LMT FETTE

Milling Tools & Inserts

Leitz Metalworking Technology Group
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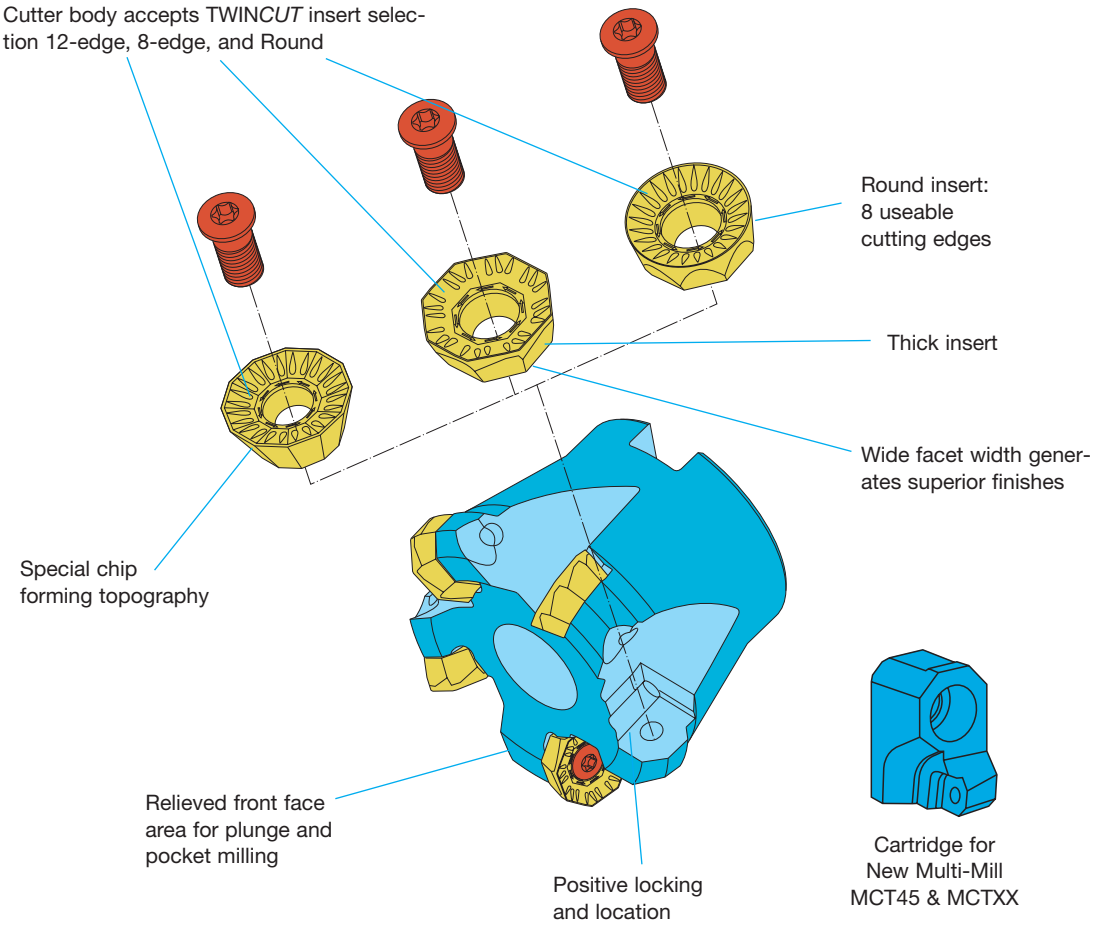
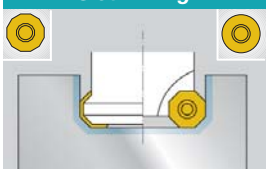
Table of Contents

FCT 45 Features & Benefits

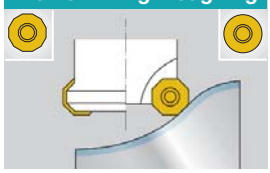
- Exclusive **TWIN*CUT*** geometry
- Large insert grade offering
- Direct pressed inserts in round, 8, and 12 cutting edges
- Designed for roughing and finishing
- Deep, positive chip grooves



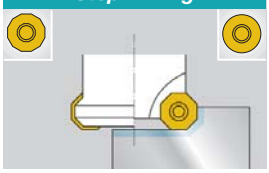
FCT45
Slot Milling



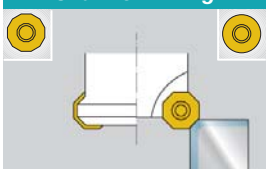
FCT45
Profile Milling-Roughing



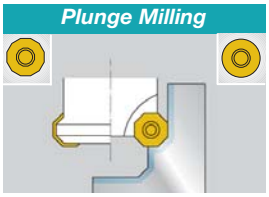
FCTXX Vario/FCT45
Step Milling



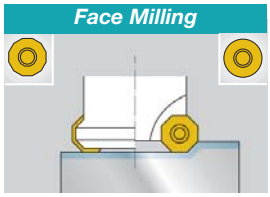
FCT45
Chamfer Milling



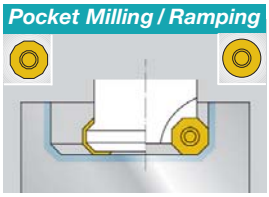
FCTXX Vario/FCT45
Plunge Milling



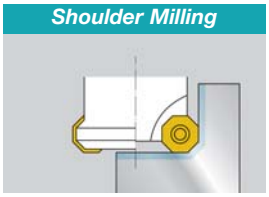
FCTXX Vario/FCT45
Face Milling



FCTXX Vario/FCT45
Pocket Milling / Ramping



FCT45
Shoulder Milling



TWIN*CUT* VARIO

The **TWIN*CUT*** VARIO is an excellent example of how cutting theory can be applied in practice. It successfully incorporates the principle of using two axially and radially offset edges to make the cut. The upper and lower rows of cutting edges each have different angles of approach and cutting depths.

This produces a technically superior chip cross-section with significantly reduced width to height relationship, sharply reducing the cutting forces. Power input can be reduced to between 75 and 85% of previous requirements. The improved dynamics of the VARIO's twin offset cutting edges make this possible and gives VARIO a competitive advantage.

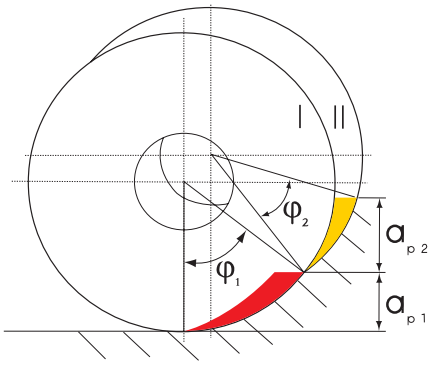
VARIO cutting tools are far superior to conventional button cutters, as they are quiet-running and reduce vibrations. This makes them especially suitable for machining under less stable conditions.

A major benefit of the Vario's innovative design is the versatility of the insert pocket. Vario's pockets will accept both the round and octagonal high-performance inserts.

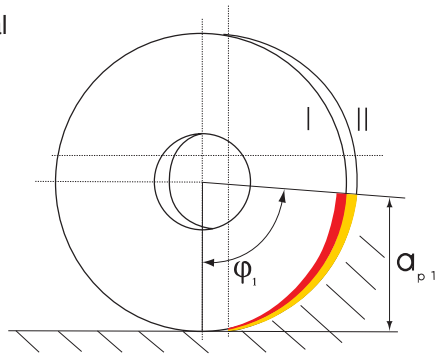
TWIN*CUT* VARIO Features & Benefits

- Broad application range for steel, castings and non-ferrous.
- Option of round or octagonal indexable inserts in same insert pocket. This flexible design helps reduce overall tooling costs.
- Increased insert thickness provides high feed rates and shorter machining times.
- Deep molded chip grooves and special design surface topography, lower horsepower requirements, reduce vibration, lower operating temperatures, yield superior surfaces, and extend tool life.
- Stable insert seating prevents insert rotation and allows precise indexing.
- Either z-axis plunging or ramping is possible making the Vario ideal for cavity milling and ramping.
- Precision sintered insert with eight effective cutting edges lower cost per cutting edge.

TWIN*CUT* VARIO
Geometry

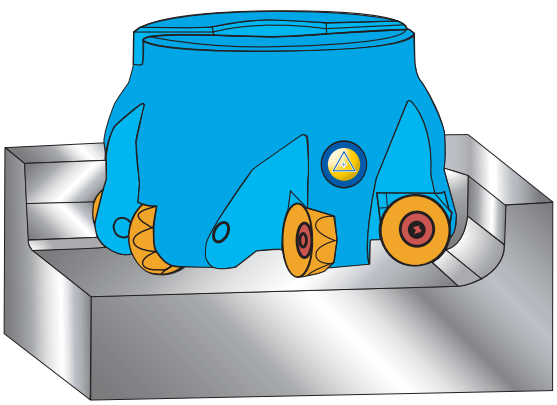


Conventional
Geometry

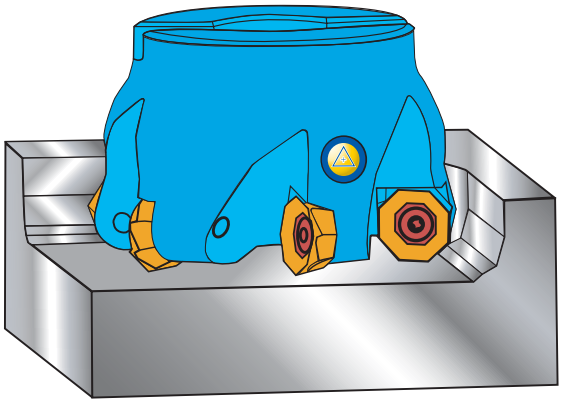


Milling profile with round inserts.

TWIN*CUT* VARIO with RCKX 1606 MO-TR



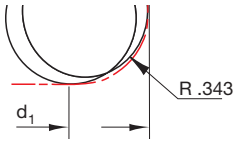
TWIN*CUT* VARIO with OCKX 0606 AD-TR

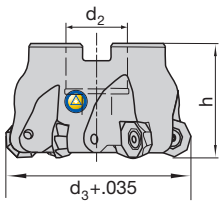


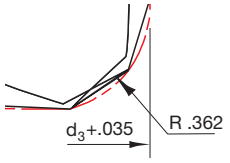
FCT XX TWINCUT - Vario

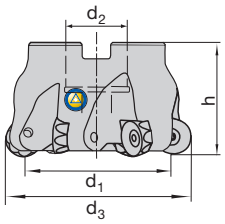
Application

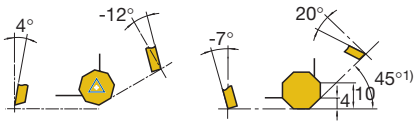
- Universal in application face milling of steel, castings, non-ferrous metals
- Exclusive TWINCUT insert design offers round, and 8 sided for roughing applications



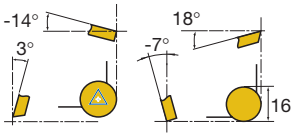








8-Sided



Round

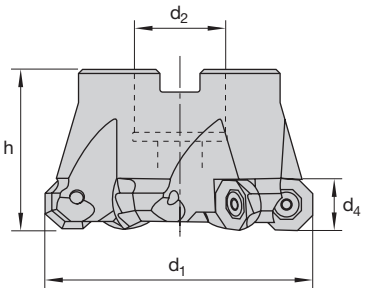
d1	Cutter Body No.	EDP	Dimensions (inches)			Teeth	Insert	Insert	Insert Screw	Torx Driver
			d3	h	d2					
1.50	FCTXX R16-150AA	51486	2.23	1.57	0.75	4	RCKX 1606	OCKX 0606	50255	50258
2.00	FCTXX R16-200AA	51487	2.73	1.57	0.75	6				
2.50	FCTXX R16-250AA	51488	3.23	1.97	0.75	6				
3.00	FCTXX R16-300AB	51489	3.73	1.97	1.00	8				
4.00	FCTXX R16-400AD	51490	4.73	1.97	1.50	10				

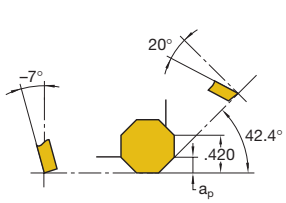
See page 8 for Inserts.
See pages 98 & 99 for recommended cutting data & application information.

FCT45 R/8/12

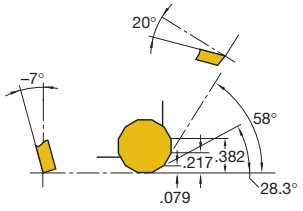
Application

- Universal milling cutter for face milling of steel, stainless and cast iron materials
- Exclusive **TWINCUT** insert design offers round, 8, and 12 cutting edges for high production milling applications

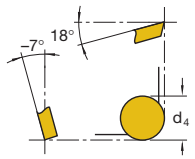




8-Sided



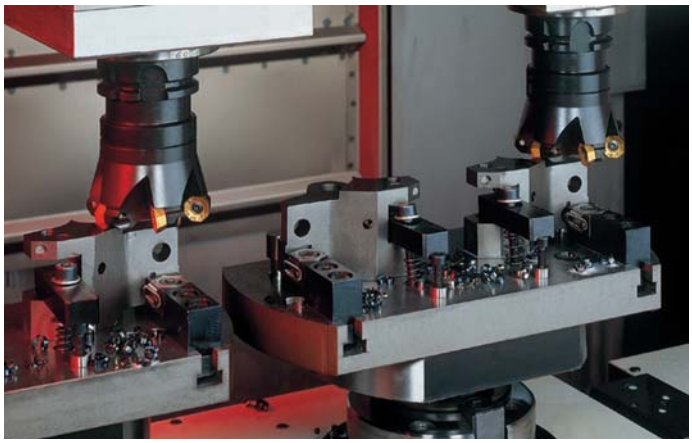
12-Sided



Round

d_1	Cutter Body No.	EDP	Dimensions (inches) max doc 8 edge	Dimensions (inches) max doc 12 edge	d_4	h	d_2	No. Teeth	Insert	Insert	Insert	Insert Screw	Torx Driver
2.00	FCT45 O06-200AA	50300	0.157	0.079	0.63	1.57	0.75	4	RCKX 1606	OCKX 0606	XCKX 1606	50255	50258
2.50	FCT45 O06-250AA	50302	0.157	0.079	0.63	1.97	0.75	4					
3.00	FCT45 O06-300AB	50304	0.157	0.079	0.63	1.97	1.00	5					
4.00	FCT45 O06-400AD	50306	0.157	0.079	0.63	1.97	1.50	7					
5.00	FCT45 O06-500AD	50308	0.157	0.079	0.63	2.48	1.50	8					

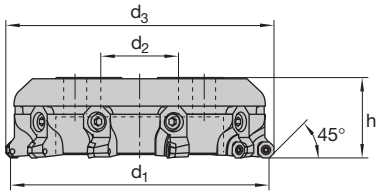
See page 8 for Inserts.
See pages 96 & 97 for recommended cutting data & application information.

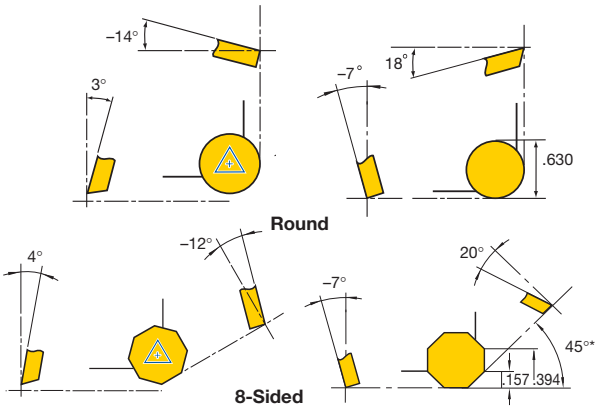


MCTXX TWINCUT VARIO

Application

- Universal modular milling cutter for face milling of steels, stainless and cast iron materials
- Especially suited for unstable machining and poor fixturing conditions
- Exclusive **TWINCUT** insert design offers round, and 8 sided inserts for high production milling applications
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*

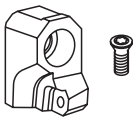




* angle generated when machining = 43°

Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

d_1	Cutter Body No.	EDP	Dimensions (inches) d_3	h	d_2	No. Teeth	Insert	Insert	Insert Screw	Torx Driver
Coarse Pitch										
4.00	MCTXX R16-400AD	55934	4.73	2.48	1.50	6	RCKX 1606	OCKX 0606	50255	50258
5.00	MCTXX R16-500AD	52511	5.73	2.48	1.50	8				
6.00	MCTXX R16-600AD	53927	6.73	2.48	1.50	10				
8.00	MCTXX R16-800AF	55935	8.73	2.48	2.50	12				
10.00	MCTXX R16-1000AF	53416	10.73	2.48	2.50	14				
12.00	MCTXX R16-1200AF	55936	12.73	3.15	2.50	18				
16.00	MCTXX R16-1600AF	55937	16.73	3.15	2.50	20				
20.00	MCTXX R16-2000AF	55938	20.73	3.15	2.50	28				
Fine Pitch										
5.00	MCTXX R16-500ADF	55939	5.73	2.48	1.50	8	RCKX 1606	OCKX 0606	50255	50258
6.00	MCTXX R16-600ADF	53519	6.73	2.48	1.50	12				
8.00	MCTXX R16-800AFF	55940	8.73	2.48	2.50	16				
10.00	MCTXX R16-1000AFF	55941	10.73	2.48	2.50	20				
12.00	MCTXX R16-1200AFF	55942	12.73	3.15	2.50	24				
16.00	MCTXX R16-1600AFF	54284	16.73	3.15	2.50	30				
20.00	MCTXX R16-2000AFF	55943	20.73	3.15	2.50	40				



Cartridge
51979

Cartridge Screw
50253

Cartridge Key
50254

Adjustment Screw
50263

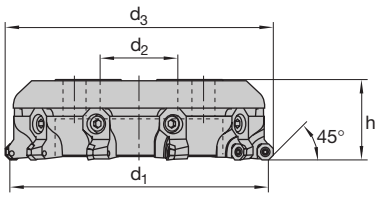
Adjustment Key
50264

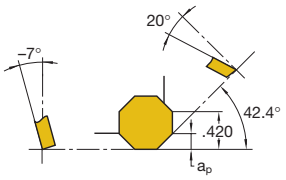
See page 8 for Inserts.
See pages 98 & 99 for recommended cutting data & application information.
Refer to page 111 in Technical Section for Multi-Mill Assembly and Adjustment Instructions.

MCT45 R/8/12

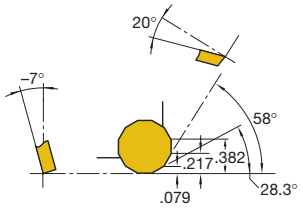
Application

- Universal modular milling cutter for face milling of steels, stainless and cast iron materials
- Exclusive **TWINCUT** insert design offers round, 8, and 12 cutting edges for high production milling applications
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*

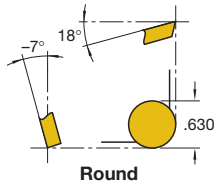




8-Sided



12-Sided



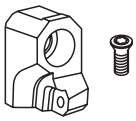
Round

Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.



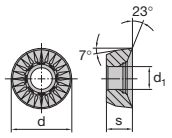
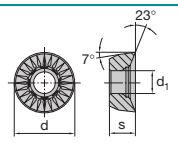
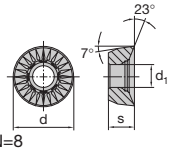
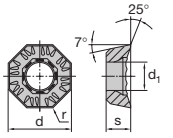
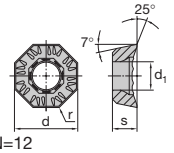
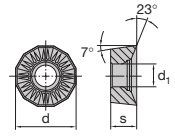


d_1	Cutter Body No.	EDP	Dimensions (inches) d_3	h	d_2	No. Teeth	Insert	Insert	Insert	Insert Screw	Torx Driver
Coarse Pitch											
4.00	MCT45 O06-400AD	50620	4.51	2.48	1.50	6	RCKX 1606	OCKX 0606	XCKX 1606	50255	50258
5.00	MCT45 O06-500AD	50622	5.51	2.48	1.50	6					
6.00	MCT45 O06-600AD	50624	6.51	2.48	1.50	10					
8.00	MCT45 O06-800AF	50626	8.51	2.48	2.50	12					
10.00	MCT45 O06-1000AF	50628	10.51	2.48	2.50	14					
12.00	MCT45 O06-1200AF	50630	12.51	3.15	2.50	18					
16.00	MCT45 O06-1600AF	50632	16.51	3.15	2.50	20					
20.00	MCT45 O06-2000AF	50634	20.51	3.15	2.50	28					
Fine Pitch											
5.00	MCT45 O06-500ADF	50636	5.51	2.48	1.50	8	RCKX 1606	OCKX 0606	XCKX 1606	50255	50258
6.00	MCT45 O06-600ADF	50638	6.51	2.48	1.50	12					
8.00	MCT45 O06-800AFF	50640	8.51	2.48	2.50	16					
10.00	MCT45 O06-1000AFF	50642	10.51	2.48	2.50	20					
12.00	MCT45 O06-1200AFF	50644	12.51	3.15	2.50	24					
16.00	MCT45 O06-1600AFF	50646	16.51	3.15	2.50	30					
20.00	MCT45 O06-2000AFF	50648	20.51	3.15	2.50	40					

				
Cartridge 50650	Cartridge Screw 50253	Cartridge Key 50254	Adjustment Screw 50263	Adjustment Key 50264

See page 8 for Inserts.
See pages 96 & 97 for recommended cutting data & application information.
Refer to page 111 in Technical Section for Multi-Mill Assembly and Adjustment Instructions.

Inserts

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=		.250	.630	.228			RCKX 1606 MO-TR		**LC225S** 60692			FCT45 R/8/12 MCT45 R/8/12
										LC240T 60696		
										LC610T 51530	**LC230F** 53241	
								LW610 51529				
 N=8		.250	.630	.228			RCKX 1606 MO-TRT			**LC610T** 51515		
 N=8		.250	.630	.228			RCKX 1606 MO-TRT			**LC280TT** 54081		
 N=8		.250	.630	.228		.020	OCKX 0606 AD-TR		**LC225S** 60704			
											LC230F 53242	
										LC240T 60708		
								LW610 51531			**LC615E** 55949	
 N=12		.250	.630	.228		.020	OCKX 0606 AD-TRT			**LC280TT** 54077		
 N=12		.250	.630	.228		.020	XCKX 1606 ZDR-TR		**LC225S** 52556			
											LC230F 53242	
										LC240T 60724		
									LC630S 60700	**LC630T** 60702		
								LW610 51532		**LC610T** 10255	**LC615E** 60698	

**F = CVD Multilayer
E = AL_2O_3

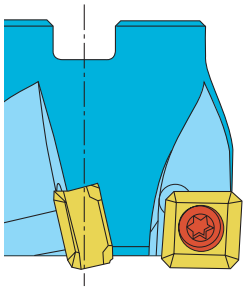
Features & Benefits

LMT-FETTE's exclusive **TWIN*CUT*** geometry lowers cutting forces and enables aggressive feed rates.

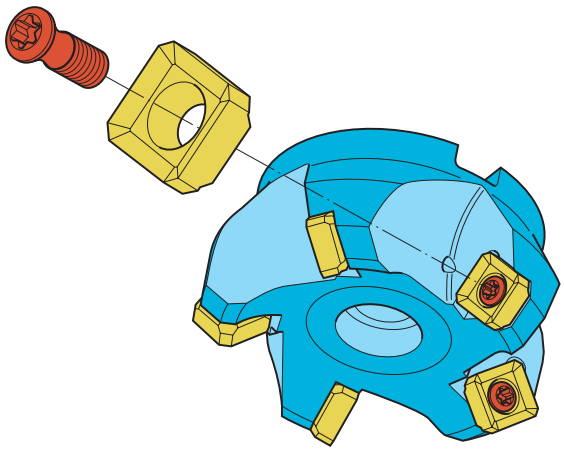
Double Negative Geometry:

The double negative insert position with high positive rake angles works well on a wide variety of materials, and on a wide variety of machines as well. The double negative design is exceptionally strong, offering unsurpassed smooth cutting action. **TWIN*CUT*** geometry directs downward pressure on the work piece, thus providing stability.

- Excellent on steels and cast iron
- Large insert seating surface
- Thick insert with rigid cross section



FMT87

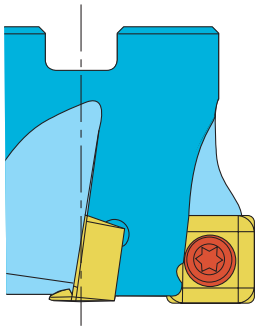


FMT45

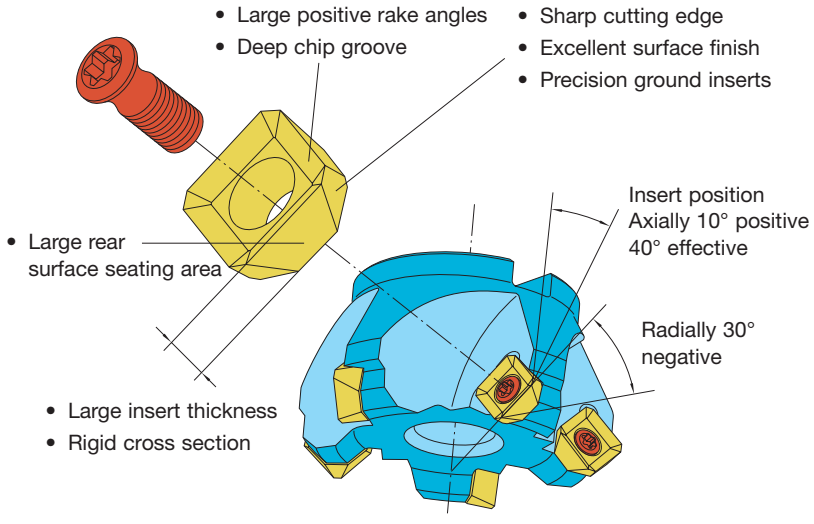
Positive Geometry:

The cutter is designed with a positive axial rake angle that allows the insert to cleanly and quietly shear the workpiece materials. This not only reduces horsepower requirements, but actually reduces wear on machine spindle bearings, ball screws and other components.

- Excellent on stainless steels, high temperature alloys and non-ferrous materials
- Extremely smooth cutting action



FMT90



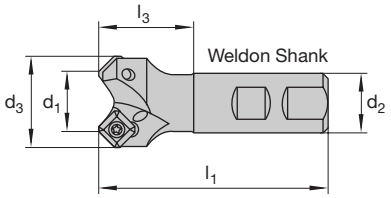
FMV45

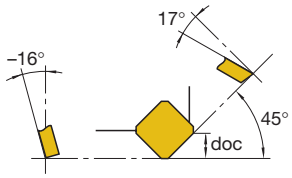
EMT45

Application

- Milling cutter for face and chamfer milling of steel and cast iron materials
- Relieved front face for plunge and heavy die sinking operations
- Features ramp milling capabilities

See page 95 for ramping angles





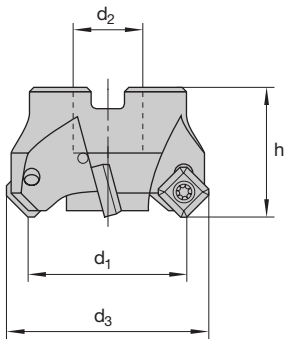
d_1	Cutter Body No.	EDP	Dimensions (inches)				No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
			d_3	l_3	l_1	d_2					
1.00	EMT45 S12-100WE	50464	1.56	1.72	4.00	1.00	2	1950058	SNKX 1205	50256	50258
1.00	EMT45 S12-100WD	50466	1.56	1.72	3.75	0.75	2	1950214			
1.25	EMT45 S12-125WE	50468	1.81	1.72	4.00	1.00	3	1950061			
1.25	EMT45 S12-125WD	50470	1.81	1.72	3.75	0.75	3	1950216			
1.50	EMT45 S12-150WE	50472	2.06	1.72	4.00	1.00	3	1950066			
1.50	EMT45 S12-150WD	50474	2.06	1.72	3.75	0.75	3	1950218			

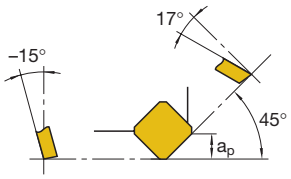
See page 18 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.

FMT45

Application

- First choice milling cutter for face milling of steel and cast iron materials
- Used in rough and finish milling operations
- Features ramp milling capabilities





d_1	Cutter Body No.	EDP	Dimensions (inches)				No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
			doc	d_3	h	d_2					
2.00	FMT45 S12-200AA	50310	0.28	2.56	1.57	0.75	4	1950044	SNKX 1205	50256	50258
2.50	FMT45 S12-250AA	50312	0.28	3.06	1.57	0.75	5	1950046			
3.00	FMT45 S12-300AB	50314	0.28	3.56	1.97	1.00	5	1950048			
3.00	FMT45 S12-300ABF*	50316	0.28	3.56	1.97	1.00	6	1950048I			
4.00	FMT45 S12-400AD	50318	0.28	4.56	1.97	1.50	7	1950050			
5.00	FMT45 S12-500AD	50320	0.28	5.56	2.48	1.50	8	1950052			
6.00	FMT45 S12-600AD	50322	0.28	6.56	2.48	1.50	9	1950054			
8.00	FMT45 S12-800AF	50324	0.28	8.56	2.48	2.50	12	1950205			
10.00	FMT45 S12-1000AF	50326	0.28	10.56	2.48	2.50	16	1950206			

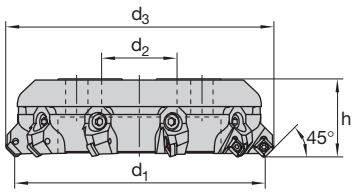
*Fine Pitch

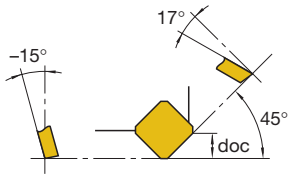
See page 18 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.

MMT45

Application

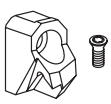
- First choice modular milling cutter for face milling of steel and cast iron materials
- Used in rough and finish milling operations
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*





Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

d_1	Cutter Body No.	EDP No.	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
Coarse Pitch										
4.00	MMT45 S12-400AD	50061	0.280	4.55	2.48	1.50	6	SNKX 1205 1187-90 Wiper	50256	50258
5.00	MMT45 S12-500AD	50062	0.280	5.55	2.48	1.50	6			
6.00	MMT45 S12-600AD	50063	0.280	6.55	2.48	1.50	10			
8.00	MMT45 S12-800AF	50064	0.280	8.55	2.48	2.50	12			
10.00	MMT45 S12-1000AF	50065	0.280	10.55	2.48	2.50	14			
12.00	MMT45 S12-1200AF	50066	0.280	12.55	3.15	2.50	18			
16.00	MMT45 S12-1600AF	50067	0.280	16.55	3.15	2.50	20			
20.00	MMT45 S12-2000AF	50068	0.280	20.55	3.15	2.50	28			
Fine Pitch										
5.00	MMT45 S12-500ADF	50069	0.280	5.55	2.48	1.50	8	SNKX 1205 1187-90 Wiper	50256	50258
6.00	MMT45 S12-600ADF	50070	0.280	6.55	2.48	1.50	12			
8.00	MMT45 S12-800AFF	50071	0.280	8.55	2.48	2.50	16			
10.00	MMT45 S12-1000AFF	50072	0.280	10.55	2.48	2.50	20			
12.00	MMT45 S12-1200AFF	50073	0.280	12.55	3.15	2.50	24			
16.00	MMT45 S12-1600AFF	50074	0.280	16.55	3.15	2.50	30			
20.00	MMT45 S12-2000AFF	50075	0.280	20.55	3.15	2.50	40			

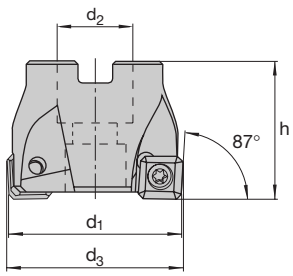
				
Cartridge SNKX 1205 50241	Cartridge Screw 50253	Cartridge Key 50254	Adjustment Screw 50263	Adjustment Key 50264

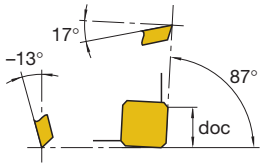
See page 18 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

FMT87

Application

- All purpose milling cutter for face and shoulder milling of steel and cast iron materials
- Used in rough and finish milling operations





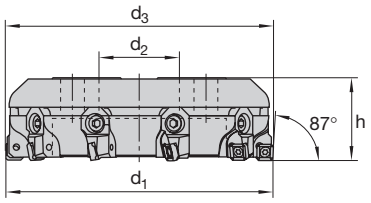
d_1	Cutter Body No.	EDP No.	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
2.00	FMT87 S12-200AA	50332	0.390	2.06	1.57	0.75	4	1950056	SNKX 1205	50256	50258
2.50	FMT87 S12-250AA	50334	0.390	2.56	1.57	0.75	5	1950068			
3.00	FMT87 S12-300AB	50336	0.390	3.06	1.97	1.00	6	1950132			
4.00	FMT87 S12-400AD	50338	0.390	4.06	1.97	1.50	7	1950133			
5.00	FMT87 S12-500AD	50340	0.390	5.06	2.48	1.50	8	1950134			
6.00	FMT87 S12-600AD	50342	0.390	6.06	2.48	1.50	9	1950138			

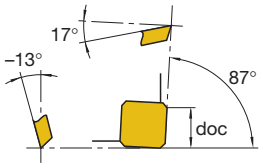
See page 18 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.

MMT87

Application

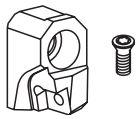
- All purpose modular milling cutter for face and shoulder milling of steel and cast iron materials
- Used in rough milling operations
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*





Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
Coarse Pitch										
4.00	MMT87 S12-400AD	50106	0.394	4.03	2.48	1.50	6	SNKX 1205	50256	50258
5.00	MMT87 S12-500AD	50107	0.394	5.03	2.48	1.50	6			
6.00	MMT87 S12-600AD	50108	0.394	6.03	2.48	1.50	10			
8.00	MMT87 S12-800AF	50109	0.394	8.03	2.48	2.50	12			
10.00	MMT87 S12-1000AF	50110	0.394	10.03	2.48	2.50	14			
12.00	MMT87 S12-1200AF	50111	0.394	12.03	3.15	2.50	18			
16.00	MMT87 S12-1600AF	50112	0.394	16.03	3.15	2.50	20			
20.00	MMT87 S12-2000AF	50113	0.394	20.03	3.15	2.50	28			
Fine Pitch										
5.00	MMT87 S12-500ADF	50114	0.394	5.03	2.48	1.50	8	SNKX 1205	50256	50258
6.00	MMT87 S12-600ADF	50115	0.394	6.03	2.48	1.50	12			
8.00	MMT87 S12-800AFF	50116	0.394	8.03	2.48	2.50	16			
10.00	MMT87 S12-1000AFF	50117	0.394	10.03	2.48	2.50	20			
12.00	MMT87 S12-1200AFF	50118	0.394	12.03	3.15	2.50	24			
16.00	MMT87 S12-1600AFF	50119	0.394	16.03	3.15	2.50	30			
20.00	MMT87 S12-2000AFF	50120	0.394	20.03	3.15	2.50	40			



Cartridge
50244

Cartridge Screw
50253

Cartridge Key
50254

Adjustment Screw
50263

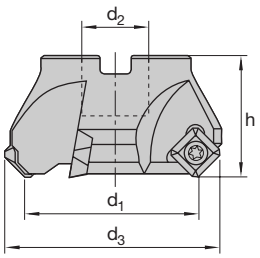
Adjustment Key
50264

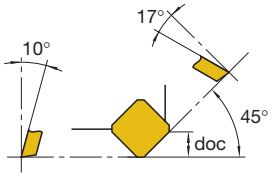
See page 18 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

FMV45

Application

- High performance *positive* milling cutter for face milling of stainless, high temperature alloys and non-ferrous materials
- Used in rough and finish milling operations
- Extremely smooth and quiet cutting action
- Designed to work well on low horsepower machines





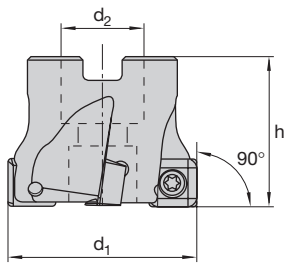
d_1	Cutter Body No.	EDP No.	Dimensions (inches)				No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
			doc	d_3	h	d_2					
2.50	FMV45 S12-250AA	50356	0.197	2.93	1.57	0.75	5	1950223	SNHX 1205	50256	50258
3.00	FMV45 S12-300AB	50358	0.197	3.43	1.97	1.00	6	1950225			
4.00	FMV45 S12-400AD	50360	0.197	4.43	1.97	1.50	7	1950227			
5.00	FMV45 S12-500AD	50362	0.197	5.43	2.48	1.50	8	1950229			
6.00	FMV45 S12-600AD	50364	0.197	6.43	2.48	1.50	9	1950231			

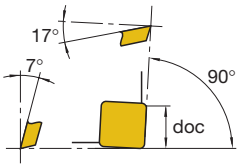
See page 18 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

FMT90

Application

- All purpose *positive* milling cutter for face and square shoulder milling of steel and non-ferrous materials
- Used in rough and finish milling operations





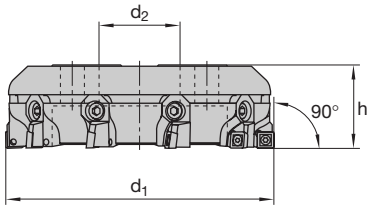
d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
2.00	FMT90 S12-200AA	50344	0.390	–	1.58	0.75	4	1950197	SPKX 120508	50256	50258
2.50	FMT90 S12-250AA	50346	0.390	–	1.58	0.75	5	1950198			
3.00	FMT90 S12-300AB	50348	0.390	–	1.97	1.00	6	1950199			
4.00	FMT90 S12-400AD	50350	0.390	–	1.97	1.50	7	1950201			
5.00	FMT90 S12-500AD	50352	0.390	–	2.48	1.50	8	1950203			
6.00	FMT90 S12-600AD	50354	0.390	–	2.48	1.50	9	1950204			

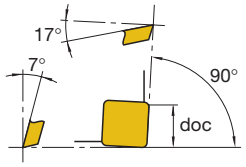
See page 18 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.

MMT90

Application

- General purpose modular milling cutter for face and square shoulder milling of steel, cast iron and non-ferrous materials
- Used in rough and finish milling operations
- Positive cutting action for low horsepower machines
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*

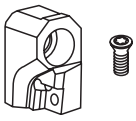




Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.



d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
Coarse Pitch										
4.00	MMT90 S12-400AD	50151	0.394	–	2.48	1.50	6	SPKX 120508	50256	50258
5.00	MMT90 S12-500AD	50152	0.394	–	2.48	1.50	6			
6.00	MMT90 S12-600AD	50153	0.394	–	2.48	1.50	10			
8.00	MMT90 S12-800AF	50154	0.394	–	2.48	2.50	12			
10.00	MMT90 S12-1000AF	50155	0.394	–	2.48	2.50	14			
12.00	MMT90 S12-1200AF	50156	0.394	–	3.15	2.50	18			
16.00	MMT90 S12-1600AF	50157	0.394	–	3.15	2.50	20			
20.00	MMT90 S12-2000AF	50158	0.394	–	3.15	2.50	28			
Fine Pitch										
5.00	MMT90 S12-500ADF	50159	0.394	–	2.48	1.50	8	SPKX 120508	50256	50258
6.00	MMT90 S12-600ADF	50160	0.394	–	2.48	1.50	12			
8.00	MMT90 S12-800AFF	50161	0.394	–	2.48	2.50	16			
10.00	MMT90 S12-1000AFF	50162	0.394	–	2.48	2.50	20			
12.00	MMT90 S12-1200AFF	50163	0.394	–	3.15	2.50	24			
16.00	MMT90 S12-1600AFF	50164	0.394	–	3.15	2.50	30			
20.00	MMT90 S12-2000AFF	50165	0.394	–	3.15	2.50	40			



Cartridge
50247

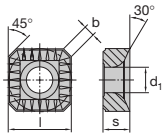
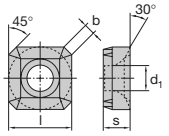
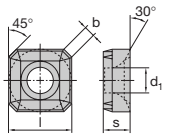
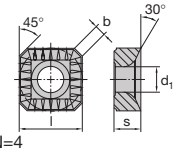
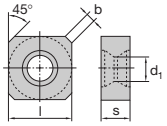
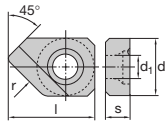
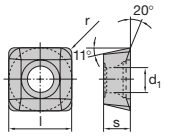
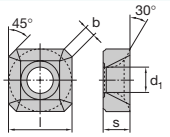
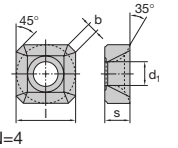
Cartridge Screw
50253

Cartridge Key
50254

Adjustment Screw
50263

Adjustment Key
50264

See page 18 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

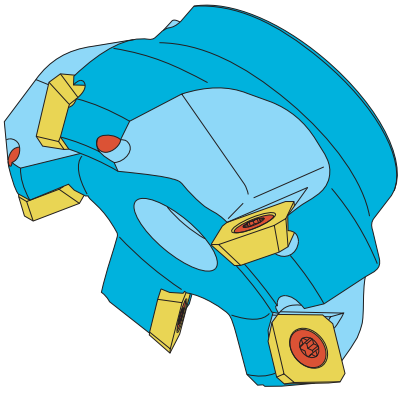
N = Number of Cutting Edges	Dimensions (inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=4	.500	.219		.205	.078		SNKX 1205 AN-TR 1187-10 TR		**LC225S** 60045			FMT 45 11250-12 FMT87 11230 MMT45 MMT90
										LC240T 60047		
										LC610T 60048		
 N=4	.500	.219		.205	.078		SNKX 1205 AN 1187-10		**LC225S** 60036			FMT 45 11250-12 FMT87 11230 MMT45 MMT90
											LC230F 53791	
										LC240T 60039		
								LW610 60035	**LC610T** 89936		**LC615E** 55955	
 N=4	.500	.219		.205	.078		SNKX 1205 AN-T 1187-12 T-Land		**LC225S** 60050			FMT 45 11250-12 FMT87 11230 MMT45 MMT90
										LC240T 60053		
										LC610T 60054		
 N=4	.500	.219		.205	.078		SNKX 1205 AN-TT T-Land			**LC280TT** 54089		FMT 45 11250-12 FMT87 11230 MMT45 MMT90
 N=8	.500	.219		.205	.078		SNKQ 1205 AN 1187-13			**LC240T** 50735		FMT 45 11250-12 FMT87 11230 MMT45 MMT90
								LW610 60055		**LC610T** 51953	**LC615E** 55954	
 N=1	.750	.219	.500	.205			1187-90 Wiper Insert		**LC225S** 60058			FMT 45 11250-12 MMT45
 N=4	.500	.219		.205		.032	SPKX 120508 1187-15		**LC225S** 60091			FMT90 11260 MMT90
										LC240T 60093		
											LC230F 53797	
								LW610 60090			**LC615E** 60726	
 N=4	.500	.219		.205	.086		SNHX 1205 AE 1187-18		**LC225S** 60340		**LC230F** 53787	FMV45 11280
									LC440T 50948			
 N=4	.500	.219		.205	.078		SNHT 1205 AEFN-ALC 1187-18 ALC				**LC610T*** 89221	FMV45 11280

**F = CVD Multilayer
E = AL_2O_3

*LC610T CVD Coated TiAlN

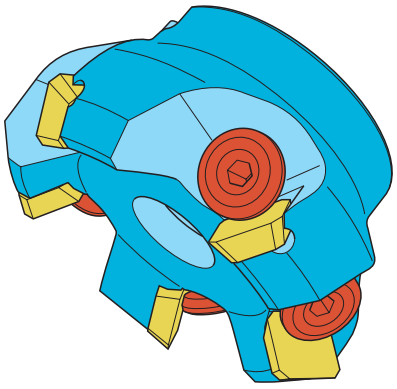
Features & Benefits

- High positive cutting geometry
- Quiet cutting action
- High cutting capacity with low horsepower machines or unstable conditions
- ISO indexable inserts



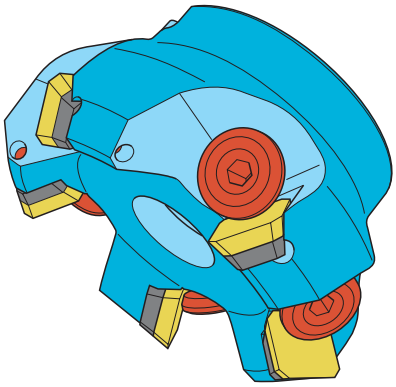
FMH45B

- Torx screw locking
- Thicker inserts for higher feed rates



FMH45A

- Locking screw (left-hand thread) for secure clamping
- Thicker inserts for higher feed rates



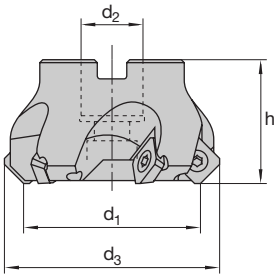
FMH45

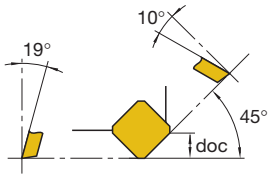
- Indexable inserts shims to protect the steel cutter body
- Locking screw (left-hand thread) for secure clamping

FMH45B

Application

- General purpose milling cutter for face milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish milling operations
- Uses ISO style inserts
- Ideal for low horsepower machines





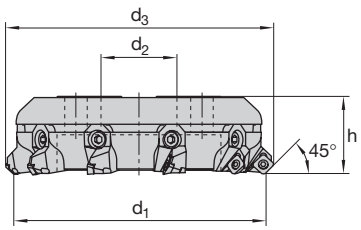
d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
2.00	FMH45B S12-200AA	50372	0.216	2.51	1.57	0.75	4	SEHW 1204	50255	50258
3.00	FMH45B S12-300AB	50374	0.216	3.51	1.97	1.00	5			
4.00	FMH45B S12-400AD	50376	0.216	4.51	1.97	1.50	6			

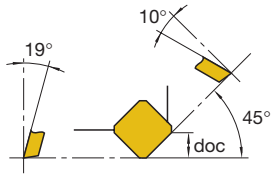
See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.

MMH45B

Application

- General purpose modular milling cutter for face milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish milling operations
- Uses ISO style inserts
- Smooth cutting action on low horsepower machines
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*

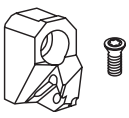




Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.



d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
Coarse Pitch										
4.00	MMH45B S12-400AD	50046	0.216	4.51	2.48	1.50	6	SEHW 1204	50255	50258
5.00	MMH45B S12-500AD	50047	0.216	5.51	2.48	1.50	6			
6.00	MMH45B S12-600AD	50048	0.216	6.51	2.48	1.50	10			
8.00	MMH45B S12-800AF	50049	0.216	8.51	2.48	2.50	12			
10.00	MMH45B S12-1000AF	50050	0.216	10.51	2.48	2.50	14			
12.00	MMH45B S12-1200AF	50051	0.216	12.51	3.15	2.50	18			
16.00	MMH45B S12-1600AF	50052	0.216	16.51	3.15	2.50	20			
20.00	MMH45B S12-2000AF	50053	0.216	20.51	3.15	2.50	28			
Fine Pitch										
5.00	MMH45B S12-500ADF	50054	0.216	5.51	2.48	1.50	8	SEHW 1204	50255	50258
6.00	MMH45B S12-600ADF	50055	0.216	6.51	2.48	1.50	12			
8.00	MMH45B S12-800AFF	50056	0.216	8.51	2.48	2.50	16			
10.00	MMH45B S12-1000AFF	50057	0.216	10.51	2.48	2.50	20			
12.00	MMH45B S12-1200AFF	50058	0.216	12.51	3.15	2.50	24			
16.00	MMH45B S12-1600AFF	50059	0.216	16.51	3.15	2.50	30			
20.00	MMH45B S12-2000AFF	50060	0.216	20.51	3.15	2.50	40			

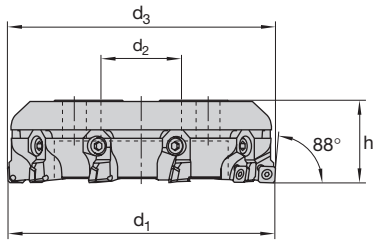
				
Cartridge 50240	Cartridge Screw 50253	Cartridge Key 50254	Adjustment Screw 50263	Adjustment Key 50264

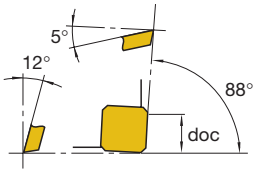
See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

MMH88B

Application

- General purpose modular milling cutter for face and shoulder milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish face and shoulder milling operations
- Uses ISO style inserts
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*

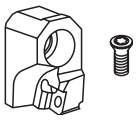




Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.



d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
Coarse Pitch										
4.00	MMH88B S12-400AD	50136	0.394	4.03	2.48	1.50	6	SEHW 1204	50255	50258
5.00	MMH88B S12-500AD	50137	0.394	5.03	2.48	1.50	6			
6.00	MMH88B S12-600AD	50138	0.394	6.03	2.48	1.50	10			
8.00	MMH88B S12-800AF	50139	0.394	8.03	2.48	2.50	12			
10.00	MMH88B S12-1000AF	50140	0.394	10.03	2.48	2.50	14			
12.00	MMH88B S12-1200AF	50141	0.394	12.03	3.15	2.50	18			
16.00	MMH88B S12-1600AF	50142	0.394	16.03	3.15	2.50	20			
20.00	MMH88B S12-2000AF	50143	0.394	20.03	3.15	2.50	28			
Fine Pitch										
5.00	MMH88B S12-500ADF	50144	0.394	5.03	2.48	1.50	8	SEHW 1204	50255	50258
6.00	MMH88B S12-600ADF	50145	0.394	6.03	2.48	1.50	12			
8.00	MMH88B S12-800AFF	50146	0.394	8.03	2.48	2.50	16			
10.00	MMH88B S12-1000AFF	50147	0.394	10.03	2.48	2.50	20			
12.00	MMH88B S12-1200AFF	50148	0.394	12.03	3.15	2.50	24			
16.00	MMH88B S12-1600AFF	50149	0.394	16.03	3.15	2.50	30			
20.00	MMH88B S12-2000AFF	50150	0.394	20.03	3.15	2.50	40			

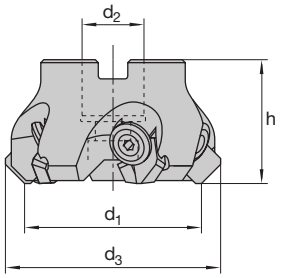
Cartridge	Cartridge Screw	Cartridge Key	Adjustment Screw	Adjustment Key
				
50246	50253	50254	50263	50264

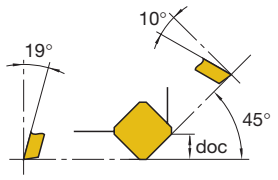
See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

FMH45A

Application

- General purpose milling cutter for face milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish milling operations
- Uses ISO style inserts
- High positive cutting geometry for low horsepower machines





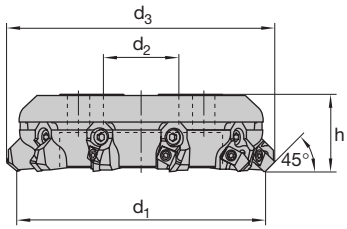
d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
2.00	FMH45A S12-200AA	50384	0.216	2.51	1.57	0.75	4	SEKN 1204	50652	50264
3.00	FMH45A S12-300AB	50386	0.216	3.51	1.97	1.00	5		50654	
4.00	FMH45A S12-400AD	50388	0.216	4.51	1.97	1.50	6		50654	

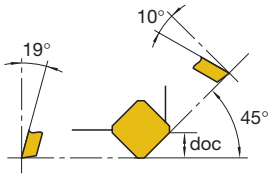
See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.

MMH45A

Application

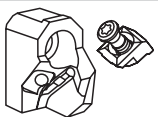
- General purpose modular milling cutter for face milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish milling operations
- Uses ISO style inserts
- Smooth cutting action on low horsepower machines
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*





Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Wedge Clamp Assembly	Wedge Driver (Torx)
Coarse Pitch										
4.00	MMH45A S12-4-400AD	50016	0.216	4.51	2.48	1.50	6	SEKN 1204	50260	50262
5.00	MMH45A S12-4-500AD	50017	0.216	5.51	2.48	1.50	6			
6.00	MMH45A S12-4-600AD	50018	0.216	6.51	2.48	1.50	10			
8.00	MMH45A S12-4-800AF	50019	0.216	8.51	2.48	2.50	12			
10.00	MMH45A S12-4-1000AF	50020	0.216	10.51	2.48	2.50	14			
12.00	MMH45A S12-4-1200AF	50021	0.216	12.51	3.15	2.50	18			
16.00	MMH45A S12-4-1600AF	50022	0.216	16.51	3.15	2.50	20			
20.00	MMH45A S12-4-2000AF	50023	0.216	20.51	3.15	2.50	28			
Fine Pitch										
5.00	MMH45A S12-4-500ADF	50024	0.216	5.51	2.48	1.50	8	SEKN 1204	50260	50262
6.00	MMH45A S12-4-600ADF	50025	0.216	6.51	2.48	1.50	12			
8.00	MMH45A S12-4-800AFF	50026	0.216	8.51	2.48	2.50	16			
10.00	MMH45A S12-4-1000AFF	50027	0.216	10.51	2.48	2.50	20			
12.00	MMH45A S12-4-1200AFF	50028	0.216	12.51	3.15	2.50	24			
16.00	MMH45A S12-4-1600AFF	50029	0.216	16.51	3.15	2.50	30			
20.00	MMH45A S12-4-2000AFF	50030	0.216	20.51	3.15	2.50	40			


Cartridge
50239


Cartridge Screw
50253


Cartridge Key
50254


Wedge Screw
50261


Adjustment Screw
50263

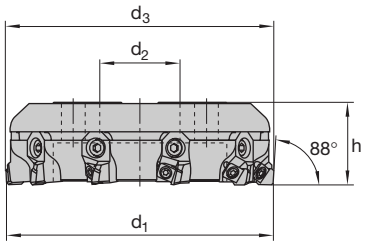

Adjustment Key
50264

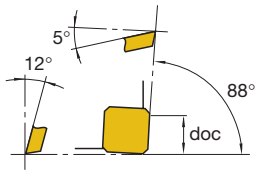
See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

MMH88A

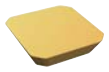
Application

- General purpose modular milling cutter for face and shoulder milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish milling operations
- Uses ISO style inserts
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*

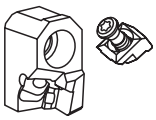




Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

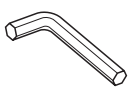


d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Wedge Clamp Assembly	Wedge Driver (Torx)
Coarse Pitch										
4.00	MMH88A S12-400AD	50121	0.394	4.03	2.48	1.50	6	SEKN 1204	50260	50262
5.00	MMH88A S12-500AD	50122	0.394	5.03	2.48	1.50	6			
6.00	MMH88A S12-600AD	50123	0.394	6.03	2.48	1.50	10			
8.00	MMH88A S12-800AF	50124	0.394	8.03	2.48	2.50	12			
10.00	MMH88A S12-1000AF	50125	0.394	10.03	2.48	2.50	14			
12.00	MMH88A S12-1200AF	50126	0.394	12.03	3.15	2.50	18			
16.00	MMH88A S12-1600AF	50127	0.394	16.03	3.15	2.50	20			
20.00	MMH88A S12-2000AF	50128	0.394	20.03	3.15	2.50	28			
Fine Pitch										
5.00	MMH88A S12-500ADF	50129	0.394	5.03	2.48	1.50	8	SEKN 1204	50260	50262
6.00	MMH88A S12-600ADF	50130	0.394	6.03	2.48	1.50	12			
8.00	MMH88A S12-800AFF	50131	0.394	8.03	2.48	2.50	16			
10.00	MMH88A S12-1000AFF	50132	0.394	10.03	2.48	2.50	20			
12.00	MMH88A S12-1200AFF	50133	0.394	12.03	3.15	2.50	24			
16.00	MMH88A S12-1600AFF	50134	0.394	16.03	3.15	2.50	30			
20.00	MMH88A S12-2000AFF	50135	0.394	20.03	3.15	2.50	40			



Cartridge
50245

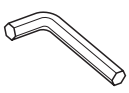
Cartridge Screw
50253



Cartridge Key
50254

Wedge Screw
50261

Adjustment Screw
50263



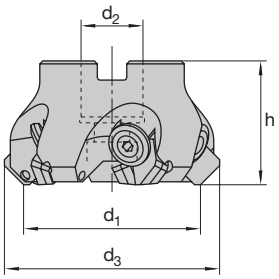
Adjustment Key
50264

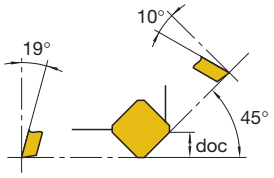
See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

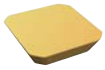
FMH45

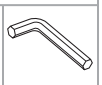
Application

- General purpose milling cutter for face milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish milling operations
- Uses ISO style inserts
- High positive cutting geometry for low horsepower machines









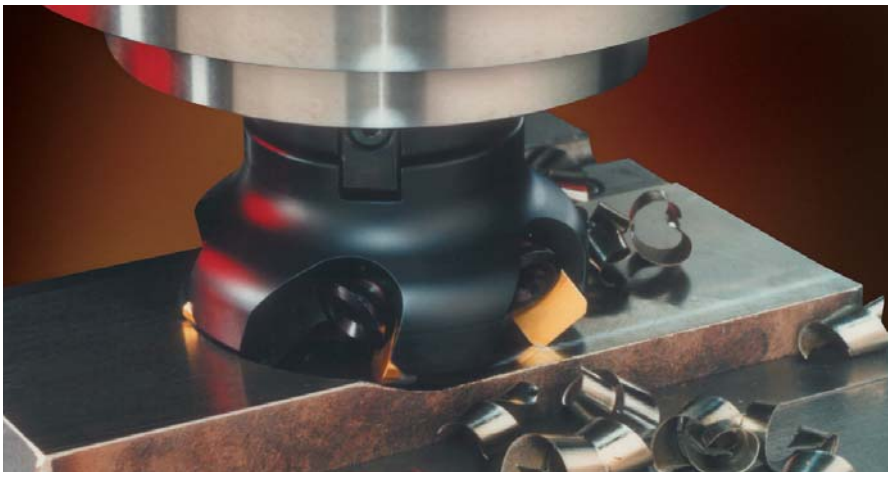
d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Insert Locking Screw	Insert Locking Key
2.00	FMH45 S12-200AA	50378	0.216	2.51	1.57	0.75	4	SEKN 1203	50652	50264
3.00	FMH45 S12-300AB	50380	0.216	3.51	1.97	1.00	5		50654	
4.00	FMH45 S12-400AD	50382	0.216	4.51	1.97	1.50	6		50654	

Insert Shim
50578

Shim Screw
50580

Shim Driver (Torx)
50582

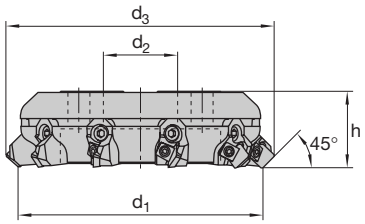
See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.

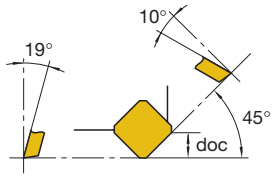


MMH45 S12

Application

- General purpose modular milling cutter for face milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish milling operations
- Uses ISO style inserts
- High positive cutting geometry
- Smooth cutting action on low horsepower machines
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*

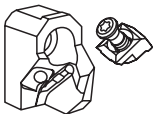




Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

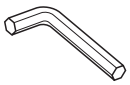


d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Wedge Clamp Assembly	Wedge Driver (Torx)
Coarse Pitch										
4.00	MMH45 S12-3-400AD	50001	0.216	4.51	2.48	1.50	6	SEKN 1203	50260	50262
5.00	MMH45 S12-3-500AD	50002	0.216	5.51	2.48	1.50	6			
6.00	MMH45 S12-3-600AD	50003	0.216	6.51	2.48	1.50	10			
8.00	MMH45 S12-3-800AF	50004	0.216	8.51	2.48	2.50	12			
10.00	MMH45 S12-3-1000AF	50005	0.216	10.51	2.48	2.50	14			
12.00	MMH45 S12-3-1200AF	50006	0.216	12.51	3.15	2.50	18			
16.00	MMH45 S12-3-1600AF	50007	0.216	16.51	3.15	2.50	20			
20.00	MMH45 S12-3-2000AF	50008	0.216	20.51	3.15	2.50	28			
Fine Pitch										
5.00	MMH45 S12-3-500ADF	50009	0.216	5.51	2.48	1.50	8	SEKN 1203	50260	50262
6.00	MMH45 S12-3-600ADF	50010	0.216	6.51	2.48	1.50	12			
8.00	MMH45 S12-3-800AFF	50011	0.216	8.51	2.48	2.50	16			
10.00	MMH45 S12-3-1000AFF	50012	0.216	10.51	2.48	2.50	20			
12.00	MMH45 S12-3-1200AFF	50013	0.216	12.51	3.15	2.50	24			
16.00	MMH45 S12-3-1600AFF	50014	0.216	16.51	3.15	2.50	30			
20.00	MMH45 S12-3-2000AFF	50015	0.216	20.51	3.15	2.50	40			



Cartridge
50237

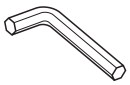
Cartridge Screw
50253



Cartridge Key
50254

Wedge Screw
50261

Adjustment Screw
50263



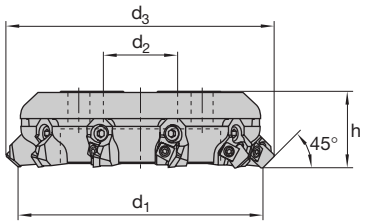
Adjustment Key
50264

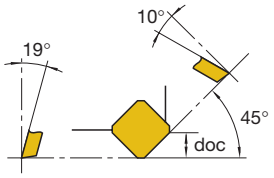
See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

MMH45 S15

Application

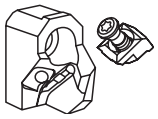
- General purpose modular milling cutter for face milling of steel, stainless and non-ferrous materials
- Used in light-duty rough and finish milling operations
- Uses ISO style inserts
- High positive cutting geometry
- Smooth cutting action on low horsepower machines
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*





Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Wedge Clamp Assembly	Wedge Driver (Torx)
Coarse Pitch										
4.00	MMH45 S15-400AD	50031	0.354	4.71	2.48	1.50	6	SEKN 1504	50260	50262
5.00	MMH45 S15-500AD	50032	0.354	5.71	2.48	1.50	6			
6.00	MMH45 S15-600AD	50033	0.354	6.71	2.48	1.50	10			
8.00	MMH45 S15-800AF	50034	0.354	8.71	2.48	2.50	12			
10.00	MMH45 S15-1000AF	50035	0.354	10.71	2.48	2.50	14			
12.00	MMH45 S15-1200AF	50036	0.354	12.71	3.15	2.50	18			
16.00	MMH45 S15-1600AF	50037	0.354	16.71	3.15	2.50	20			
20.00	MMH45 S15-2000AF	50038	0.354	20.71	3.15	2.50	28			
Fine Pitch										
5.00	MMH45 S15-500ADF	50039	0.354	5.71	2.48	1.50	8	SEKN 1504	50260	50262
6.00	MMH45 S15-600ADF	50040	0.354	6.71	2.48	1.50	12			
8.00	MMH45 S15-800AFF	50041	0.354	8.71	2.48	2.50	16			
10.00	MMH45 S15-1000AFF	50042	0.354	10.71	2.48	2.50	20			
12.00	MMH45 S15-1200AFF	50043	0.354	12.71	3.15	2.50	24			
16.00	MMH45 S15-1600AFF	50044	0.354	16.71	3.15	2.50	30			
20.00	MMH45 S15-2000AFF	50045	0.354	20.71	3.15	2.50	40			



Cartridge
50238

Cartridge Screw
50253

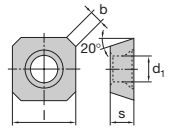
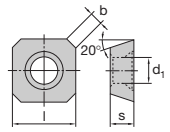
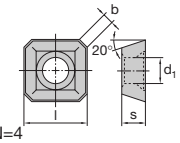
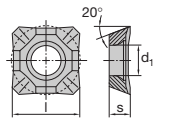
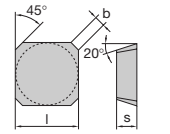
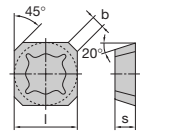
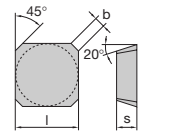
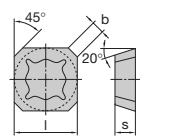
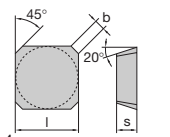
Cartridge Key
50254

Wedge Screw
50261

Adjustment Screw
50263

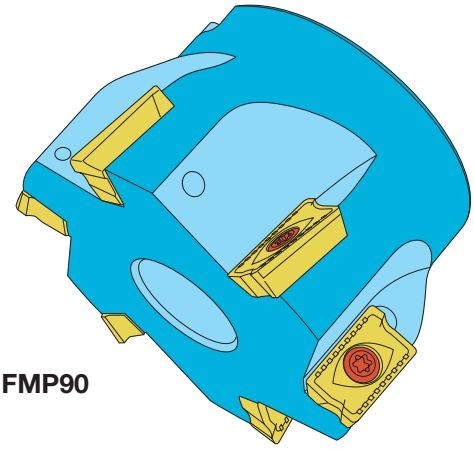
Adjustment Key
50264

See page 29 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

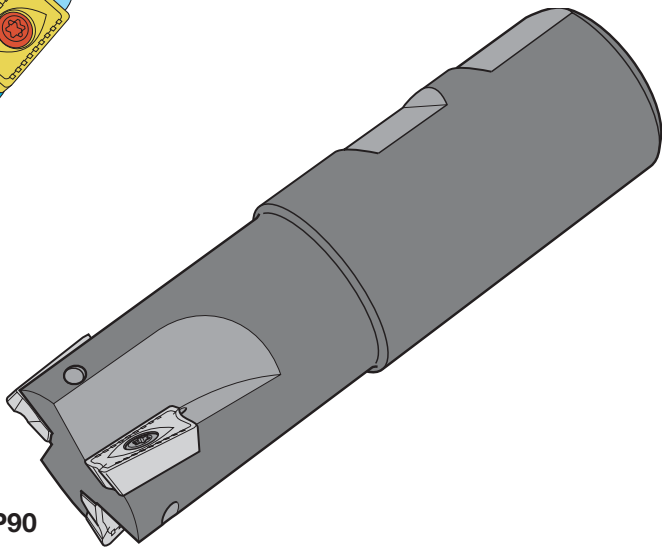
N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=4	.500	.187		.217	.062		SEKW 1204 AFSN		**LC225S** 60031			FMH45B 11171 MMH45B MMH88B
											LC230F 53786	
										LC240T 60722		
								LW610 60029		**LC610T** 60030		
 N=4	.500	.187		.217	.062		SEKW 1204 AESN				**LC615E** 55953	
 N=4	.500	.187		.217	.062		SEHT 1204 AFSN		**LC225S** 60033			
										LC240T 60729		
									LC444W 54150	**LC430T** 53713		
 N=4	.500	.187		.217	.062		SEHT 1204 AFFN-ALC			**LC610T*** 89222		
 N=4	.500	.125			.055		SEKN 1203 AF_ _		**LC225S** 60003			FMH45 11172 MMH45-12
											LC230F 51754	
										LC240T 60732		
									LC444W 54146	**LC440T** 51749		
								LW610 60002		**LC610T** 60004	**LC615E** 60734	
 N=4	.500	.125			.063		SEKR 1203 AF_ _		**LC225S** 60012			
											LC230F 53178	
										LC240T 60737		
									LC444W 51825	**LC430T** 51824		
 N=4	.500	.187			.055		SEKN 1204 AF_ _		**LC225S** 60016			FMH45A 11173 MMH45A MMH88A
											LC230F 53782	
										LC240T 60741		
									LC444W 54148	**LC440T** 54147		
								LW610 60014		**LC610T** 60015	**LC615E** 55952	
 N=4	.500	.187			.063		SEKR 1204 AF_ _		**LC225S** 60018			
											LC230F 53784	
										LC240T 60745		
									LC444W 54149	**LC430T** 50950		
 N=4	.625	.187			.079		SEKN 1504 AF_ _ 1193-26		**LC225S** 60021			MMH45-15
										LC240T 50668	**LC230F** 53783	

**F = CVD Multilayer
E = AL_2O_3

*LC610T CVD Coated TiAlN



FMP90



EMP90

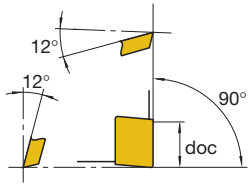
Special Features

- Universal applications
- Face milling, slotting, and shoulder milling
- For a wide range of materials
- Stable indexable inserts
- Large cutting length
- Positive cutting geometry
- High cutting edge stability

EMP90

Application

- General purpose milling cutter for face, edge, slot and square shoulder milling of steel, stainless and non-ferrous materials
- Uses ISO style insert
- Positive cutting action for low horsepower machines



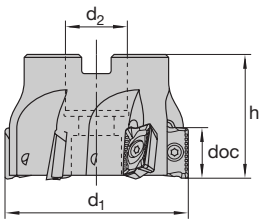
d_1	Cutter Body No.	EDP	Dimensions (inches)					No. Teeth	Insert	Insert Screw	Torx Driver
			doc	h	l_3	l_2	d_2				
0.500	EMP90-A10-050WCI	53858	0.330	–	3.00	1.10	0.63	1	APKT 1003	53886	89978
0.500	EMP90-A10-050SCI-XL	53866	0.330	–	4.00	2.10	0.63	1			
0.625	EMP90-A10-062WCI	53859	0.330	–	3.00	1.10	0.63	2			
0.625	EMP90-A10-062SCI-XL	53867	0.330	–	4.00	2.10	0.63	2			
0.750	EMP90-A10-075WDI	53860	0.330	–	3.50	1.47	0.75	2			
0.750	EMP90-A10-075WDFI	53861	0.330	–	3.50	1.47	0.75	3			
0.750	EMP90-A10-075SDI-XL	53868	0.330	–	5.00	2.97	0.75	2			
1.000	EMP90-A10-100WEI	53862	0.330	–	4.00	1.72	1.00	3			
1.000	EMP90-A10-100WEFI	53863	0.330	–	4.00	1.72	1.00	4			
1.000	EMP90-A10-100SEI-XL	53869	0.330	–	6.00	3.72	1.00	3			
1.250	EMP90-A10-125WFI	53864	0.330	–	4.00	1.72	1.25	5			
1.500	EMP90-A10-150WFI	53865	0.330	–	4.00	1.72	1.25	6			
0.750	EMP90-A16-075WDI	53871	0.550	–	3.50	1.47	0.75	1	APKT 1604	53887	50259
1.000	EMP90-A16-100WEI	53872	0.550	–	4.00	1.71	1.00	2			
1.000	EMP90-A16-100SEI-XXL	53876	0.550	–	8.00	2.62	1.00	2			
1.250	EMP90-A16-125WFI	53873	0.550	–	4.00	1.71	1.25	3			
1.250	EMP90-A16-125SFI-XXL	53878	0.550	–	8.00	2.62	1.25	3			
1.500	EMP90-A16-150WFI	53874	0.550	–	4.00	–	1.25	3			
1.500	EMP90-A16-150WFFI	53875	0.550	–	4.00	–	1.25	4			
1.500	EMP90-A16-150SFI-XXL	53879	0.550	–	8.00	–	1.25	3			

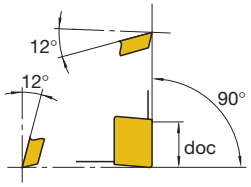
See page 34 for Inserts.
See pages 104 & 105 for face mill data & application information.

FMP90

Application

- General purpose milling cutter for face, edge, slot and square shoulder milling of steel, stainless and non-ferrous materials
- Uses ISO style insert
- Positive cutting action for low horsepower machines





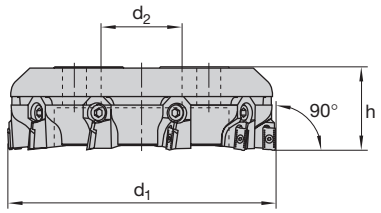
d_1	Cutter Body No.	EDP	Dimensions (inches)					No. Teeth	Insert	Insert Screw	Torx Driver
			doc	h	l_1	l_3	d_2				
2.00	FMP90-A10-200AA	53870	0.330	1.50	–	–	0.75	7	APKT 1003	53886	89978
2.00	FMP90 A16-200AA	50366	0.550	1.57	–	–	0.75	5	APKT 1604	50257	50259
2.50	FMP90-A16-250AB	53881	0.550	1.75	–	–	1.00	6			
3.00	FMP90 A16-300AB	50688	0.550	1.57	–	–	1.00	5			
3.00	FMP90 A16-300ABF	89239	0.550	1.97	–	–	1.00	7			
4.00	FMP90 A16-400AD	50370	0.550	1.97	–	–	1.50	8			
5.00	FMP90-A16-500AD	53884	0.550	2.00	–	–	1.50	9	APKT 1604	53887	50259
6.00	FMP90-A16-600AE	53885	0.550	2.50	–	–	2.00	10			

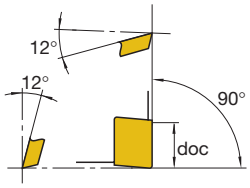
See page 34 for Inserts.
See pages 94 & 95 for face mill data & application information.

MMP90

Application

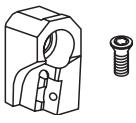
- General purpose modular milling cutter for face, edge, slot, and square shoulder milling of steel, stainless and non-ferrous materials
- Uses ISO style insert
- Positive cutting action for low horsepower machines
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*





Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

d_1	Cutter Body No.	EDP	Dimensions (inches) doc	h	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
Coarse Pitch									
4.00	MMP90 A16-400AD	50196	0.551	2.48	1.50	6	APKT 1604	50257	50259
5.00	MMP90 A16-500AD	50197	0.551	2.48	1.50	6			
6.00	MMP90 A16-600AD	50198	0.551	2.48	1.50	10			
8.00	MMP90 A16-800AF	50199	0.551	2.48	2.50	12			
10.00	MMP90 A16-1000AF	50200	0.551	2.48	2.50	14			
12.00	MMP90 A16-1200AF	50201	0.551	3.15	2.50	18			
16.00	MMP90 A16-1600AF	50202	0.551	3.15	2.50	20			
20.00	MMP90 A16-2000AF	50203	0.551	3.15	2.50	28			
Fine Pitch									
5.00	MMP90 A16-500ADF	50204	0.551	2.48	1.50	8	APKT 1604	50257	50259
6.00	MMP90 A16-600ADF	50205	0.551	2.48	1.50	12			
8.00	MMP90 A16-800AFF	50206	0.551	2.48	2.50	16			
10.00	MMP90 A16-1000AFF	50207	0.551	2.48	2.50	20			
12.00	MMP90 A16-1200AFF	50208	0.551	3.15	2.50	24			
16.00	MMP90 A16-1600AFF	50209	0.551	3.15	2.50	30			
20.00	MMP90 A16-2000AFF	50210	0.551	3.15	2.50	40			



Cartridge
50250

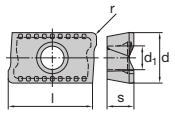
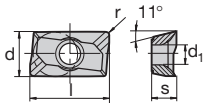
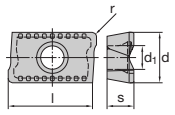
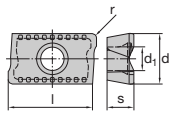
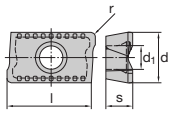
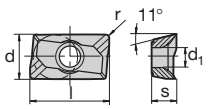
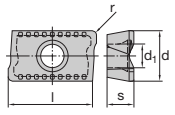
Cartridge Screw
50253

Cartridge Key
50254

Adjustment Screw
50263

Adjustment Key
50264

See page 34 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=2	.431	.138	.262	.110		.020	APKT 100305 PDSR		**LC444W** 53889	**LC440T** 53712	**LC230F** 53889	EMP90 FMP90
									LC630S 89363		**LC615E** 55944	
 N=2	.431	.138	.262	.110		.020	APHT 1003 PDFR-ALC	**LW610** 53932			**LC620T*** 51097	
 N=2	.642	.207	.375	.177		.031	APKT 160408 PDSR		**LC225S** 60120			
											LC230F 53382	
										LC240T 60119		
										LC440T 50949	**LC444W** 54145	
								LW610 60115	**LC630S** 89500	**LC630T** 89125	**LC615E** 55945	
 N=2	.642	.207	.375	.177		.062	APKT 160416 PDSR		**LC225S** 60720			
											LC230F 53310	
										LC240T 89319		
									LC630S 89321	**LC630T** 89322		
 N=2	.642	.207	.375	.177		.094	APKT 160424 SR-BP				**LC230F**	
 N=2	.642	.207	.375	.177		.031	APHT 1604 PDFR-ALC	**LW610** 89311		**LC610T*** 89310		
 N=2	.642	.207	.375	.177		.125	APKT 160432				**LC230F** 50671	

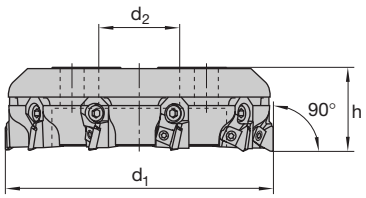
**F = CVD Multilayer
W = CVD Multilayer
E = AL_2O_3

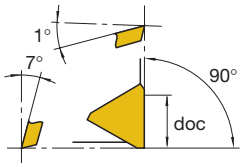
*LC610T CVD Coated TiAIN

MMP90 T16

Application

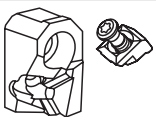
- General purpose modular milling cutter for face and square shoulder milling of steel
- Used in rough and finish milling operations
- Positive cutting action
- Designed for light depth of cuts
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*





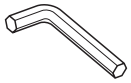
Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

d_1	Cutter Body No.	EDP	Dimensions (inches) doc	h	d_2	No. Teeth	Insert	Wedge Clamp Assembly	Wedge Driver (Torx)
Coarse Pitch									
4.00	MMP90 T16-400AD	50166	0.472	2.48	1.50	6	TPKN 1603	50260	50262
5.00	MMP90 T16-500AD	50167	0.472	2.48	1.50	6			
6.00	MMP90 T16-600AD	50168	0.472	2.48	1.50	10			
8.00	MMP90 T16-800AF	50169	0.472	2.48	2.50	12			
10.00	MMP90 T16-1000AF	50170	0.472	2.48	2.50	14			
12.00	MMP90 T16-1200AF	50171	0.472	3.15	2.50	18			
16.00	MMP90 T16-1600AF	50172	0.472	3.15	2.50	20			
20.00	MMP90 T16-2000AF	50173	0.472	3.15	2.50	28			
Fine Pitch									
5.00	MMP90 T16-500ADF	50174	0.472	2.48	1.50	8	TPKN 1603	50260	50262
6.00	MMP90 T16-600ADF	50175	0.472	2.48	1.50	12			
8.00	MMP90 T16-800AFF	50176	0.472	2.48	2.50	16			
10.00	MMP90 T16-1000AFF	50177	0.472	2.48	2.50	20			
12.00	MMP90 T16-1200AFF	50178	0.472	3.15	2.50	24			
16.00	MMP90 T16-1600AFF	50179	0.472	3.15	2.50	30			
20.00	MMP90 T16-2000AFF	50180	0.472	3.15	2.50	40			



Cartridge
50248

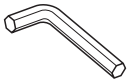
Cartridge Screw
50253



Cartridge Key
50254

Wedge Screw
50261

Adjustment Screw
50263



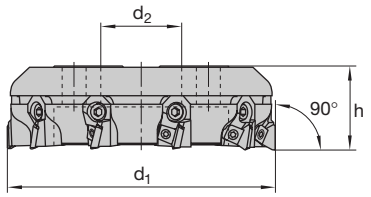
Adjustment Key
50264

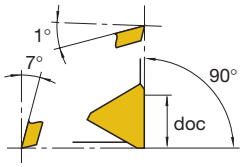
See page 38 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

MMP90 T22

Application

- General purpose modular milling cutter for face and square shoulder milling of steel
- Used in rough and finish milling operations
- Positive cutting action
- Designed for heavy depth of cuts
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*

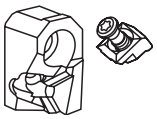




Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.



d_1	Cutter Body No.	EDP	Dimensions (inches) doc	h	d_2	No. Teeth	Insert	Wedge Clamp Assembly	Wedge Driver (Torx)
Coarse Pitch									
4.00	MMP90 T22-400AD	50181	0.708	2.48	1.50	6	TPKN 2204	50260	50262
5.00	MMP90 T22-500AD	50182	0.708	2.48	1.50	6			
6.00	MMP90 T22-600AD	50183	0.708	2.48	1.50	10			
8.00	MMP90 T22-800AF	50184	0.708	2.48	2.50	12			
10.00	MMP90 T22-1000AF	50185	0.708	2.48	2.50	14			
12.00	MMP90 T22-1200AF	50186	0.708	3.15	2.50	18			
16.00	MMP90 T22-1600AF	50187	0.708	3.15	2.50	20			
20.00	MMP90 T22-2000AF	50188	0.708	3.15	2.50	28			
Fine Pitch									
5.00	MMP90 T22-500ADF	50189	0.708	2.48	1.50	8	TPKN 2204	50260	50262
6.00	MMP90 T22-600ADF	50190	0.708	2.48	1.50	12			
8.00	MMP90 T22-800AFF	50191	0.708	2.48	2.50	16			
10.00	MMP90 T22-1000AFF	50192	0.708	2.48	2.50	20			
12.00	MMP90 T22-1200AFF	50193	0.708	3.15	2.50	24			
16.00	MMP90 T22-1600AFF	50194	0.708	3.15	2.50	30			
20.00	MMP90 T22-2000AFF	50195	0.708	3.15	2.50	40			



Cartridge
50249

Cartridge Screw
50253

Cartridge Key
50254

Wedge Screw
50261

Adjustment Screw
50263

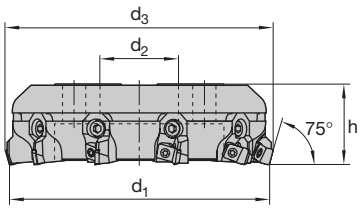
Adjustment Key
50264

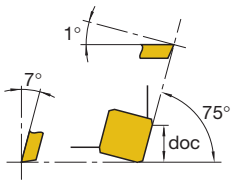
See page 38 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

MMP75

Application

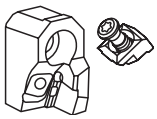
- General purpose modular milling cutter for face milling of steel
- Used in rough and finish milling operations
- Positive cutting action
- Designed for moderate depth of cuts
- Cartridge design interchangeable with other LMT Multi-Mills
- *Available in coarse and fine pitch*





Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.

d_1	Cutter Body No.	EDP	Dimensions (inches) doc	d_3	h	d_2	No. Teeth	Insert	Wedge Clamp Assembly	Wedge Driver (Torx)
Coarse Pitch										
4.00	MMP75 S12-400AD	50091	0.354	4.19	2.48	1.50	6	SPKN 1203	50260	50262
5.00	MMP75 S12-500AD	50092	0.354	5.19	2.48	1.50	6			
6.00	MMP75 S12-600AD	50093	0.354	6.19	2.48	1.50	10			
8.00	MMP75 S12-800AF	50094	0.354	8.19	2.48	2.50	12			
10.00	MMP75 S12-1000AF	50095	0.354	10.19	2.48	2.50	14			
12.00	MMP75 S12-1200AF	50096	0.354	12.19	3.15	2.50	18			
16.00	MMP75 S12-1600AF	50097	0.354	16.19	3.15	2.50	20			
20.00	MMP75 S12-2000AF	50098	0.354	20.19	3.15	2.50	28			
Fine Pitch										
5.00	MMP75 S12-500ADF	50099	0.354	5.19	2.48	1.50	8	SPKN 1203	50260	50262
6.00	MMP75 S12-600ADF	50100	0.354	6.19	2.48	1.50	12			
8.00	MMP75 S12-800AFF	50101	0.354	8.19	2.48	2.50	16			
10.00	MMP75 S12-1000AFF	50102	0.354	10.19	2.48	2.50	20			
12.00	MMP75 S12-1200AFF	50103	0.354	12.19	3.15	2.50	24			
16.00	MMP75 S12-1600AFF	50104	0.354	16.19	3.15	2.50	30			
20.00	MMP75 S12-2000AFF	50105	0.354	20.19	3.15	2.50	40			


Cartridge
50243


Cartridge Screw
50253


Cartridge Key
50254

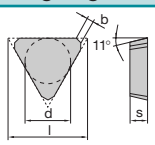
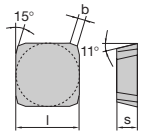
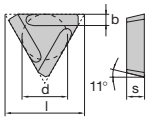
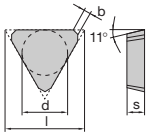
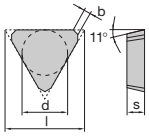
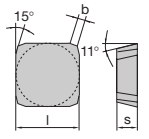
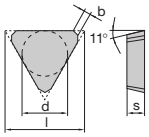
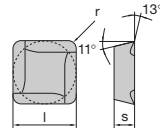

Wedge Screw
50261


Adjustment Screw
50263


Adjustment Key
50264

See page 38 for Inserts.
See pages 94 & 95 for recommended cutting data & application information.
Refer to page 111 in technical section for Multi-Mill assembly and adjustment instructions.

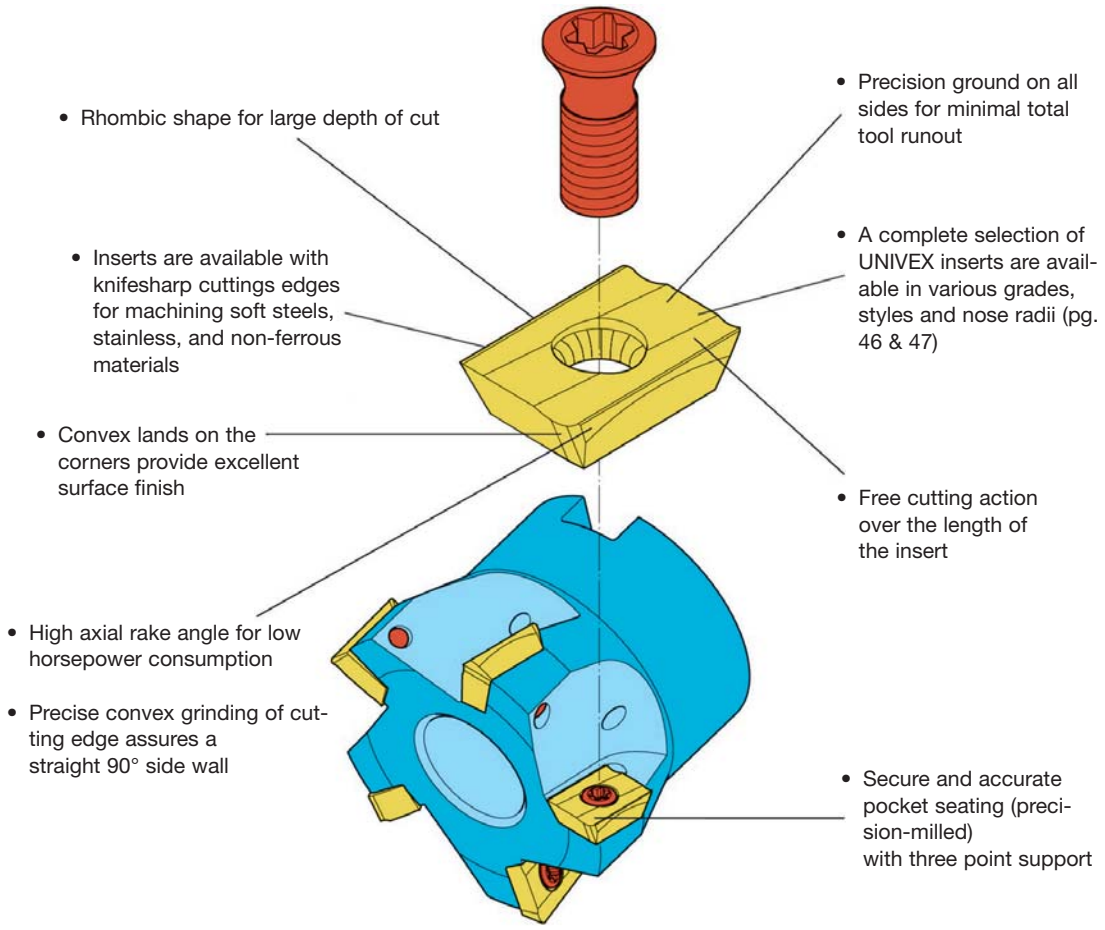
Inserts

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=3	.650	.125	.375		.047		TPKN 1603 PDER 1172-10		**LC225S** 60097			MMP90-16
											LC230F 53801	
								LW610 60095		**LC610T** 60096	**LC615E** 55961	
 N=3	.650	.125	.375		.055		SPKN 1203 EDSR				**LC615E** 55956	
 N=3	.650	.125	.375		.047		TPAR 1603 PDR 1165-12		**LC225S** 60103			
								LW610 60102				
 N=3	.866	.187	.500		.047		TPKN 2204 PDSR		**LC225S** 60112			MMP90-22
											LC230F 53802	
								LW610 60110		**LC610T** 60111		
 N=3	.866	.187	.500		.047		TPKN 2204 PDER				**LC615E** 55962	
 N=4	.500	.125			.055		SPKN 1203 EDER 1192-10		**LC225S** 60069		**LC230F** 53792	MMP75
										LC240T 51510		
								LW610 60067		**LC610T** 60068		
 N=4	.650	.125	.375		.047		TPKN 1603 PDER				**LC615E** 55961	
 N=4	.500	.125			.047		SPMR 120312 R 1191-10	**LW610** 60083				

**F = CVD Multilayer
E = AL_2O_3

Features & Benefits

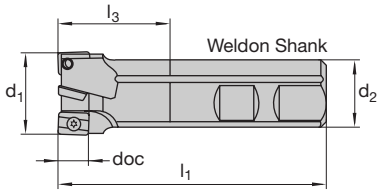
LMT-FETTE's UNIVEX double-positive geometry provides smooth cutting action and low horsepower consumption. LMT-FETTE's UNIVEX line features double positive geometry with a high axial rake angle. UNIVEX is capable of cutting a true 90° wall, UNIVEX cutters perform well on steels, stainless and non-ferrous materials and are available in face mills, end mills, long edge helical mills and long edge shell mills. LMT-FETTE offers integral shank designs: CAT 40 and CAT 50.

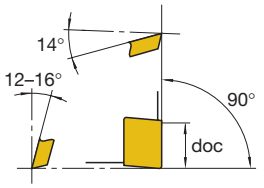


EMU90

Application

- High performance end milling cutter for square shoulder and slot milling of steel, stainless and non-ferrous materials
- High positive axial rake angle provides quiet and smooth cutting action
- Standard end mills furnished with external coolant slots





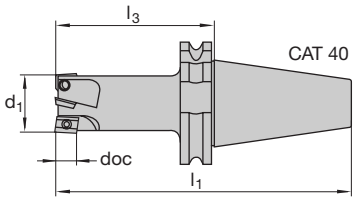
d_1	Cutter Body No.	EDP	Dimensions (inches) doc	l_1	l_3	d_2	No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
0.500	EMU90 A09-050WBI	50390	0.354	2.50	0.70	0.50	1	2304513	ADHX 0903	89972	89978
0.500	EMU90 A09-050WCI	50392	0.354	2.50	0.70	0.63	1	2304515			
0.625	EMU90 A09-0625WCI	50394	0.354	3.00	1.10	0.63	2	1950150			
0.750	EMU90 A09-075WDI	50396	0.354	3.25	1.42	0.75	2	1950151			
0.750	EMU90 A09-075WDIF	50398	0.354	3.25	1.42	0.75	3	1950165			
0.625	EMU90 A11-0625 WCI	54059	0.413	3.00	1.22	0.63	1	–	ADHX 1103	89979	89978
0.750	EMU90 A11-075 WDI	54060	0.413	3.25	1.22	0.75	2	–			
1.000	EMU90 A11-100WDI	50400	0.413	3.25	1.22	0.75	3	1950200			
1.000	EMU90 A11-100WEI	50402	0.413	3.50	1.57	1.00	3	1950152			
1.000	EMU90 A11-100 WEI-060	54062	0.413	6.00	3.65	1.00	3	–			
1.000	EMU90 A11-100 WEI-080	54063	0.413	8.00	5.68	1.00	3	–			
1.250	EMU90 A11-125WDI	50404	0.413	3.25	1.22	0.75	4	1950202			
1.250	EMU90 A11-125 WFI-0325	54064	0.413	3.25	1.57	1.25	4	–			
1.250	EMU90 A11-125WEI	50406	0.413	3.50	1.57	1.00	4	1950153			
1.250	EMU90 A11-125 WFI-060	54065	0.413	6.00	3.65	1.25	4	–			
1.250	EMU90 A11-125 WFI-080	54066	0.413	8.00	5.62	1.25	4	–			
1.500	EMU90 A11-150WEI	50408	0.413	3.50	1.57	1.00	4	1950207			
1.500	EMU90 A11-150 WGI-035	54067	0.413	3.50	1.57	1.50	4	–			
1.500	EMU90 A11-150 WFI-060	54068	0.413	6.00	3.25	1.50	4	–			
1.500	EMU90 A11-150 WFI-080	54069	0.413	8.00	5.20	1.50	4	–			

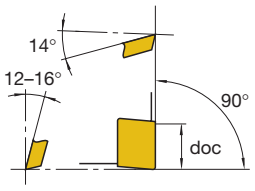
See pages 46–47 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

EMU90

Application

- High performance end milling cutter for square shoulder and slot milling of steel, stainless and non-ferrous materials
- High positive axial rake angle provides quiet and smooth cutting action for low horsepower machines
- *Available in CAT 40 taper only*





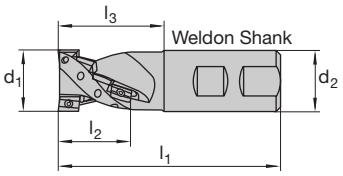
d_1	Cutter Body No.	EDP	Dimensions (inches)			Shank Taper	No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
			doc	l_1	l_3						
1.00	EMU90 A11-100CA	50410	0.413	5.50	2.76	40	3	1950154	ADHX 1103	89979	89978
1.25	EMU90 A11-125CA	50412	0.413	6.00	3.27	40	4	1950155			
1.50	EMU90 A11-150CA	50414	0.413	6.25	3.58	40	4	1950156			

See pages 46–47 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

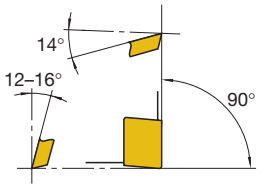
ERU90

Application

- High performance long edge end milling cutter for square shoulder and slot milling of steel, stainless and non-ferrous materials
- Full effective flute design
- High positive axial rake angle provides smooth cutting action and good chip removal



l_2 is the effective cutting length



d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	l_3	l_1	d_2	No.Eff. Flutes	No. Inserts	Euro Ref. No.	Insert	Insert Screw	Torx Driver
1.00	ERU90 A09-100WE	50422	0.95	1.75	4.03	1.00	2	6	1950100	ADHX 0903	89972	89978
1.25	ERU90 A11-125WF	50424	1.46	2.25	4.53	1.25	2	8	1950101	ADHX 1103	89979	89978
1.50	ERU90 A11-150WG	50426	1.77	2.75	5.44	1.50	3	15	1950104			

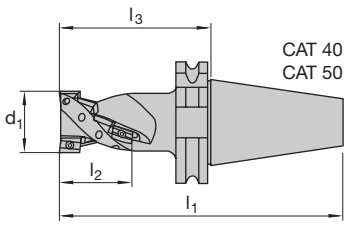
Note: End cutting inserts are offered in various nose radii. When using larger nose radii inserts, the outside corner of the steel body must be modified, or it will protrude beyond the cutting radius of the insert. Side cutting or periphery inserts must have .020 nose radius or smaller. This .020 radius is necessary for the inserts to overlap and not generate peaks.

See pages 46–47 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

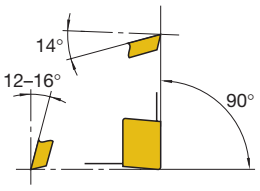
ERU90

Application

- High performance long edge end milling cutter for square shoulder and slot milling of steel, stainless and non-ferrous materials
- High positive axial rake angle provides smooth cutting action and excellent chip removal
- All-effective fluted design



l_2 is the effective cutting length



d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	l_3	l_1	Shank Taper	No.Eff. Flutes	No. Inserts	Euro Ref. No.	Insert	Insert Screw	Torx Driver
CAT 40												
1.00	ERU90 A09-100CA	50428	0.95	2.75	5.44	40	2	6	1950070	ADHX 0903	89972	89978
1.25	ERU90 A11-125CA	50430	1.46	3.13	5.82	40	2	8	1950072	ADHX 1103	89979	89978
1.50	ERU90 A11-150CA	50432	1.77	3.50	6.19	40	3	15	1950090			
CAT 50												
2.00	ERU90 A12-200CB	50434	2.40	4.50	8.50	50	3	18	1950096	ADHX 12T3	89974	50259
2.50	ERU90 A12-250CB	50436	2.95	5.00	9.00	50	4	28	1950098			

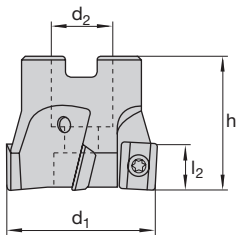
Note: End cutting inserts are offered in various nose radii. When using larger nose radii inserts, the outside corner of the steel body must be modified, or it will protrude beyond the cutting radius of the insert. Side cutting or periphery inserts must have .031 nose radius or smaller (for CAT 40) or .024 nose radius or smaller (for CAT 50). This radius is necessary for the inserts to overlap and not generate peaks.

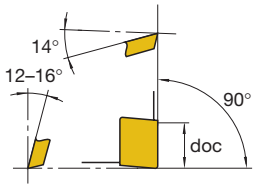
See pages 46–47 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

FMU90

Application

- High performance milling cutter for face, slot and square shoulder milling of steel, stainless and non-ferrous materials
- High positive axial rake angle provides quiet and smooth cutting action







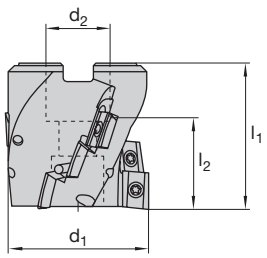
d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	h	d_2	No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
2.00	FMU90 A11-200AAI	54070	0.41	1.57	0.75	4	4052271	ADHX 1103	89979	89978
2.00	FMU90 A11-200AAFI	54071	0.41	1.57	0.75	5	4052274			
2.50	FMU90 A11-250ABI	54072	0.41	1.57	1.00	5	4052272			
2.50	FMU90 A11-250ABFI	54073	0.41	1.57	1.00	6	4052275			
3.00	FMU90 A11-300ACI	54074	0.41	1.97	1.25	6	4052273			
3.00	FMU90 A11-300ACFI	54075	0.41	1.97	1.25	8	4052276			
1.58	FMU90 A12-158AA	50416	0.47	1.42	0.75	4	1950195	ADHX 12T3	89974	50259
2.00	FMU90 A12-200AA	50418	0.47	1.57	0.75	5	1950158			
2.50	FMU90 A12-250AA	50420	0.47	1.57	0.75	6	1950159			

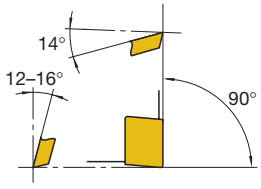
See pages 46–47 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

FRU90

Application

- High performance long edge milling cutter for square shoulder and slot milling of steel, stainless and non-ferrous materials
- High positive axial rake angle provides smooth cutting action and excellent chip removal
- Full effective flute design
- Offered in shell mill style



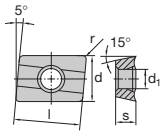
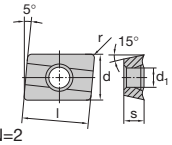
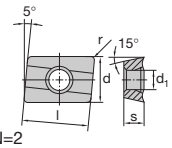
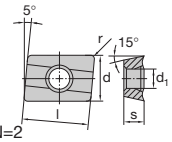
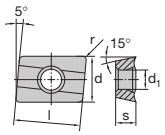
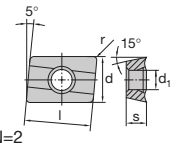
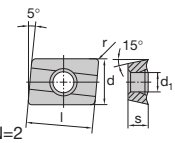
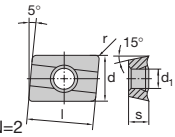
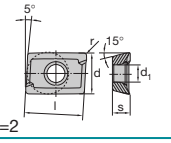
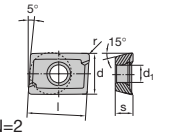


d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	l_1	d_2	Flutes	No.Eff. Ref. No.	Euro Inserts	No. Inserts	Insert Screw	Torx Driver
2.00	FRU90 A12-200AA200	50438	1.10	2.00	0.75	3	1950124	9	ADHX 12T3	89974	50259
2.00	FRU90 A12-200AA287	50440	2.00	2.88	0.75	3	1950126	15			
2.50	FRU90 A12-250AB200	50442	1.25	2.00	1.00	4	1950128	12			
2.50	FRU90 A12-250AB287	50444	2.00	2.88	1.00	4	1950130	20			

*Socket head cap screw NOT furnished with cutter.

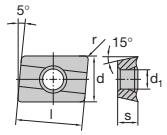
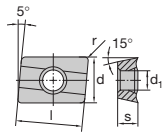
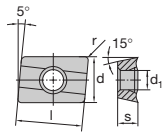
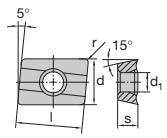
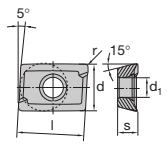
Note: End cutting inserts are offered in various nose radii. When using larger nose radii inserts, the outside steel body must be modified, or it will protrude beyond the cutting radius of the insert. Side cutting or periphery inserts must have .024 nose radius or smaller. This .024 radius is necessary for the inserts to overlap and not generate peaks.

See pages 46–47 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=2	.375	.113	.250	.110		.016	ADHX 090304 ER 1196-80		**LC225S** 60511			EMU90 11473-IC EMU90 11474 ERU90 11552 ERU90 11555
										LC240T 60482	**LC230F** 53757	
										LC430T 50965		
								LW610 60510		**LC610T** 89382		
								LW630 60538	**LC630S** 60752	**LC630T** 60753		
 N=2	.375	.113	.250	.110		.031	ADHX 090308 ER 1196-80		**LC225S** 60636			
											LC230F 53831	
								LW630 60634	**LC630S** 60757	**LC630T** 60758		
 N=2	.375	.113	.250	.110		.060	ADHX 090315 ER 1196-80		**LC225S** 60639			
											LC230F 53832	
								LW630 60637				
 N=2	.375	.113	.250	.110		.016	ADMX 090304 ER 1196-81		**LC225S** 60520			
										LC240T 60542		
 N=2	.437	.125	.313	.134		.020	ADHX 110305 ER 1196-82		**LC225S** 60514			
										LC240T 60483	**LC230F** 53788	
										LC430T 50946		
								LW610 60513		**LC610T** 60533		
								LW630 60667	**LC630S** 60760	**LC630T** 60761		
 N=2	.437	.125	.313	.134		.031	ADHX 110308 ER 1196-82		**LC225S** 60630			
											LC230F 53833	
								LW630 60628	**LC630S** 60765	**LC630T** 60766		
 N=2	.437	.125	.313	.134		.060	ADHX 110315 ER 1196-82		**LC225S** 60633			
											LC230F 53834	
								LW630 60631	**LC630S** 60770	**LC630T** 60771		
 N=2	.437	.125	.313	.134		.020	ADMX 110305 ER 1196-83		**LC225S** 60478			
										LC240T 60772		
 N=2	.375	.113	.250	.110		.016	ADHT 090304 FR-ALC 1196-80 ALC	**LW610** 51663			**LC610T*** 89347	
 N=2	.437	.125	.313	.134		.020	ADHT 110305 FR-ALC 1196-82 ALC	**LW610** 51664			**LC610T*** 89348	

**F = CVD Multilayer
E = AL_2O_3

*LC610T CVD Coated TiAlN

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=2	.500	.156	.375	.157		.024	ADHX 12T306 ER 1196-84		**LC225S** 60517			FMU90 11475 FRU90 11335 ERU90 11555
										LC240T 60484	**LC230F** 53758	
										LC430T 50947		
								LW610 60516		**LC610T** 60534		
								LW630 60133	**LC630S** 60716	**LC630T** 60747		
 N=2	.500	.156	.375	.157		.060	ADHX 12T315 ER 1196-84		**LC225S** 60642			
											LC230F 53835	
								LW630 60640	**LC630S** 60748	**LC630T** 60749		
 N=2	.500	.156	.375	.157		.090	ADHX 12T323 ER 1196-84		**LC225S** 60645			
											LC230F 53836	
								LW630 60643	**LC630S** 60750	**LC630T** 60751		
 N=2	.500	.156	.375	.157		.024	ADMX 12T306 ER 1196-85		**LC225S** 60526			
										LC240T 60545		
 N=2	.500	.156	.375	.157		.024	ADHT 12T306 FR-ALC 1196-84 ALC	**LW610** 51667		**LC610T*** 89349		

**F = CVD Multilayer
E = AL_2O_3

Insert Tolerance

ADHX & ADHT (Ground) 1196-80 1196-82 1196-84	ADMX (Direct Pressed) 1196-81 1196-83 1196-85
s = +/- 0.001 l = +/- 0.0004 d = +/- 0.0004	s = +/- 0.001 l = +/- 0.002 d = +/- 0.002

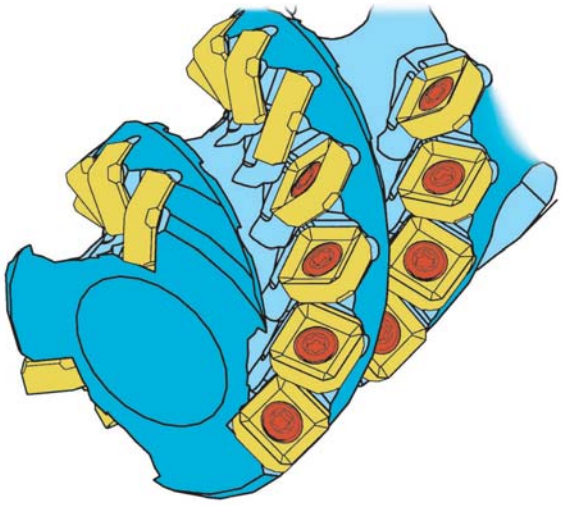
Long Edge Roughers

Features & Benefits

With TWIN*CUT* Geometry:

These end mills are excellent for operations that require roughing, semi-finishing, contour profile milling, and 90° shoulder milling.

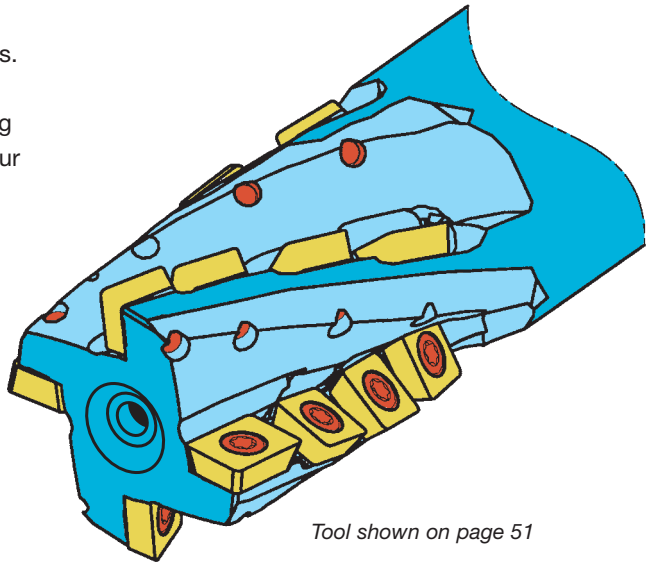
- For contour milling, maximum width of cut ≤ 0.5 x d1 using the **TWIN*CUT*** inserts
- Also available in longer lengths as special designs
- Stable cutting action due to rigid pocket



With Right Hand Helix:

These end mills use screw on positive ISO inserts.

- For roughing work, slotting, and contour milling
- Staggered inserts are located on a helix contour
- Extremely smooth cutting action
- Replaceable end cap with integral pilot
- Extra large flute capacity for easier chip flow

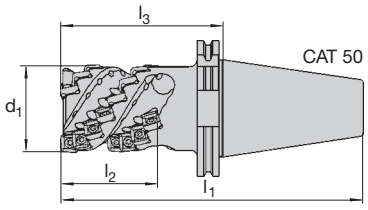


Tool shown on page 51

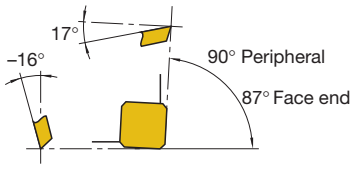
ERT90

Application

- Heavy-duty long edge end milling cutter used *only* for edge milling of steel plate, and cast iron materials
- Left hand helix provides smooth cutting action
- Full-effective flute design
- Not recommended for face, step or slot milling
- Only offered in CAT 50

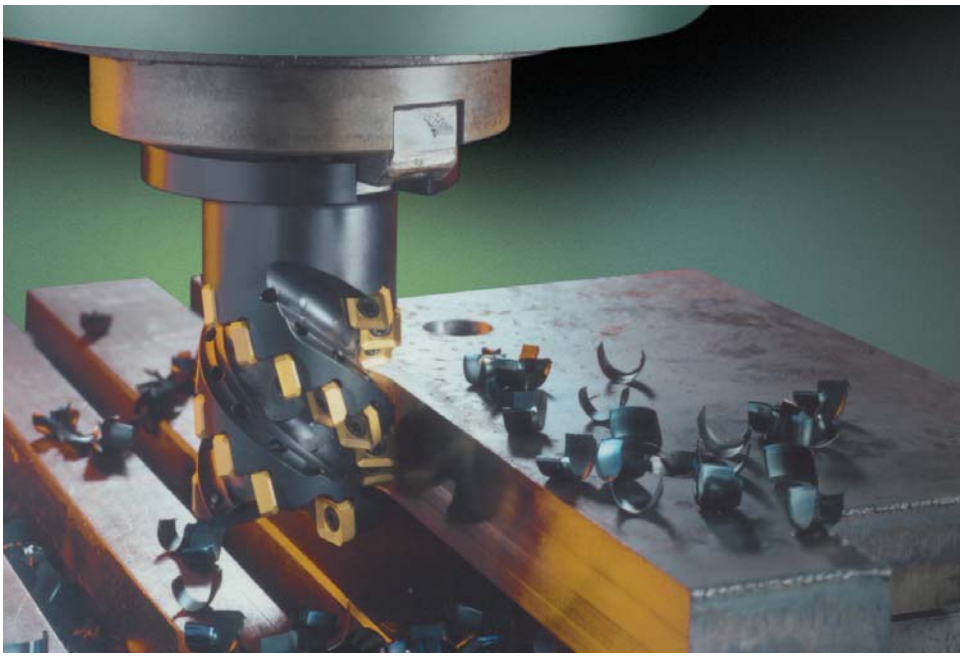


l_2 is the effective cutting length



d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	l_1	l_3	Shank Taper	No. Eff. Flutes	No. Inserts	Euro Ref. No.	Insert	Insert Screw	Torx Driver
2.00	ERT90 S12-200CB	50606	2.50	8.75	4.75	50	2	16	1950010	SNKX 1205	50256	50258
2.50	ERT90 S12-250CB	50608	3.00	9.75	5.75	50	3	27	1950012			
3.00	ERT90 S12-300CB	50610	4.00	11.75	7.75	50	3	36	1950014			

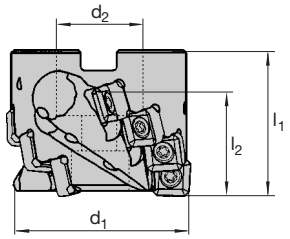
See page 53 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.



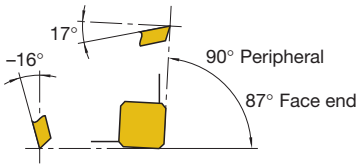
FRT90

Application

- Heavy-duty long edge milling cutter used *only* for edge milling of steel plate, and cast iron materials
- Left hand helix provides smooth cutting action
- Full effective flute design
- Not recommended for face, step or slot milling



l_2 is the effective cutting length



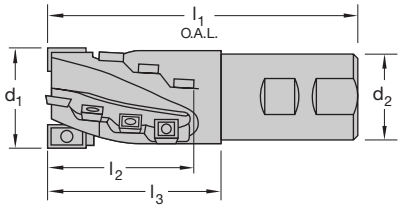
d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	Dimensions (inches) l_1	Dimensions (inches) d_2	No. Eff. Flutes	No. Inserts	Euro Ref. No.	Insert	Insert Screw	Torx Driver
2.00	FRT90 S12-200AA	50612	1.10	2.00	0.75	2	6	1950024	SNKX 1205	50256	50258
2.50	FRT90 S12-250AB	50614	1.42	2.00	1.00	3	12	1950026			
3.00	FRT90 S12-300AD	50616	1.77	2.50	1.50	3	15	1950028			

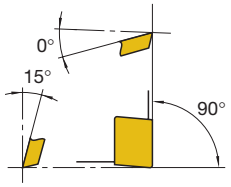
See page 53 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

ERP90

Application

- Long edge end milling cutter for square shoulder and slot milling of steel and stainless materials
- Flute clearance provides maximum space for chip removal, *air blast always recommended*





l_2 is the effective cutting length

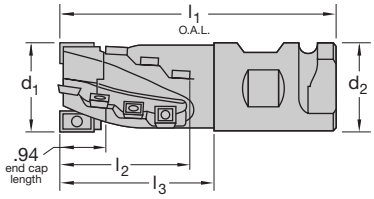
d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	l_1	l_3	d_2	No. Flutes	*No. Eff. Flutes	Euro Ref. No.	No. Per. Inserts	Periphery Insert	No. Face Inserts	Face End Insert	Insert Screw	Torx Driver
1.25	ERP90 S09 125WF	50446	1.58	4.53	2.25	1.25	3	1	1950102	8	SDMW 322	1	ADHW322	89974	50259
1.50	ERP90 S09 150WF	50448	1.97	5.51	3.32	1.25	4	2	1950106	12		2			
2.00	ERP90 S12 200WH	50450	2.36	6.23	3.03	2.00	4	2	1950108	12	SDMW 432	2	SDHW533	89971	50258

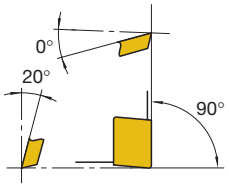
See page 53 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

ERP90

Application

- General purpose long edge end milling cutter for square shoulder and slot milling of steel, stainless and non-ferrous materials
- Positive axial rake angle and generous chip gullets provide space for chip removal, *air blast always recommended*
- Sold as assembled tool with replaceable end cap





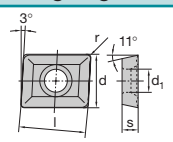
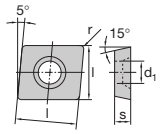
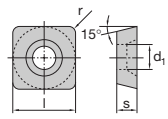
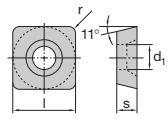
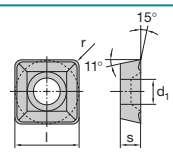
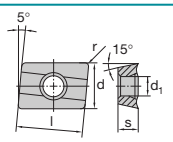
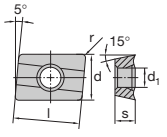
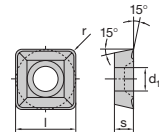
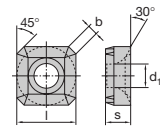
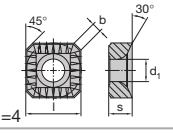
l_2 is the effective cutting length

d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	l_1	l_3	d_2	No. Flutes	*No. Eff. Flutes	No. Per. Inserts	Periphery Insert	No. Face Inserts	Face End Insert	Rep. Front End Cap	EC Soc. Hd. Screw	Insert Screw	Torx Driver
2.00	ERP90 S12 200PH 081	89251	4.30	8.10	4.85	2.00	4	2	20	SPMT 120408	2	XPMT 150408	89245	89312	89314	50258
2.00	ERP90 S12 200PH 101	89240	6.30	10.10	6.85	2.00	4	2	30		2					
2.50	ERP90 S12 250PI 083	89252	4.30	8.30	4.80	2.50	4	2	20		2					
2.50	ERP90 S12 250PI 103	89253	6.30	10.30	6.80	2.50	4	2	30		2		89246	89313		
2.50	ERP90 S12 250PI 123	89254	8.30	12.30	8.80	2.50	4	2	40		2					
2.50	ERP90 S12 250PI 143	89255	10.30	14.30	10.80	2.50	4	2	50		2					
3.00	ERP90 S12 300PI 113	89323	7.10	11.30	7.80	2.50	4	2	34		2		89268			

Note: End mills furnished with Combo Posi-lock shanks. Posi-lock shanks can also be used in standard weldon shank end mill holders. End mills shipped with insert locking screws, replaceable end cap screw & T20 torx wrench.

*Inserts are staggered in rows; two rows make one effective flute. Only one row cuts to the end. Each insert in that row is spaced so the next adjacent row of inserts cuts in the gap area (with some overlap) to complete the length of cut (and make an effective flute).

See page 53 for Inserts.
See pages 104 & 105 for recommended cutting data & application information.

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	AL_2O_3	For Cutter Cat. No.
 N=2	.625	.187	.500	.216		.031	XPMT 150408 1196-79		**LC435I** 89140			ERP 90 11453
 N=2	.500	.125	.375	.157		.031	(ADHW 322) ADHW 120308 R 1196-02		**LC225S** 60442			ERP 90 11453 EPR 90 11452
								LW610 60439				
 N=4	.375	.125		.154		.031	(SDMW 322) SDMW 090308 1196-01		**LC225S** 60438			ERP 90 11452
										LC240T 51200		
								LW610 60435				
 N=4	.500	.187		.205		.031	(SPMW 432) SPMW 120408 1196-10		**LC225S** 60452			
											LC230F 53800	
								LW610 60451			**LC615E** 55958	
 N=4	.500	.187		.205		.031	SPMT 120408 1196-12		**LC225S** 60458			
										LC240T 60773	**LC230F** 51759	
									LC435I 89130			
								LW610 60456				
 N=2	.500	.125	.375	.157		.031	(ADHW 322) ADMW 120308 R 1196-06	**LW610** 60574				
 N=2	.500	.125	.375	.157		.031	(ADMT 322) ADMT 120308 R 1196-04		**LC225S** 60649			
								LW610 60446				
 N=2	.630	.197		.205		.039	(SDMT 533) SDMT 150410 1196-22		**LC225S** 60651			
 N=4	.500	.219		.205	.078		SNKX 1205 AN 1187-10		**LC225S** 60036			ERT90 11257 FRT90 11259
											LC230F 53791	
										LC240T 60039		
									LC610T 89936		**LC615E** 89365	
 N=4	.500	.219		.205	.078		SNKX 1205 AN-TR 1187-10 TR		**LC225S** 60045			
										LC240T 60047		
										LC610T 60048		

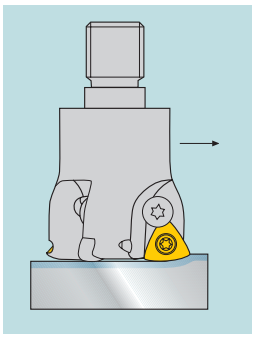
**F = CVD Multilayer
E = AL_2O_3

TWINCUT Feed Mills

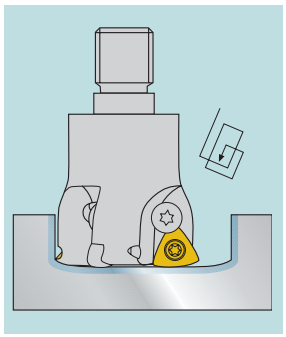
Advantages

- High feed rates with small cutting depths
- Proven indexable insert geometry with optimized cutting edge design
- Indexable insert with three cutting edges and large inscribed circle
- Internal coolant supply

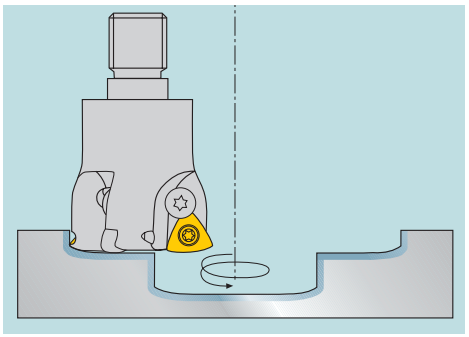
Face milling



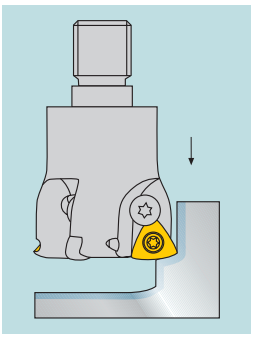
Pocketing



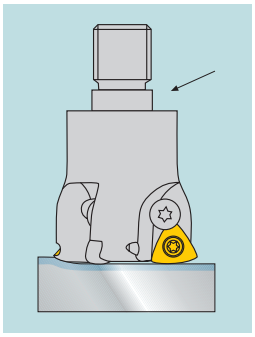
Helical boring



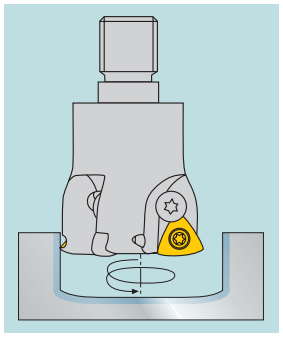
Plunge milling



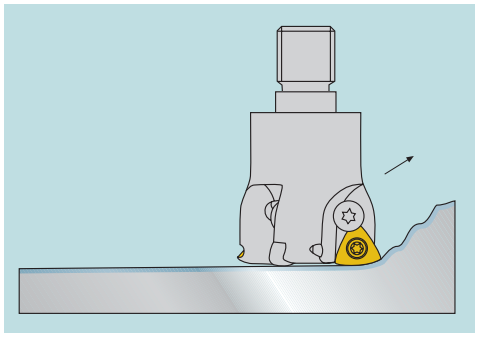
Ramping



Helical interpolation



3D rough copy milling

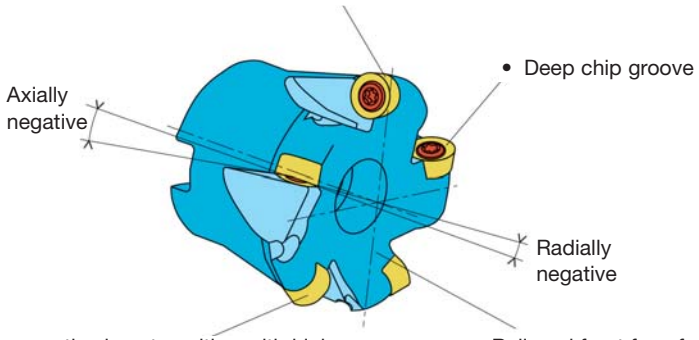


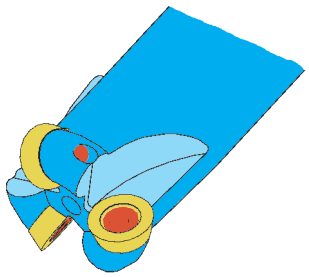
TWINCUT Copy Face Mills

Features & Benefits

LMT-FETTE's Copy face milling cutters with round inserts are designed for copy, face, ramping, and contour milling of molds and dies.

- Negative insert mounting allows thick, stable insert cross section
- Periphery ground insert



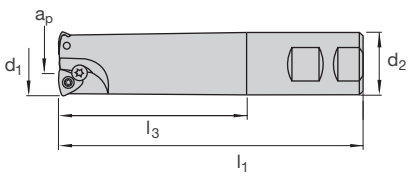


- Double negative insert position with high positive rake angles permits smooth entry and quiet operation
- Relieved front face for ramp milling and heavy die sinking operations

ECP05

Application

- **TWIN*CUT*** feed for use in roughing, semi-finish in die and mold industry
- Provides superior metal removal rates
- Offers ramping, plunge milling, helical boring and drilling capabilities



d1	Cutter Body No.	EDP	Dimensions (inches)				z	Insert	Insert Screw	Top Clamp Screw	Torx Driver
			di	d2	l3	l1					
1.00	ECP05X11 1000WE-I 060	53837	0.60	1.00	3.72	6.00	2	WP1177-11T	50546	54095	50259
1.00	ECP05X11 100WE-I 080	53838	0.60	1.00	5.72	8.00	2				
1.25	ECP05X11 125WF-I 060	53839	0.85	1.25	3.72	6.00	3	WP1177-11T	50546		
1.25	ECP05X11 125WF-I 080	53840	0.85	1.25	5.72	8.00	3				
1.25	ECP05X65 125WF-I 060	53841	0.60	1.25	3.72	6.00	2	WP1177-65T	89974		
1.25	ECP05X65 125WF-I 080	53842	0.60	1.25	5.72	8.00	2				
1.50	ECP05X11 150WG-I 060	53843	1.10	1.50	3.31	6.00	4	WP1177-11T	50546		
1.50	ECP05X11 150WG-I 080	53844	1.10	1.50	5.31	8.00	4				
1.50	ECP05X65 150WG-I 060	53845	0.85	1.50	3.31	6.00	3	WP1177-65T	89974		
1.50	ECP05X65 150WG-I 080	53846	0.85	1.50	5.31	8.00	3				

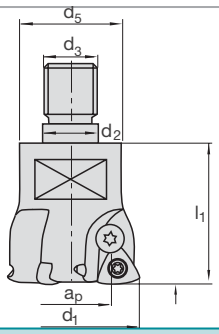
See pages 100 & 101 for recommended cutting data & application information.

Screw-On TWIN*CUT* Feed

ECP05

Application

- **TWIN*CUT*** feed for use in roughing, semi-finish in die and mold industry
- Provides superior metal removal rates
- Offers ramping, plunge milling, helical boring and drilling capabilities



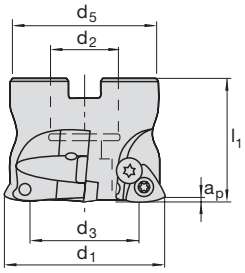
d1	Cutter Body No.	EDP	Dimensions (inches)				z	Insert	Insert Screw	Top Clamp Screw	Torx Driver
			di	d2	M	l3					
1.00	ECP05X11 100TF-I 1.00	53847	0.60	0.49	M12	1.30	2	WP1177-11T	50546	54095	50259
1.25	ECP05X65 125TH-I 1.25	53848	0.60	0.67	M16	1.69	2	WP1177-65T	89974		
1.50	ECP05X65 150TH-I 1.50	53849	0.85	0.67	M16	1.69	3				

See page 61–62 for Inserts. See page 74 for Extension Arbor for Screw-On tools.

FCP05

Application

- **TWIN*CUT*** feed for use in roughing, semi-finish in die and mold industry
- Provides superior metal removal rates
- Offers ramping, plunge milling, helical boring and helical drilling capabilities





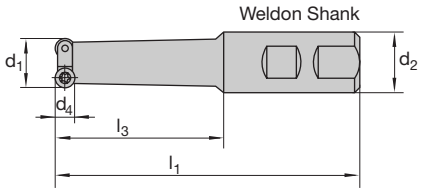

d_1	Cutter Body No.	EDP	Dimensions (inches) di	d_2	h	z	Insert	Insert Screw	Top Clamp Screw	Torx Driver
2.00	FCP05X11 200AA-I 2.00	53850	1.60	0.75	1.58	5	WP1177-11T	50546	50495	50259
2.00	FCP05X65 200AA-I 2.00	53851	1.35	0.75	1.58	4	WP1177-65T	89974		
2.50	FCP05X11 250AB-I 2.50	53852	2.10	1.00	1.97	6	WP1177-11T	50546		
2.50	FCP05X65 250AB-I 2.50	53853	1.85	1.00	1.97	4	WP1177-65T	89974		
3.00	FCP05X11 300AC-I 3.00	53854	2.60	1.25	1.97	7	WP1177-11T	50546		
3.00	FCP05X65 300AC-I 3.00	53855	2.35	1.25	1.97	5	WP1177-65T	89974		
4.00	FCP05X11 400AD-I 4.00	53856	3.60	1.50	1.97	8	WP1177-11T	50546		
4.00	FCP05X65 400AD-I 4.00	53857	3.35	1.50	1.97	6	WP1177-65T	89974		

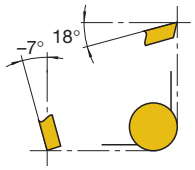
See page 61–62 for Inserts.
See pages 100 & 101 for recommended cutting data & application information.

ECT R

Application

- Milling cutter for copy, face, and contour milling of steel, stainless, and cast iron materials
- Features ramping capabilities
- Straight front end (no taper)





d_1	Cutter Body No.	EDP	Dimensions (inches)				No. Teeth	Insert	Insert Screw	Torx Driver
			d_4	l_1	l_3	d_2				
1.00	ECT R12 100WE 040	89352	0.47	4.00	1.72	1.00	2	RC_X 1205	50256	50258
1.00	ECT R12 100WE 060	50584	0.47	6.00	3.72	1.00	2			
1.00	ECT R12 100WE 080	10603	0.47	8.00	5.77	1.00	2			
1.25	ECT R12 125WF 040	50586	0.47	4.00	1.72	1.25	3			
1.25	ECT R12 125WF 060	10345	0.47	6.00	3.72	1.25	2			
1.25	ECT R12 125WFF 060	89244	0.47	6.00	3.72	1.25	3			
1.25	ECT R12 125WF 080	10347	0.47	8.00	5.77	1.25	2			
1.25	ECT R12 125WFF 080	50588	0.47	8.00	5.77	1.25	3			
1.50	ECT R12 150WG 060	50590	0.47	6.00	3.31	1.50	3			
1.50	ECT R12 150WG 080	50592	0.47	8.00	5.31	1.50	3			
1.50	ECT R12 150WG 100	50594	0.47	10.00	7.31	1.50	3			

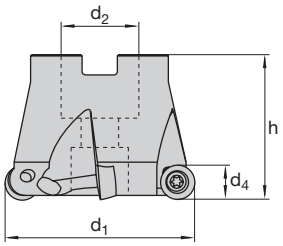
See page 61–62 for Inserts.

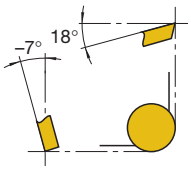
See pages 96 & 97 for recommended cutting data & application information.

FCT R

Application

- First choice milling cutter for copy, face, and contour milling of steel, stainless, and cast iron materials
- Features ramping capabilities





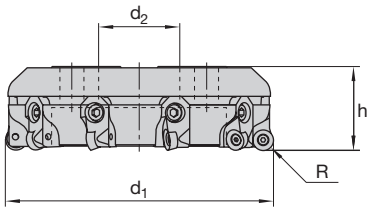
d_1	Cutter Body No.	EDP	Dimensions (inches)			No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
			d_4	h	d_2					
2.00	FCT R12 200AA	89803	0.47	1.57	0.75	5	1950040	RC_X 1205	50256	50258
2.50	FCT R12 250AB	89804	0.47	1.98	1.00	6	1950042			
3.00	FCT R12 300AB	50743	0.47	1.98	1.00	6				
2.50	FCT R16 250AB	89805	0.63	1.98	1.00	5	1950051	RC_X 1606	50255	
3.00	FCT R16 300AB	89813	0.63	1.98	1.00	6	1950182			
4.00	FCT R16 400AD	89800	0.63	1.98	1.50	7				

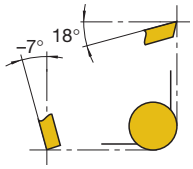
See page 61–62 for Inserts.
See pages 96 & 97 for recommended cutting data & application information.

MMT R

Application

- Modular milling cutter for face and contour milling of steel, stainless and cast iron materials
- Used in rough milling operations
- Cartridge design interchangeable with other LMT Multi-Mills
- Available in coarse and fine pitch

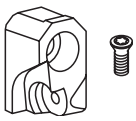




Multi-Mills furnished with cartridges and hardware.
Inserts must be ordered separately.



d_1	Cutter Body No.	EDP	Dimensions (inches) h	Dimensions (inches) d_2	No. Teeth	Insert	Insert Screw	Torx Driver
Coarse Pitch								
4.00	MMT R16-400AD	50211	2.48	1.50	6	RCHX 1606	50255	50258
5.00	MMT R16-500AD	50212	2.48	1.50	6			
6.00	MMT R16-600AD	50213	2.48	1.50	10			
8.00	MMT R16-800AF	50214	2.48	2.50	12			
10.00	MMT R16-1000AF	50215	2.48	2.50	14			
12.00	MMT R16-1200AF	50216	3.15	2.50	18			
16.00	MMT R16-1600AF	50217	3.15	2.50	20			
20.00	MMT R16-2000AF	50218	3.15	2.50	28			
Fine Pitch								
5.00	MMT R16-500ADF	50219	2.48	1.50	8	RCHX 1606	50255	50258
6.00	MMT R16-600ADF	50220	2.48	1.50	12			
8.00	MMT R16-800AFF	50221	2.48	2.50	16			
10.00	MMT R16-1000AFF	50222	2.48	2.50	20			
12.00	MMT R16-1200AFF	50223	3.15	2.50	24			
16.00	MMT R16-1600AFF	50224	3.15	2.50	30			
20.00	MMT R16-2000AFF	50225	3.15	2.50	40			



Cartridge
50251

Cartridge Screw
50253

Cartridge Key
50254

Adjustment Screw
50263

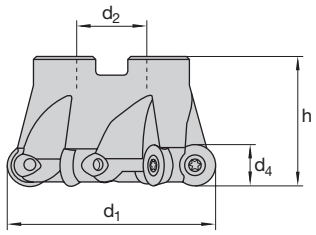
Adjustment Key
50264

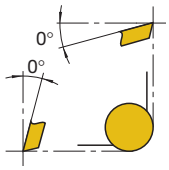
See page 61–62 for Inserts.
See pages 96 & 97 for recommended cutting data & application information.

FCZ R

Application

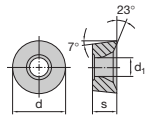
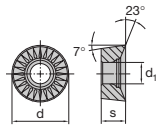
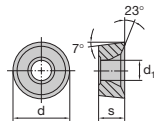
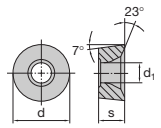
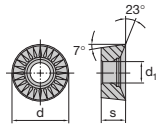
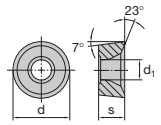
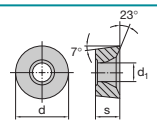
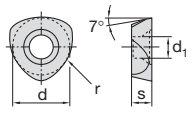
- Milling cutter for copy, face, and contour milling of steel, stainless, and cast iron materials
- Used in rough milling operations
- Features ramp and plunge capabilities



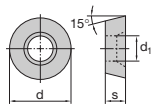
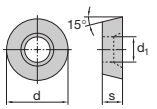
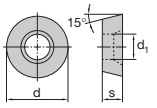
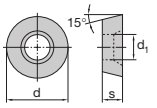
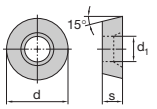
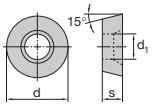
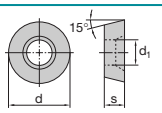
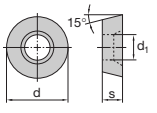
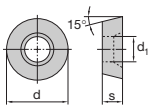
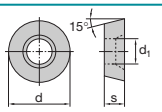


d_1	Cutter Body No.	EDP	Dimensions (inches) doc	Dimensions (inches) d_3	Dimensions (inches) h	No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
2.00	FCZ R12 200AA	50596	0.472	1.77	0.75	5	1940031	RDHW 12T3	50256	50258
3.00	FCZ R12 300AB	50598	0.472	1.97	1.00	6	1940033			
4.00	FCZ R16 400AD	50600	0.630	1.97	1.50	6	1940035	RDHW 1604	50530	
5.00	FCZ R16 500AD	50602	0.630	2.48	1.50	8	1940037			

See page 61–62 for Inserts.
See pages 96 & 97 for recommended cutting data & application information.

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
		.219	.472	.205			RCHX 1205 MO 1195-13		**LC225S** 89847			ECT / FCT R12
										LC240T 89862		
								LW610 89841		**LC610T** 60775		
		.219	.472	.205			RCHT 1205 MO				**LC230T** 53261	
		.219	.472	.205			RCHX 1205 MO-TR 1195-13 TR		**LC225S** 89849			
										LC240T 89864		
								LW610 89843		**LC610T** 89872		
		.219	.472	.205			RCKT 1205 MO-TT			**LC280TT** 54079		
		.219	.472	.205			RCHX 1205 MO - T 1195-23 T-Land		**LC225S** 89851			
										LC240T 60777		
								LW610 89845		**LC610T** 50669		
		.219	.472	.205			RCMX 1205 MO - T 1195-27 T-Land			**LC240T** 89868		ECT / FCT R16
		.250	.630	.228			RCHX 1606 MO 1195-14		**LC225S** 60124			
										LC240T 60126	**LC230F** 53262	
								LW610 60123		**LC610T** 60127		
		.250	.630	.228			RCHT 1606 MO				**LC230F** 53262	
		.250	.630	.228			RCHX 1606 MO - TR 1195-14TR		**LC225S** 60131			
										LC240T 60134		
								LW610 60130		**LC610T** 60135		
		.250	.630	.228			RCKT 1606 MO			**LC280TT** 54080		
		.250	.630	.228			RCHX 1606 MO - T 1195-24 T-Land		**LC225S** 60139			
										LC240T 60141		
								LW610 60138		**LC610T** 60779		
		.250	.630	.228			RCMX 1606 MO - T 1195-28 T-Land			**LC240T** 89869		
 N=3		.109	.375	.154	.236	.150	WP1177-11T			**LC280TT** 54090		ECP 05 / FCP 05 X11
										LC610T 54097		
		.157	.375	.154	.984	.079	WP1177-65T			**LC280TT** 54091		ECP 05 / FCP 05 X65
										LC240T 55035		
										LC610T 54098		

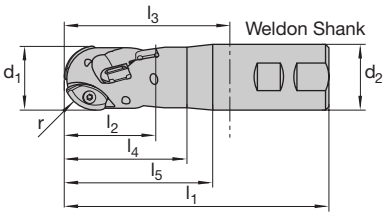
**F = CVD Multilayer
E = AL_2O_3

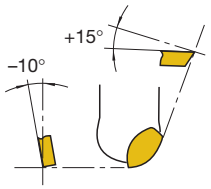
N = Number of Cutting Edges	Dimensions (Inch)						Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No.				For Cutter Cat. No.
	l	s	d	d_1	b	r		Uncoated	TiCN Plus	AL Plus	AL_2O_3	
		.059	.197	.079			RDHX 0501 MO			**LC240T** 53469		ECZ
										LC603Z 53462		
										LC610T 56055		
		.094	.276	.106			RDHX 0702 MO			**LC240T** 53470		ISO
										LC603Z 53463		
										LC610T 56056		
		.094	.276	.106			RDKT 0702 MO-TT			**LC280TT** 54082		
		.094	.315	.110			RDHW 0802 MO			**LC240T** 89402		ECZ
										LC603Z 53464		
										LC610T 56057		
		.094	.315	.110			RDHW 0802 MO			**LC280TT** 54083		
		.125	.394	.150			RDHW 1003 MO 1195-25		**LC225S** 60587	**LC240T** 60424		ISO
										LC603Z 53465		
										LC610T 52528		
		.125	.394	.150			RDKT 1003 MO-TT			**LC280TT** 54084		
		.156	.472	.197			RDHW 12T3 MO 1195-35		**LC225S** 60591			ECZ
										LC240T 60425		
										LC603Z 53466		
										LC610T 52529		
								LW610 60589				
		.156	.472	.150			RDHX 12T3 MO			**LC240T** 53471		ISO
										LC603Z 53467		
										LC610T 55005		
		.156	.472	.197			RDKT 12T3 MO-TT			**LC280TT** 54085		ECZ
		.156	.472	.150			RDKX 12T3 MO-TT			**LC280TT** 54087		ISO
		.187	.630	.205			RDHW 1604 MO 1195-45		**LC225S** 60594	**LC240T** 60426		ECZ ISO
										LC603Z 53468		
										LC610T 52531		
		.187	.630	.205			RDKT 1604 MO-TT			**LC280TT** 54086		

EBT

Application

- Heavy duty rough copy milling cutter for use on steel, stainless, and non-ferrous molds and dies
- Features periphery inserts for deep cavity molds
- Ball end inserts are two effective and offer 2 indexes
- Periphery inserts offer 2 and 4 indexes for deep cavity work





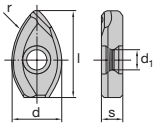
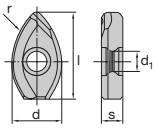
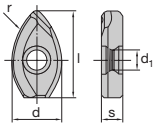
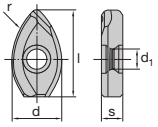
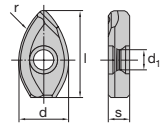
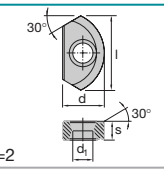
l_2 is the effective cutting length

d_1	Cutter Body No.	EDP	Dimensions (inches) r	l_1	l_2	l_4	l_5	l_3	d_2	Euro Ref. No.	Ball End Insert	Periphery Insert
0.750	EBT T0750W1000 532	89821	0.38	5.32	1.18	1.58	2.36	3.11	1.00	1950210	1179-24	CCMT 060204
0.750	EBT T0750W1000 630	89822	0.38	6.30	1.18	1.58	3.35	4.09	1.00	1950211		
0.787	EBT T0787W1000 532	89836	0.39	5.32	1.18	1.58	2.36	3.11	1.00	1950248	1179-25	
0.787	EBT T0787W1000 630	89837	0.39	6.30	1.18	1.58	3.35	4.09	1.00	1950249		
1.000	EBT T1000W1000 472	89823	0.50	4.72	1.38	2.13	2.13	2.13	1.00	1950212	1179-35	CCMT 080308
1.000	EBT T1000W1250 669	89824	0.50	6.69	1.38	1.97	3.54	4.33	1.25	1950213		
1.250	EBT T1250W1250 591	89825	0.63	5.91	1.58	2.76	2.76	3.54	1.25	1950215	1179-45	SNKX 0904
1.250	EBT T1250W1500 787	89826	0.63	7.87	1.58	2.36	4.53	5.12	1.50	1950217		
1.500	EBT T1500W1500 571	89827	0.75	5.71	2.17	3.15	3.15	3.35	1.25	1950219	1179-55	SNKX 1205
1.500	EBT T1500W1500 787	89828	0.75	7.87	2.17	4.53	4.53	5.12	1.50	1950220		
2.000	EBT T2000W2000 700	89840	1.00	7.00	3.00	3.75	3.75	3.75	2.00	2340261	1179-66	
2.000	EBT T2000W2000 900	89838	1.00	9.00	4.00	5.00	5.75	5.75	2.00	2340257		
2.000	EBT T2000W2000 110	89839	1.00	11.00	4.00	7.00	7.75	7.75	2.00	2340259		

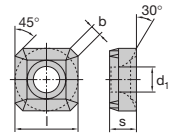
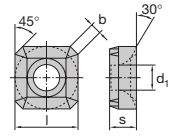
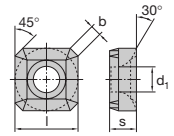
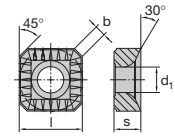
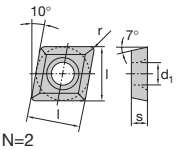
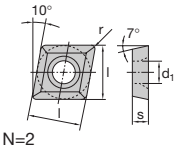
Parts and Accessories

Spare Parts for Cutter Body Number	EDP	No. of Inserts	Ball End Insert	Insert Screw EDP Euro Ref. No.	No. of Inserts	Periphery Insert	Insert Screw	Torx Driver
EBT T0750W1000 532	89821	2	1179-24	89979	4	*CCMT 060204	89972	89978
EBT T0750W1000 630	89822							
EBT T0787W1000 532	89836	2	1179-25					
EBT T0787W1000 630	89837							
EBT T1000W1000 472	89823	2	1179-35	89974	4	*CCMT 080308	89979	50259
EBT T1000W1250 669	89824							
EBT T1250W1250 591	89825	2	1179-45	89976	4	SNKX 0904	89974	
EBT T1250W1500 787	89826							
EBT T1500W1500 571	89827	2	1179-55	50255	4	SNKX 1205	50256	50258
EBT T1500W1500 787	89828							
EBT T2000W2000 700	89840	2	1179-66		6			
EBT T2000W2000 900	89838				9			
EBT T2000W2000 110	89839							

See pages 64–65 for Inserts.
See pages 102 & 103 for recommended cutting data & application information.
**Periphery inserts with 2 indexes.*

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=2	.504	.125	.281	.138		.375	1179-24		**LC225S** 89886			EBT 11493
										LC240T 89917		
 N=2	.504	.125	.281	.138		.378	1179-25		**LC225S** 89887			
										LC240T 89918		
								LW610 89875		**LC610T** 60783		
 N=2	.630	.156	.352	.161		.473	1179-35		**LC225S** 89888			
										LC240T 89919		
								LW610 89876		**LC610T** 60785		
 N=2	.806	.200	.450	.177		.606	1179-45		**LC225S** 89889			
										LC240T 89920		
								LW610 89877		**LC610T** 60788		
 N=2	1.00	.250	.563	.217		.757	1179-55		**LC225S** 89890			
										LC240T 89921		
								LW610 89878		**LC610T** 60786		
 N=2	1.424	.250	.563	.217		.953	1179-66					
										LC240T 89922		

**F = CVD Multilayer
E = AL_2O_3

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	**CVD or AL_2O_3	For Cutter Cat. No.
 N=4	.375	.187		.173	.059		SNKX 0904 AN 1187-00		**LC225S** 89892			EBT 11493
										LC240T 88923		
								LW610 89880		**LC610T** 51855		
 N=4	.375	.187		.173	.059		SNKX 0904 AN - TT			**LC280TT** 54088		
 N=4	.500	.219		.205	.079		SNKX 1205 AN 1187-10		**LC225S** 60036			
											LC230F 53791	
										LC240T 60039		
								LW610 60035			**LC615E** 55961	
 N=4	.500	.219		.205	.079		SNKX 1205 AN - TR 1187-10TR		**LC225S** 60045			
										LC240T 60047		
										LC610T 60048		
 N=2	.250	.094		.110	.016		CCMT 060204 1196-36		**LC225S** 89896			
										LC240T 89927		
								LW610 89884		**LC610T** 51856		
 N=2	.313	.125		.134	.031		CCMT 080308 1196-46		**LC225S** 89897			
										LC240T 89928		
								LW610 89885		**LC610T** 51870		

**F = CVD Multilayer
E = AL_2O_3

Copy / Flat Bottom / Back Draft Mills

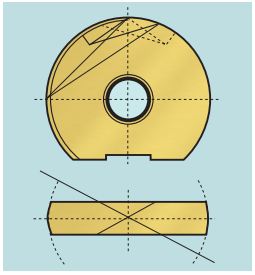
Features & Benefits

LMT-FETTE's finish copy mills are setting the global standard for precision and performance.

- Steel holders offered in straight and tapered neck design, capable of running at spindle speeds up to 80,000 rpm
- Precision manufacturing enables the highest accuracy of the finished workpiece
- Total tool runout within .0008" for insert/cutter assembly
- Inserts available in chipbreaker and non-chipbreaker styles
- The copying end mill dia. .250", .312" and .375" can also accept flat bottom and back draft inserts
- Metric insert sizes 6mm–32mm and shanks also available

Copy Inserts

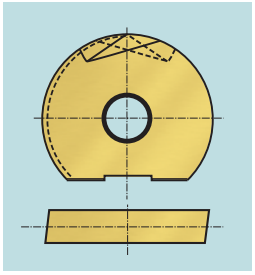
Used for super finishing



F = Super Finisher

7° radial clearance angle

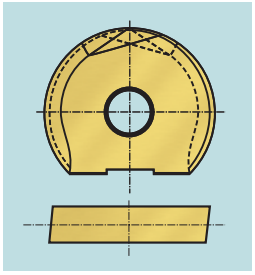
Used for finishing



N = Non Chipbreaker

7° radial clearance angle

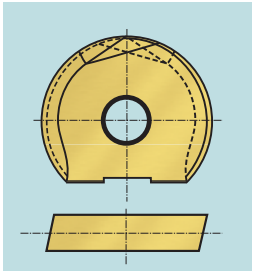
Used for semi-finishing



CF = Chipbreaker Ferrous

7° radial clearance angle

Used for semi-finishing

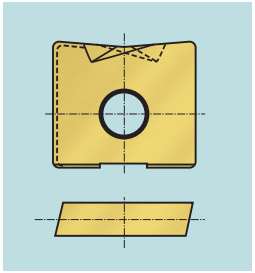


CN = Chipbreaker Non-ferrous

12° radial clearance angle for less friction

Flat Bottom Inserts

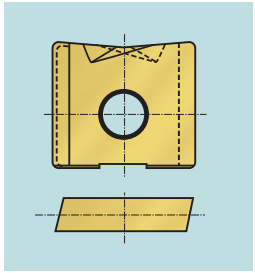
Used for finishing



N = Non Chipbreaker

7° radial clearance angle

Used for semi-finishing

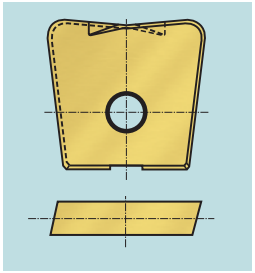


CF = Chipbreaker Ferrous

7° radial clearance angle

7° Back Draft Inserts

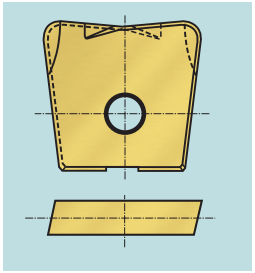
Used for finishing



N = Non Chipbreaker

7° radial clearance angle

Used for semi-finishing



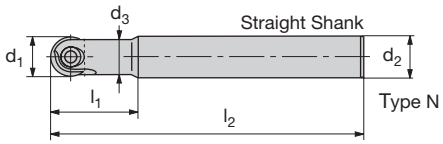
CF = Chipbreaker Ferrous

7° radial clearance angle

EBG-R-N (Inch) Straight Neck Cutter Body – HSS

Application

- First choice rough and finish copy milling cutter for milling of steel, stainless and non-ferrous molds and dies
- Ground steel shank holders are offered in a variety of lengths



d_1	Cutter Body No.	EDP	Dimensions (inches) l_1	l_2	d_2	d_3	Size	Insert Screw	Torx Driver
0.375	EBG R0375A0500 090N	88114	1.34	3.54	0.50	0.34	WPR 0375	88706	50259
0.500	EBG R0500A0500 130N	88115	1.26	5.12	0.50	0.41	WPR 0500	88707	50259
0.500	EBG R0500A0500 150N	88116	1.81	5.91	0.50	0.41	WPR 0500	88707	50259
0.625	EBG R0625A0625 140N	88117	1.42	5.51	0.63	0.55	WPR 0625	88708	50258
0.625	EBG R0625A0625 160N	88118	2.09	6.30	0.63	0.55	WPR 0625	88708	50258
0.750	EBG R0750A0750 160N	88119	1.77	6.30	0.75	0.71	WPR 0750	88709	50258
0.750	EBG R0750A0750 175N	88120	2.40	6.89	0.75	0.71	WPR 0750	88709	50258
0.750	EBG R0750A0750 210N	88913	2.36	8.27	0.75	0.71	WPR 0750	88709	50258
1.000	EBG R1000A1000 160N	88121	1.77	6.30	1.00	0.88	WPR 1000	88710	88606
1.000	EBG R1000A1000 190N	88122	2.76	7.48	1.00	0.88	WPR 1000	88710	88606
1.000	EBG R1000A1000 230N	88898	3.14	9.06	1.00	0.88	WPR 1000	88710	88606
30mm	EBG R30 A1250 175N*	88123	2.20	6.89	1.25	1.13	WPR 30	88711	88606
30mm	EBG R30 A1250 210N*	88124	3.15	8.27	1.25	1.13	WPR 30	88711	88606
1.250	EBG R1250A1250 175N	88125	2.20	6.89	1.25	1.13	WPR 1250	88711	88606
1.250	EBG R1250A1250 210N	88126	3.15	8.27	1.25	1.13	WPR 1250	88711	88606
2.000	EBG R2000A2000 330N	88906	4.92	12.99	2.00	1.77	WPR 2000	88910	88712 88713

**Metric cutting diameter, inch shank*
High temperature anti-seize lubricant available - Order: 88610
See page 70–71 for Inserts.
See pages 102 & 103 for recommended cutting data & application information.
See LMT-FETTE Mold & Die Catalog for complete metric offering.

Copy Mill Insert Identification System

INCH

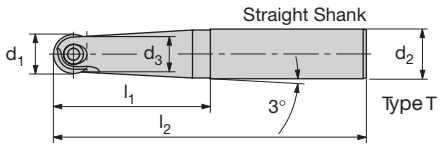
WP R 0500 - CF

- Indexable Insert
- Shape Of Cut, R = Ball Nose V = Flat bottom B = Back-Draft
- Diameter or Width Of Cut (inch)
- Chipbreaker Style
  - N = None, Flat Face
  - CF = Ferrous Materials
  - CN = Non-ferrous Materials

EBG-R-T (Inch) Tapered Neck Cutter Body – HSS

Application

- Roughing, semi-finishing, and finish copy milling cutter for steel, stainless, and non-ferrous molds and dies
- Inserts are available in chipbreaker and non-chipbreaker styles, and can be used in both tapered and straight style holders



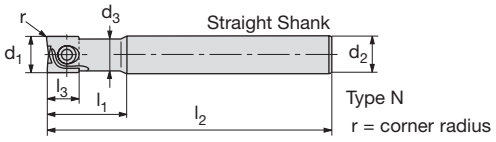
d_1	Cutter Body No.	EDP	Dimensions (inches)				Insert Size	Insert Screw	Torx Driver
			l_1	l_2	d_2	d_3			
0.250	EBG R0250A0375 090T	10525	1.57	3.54	0.38	0.22	WPR 0250	88704	88600
0.312	EBG R0312A0500 140T	88100	1.97	5.51	0.50	0.30	WPR 0312	88705	89978
0.375	EBG R0375A0500 150T	88101	1.38	5.91	0.50	0.35	WPR 0375	88706	50259
0.500	EBG R0500A0625 160T	88102	2.36	6.30	0.63	0.41	WPR 0500	88707	50259
0.625	EBG R0625A0750 175T	88103	2.64	6.89	0.75	0.55	WPR 0625	88708	50258
0.750	EBG R0750A1000 190T	88104	3.15	7.48	1.00	0.71	WPR 0750	88709	50258
1.000	EBG R1000A1250 210T	88105	3.94	8.27	1.25	0.88	WPR 1000	88710	88606
1.250	EBG R1250A1500 240T	88106	4.84	9.45	1.50	1.17	WPR 1250	88711	88606

Flat Bottom / Back Draft Mills

EBG-V-N (Inch) Flat Bottom & Back Draft Cutter Body – HSS

Application

- Roughing, semi-finishing and finish, flat bottom and back draft milling cutter for steel, stainless, and non-ferrous molds and dies
- Flat Bottom 90° (WPV) and Back Draft 7° (WPB) inserts can be used in the same cutter body



d_1	Cutter Body No.	EDP	Dimensions (inches)					Insert Size	Insert Screw	Torx Driver
			l_1	l_2	d_2	d_3	l_3			
0.500	EBG V0500A0500 130N	88139	1.34	5.20	0.50	0.41	0.55	WP_ 0500	88707	50259
0.500	EBG V0500A0500 150N	88140	1.89	5.98	0.50	0.41	0.55	WP_ 0500	88707	50259
0.625	EBG V0625A0625 140N	88141	1.50	5.51	0.63	0.55	0.63	WP_ 0625	88708	50258
0.625	EBG V0625A0625 160N	88142	2.16	6.30	0.63	0.55	0.63	WP_ 0625	88708	50258
0.750	EBG V0750A0750 160N	88143	1.85	6.30	0.75	0.71	0.70	WP_ 0750	88709	50258
0.750	EBG V0750A0750 175N	88144	2.48	6.89	0.75	0.71	0.70	WP_ 0750	88709	50258
0.750	EBG V0750A0750 210N	88914	2.36	8.27	0.75	0.71	0.70	WP_ 0750	88709	50258
1.000	EBG V1000A1000 160N	88145	1.85	6.30	1.00	0.88	0.93	WP_ 1000	88710	88606
1.000	EBG V1000A1000 190N	88146	2.83	7.48	1.00	0.88	0.93	WP_ 1000	88710	88606
1.000	EBG V1000A1000 230N	88902	3.14	9.06	1.00	0.88	0.93	WP_ 1000	88710	88606

High temperature anti-seize lubricant available - Order: 88610

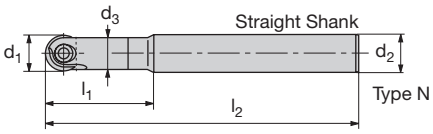
See page 70–71 for Inserts.

See pages 102 & 103 for recommended cutting data & application information.

EBG-R-N Straight Neck Cutter Body – Carbide

Application

- Specially designed for rough and finish milling of steels, stainless and non-ferrous molds and dies and graphite
- Suitable for shrink-fit mounting
- Carbide shank provides excellent rigidity in long tool overhang applications
- High accuracy indexable ball nose inserts with diameters from .250" to 1.250"



d_1	Cutter Body No.	EDP	Dimensions (inches)				Insert Size	Insert Screw	Torx Driver
			l_1	l_2	d_2	d_3			
0.250	EBG R0250A0375 100NC	50269	1.57	3.94	0.38	0.22	WP_ 0250	88704	88600
0.250	EBG R0250A0250 100NC-40	55504	1.57	3.94	0.25	0.22	WP_ 0250	88704	88600
0.250	EBG R0250A0250 150NC-70	55505	2.76	5.91	0.25	0.22	WP_ 0250	88704	88600
0.250	EBG R0250A0250 200NC-100	55506	3.94	7.88	0.25	0.22	WP_ 0250	88704	88600
0.250	EBG R0250A0250 200NC-14	55507	0.55	7.88	0.25	0.22	WP_ 0250	88704	88600
0.312	EBG R0312A0375 100NC	50270	0.99	3.94	0.38	0.28	WP_ 0312	88705	89978
0.312	EBG R0312A0375 150NC	50271	1.57	5.91	0.38	0.28	WP_ 0312	88705	89978
0.312	EBG R0312A0312 200NC-100	55508	3.94	7.88	0.31	0.28	WP_ 0312	88705	89978
0.312	EBG R0375A0375 200NC-100	55509	3.94	7.88	0.38	0.35	WP_ 0375	88706	50259
0.375	EBG R0375A0375 120NC	50272	1.38	4.73	0.38	0.35	WP_ 0375	88706	50259
0.375	EBG R0375A0375 150NC	50273	1.97	5.91	0.38	0.35	WP_ 0375	88706	50259
0.500	EBG R0500A0500 120NC	50274	1.38	4.73	0.50	0.42	WPR 0500	88707	50259
0.500	EBG R0500A0500 160NC	50275	1.97	6.30	0.50	0.42	WPR 0500	88707	50259
0.625	EBG R0625A0625 140NC	50276	1.58	5.52	0.63	0.56	WPR 0625	88708	50258
0.625	EBG R0625A0625 175NC	50277	2.17	6.89	0.63	0.56	WPR 0625	88708	50258
0.750	EBG R0750A0750 140NC	50278	1.58	5.52	0.75	0.71	WPR 0750	88709	50258
0.750	EBG R0750A0750 190NC	50279	2.96	7.48	0.75	0.71	WPR 0750	88709	50258
1.000	EBG R1000A1000 160NC	50280	2.37	6.30	1.00	0.89	WPR 1000	88710	88606
1.000	EBG R1000A1000 210NC	50281	3.55	8.27	1.00	0.89	WPR 1000	88710	88606
1.250	EBG R1250A1250 190NC	50282	2.56	7.48	1.25	1.13	WPR 1250	88711	88606
1.250	EBG R1250A1250 240NC	50283	4.14	9.45	1.25	1.13	WPR 1250	88711	88606

High temperature anti-seize lubricant available - Order: 88610

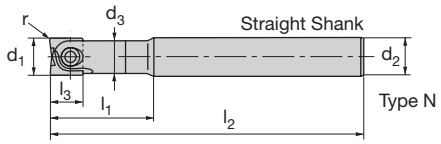
See page 70–71 for Inserts.

See pages 102 & 103 for recommended cutting data & application information.

EBG-V-N Carbide Straight Front Cutter Body – Carbide

Application

- Same features as EBG-R-V-Carbide
- High accuracy indexable flat bottom and back draft inserts with diameters from .250" to 1.250"



d_1	Cutter Body No.	EDP	Dimensions (inches)						Insert Size	Insert Screw	Torx Driver
			l_1	l_2	d_2	d_3	r	l			
0.500	EBG V0500A0500 120NC	50286	1.38	4.73	0.50	0.42	0.03	0.55	WP_ 0500	88707	50259
0.500	EBG V0500A0500 160NC	50287	1.97	6.30	0.50	0.42	0.03	0.55	WP_ 0500	88707	50259
0.625	EBG V0625A0625 140NC	50288	1.58	5.52	0.63	0.56	0.03	0.63	WP_ 0625	88708	50258
0.625	EBG V0625A0625 175NC	50289	2.17	6.89	0.63	0.56	0.03	0.63	WP_ 0625	88708	50258
0.750	EBG V0750A0750 140NC	50290	1.58	5.52	0.75	0.71	0.06	0.70	WP_ 0750	88709	50258
0.750	EBG V0750A0750 190NC	50291	2.96	7.48	0.75	0.71	0.06	0.70	WP_ 0750	88709	50258
1.000	EBG V1000A1000 160NC	50292	2.37	6.30	1.00	0.89	0.06	0.93	WPV_ 1000	88710	88606
1.000	EBG V1000A1000 210NC	50293	3.55	8.27	1.00	0.89	0.06	0.93	WPV_ 1000	88710	88606

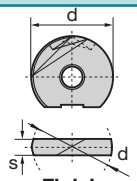
High temperature anti-seize lubricant available - Order: 88610

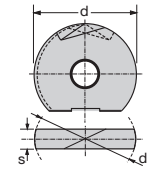
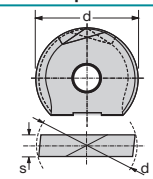
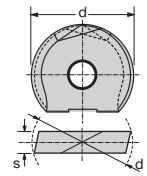
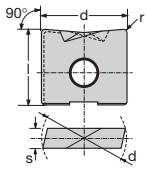
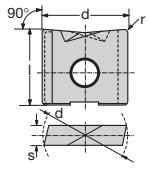
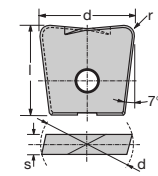
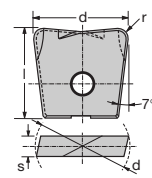
See page 70–71 for Inserts.

See pages 102 & 103 for recommended cutting data & application information.

Insert Thickness Dimension for WPR WPV WPB (inch)					
d_1	s	d_1	s	d_1	s
.312	.079	.625	.118	1.250	.197
.375	.098	.750	.118	2.000	.315
.500	.098	1.000	.157		

Inserts

	Dimensions (Inch)		Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. LC610T	For Cutter Cat. No.
	d	s			
 F=Super Finisher	0.250	–	WPR 0250-F	89981	EBG-RT EBG-RN
	0.375	–	WPR 0375-F	51213	
	0.500	–	WPR 0500-F	51214	
	0.625	–	WPR 0625-F	51215	
	0.750	–	WPR 0750-F	51216	
	1.000	–	WPR 1000-F	51217	

	Dimensions (Inch)			Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No.				For Cutter Cat. No.
	d_1*	r	l		LW610F	LC240T	LC609T**	LDP05B	
 N - Non-chipbreaker	0.312	–	–	WPR 0312-N	–	54859	88258	–	EBG-RT EBG-RN
	0.375	–	–	WPR 0375-N	–	54860	88259	–	
	0.500	–	–	WPR 0500-N	–	53309	88260	–	
	0.625	–	–	WPR 0625-N	–	54298	88261	–	
	0.750	–	–	WPR 0750-N	–	54299	88262	–	
	1.000	–	–	WPR 1000-N	–	54861	88263	–	
	1.250	–	–	WPR 1250-N	–	54862	88264	–	
	2.000	–	–	WPR 2000-N	–	–	88905	–	
 CF - chipbreaker ferrous	0.312	–	–	WPR 0312-CF	–	53442	88265	–	
	0.375	–	–	WPR 0375-CF	–	53444	88266	–	
	0.500	–	–	WPR 0500-CF	–	53445	88267	–	
	0.625	–	–	WPR 0625-CF	–	53446	88268	–	
	0.750	–	–	WPR 0750-CF	–	53447	88269	–	
	1.000	–	–	WPR 1000-CF	–	53448	88270	–	
	1.250	–	–	WPR 1250-CF	–	10298	88271	–	
	2.000	–	–	WPR 2000-CF	–	–	88912	–	
 CN - chipbreaker non-ferrous	0.312	–	–	WPR 0312-CN	88209	–	88272	–	
	0.375	–	–	WPR 0375-CN	88210	–	88273	–	
	0.500	–	–	WPR 0500-CN	88211	–	88274	–	
	0.625	–	–	WPR 0625-CN	88212	–	88275	–	
	0.750	–	–	WPR 0750-CN	88213	–	88276	–	
	1.000	–	–	WPR 1000-CN	88214	–	88277	–	
	1.250	–	–	WPR 1250-CN	88215	–	88278	–	
 N - Non-chipbreaker	0.375	0.032	0.453	WPV 0375N-2	–	–	89502	50890	EBG-V-N
	0.375	0.063	0.453	WPV 0375N-4	–	–	89504	50891	
	0.500	0.032	0.550	WPV 0500N-2	–	–	88543	50895	
	0.500	0.063	0.550	WPV 0500N-4	–	–	88751	50896	
	0.625	0.032	0.625	WPV 0625N-2	–	–	88544	50902	
	0.625	0.063	0.625	WPV 0625N-4	–	–	88756	50903	
	0.750	0.032	0.700	WPV 0750N-2	–	–	88761	50904	
	0.750	0.063	0.700	WPV 0750N-4	–	–	88545	50905	
	1.000	0.032	0.925	WPV 1000N-2	–	–	88766	50906	
	1.000	0.063	0.925	WPV 1000N-4	–	–	88546	50798	
	1.000	0.125	0.925	WPV 1000N-8	–	–	88771		
 CF - chipbreaker ferrous	0.500	0.032	0.550	WPV 0500CF-2	–	54863	–	–	
	0.500	0.063	0.550	WPV 0500CF-4	–	54867	–	–	
	0.625	0.032	0.625	WPV 0625CF-2	–	54864	–	–	
	0.625	0.063	0.625	WPV 0625CF-4	–	54868	–	–	
	0.75	0.032	0.700	WPV 0750CF-2	–	54869	–	–	
	0.75	0.063	0.700	WPV 0750CF-4	–	54865	–	–	
	0.75	0.032	0.925	WPV 1000CF-2	–	54870	–	–	
	1.000	0.063	0.925	WPV 1000CF-4	–	54866	–	–	
	1.000	0.125	0.925	WPV 1000CF-8	–	54871	–	–	
 N - non chipbreaker	0.250	0.032	–	WPB 0250N-2	–	–	–	50696	
	0.375	0.032	–	WPB 0375N-2	–	–	–	54262	
	0.375	0.063	–	WPB 0375N-4	–	–	–	54263	
	0.500	0.032	–	WPB 0500N-2	–	–	88806	54264	
	0.500	0.063	–	WPB 0500N-4	–	–	88811	54265	
	0.625	0.032	–	WPB 0625N-2	–	–	88816	54757	
	0.625	0.063	–	WPB 0625N-4	–	–	88821	54758	
	0.750	0.032	–	WPB 0750N-2	–	–	88826	54266	
	0.750	0.063	–	WPB 0750N-4	–	–	88831	51150	
	1.000	0.032	–	WPB 1000N-2	–	–	88836	54267	
	1.000	0.063	–	WPB 1000N-4	–	–	88841	54268	
	1.000	0.125	–	WPB 1000N-8	–	–	88846	54759	
 CF - chipbreaker ferrous	0.500	0.032	–	WPB 0500CF-2	–	54851	53453	–	
	0.500	0.063	–	WPB 0500CF-4	–	54852	53454	–	
	0.625	0.032	–	WPB 0625CF-2	–	54853	53455	–	
	0.625	0.063	–	WPB 0625CF-4	–	54854	53456	–	
	0.750	0.032	–	WPB 0750CF-2	–	54855	53457	–	
	0.750	0.063	–	WPB 0750CF-4	–	54856	53458	–	
	1.000	0.032	–	WPB 1000CF-2	–	54857	53459	–	
	1.000	0.063	–	WPB 1000CF-4	–	54876	53460	–	
	1.000	0.125	–	WPB 1000CF-8	–	54858	53461	–	

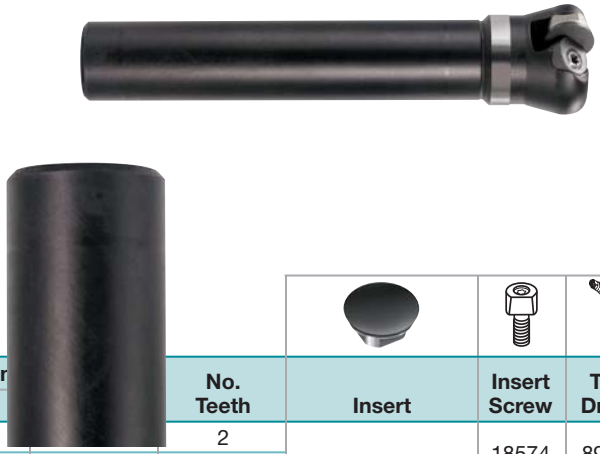
WPR .250, .312, .375, .500 in styles "N", "CF" and "CN" have a different clearance for clamping reasons than the above illustrations suggest.

**d1 = ±.0004 insert tolerance*
***LC609T insert grade will change to LC610T in mid 2004. This is a designation change only. Substrate and coating remain the same.*

EHD / FHD

Application

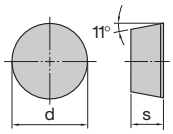
- Cutter specifically designed for high-speed contouring and face milling of hardened steels, plastic composites, high silicon aluminum and graphite
- Cutter pocket provides secure insert locking and allows 4 indexes (10mm diameter insert)
- Cutters manufactured with a run-out accuracy of ± .001"
- Inserts are regrindable



d_1	Cutter Body No.	EDP	Dimensions (in d_2	d_4		No. Teeth	Insert	Insert Screw	Torx Driver
1.00	EHD R10 100 SA	50296	0.75			2	R10 10 42 S	18574	89978
1.25	EHD R10 125 SB	50297	1.00		4.73	3			
1.57	EHD R10 150 SB	50298	1.00		4.73	4		18575	11171
2.00	FHD R10 200 AA	50299		0.75	1.57	5			
2.50	FHD R10 250 AA	50301		0.75	1.57	6			

See below for Inserts.
See pages 102 & 103 for recommended cutting data & application information.

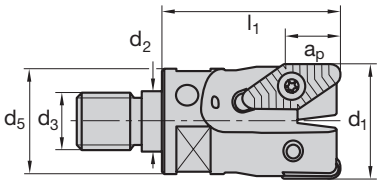
Inserts

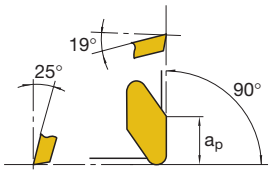
	Dimensions (Inch) d	s	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. DF012-PCD	BN011-CBN	LC610T	For Cutter Cat. No.
	.394	.165	R10 10 42 S	50303	50305		EHD/ FHD

EMZ90 THR

Application

- Designed exclusively for High speed milling of Aluminum alloys, Copper alloys, and plastics
- End mills designed with coolant thru holes for maximum coolant flow and chip evacuation
- Used for face milling, slotting, edge milling, and excellent for deep cavity work
- Ramping and plunge milling capabilities



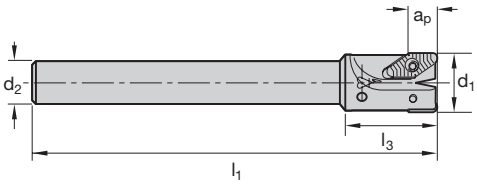


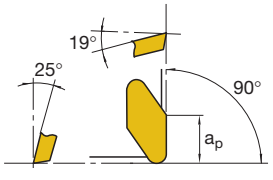
d_1	Cutter Body No.	EDP	Dimensions (inches)						No. Teeth	Insert Size	Insert Screw	Torx Driver
			l_2	l_3	d_6	d_3	d_5	R				
1.00	EMZ90 V16-100TF-I	51639	0.53	1.57	0.49	M12	0.83	0.05	2	VPGT 160412 ALM	51706	50259
1.25	EMZ90 V22-125TH-I	51640	0.59	1.97	0.67	M16	1.02	0.12	2	VCGT 220530 ALM	51707	50259
1.50	EMZ90 V22-150TH-I	51641	0.59	1.97	0.67	M16	1.02	0.12	2			

EMZ90

Application

- Designed exclusively for High speed milling of Aluminum alloys, Copper alloys, and plastics
- End mills designed with coolant thru holes for maximum coolant flow and chip evacuation
- Used for face milling, slotting, edge milling, and excellent for deep cavity work
- Ramping and plunge milling capabilities





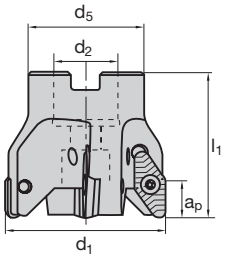
d_1	Cutter Body No.	EDP	Dimensions (inches)					No. Teeth	Insert Size	Insert Screw	Torx Driver
			l_2	l_1	d_6	l_3	R				
1.00	EMZ90 V16-100SA-I	54651	0.53	8.00	0.75	2.00	0.05	2	VPGT 160412 ALM	51706	50259
1.00	EMZ90 V16-100SB-I	51635	0.53	7.88	1.00	1.58	0.05	2			
1.00	EMZ90 V16-100WB-I	54286	0.53	4.28	1.00	2.00	0.05	2			
1.25	EMZ90 V16-125SB-I	54294	0.53	8.00	1.00	2.00	0.05	2			
1.25	EMZ90 V16-125WC-I	54287	0.53	4.28	1.25	2.00	0.05	2			
1.50	EMZ90 V16-150SC-I	54295	0.53	8.00	1.25	2.00	0.05	3			
1.50	EMZ90 V16-150WC-I	54288	0.53	4.88	1.25	2.00	0.05	3			
1.25	EMZ90 V22-125SB-I	51636	0.59	8.62	1.00	2.00	0.12	2	VCGT 220530 ALM	51707	50259
1.50	EMZ90 V22-150SB-I	51637	0.59	8.62	1.00	2.00	0.12	2			

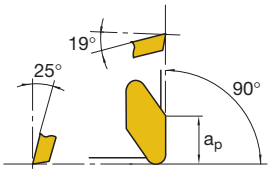
See page 75 for inserts. See page 74 for Extension Arbor for Screw-On tools.
See pages 106 & 107 for recommended cutting data & application information.

FMZ90

Application

- Designed exclusively for High speed milling of Aluminum alloys, Copper alloys, and plastics
- Used for face milling, slotting, edge milling, and excellent for deep cavity work
- Ramping and plunge milling capabilities





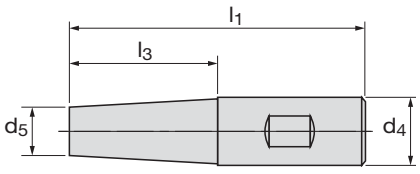
d_1	Cutter Body No.	EDP	Dimensions (inches) l_2	h	d_2	R	No. Teeth	Insert Size	Insert Screw	Torx Driver
1.50	FMZ90 V16-150AA	51642	0.53	2.12	0.75	0.05	3	VPGT 160412 ALM	51706	50259
2.00	FMZ90 V16 200AA	53521	0.53	2.12	0.75	0.05	4			
2.00	FMZ90 V22-200AA	51643	0.59	2.12	0.75	0.12	3	VCGT 220530 ALM	51707	50259
2.50	FMZ90 V22-250AA	51644	0.59	2.12	0.75	0.12	4			
3.00	FMZ90 V22-300AB	54794	0.59	2.12	1.00	0.12	3			
3.00	FMZ90 V22-300ABE	51645	0.59	2.50	1.00	0.12	4			
3.00	FMZ90 V22-300ABF	54781	0.59	2.12	1.00	0.12	5			
4.00	FMZ90 V22-400AD	51646	0.59	2.50	1.50	0.12	5			

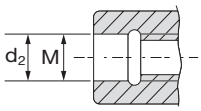
Extension Arbors

Arbors

Application

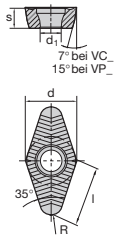
- HSS Screw-On Extended Length Arbors





Arbor Description	EDP	Dimensions (inches) M	d_2	d_5	l_3	l_1	d_4	Arbor Description	EDP	Dimensions (inches) M	d_2	d_5	l_3	l_1	d_4
ADT T10 W0750 4030T	12800	M10	0.41	0.63	2.00	4.03	0.75	ADT T16 W1250 5280T	12806	M16	0.67	1.02	3.00	5.28	1.25
ADT T10 W1000 6280T	12801	M10	0.41	0.63	4.00	6.28	1.00	ADT T16 W1250 7280T	12807	M16	0.67	1.02	5.00	7.28	1.25
ADT T10 W1250 8280T	12802	M10	0.41	0.63	6.00	8.28	1.25	ADT T16 W1250 9280T	12808	M16	0.67	1.02	7.00	9.28	1.25
ADT T10 W1000 5280T	12803	M12	0.49	0.83	3.00	5.28	1.00	ADT T16 W1500 5680T	12809	M16	0.67	1.34	3.00	5.68	1.50
ADT T10 W1250 7280T	12804	M12	0.49	0.83	5.00	7.28	1.25	ADT T16 W1500 7680T	12810	M16	0.67	1.34	5.00	7.68	1.50
ADT T10 W1250 9280T	12805	M12	0.49	0.83	7.00	9.28	1.25	ADT T16 W1500 9680T	12811	M16	0.67	1.34	7.00	9.68	1.50
								ADT T16 W1250 3270T	12812	M16	0.67	1.34	1.00	3.27	1.25

See page 75 for inserts.
See pages 106 & 107 for recommended cutting data & application information.

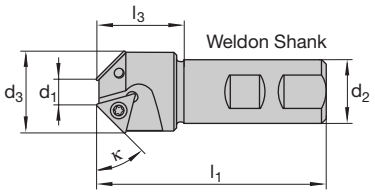
N = Number of Cutting Edges	Dimensions (Inch)					Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No.		For Cutter Cat. No.
	l	s	d	d_1	r		LW610	LC610M	
	.630	.187	.375	.173	.047	VPGT160412-ALM	51672	51673	EMZ90 FMZ90
	.866	.219	.500	.216	.118	VCGT220530-ALM	51676	51677	

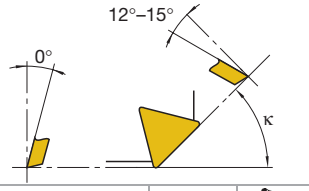
45° / 60° Chamfer End Mills

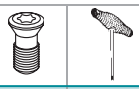
EFZ45/60

Application

- Chamfer-countersinking mills for both manual and CNC machines
- Positive cutting geometry provides free-cutting action on a wide variety of materials
- Available in 45° and 60° chamfer angles
- Uses industry standard inserts





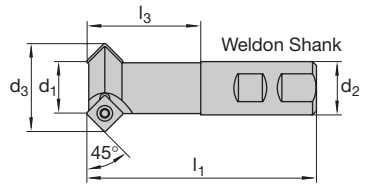


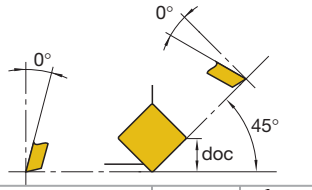
d_1	Cutter Body No.	EDP	Dimensions (inches) K	d_3	l_1	l_3	d_2	No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
0.05	EFZ45 T11-047WB	50480	45°	0.63	2.16	0.79	0.50	1	1950224	TCMT 110202	89972	89978
0.24	EFZ45 T11-244WC	50482		0.83	3.15	1.26	0.63	2	1950226			
0.41	EFZ45 T16-409WE	50484		1.26	3.74	1.26	1.00	2	1950228	TCMT 16T304	89974	50259
0.21	EFZ60 T11-213WB	50486	60°	0.63	2.76	0.79	0.50	1	1950230	TCMT 110202	89972	89978
0.57	EFZ60 T11-567WC	50488		0.98	3.15	1.26	0.63	2	1950232			
0.63	EFZ60 T16-630WE	50490		1.26	3.74	1.42	1.00	2	1950233	TCMT 16T304	89974	50259

EFP45

Application

- Multiple application chamfer milling cutter for steel, stainless and non-ferrous materials
- Positive cutting action provides smooth and quiet cutting
- Unique design chamfers top and bottom bores; mill “V” grooves; chamfer T slots; and chamfer slots





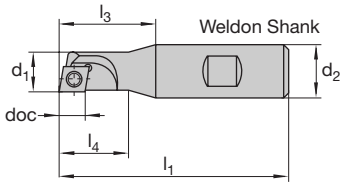
d_1	Cutter Body No.	EDP	Dimensions (inches) d_3	l_1	l_3	d_2	No. Teeth	Euro Ref. No.	Insert	Insert Screw	Torx Driver
0.63	EFP45 S09-063WC	50476	1.13	3.35	1.46	0.63	2	1950135S	SDMT 090308	60712	50259
1.26	EFP45 S12-126WF	50478	1.94	4.92	2.56	1.25	3	1950136	SPMT 120408	89971	50258

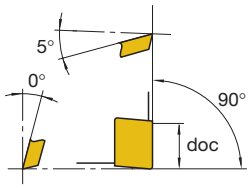
See page 78 for inserts.
See pages 104 & 105 for recommended cutting data & application information.

ESP90

Application

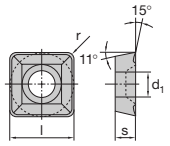
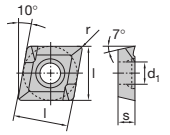
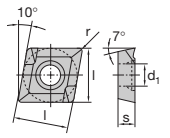
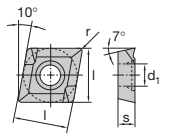
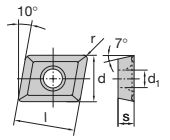
- Center cutting drill-mill cutter for use on steel, stainless and non-ferrous materials
- Used in milling operations requiring counter bores or slotting cutters
- Coolant through standard

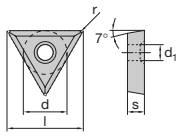
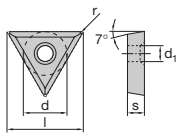
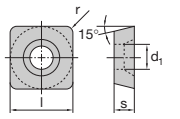
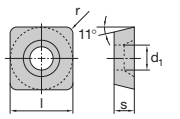
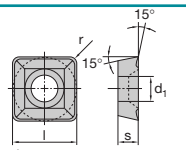
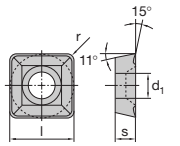




d_1	Cutter Body No.	EDP	Dimensions (inches)					No. Teeth	Euro Ref. No.	Face End Insert	Center Insert	Insert Screw	Torx Driver
			doc	l_1	l_3	l_4	d_2						
0.488	ESP90 C08-0488WCI	50452	0.276	3.00	0.75	0.65	0.63	1	1950183	CCHX 080203	Not Required	50532	89978
0.613	ESP90 C09-0613WDI	50454	0.335	3.38	0.95	0.95	0.75	1	1950185	CCHX 090304		50546	50259
0.738	ESP90 C12-0738WEI	50456	0.433	3.75	1.10	0.99	1.00	1	1950167	CCHX 12T305		50534	
0.863	ESP90 C12-0863WEI	50458	0.512	3.38	1.10	0.99	1.00	1	1950169				
0.988	ESP90 X09 0988WFI	50460	0.512	4.00	1.42	1.34	1.25	1+1	1950171		SPMT 3(2.5)2	89973	50259
1.238	ESP90 X09 1238WFI	50462	0.512	4.00	1.42	1.34	1.25	1+1	1950173				

See page 78 for inserts.
See pages 104 & 105 for recommended cutting data & application information.

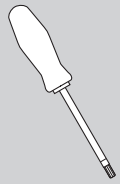
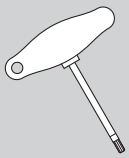
N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	AL_2O_3	For Cutter Cat. No.
 N=4	.375	.156		.173		.031	SPMT 09T308 1196-24	**LW610** 60464	**LC225S** 60471	**LC610T** 51372		ESP90 11470
 N=2	.313	.113		.134		.012	CCHX 080203 1196-44	**LW610** 10912	**LC225S** 60466			
 N=2	.375	.125		.173		.016	CCHX 090304 1196-54	**LW610** 60479	**LC225S** 60470			
 N=2	.500	.156		.217		.020	CCHX 12T305 1196-64		**LC225S** 60467			
 N=2	.563	.156	.375	.173		.020	1196-74		**LC225S** 60469			

N = Number of Cutting Edges	Dimensions (Inch) l	s	d	d_1	b	r	Insert Description ISO Code LMT Cat. No.	Insert Grade Ordering No. Uncoated	TiCN Plus	AL Plus	AL_2O_3	For Cutter Cat. No.
 N=3	.433	.094	.250	.110		.008	TCMT 110202 1166-00		**LC225S** 60311			EFZ45 1148
								LW610 60314		**LC610T** 50684		
 N=3	.650	.156	.375	.169		.016	TCMT 16T304 1166-10		**LC225S** 60312			
								LW610 60315				
 N=4	.375	.125		.154		.031	SDMW 090308 1196-01		**LC225S** 60438			EFZ45 11483
										LC240T 51200		
								LW610 60435				
 N=4	.500	.187		.205		.031	SPMW 120408 1196-10		**LC225S** 60452			
									LC230F 53800			
								LW610 60451				
 N=4	.375	.125		.157		.031	SDMT 090308 1196-03		**LC225S** 60648			
								LW610 60443				
 N=4	.500	.187		.205		.031	SPMT 120408 1196-12		**LC225S** 60458			
									LC230F 51759			
										LC240T 60773		
									LC435I 89130			
								LW610 60456		**LC610T** 10198	**LC630E** 10118	

Replacement Screws and Torque Specifications for Ball Nose, Flat Bottom / Back Draft Tools Found on Pages 67–70

Screw EDP Number	Euro Reference Number	Torx Size	Torque In-Lbs
88704	GWS 06	6	HAND TIGHTEN
88705	GWS 08	8	HAND TIGHTEN
88706	GWS 10	15	HAND TIGHTEN
88707	GWS 12	15	53
88708	GWS 16	20	54.5
88709	GWS 20	20	56
88710	GWS 25	30	57.5
88711	GWS 32	30	57.5
88910	GWS 50	8mm Hex	57.5

Torx Drivers & Hex Wrenches

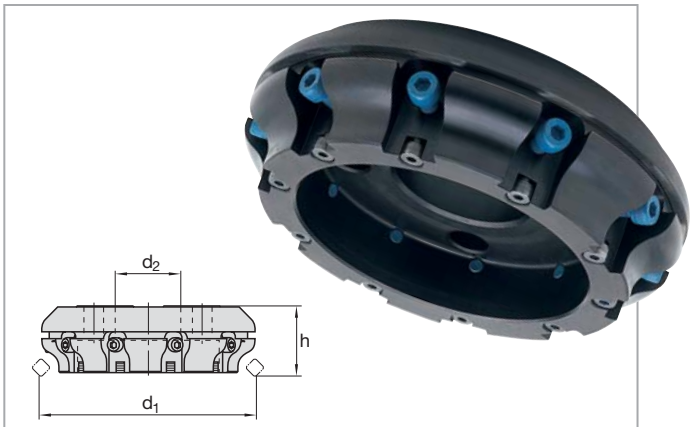
	EDP Number	Size
	88600 89978 11171	6 8 10
	50259 50258 88606	15 20 30
	88712 88713	8mm Hex 6mm Hex

Anti-Seize Lubricant

EDP Number	Part Number
88610	SL1

Anti-Seize lubricates locking screw threads to prevent seizing caused by extreme temperatures and corrosion in machining operations. Screws should be coated frequently to prevent seizing.

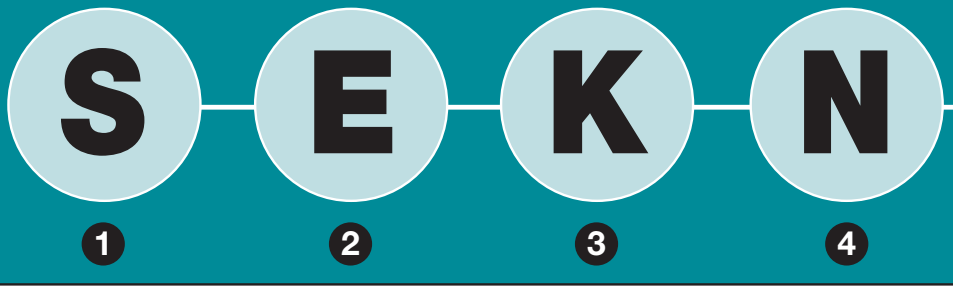
MM Body Sold Without Cartridges



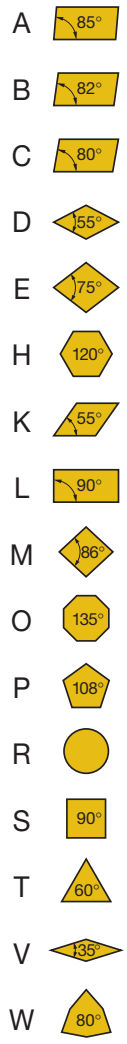
EDP	Cutter Body No.	No. Teeth	Dimensions (inches) d_1	h	d_2
Coarse Pitch					
50226	MM BODY 4.0 x 6	6	4.00	2.48	1.50
50227	MM BODY 5.0 x 6	6	5.00	2.48	1.50
50228	MM BODY 6.0 x 10	10	6.00	2.48	1.50
50229	MM BODY 8.0 x 12	12	8.00	2.48	2.50
50230	MM BODY 10.0 x 14	14	10.00	2.48	2.50
50231	MM BODY 12.0 x 18	18	12.00	3.15	2.50
50265	MM BODY 16.0 x 20	20	16.00	3.15	2.50
50266	MM BODY 20.0 x 28	28	20.00	3.15	2.50
Fine Pitch					
50232	MM BODY 5.0 x 8	8	5.00	2.48	1.50
50233	MM BODY 6.0 x 12	12	6.00	2.48	1.50
50234	MM BODY 8.0 x 16	16	8.00	2.48	2.50
50235	MM BODY 10.0 x 20	20	10.00	2.48	2.50
50236	MM BODY 12.0 x 24	24	12.00	3.15	2.50
50267	MM BODY 16.0 x 30	30	16.00	3.15	2.50
50268	MM BODY 20.0 x 40	40	20.00	3.15	2.50

ISO Insert Designation

ISO Example

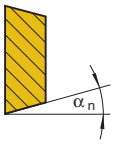


1 Insert Shape



Note 1:
In case of more than one angle, always use smallest angle.

2 Clearance Angle

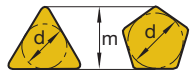


	α_n
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Normal clearance angles, which require a special description.

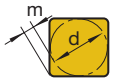
3

Tolerances (inches)

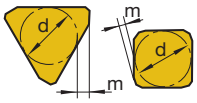
	m	s	d
A	±0.0002	±0.001	±0.001
C	±0.0005		
E	±0.001		
F	±0.0002		±0.0005
G	±0.001	±0.005	±0.001
H	±0.0005	±0.001	±0.0005
J	±0.0002		See Table 5
K	±0.0005		
L	±0.001		
M	See Table 4	±0.005	
N		±0.001	
U		±0.005	



Corner rounding, uneven number of sides



Corner rounding, even number of sides



Chamfered inserts

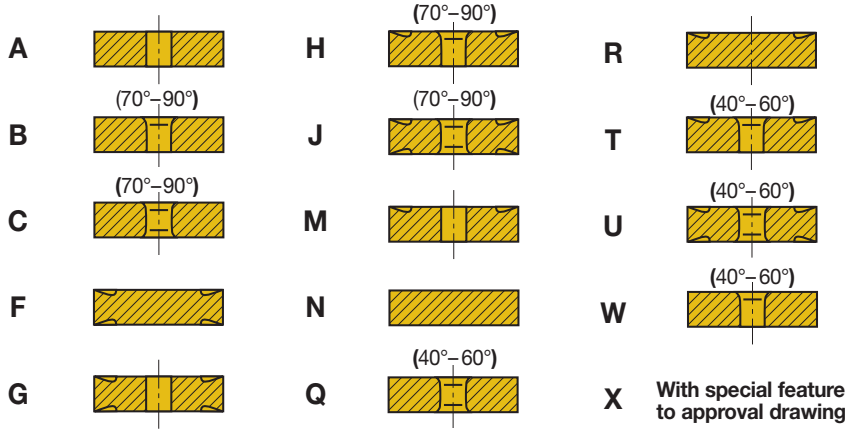
Table 4-m

d		M, N	U
Over .154	**Up to .394**		
		±0.003	±0.005
.394	.590	±0.005	±0.008
.590	.787	±0.006	±0.011
.787	1.024	±0.007	±0.015
1.024	1.260	±0.008	±0.015

Table 5-d

d		J, K, L, M	U
Over .154	**Up to .394**		
		±0.002	±0.003
.394	.590	±0.003	±0.005
.590	.787	±0.004	±0.007
.787	1.024	±0.005	±0.001
1.024	1.260	±0.006	±0.001

4 Cutting Face, Clamp Style



With special feature to approval drawing

( ) Cone angle for screw

ISO Insert Designation

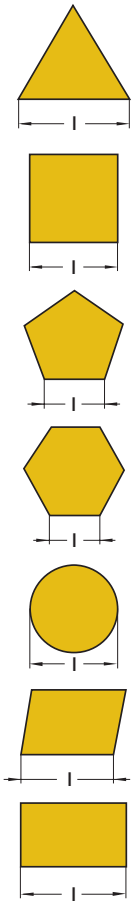
12 03 AF S N

5 6 7 8 9

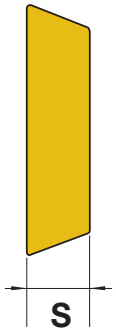
5 Cutting Edge Length

l = Length

	l
06	.250
07	.312
09	.375
11	.433
12	.500
15	.625
16	.649
19	.750
22	.866
25	1.00
31	1.25
38	1.50



6 Thickness

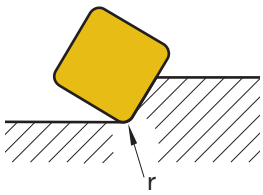


(Inches)

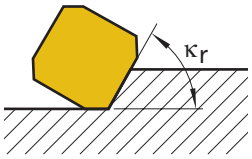
02	.094
03	.125
T3	.156
04	.187
05	.219
06	.250
07	.312
08	.315
09	.375

7 A Cutting Edge Corner

Radius inserts



For chamfer face milling inserts



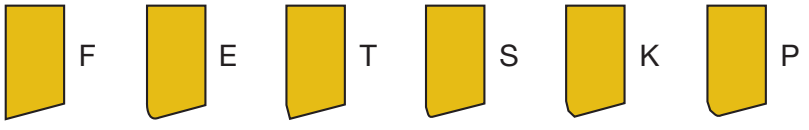
	Corner radius-r (Inches)
00	sharp-edged
02	0.007
04	0.015
08	0.031
12	0.047
16	0.062
20	0.078

	Approach angle κr
A	45°
D	60°
E	75°
F	85°
P	90°
Z	Special

7 B

A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Clearance of face milling edge

8 Cutting Edge Corner*



F Sharp-edged

E Rounded

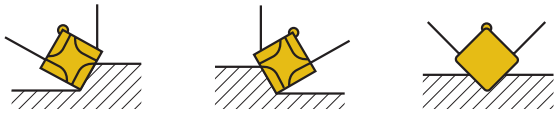
T Chamfered

S Chamfered and Rounded

K Doubled Chamfered

P Double Chamfered and Rounded

9 Direction of Cut*



R RH cut only

L LH cut only

N RH and LH cut

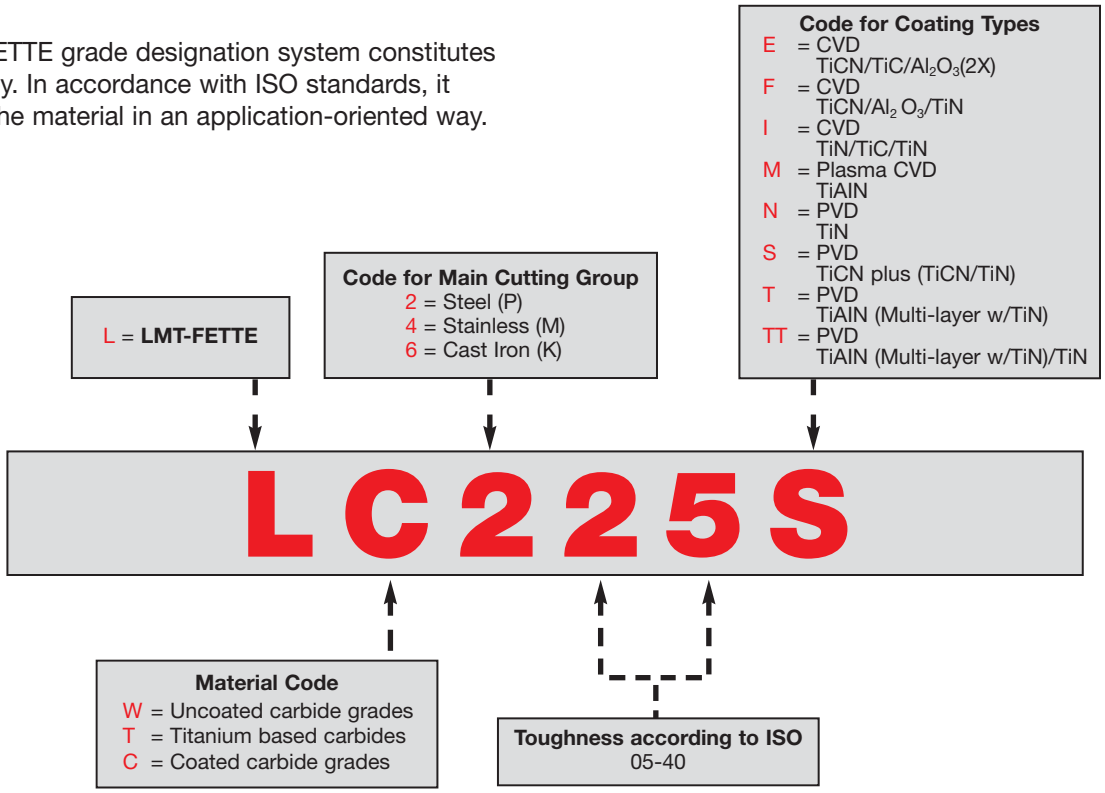
*This reference letter is not always used

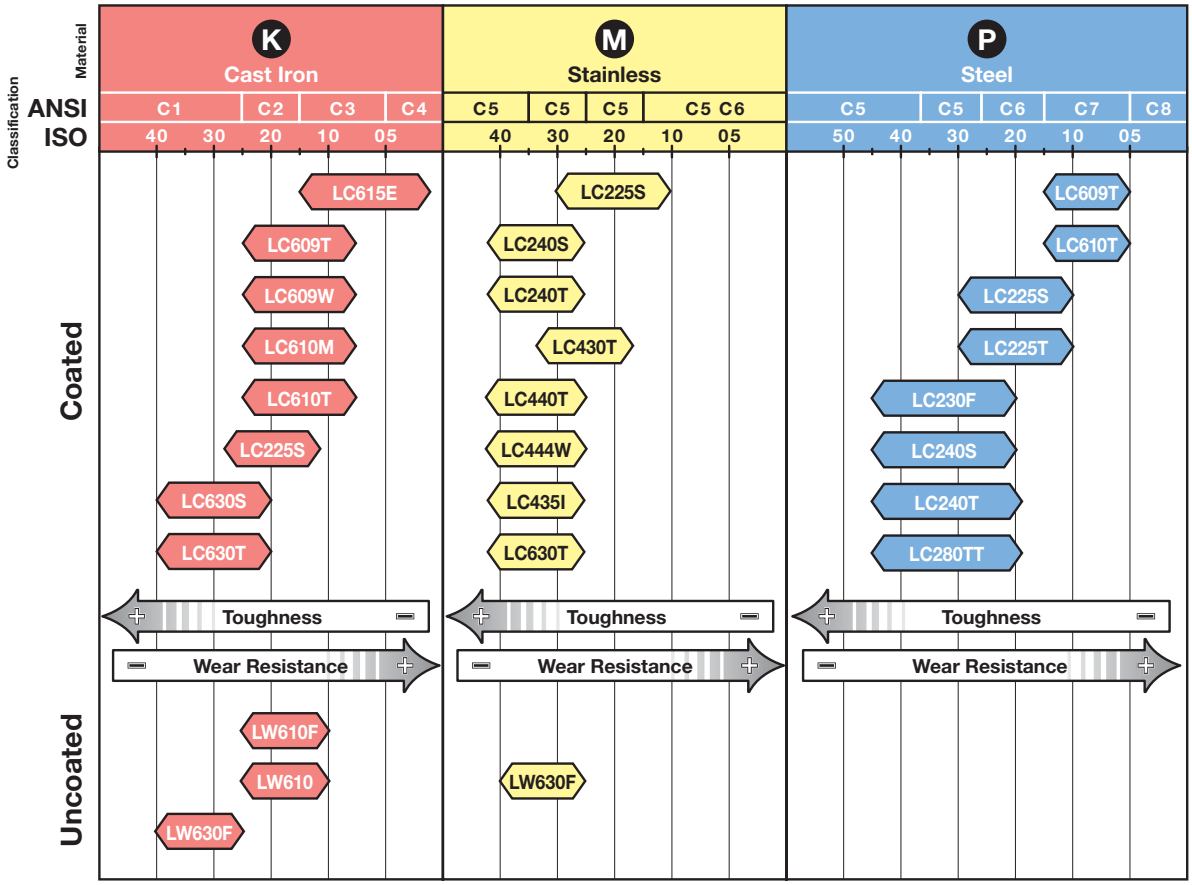
LMT Insert Grades

GRADE	DESCRIPTION
LW610	Uncoated Fine grain K10 grade. Premium uncoated carbide grade designed for high edge wear resistance in non-ferrous and cast iron materials running at moderate to high surface speed. Recommended to run with coolant only when specific materials requires wet process.
LW630	Uncoated Fine grain K30 grade. Premium uncoated carbide grade designed to run in applications needing a tough wear resistant edge at lower speeds and feeds. Recommended for steel, stainless, and non-ferrous materials.
LC225S	Premium PVD coated P25 grade, with our New TiCN-PLUS coating for optimum wear resistance and lubricity. First choice for general purpose applications of steel and stainless at high cutting speeds. Recommended to run dry, but can run with coolant.
LC225T	Premium PVD coated P25 grade, with TiALN coating for extended tool life at moderate to high feed rates. Recommended to run in dry milling applications.
LC230F	Universal milling grade MT-CVD P30, with TiCN / Al_2O_3 / TiN coating that provides excellent edge wear resistance and toughness. LC230F is primarily designed in applications from soft gummy carbon steels to alloy tools steels. Additionally performs in Austenitic Stainless. This grade is recommended for medium to heavy chip loads and can be used in wet or dry milling applications.
LC240S	Premium PVD coated P40 grade, with our new TiCN-PLUS coating for both wear resistance and lubricity. Used in steels, steel casting, stainless, at low speeds to moderate speeds. Recommended to run dry, but can run with coolant.
LC240T	Premium PVD coated P40 grade, with a TiAlN for extended tool life in the cut at moderate feeds at high cutting speeds. First choice grade for milling in all steels including mold and die steels. Recommended to run in dry milling applications.
LC280TT	Premium PVD coated P40 grade, with a TiAlN/TiN for extended tool life in the cut at heavy feeds at medium cutting speeds. First choice grade for milling in all steels including mold and die steels, even interrupted cuts. Recommended to run in dry milling applications.
LC430T	Premium milling grade PVD M30, with TiALN coating. LC430T developed for face and shoulder milling operations under stable working conditions in Austenitic and Martensitic Stainless Steels. This grade is for recommended light to medium chip loads in finishing applications.
LC435I	CVD coated M35 grade, with a Multi-layer TiN/TiC/TiN coating on a tough carbide substrate. A tough milling grade for steel, cast steel, and stainless. Recommended to run dry, but can run with coolant.
LC440T	Premium milling grade PVD M40, with TiALN coating. LC440T developed for Face and shoulder milling operations for interrupted cuts, heavy depth of cuts, and machining under unstable working conditions in Austenitic and Martensitic Stainless Steels. This grade is recommended for medium chip loads in roughing applications.
LC444W	Premium milling grade CVD M40, with TiCN coating. LC444W was developed as a universal grade for face and shoulder milling applications in Austenitic and Martensitic Stainless steels. This grade is recommended for wet milling in with light to medium chip loads in Stainless applications.
LC609T	Premium PVD coated K10F grade for edge wear resistance, with a TiAlN coating for extended time in cut during finish work. Used in finish Ball Nose, Back Draft/Flat Bottom copy milling. Insert grade for both semi finishing and finishing of molds and dies (soft or hard). Capable of running at moderate to high cutting speeds. Recommended to run in dry milling applications, or with the use of air.
LC610T•	CVD coated K10 grade, with a TiAlN coating providing heat and edge wear resistance. Designed specially for the machining of aluminum and non-ferrous material that require high cutting speeds. Recommended to run with coolant.
LC610T	Premium PVD coated K10F grade for edge wear resistance, with a TiAlN coating for extended time in cut during finish work. Used in finish Ball Nose, Back Draft/Flat Bottom copy milling. Insert grade for both semi finishing and finishing of molds and dies (soft or hard). Capable of running at moderate to high cutting speeds. Recommended to run in dry milling applications, or with the use of air.
LC615E	CVD coated K15 grade, with a Al_2O_3 coating on a very tough heat & abrasion resistant substrate. A milling insert grade for grey cast irons, nodular irons that require high cutting speeds and feeds. Recommended to run dry, but can run with coolant.
LC630S	PVD coated K30F grade, with a TiCN-PLUS coating for both wear and lubricity. Designed as a all around general purpose grade for steels, stainless, and cast iron materials at moderate speeds. Recommended to run dry, but can run with coolant.
LC630T	PVD coated K30F grade, with a TiAlN coating providing heat and edge wear resistance on a tough substrate. Designed as a general purpose dry milling grade for all steels, stainless, and cast iron material at moderate to high speeds. Recommended to run in dry milling applications.

Insert Grade Designation

The LMT-FETTE grade designation system constitutes a simple key. In accordance with ISO standards, it describes the material in an application-oriented way.





Cutting Data Recommendations for Copying-Cutters for Roughing with LC280TT

	Material	Examples	SFM
	Unalloyed tool steel	1045, W1	900
	Heat – treatable die steels	1212, 12L13	820
	Case hardening steels	1040, 4130	900
	Full hardening tool steels	O2, D2, D3, H13, H11	650
	Nitriding steels	H13, 6150, A355 Cl C	575
	Stainless steel, austenitic	316L 304	820
	Maraging steel		
	Grey cast iron and Alloyed grey cast iron	No. 35B	750
	Nodular cast iron and Alloyed nodular cast iron	60-40-18	650
	Chilled cast iron		590
	Hardened steel	45-52 Rc	450

Cutting Data Recommendations for LC240T

Material	Examples	Rockwell C	Feed per Tooth (f_z) / SFM					
			0.003 - 0.006		0.006 - 0.014		0.014 - 0.020	
			💧💧	☀	💧💧	☀	💧💧	☀
Plain Carbon steel	1018, 1025,	< 20	690	870	540	720	430	570
Free Machining steel	1212, 12L13	< 20	690	870	540	720	430	570
Structural alloy steel	1040, 4130	< 30	690	870	540	720	430	570
Heat-treatable steel, medium strength	4140, 6150	< 30	560	710	440	590	360	480
Cast Steel	4340, 8740	< 30	560	710	440	590	360	480
Case hardening steel	52100, 8620	< 30	560	710	440	590	360	480
Stainless steel, ferritic martensitic	410, 430F, 440	< 30	560	710	440	590	360	480
Heat treatable steel, High strength	4140, 8740	28 - 44	490	620	390	520	310	430
Nitriding Steel	A355	28 - 44	490	620	390	520	310	430
Tool Steel	H13, D2	28 - 44	490	620	390	520	310	430
Stainless steel austentic	304, 316	< 30	750	950	590	790	480	620
Maraging steel			750	950	590	790	480	620
Grey cast iron	A319, J431 No. 25B, No. 50B	< 27	690	870	540	720	430	570
Alloyed grey cast iron	A434, A436-72	< 22	560	710	440	590	360	480
Nodular cast iron	A536 (80-55-06), J434	< 34	490	620	390	520	310	430
Malleable cast iron	A220, 50005 A47,32510	< 29	490	620	390	520	310	430
Pure metals, soft	Pure Iron, Lead	< 20						
Aluminum alloys, long chipping	6061, 7050	< 20						
Aluminum alloys, short chipping	A356, 4218	< 20						
Copper alloys, long chipping	C27200, B-148-52	< 20						
Copper alloy, Short chipping		< 20						
Magnesium alloys	B94, M11910							
Thermoplastics	PVC, Acrylic glass							
Duroplastics	Durolite, Ampal							
Graphite								
Titanium alloys, medium strength	F67, B265	< 29						
Titanium alloys high strength Alloy	Ti-6Al-4V	27 - 44						
Nickel based alloys medium strength	20Cb3	< 29				230		
Heat resistant nickel based alloys high strength	Inconel 718	27 - 44				160		
Chilled cast iron	Ampco 25	< 20				160		
Hardened steel		45 - 52				160		
		53 - 59						
		60 - 65						

💧💧 Wet machining ☀ Dry machining

Cutting Data Recommendations for LC230F

Material	Examples	Rockwell C	Feed per Tooth (f_z) / SFM					
			0.003 - 0.006		0.006 - 0.014		0.014 - 0.020	
			💧💧	☀	💧💧	☀	💧💧	☀
Plain Carbon steel	1018, 1025,	< 20	460	750	360	520	390	660
Free Machining steel	1212, 12L13	< 20	460	750	360	520	390	660
Structural alloy steel	1040, 4130	< 30	460	750	360	520	390	660
Heat-treatable steel, medium strength	4140, 6150	< 30	390	560	300	390	390	490
Cast Steel	4340, 8740	< 30	390	560	300	390	390	490
Case hardening steel	52100, 8620	< 30	390	560	300	390	390	490
Stainless steel,	410, 430F, 440	< 30						
ferritic,			490	520	330	460	430	560
martensitic			360	520	260	360	330	460
Heat treatable steel, High strength	4140, 8740	28 - 44	390	520	260	360	330	460
Nitriding Steel	A355	28 - 44	390	520	260	360	330	460
Tool Steel	H13, D2	28 - 44	390	520	260	360	330	460
Stainless steel austenitic	304, 316	< 30	260	520	-	-	-	-
Maraging steel								
Grey cast iron	A319, J431 No. 25B, No. 50B	< 27	-	-	-	-	-	-
Alloyed grey cast iron	A434, A436-72	< 22	-	-	-	-	-	-
Nodular cast iron	A536 (80-55-06), J434	< 34	490	590	310	430	430	520
Malleable cast iron	A220, 50005 A47,32510	< 29	-	-	-	-	-	-
Pure metals, soft	Pure Iron, Lead	< 20	-	-	-	-	-	-
Aluminum alloys, long chipping	6061, 7050	< 20	-	-	-	-	-	-
Aluminum alloys, short chipping	A356, 4218	< 20	-	-	-	-	-	-
Copper alloys, long chipping	C27200, B-148-52	< 20	-	-	-	-	-	-
Copper alloy, short chipping		< 20	-	-	-	-	-	-
Magnesium alloys	B94, M11910		-	-	-	-	-	-
Thermoplastics	PVC, Acrylic glass		-	-	-	-	-	-
Duroplastics	Durolite, Ampal		-	-	-	-	-	-
Graphite			-	-	-	-	-	-
Titanium alloys, medium strength	F67, B265	< 29	-	-	-	-	-	-
Titanium alloys, high strength Alloy	Ti-6Al-4V	27 - 44	-	-	-	-	-	-
Nickel based alloys medium strength	20Cb3	< 29	-	-	-	-	-	-
Heat resistant nickel based alloys high strength	Inconel 718	27 - 44	-	-	-	-	-	-
Chilled cast iron	Ampco 25	< 20						
Hardened steel		45 - 52	-	-	-	-	-	-
		53 - 59						
		60 - 65	-	-	-	-	-	-

💧💧 Wet machining ☀ Dry machining

Cutting Data Recommendations for LC225T, LC225S

Material	Examples	Rockwell C	Feed per Tooth (f_z) / SFM					
			0.003 - 0.006		0.006 - 0.014		0.014 - 0.020	
			Wet	Dry	Wet	Dry	Wet	Dry
Plain Carbon steel	1018, 1025,	< 20	520	790	490	720	390	520
Free Machining steel	1212, 12L13	< 20	520	790	490	720	390	520
Structural alloy steel	1040, 4130	< 30	520	790	490	720	390	520
Heat-treatable steel,	4140, 6150	< 30	490	620	430	520	360	460
medium strength	4340, 8740		490	620	430	520	360	460
Cast Steel	52100, 8620	< 30	490	620	430	520	360	460
Case hardening steel	410, 430F, 440	< 30	-	-	-	-	-	-
Stainless steel,	4140, 8740	< 30	520	720	430	590	330	460
ferritic			430	590	330	460	260	360
martensitic			390	520	300	430	230	330
Heat treatable steel, High strength	A355	28 - 44	-	-	-	-	-	-
Nitriding Steel	H13, D2	28 - 44	390	520	300	430	230	330
Tool Steel	1018, 1025,	28 - 44	390	520	300	430	230	330
Stainless steel, austenitic Maraging steel	304, 316	< 30	390	590	-	-	-	-
Grey cast iron	A319, J431 No. 25B, No. 50B	< 27	-	-	-	-	-	-
Alloyed grey cast iron	A434, A436-72	< 22	-	-	-	-	-	-
Nodular cast iron	A536 (80-55-06), J434	< 34	490	620	410	540	340	460
Malleable cast iron	A220, 50005 A47,32510	< 29	-	-	-	-	-	-
Pure metals, soft	Pure Iron, Lead	< 20	-	-	-	-	-	-
Aluminum alloys, long chipping	6061, 7050	< 20	-	-	-	-	-	-
Aluminum alloys, short chipping	A356, 4218	< 20	-	-	-	-	-	-
Copper alloys, long chipping	C27200, B-148-52	< 20	-	-	-	-	-	-
Copper alloy, short chipping		< 20	-	-	-	-	-	-
Magnesium alloys	B94, M11910		-	-	-	-	-	-
Thermoplastics	PVC, Acrylic glass		-	-	-	-	-	-
Duroplastics	Durolite, Ampal		-	-	-	-	-	-
Graphite			-	-	-	-	-	-
Titanium alloys, medium strength	F67, B265	< 29	-	-	-	-	-	-
Titanium alloys, high strength Alloy	Ti-6Al-4V	27 - 44	-	-	-	-	-	-
Nickel based alloys medium strength	20Cb3	< 29	-	-	-	-	-	-
Heat resistant nickel based alloys high strength	Inconel 718	27 - 44	-	-	-	-	-	-
Chilled cast iron	Ampco 25	< 20	-	-	-	-	-	-
Hardened steel		45 - 52	-	-	-	-	-	-
		53 - 59						
		60 - 65						

Wet machining Dry machining

Cutting Data Recommendations for LC430T, LC440T

	Material	Examples	Rockwell C	Feed per Tooth (f_z) / SFM	
				0.003 - 0.006	0.006 - 0.014
	Austenitic	303, 304, 304L, 316, 316L, 321, 347	< 20	820 - 1050	660 - 920
	Austenitic hardened	309, 310S, 630, J775(SAE)	< 20	660 - 920	-
	Duplex (Austentic / ferritic)	329	< 20	660 - 920	-

Dry machining

For ferritic and martensitic stainless steels we recommend grade LC230F (preferably dry machining)

Cutting Data Recommendations for LC444W

	Material	Examples	Rockwell C	Feed per Tooth (f_z) / SFM	
				0.003 - 0.008	0.009 - 0.016
	Austenitic	303, 304, 304L, 316, 316L	< 20	260 - 525	229 - 460
		316Ti, 318, 321, 347, 348	< 20	230 - 410	165 - 395
	Austenitic hardened	309, 310S, 630, J775 (SAE)		230 - 330	
	Duplex (austenitic/ferritic)	329		230 - 395	
	Heat resistant alloys				
	Ni- or Co-basis	Inconel 718, Incoloy 925	32 - 38	130 - 230	95 - 195
	Titanium alloys:				
	Alpha- + Beta-alloys	Ti -6Al-4V	< 32	150 - 195	130 - 180

Wet machining

For ferritic and martensitic stainless steels we recommend grade LC230F (preferably dry machining)

Cutting Data Recommendations for LC610T

Material	Examples	Rockwell C	Feed per Tooth (f_z) / SFM					
			0.003 - 0.006		0.006 - 0.014		0.014 - 0.020	
			💧	☀	💧	☀	💧	☀
Plain Carbon steel	1018, 1025,	< 20	940	1180	740	980	590	790
Free Machining steel	1212, 12L13	< 20	940	1180	740	980	590	790
Structural alloy steel	1040, 4130	< 30	940	1180	740	980	590	790
Heat-treatable steel, medium strength	4140, 6150	< 30	940	1180	740	980	590	790
Cast Steel	4340, 8740	< 30	770	980	740	820	490	660
Case hardening steel	52100, 8620	< 30	770	980	740	820	490	660
Stainless steel, ferritic, martensitic	410, 430F, 440	< 30	770	980	740	820	490	660
Heat treatable steel, High strength	4140, 8740	28 -44	620	790	490	660	390	520
Nitriding Steel	A355	28 - 44	620	790	490	660	390	520
Tool Steel	H13, D2	28 -44	620	790	490	660	390	520
Stainless steel, austenitic	304, 316	< 30	-	-	-	-	-	-
Maraging steel			-	-	-	-	-	-
Grey cast iron	A319, J431 No. 25B, No. 50B	< 27	940	1180	740	980	590	790
Alloyed grey cast iron	A434, A436-72	< 22	720	910	560	750	460	610
Nodular cast iron	A536 (80-55-06), J434	< 34	660	820	520	690	410	560
Malleable cast iron	A220, 50005 A47,32510	< 29	660	820	520	690	410	560
Pure metals, soft	Pure Iron, Lead	< 20	2180	2760	1720	2300	1380	1840
Aluminum alloys, long chipping	6061, 7050	< 20	3120	3280	2460	3280	1970	2620
Aluminum alloys, short chipping	A356, 4218	< 20	1250	1570	980	1310	790	1050
Copper alloys, long chipping	C27200, B-148-52	< 20	3120	3280	2460	3280	1970	2620
Copper alloy, short chipping		< 20	1250	1570	980	1310	790	1050
Magnesium alloys	B94, M11910		-	1970	-	1640	-	1310
Thermoplastics	PVC, Acrylic glass		-	1970	-	1640	-	1310
Duroplastics	Durolite, Ampal		-	1970	-	1640	-	1310
Graphite			-	1970	-	1640	-	1310
Titanium alloys, medium strength	F67, B265	< 29						
Titanium alloys, high strength Alloy	Ti-6Al-4V	27 - 44						
Nickel based alloys medium strength	20Cb3	< 29	260	300				
Heat resistant nickel based alloys high strength	Inconel 718	27 - 44	200	230				
Chilled cast iron	Ampco 25	< 20	200	230				
Hardened steel		45 - 52	260	300				
		53 - 59	200	230				
		60 - 65	130	160				

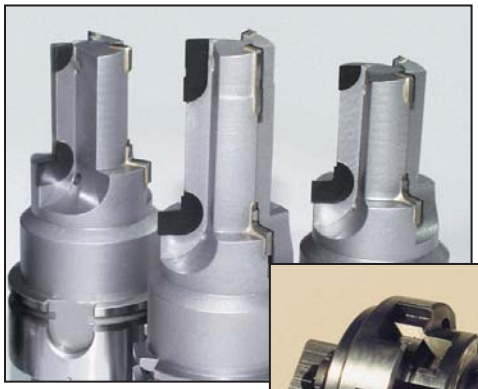
💧 Wet machining ☀ Dry machining

Cutting Data Recommendations for LC615E

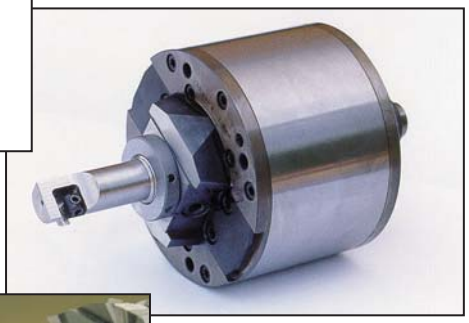
Material	Examples	Rockwell C	Feed per Tooth (f_z) / SFM					
			0.003 - 0.006		0.006 - 0.014		0.014 - 0.020	
			💧💧	☀	💧💧	☀	💧💧	☀
Plain Carbon steel	1018, 1025,	< 20						
Free Machining steel	1212, 12L13	< 20						
Structural alloy steel	1040, 4130	< 30						
Heat-treatable steel, medium strength	4140, 6150	< 30						
Cast Steel	4340, 8740	< 30						
Case hardening steel	52100, 8620	< 30						
Stainless steel, ferritic, martensitic	410, 430F, 440	< 30						
Heat treatable steel, High strength	4140, 8740	28 - 44						
Nitriding Steel	A355	28 - 44						
Tool Steel	H13, D2	28 -44						
Stainless steel, austenitic	304, 316	< 30						
Maraging steel								
Grey cast iron	A319, J431 No. 25B, No. 50B	< 27	520	1050	430	790	300	590
Alloyed grey cast iron	A434, A436-72	< 22	430	820	330	660	260	490
Nodular cast iron	A536 (80-55-06), J434	< 34	490	590	390	490	300	430
Malleable cast iron	A220, 50005 A47,32510	< 29	490	920	390	690	300	490
Pure metals, soft	Pure Iron, Lead	< 20						
Aluminum alloys, long chipping	6061, 7050	< 20						
Aluminum alloys, short chipping	A356, 4218	< 20						
Copper alloys, long chipping	C27200, B-148-52	< 20						
Copper alloy, short chipping		< 20						
Magnesium alloys	B94, M11910							
Thermoplastics	PVC, Acrylic glass							
Duroplastics	Durolite, Ampal							
Graphite								
Titanium alloys, medium strength	F67, B265	< 29						
Titanium alloys, high strength Alloy	Ti-6Al-4V	27 - 44						
Nickel based alloys medium strength	20Cb3	< 29						
Heat resistant nickel based alloys high strength	Inconel 718	27 - 44						
Chilled cast iron	Ampco 25	< 20						
Hardened steel		45 - 52						
		53 - 59						
		60 - 65						

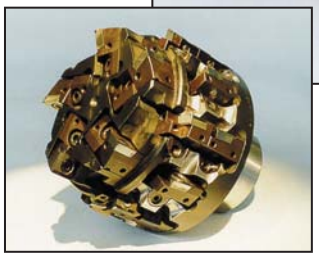
💧💧 Wet machining ☀ Dry machining

Look to LMT-FETTE for all your precision metalworking needs



- Productive solutions for your manufacturing problems
- Advanced cutting materials for today's production requirements.
- The correct tool for your automotive, aerospace, or medical fabrication needs.





Cutting Data Recommendations for Face Mills – TWIN*CUT* / ISO

Work Material	Hardness		Cutting Speed (SFM) Range			Recommended Grade	Feed Per Tooth (f_z) Range	Starting Speed (SFM)	Starting Feed Per Tooth (f_z)	Wet or Dry
	Brinell (BHN)	Rockwell (HRC)	Uncoated Carbide	Coated Carbide	CBN/PCD					
Low Carbon Steels	< 220	< 19		350-900		LC240T	.004-.020	500	.012	D
AISI: 1008, 1010, 1018, 1117, 1141				400-1100		LC225S/T	.004-.014	650	.010	D
Plain Carbon,	200-300	19-32		300-700		LC240T	.003-.018	400	.012	D
Alloy and Tool Steels				300-900		LC225S/T	.003-.012	500	.009	D
AISI: 1045, 4140, 4320,	300-425	32-45		175-400		LC240T	.003-.014	300	.008	D
4340,5120, 8620, P-20				250-650		LC225S/T	.003-.008	450	.006	D
	425-570	45-54		300-500		LC610T	.003-.006	350	.004	D
					300-800	CBN	.003-.006	550	.004	D
Stainless Steels	< 330	< 35		200-600		LC240T	.003-.012	400	.007	W/D
Ferritic-Martensitic				250-650		LC225S/T	.003-.009	.450	.005	D
400 to 500 Series	330-450	35-45		150-500		LC225S	.003-.006	425	.005	D
PH Stainless Steels				150-425		LC240T	.004-.011	350	.007	W/D
Austenitic	135-275	< 28		250-550		LC240T	.004-.012	425	.007	
200 to 300 Series				300-600		LC225S/T	.004-.009	450	.006	D
				300-700		LC610T	.003-.008	500	.005	D
Aluminum and other										
Free-Machining	50-150		700-2000			LW610	.004-.015	1000	.008	W/D
Non-Ferrous Materials					1000-12,000	PCD	.004-.012	4000	.006	W/D
Aluminum/High-Silicon			700-1500			LW610	.003-.014	1000	.009	D
(12% or higher)					1000-6000	PCD	.003-.012	2000	.007	D
Grey Cast Iron	120-320	< 34		300-900		LC610T	.003-.009	700	.007	D
				300-1100		LC615E	003-.010	850	.007	D
Cast Iron	120-320	< 34		300-800		LC610T	.003-.008	500	.006	D
Ductile and Malleable				300-1000		LC615E	.003-.009	575	.007	D
				250-550		LC240T	003-.009	450	.008	D
Cast Iron	400-560	43-55		150-600		LC610T	.004-.008	400	.006	D
Hardened or Chilled				150-675		LC615E	.004-.008	475	.006	D
					200-900	CBN	.003-.008	600	.006	D
Nickel-Base Alloys										
Annealed 600 series	140-300	< 32		50-220		LC630T/S	.002-.006	120	.004	D
Inconel, Hastelloy, & Waspaloy				50-220		LC240T	.002-.008	110	.005	D
Nickel-Base,										
Heat Resistant Alloys	300-475	31-49		60-200		LC630S/T	.002-.006	95	004	D
Annealed Inconel				60-200		LC225S/T	.002-.007	90	.004	D
700 Series				60-200		LC240T	.002-.008	80	.005	D
Iron-Base,										
Heat Resistant Alloys	135-320	< 34		80-450		LC630S/T	.003-.007	280	004	D
Wrought: A-286, Incoloy 801, ASTM351 grade				80-350		LC225S/T	.003-.008	240	.005	D
HK-30, 40, HT-30				80-300		LC240T	.003-.009	210	.006	D
Cobalt	150-425	< 45		75-400		LC630S/T	.002-.007	120	.004	D
Heat Resistant Alloys				75-400		LC225S/T	.002-.008	110	.005	D
				75-400		LC240T	.003-.009	100	.006	D
Titanium-Alloy	110-300	< 32	60-300	90-400		LC240T/LW610	.003-.008	220	.004	W
Annealed Ti6Al-4V,	300-350	32-36	60-220	90-300		LC240T/LW610	.003-.007	150	.004	W
Ti6Al, Ti98.8, Ti99.9	350-440	36-46	60-180	90-200		LC240T/LW610	.003-.006	130	.004	W

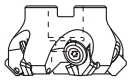
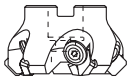
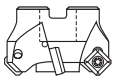
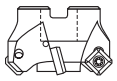
When setting initial cutting conditions, consider the following:
Suggested starting conditions are based on a .100" axial depth of cut. Cutting speed should be adjusted for a greater or lesser depth. Using a cutter with the recommended 3:2 cutter diameter-to-workpiece width ratio will provide a negative angle of entry, allowing the insert to make contact with the workpiece at its strongest point on the cutting edge.

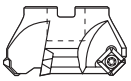
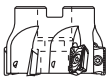
Climb Milling is normally recommended in order to allow the insert to enter with a heavier chip load. This reduces edge build up and dissipates the heat in the chip minimizing workhardening.

Use LC280TT in case of tool breakage, or heavy rough milling operations.

For 87° **TWIN*CUT***, reduce roughing and semi-finishing chiploads by 40%
For 90° **TWIN*CUT***, and ISO 90° APKT style cutters reduce roughing and semi-finishing chiploads by 45%
For Face Milling using ISO 45° insert styles SEAN and SEKN, reduce roughing and finishing chiploads by 30%
For **UNIVEX** data, see page 86 and 87

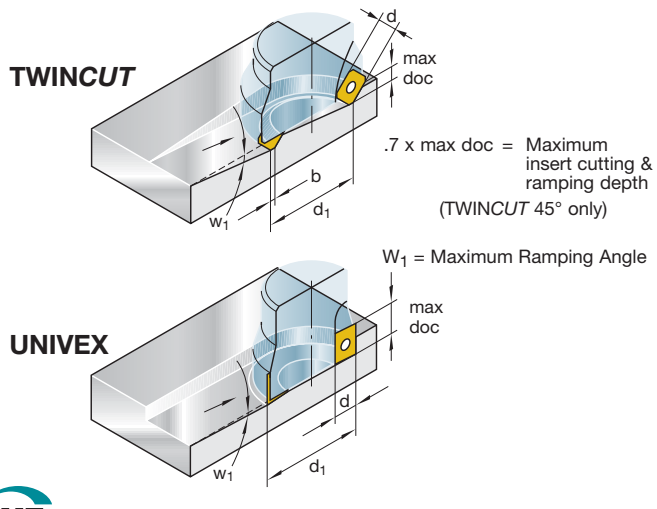
Recommended *maximum* feed per tooth (f_z) when woc = 3:2 (.67 x d_1) d_1 = Cutter dia.

Catalog No.	FMH45B 11171 MMH45B S12	FMH45 11172 MMH45 S12	FMH45 11173 MMH45A S12	FMT45 11250-12 MMT45 S12	FMT45 11250-19
					
a_p = max doc	.216	.216	.216	.275	.394
lead angle	45°	45°	45°	45°	45°
ISO-Code	SEHW 1204 AF	SEKN 1203 AF	SEKN 1204 AF	SNKX 1205 AN	SNKX 1907 AN
	.015	.012	.015	.020	.024
	.012	.010	.012	.015	.020
	.009	.007	.009	.012	.014
	.020	.015	.020	.024	.024
	.015	.012	.015	.020	.020
	.010	.008	.010	.012	.012

Catalog No.	FMV45 11280	FMT87 11230	FMT90 11260 MMT90 S12	FMP90 11415 MMP90 A16	FMU90 11475
					
a_p = max doc	.197	.394	.394	.551	.472
lead angle	45°	87°	90°	90°	90°
ISO-Code	SNHX 1205 AE	SNKX 1205 AN	SPKX 120508	APKT 1604 PDR	ADHX 12T306
	.012	.013	.015	.010	.010
	–	.012	.012	.008	.008
	.007	.010	.009	.006	.006
	.020	.016	.0013	.015	.015
	–	.012	.012	.012	.012
	.012	–	–	–	.008

Ramping with TWIN*CUT* 45° and UNIVEX

Ramping is always recommended over plunging when entering the workpiece. Ramp milling minimizes the likelihood of the workpiece material work hardening and improves tool life. Climb milling is recommended with workpiece materials that work harden. This method reduces the heat in the workpiece by dissipating it into the chip.



	TWIN*CUT* 45°		UNIVEX 90°	
d (insert ic)	.500	.750	.500	
b (facet width)	.078	.118	-	
a_p = max doc	.276	.394	.425	
d_1 inch	d_1 mm	W_1 max Degree	d_1 inch	W_1 max Degree
1.00	25	17.0		
1.25	32	12.0		
1.50	40	9.0	1.57	1.2
2.00	50	7.0	2.00	0.9
2.50	63	5.0	2.50	0.7
3.00	80	4.0		
4.00	100	3.0		
5.00	125	2.5		
6.00	160	2.0		
8.00	200	1.5	2.11	
10.00	250	1.2	1.66	

See page 80 for milling formulas.

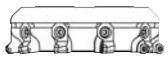
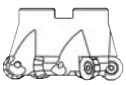
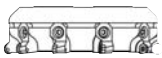
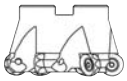
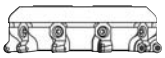
Cutting Data Recommendations for Copy Mills

Roughing Tools

Work Material	Hardness (BHN)	Cutting Speed (SFM) Range		Chip Thickness Range	Recommended Grade	Starting Feed Per Tooth (F_Z)	Starting Speed (SFM)	Wet or Dry
		Coated	CBN*/ PCD**					
Carbon Steels	50-180	350-700		.004-.015	LC280TT/LC240T	.008	600	D
	180-330	250-450		.003-.015	LC225S/LC225T	.008	500	D
Alloy Steels and Lower	135-330	220-550		.003-.015	LC280TT/LC240T	.008	550	D
Carbon Tool Steels	330-450	150-400		.003-.010	LC225S/LC610S	.007	550	D
P20-H13	450-560	200-450	300-1000	.003-.008	LC225T/LC610T	.005	275	D
Stainless Steels								
200 & 300 series	135-330	200-700		.003-.010	LC225S/LC240T	.007	500	W/D
400 & 500 series	135-330	230-650		.003-.011	LC225S/LC240T	.007	500	W/D
	330-425	180-600	300-900	.003-.008	LC225S/LC225T	.006	450	W/D
	425-600			.003-.008	CBN	.005	600	W/D
PH series	150-375	200-600		.003-.012	LC225S/LC240T	.006	400	W/D
Grey Cast Irons	120-320	300-1000		.003-.014	LC225T/LC610T	.007	700	D
Ductile & Malleable Cast Iron	120-320	300-800		.003-.014	LC225T/LC240T	.005	600	D
Hardened or Chilled Cast Iron	400-600	200-400	200-950	.005-.010	LC610T	.005	500	D
Nickel Base Alloys	140-300	80-450		.002-.008	LC240T	.005	130	D
	300-475	50-260		.002-.008	LC225S/LC225T	.004	100	W/D
Titanium-Alloyed	110-300	100-400		.003-.010	LC240T	.005	200	W/D
	300-350	75-350		.003-.010	LC225S/LC225T	.005	150	W/D
	350-440	50-250		.003-.008	LC610T	.004	130	W/D
Aluminum-Low Silicon		700-3000	1000-4000	.003-.020	LC610T/LC225S	.010	1500	W
Aluminum-High Silicon		300-550	1000-2500	.003-.015	LC610T/LC225S	.010	500	W
Wood and Resins		800-1400	2000-5000	.003-.020	LC610T/LC225T	.006	1000	D

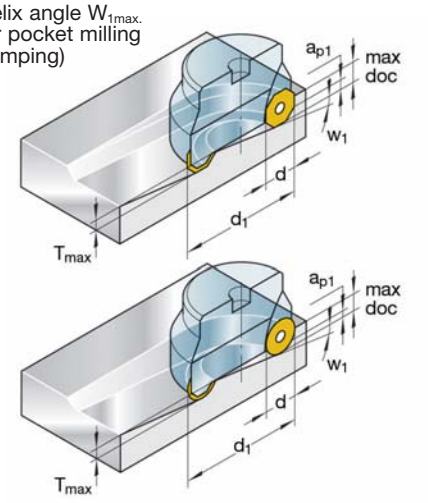
Application Data for FCT45 and MCT45 Face Mill

Recommended *maximum* feed per tooth (f_z) when woc = 3:2 (.67 x d_1) d_1 = Cutter dia.

Catalog No.	FCT45	MCT45	FCT 45	MCT45	FCT 45	MCT45
						
ap_1 (doc)	.118 with 8 indexed edges max.		.060 with 12 indexed edges max.		.078 with 8 indexed edges max.	
max.doc.	.394		.380		.315	
ISO-Code	OCKX 0606 AD-TR		XCHX 1606 DD-TR		RCKX 1606 MO-TR	
Recommended Maximum Feed per Tooth (f_z)						
	.017		.017		.017	
	.015		.015		.015	
	.008		.008		.008	
	.015		.015		.015	
	.014		.014		.014	
	.012		.012		.012	

Pocket Milling and Ramp Milling

Helix angle $W_{1max.}$ for pocket milling (ramping)



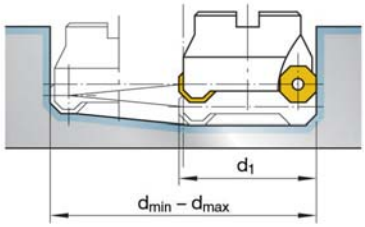
	FCT45 with OCKX 0606 AD-TR	FCT45 with XCKX 0606 AD-TR	FCT45 with RCKX 1606 MO-TR
d	.630	.630	.630
max.doc.	.394	.380	.315
d_1 cutter dia.	**W_{1max} in deg.**		
2.00	8	7	7
2.50	5.4	4.8	4.8
3.00	4	3.6	3.6
4.00	3	2.7	2.7
5.00	2	2	2

Internal cutting depth T_{max} = .158"

Ramping

Ramping is always recommended over plunging when entering the workpiece. Ramp milling minimizes the likelihood of the workpiece material work hardening and improves tool life. Climb milling is recommended with workpiece materials that work harden. This method reduces the heat in the workpiece by dissipating it into the chip.

Circular Milling



Diameter Range for Helical Interpolation in a Recess		
d_1	d_{min}	d_{max}
2.00	2.799	4.00
2.50	3.799	5.00
3.00	4.799	6.00
4.00	6.799	8.00
5.00	8.799	10.00

Helical Interpolation

When possible Helical Interpolation is another preferred method of entry into the workpiece when roughing with button style cutters to full cavity depth. (See chart)

A consistent depth of cut and chip load is maintained without the need to dwell on the Z-axis. Once there is a cavity in the workpiece, the cutter can be used as a conventional facemill and rough the part with normal X and Y axis tool paths.

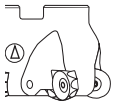
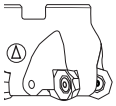
Cutting Data Recommendations for TWINCUT VARIO

Material	Brinell (BHN)	Recommended Grade	Cutting Speed	
			Face Milling sfm	Copy Milling sfm
Low Carbon Steel	< 206		525-720	820-980
Plain Carbon Steel	147-280		525-655	600-850
Alloy Steel	147-280	LC280TT	460-590	600-850
Cast steel	< 280	LC240T	460-590	600-850
Carburizing steel	< 950	LC225S	460-590	600-850
Stainless, ferritic, martensitic 400-500 series	147-280		460-560	500-850
Heat-treatable steel, high-strength	280-1400	LC280TT	394-492	500-720
Nitralloy steel, heat-treated	950-1400	LC240T	394-492	500-720
Tool steel	280-412	LC610T	394-492	500-720
Stainless, austenitic 200-300 series	147-280	LC240T	400-630	400-575
Aluminum alloys, long chipping	< 164	LW610*	984-3000	984-3000
Copper alloys, long chipping	88-206	LC225S	820-1600	984-3000
Pure metals, soft	147	LC225S	820-1600	984-3000
Thermoplastics	< 70	LW610*	650-1300	984-3000
Grey cast iron	< 120	LC610T	425-690	650-984
Alloyed gray cast iron	< 75	LC610T	325-525	500-820
Spheroidal graphite iron	120-238	LC610T	325-525	524-984
Malleable cast iron		LC610T	390-690	524-820
Aluminum alloys, short chipping	350-700	LW610*	650-980	524-984
Copper alloys, short chipping		LC225S	650-980	524-984
Magnesium alloys	< 119	LW610*	650-1300	524-1300
Thermosetting plastics	< 147	LW610*	590-820	524-984
Titanium alloys, medium-strength	110-275	LW610*	120-250	120-250
Titanium alloys, high-strength	300-350	LW610*	80-170	80-170
Nickel-based alloys, medium-strength	< 280	LC225S	90-200	80-200
Highly refractory Nickel-based alloys	266-912	LC225S**	98-165	80-220
Chilled cast iron	266-412	LC225S*	98-130	80-220

*Uncoated LW610 grade, the sfm specified in the table is for this material.

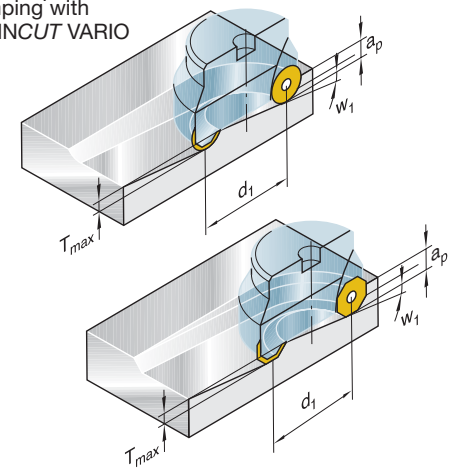
**Substitute LC280TT grade in cases where there is a risk of the tool breaking.

Face Milling

Catalog No.	Round	Octagonal
		
max.doc.	0.315	0.394
min.doc.	0.079	0.079
ISO-Code	RCKX 1606 MO-TR	OCKX 0606 AD-TR
Recommended Maximum Feed per Tooth (f_z)		
	0.018	0.014
	0.016	0.012
	0.008	0.006
	0.016	0.012
	0.014	0.012
	0.012	0.010

Pocket Milling and Ramp Milling

Max. W_1 angle when ramping with TWIN*CUT* VARIO



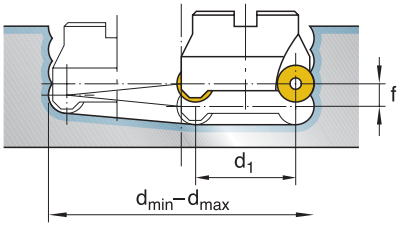
	TWIN*CUT* VARIO with RCKX 1606 MO-TR	TWIN*CUT* VARIO with OCKX 0606 AD-TR
d_1 inch	W_1°	W_1°
1.50	1.3°	1.1°
2.00	1.8°	1.6°
2.50	2.3°	2.1°
3.00	2.8°	2.6°
4.00	3.8°	3.6°

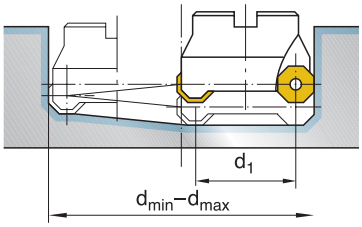
Internal cut depth T_{max} = 0.157"

Ramping

Ramping is always recommended over plunging when entering the workpiece. Ramp milling minimizes the likelihood of the workpiece material work hardening and improves tool life. Climb milling is recommended with workpiece materials that work harden. This method reduces the hear in the workpiece by dissipating it into the chip.

Circular Milling

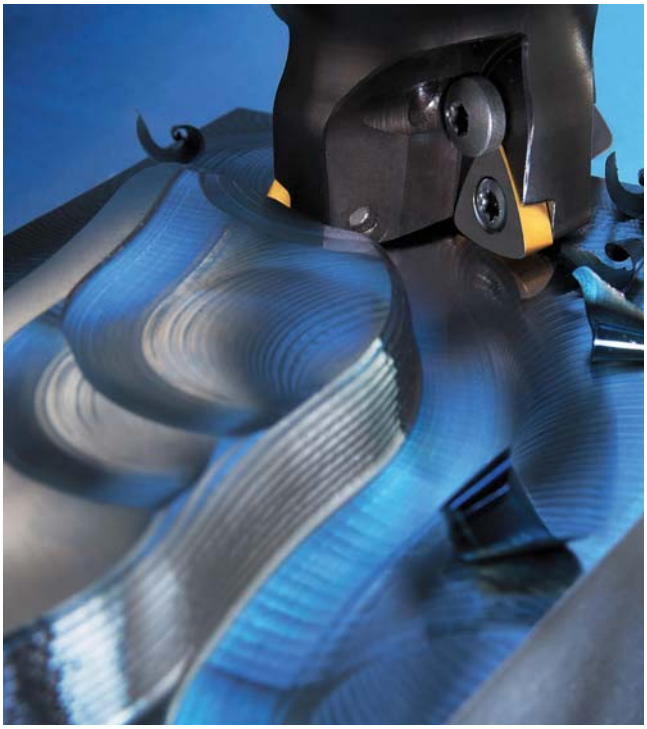




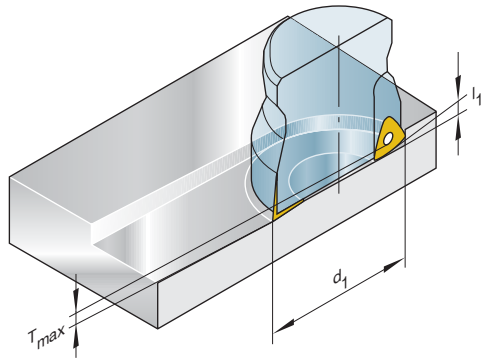
Diameter Range for Helical Interpolation in One Operation		
d_1	d_{min}	d_{max}
1.50	3.06	4.54
2.00	4.06	5.54
2.50	5.06	6.54
3.00	6.06	7.54
4.00	8.06	9.54

Cutting Data Recommendations for TWINCUT Feed Mill ECP05/FCP05

	Material	Material Examples	HRC	LC280TT		LC610T	
				Cutting Speed (sfm)	Feed per Tooth (f_z)	Cutting Speed (sfm)	Feed per Tooth (f_z)
	Unalloyed Carbon Steels	A36, 1005–1029, 1213, 12L14 1030–1055	16–30	800–1000	.070"–.100"	1000-1080	.060"–.088"
	Alloyed Steels, Medium Strength	4140, 6150, 5115, 8620	< 30	700–800	.060"–.080"	800–900	.060"–.072"
	Heat Treatable Steel, High Strength	4340	30–44	720–790	.060"–.080"	870–1000	.060"–.072"
	Nitriding Steel	H13	30–44	490–590	.060"–.080"	655–720	.052"–.072"
	Tool Steel	A2, D2, P20	30–44	590–720	.060"–.080"	720–870	.052"–.072"
	Stainless (Austenitic)	303, 304, 316, Nitronic	< 30	700–800	.040"–.060"	750–850	.040"–.052"
	Grey Cast Iron, Alloyed Grey Cast Iron	No. 30B, A436–725	< 30	750–820	.112"–.118"	820–1000	.080"–.100"
	Nodular Cast Iron	5005	< 23	550–590	.072"–.080"	770–820	.064"–.072"
	Alloyed Nodular Cast Iron	5005	< 16	625–655			

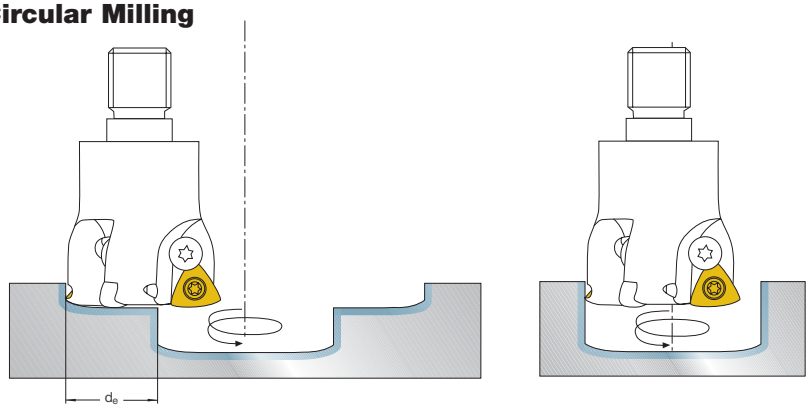


Pocket Milling and Axial Plunging



	1177-11T	1177-65T
l_1	.118	.059
T_{max}	.043	.035
d_1	$W_{1\ max}$ Degree	
1.00	2.9	–
1.25	2.2	4.6
1.50	1.8	2.9
2.00	1.3	1.7
2.50	1.0	1.2
3.00	0.8	0.9
4.00	0.6	0.6

Circular Milling

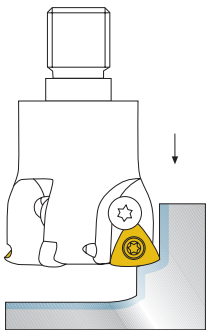


d_1	1177-11T		1177-65T	
	d_{min}	d_{max}	d_{min}	d_{max}
1.00	1.41	1.96	–	–
1.25	1.91	2.46	1.63	2.38
1.50	2.41	2.96	2.13	2.88
2.00	3.41	3.96	3.13	3.88
2.50	4.41	4.96	4.13	4.88
3.00	5.41	5.96	5.13	5.88
4.00	7.41	7.96	7.13	7.88

Feed Correction		
F_Z		
a_p	l_{ges} = *max 4 × d1*	l_{ges} = *> 4 × d1*
.020	1.3	1.00
.040	1.0	0.75
.050	0.7	0.50

v_f = Feed rate in inches per minute
n = RPM
z = No. of teeth
f_z = Feed per tooth in inches
l_{ges} = Overhang
a_p = Depth of cut in inches

Plunge Milling – 65T		
d_1	Step width in.	f_Z (inch)
1.000	.080	.004
1.250	.156	.006
1.500	.197	.008
2.000	.197	.008
2.500	.197	.008
3.000	.197	.008
4.000	.197	.008



Cutting Data Recommendations for Ball Nose, and Flat Bottom / Back Draft End Mills

Finishing Tools

Work Material	Hardness (BHN)	Cutting Speed (SFM) Range		Chip Thickness Range	Recommended Grade	Chip Breaker	Starting Feed Per Tooth (f_z)	Speed (SFM)	Wet or Dry
		Coated	CBN*/ PCD**						
Plain Carbon Steels	50-180	350-900		.004-.015	LC609T/LC225S	YES	.007*	700	D
	180-330	350-900		.003-.015	LC609T/LC225S	Y/N	.007*	600	D
Alloy Steels and Lower Carbon Tool Steels	135-330	520-850		.003-.010	LC609T/LC225S	Y/N	.006*	625	D
	330-450	450-800		.003-.008	LC609T	NO	.005*	550	D
P20-H13	450-560		300-1000	.003-.008	CBN	NO	.005*	550	D
Stainless Steels 200 & 300 series	135-330	400-900		.003-.008	LC609T/LC225S	YES	.007*	600	W/D
400 & 500 series	135-330	430-850		.003-.008	LC609T/LC225S	Y/N	.007	600	W/D
	330-425	430-800		.003-.007	LC609T/LC225S	NO	.006*	525	W/D
	425-600		400-950	.003-.006	CBN	NO	.005*	525	W/D
PH series	150-375	400-800		.003-.008	LC609T/LC225S	NO	.0055*	450	W/D
Grey Cast Irons	120-320	600-1200		.003-.010	LC609T	NO	.007*	800	D
Ductile & Malleable Cast Iron	120-320	600-900		.003-.009	LC609T	NO	.006*	650	D
Hardened or Chilled Cast Iron	400-600	200-400	300-1100	.005-.006	CBN	NO	.004	550	D
Nickel Base Alloys	140-300	200-650		.002-.007	LC609T/LC225S	Y/N	.0045*	140	D
	300-475	150-560		.002-.007	LC609T	NO	.004	110	D
Titanium-Alloyed	110-300	150-500		.002-.008	LC609T	YES	.0055*	160	W/D
	300-350	90-450		.002-.008	LC609T	Y/N	.005*	135	W/D
	350-440	35-250		.002-.006	LC609T	NO	.004*	110	W/D
Aluminum-Low Silicon		800-8000	1000-15,000	.003-.012	LC609W/LC609S	YES	.009*	2000	W
Aluminum-High Silicon		500-800	1000-6000	.003-.010	LC609W/LC609S	YES	.007*	600	W
Wood and Resins		1000-2400	3000-7200	.003-.015	LC609T/PCD	Y/N	.0075*	1000	D
Graphite		800-1500	1800-4300	.003-.010	LC609T/PCD	YES	.0055*	1000	D

*CBN for use on ferrous metals only
**PCD for non-ferrous metals/materials

***Chip Thickness Correction Factors**
Cutter diameters below 1/2" multiply chip thickness x 0.6
Cutter diameters 1/2" to 1" multiply chip thickness x 0.85

1. Selected diameter of tool to be used.
2. Determine Depth of Cut (DOC) to be used.
3. Refer to Figure and Table to find the Effective Cutting Diameter (ECD).
4. Refer to Feed and Speed chart on page 102 to select the surface footage to be used (SFM).
5. Calculate RPM using the ECD and SFM. (SFM x 3.82 / ECD = RPM)
6. Refer to Table to determine Feed Rate Adjustment (FRA).
7. Refer to chart on page 102 and select Inches per Teeth (IPT). Calculate Inches per Minute (IPM). (No Teeth x IPT x RPM x FRA = IPM)

Formulas

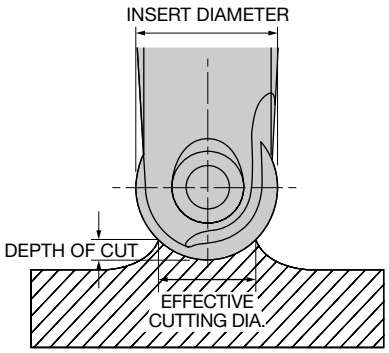
SFM = .262 x RPM x Diameter of Cutter
RPM = 3.82 x SFM ÷ Diameter of Cutter
IPR = IPM ÷ RPM
IPM = IPT x Number Of Teeth x RPM
IPT = IPM ÷ (Number Of Teeth x RPM)
MRR = Axial DOC x Radial WOC x IPM = in^3/min
HP (Cutter) = MRR ÷ Power Factor (K)
HIFB = (2 x d) – IC

Legend

RPM = Revolutions Per Minute
SFM = Surface Feet Per Minute
IPR = Inches Per Revolution
IPM = Inch Per Minute
IPT = Inches Per Tooth (Chip load)
DOC = Depth Of Cut
MRR = Metal Removal Rate
HP = Horse Power
HIFB = Helical Interpolation to Flat Bottom
ECD = Effective Cutting Data
FRA = Feed Rate Adjustment

Calculated Effective Cutting Diameter for Ball Nose Tooling

Inch	Insert Diameter									
DOC	**0.250**	**0.312**	**0.375**	**0.500**	**0.625**	**0.750**	**1.000**	**1.250**	**1.500**	**2.000**
0.005	0.070	0.078	0.086	0.099	0.111	0.122	0.141	0.158	0.173	0.200
0.010	0.098	0.110	0.121	0.140	0.157	0.172	0.199	0.223	0.244	0.282
0.020	0.136	0.153	0.169	0.196	0.220	0.242	0.280	0.314	0.344	0.398
0.050	0.200	0.229	0.255	0.300	0.339	0.374	0.436	0.490	0.539	0.624
0.075	0.229	0.267	0.300	0.357	0.406	0.450	0.527	0.594	0.654	0.760
0.100	0.245	0.291	0.332	0.400	0.458	0.510	0.600	0.678	0.748	0.872
0.125	0.250	0.306	0.354	0.433	0.500	0.559	0.661	0.750	0.829	0.968
0.156		0.312	0.370	0.463	0.541	0.609	0.726	0.826	0.916	1.073
0.188			0.375	0.484	0.573	0.650	0.781	0.894	0.993	1.167
0.250				0.500	0.612	0.707	0.866	1.000	1.118	1.323
0.312					0.625	0.739	0.927	1.082	1.218	1.451
0.375						0.750	0.968	1.146	1.299	1.561
0.600							1.000	1.225	1.414	1.732
0.625								1.250	1.479	1.854
0.750									1.500	1.936
1.000										2.000



Feed Rate Adjustment (FRA)

Inch	Insert Diameter							
DOC	**0.250**	**0.312**	**0.375**	**0.500**	**0.625**	**0.750**	**1.000**	**1.250**
0.005	3.6	4.0	4.4	5.0	5.6	6.1	7.1	7.9
0.010	2.6	2.8	3.1	3.6	4.0	4.4	5.0	5.6
0.015	2.1	2.3	2.6	2.9	3.3	3.6	4.1	4.6
0.020	1.8	2.0	2.2	2.6	2.8	3.1	3.6	4.0
0.025	1.7	1.8	2.0	2.3	2.6	2.8	3.2	3.6
0.050	1.2	1.4	1.5	1.7	1.8	2.0	2.3	2.6
0.075	1.1	1.2	1.2	1.4	1.5	1.7	1.9	2.1
0.100		1.1	1.1	1.2	1.4	1.5	1.7	1.8
0.125			1.1	1.2	1.3	1.3	1.4	1.5
0.150				1.1	1.2	1.3	1.4	1.5
0.175					1.1	1.2	1.3	1.4
0.200						1.1	1.3	1.4
0.250							1.2	1.2
0.300							1.1	1.2
0.400								1.1

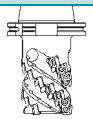
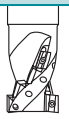
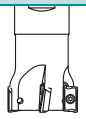
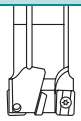
Cutting Data Recommendations for UNIVEX Face Mills, End Mills, Helical Mills, and Chamfering Cutters

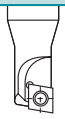
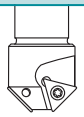
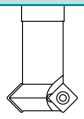
Finishing Tools

Work Material	Hardness		Cutting Speed (SFM) Range		Recommended Grade	Feed Per Tooth (f_z) Range	Starting Speed (SFM)	Starting Feed Per Tooth (f_z)	Starting Chamfering (IPT)	Wet or Dry
	Brinell (BHN)	Rockwell (HRC)	Uncoated Carbide	Coated Carbide						
Low Carbon Steels	< 220	< 19		350-800	LC240T	.003-.009	500	.006	.013	D
AISI: 1008, 1010,				400-1000	LC225T	.003-.008	650	.005	.011	D
1018, 1117, 1141				300-650	LC630T	.003-.009	450	.006	.012	D
Plain Carbon, Alloy and Tool Steels	200-300	19-32		300-700	LC240T	.003-.009	450	.006	.013	D
AISI: 1045, 4140, 4320,				300-900	LC225T	.003-.008	550	.005	.013	D
4340,5120, 8620, P-20				300-600	LC630T	.003-.009	400	.006		
Alloy and Tool Steels	300-381	32-41		175-400	LC240T	.003-.008	300	.005	.009	D
AISI Tool steels: H10, H11,				250-650	LC225S/T	.003-.007	450	.005	.008	D
H13, alloy steels: 4140, 4150,				200-400	LC630S/T	.003-.008	300	.005	.009	D
4320, 4340, 5120, 8620, 8640										
Stainless Steels										
Ferritic-Martensitic	< 330	< 35		200-600	LC240T	.003-.008	450	.005	.008	D
400 to 500 Series				250-650	LC225T	.003-.007	500	.004	.008	D
	330-371	35-40		150-500	LC240T	.003-.007	350	.005	.008	D
				175-550	LC225T	.003-.006	425	.004	.008	D
PH Stainless Steels 15-5PH, 17-4PH, 17-7PH	150-371	< 40		175-500	LC240T	.003-.007	400	.005	.008	W/D
Stainless Steels										
Austenitic 200 to 300 Series	135-275	< 29		250-600	LC240T	.003-.007	400	.005	.008	D
303, 304, 306, 316, 347				300-800	LC225T	.003-.007	450	.005	.008	D
Aluminum and other										
Free-Machining	50-150			700-2000	LC610T•	.003-.012	1000	.008	.012	W/D
Non-fererrous Materials				1000-12000	PCD	.003-.010	4000	.006	.010	W/D
(copper, brass, zinc				900-4000	LC610T•	.003-.010	1500	.008	.012	W/D
and magnesium)										
Aluminum/High-Silicon				1000-6000	PCD	.003-.010	4000	.007	.010	W/D
(12% or Higher)				700-1500	LC610T•	.003-.010	1000	.007	.010	W/D
Grey Cast Iron										
Class: 20, 25, 30, 35, 40, 45, 50	120-320	< 34		300-900	LC610T	.003-.008	700	.006	.012	D
SAE: grade G1800, G3000,				300-1100	LC615E	.003-.008	850	.006	.012	D
G3500, G4000										
Cast Iron										
Ductile and Malleable	120-320	< 34		275-500	LC240T	.003-.006	325	.004	.008	D
ASTM A536: 60-40-18,				300-600	LC610T	.003-.006	475	.004	.008	D
65-45-12, 100-70-06				300-800	LC612E	.003-.006	525	.004	.008	D
ASTM A47 grades 3000,										
4000, 5000, 6000										
Nickel-Base Alloys										
Annealed 600 series Inconel	140-300	< 32		50-300	LC610M	.003-.006	130	.004	.008	D
Hastelloy & Waspaloy-Hastelloy B,				50-250	LC240T	.003-.007	110	.004	.008	D
C-27, Inconel 601, 617, 625, 718										
Nickel-Base,										
Heat Resistant Alloys	300-475	31-49		60-200	LC240T	.002-.005	90	.003	.008	D
Annealed Inconel 700 Series				60-200	LC225T	.002-.005	95	.003	.008	D
Inconel 718, Rena 95,										
MA6000, Hastelloy C										
Titanium-Alloy	110-300	< 32	60-300	90-400	LC610T LW610	.003-.006	220	.003	.005	W
Annealed Ti6Al-4V	300-350	32-36	60-220	90-300	LC610T LW610	.002-.006	150	.003	.005	W
Ti6Al, Ti98.8, Ti99.9	350-440	36-46	60-180	90-200	LC610T LW610	.003-.006	130	.003	.005	W

When using uncoated grades reduce cutting speeds by 25%.
Use grade LC240S/T if tool breakage occurs.

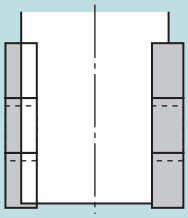
Recommended *maximum* feed per tooth (f_z) when woc = .5 x d_1 (d_1 = Cutter dia.)

Catalog No.	ERT90 11257 FRT90 11259	ERU90 11552 ERU90 11555 ERU90 11335	EMP90 11415 FMP90 11415	EMU90 11473 EMU90 11474
				
Cutter Dia.	2.00-3.00	1.00-2.50	1.00-4.00	0.50-1.50
ISO Code	SNKX	ADMX	APKT	ADHX
Recommended Maximum Feed per Tooth (f_z)				
	.010	.006	.010	.006*
	.008	.005	.008	.005*
	–	.004	–	.004*
	.012	.010	.010	.010*
	.010	.008	.008	.008*
	–	.004	–	.004*

Catalog No.	EMT45 11253	ESP90 11470	EFZ45/60 1148	EFP45 11483
				
Cutter Dia.	1.56-2.06	.488-1.238	.630-1.26	1.134-1.941
ISO Code	SNKX	CCHX	TCMT	SDM_ and SP__
Recommended Maximum Feed per Tooth (f_z)				
	.010	.006	.008	.008
	.008	.004	.006	.006
	.006	–	.004	.004
	.012	.008	.010	.010
	.010	.006	.008	.008
	.004	–	.003	.003

*These recommendations represent the average of the size range offered. These figures are not appropriate for smaller cutter diameters.

Calculation of Feed (IPM) When Applying Long Edge Helical Cutters



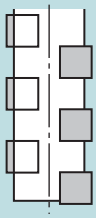
Inserts overlap
(all effective)
$nt_{eff.}$ = number of flutes

rpm = 3.82 x sfm ÷ d

IPM = rpm x $nt_{eff.}$ x f_z x M_f

rpm = spindle speed
f_z = feed per tooth
$nt_{eff.}$ = effective teeth
M_f = multiplication factor

See next page for multiplication factors
(M_f)



Inserts do not overlap
(half effective)
$nt_{eff.}$* ÷ 2 = number of flutes

*Inserts are staggered in rows; two rows make one effective flute. Only one row cuts to the end. Each insert in that row is spaced so the next adjacent row of inserts cuts in the gap area with some insert overlap to complete the length of cut and make an effective flute.

Cutting Data Recommendations for EMZ90 / FMZ90

	Material	Brinell Hardness (BHN)	Cutting Speed	
			LW610 SFM	LC610T* SFM
	Aluminum Free Machining	HB < 80	3280	4920
		HB > 80	2620	3280
	Copper alloys	long chipping	820	985
	Thermoplastics		985	–
	Aluminum alloys	Si < 12%	2620	328
		Si ≥ 12%**	–	650
	Copper alloys	short chipping	1320	1640
	Magnesium alloys	1320	–	
	Duroplastics		490	650

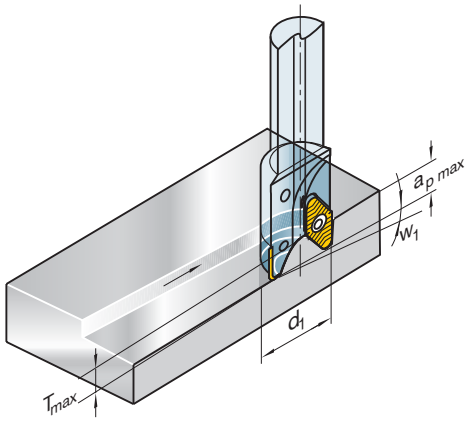
*LC610T CVD Coated TiAlN

**PCD-tipped inserts upon request.

Recommended Maximum Feed per Tooth (f_z) for V_GT Inserts

	Maximum Feed Per Tooth (f_z)	
	VPGT1604 . . .	VCGT2205 . . .
	.014	.020
	.012	.016

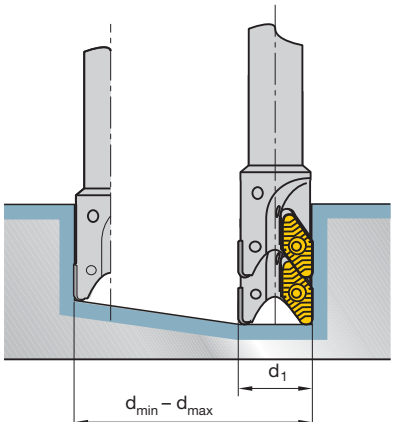
Pocket Milling and Axial Plunging



	VPGT 160412-ALM	VCGT 220530-ALM
$a_{p\,max}$	.531	.590
T_{max}	.31	.350
$W_{1\,max}$ Degree		
1.00	24	
1.25		22
1.50		15
2.00		12
2.50		9
3.00		7
4.00		5

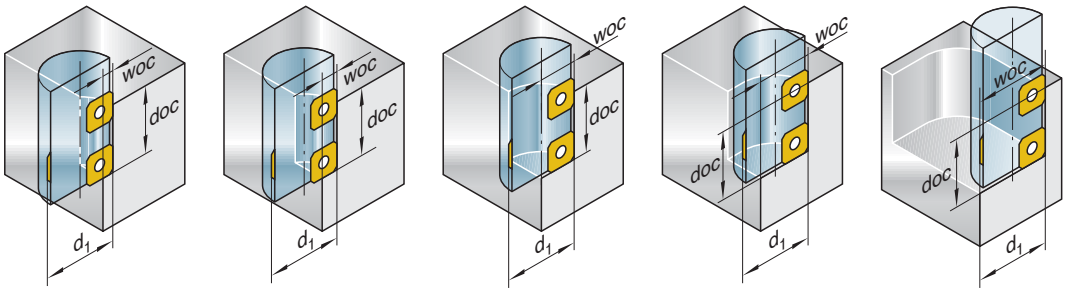
Helix angle $W_{1\,max}$ and internal depth of cut T_{max}

Circular Milling



d_1	d_{min}	d_{max}
1.00	1.40	1.91
1.25	1.64	2.26
1.50	2.34	2.75
2.00	3.18	3.76
2.50	4.23	4.76
3.00	5.28	5.76
4.00	7.07	7.75

Application Data for End Mill, Face Mill, and Helical Mill

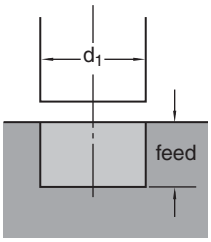


woc =	.10 x d_1	.25 x d_1	.50 x d_1	.75 x d_1	(full slot) 1.0 x d_1
M_f (multiplication factor) =	2.2	1.4	1	.8	.7

See page 109 for calculation of feed (IPM) formula

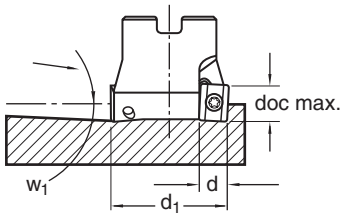
Center Cutting End Mills

IPM = eff. teeth x fpt x M_f
Z eff. teeth = 1
Drilling with full engagement M_f = .5



Ramp Milling Using UNIVEX

W_1 = Maximum Ramping Angle

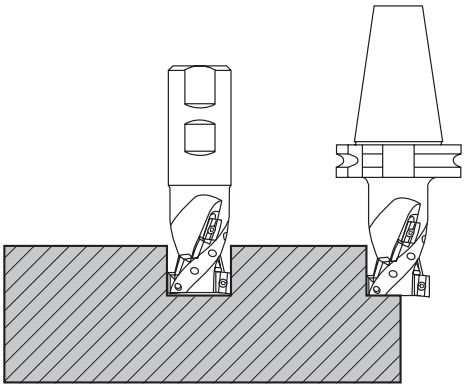


d_1 inch	d_1 mm	doc inch	d inch	W_1 max. Degree
.500	12	.354	.250	4.0
	14			4.0
.625	16			2.6
	18			2.2
.750	20			1.9
	22			1.6
1.000	25	.413	.313	1.9
	28			1.6
	30			1.4
1.250	32			1.3
	36			1.1
1.500	40	.472	.375	1.0
1.500	40			1.2
2.000	50			0.9
2.500	63			0.7

Ramping is always recommended over plunging when entering the workpiece. Ramp milling minimizes the likelihood of the workpiece material work hardening and improves tool life. Climb milling is recommended with workpiece materials that work harden. This method reduces the heat in the workpiece by dissipating it into the chip.

Indexable End Mill Application Tips

- Maximize chip evacuation with:
  - air blast
  - high pressure coolant
- Ensure rigid tool holding
- Ensure concentric tool holding
- Climb cut, when possible
- Do not exceed recommended cutter depth
- Calculate feed using number of effective teeth



Formulas	
surface feet per minute	**sfm** = .262 x rpm x D
revolutions per minute	**rpm** = 3.82 x sfm ÷ D
inch per revolution	**ipr** = lpm ÷ rpm
(feed rate) inch per minute	**ipm** = lpt x nt x rpm
feed per tooth (chip load)	**fpt** = ipm ÷ (nt x rpm)
metal removal rate	**mrr** = doc x woc x ipm = cu. inches/min.
horse power at cutter	**HPc** = mrr ÷ k
horse power at motor	**HPm** = hpc ÷ e

Legend	
doc	= axial depth of cut
woc	= radial width of cut
e	= spindle efficiency (varies 75% to 90%)
k	= a power factor that represents the number of cubic inches of metal per minutes that can be removed by one horsepower.
nt	= number of effective teeth or inserts in a cutter body
D	= cutter diameter

Example

5" cutter diameter

8 teeth in cutter — *rpm = 3.82 x 550 ÷ 5 = 420*

550 sfm — *ipm = .008 x 8 x 420 = 26.9*

.008 ipt — *ipr = 26.9 ÷ 420 = .064*

Brinell	Rockwell		Brinell	Rockwell		diameter	
BHN	HRB	HRC	BHN	HRB	HRC	inches	mm
654	–	60	253	101.5	25	.314	8.0
634	–	59	247	101.5	24	.375	9.5
615	–	58	243	100.1	23	.394	10.0
595	–	57	237	99	22	.472	12.0
577	–	56	231	98.5	21	.500	12.7
560	–	55	228	98	20	.625	15.9
543	–	54	222	97	18.6	.630	16.0
525	–	53	216	96	17.2	.750	19.1
512	–	52	210	95	15.7	.787	20.0
496	–	51	205	94	14.3	.875	22.2
481	–	50	200	93	18	.984	25.0
469	–	49	195	92	11.7	1.000	25.4
455	–	48	190	91	10.4	1.259	32.0
443	–	47	185	90	9.2	1.500	38.1
432	–	46	180	89	8	1.968	50.0
421	–	45	176	88	6.8	2.000	50.8
409	–	44	172	87	5.8	2.480	63.0
400	–	43	169	86	4.7	2.500	63.5
390	–	42	165	85	3.6	3.000	76.2
381	–	41	162	84	2.5	3.149	80.0
371	–	40	159	93	1.4	3.500	88.9
362	–	39	156	82	0.3	3.937	100.0
353	–	38	153	81	–	4.000	101.6
344	–	37	150	80	–	4.921	125.0
336	109.0	36	147	79	–	5.000	127.0
327	108.5	35	144	78	–	6.000	152.4
319	108.0	34	141	77	–	6.299	160.0
311	107.5	33	139	76	–	7.000	177.8
301	107.0	32	137	75	–	7.874	200.0
294	106.0	31	135	74	–	8.000	203.2
286	105.5	30	132	73	–	9.842	250.0
279	104.5	29	130	72	–	10.000	254.0
271	104.0	28	127	71	–	12.000	304.8
264	103.0	27	125	70	–	14.000	355.6
258	102.5	26	123	69	–	15.748	400.0

"K" Factors

Work Material	Hardness BHN	"K" factor
steel, wrought and cast (plain carbon, alloy steels, and tool steels)	85-200 201-253 254-288 287-327 328-371 372-481 492-550 561-515	1.64 1.58 1.28 1.10 .88 .69 .59 .54
precipitation, hardening stainless steels	150-450	1.27-.42
cast irons (grey, ductile and malleable)	150-175 110-190 176-200 201-250 251-300 301-320	2.27 2.00 1.89 1.52 1.27 1.19
stainless steels, wrought and cast (ferritic, austenitic, & martensitic)	135-275 288-421	1.54-.76 .74-.50
titanium	250-375	1.33-.87
high-temperature alloys nickel, and cobalt based	200-380	.83-.48
iron base	180-320	.91-.53
nickel alloys	80-360	.91-.53
aluminum alloys	30-150 (500kg)	6.25-3.33
magnesium alloys	40-90 (500kg)	10.0-6.67
copper	150	3.33
copper alloys	100-150	3.33
	151-240	2.0

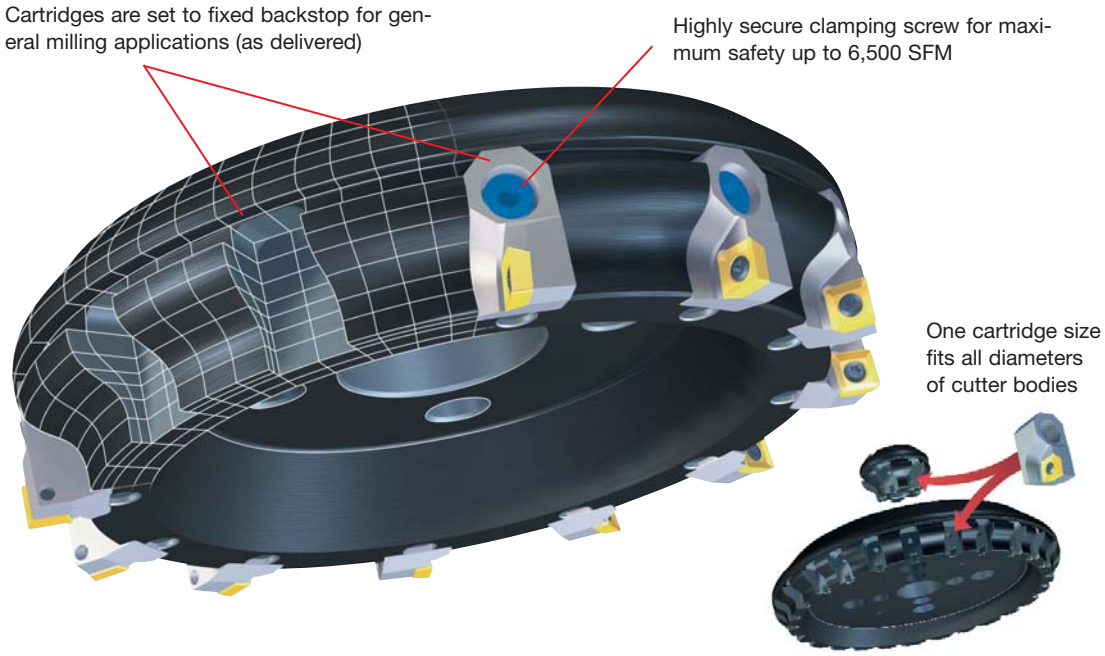
Conversion Charts

doc		Speed	
inches	mm	sfm	m/min.
.010	0.254	300	91
.015	0.381	400	122
.030	0.762	500	152
.050	1.270	600	183
.100	2.540	800	244
.125	3.175	1000	305
.150	3.810	1200	366
.250	6.350	2000	610
.375	9.525	4000	1219
.500	12.700	10000	3048
Chipload fpt		**Surface Finish (Ra)**	
inch/T	mm/T	µinch	µm
.003	0.076	500	12.5
.004	0.102	250	6.3
.005	0.127	125	3.2
.006	0.152	63	1.6
.007	0.178	32	0.8
.008	0.203	16	0.4
.009	0.229		
.010	0.254		
.011	0.279		
.012	0.305		

Multiply	By	To Obtain
millimeters/minute	*3.281*	*SFM (feet/minute)*
inches	*25.4*	*millimeters*
millimeters	*.03937*	*inches*

MULTI-MILL - Modular Mills

The distinctively robust design of the **LMT-FETTE** Multi-Mill allows for optimum performance. Two basic versions are available, course and fine pitch. For your convenience, Multi-Mill has standardized components for all diameters, and one cartridge size fits all diameters. The variable pitch design eliminates chatter and vibration.



Broad insert cartridge offering allows an extensive field of application

Comes ready to use . . . without adjustment. It is both a rougher and a finisher.

The **LMT-FETTE** Multi-Mill is the ideal milling cutter for a wide variety of applications. This unique milling cutter system can be used as a 45° face mill or as a square shoulder face mill on most standard milling machines. With button inserts, Multi-Mill can be used as a rougher and/or finisher for molds and dies, welded structures and frames. It can also be used to cut castings. Multi-Mill functions as two tools in one. Using the same cutter body, it can cut both clockwise and counterclockwise with a simple left hand / right hand cartridge change. Now that's a super-finisher!

Clamped indexable inserts also allow axial adjustability. One clamp for all versions.

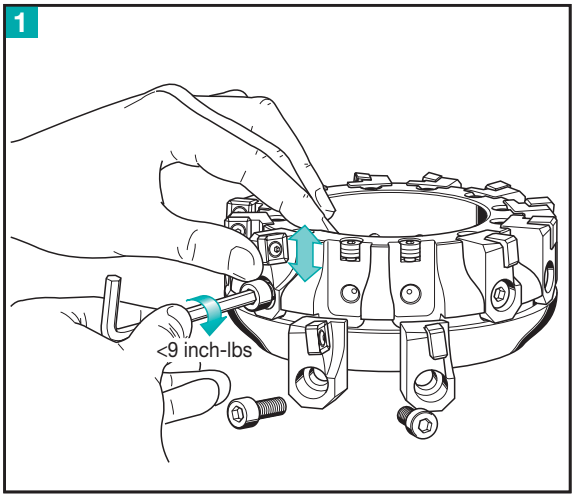
Cartridge can be axially adjusted within ±.0002".

Differential pitch reduces vibration.

Available in coarse and fine pitch.

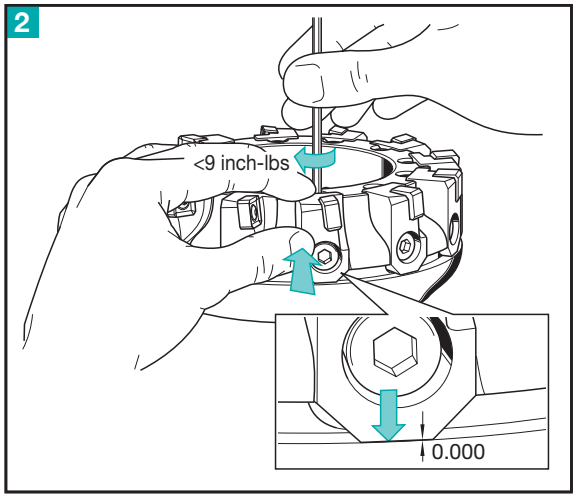
Assembly and Adjustment Instructions

1



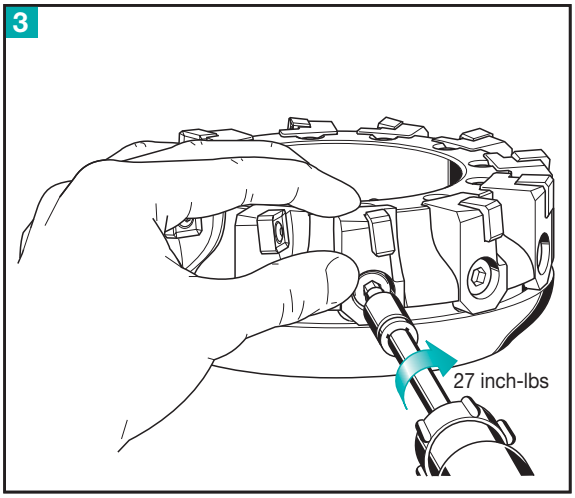
Load cartridges and pre-torque to 9 inch-lbs.

2



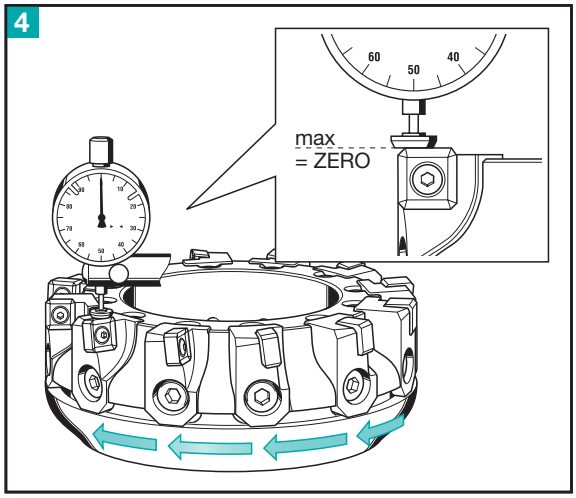
Push cartridges in and adjust down to fixed ground undercut surface with allen wrench as shown.

3



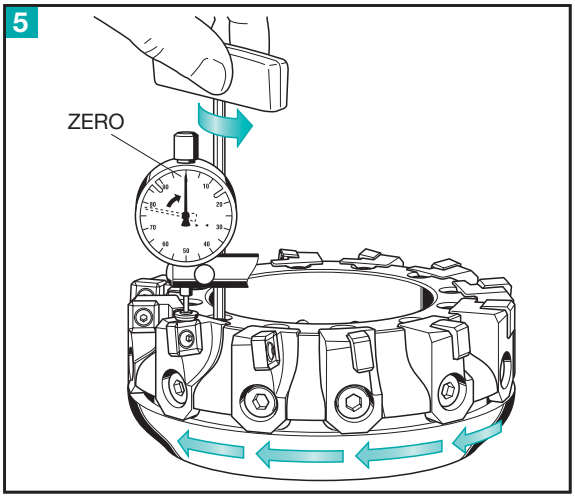
Pre-load all cartridges to 27 inch-lbs.

4



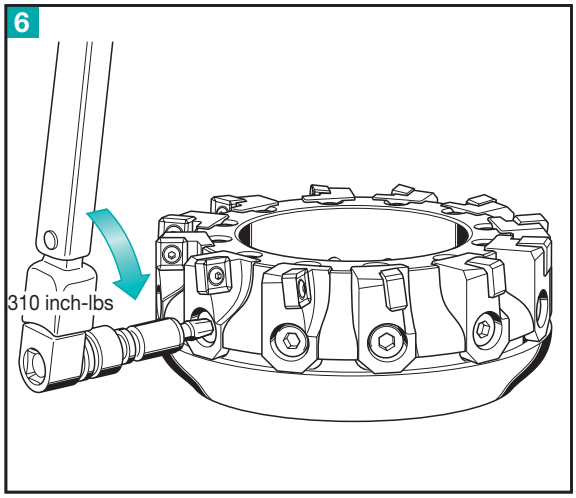
Measure height of all inserts and select highest insert as the established zero point on indicator.

5



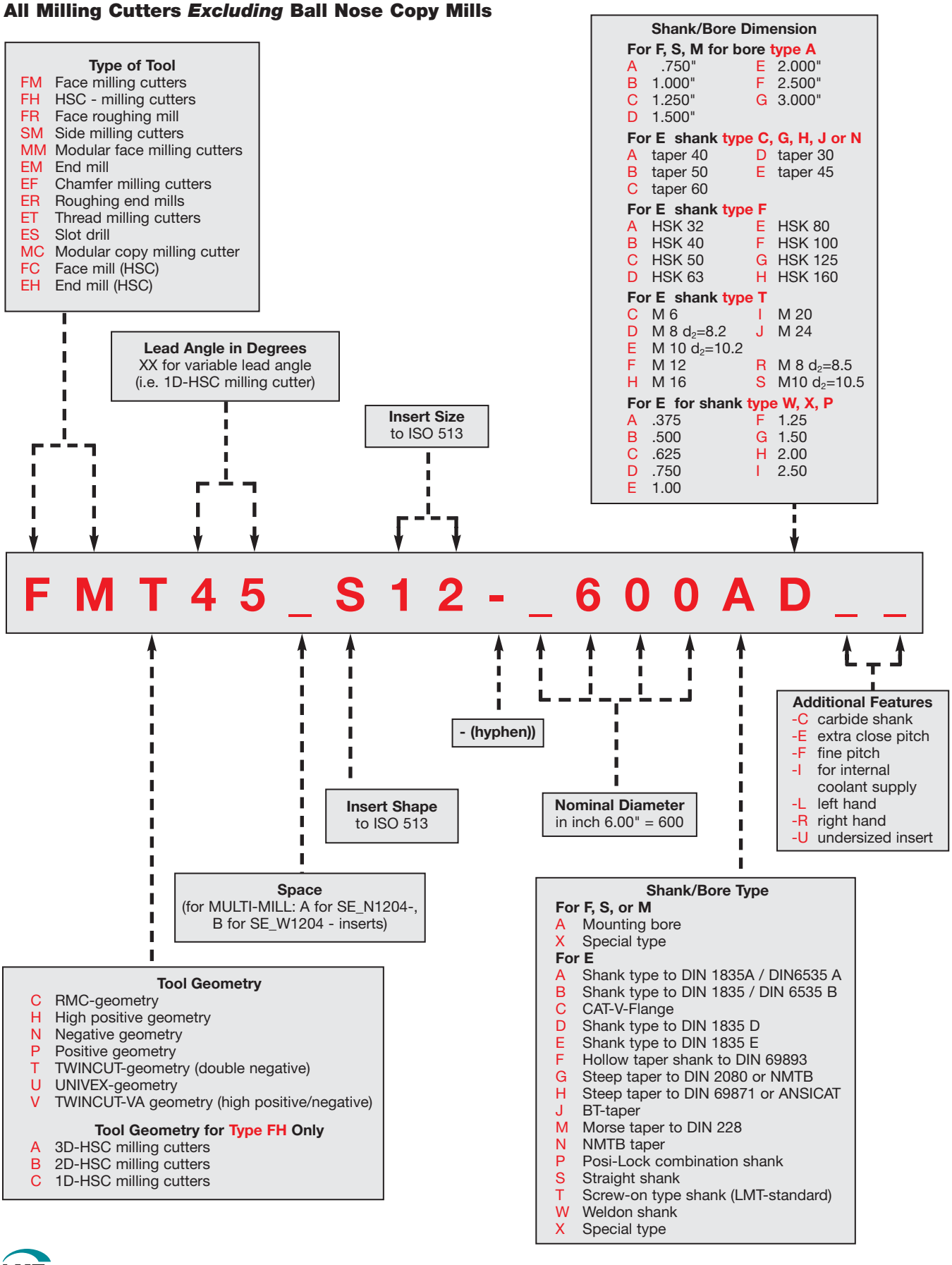
Adjust all cartridges up to the established zero point on the indicator that was predetermined by the highest insert

6

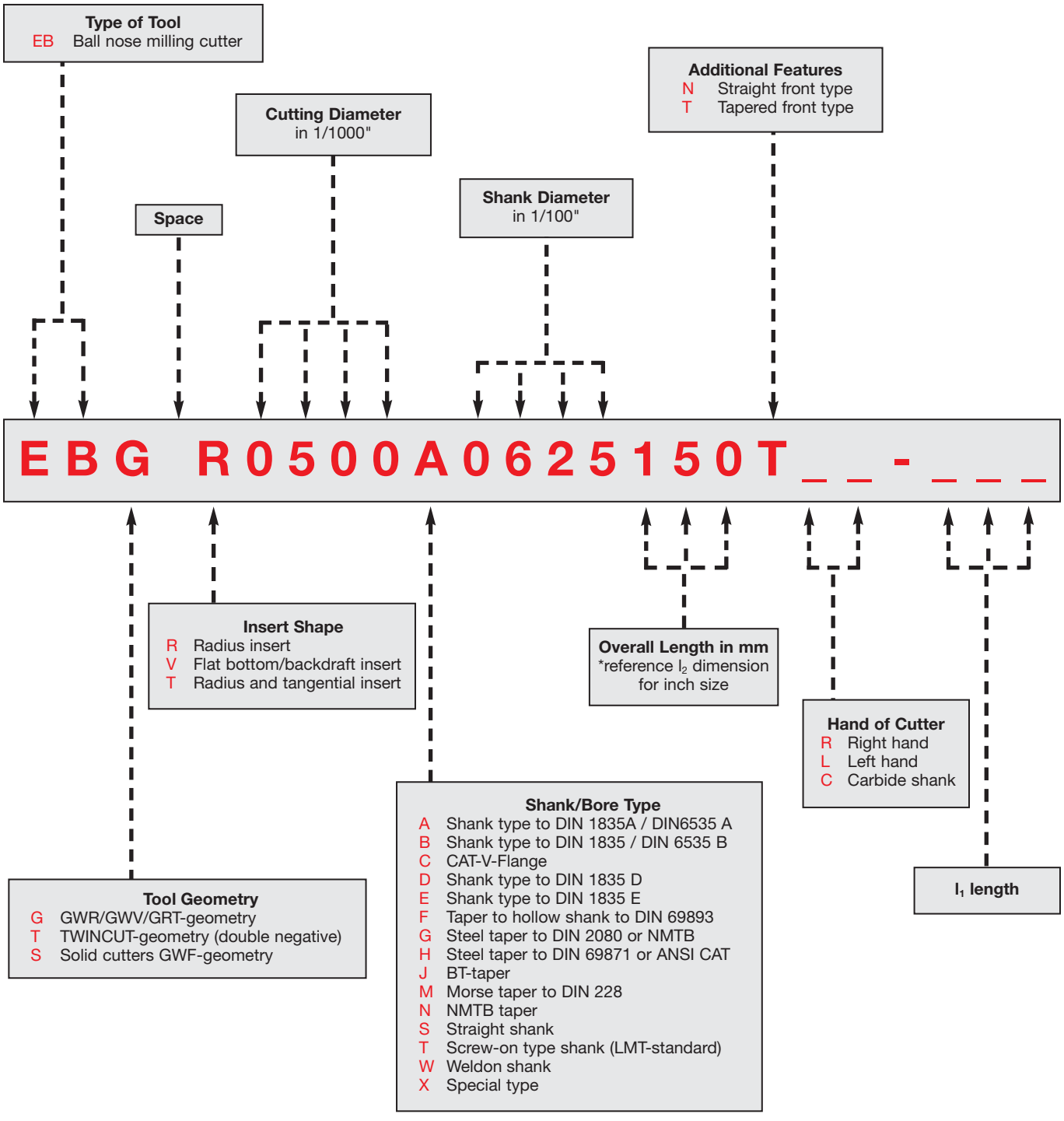


Finish torque all cartridges to 310 inch-lbs.

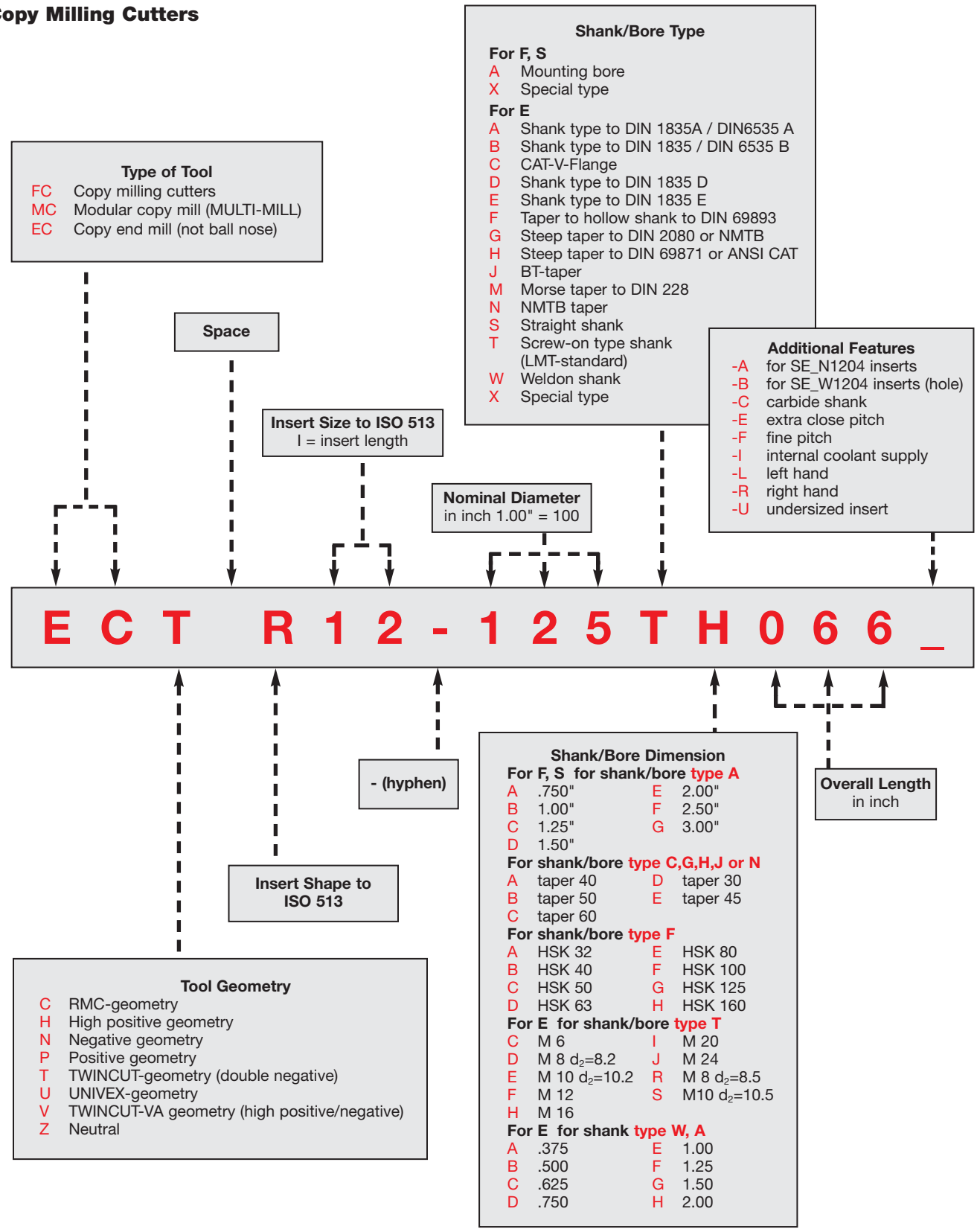
All Milling Cutters *Excluding* Ball Nose Copy Mills



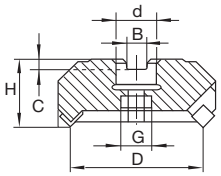
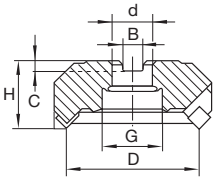
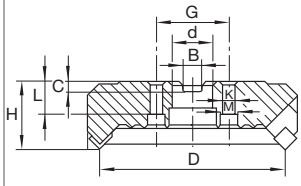
Ball Nose Milling Cutters



Copy Milling Cutters



Mounting Dimensions

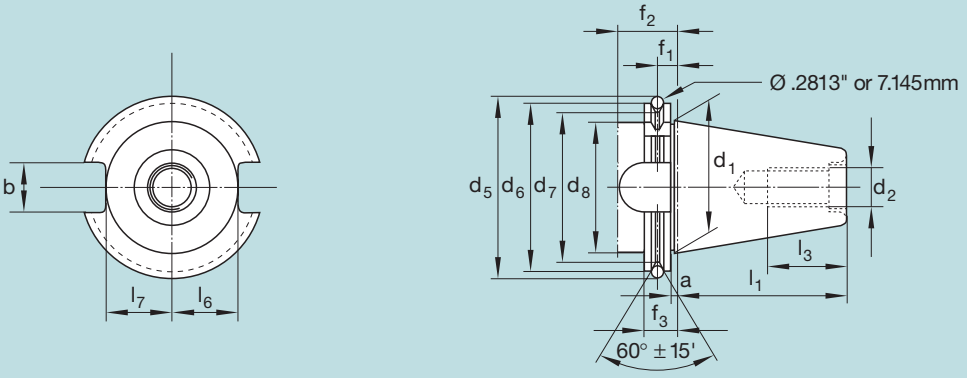
	Mounting	Ø D Cutting Diameter	d Pilot Diameter	H Overall Height	B Width of Keyway	C Depth of Keyway	G Mounting Screw DIA Counterbore or B.C.	K Bore Diameter	L Length of Bore	M Bolt Hole Counterbore
	Shell Mill Arbor	1.575	.750	1.42	.312		*			
		2.000	.750	1.57	.312		*			
		2.000	.750	1.57	.312		*			
		2.500	.750	1.57	.312		*			
		2.500	1.000	1.97	.375	.219	.827			
	Shell Mill Arbor	3.000	1.000	1.97	.375	.219	1.260			
		4.000**	1.500**	1.97	.625	.375	2.047			
		5.000	1.500	2.48	.625	.375	2.205			
		6.000	1.500	2.48	.625	.375	2.205			
	Milling Spindle ISO 50	8.000	2.500	2.48	1.000	.600	4.000	.709	1.141	1.024
		10.000	2.500	2.48	1.000	.600	4.000	.709	1.141	1.024

*3/8"-24 Socket Head Cap Screw required to mount this diameter cutter
**4" diameter Multi-Mill require a 3/4"-16 x 1.25 Socket Head Screw (edp 85000)
Note: Requires four 5/8"-11 Socket Head Cap Screws on a 4.00 inch bolt circle.

Taper Shanks

ANSI-CAT

CAT	a ±.004	b +.008	d_1	d_2	d_5 ±.004	d_6 ±.002	d_7 ±.008	d_8 max.	f_1 ±.004	f_2 min.	f_3 -.004	l_1	l_3 min	l_6 -.014	l_7 -.014
40	.126	.645	1.750	UNC 5/8	2.863	2.500	2.219	1.75	.438	1.38	.752	2.687	1.12	.890	.985
50	.126	1.020	2.750	UNC 1	4.238	3.875	3.594	2.75	.438	1.38	.752	4.000	1.75	1.390	1.485



Insert	Grade	EDP No.	Page
ADHX 12T315 ER	LC225S	60642	47
ADHX 12T315 ER	LC230F	53835	47
ADHX 12T315 ER	LC630S	60748	47
ADHX 12T315 ER	LC630T	60749	47
ADHX 12T315 ER	LW630	60640	47
ADHX 12T323 ER	LC225S	60645	47
ADHX 12T323 ER	LC230F	53836	47
ADHX 12T323 ER	LC630S	60750	47
ADHX 12T323 ER	LC630T	60751	47
ADHX 12T323 ER	LW630	60643	47
ADHT 090304 FR-ALC	LC610T•	89347	46
ADHT 090304 FR-ALC	LW610	51663	46
ADHT 110305 FR-ALC	LC610T•	89348	46
ADHT 110305 FR-ALC	LW610	51664	46
ADHT 12T306 FR-ALC	LC610T•	89349	47
ADHW 120308 R	LC225S	60442	53
ADHW 120308 R	LW610	60439	53
ADHX 090304 ER	LC225S	60511	46
ADHX 090304 ER	LC230F	53757	46
ADHX 090304 ER	LC240T	60482	46
ADHX 090304 ER	LC430T	50965	46
ADHX 090304 ER	LC610T	89382	46
ADHX 090304 ER	LC630S	60752	46
ADHX 090304 ER	LC630T	60753	46
ADHX 090304 ER	LW610	60510	46
ADHX 090304 ER	LW630	60538	46
ADHX 090308 ER	LC225S	60636	46
ADHX 090308 ER	LC230F	53831	46
ADHX 090308 ER	LC630S	60757	46
ADHX 090308 ER	LC630T	60758	46
ADHX 090308 ER	LW630	60634	46
ADHX 090315 ER	LC225S	60639	46
ADHX 090315 ER	LC230F	53832	46
ADHX 090315 ER	LW630	60637	46
ADHX 110305 ER	LC225S	60514	46
ADHX 110305 ER	LC230F	53788	46
ADHX 110305 ER	LC240T	60483	46
ADHX 110305 ER	LC430T	50946	46
ADHX 110305 ER	LC610T	60533	46
ADHX 110305 ER	LC630S	60760	46
ADHX 110305 ER	LC630T	60761	46
ADHX 110305 ER	LW610	60513	46
ADHX 110305 ER	LW630	60667	46
ADHX 110308 ER	LC225S	60630	46
ADHX 110308 ER	LC230F	53833	46
ADHX 110308 ER	LC630S	60765	46
ADHX 110308 ER	LC630T	60766	46
ADHX 110308 ER	LW630	60628	46
ADHX 110315 ER	LC225S	60633	46
ADHX 110315 ER	LC230F	53834	46
ADHX 110315 ER	LC630S	60770	46
ADHX 110315 ER	LC630T	60771	46
ADHX 110315 ER	LW630	60631	46
ADHX 12T306 ER	LC225S	60517	47
ADHX 12T306 ER	LC230F	53758	47
ADHX 12T306 ER	LC240T	60484	47
ADHX 12T306 ER	LC430T	50947	47
ADHX 12T306 ER	LC610T	60534	47
ADHX 12T306 ER	LC630S	60716	47
ADHX 12T306 ER	LC630T	60747	47

Insert	Grade	EDP No.	Page
ADHX 12T306 ER	LW610	60516	47
ADHX 12T306 ER	LW630	60133	47
ADKX 090304 ER	LC240T	52060	46
ADKX 090304 ER	LC225S	52057	46
ADKX 090304 ER	LC610T	52063	46
ADKX 090304 PESR-BP	LC230F	53759	46
ADKX 110305 ER	LC240T	52516	46
ADKX 110305 ER	LC225S	52058	46
ADKX 110305 ER	LC610T	52064	46
ADKX 110305 PESR-BP	LC230F	53760	46
ADKX 120305 ER	LC240T	52061	46
ADKX 12T306 ER	LC225S	52059	46
ADKX 12T306 ER	LC240T	52062	46
ADKX 12T306 ER	LC610T	52065	46
ADKX 12T306 PESR-BP	LC230F	53761	46
ADMT 120308 R	LC225S	60649	53
ADMT 120308 R	LW610	60446	53
ADMW 120308 R	LW610	60574	53
ADMX 090304 ER	LC225S	60520	46
ADMX 090304 ER	LC240T	60542	46
ADMX 110305 ER	LC225S	60478	46
ADMX 110305 ER	LC240T	60772	46
ADMX 12T306 ER	LC225S	60526	47
ADMX 12T306 ER	LC240T	60545	47
APHT 1604 PDFR-ALC	LC610T•	89310	34
APHT 1604 PDFR-ALC	LW610	89311	34
APKT 100305 PDSR	LC440T	53712	34
APKT 100305 PDSR	LC444W	53889	34
APKT 100305 PDSR	LC615E	55944	34
APKT 100305 PDSR	LC630S	89363	34
APKT 160408 PDSR	LC225S	60120	34
APKT 160408 PDSR	LC230F	53382	34
APKT 160408 PDSR	LC240T	60119	34
APKT 160408 PDSR	LC440T	50949	34
APKT 160408 PDSR	LC615E	55945	34
APKT 160408 PDSR	LC630S	89500	34
APKT 160408 PDSR	LC630T	89125	34
APKT 160408 PDSR	LW610	60115	34
APKT 160416 PDSR	LC225S	60720	34
APKT 160416 PDSR	LC230F	53310	34
APKT 160416 PDSR	LC240T	89319	34
APKT 160416 PDSR	LC630S	89321	34
APKT 160416 PDSR	LC630T	89322	34
APKT 160432	LC230F	50671	34
CCHX 080203	LC225S	60466	78
CCHX 080203	LW610	10912	78
CCHX 090304	LC225S	60470	78
CCHX 090304	LW610	60479	78
CCHX 12T305	LC225S	60467	78
CCMT 060204	LC225S	89896	65
CCMT 060204	LC240T	89927	65
CCMT 060204	LC610T	51856	65
CCMT 060204	LW610	89884	65
CCMT 080308	LC225S	89897	65
CCMT 080308	LC240T	89928	65
CCMT 080308	LC610T	51870	65
CCMT 080308	LW610	89885	65
OCKX 0606 AD-TR	LC225S	60704	8
OCKX 0606 AD-TR	LC230F	53242	8
OCKX 0606 AD-TR	LC240T	60708	8

Insert	Grade	EDP No.	Page
OCKX 0606 AD-TR	LC615E	60710	8
OCKX 0606 AD-TR	LW6610	51531	8
OCKX 0606 AD-TRT	LC280TT	54077	8
RCHT 1205 MO	LC230F	53261	61
RCHT 1205 MO-TT	LC280TT	54079	61
RCHT 1606 MO	LC230F	53262	61
RCHX 1205 MO	LC225S	89847	61
RCHX 1205 MO	LC240T	89862	61
RCHX 1205 MO	LC610T	60775	61
RCHX 1205 MO	LW610	89841	61
RCHX 1205 MO - T	LC225S	89851	61
RCHX 1205 MO - T	LC240T	60777	61
RCHX 1205 MO - T	LC610T	50669	61
RCHX 1205 MO - T	LW610	89845	61
RCHX 1205 MO - TR	LC225S	89849	61
RCHX 1205 MO - TR	LC240T	89864	61
RCHX 1205 MO - TR	LC610T	89872	61
RCHX 1205 MO - TR	LW610	89843	61
RCHX 1606 MO	LC225S	60124	61
RCHX 1606 MO	LC240T	60126	61
RCHX 1606 MO	LC610T	60127	61
RCHX 1606 MO	LW610	60123	61
RCHX 1606 MO - T	LC225S	60139	61
RCHX 1606 MO - T	LC240T	60141	61
RCHX 1606 MO - T	LC610T	60779	61
RCHX 1606 MO - T	LW610	60138	61
RCHX 1606 MO - TR	LC225S	60131	61
RCHX 1606 MO - TR	LC240T	60134	61
RCHX 1606 MO - TR	LC610T	60135	61
RCHX 1606 MO - TR	LW610	60130	61
RCKT1606 MO	LC280TT	54080	61
RCKX 1606 MO-TR	LC225S	60692	8
RCKX 1606 MO-TR	LC230F	53241	8
RCKX 1606 MO-TR	LC240T	60696	8
RCKX 1606 MO-TR	LC610T	51530	8
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SEKN 1203 AFSN	LC440T	51749	29
SEKN 1203 AFSN	LC610T	60004	29
SEKN 1203 AFSN	LC615E	60734	29
SEKN 1203 AFSN	LW610	60002	29
SEKN 1204 AFEN	LC444W	54148	29
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