LMT FETTE

New Product Catalog 2005

Leitz Metalworking Technology Group

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I N N O V A T I O N

At LMT-FETTE, we understand the importance of new product innovations to our customers.

We understand that, in today's global economy, all our our customers must continually strive for improved productivity, while reducing manufacturing costs. That is why LMT-Fette invests continually in product research and development in advancing technology forward. We are pleased to provide the 2005 New Product Catalog!

The products shown on this page are some of the latest developments from the LMT Group in Milling, Turning, Reaming, Boring, Thread Rolling and Tool Work Holding.









2005

P R O D U C T I V I T Y

CONTENTS

NEW UNIVEX PREMIUM – 17mm End Mills and Face Mills 90°

Products

LMT-Fette is pleased to announce UNIVEX PREMIUM. This new generation of 90° end mills and face mills is designed with ultra-high positive geometry and unequal pitched flutes for smooth performance, and a true 90° design for efficient and accurate corner milling. LMT-Fette's new UNIVEX PREMIUM series of square shoulder mills achieve high feed rates, resulting in reduced cycle times. Unique ultra-durable nickel-plated bodies ensure long-term performance. The UNIVEX PREMIUM end mills and face mills are designed with thru-the-tool coolant supply improving chip evacuation and tool life. The UNIVEX PREMIUM end mills are available in Weldon shanks or straight shanks for precision mounting in end mill adapters.

The UNIVEX PREMIUM end mills and face mills feature precision indexable 17mm carbide inserts available with a variety of corner radii. A range of carbide substrates and coatings are available to meet your specific application needs, resulting in optimum cutting speeds and tool life, and excellent surface finishes.

Application Area

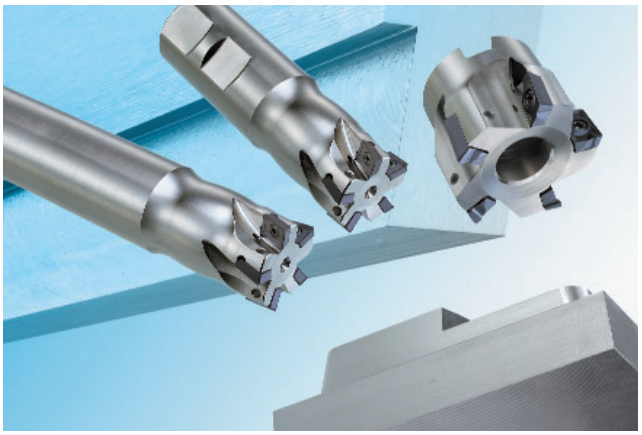
The UNIVEX PREMIUM end mill and face mill cutters are designed to cover a wide range of roughing and semi-finish milling applications. The UNIVEX PREMIUM cutters offer precise location of inserts to minimize witness lines when face milling. The milling cutters are available in course and fine pitch for maximum feed rates in specific material groups. The inserts and body pocket design offer unmatched performance and smooth cutting action when milling in all steels, stainless, and non-ferrous materials. The new UNIVEX PREMIUM features a longer insert edge length for greater depths of cut, up to 0.670″. All UNIVEX PREMIUM milling cutters are nickel-plated for long-term performance even when used in unfavorable conditions.

Materials

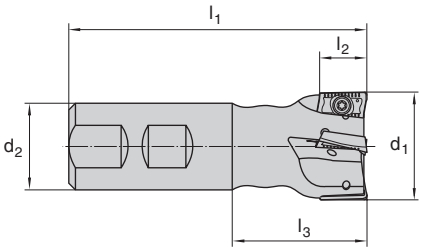
The UNIVEX PREMIUM end mills and face mills are primarily designed for steel material groups. A broad selection of inserts, grades and chip breaking geometries make it an easy choice for machining materials from low carbon steel to mild steel and tool steels.

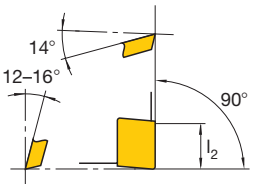
Advantages

The new generation of UNIVEX PREMIUM end mills and face mills adds 17mm edge length inserts to our already successful UNIVEX 90° end mill and face mill program of 9mm and 11mm. LMT-Fette offers the Total Tooling Solution with its complete line of 90° indexable end mills ranging from 1/2″ to 1.5″ diameters and face mills ranging from 2″ to 4″ diameters.



EMU90

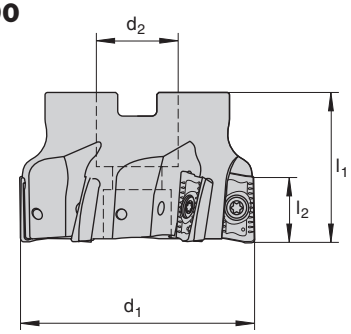


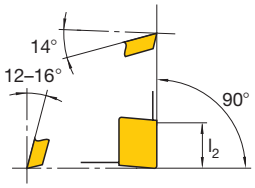


d_1	Cutter Body No.	EDP	Dimensions (inches) doc (l_2)	l_1	l_3	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
1.00	EMU90 A17-100WEI	12911	0.670	4.000	1.720	1.000	2	ADKX 1705_ _ SR-TR	89973	50259
1.00	EMU90 A17-100SEI	12912	0.670	6.000	1.720	1.000	2			
1.00	EMU90 A17-100SEI	12913	0.670	10.000	1.720	1.000	2			
1.25	EMU90 A17-125WFI	12914	0.670	4.000	1.720	1.250	2		89974	
1.25	EMU90 A17-125SFI	12915	0.670	6.000	1.720	1.250	2			
1.25	EMU90 A17-125SFI	12916	0.670	10.000	1.720	1.250	2			
1.25	EMU90 A17-125WFI	12917	0.670	4.000	1.720	1.250	3			
1.25	EMU90 A17-125SCFI	12918	0.670	6.000	1.720	1.250	3			
1.50	EMU90 A17-150WGI	12919	0.670	4.500	1.720	1.500	3			
1.50	EMU90 A17-150SGI	12920	0.670	6.000	1.720	1.500	3			
1.50	EMU90 A17-150SGI	12921	0.670	10.000	1.720	1.500	3			
1.50	EMU90A17.150WGIF	12922	0.670	4.500	1.720	1.500	4			
1.50	EMU90 A17-150SGIF	12923	0.670	6.000	1.720	1.500	4			

See pages 4 for inserts
See pages 4–6 for recommended cutting data and application information

FMU90

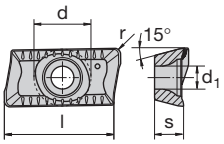




d_1	Cutter Body No.	EDP	Dimensions (inches) doc (l_2)	l_1	d_2	No. Teeth	Insert	Insert Screw	Torx Driver
2.00	FMU90 A17-200AAI	12903	0.670	1.575	0.750	4	ADKX 1705_ _ SR-TR	89974	50259
2.00	FMU90 A17-200AAIF	12904	0.670	1.575	0.750	5			
2.50	FMU90 A17-250ABI	12905	0.670	1.575	1.000	5			
2.50	FMU90 A17-250ABIF	12906	0.670	1.575	1.000	6			
3.00	FMU90 A17-300ACI	12907	0.670	1.969	1.250	5			
3.00	FMU90 A17-300ACIF	12908	0.670	1.969	1.250	8			
4.00	FMU90 A17-400ADI	12909	0.670	1.960	1.500	6			
4.00	FMU90 A17-400ADIF	12910	0.670	1.990	1.500	9			

See pages 4 for inserts
See pages 4–6 for recommended cutting data and application information

Inserts

N = No. of Cutting Edges	Insert Description ISO Code LMT Cat. No.	Dimensions (mm/inches) l	s	d	d_1	r	Insert Grade Ordering No. LC240T	LC630T	LC610T	For Cutter No.
	ADKX 170508 SR-TR	17.5 (.689)	5.6 (.220)	9.62 (.379)	3.8 (.150)	0.8 (0.031)	16024	16023	16022	EMU90 FMU90
	ADKX 170512 SR-TR	17.5 (.689)	5.6 (.220)	9.62 (.379)	3.8 (.150)	1.2 (0.047)	16027	16026	16025	
	ADKX 170516 SR-TR	17.5 (.689)	5.6 (.220)	9.62 (.379)	3.8 (.150)	1.6 (0.062)	16030	16029	16028	
N = 2	ADKX 170520 SR-TR	17.5 (.689)	5.6 (.220)	9.62 (.379)	3.8 (.150)	2.0 (0.079)	16033	16032	16031	

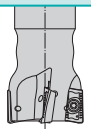
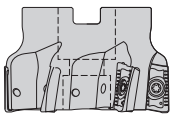
Grade Overview

Grade	ISO	Range of Applications 01 05 10 15 20 25 30 35 40 45 50	Group of Materials P Steel	M Stainless	K Gray cast iron	N Nonferrous materials	S High temperature materials	H Hard materials
LC240T	HC-P40		□					
	HC-M40			▣				
LC630T	HC-P20		□				▣	
	HC-K15				▣			
LC610T	HC-K10				▣			
	HC-K10					▣		
	HC-P10		▣					
	HC-M10			▣				

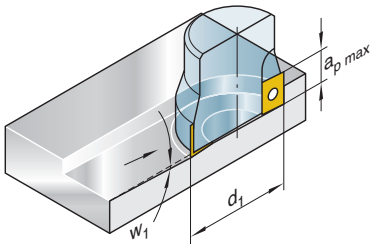
Cutting Data Recommendations

P	Plain Carbon Steel	1018, 1025	< 20	660	870	640
	Free Machining Steel	1212, 12L13	< 20	660	870	640
	Structural Alloy Steel	1040, 4130	< 30	590	870	640
	Heat Treatment Steel, medium strength	4140, 6150	< 30	520	870	525
	Cast Steel	4340, 8740	< 30	520	750	525
	Caste Hardening Steel	52100, 8620	< 30	520	750	525
	Stainless Steel, ferritic martensitic	410, 430F, 440	< 30	520	750	525
	Heat Treatment Steel, high strength	4140, 8740	28 - 44	390	575	460
	Nitriding Steel	A355	28 - 44	390	575	460
	Tool Steel	H13, D2	28 - 44	390	575	460
M	Stainless Steel, austenitic	304, 316	< 30	790	–	700
	Maraging Steel			200	–	700
K	Grey Cast Iron	A319, J431, No. 25B, No. 50B	< 27	660	870	640
	Alloyed Grey Cast Iron	A434, A436-72	< 22	490	675	525
	Nodular Cast Iron	A536 (80-55-06), J434	< 34	490	610	460
	Malleable Cast Iron	A220, 50005, A47, 32510	< 29	520	610	460
N	Pure Metals, soft	Pure Iron, Lead	< 20	980	2030	–
	Aluminum Alloys, long chipping	6061, 7050	< 20	3280	2750	–
	Aluminum Alloys, short chipping	A356, 4218	< 20	980	1150	–
	Copper Alloys, long chipping	C27200, B-148-52	< 20	820	2750	–
	Copper Alloys, short chipping		< 20	820	1150	–
	Magnesium Alloys	B94, M11910		1310	1640	–
	Thermoplastics	PVC, Acrylic glass		820	1640	–
	Duroplastics	Durolite, Ampal		660	1640	–
	Graphite			660	1640	–
S	Titanium Alloys, medium strength	F67, B265	< 29	260	–	–
	Titanium Alloys, high strength	Ti-6Al-4V	27 - 44	130	–	–
	Nickel Based Alloys medium strength	20Cb3	< 29	200	280	230
	Heat Resistant Nickel Based Alloys, high strength	Inconel 718	27 - 44	100	215	160
H	Chilled Cast Iron	Ampco 25	< 20	130	215	160
	Hardened Steel		45 - 52	–	280	160
			53 - 59	–	215	–
			60 - 65	–	145	–

Cutting Data Recommendations

Catalog No.	EMU90	FMU90
		
Ø	1.0″ - 1.5″	2″ - 4″
ISO-Code	ADKX 1705_ _	ADKX 1705_ _
	.006 - .010	.008 - .012
	.006	.007
	.012	.014
	.014	.016
	.006	.006

Ramp Milling Using UNIVEX PREMIUM



Type	Ø	ISO Code	W_1 Max Ramp Angle
EMU90	1.00	ADKX 1705_ _	4.0
	1.25		2.7
	1.50		2.0
FMU90	2.00	ADKX 1705_ _	1.5
	2.50		1.1
	3.00		0.8
	4.00		0.6

Application Examples

Material: 4140 Pre-Hard
Hardness: 27-32 HRC

LMT-Fette UNIVEX PREMIUM Face Milling Cutter
FMU90 A17-200
Ø 2.00″ 5 teeth
with inserts
Insert Grade LC630T

Cutting Data
sfm = 825
rpm = 1,600
ipt = .006″
ipm = 40
woc = 1.400″
doc = .400″

Material: 4140 Pre-Hard
Hardness: 27-32 HRC

LMT-Fette UNIVEX PREMIUM End Mill
Cat. Desc. EMU90
Ø 1.00″ 2 teeth
with inserts
Insert Grade LC630T

Cutting Data
sfm = 1,100
rpm = 2,130
ipt = .005″
ipm = 53
woc = .020″
doc = .500″

NEW WPR-D – Helical Ball Nose Insert LC610Q

Products

LMT-Fette is pleased to announce the helical-shaped, extremely free-cutting geometry of our new WPR-D Helical Ball Nose insert. The new insert provides long tool life and excellent surface finishes when machining complex work pieces. The use of traditional inserts with straight cutting edges typically results in unequal cutting forces, as well as increased vibration, shorter tool life and slower feed rates. The WPR-D helical cutting edge results in incremental entry of the cutter and significantly reduces vibration for a soft, peeling cut. The WPR-D insert cutting edge is designed to always be under a load for increased stability and further reduced vibration.

Application Area

The new WPR-D Helical Ball Nose inserts are designed to meet the demands of the growing segment of high-speed machining in the die and mold market, on tool steels up to 60 Rc.

The inserts, with their free-cutting action, consistently proves to be a finishing tool of choice. Super-fine carbide substrate combined with a unique helical grind and PVD ALCrN coating result in a new standard for semi-finishing ball milling applications.

Materials

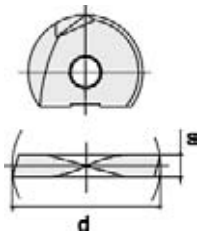
WPR-D Helical Ball Nose inserts are designed for die and mold materials commonly used, such as tools steels P20, H13, A2, and D2. WPR-D helical inserts can also provide excellent tool life in softer alloy materials, less than 45 Rc. With its new enhanced coating, the LC610Q insert grade is suitable for either wet or dry milling applications.

Advantages

The primary advantage of LMT-Fette's new WPR-D Helical Ball Nose insert is its ability to cut freely, reduce vibration and extend tool life. The WPR-D insert geometry exhibits a helical cutting action, providing soft, peeling cutting to the center of the insert, and in turn reducing horsepower and increasing insert stability.

WPR-D – Helical Ball Nose Insert LC610Q

Inserts

D = Helical Chipbreaker	Insert Description ISO Code LMT Cat. No.	Dimensions (inches) d	 s	Insert Grade Ordering No. LC610Q	For Cutter Body No.
	WPR 0500-D	0.500	0.098	88218	EBG-R-T EBG-R-N
	WPR 0625-D	0.625	0.118	88219	
	WPR 0750-D	0.750	0.118	88220	
	WPR 1000-D	1.000	0.157	88221	
	WPR 12-D	12	2.5	88225	EBG-R-T EBG-R-N
	WPR 16-D	16	3.0	88226	
	WPR 20-D	20	3.0	88227	
	WPR 25-D	25	4.0	88228	

Grade Overview

Grade	ISO	Range of Applications 01 05 10 15 20 25 30 35 40 45 50	Group of Materials P Steel	M Stainless	K Gray cast iron	N Nonferrous materials	S High temperature materials	H Hard materials
LC610Q	HC-K10		■	□	□	□	□	

Cutting Data Recommendations

ISO Code	Material	Material Examples	Rockwell C	Feed IPT / SFM .002″ - .012″ IPT	
P	Plain Carbon steel	1018, 1025,	< 20	1050	1300
	Free Machining steel	1212, 12L13	< 20	1050	1300
	Structural alloy steel	1040, 4130	< 30	1050	1300
	Heat-treatment steel, medium strength	4140, 6150	< 30	1050	1300
	Cast Steel	4340, 8740	< 30	850	980
	Caste hardening steel	52100, 8680	< 30	850	980
	Stainless steel, ferritic martensitic	410, 430F, 440	< 30	850	980
	Heat treatment steel, high strength	4140, 8740	28 - 44	680	790
	Nitriding Steel	A355	28 - 44	680	790
	Tool Steel	H13, D2	28 - 44	680	790
M	Stainless steel, austenitic	304, 316	< 30	–	–
	Maraging steel			–	–
K	Grey cast iron	A319, J431 No. 25B, No. 50B	< 27	1050	1300
	Alloyed grey cast iron	A434, A436-72	< 22	800	910
	Nodular cast iron	A536 (80-55-06), J434	< 34	725	820
	Malleable cast iron	A220, 50005 A47,32510	< 29	725	820
N	Pure metals, soft	Pure Iron, Lead	< 20	2400	2760
	Aluminum alloys, long chipping	6061, 7050	< 20	3120	3280
	Aluminum alloys, short chipping	A356, 4218	< 20	1250	1570
	Copper alloys, long chipping	C28000, B-148-52	< 20	3120	3280
	Copper alloy, short chipping		< 20	1250	1570
	Magnesium alloys	B94, M11910		–	1570
	Thermoplastics	PVC, Acrylic glass		–	1970
	Duroplastics	Durolite, Ampal		–	1970
	Graphite			–	1970
S	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
H	Chilled cast iron	Ampco 25	< 20	200	230
	Hardened steel		45 - 52	260	300
			53 - 59	200	230
			60 - 65	130	160

NEW HSC FEED™ – High Feed, Solid Carbide Roughing End Mills

Products

LMT-Fette is pleased to announce the introduction of the first Solid Carbide High Feed End Mill. Called the HSC FEED™, these new cutters feature an exceptionally tough sub-micrograin substrate and LMT's superior AL2 plus PVD Titanium Aluminum Nitride coating. Combined, these two features offer the best combination of wear resistance and toughness.

Application Area

The new HSC FEED™ product is primarily designed for roughing and semi-finishing in the die and mold industry. In this application area, materials such as P20, H13, and S7 are commonly a hardness up to nearly 60 Rc. However, the HSC FEED™ also performs exceptional in both carbon and alloy steels, cast iron, and stainless steel.

With its patented bottom radius design, the HSC FEED™ can rough at chip loads 3–5 times higher than conventional solid carbide, ball nose end mills. This unique capability leads to metal removal rates significantly higher than conventional tools, and noticeable productivity improvements.

HSC FEED's™ unique, center-cutting design works exceptionally well in a wide range of applications, including 3D contouring, pocketing, helical interpolation, and slotting.

Materials

As stated above, the HSC FEED™ was primarily designed for use in materials commonly found in the die and mold industry, including P20, H13, S7, and 400 series stainless steels. However, the design has also proved to be effective in virtually any steel application, as well as cast iron. Because of the relatively heavy edge preparation on the HSC FEED™, it is not ideally suitable for aluminum, graphite, titanium, or nickel-based alloys.

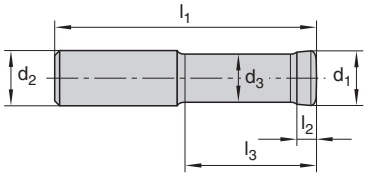
Advantages

The primary advantage of LMT-Fette's new HSC FEED™ product is in its ability to significantly shorten roughing times in the machining of die and mold steels. With chip loads up to .031″ per tooth, and cutting speeds in excess of 650 sfm, it is common to run the HSC FEED™ at table feeds exceeding 500 ipm.

Additionally, the unique geometry of the HSC FEED™ leaves less stock in the corner of pockets than a conventional ball nose end mill, thus reducing the number of tools necessary to complete a mold.

Like the HSC Ball Nose End Mills, the HSC FEED™ is also designed to cut material as hard as 60 Rc. The superior substrate and coating, combined with an exceptionally strong geometry can handle even the most demanding die and mold applications.

Inch/Metric Solid Carbide, Center Cutting, High Speed Machining CNC



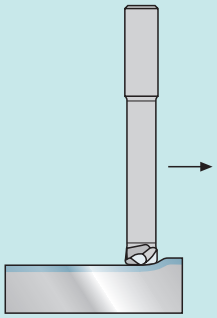
Style	1430C
Helix Angle	0°
Shank	DIN 6535 HA
Coating	PVD AL2 Plus
Grade	LC620T

d_1	Length	EDP No.	Dimensions (mm/inches)					Flutes	*$a_{p\ max}$	R_{theo}
			l_2	l_1	l_3	d_3	$d_{2\ h6}$			
INCH										
0.187	Short	10388	0.075	2.000	0.660	0.156	0.250	2	0.009	0.019
0.187	Long	10389	0.075	3.000	1.500	0.156	0.250	2	0.009	0.019
0.250	Short	10390	0.104	2.500	0.770	0.208	0.250	2	0.013	0.025
0.250	Long	10391	0.104	3.250	1.750	0.208	0.250	2	0.013	0.025
0.312	Short	10392	0.120	2.500	0.940	0.260	0.312	2	0.016	0.031
0.312	Long	10393	0.120	3.500	2.100	0.260	0.312	2	0.016	0.031
0.375	Short	10394	0.136	2.500	1.060	0.312	0.375	2	0.019	0.038
0.375	Long	10395	0.136	4.000	2.250	0.312	0.375	2	0.019	0.038
0.500	Short	10396	0.167	3.500	1.420	0.417	0.500	2	0.025	0.050
0.500	Long	10397	0.167	4.500	2.500	0.417	0.500	2	0.025	0.050
METRIC										
4.0	Short	55480	1.5 (0.059)	57 (2.244)	15 (0.591)	3.4 (0.134)	6 (0.236)	2	0.20 (0.008)	0.4 (0.016)
4.0	Long	55481	1.5 (0.059)	80 (3.150)	34 (1.339)	3.4 (0.134)	6 (0.236)	2	0.20 (0.009)	0.4 (0.016)
5.0	Short	55482	2.0 (0.079)	57 (2.244)	17.5 (0.689)	4.2 (0.165)	6 (0.236)	2	0.25 (0.010)	0.5 (0.020)
5.0	Long	55483	2.0 (0.079)	80 (3.150)	37 (1.457)	4.2 (0.165)	6 (0.236)	2	0.25 (0.010)	0.5 (0.020)
6.0	Short	55484	2.5 (0.098)	57 (2.244)	19 (0.748)	5.0 (0.197)	6 (0.236)	2	0.30 (0.012)	0.6 (0.024)
6.0	Long	55485	2.5 (0.098)	80 (3.150)	42 (1.654)	5.0 (0.197)	6 (0.236)	2	0.30 (0.012)	0.6 (0.024)
8.0	Short	55486	3.0 (0.118)	63 (2.480)	24 (0.945)	6.7 (0.264)	8 (0.315)	2	0.40 (0.016)	0.8 (0.031)
8.0	Long	55487	3.0 (0.118)	90 (3.543)	51 (2.008)	6.7 (0.264)	8 (0.315)	2	0.40 (0.016)	0.8 (0.031)
10.0	Short	55488	3.5 (0.138)	72 (2.835)	28.5 (1.122)	8.5 (0.335)	10 (0.394)	2	0.50 (0.020)	1.0 (0.039)
10.0	Long	55489	3.5 (0.138)	100 (3.937)	56.5 (2.224)	8.5 (0.335)	10 (0.394)	2	0.50 (0.020)	1.0 (0.039)
12.0	Short	55490	4.0 (0.157)	83 (3.268)	34 (1.339)	10.0 (0.394)	12 (0.472)	2	0.60 (0.024)	1.2 (0.047)
12.0	Long	55491	4.0 (0.157)	110 (4.331)	61 (2.402)	10.0 (0.394)	12 (0.472)	2	0.60 (0.024)	1.2 (0.047)

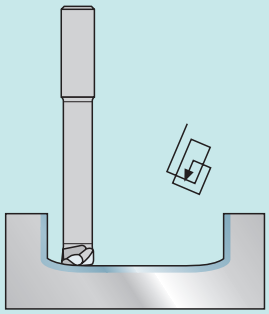
*denotes maximum axial depth of cut

Application Examples

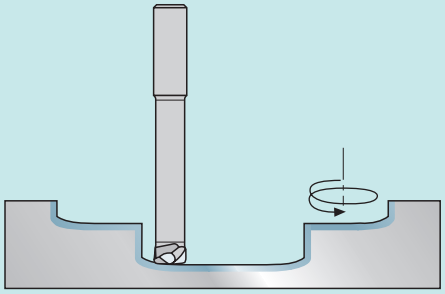
Face Milling



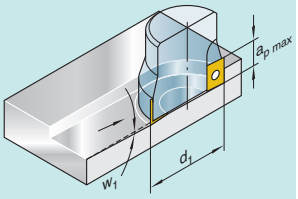
Pocketing



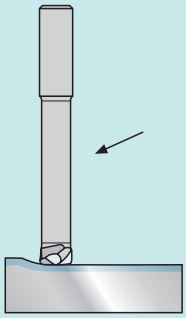
Opening cavity



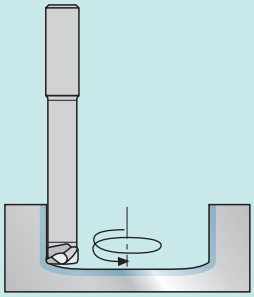
Plunge Milling



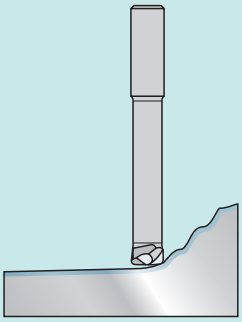
Ramping
Ramp Angle = 1-2°



Circular interpolation



3D rough copy milling



Cutting Data Recommendations

ISO Code	Material	Material Examples	HRC	LC620T	
				Cutting Speed (sfm)	Feed Per Tooth (f_z)
P	Unalloyed Carbon Steel	A36, 1005-1029, 1213, 12L14	16 - 30	800 - 1000	.040
	Alloyed Steel, medium strength	4140, 6150, 5115, 8620	< 30	800 - 990	.030
	Heat Treatable Steel, high strength	4340	30 - 44	720 - 790	.030
	Nitriding Steel	H13	30 - 44	490 - 590	.030
	Tool Steel	A2, D2, P20	30 - 44	590 - 720	.030
M	Stainless Steel, austenitic	303, 304, 316, Nitronic	< 30	700 - 800	.030
K	Grey Cast Iron Alloyed Grey Cast Iron	No. 30B A436-725	< 30	750 - 820	.050
	Nodular Cast Iron	5005	< 23	550 - 590	.040
	Alloyed Nodular Cast Iron	5005	< 16	450 - 590	.030

The cutting data indicated are starting values and must be adjusted to current machining conditions
*We recommend reducing the feed per tooth value with the long length version by 30%.

Application Examples

Material: 4140 Pre-Hard
Hardness: 27-32 HRC

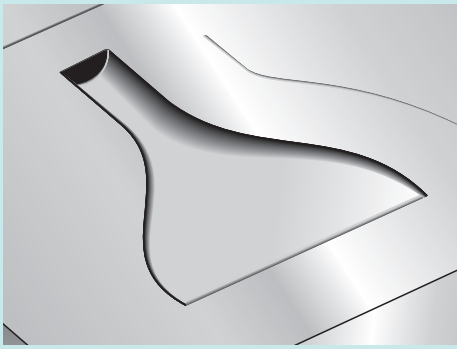
LMT-Fette HSC FEED™ Mill
Cat. Desc. 1430 HSC FEED™ Mill
Ø 1/2″ 2 flute
Cutting Material LC620T

Cutting Data
sfm = 1,100
rpm = 9,000
ipt = .030″
ipm = 540
woc = .200″
doc = .024″

HSC FEED was used instead of a radius end mill for Z-level-roughing of a chissel die.

Feed rate could be doubled to v_f (IPM) = 365, without changing speed of

v_c (SFM) = 492 and tool life was 4 times higher.



AIR LINE® Solid Carbide – High Performance End Mills

Products

LMT-Fette has long been recognized as a premier supplier in the HSS and powdered metal end mill market. Now, LMT-Fette is pleased to announce the introduction of our first solid carbide end mill product for the North American market, our new AIR LINE® Solid Carbide end mill. This unique end mill, some of which have “coolant-through” capability, is designed for roughing and finishing in non-ferrous materials, as well as finishing in steel, stainless steel, and nickel-based alloys.

Application Area

The AIR LINE® Solid Carbide end mill is designed primarily for use in roughing and finishing of non-ferrous alloys such as aluminum, magnesium, brass, etc. The AIR LINE® geometry, with its unique “stepped-relief,” 20° rake angle, and dead-sharp cutting edge, allows for trouble free slotting and shouldering, even in softer aluminum alloys. This geometry combined with LMT-Fette’s new super-fine grain-grade substrate, provides unmatched, economical removal rates in all non-ferrous materials.

The AIR LINE® product also performs exceptionally in finishing applications on more difficult materials that benefit from a positive, up-sharp geometry. This geometry, when combined with our PVD TiAlN coating, also performs excellent in finishing of low-carbon steels, austenitic stainless steel, and nickel-based alloys.

The versatile design of the AIR LINE® Solid Carbide end mill performs even the most difficult end milling operation with ease.

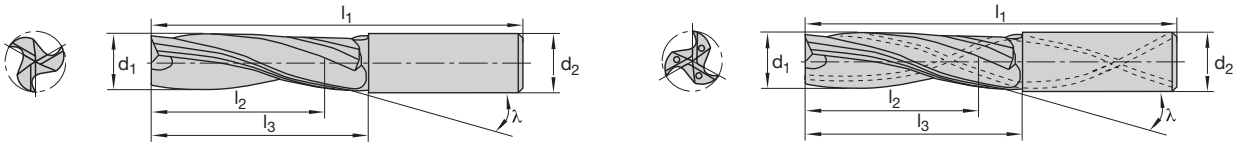
Materials

The AIR LINE® Solid Carbide end mill is generally designed for materials commonly used in the Aerospace industry, especially aluminum and magnesium alloys. However, the AIR LINE® end mill has also shown exceptional versatility and excellent performance in brass, copper, and finishing of 300 series stainless steels and nickel-based alloys such as Inconel and Hastelloy.

Advantages

The primary advantage of the AIR LINE® Solid Carbide end mill is its ability to run at 50% higher feed rates, leading to shorter machining times, specifically when combined with “coolant-through” capability. The slow-helix design of the tool, combined with the “stepped-relief,” leads to excellent edge strength, while maintaining a positive, up-sharp edge. Additionally, the AIR LINE’s® unique “coolant-though” capability leads to simplified chip removal, thus improving process reliability.

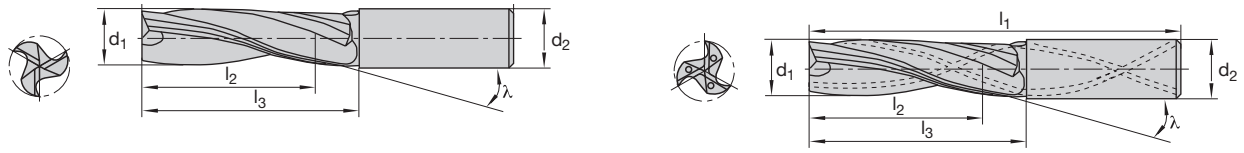
Solid Carbide, Super-Fine Grain Center Cutting End Mills



Style	1571
Primary Application	Aluminum/Thermoplastics
Type	SH
Standard	DIN 6527 A
Helix Angle	λ = 30°
Straight Shank	Yes
Coating	–
Cutting Materials	LW630

d_1	EDP No.	Helix	Dimensions (inches) l_2	d_2	l_3	l_1	Flutes	Thru Coolant
UNCOATED / LW630								
0.250	53756	30°	0.625	0.250	0.813	2.500	2	Yes
0.375	53720	30°	0.875	0.375	1.250	3.000	2	Yes
0.500	53721	30°	1.125	0.500	1.500	3.500	3	Yes
0.625	53722	30°	1.250	0.625	1.750	4.000	3	Yes
0.750	53723	30°	1.500	0.750	2.125	4.000	3	Yes
1.000	53724	30°	2.000	1.000	2.750	4.000	3	Yes
0.250	53725	30°	0.625	0.250	0.813	2.500	2	No
0.375	53726	30°	0.875	0.375	1.250	3.000	2	No
0.500	53727	30°	1.125	0.500	1.500	3.500	3	No
0.625	53728	30°	1.250	0.625	1.750	4.000	3	No
0.750	53729	30°	1.500	0.750	2.125	4.000	3	No
1.000	53730	30°	2.000	1.000	2.750	4.000	3	No
COATED / LC630T								
0.250	53731	30°	0.625	0.250	0.813	2.500	2	Yes
0.375	53732	30°	0.875	0.375	1.250	3.000	2	Yes
0.500	53733	30°	1.125	0.500	1.500	3.500	3	Yes
0.625	53734	30°	1.250	0.625	1.750	4.000	3	Yes
0.750	53735	30°	1.500	0.750	2.125	4.000	3	Yes
1.000	53736	30°	2.000	1.000	2.750	4.000	3	Yes
0.250	53737	30°	0.625	0.250	0.813	2.500	2	No
0.375	53738	30°	0.875	0.375	1.250	3.000	2	No
0.500	53739	30°	1.125	0.500	1.500	3.500	3	No
0.625	53740	30°	1.250	0.625	1.750	4.000	3	No
0.750	53741	30°	1.500	0.750	2.125	4.000	3	No
1.000	53742	30°	2.000	1.000	2.750	4.000	3	No

Solid Carbide, Super-Fine Grain Center Cutting End Mills



Style	1571
Primary Application	Aluminum/Thermoplastics
Type	SH
Standard	DIN 6527 A
Helix Angle	λ = 30°
Straight Shank	DIN 6535 HA
Coating	–
Cutting Materials	LW630

d_1	EDP No.	Helix	Dimensions (mm/inches)				Flutes	Thru Coolant
			l_2	d_2	l_3	l_1		
UNCOATED / LW630								
8 (0.315)	53743	30°	19 (0.748)	8 (0.315)	27 (1.063)	63 (2.480)	2	Yes
10 (0.394)	53744	30°	22 (0.866)	10 (0.394)	32 (1.260)	72 (2.835)	2	Yes
12 (0.472)	53745	30°	26 (1.023)	12 (0.472)	38 (1.496)	83 (3.267)	3	Yes
16 (0.630)	53746	30°	32 (1.260)	16 (0.630)	44 (1.732)	92 (3.622)	3	Yes
20 (0.787)	53747	30°	38 (1.496)	20 (0.787)	54 (2.126)	104 (4.095)	3	Yes
COATED / LC630T								
8 (0.315)	54031	30°	19 (0.748)	8 (0.315)	27 (1.063)	63 (2.480)	2	Yes
10 (0.394)	53748	30°	22 (0.866)	10 (0.394)	32 (1.260)	72 (2.835)	2	Yes
12 (0.472)	53749	30°	26 (1.023)	12 (0.472)	38 (1.496)	83 (3.267)	3	Yes
16 (0.630)	53750	30°	32 (1.260)	16 (0.630)	44 (1.732)	92 (3.622)	3	Yes
20 (0.787)	53751	30°	38 (1.496)	20 (0.787)	54 (2.126)	104 (4.095)	3	Yes

Cutting Data Recommendations

ISO Code	Material	sfm Cutting Speed v_c	Feed per Tooth f_z at Cutter Diameter d_1		
			.250 - .394	.472 - .630	> .630
N	Aluminum Malleable Alloys	2950	.004	.010	.010
	Aluminum Casting Alloys with < 12%	2000	.004	.006	.001
	Aluminum Casting Alloys with > 12%	820	.004	.006	.010
	Soft Plastic	1500	.006	.008	.012
	Hard Plastic	1000	.005	.007	.010
	Composites	1000	.002	.002	.003

Calculation Formulas

Speed

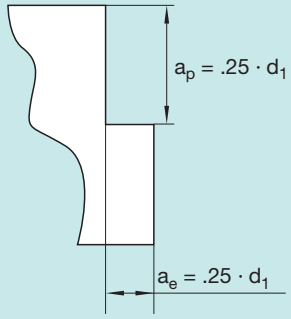
$$n = \frac{v_c \cdot 1000}{\pi \cdot d_1}$$

Feed Rate

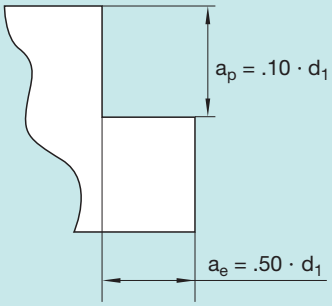
$$v_f = f_z \cdot z \cdot n \cdot f_1$$

a_e = Width of cut in inch
a_p = Depth of cut in inch
d_1 = Cutter diameter in inch
f_1 = Correction factor v_f
f_z = Feed per tooth in inch
n = rpm^{-1}
v_c = Cutting speed in sfm
v_f = Feed rate in ipm
z = No. of flutes

Feed Rate Correction Factor f_1



$f_1 = 1.0$



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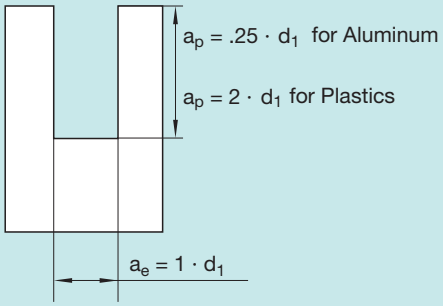


$f_1 = 0.75$

HSC LINE® – Hard Milling Solid Carbide Ballnose End Mills

Products

LMT-Fette's new HSC LINE® of Solid Carbide End Mills are designed exclusively for the demanding high-speed machining market. These new end mills feature a premium sub-micro-grain substrate combined with LMT-Fette's superb AL2 Plus Titanium Aluminum Nitride PVD coating, offering an excellent combination of performance and value.

The new product features standard, metric ballnose end mills from 0.4mm (.016″) to 12mm (.472″) in common sizes. In addition, LMT-Fette's new HSC product also offers many of these items in short, long, and extra long lengths for all of your toughest applications.

Application Area

The new HSC LINE® of products is designed to meet the demands of today's die and mold market. The line is for tool steels up to 60 Rc, austenitic stainless steels, and both grey and nodular iron. Additionally, with its TiAlN coating, this new product performs excellent on demanding aerospace materials, Inconel, Hastelloy, etc. However, the primary application area is in the machining of H13, P20, S7 and all of today's common die and mold workpiece materials.

With the high-speed machining market rapidly growing in the U.S. and Canada, our customers continue to look for vendors that offer a comprehensive product offering, along with products that consistently perform in heat treated steels. Our new HSC LINE® exceeds all of these requirements, offering exceptional performance at a reasonable price.

Materials

Like the TWINCUT Feed, the new HSC LINE® is generally designed for the materials commonly used in the North American die and mold industry, such as H13, P20, etc. These materials typically run in the 28–42 Rc range, with some of the hardened H13 running up in to the low 50 Rc range. Additionally, many of the die and punch manufacturers in North America are machining A2 and D2 Tool Steel at a hardness exceeding 60 Rc. The HSC LINE® is also designed to perform well in these materials at significantly lower cutting speeds.

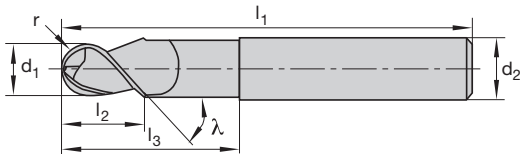
Advantages

The primary advantages of the LMT-Fette's new HSC LINE® lie in the design of the product. This new product, unlike many of our competitors, is designed exclusively to meet the demands of high-speed machining of hardened die and mold steels. The LC620T and LC630T are each optimized for their corresponding cutter family to offer the perfect combination of heat and wear resistance, with excellent edge toughness.

The AL2 Plus coating is a unique PVD TiAlN coating designed to provide the perfect combination of heat resistance and lubricity, adding to the versatility of these products.

Lastly, the geometry of the HSC LINE® is also designed for hardened materials, with rake angles and edge preparations capable of handling the demands put on a tool when machining materials up to 60 Rc.

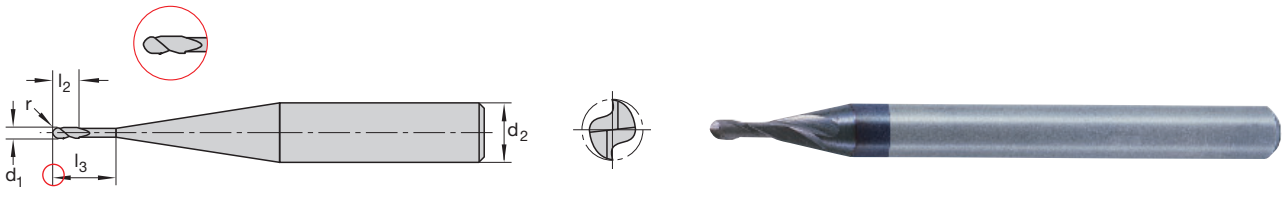
Metric Solid Carbide, Center Cutting, 2 Flute



Style	1412C
Helix Angle	20°
Shank	Straight Shank DIN 6535 HA
Coating	AL Plus (TiAlN) / LC620T

d_1	EDP No.	Dimensions (mm/inches)				z	r
		l_2	1_1	l_3	d_2		
SHORT							
1 (0.039)	53987	1.5 (0.059)	38 (1.496)	2.7 (0.106)	3 (0.118)	2	0.5 (0.020)
2 (0.079)	53988	2 (0.079)	50 (1.969)	3.6 (0.142)	6 (0.236)	2	1 (0.039)
3 (0.118)	53989	3 (0.118)	50 (1.969)	5.5 (0.217)	6 (0.236)	2	1.5 (0.059)
4 (0.157)	53990	4 (0.157)	57 (2.244)	14.5 (0.571)	6 (0.236)	2	2 (0.079)
5 (0.157)	53991	5 (0.157)	57 (2.244)	14.5 (0.571)	6 (0.236)	2	2.5 (0.098)
6 (0.236)	53992	6 (0.236)	57 (2.244)	21 (0.827)	6 (0.236)	2	3 (0.118)
8 (0.315)	53993	8 (0.315)	63 (2.480)	27 (1.063)	8 (0.315)	2	4 (0.157)
10 (0.394)	53994	10 (0.394)	72 (2.830)	32 (1.260)	10 (0.394)	2	5 (0.197)
12 (0.472)	53995	12 (0.472)	83 (3.270)	38 (1.496)	12 (0.472)	2	6 (0.236)
LONG							
2 (0.079)	53996	2 (0.079)	70 (2.756)	17 (0.669)	6 (0.236)	2	1 (0.039)
3 (0.118)	53997	3 (0.118)	70 (2.756)	18 (0.709)	6 (0.236)	2	1.5 (0.059)
4 (0.157)	53998	4 (0.157)	80 (3.150)	19 (0.748)	6 (0.236)	2	2 (0.079)
5 (0.197)	53999	5 (0.197)	80 (3.150)	44 (1.732)	6 (0.236)	2	2.5 (0.098)
6 (0.236)	54000	6 (0.236)	80 (3.150)	44 (1.732)	6 (0.236)	2	3 (0.118)
8 (0.315)	54001	8 (0.315)	90 (3.543)	54 (2.126)	6 (0.236)	2	4 (0.157)
10 (0.394)	54002	10 (0.394)	100 (3.937)	60 (2.362)	10 (0.394)	2	5 (0.197)
12 (0.472)	54003	12 (0.472)	110 (4.331)	65 (2.559)	12 (0.472)	2	6 (0.236)
EXTRA LONG							
2 (0.079)	54004	2 (0.079)	120 (4.724)	17 (0.669)	6 (0.236)	2	1 (0.039)
3 (0.118)	54005	3 (0.118)	120 (4.724)	18 (0.709)	6 (0.236)	2	1.5 (0.059)
4 (0.157)	54006	4 (0.157)	160 (6.299)	19 (0.748)	6 (0.236)	2	2 (0.079)
5 (0.197)	54007	5 (0.197)	160 (6.299)	94 (3.700)	6 (0.236)	2	2.5 (0.098)
6 (0.236)	54008	6 (0.236)	160 (6.299)	94 (3.700)	6 (0.236)	2	3 (0.118)
8 (0.315)	54009	8 (0.315)	160 (6.299)	94 (3.700)	6 (0.236)	2	4 (0.157)
10 (0.394)	54010	10 (0.394)	160 (6.299)	94 (3.700)	10 (0.394)	2	5 (0.197)
12 (0.472)	54011	12 (0.472)	200 (7.874)	114 (4.490)	12 (0.472)	2	6 (0.236)

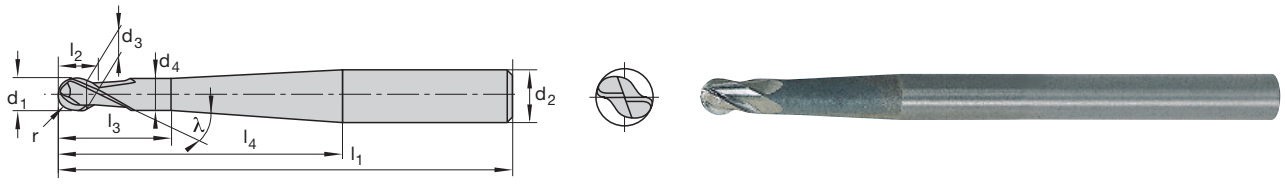
Metric Solid Carbide, Mini, Center Cutting, 2 Flute



Style	1419C
Helix Angle	30°
Shank	Straight Shank DIN 6535 HA
Coating	AL Plus (TiAlN) / LC630T

d_1	EDP No.	Dimensions (mm/inches)				z	r
		l_2	1_1	l_3	d_2		
0.4 (0.0157)	54014	0.8 (0.032)	40 (1.575)	1.3 (0.051)	3 (0.118)	2	0.20 (0.0079)
0.5 (0.0197)	54015	1.0 (0.039)	40 (1.575)	1.5 (0.059)	3 (0.118)	2	0.25 (0.0098)
0.6 (0.0236)	54016	1.2 (0.047)	40 (1.575)	1.7 (0.067)	3 (0.118)	2	0.30 (0.0118)
0.8 (0.0315)	54017	1.6 (0.063)	40 (1.575)	2.1 (0.083)	3 (0.118)	2	0.40 (0.0157)

Metric Solid Carbide, Center Cutting, 2 Flute



Style	1422C
Helix Angle	20°
Shank	Straight Shank DIN 6535 HA
Coating	AL Plus (TiAlN) / LC620T

d_1	EDP No.	Dimensions (mm/inches)							r
		l_2	1_1	l_3	l_4	d_2	d_3	d_4	
4 (0.157)	54018	2.8 (0.110)	80 (3.150)	17.3 (0.681)	44 (1.732)	6 (0.236)	3.6 (0.142)	3.2 (0.126)	2 (0.079)
5 (0.197)	54019	3.6 (0.142)	80 (3.150)	21.1 (0.831)	44 (1.732)	6 (0.236)	4.5 (0.177)	4 (0.157)	2.5 (0.098)
6 (0.236)	54020	4.3 (0.169)	80 (3.150)	26.8 (1.055)	44 (1.732)	6 (0.236)	5.4 (0.213)	4.8 (0.189)	3 (0.118)
8 (0.315)	54021	5.7 (0.224)	90 (3.543)	29.6 (1.165)	54 (2.126)	8 (0.315)	7.3 (0.287)	6.8 (0.268)	4 (0.157)
10 (0.393)	54022	7.1 (0.280)	100 (3.937)	31.4 (1.236)	60 (2.362)	10 (0.394)	9.1 (0.358)	8.5 (0.335)	5 (0.197)
12 (0.472)	54023	8.5 (0.335)	110 (4.330)	36.4 (1.433)	65 (2.260)	12 (0.472)	10.9 (0.429)	10 (0.394)	6 (0.236)

Cutting Data Recommendations

ISO Code	Material	Material Examples	HRC	LC620T/ LC630T Cutting Speed (sfm)	Feed per Tooth (f_z)					
					≤ 1mm	1–2mm	2–4mm	4–6mm	6–10mm	12mm
P	Unalloyed Carbon Steels	A36, 1005–1029 1213, 12L14 1030–1055	< 16	1635 - 1965	.0008	.0012	.0016	.0032	.0040	.0052
	Alloyed Steels	4140, 6150	< 30	1635 - 1965	.0008	.0012	.0016	.0032	.0040	.0052
	Heat Treatable Steel, medium strength	4140, 4340	< 30	1475	.0004	.0005	.0008	.0020	.0032	.0040
	Heat Treatable Steel, high strength		30-42 Rc	1150	.0004	.0008	.0016	.0024	.0032	.0044
	Cast Steel		< 30	1475	.0003	.0004	.0006	.0020	.0032	.0040
	Nitriding Steel	H13	30-42 Rc	985	.0004	.0008	.0016	.0024	.0032	.0044
	Tool Steel	A2, S7, P20	30-42 Rc	820	.0004	.0008	.0016	.0024	.0032	.0044
	Case Hardening Steel	8620, 52100	< 30	1310	.0003	.0004	.0006	.0020	.0032	.0040
	Maraging Steel			785 - 985	.0004	.0012	.0020	.0028	.0036	.0044
M	Stainless Steel, austenitic	304, 316	< 30	785 - 985	.0004	.0012	.0020	.0028	.0036	.0044
K	Grey Cast Iron	Class 30	< 16	1965	.0006	.0018	.0021	.0040	.0048	.0060
	Alloyed Grey Cast Iron		< 20	1635	.0006	.0010	.0022	.0030	.0038	.0048
	Nodular Iron		< 16	1150	.0006	.0010	.0022	.0030	.0038	.0048
	Malleable Cast Iron		< 20	1150	.0006	.0018	.0021	.0040	.0048	.0060
S	Titanium Alloys, medium strength	Ti6Al4V	< 30	600	.0004	.0008	.0016	.0028	.0036	.0044
	Titanium Alloys, high strength		27-44 Rc	400	.0004	.0006	.0014	.0026	.0040	.0048
	Nickel-Based Alloys	Inconel 718, Hastelloy C	27-44 Rc	325 - 490	.0004	.0008	.0016	.0028	.0036	.0044
H	Chilled Cast Iron			655	.0004	.0006	.0008	.0016	.0026	.0032
	Hardened Steel		45-52 Rc	1150	.0008	.0013	.0016	.0023	.0028	.0037
			53-59 Rc	985	.0006	.0010	.0012	.0021	.0027	.0033
			60-65 Rc	655	.0004	.0008	.0009	.0018	.0023	.0032

Application Examples

Machining of Forging Die

Tool
HSC LINE®
Solid Carbide End Mill
#1412C, d_1 = .236″ (6.0mm)

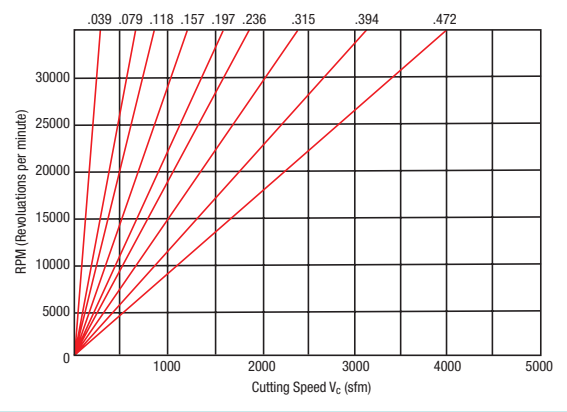
Carbide Grade
LC620T
AL2 Plus (TiAlN)

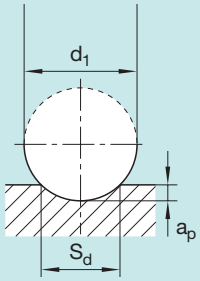
Material
D2 Tool Steel
54 HRC

Cutting Data
dry

v_c (sfm)	=	927
n (rpm)	=	15000
f_z	=	0.005
v_f (ipm)	=	79.6
a_e	=	0.008
a_p	=	0.008

Calculation of Cutting Data*





Ball Nose Solid Carbide End Mill

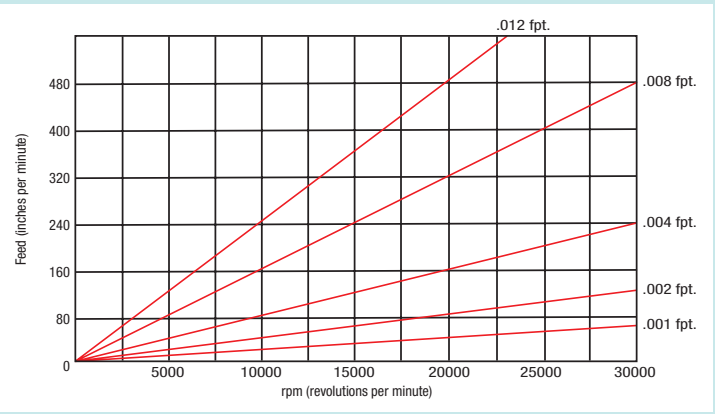
Ball Nose End Mill with depth of cut

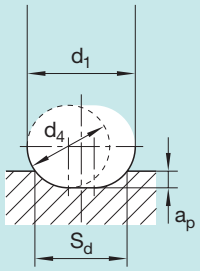
$a_p < 0.5 \cdot d_1$

$$n = \frac{v_c \cdot 1000}{2 \cdot \pi \sqrt{d_1 \cdot a_p - a_p^2}} \quad [min^{-1}]$$

a_p = Depth of cut
S_d = Effective cut diameter
d_1 = Milling Cutter diameter

$$S_d = 2 \cdot \sqrt{d_1 \cdot a_p - a_p^2}$$





Milling Cutter with Corner Radius

Cutter with depth of cut
$a_p < 0.5 \cdot d_4$

$$n = \frac{v_c \cdot 1000}{(d_1 - d_4 + 2 \cdot \sqrt{d_4 \cdot a_p - a_p^2}) \cdot \pi} \quad [min^{-1}]$$

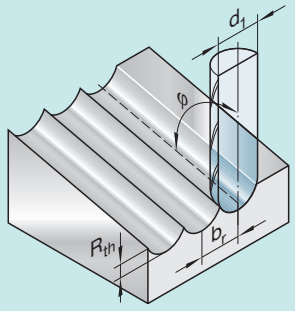
d_4 = 2 · Corner radius

$$S_d = d_1 - d_4 + 2 \cdot \sqrt{d_4 \cdot a_p - a_p^2}$$

z = No. of teeth
f_z = Feed/Tooth
f = Feed/Revolution

*Diagrams are valid
for $a_p \geq 0.5 \cdot d_1$ respectively
$a_p \geq 0.5 \cdot d_4$ otherwise
see formula above

Theoretical Surface Roughness R_{th} for High Speed Cutting

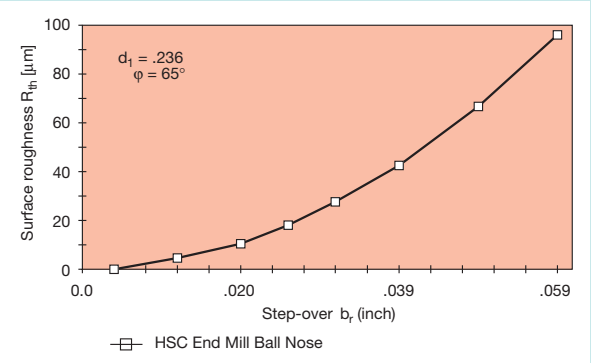


HSC End Mill Ball Nose

$$R_{th} = \frac{d_1}{2} - \sqrt{\frac{d_1^2 - b_r^2}{4}}$$

$$r_a = \frac{r_{th}}{8.7}$$

r = Corner radius
d_1 = Milling Cutter diameter
φ = Milling Cutter setting angle



PL SERIES – Solid Carbide End Mills for Plastics

Products

LMT-Fette is pleased to announce the introduction of our new solid carbide PL SERIES End Mills for plastics. This line of tools is designed to cut both hard and soft plastics leaving superior surface finishes. The unique design allows for high chip loads and therefore high production rates, while leaving superior surface finishes.

Application Area

The single edge PL SERIES End Mills are designed for production roughing and finishing of plastics. Target applications are sheet, stacked sheets, slab cutting, slotting, and nested parts. The series is best in smaller diameter machining applications where good finish is important on the work piece. Machining plastic is easy when using the right tool with the right geometry, applied with the right methods. As a result of the PL SERIES geometry for plastic, there is no melting, chipping, or burrs, keeping productivity high.

And LMT-Fette's super-fine grain grade substrate provides unmatched, economical removal rates on specific plastics (see materials).

Materials

PL SERIES End Mills are designed specifically for the following plastics:

Hard Plastics: acrylic, nylon, PVC, polycarbonate and solid surface

Soft Plastics: HDPE, HIPS, UHMW, ABS, polycarbonate, PE, polystyrene, polypropylene, acetal, acrylic, PET and solid surface (Corian)

Softer plastics can be challenging materials to cut cleanly with a smooth surface finish. The PL SERIES will out-perform all multi-fluted tools when cutting these softer plastics.

Advantages

The primary advantage of the PL SERIES End Mills is their ability to take higher chip loads (faster feed rates) and deeper cuts with smaller diameters. This means you get more work done with smaller diameter tools in less time. Therefore, if getting the job done faster through less machining passes is important, the PL SERIES is the solution.

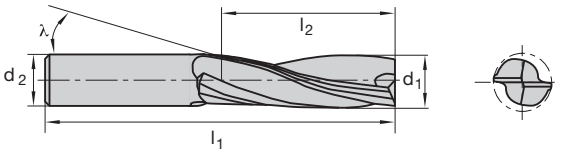
A key feature of the PL SERIES is their extremely sharp edge. The polished flutes and clearance create a razor-sharp edge essential for cutting plastics. The PL SERIES tools start out sharper and last longer in the cut.

Another key feature is getting the heat out in the chip, allowing the tool to run at cooler temperatures. Plastics are very sensitive to heat. Having only a single-flute, the PL SERIES tools cut 180° per revolution generating less heat. The geometry allows larger chips to evacuate through the open flute. Most multi-fluted tools can take large chips, but there is no place for them to go.

Lastly, the PL SERIES exhibits low cutting forces during the cut. The forces are half that of a 2-flute tool and a third of a 3-flute tool. This allows the tools to feed faster and deeper, leading to shorter machining times.

The tools have a 20°+ helix and a wide open flute design for chip flow, making them excellent performers from low to extremely high (60,000+ RPM) spindle speed applications.

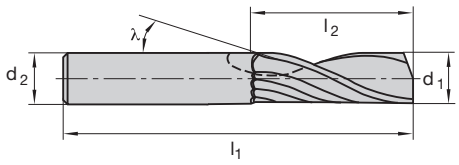
Solid Carbide, Double-Edge, Spiral Upcut O-Flute End Mills



Style	1491
Primary Application	Acrylic and Hard Plastics
Helix Angle	λ = 22°
Straight Shank	Yes
Cutting Materials	LW630

d_1	EDP No.	Dimensions (inches)			No. of Flutes	Helix
		l_2	d_2	l_1		
UNCOATED / LW630						
0.250	55787	1.250	0.250	3.000	2	22°
0.375	55789	1.500	0.375	4.000	2	22°
0.500	55790	1.250	0.500	4.000	2	22°
0.500	55791	1.750	0.500	4.000	2	22°
0.500	55792	2.125	0.500	4.000	2	22°
0.625	55793	1.750	0.625	5.000	2	22°
0.625	55794	2.250	0.625	5.000	2	22°
0.750	55795	2.500	0.750	5.000	2	22°

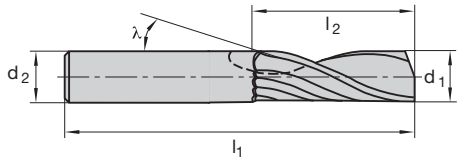
Solid Carbide, Single-Edge, Spiral Upcut O-Flute End Mills for Hard Plastics



Style	1485
Primary Application	Hard Plastics
Helix Angle	λ = 21°
Straight Shank	Yes
Special Features	Polished Flutes
Cutting Materials	LW630

d_1	EDP No.	Dimensions (inches)			No. of Flutes	Helix
		l_2	d_2	l_1		
UNCOATED / LW630						
0.062	55814	0.250	0.125	2.000	1	21°
0.062	55815	0.250	0.250	2.000	1	21°
0.125	55816	0.250	0.125	2.000	1	21°
0.125	55817	0.250	0.250	2.000	1	21°
0.125	55818	0.500	0.125	2.000	1	21°
0.125	55819	0.500	0.250	2.000	1	21°
0.125	55820	0.500	0.250	2.000	1	21°
0.188	55821	0.375	0.188	2.000	1	21°
0.188	55822	0.375	0.250	2.000	1	21°
0.188	55842	0.625	0.188	2.000	1	21°
0.188	55843	0.625	0.250	2.000	1	21°
0.250	55844	0.375	0.250	2.000	1	21°
0.250	55845	0.750	0.250	2.500	1	21°
0.250	55846	0.750	0.250	2.500	1	21°
0.250	55847	1.250	0.250	3.000	1	21°
0.250	55848	1.500	0.250	3.000	1	21°
0.375	55849	0.625	0.375	2.500	1	21°
0.375	55850	0.750	0.375	3.000	1	21°
0.375	55851	1.125	0.375	3.000	1	21°
0.375	55852	1.625	0.375	3.500	1	21°
0.375	55853	1.625	0.375	3.500	1	21°
0.500	55854	1.625	0.500	3.500	1	21°
0.500	55855	1.625	0.500	3.500	1	21°

Solid Carbide, Single-Edge, Spiral Upcut O-Flute End Mills for Soft Plastics



Style	1485S
Primary Application	Soft Plastics
Helix Angle	λ = 21°
Straight Shank	Yes
Special Features	Polished Flutes
Cutting Materials	LW630

d_1	EDP No.	Dimensions (inches) l_2	d_2	l_1	No. of Flutes	Helix
UNCOATED / LW630						
0.062	55856	0.250	0.125	2.000	1	21°
0.062	55857	0.250	0.250	2.000	1	21°
0.125	55858	0.250	0.125	2.000	1	21°
0.125	55859	0.250	0.250	2.000	1	21°
0.125	55860	0.500	0.125	2.000	1	21°
0.125	55861	0.500	0.250	2.000	1	21°
0.125	55862	0.500	0.250	2.000	1	21°
0.188	55863	0.375	0.188	2.000	1	21°
0.188	55864	0.375	0.250	2.000	1	21°
0.188	55865	0.625	0.188	2.000	1	21°
0.188	55866	0.625	0.250	2.000	1	21°
0.250	55867	0.375	0.250	2.000	1	21°
0.250	55868	0.750	0.250	2.500	1	21°
0.250	55869	0.750	0.250	2.500	1	21°
0.250	55870	1.250	0.250	3.000	1	21°
0.250	55871	1.500	0.250	3.000	1	21°
0.375	55872	0.625	0.375	2.500	1	21°
0.375	55873	0.750	0.375	3.000	1	21°
0.375	55874	1.125	0.375	3.000	1	21°
0.375	55875	1.625	0.375	3.500	1	21°
0.375	55876	1.625	0.375	3.500	1	21°
0.500	55877	1.625	0.500	3.500	1	21°
0.500	55878	1.625	0.500	3.500	1	21°

Cutting Data Recommendations

ISO Code	Material	sfm Cutting Speed V_c	Feed per Tooth* f_z at Cutter Diameter d_1			
			.062 - .188	.250 - .375	.500 - .625	.750
N	Soft Plastic	100 - 6000*	.002 - .008	.008 - .012	.012 - .016	.016 - .018
	Hard Plastic	100 - 6000*	.002 - .008	.008 - .012	.012 - .016	.016 - .018

*Please note that the large variation in SFM is as a result of the wide range of tool diameters

Plastic Material Cross-Reference

Material Group	Material	Tensile Strength (N/mm²)	Brand Name
Thermoplastics	Acrylonitrile-butadiene-styrene	38 - 50	Lustran, Novodur, Terluran, Vestodur
	Polypropylene	14 - 40	Hostalen, Novolen, Eltex, Vestolen
	Polyvinyl chloride	8 - 20	Trovidur, Hostalit, Vestolit, Vinoflex, Vinnol
	Polyethylene	22 - 40	Baylon, Sustylen, Hostalem, Lumpolen, Vestolen
	Polycarbonate	65 - 75	Bayfol, Makrolon, Stapron, Lexan, Merlon
	Polystyrene	30 - 60	Bucara, Langolen, Hostyren, Polystyrol
	Acrylonitrile-styrene-acrylate	45 - 65	Polyman, Luran s
	Polymethyl methacrylate	40 - 110	Acryl, Plexiglas, Resartglas, Pegalan
	Polyoxymethylene	24 - 110	Aceton, Hostaform, Latan, Delrin, Ultraform
	Polyamide (nylon)	50 - 120	Ultramid, Akromid, Polyloy, Nylon, Durethan
	Polyethylene terephthalate	90 - 220	Hostaphan, Novatron
	Polybutylene terephthalate	25 - 105	Enduran, Bitan, Celanex
	Polyphenylene ether	55 - 68	Noryl, Vestoran
	Polyaryletherketone	92	Tecapeek, Ultrax
Duroplastics	Polyimide	75 -100	Sintimid, Kapton
	Polyamide-imide	52 - 190	Torlon, Ensinger PAI
	Polyetherimide	105 - 180	Ultern
	Polymethacylimide	88 - 98	Rohacell
	Phenol-formaldehyde (resin)	20 - 25	Delchi, Deltes, Resinol, Trolitan
	Melamine-formaldehyde (resin)	15 - 300	Melmex, Urochem, Melopas, Duropal
	Unsaturated polyester	25 - 40	Durolite, Ampal, Mitras, Tacon, Palatal
	Epoxide	25 - 80	Epikote, Eposite, Epodur, Araldit
Composites	Hard-paper honeycomb profiles		Pertinax, Resocel

AL SERIES – Solid Carbide End Mills for Aluminum

Products

LMT-Fette is pleased to announce the expansion of our high-performance aluminum machining tools with three new product lines to solve tough machining problems.

- The AL-HPM-Line is a high-performance end mill line with corner radii to efficiently machine thin-walled parts from solids. These tools can take heavy chip loads while delivering ultra-smooth finishes.
- The AL-BALL-Line is a 3-flute ball nose tool line designed for efficient high feed profile machining in aluminum die/mold making applications.
- The AL-O-Line is a single-flute end mill line that cuts both hard and soft aluminum, with or without coolant, allowing very high chip-loads and deep cuts common in nesting and stacking of sheet parts.

Application Area

The AL-HPM-Line is designed for the extremes of high speeds and feeds with low chatter, resulting in highly smooth surface finishes. A common application is block aluminum machining through either high speed machining (HSM) methods or high feed machining where the chip loads and depths of cut are higher. Corner radii provide smooth bottom finishes. The special double-flute face helps to eject the chips at high feed rates eliminating chips from being re-cut or re-welded on to the finished parts.

The AL-BALL-Line is designed for high production profiling. The uniquely designed point has more flutes for roughing in deeper cuts. Near the point, the tool is effectively a single-flute, generating less heat, reducing burning or melting when finishing. This makes the AL-BALL a roughing and finishing tool in one, and can save significant time in die/mold prototyping.

The AL-O-Line is designed for production roughing and finishing of non-ferrous alloys such as aluminum, magnesium, brass, etc. The unique “O”-shaped flute geometry allows chips to flow through the center of the tool, ejecting out the other side. The flutes are polished, minimizing friction and build-up. The dead-sharp edge is created with high rake and clearance combined with a low helix, resulting in lower cutting forces. The lower cutting forces allows for faster feeds and less deflection during the cut. This is a perfect tool when the diameter-to-length ratio is over 1:2, in applications such as sheet, stacked sheets, slab cutting, slotting, and nested.

Materials

The new LMT high-performance aluminum lines are designed specifically for machining aluminum alloys used in aircraft industries such as 2024-O, 2024-T3, 6061-O, 6061-T6, 7075-O, 7075-T6.

Softer aluminums are one of the most challenging materials to cut. The AL-O-Line will out perform all multi-fluted tools cutting architectural aluminum alloys. While the tools will cut soft aluminum without coolant, use of coolant in softer materials will greatly extend tool life in architectural materials such as 3003-H and 5052-H series.

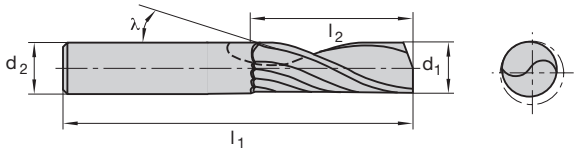
The new LMT high-performance aluminum end mills also excel in other non-ferrous materials such as brass, magnesium, and copper alloys.

Advantages

The primary advantage of the new LMT high-performance aluminum tools is their ability to take higher chip loads and deeper cuts with smaller diameters. The tools are very quiet in the cut, having a large sweet-spot range. This means you get more work done with smaller diameter tools in less time. For example, the single-edge AL-O-Line tools allow faster feeds while taking deeper cuts, resulting in less machine passes and faster overall slotting operations.

A key feature of all of the new LMT high-performance aluminum tools is the ability to get the heat out in the chip, allowing the tools to run at a cooler temperature. Using a tool with the least number of flutes necessary to get the job done is normally the best solution. For example, a single-flute tool cutting 180° per revolution generates less heat. By design, a single-flute tool allows larger chips to evacuate through the wide open flute area. Most multi-fluted tools can take large chips but there is no place for the chips to go with small flute openings.

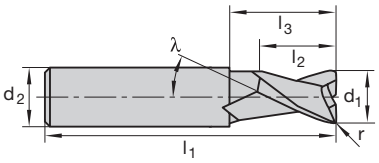
Solid Carbide, Single-Edge, Spiral Upcut O-Flute End Mills for Aluminum



Style	1482
Primary Application	Aluminum Sheets and Non-Ferrous Materials
Helix Angle	λ = 22°
Straight Shank	Yes
Cutting Materials	LW630

d_1	EDP No.	Dimensions (inches)				No. of Flutes	Helix
		l_2	d_2	l_3	l_1		
UNCOATED / LW630							
0.062	55796	0.250	0.125	0.250	1.500	1	22°
0.094	55797	0.250	0.125	0.250	2.000	1	22°
0.125	55798	0.250	0.125	0.250	1.500	1	22°
0.125	55799	0.250	0.250	0.250	2.000	1	22°
0.125	55800	0.500	0.250	0.500	2.000	1	22°
0.188	55801	0.375	0.188	0.375	1.500	1	22°
0.188	55802	0.375	0.250	0.375	2.000	1	22°
0.188	55803	0.625	0.250	0.625	2.000	1	22°
0.250	55804	0.375	0.250	0.375	2.000	1	22°
0.250	55805	0.750	0.250	0.750	2.500	1	22°
0.250	55806	1.250	0.250	1.250	3.000	1	22°
0.312	55807	0.562	0.312	0.562	2.500	1	22°
0.312	55808	0.750	0.312	0.750	3.000	1	22°
0.375	55809	0.750	0.375	0.750	3.000	1	22°
0.375	55810	1.125	0.375	1.125	3.000	1	22°
0.375	55811	1.375	0.375	1.375	3.000	1	22°
0.500	55812	1.625	0.500	1.625	3.500	1	22°
0.500	55813	1.375	0.500	1.375	3.500	1	22°

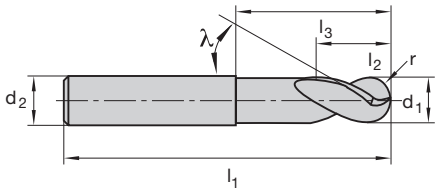
Solid Carbide, High Performance End Mills for Aluminum



Style	1485
Primary Application	Aluminum and Non-Ferrous Materials
Helix Angle	λ = 40°
Straight Shank	Yes
Cutting Materials	LW630

d_1	EDP No.	Dimensions (inches)				Corner Radius	No. of Flutes	Helix
		l_2	d_2	l_3	l_1			
UNCOATED / LW630								
0.125	55879	0.250	0.125	0.500	2.000	0.002	2	40°
0.125	55880	0.250	0.250	0.250	2.000	0.005	2	40°
0.188	55881	0.375	0.188	0.875	2.000	0.002	2	40°
0.188	55882	0.375	0.188	0.875	2.000	0.008	2	40°
0.250	55883	0.375	0.250	1.125	2.500	0.002	2	40°
0.250	52917	0.375	0.250	1.125	2.500	0.020	2	40°
0.312	55884	0.500	0.312	1.125	2.500	0.020	2	40°
0.375	55885	0.500	0.375	1.125	2.500	0.002	2	40°
0.375	55886	0.500	0.375	1.125	2.500	0.020	2	40°
0.375	55887	0.750	0.375	–	3.000	0.020	2	40°
0.375	55888	0.500	0.375	2.125	4.000	0.020	2	40°
0.500	55889	0.750	0.500	1.500	3.000	0.002	2	40°
0.500	52918	0.625	0.500	1.375	3.000	0.020	2	40°
0.500	55891	0.750	0.500	1.500	3.000	0.020	2	40°
0.500	55892	0.625	0.500	2.125	4.000	0.020	2	40°
0.500	55900	0.625	0.500	3.125	5.000	0.020	2	40°
0.625	55893	0.750	0.625	1.625	3.500	0.002	2	40°
0.625	55006	0.750	0.625	1.625	3.500	0.020	2	40°
0.750	55894	1.250	0.750	2.000	4.000	0.002	2	40°
0.750	55895	1.000	0.750	1.625	4.000	0.020	2	40°
0.750	55896	1.000	0.750	2.500	6.000	0.020	2	40°
0.750	55897	1.250	0.750	2.000	4.000	0.020	2	40°
1.000	55898	1.500	1.000	3.125	5.000	0.002	2	40°
1.000	55899	1.500	1.000	3.125	5.000	0.020	2	40°

Solid Carbide, High Performance Ball Nose End Mills for Aluminum



Style	1482
Primary Application	Aluminum and Non-Ferrous Materials
Helix Angle	λ = 45°
Straight Shank	Yes
Cutting Materials	LW630

d_1	EDP No.	Dimensions (inches)				No. of Flutes	Helix
		l_2	d_2	l_3	l_1		
UNCOATED / LW630							
0.250	55903	0.375	0.250	0.375	2.500	3	45
0.250	55904	0.375	0.250	2.125	4.000	3	45
0.375	55905	0.500	0.375	0.375	3.000	3	45
0.375	54211	0.500	0.375	2.125	4.000	3	45
0.500	54906	0.625	0.500	0.500	3.000	3	45
0.500	54907	0.625	0.500	2.125	4.000	3	45
0.500	54908	0.625	0.500	4.125	6.000	3	45
0.750	53577	1.000	0.750	0.750	4.000	3	45
0.750	55909	1.000	0.750	4.125	6.000	3	45

Cutting Data Recommendations

ISO Code	Material	sfm Cutting Speed v_c	Feed per Tooth* f_z at Cutter Diameter d_1			
			.062 - .188	.250 - .375	.500 - .625	.750
N	Aluminum Malleable Alloys	2950	.002 - .006	.002 - .010	.003 - .015	.005 - .020
	Aluminum Casting Alloys with, <12% Si	2000	.002 - .006	.002 - .010	.003 - .015	.005 - .020
	Aluminum Casting Alloys with, >12% Si	800	.002 - .006	.002 - .010	.003 - .015	.005 - .020

*Please note that the recommended chip loads are based on 1 x D. For depths of 2 x D reduce the chip load by 25% and for 3 x D, please reduce your chip load by 50%

NEW POINT-BLANK™ Expansion – Additional Holder Program

Products

The overwhelming response to LMT-Fette's POINT-BLANK™ turning system has created the need to further expand the program. This program now includes popular Swiss-style OD turning holders and common boring bars.

This patented holder allows for the coolant to be put exactly where it is needed, on the cutting edge. This alone has a significant impact on chip control, tool life, and work piece surface finish.

With our patented POINT-BLANK™ design, the coolant is directed to the cutting edge by way of our patented top plate or coolant nozzle design. There no longer is the worry of coolant lines being moved by stringy chips or high-coolant pressure. You will always have directional control of your coolant, and have it right where it is needed, on the cutting edge.

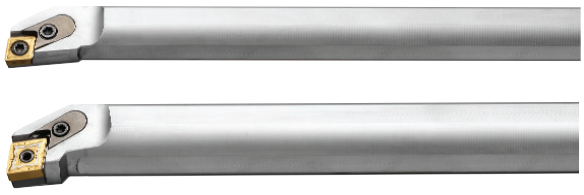
Application Area

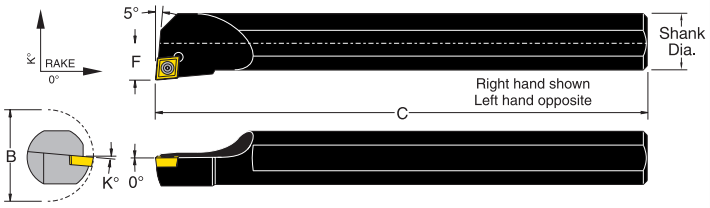
The POINT-BLANK™ tool holder is designed for use in all rough or finish turning applications. Where any standard turning holder is being used, the POINT-BLANK™ tool holder can be used. There is no longer the worry of where the coolant is hitting the insert. The versatile design of the POINT-BLANK™ tool holder allows maximum coolant volume and pressure to be put directly on the cutting edge. With standard coolant pumps, increased coolant velocity can be obtained to help with tool life and chip control.

Advantages

The primary advantage of POINT-BLANK™ tool holder concept is its ability to run LMT-Fette's turning inserts at higher speeds and feeds because of the security and velocity of the coolant flow. Additionally, all the dimensions are the same as standard tool holders so the machine programs do not have to be changed. The coolant-through capability allows for excellent tool life, as well as tremendous chip evacuation. The increased coolant velocity keeps the chips from adhering to the cutting edge and reduces the temperature at the cutting edge via increased lubricity, even while cutting at higher cutting speeds. Lastly, the POINT-BLANK™ tool holder can be used with all standard LMT-Fette turning inserts, as well as any ANSI or ISO standard turning insert.

POINT-BLANK™ Direct Flow Boring Bars – For Inserts CCMT and CNMG

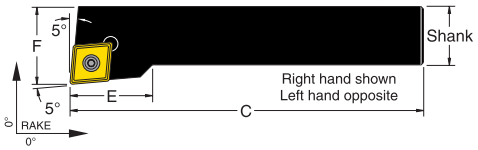




Description	EDP No.	Insert	Shank Dia.	Min. Bore	C	F	K°	Seat	Lock Pin	Clamp	Clamp Screw	Seat Screw	Insert Screw	Torx Driver
Screw Lock Positive														
A08M SCLCR-2 DFC	56590	CCMT 2(1.5)_	0.500	0.625	6.000	0.312	8°						30861	36307
A12S SCLCR-3 DFC	55710	CCMT 3(2.5)_	0.750	1.000	10.000	0.500	5°						30864	36315
A16T SCLCR-3 DFC	55711	CCMT 3(2.5)_	1.000	1.200	12.000	0.640	4°							
Multiple Lock Negative Holders														
A16T MCLNR-4 DFC	55709	CNMG 43_	1.000	1.200	12.000	0.640	14°	ICSN-433	NL-44	CL-20	XNS-47	S-16		
A20U MCLNR-4 DFC	55741	CNMG 43_	1.250	1.470	14.000	0.765	14°		NL-46					
A24U MCLNR-4 DFC	56585	CNMG 43_	1.500	1.760	14.000	0.890	12°							
A32U MCLNR-4 DFC	56586	CNMG 43_	2.000	2.400	16.000	1.281	12°							
A32U MCLNR-6 DFC	56587	CNMG 64_	2.000	2.400	16.000	1.281	12°	ICSN-633	NL-68	CL-12	XNS-510	S-68		

For Turning Inserts, please refer to our Turning Catalog, pages 18–47.

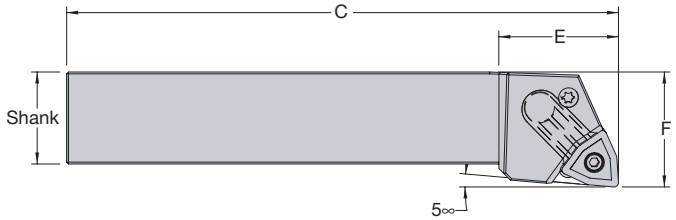
POINT-BLANK™ Direct Flow Screw Lock Positive Holders (Swiss Type) – For Inserts CCMT, DCMT, VCMT



Description	EDP No.	Shank Width	Shank Height	C	E	F	Shape Insert	Insert Screw	Nozzle Screw
SCACR 08-3D DFC	55689	0.500	0.500	6.0	0.625	0.500	CCMT 3(2.5)_	55823	59778
SCACR 10-3D DFC	55691	0.625	0.625	6.0	0.500	0.625			
SCACR 12-3D DFC	55693	0.750	0.750	6.0	0.625	1.000			
SDJCR 08-3D DFC	55695	0.500	0.500	6.0	0.880	0.625	DCMT 3(2.5)_		
SDJCR 10-3D DFC	55697	0.625	0.625	6.0	0.880	0.750			
SDJCR 12-3D DFC	55699	0.750	0.750	6.0	0.880	1.000			
SVJBR 08-3D DFC	55701	0.500	0.500	6.0	0.880	0.625	VCMT 33_		
SVJBR 10-3D DFC	55703	0.625	0.625	6.0	0.880	0.750			
SVJBR 12-3D DFC	55705	0.750	0.750	6.0	1.380	1.000			
SVJCR 08-3D DFC	56439	0.500	0.500	6.0	0.880	0.625	VCMT 33_		
SVJCR 10-3D DFC	56441	0.625	0.625	6.0	0.880	0.750			
SVJCR 12-3D DFC	56443	0.750	0.750	6.0	1.380	1.000			

For Turning Inserts, please refer to our Turning Catalog, pages 18–47.

POINT-BLANK™ Direct Flow Negative Turning Holders



Left hand view shown

Description	EDP No. Right Hand	EDP No. Left Hand	Shank Width	Shank Height	C	E	F	Shape Insert	Seat	Lock Pin	Pin Wrench	Lock Nozzle Screw
MCLNR/L 12-4B DFC	53664	53662	0.75	0.75	4.50	1.25	1.00	CNM_ 43	ICSN 432	NL 46	54151	TS35.6-9M1
MCLNR/L 16-4D DFC	53665	53663	1.00	1.00	6.00	1.25	1.25	CNM_ 43	ICSN 432	NL 46	54151	TS35.6-9M1
MDJNR/L 12-3B DFC	53669	53666	0.75	0.75	4.50	1.25	1.00	DNM_ 33	IDSN 322	NL 34L	54152	TS35.6-9M1
MDJNR/L 12-4B DFC	53670	53667	0.75	0.75	4.50	1.25	1.00	DNM_ 43	IDSN 433	NL 46	54151	TS35.6-9M1
MDJNR/L 16-4D DFC	53671	53668	1.00	1.00	6.00	1.25	1.25	DNM_ 43	IDSN 433	NL 46	54151	TS35.6-9M1
MTJNR/L 12-3B DFC	53675	53672	0.75	0.75	4.50	1.25	1.00	TNM_ 33	ITSN 332	NL 34L	54152	TS35.6-9M1
MTJNR/L 16-3D DFC	53676	53673	1.00	1.00	6.00	1.25	1.25	TNM_ 33	ITSN 332	NL 34L	54152	TS35.6-9M1
MTJNR/L 16-4D DFC	53677	53674	1.00	1.00	6.00	1.25	1.25	TNM_ 43	ITSN 433	NL 46	54151	TS35.6-9M1
MVJNR/L 12-3B DFC	53681	53678	0.75	0.75	4.50	1.25	1.00	VNM_ 32	IVNS 322	NL 34L	54152	TS35.6-9M1
MVJNR/L 16-3D DFC	53682	53680	1.00	1.00	6.00	1.25	1.25	VNM_ 33	IVSN 322	NL 34L	54152	TS35.6-9M1
MWLNR/L 12-3B DFC	53686	53683	0.75	0.75	4.50	1.25	1.00	WNM_ 33	IWSN 322	NL 34L	54152	TS35.6-9M1
MWLNR/L 12-4B DFC	53687	53684	0.75	0.75	4.50	1.25	1.00	WNM_ 43	IWSN 432	NL 46	54151	TS35.6-9M1
MWLNR/L 16-3D DFC	55516	55517	1.00	1.00	6.00	1.25	1.25	WNM_ 33	IWSN 322	NL 34L	54152	TS35.6-9M1
MWLNR/L 16-4D DFC	53688	53685	1.00	1.00	6.00	1.25	1.25	WNM_ 43	IWSN 433	NL 46	54151	TS35.6-9M1
MCLNR/L 20-5D DFC	54995	55963	1.25	1.25	6.00	1.38	1.50	CNM_ 54	ICSN 533	NL 58		TS35.6-9M1
MCLNR/L 24-6D DFC	55008	55979	1.50	1.50	7.00	1.50	2.00	CNM_ 64	ICSN 633	NL 68		TS35.6-9M1

For turning inserts, please refer to our Turning Catalog, pages 18–47.

POINT-BLANK™ Direct Flow Positive Turning Holders

Description	EDP No. Right Hand	EDP No. Left Hand	Shank Width	Shank Height	C	E	F	Shape Insert	Shim No.	Shim Filler Screw	Insert Screw	Lock Nozzle Screw
SCLCR/L 12-3B DFC	55494	10577	0.750	0.750	4.5	0.690	1.000	CCMT 3(2.5)_	55799	55825	55823	TS35.6-9M1
SCLCR/L 16-3D DFC	10580	10581	1.000	1.000	6.0	0.690	1.250	CCMT 3(2.5)_	55799	55825	55823	TS35.6-9M1
SDJCR/L 12-3B DFC	10584	10585	0.750	0.750	4.5	1.000	1.000	DCMT 3(2.5)_	55826	55825	55823	TS35.6-9M1
SDJCR/L 16-3D DFC	10882	10883	1.000	1.000	6.0	1.000	1.000	DCMT 3(2.5)_	55826	55825	55823	TS35.6-9M1
SVJCR/L 12-3B DFC	10886	10887	0.750	0.750	4.5	1.250	1.000	VCMT 33_	55827	55825	55823	TS35.6-9M1
SVJCR/L 16-3D DFC	10890	10891	1.000	1.000	6.0	1.250	1.250	VCMT 33_	55827	55825	55823	TS35.6-9M1

Clean Coolant Is Essential

- 200–300 PSI is recommended with standard machine pumps.
- A coolant volume of 8–10 gallons per minute is recommended. This is with a standard coolant pump without high pressure.
- The above calculations are estimated using the standard coolant pumps on CNC lathes.
- Coolant must be kept clean. Coolant should be filtered to 5–20 microns if possible and at least 5–6% concentricity using a refractometer.
- Maximum recommended PSI — 1000 PSI

POINT-BLANK™ Coolant Set Up Instructions

- Insert 1/8″ NPT fitting into toolholder bottom.
- Insert 8″ length of Loc Line Hose (14 Segments) into the 1/8″ NPT fitting. Between 1/4″ NPT fitting and hose, insert double socket fitting.
- Insert 1/4″ NPT fitting into machine turret. If the turret has an eye ball coolant nozzle, take out eye ball and remove 1/4″ NPT fitting. The end of the double socket can be inserted directly in turret and tightened down.
- If your machine turret has metric threads, screw in the 1/4″ NPT fitting. It will tighten down without damaging the thread in the turret.
- Any other questions please contact your LMT sales representative.

Loc Line Replacement Parts

EDP No.	Description	Qty.
54055	1/8″ NPT Fitting	1
54057	8″ Hose (14 segments)	1
54054	1/4″ NPT Fitting	1
54056	Double Socket	1
54058	Wrench for Fittings	1

Recommended Loc Line ID: 1/4″

Top Plate Coolant Nozzle

EDP No.			
Right Hand	Left Hand	Description	Shape Insert
53690	53689	MCLNR/L 12-4B TP	CNM_43
53692	53691	MCLNR/L 16-4B TP	CNM_43
53694	53693	MDJNR/L 12-3B TP	DNM_32
53696	53695	MDJNR/L 12-4B TP	DNM_43
53698	53697	MDJNR/L 16-4D TP	DNM_43
53701	53700	MTJNR/L 12-3B TP	TNM_32
53703	53702	MTJNR/L 16-4B TP	TNM_43
53705	53704	MVJNR/L 12-3B TP	VNM_33
53707	53706	MVJNR/L 16-3B TP	VNM_33
53709	53708	MWLNR/L 12-4B TP	WNM_43
53711	53710	MWLNR/L 16-4B TP	WNM_43

NEW ALUTEC LC600A – The New Revolution in Aluminum Turning

Products

LMT-Fette is pleased to announce the introduction of a new diamond film coating, ALUTEC LC600A. This new grade features a tungsten carbide substrate engineered for toughness and wear resistance, and a PCD diamond film hard coating up to 10,000 Hardness Vickers. The new product will revolutionize rough and finish turning applications.

Application Area

With an excellent balance of carbide substrate toughness, and highly wear resistant diamond coating, LC600A is excellent for turning of cast aluminum alloys. LC600A combined with our BAL (Boehlerit Aluminum) geometry provides optimum chip control and tool life in aluminum alloys with either low or high silicon content. The new PCD diamond-coating technology of LC600A makes it possible to run at slower sfm ranges from 650 to extremely high ranges over 9,800, providing the wide range of sfm needed when machining automotive products such as cast aluminum wheels.

Materials

As stated above, LC600A's primary application use is in machining of cast aluminum automotive products. Its performance is unmatched by the PCD coating technology. The nano crystalline and microcrystalline layering process in LC600A inserts provides an excellent hard coat surface needed for tool life and improved finishes. Boehlerit offers the BAL chip breaker geometry in ISO style inserts more cutting edges than conventional brazed tipped cutting edge inserts.

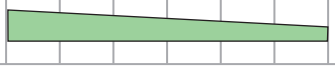
Advantages

Combining the toughness of tungsten carbide and the wear resistance of PCD, LMT-Fette's LC600A insert grade is a new generation of diamond film coating produced to compete with conventional brazed PCD tipped inserts for machining of aluminum alloys. This new product offers five to ten times the tool life achieved by conventional tungsten carbide inserts. LMT-Fette offers its exclusive BAL geometry designed specifically for short and long chipping aluminum, materials providing optimum chip control compared to brazed PCD flat top style non-chip breaker inserts.

Indexable Inserts

	EDP No.	ANSI Designation	ISO Designation	l edge length	d I/C	s thickness	d_1 hole size	r radius
CCGT_ _ _ -BAL 	13121	CCGT 431-BAL	CCGT 120404-BAL	0.500	0.500	0.187	0.217	0.016
	13122	CCGT 432-BAL	CCGT 120408-BAL	0.500	0.500	0.187	0.217	0.031
DCGT _ _ _ -BAL 	13123	DCGT 3 (2.5) 1-BAL	DCGT 11T304-BAL	0.457	0.375	0.156	0.173	0.016
	13124	DCGT 3 (2.5) 2-BAL	DCGT 11T308-BAL	0.457	0.375	0.156	0.173	0.031
RCGT _ _ _ -BAL 	13125	RCGT 0803-BAL	RCGT 0803-BAL		0.315	0.125	0.134	
	13126	RCGT 1003-BAL	RCGT 1003-BAL		0.394	0.125	0.157	
TCGT _ _ _-BAL 	13127	TCGT 2 (1.5) 1-BAL	TCGT 110204-BAL	0.433	0.250	0.094	0.110	0.016
VCGT_ _ _ -BAL 	13128	VCGT 331-BAL	VCGT 160404-BAL	0.654	0.375	0.187	0.173	0.016
	13129	VCGT 332-BAL	VCGT 160408-BAL	0.654	0.375	0.187	0.173	0.031
	13130	VCGT 333-BAL	VCGT 160412-BAL	0.654	0.375	0.187	0.173	0.046
	13131	VCGT 4 (3.5) (8)-BAL	VCGT 220530-BAL	0.870	0.500	0.219	0.217	0.118
VPGT_ _ _-BAL 	13132	VPGT 4 (3.5) (4)-BAL	VCGT 220516-BAL	0.870	0.500	0.219	0.217	0.062
WCGT_ _ _-BAL 	13133	WCGT 431-BAL	WCGT 080404-BAL	0.339	0.500	0.187	0.217	0.016
	13134	WCGT 432-BAL	WCGT 080408-BAL	0.339	0.500	0.187	0.217	0.031

Grade Overview

Grade	ISO	Range of Applications (01 05 10 15 20 25 30 35 40 45 50)	P Steel	M Stainless	K Gray cast iron	N Nonferrous materials	S High temperature materials	H Hard materials
LC600A	HC-K0 to K25					■		

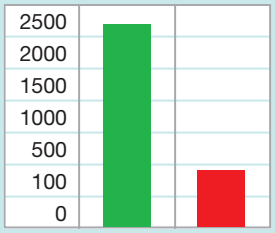
Cutting Data Recommendations

ISO Code	Material	Material Examples	Rockwell C	FPR / SFM .004 - .020
N	Pure Metals, soft	Pure Iron, Lead	< 20	750 -10000
	Aluminum Alloys, long chipping	6061, 7050	< 20	
	Aluminum Alloys, short chipping	A356, 4218	< 20	

Application Examples

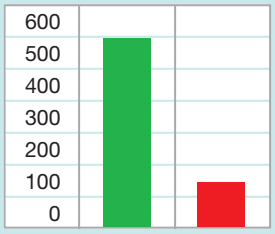
Application: Inside Profiling
Workpiece: 14″ diameter Rim
Material: 6061-T6 Alum.
Insert / Grade: VCGT 160412-BAL LC600A
Cutting Data: 750 - 9500 SFM
.080″ - .160″ DOC
.010″ - .020″ FPR
Coolant: Minimum quantity lubricant

Result:
A 24 fold increase in toollife



Application: Inside Profiling
Workpiece: 16″ x 6.5″ diameter Rim
Material: 6061-T6 Alum.
Insert / Grade: VCGT 160412-BAL LC600A
Cutting Data: 750 - 9500 SFM
.080″ - .160″ DOC
.010″ - .020″ FPR
Coolant: Full flood coolant

Result:
A 6 fold increase in toollife



NEW CASTEC® LC620H – Cast Iron Turning Grade

Products

LMT-Fette is pleased to introduce our new CASTEC® LC620H turning grade for ductile irons, malleable irons, and grey iron materials. Cast iron materials vary greatly in the composition of the alloy. They also vary in the cool down times, have different fluctuating physical properties, and are produced by various casting methods. These materials are best machined by means of indexable inserts made from carbide. LC620H provides K20 substrate carbide that is gradient-sintered to provide excellent edge toughness. LC620H is a multi-layer MT-coated grade featuring TiN, TiCN, and Al_2O_3 for excellent heat- and wear-resistance.

Application Area

CASTEC® LC620H turning grade is designed with a special, ceramic layered coating and is highly resistant to crater wear in abrasive cast iron materials. The main problem with cast iron is the heat that is generated during machining, not chip breaking. This grade reduces the friction during machining so that less heat is generated, making dry machining possible from an economic point of view.

Materials

In the development of the CASTEC® LC620H, the focus was on a tough, carbide substrate covered with a fine, extremely wear-resistant MT-CVD layer coating. CASTEC® LC620H turning grade is a universal turning grade for all cast iron materials such as ductile, malleable, and grey iron.

Advantages

The primary advantage of the new LC620H is its ability to handle a wide range of cast iron materials. In difficult turning operations such as high abrasive materials, LC620H provides the ultimate crater wear-resistance and tool life. The new CASTEC® LC620H adds more flexibility with a wide range of ISO/ANSI indexable inserts. They allow more productivity by increased performance, tool life and reduced overall production costs.

Indexable Inserts

	EDP No.	ANSI Designation	ISO Designation	l edge length	d I/C	s thickness	d_1 hole size	r radius
	13135	CCMT 3 (2.5) 1-BSM	CCMT 09T304-BSM	0.382	0.375	0.156	0.173	0.016
	13136	CCMT3 (2.5) 2-BSM	CCMT 09T308-BSM	0.382	0.375	0.156	0.173	0.031
	13137	CCMT 432-BSM	CCMT 120408-BSM	0.508	0.500	0.187	0.217	0.031
	13138	CCMT 433-BSM	CCMT 120412-BSM	0.508	0.500	0.187	0.217	0.047
	13139	CNMA 432	CNMA 120408	0.508	0.500	0.187	0.217	0.031
	13140	CNMA 433	CNMA 120412	0.508	0.500	0.187	0.217	0.047
	13141	CNMA 434	CNMA 120416	0.508	0.500	0.187	0.217	0.062
	13142	CNMG 432-BM	CNMG 120408-BM	0.508	0.500	0.187	0.217	0.031
	13143	CNMG 433-BM	CNMG 120412-BM	0.508	0.500	0.187	0.217	0.047
	13144	CNMG 432-BMR	CNMG 120408-BMR	0.508	0.500	0.187	0.217	0.031
	13145	CNMG 433-BMR	CNMG 120412-BMR	0.508	0.500	0.187	0.217	0.047
	13146	CNMG 434-BMR	CNMG 120416-BMR	0.508	0.500	0.187	0.217	0.062
	13147	CNMG 543-BMR	CNMG 160612-BMR	0.508	0.500	0.187	0.217	0.047
	13148	CNMG 544-BMR	CNMG 160616-BMR	0.508	0.500	0.187	0.217	0.062
	13149	DCMT 3 (2.5) 1-BSM	DCMT 11T304-BSM	0.457	0.375	0.156	0.173	0.016
	13150	DCMT 3 (2.5) 2-BSM	DCMT 11T308-BSM	0.457	0.375	0.156	0.173	0.031
	13151	DNMA 432	DNMA 150408	0.610	0.500	0.187	0.203	0.031
	13152	DNMA 433	DNMA 150412	0.610	0.500	0.187	0.203	0.047
	13153	DNMA 442	DNMA 150608	0.610	0.500	0.250	0.203	0.031
	13154	DNMA 443	DNMA 150612	0.610	0.500	0.250	0.203	0.047
	13155	DNMG 432-BMR	DNMG 150408-BMR	0.610	0.500	0.187	0.203	0.031
	13156	DNMG 433-BMR	DNMG 150412-BMR	0.610	0.500	0.187	0.203	0.047
	13157	DNMG 434-BMR	DNMG 150416-BMR	0.610	0.500	0.187	0.203	0.062
	13158	DNMG 442-BMR	DNMG 150608-BMR	0.610	0.500	0.250	0.203	0.031
	13159	DNMG 443-BMR	DNMG 150612-BMR	0.610	0.500	0.250	0.203	0.047
	13160	DNMG 444-BMR	DNMG 150616-BMR	0.610	0.500	0.250	0.203	0.062
	13161	SCMT 432-BSM	SCMT 120408-BSM	0.500	0.500	0.187	0.217	0.031
	13162	SCMT 433-BSM	SCMT 120412-BSM	0.500	0.500	0.187	0.217	0.047
	13163	SNMA 432	SNMA 120408	0.500	0.500	0.187	0.217	0.031
	13164	SNMA 433	SNMA 120412	0.500	0.500	0.187	0.217	0.047
	13165	SNMA 434	SNMA 120416	0.500	0.500	0.187	0.217	0.062
	13166	SNMA 443	SNMA 150612	0.625	0.625	0.250	0.217	0.047
	13167	SNMA 444	SNMA 150616	0.625	0.625	0.250	0.217	0.062
	13168	SNMG 432-BM	SNMG 120408-BM	0.500	0.500	0.187	0.203	0.031
	13169	SNMG 433-BM	SNMG 120412-BM	0.500	0.500	0.187	0.203	0.047
	13170	SNMG 432-BMR	SNMG 120408-BMR	0.500	0.500	0.187	0.203	0.031
	13171	SNMG 433-BMR	SNMG 120412-BMR	0.500	0.500	0.187	0.203	0.047

Indexable Inserts

	EDP No.	ANSI Designation	ISO Designation	l edge length	d I/C	s thickness	d_1 hole size	r radius
	13172	TNMA 332	TNMA 160408	0.650	0.375	0.187	0.150	0.031
	13173	TNMA 333	TNMA 160412	0.650	0.375	0.187	0.150	0.047
	13174	TNMA 334	TNMA 160416	0.650	0.375	0.187	0.150	0.062
	13175	TNMA 433	TNMA 220412	0.866	0.500	0.187	0.203	0.047
	13176	TNMA 434	TNMA 220416	0.866	0.500	0.187	0.203	0.062
	13177	TNMG 332-BM	TNMG 160408-BM	0.650	0.375	0.187	0.150	0.031
	13178	TNMG 333-BM	TNMG 160412-BM	0.650	0.375	0.187	0.150	0.047
	13179	TNMG 332-BMR	TNMG 160408-BMR	0.650	0.375	0.187	0.150	0.031
	13180	TNMG 333-BMR	TNMG 160412-BMR	0.650	0.375	0.187	0.150	0.047
	13181	TNMG 433-BMR	TNMG 220412-BMR	0.866	0.500	0.187	0.203	0.047
	13182	TNMG 434-BMR	TNMG 220416-BMR	0.866	0.500	0.187	0.203	0.062
	13183	WNMA 432	WNMA 080408	0.339	0.500	0.187	0.203	0.031
	13184	WNMA 433	WNMA 080412	0.339	0.500	0.187	0.203	0.047
	13185	WNMA 434	WNMA 080416	0.339	0.500	0.187	0.203	0.062
	13186	WNMG 332-BM	WNMG 060408-BM	0.256	0.375	0.187	0.150	0.031
	13187	WNMG 333-BM	WNMG 060412-BM	0.256	0.375	0.187	0.150	0.047
	13188	WNMG 432-BMR	WNMG 080408-BMR	0.339	0.500	0.187	0.203	0.031
	13189	WNMG 433-BMR	WNMG 080412-BMR	0.339	0.500	0.187	0.203	0.047
	13190	WNMG 434-BMR	WNMG 080416-BMR	0.339	0.500	0.187	0.203	0.062

Cutting Data Recommendations

ISO Code	Material	Material Examples	Brinell Hardness HB	FPR / SFM					
				.015 - .031		.009 - .016		.002 - .010	
				💧💧	☀	💧💧	☀	💧💧	☀
K	Grey cast iron	Perlitic / Ferritic	180	690	980	980	1480	1150	1640
		Perlitic / Martenistic	260	460	660	560	790	620	890
	Nodular cast iron	Ferritic	160	490	690	590	850	690	980
		Perlitic	250	360	520	430	620	490	660
	Malleable cast iron	Ferritic	130	660	920	720	980	790	1080
		Perlitic	230	330	490	460	720	560	790

💧💧 Wet Machining ☀ Dry Machining

LC215H – High-Speed Machining Grade for Steel Turning

Products

LMT-Fette is pleased to announce the introduction of Bohlerit's new high-speed turning grade LC215H. This new grade features a highly wear resistant P10-P15 substrate that is gradient sintered to provide exceptional edge toughness. LC215H is a multi-layer MT-CVD coated grade featuring TiN, TiCN, and Al_2O_3 for excellent heat and wear resistance.

Application Area

With its excellent balance of wear resistance and toughness, LC215H grade is excellent for turning of carbon and alloy steels up to 40 Rc. Additionally LC215H is also LMT's number one choice for the turning of tool steel and high-speed steel. Due to its excellent heat resistance, LC215H performs exceptionally at cutting speeds as high as 1500 SFM. LC215H should be used in applications where LC215B has been proven to lack wear resistance or heat resistance.

Materials

As stated above, LC215H's primary application is in the high-speed machining of carbon and alloy steels, as well as the turning of various tool steels. However, LC215H performs exceptional in any tough steel applications where the work piece material features alloying elements such as tungsten, vanadium, chromium, or molybdenum. LC215H offers exceptional heat resistance as a result of the multi-layer MT-CVD coating featuring Al_2O_3.

Advantages

The primary advantages of LMT-Fette's new LC215H are in its unique ability to handle high-heat turning conditions, in difficult turning operations such as heat-treated work pieces, high alloy steels and tool steels, or at cutting speeds in excess of 1000 SFM, LC215H excels.

Additionally, the insert toughness, as a result of the gradient sintered substrate, offers exceptional versatility. These two features combined make LC215H the new standard for turning of difficult steels, and ultra-high-speed turning of carbon and alloy steel.

Indexable Inserts – Single-Sided, Positive Inserts

	EDP No.	ANSI Designation	ISO Designation	l	d	s	d_1	r
	54913	CCMT 431 BSF	CCMT 120404 BSF	0.500	0.500	0.187	0.203	0.016
	54915	CCMT 431 BSMS	CCMT 120404 BSMS	0.500	0.500	0.187	0.203	0.016
	54916	CCMT 432 BSMS	CCMT 120408 BSMS	0.500	0.500	0.187	0.203	0.031
	54925	DCMT 2(1.5)(.5) BSF	DCMT 070202 BSF	0.305	0.250	0.094	0.147	0.008
	54926	DCMT 2(1.5) 1 BSF	DCMT 070204 BSF	0.305	0.250	0.094	0.147	0.016
	54927	DCMT 3(2.5)1 BSF	DCMT 11T304 BSF	0.457	0.375	0.156	0.173	0.016
	54928	DCMT 3(2.5) 2 BSF	DCMT 11T308 BSF	0.457	0.375	0.156	0.173	0.031
	54930	DCMT 3(2.5)1 BFMS	DCMT 11T304 BFMS	0.457	0.375	0.156	0.173	0.016
	54931	DCMT 3(2.5) 2 BFMS	DCMT 11T308 BFMS	0.457	0.375	0.156	0.173	0.031
	54943	VCMT 220 BSF	VCMT 110302 BSF	0.437	0.250	0.125	0.110	0.008
	54944	VCMT 221 BSF	VCMT 110304 BSF	0.437	0.250	0.125	0.110	0.016
	54946	VCMT 332 BSF	VCMT 160408 BSF	0.654	0.375	0.187	0.173	0.031

Indexable Inserts – Double-Sided, Negative Inserts

	EDP No.	ANSI Designation	ISO Designation	l	d	s	d_1	r
	54917	CNMG 431 BF	CNMG 120404 BF	0.500	0.500	0.187	0.203	0.016
	54919	CNMG 431 BFMS	CNMG 120404 BFMS	0.500	0.500	0.187	0.203	0.016
	51920	CNMG 432 BFMS	CNMG 120408 BFMS	0.500	0.500	0.187	0.203	0.031
	54921	CNMG 432 BMS	CNMG 120408 BMS	0.500	0.500	0.187	0.203	0.031
	54922	CNMG 432 BMRS	CNMG 120408 BMRS	0.500	0.500	0.187	0.203	0.031
	54934	DNMG 331 BFMS	DNMG 110404 BFMS	0.457	0.375	0.156	0.156	0.016
	54951	WNMG 331 BFMS	WNMG 060404 BFMS	0.256	0.375	0.187	0.150	0.016
	54952	WNMG 332 BFMS	WNMG 060408 BFMS	0.256	0.375	0.187	0.150	0.031

Cutting Data Recommendations

ISO Code	Material	Material Examples	Brinell Hardness HB	FPR / SFM		
				.015 - .031 💧💧	.009 - .015 💧💧	.002 - .009 💧💧
P	Unalloyed Steel	1018, 1020, 12L14 1030, 1055	125	540 - 720	755 - 1050	900 - 1400
			190	450 - 630	660 - 960	810 - 1380
			250			
			270	420 - 600	600 - 810	750 - 1050
	Low Alloy Steel	4140, 5150 6150, 8620	180	420 - 600	540 - 810	750 - 1140
	High Alloy Tool Steel	H13, M2	280		450 - 540	520 - 600
			325			
	High Speed Steel (HSS)	M2, M35	280		240 - 300	270 - 360

💧💧 Wet Machining

PENTATEC® – Multi-Functional Indexable Carbide Turning Tool

Products

LMT-Fette is pleased to announce the introduction of our patented, PENTATEC® Multi-Functional Turning tool. This unique, indexable tool is capable of drilling, boring, facing, and turning, without changing tools. Its unique design features a variation on the conventional trigon-shaped carbide insert, which is set in a position that allows for drilling of holes down to 8mm (.315″), while being capable of performing the additional operations outlined above.

Application Area

The PENTATEC® product is designed to perform the duties of several tools, thus eliminating turret indexes and reducing machining time. The PENTATEC® has a helical geometry, and a large, single helical flute for maximizing chip evacuation. This design allows the PENTATEC® to perform exceptionally as an indexable drill, as well as in deep boring applications where chip evacuation is critical to success.

A typical application for the PENTATEC® tool would be one where the PENTATEC® could start by drilling a hole at the nominal PENTATEC® size. After drilling, the PENTATEC® could then be used to rough and finish the bore, as well as chamfer the bore. After completing the internal work, the PENTATEC® would then go on to face the work piece, then rough and finish turn the O.D.

The result is a work piece that is machined completely with a single tool, and a dramatic decrease in cycle time.

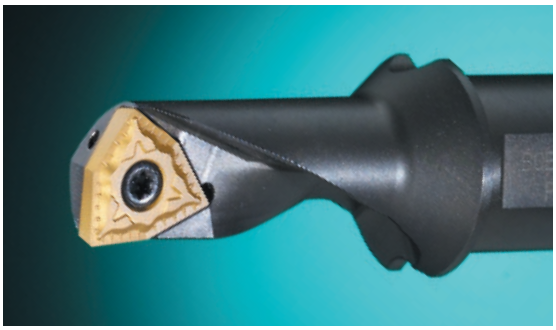
Materials

With a wide range of grades, and two optimized geometries, the PENTATEC® is capable of machining most materials, from carbon and alloy steels, to aluminum, to stainless steel and cast iron. In steel, gear blanks or bearing races can be machined quickly and cost effectively with a single PENTATEC® tool.

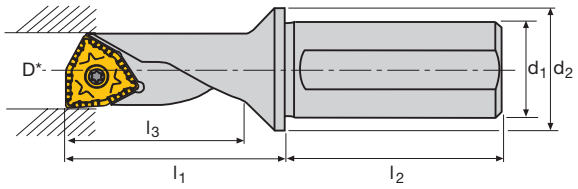
Advantages

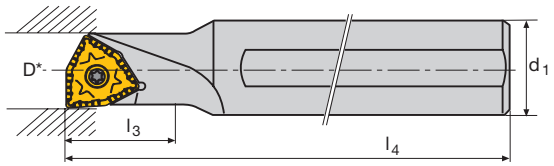
The primary advantage of LMT-Fette's new PENTATEC® tool is its ability to perform a wide range of applications without changing tools. Additionally, the PENTATEC® also doubles as the industry's smallest indexable drill at 8.0mm (.315″).

Lastly, with its trigon-shaped insert, the PENTATEC® maximizes cost effectiveness by offering three complete edges per insert. All in all, the PENTATEC® tool replaces as many as five tools with a single tool.



PENTATEC® Toolholder





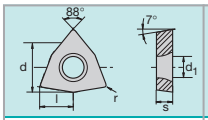
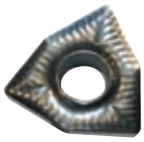
D* = Diameter for drilling

D*	Description	EDP No.	Dimensions (mm/inches)						Shank Type	Indexable Insert
			d_1	d_2	l_1	l_2	l_3	l_4		
8 (0.315)	PTR 08-150D-04-12.7	53937	12.7 (0.500)	-	-	-	12 (0.47)	90 (3.54)	Inch	WCHX 04....
8 (0.315)	PTR 08-225D-04-12.7	53938	9.52 (0.375)	12.7 (0.50)	22.5 (0.89)	38 (1.50)	18 (0.71)		Inch	WCHX 04....
10 (0.394)	PTR 10-150D-05-12.7	53939	12.7 (0.500)	-	-	-	15 (0.59)	90 (3.54)	Inch	WCHX 05....
10 (0.394)	PTR 10-225D-05-12.7	53942	12.7 (0.500)	16 (0.63)	28 (1.10)	42 (1.65)	22.5 (0.89)	-	Inch	WCHX 05....
11 (0.433)	PTR 11-150D-06-15.87	53943	15.87 (0.625)	-	-	-	16.5 (0.65)	100 (3.40)	Inch	WCHX 06....
11 (0.433)	PTR 11-225D-06-15.87	53948	15.87 (0.625)	20 (0.79)	32 (1.26)	45 (1.77)	24.75 (0.97)	-	Inch	WCHX 06....
15 (0.590)	PTR 15-150D-07-19.05	53949	19.05 (0.750)	-	-	-	22.5 (0.87)	125 (4.92)	Inch	WCHX 07....
15 (0.590)	PTR 15-225D-07-19.05	53950	19.05 (0.750)	25 (0.98)	43 (1.69)	50 (1.97)	33.75 (1.33)	-	Inch	WCHX 07....
18 (0.709)	PTR 18-150D-09-25.4	53986	25.4 (1.000)	-	-	-	27 (1.06)	135 (5.32)	Inch	WCHX 09....
18 (0.709)	PTR 18-225D-09-25.4	54024	25.4 (1.000)	32 (1.26)	53 (2.09)	56 (2.21)	40.5 (1.59)	-	Inch	WCHX 09....
20 (0.787)	PTR 20-150D-10-25.4	54025	25.4 (1.000)	-	-	-	30 (1.18)	150 (5.91)	Inch	WCHX 10....
20 (0.787)	PTR 20-225D-10-25.4	54026	25.4 (1.000)	32 (1.26)	56 (2.21)	56 (2.21)	45 (1.77)	-	Inch	WCHX 10....
8 (0.315)	PTR 08-150D-04-12	55966	12 (0.472)	-	-	-	12 (.47)	90 (3.54)	Metric	WCHX 04....
8 (0.315)	PTR 08-225D-04-10	55967	10 (0.394)	12 (0.47)	22.5 (0.87)	38 (1.50)	18 (0.71)		Metric	WCHX 04....
10 (0.394)	PTR 10-150D-05-12	55968	12 (0.472)	-	-	-	15 (0.59)	90 (3.54)	Metric	WCHX 05....
10 (0.394)	PTR 10-225D-05-12	55969	12 (0.472)	16 (0.63)	28 (1.10)	42 (1.65)	22.5 (0.89)	-	Metric	WCHX 05....
11 (0.433)	PTR 11-150D-06-16	55970	16 (0.630)	-	-	-	16.5 (0.65)	100 (3.40)	Metric	WCHX 06....
11 (0.433)	PTR 11-225D-06-16	55971	16 (0.630)	20 (0.79)	32 (1.26)	45 (1.77)	24.75 (0.97)	-	Metric	WCHX 06....
15 (0.590)	PTR 15-150D-07-20	55972	20 (0.787)	-	-	-	22.5 (0.89)	125 (4.92)	Metric	WCHX 07....
15 (0.590)	PTR 15-225D-07-20	55973	20 (0.787)	25 (0.98)	43 (1.69)	50 (1.97)	33.75 (1.33)	-	Metric	WCHX 07....
18 (0.709)	PTR 18-150D-09-25	55974	25 (0.984)	-	-	-	27 (1.06)	135 (5.32)	Metric	WCHX 09....
18 (0.709)	PTR 18-225D-09-25	55975	25 (0.984)	32 (1.26)	53 (2.09)	56 (2.21)	40.5 (1.59)	-	Metric	WCHX 09....
20 (0.787)	PTR 20-150D-10-25	55976	25 (0.984)	-	-	-	30 (1.18)	150 (5.91)	Metric	WCHX 10....
20 (0.787)	PTR 20-225D-10-25	55977	25 (0.984)	32 (1.26)	56 (2.20)	56 (2.21)	45 (1.77)	-	Metric	WCHX 10....

Spare Parts

Description	Insert Screw	EDP No. Insert Screw	Torx	EDP No. Torx
PTR 08-150D-04-12/12.7	A02-20033	55087	06	88600
PTR 08-225D-04-12/12.7	A02-20033	55087	06	88600
PTR 10-150D-05-12/12.7	A13-25042	55088	08	89978
PTR 10-225D-05-12/12.7	A13-25042	55088	08	89978
PTR 11-150D-06-16/15.87	A13-25050	55089	08	89978
PTR 11-225D-06-16/15.87	A13-25050	55089	08	89978
PTR 15-150D-07-20/19.05	A13-30073	55090	08	89978
PTR 15-225D-07-20/19.05	A13-30073	55090	08	89978
PTR 18-150D-09-25/25.4	A02-35082	55091	15	88602
PTR 18-225D-09-25/25.4	A02-35082	55091	15	88602
PTR 20-150D-10-25/25.4	A06-50088	55092	20	50258
PTR 20-225D-10-25/25.4	A06-50088	55092	20	50258

Indexable Inserts

	EDP No.	Ordering Code	Dimensions (mm/inches)					Grade	
			l	d	s	d_1	r	HC LC235C	HW LW610
WCHX...-BAL	55097	WCHX 040104 FN-BAL	4.00 (0.157)	6.35 (0.250)	1.59 (0.063)	2.25 (0.089)	0.40 (0.016)		•
	55098	WCHX 05T104 FN-BAL	5.00 (0.197)	7.94 (0.313)	1.98 (0.078)	2.80 (0.110)	0.40 (0.016)		•
	55101	WCHX 060204 FN-BAL	6.00 (0.236)	8.73 (0.344)	2.38 (0.094)	2.80 (0.110)	0.40 (0.016)		•
	55102	WCHX 070308 FN-BAL	7.00 (0.276)	12.00 (0.472)	3.18 (0.125)	3.40 (0.134)	0.80 (0.031)		•
	55103	WCHX 090308 FN-BAL	9.00 (0.354)	14.29 (0.563)	3.18 (0.125)	4.40 (0.173)	0.80 (0.031)		•
	55104	WCHX 10T308 FN-BAL	10.00 (0.394)	15.88 (0.625)	3.97 (0.156)	5.90 (0.232)	0.80 (0.031)		•
WCHX...-BFM	55096	WCHX 040104 EN-BFM	4.00 (0.157)	6.35 (0.250)	1.59 (0.063)	2.25 (0.089)	0.40 (0.016)	•	
	74564	WCHX 05T104 EN-BFM	5.00 (0.197)	7.94 (0.313)	1.98 (0.078)	2.80 (0.110)	0.40 (0.016)	•	
	55099	WCHX 060202 EN-BFM	6.00 (0.236)	8.73 (0.344)	2.38 (0.094)	2.80 (0.110)	0.20 (0.008)	•	
	55100	WCHX 060204 EN-BFM	6.00 (0.236)	8.73 (0.344)	2.38 (0.094)	2.80 (0.110)	0.40 (0.016)	•	
	74566	WCHX 070308 EN-BFM	7.00 (0.276)	12.00 (0.472)	3.18 (0.125)	3.40 (0.134)	0.80 (0.031)	•	
	74570	WCHX 10T308 EN-BFM	10.00 (0.394)	15.88 (0.625)	3.97 (0.156)	5.90 (0.232)	0.80 (0.031)	•	
	55095	WCHX 040102 EN-BFM	4.00 (0.157)	6.35 (0.250)	1.59 (0.063)	2.25 (0.089)	0.20 (0.008)	•	
	74563	WCHX 05T102 EN-BFM	5.00 (0.197)	7.94 (0.313)	1.98 (0.078)	2.80 (0.110)	0.20 (0.008)	•	
	74565	WCHX 070304 EN-BFM	7.00 (0.276)	12.00 (0.472)	3.18 (0.125)	3.40 (0.134)	0.40 (0.016)	•	
	74567	WCHX 090304 EN-BFM	9.00 (0.354)	14.29 (0.563)	3.18 (0.125)	4.40 (0.173)	0.40 (0.016)	•	
	74568	WCHX 090308 EN-BFM	9.00 (0.354)	14.29 (0.563)	3.18 (0.125)	4.40 (0.173)	0.80 (0.031)	•	
	74569	WCHX 10T304 EN-BFM	10.00 (0.394)	15.88 (0.625)	3.97 (0.156)	5.90 (0.232)	0.40 (0.016)	•	

• Available from stock

LMT Cutting Material Overview

Grade	ISO	Range of applications	Group of materials						Application					
		01 05 10 15 20 25 30 35 40 45 50	P Steel	M Stainless	K Grey cast iron	N Nonferrous metals	S High temperature materials	H Hard materials	T Turning	M Milling	D Drilling	S Threading	G Grooving	P Parting
LC235C	HC-P35		■						●		●			
	HC-M35			□					●		●			
LW610	HW-K10					■			●		●			

Application peak

Full range to ISO 513

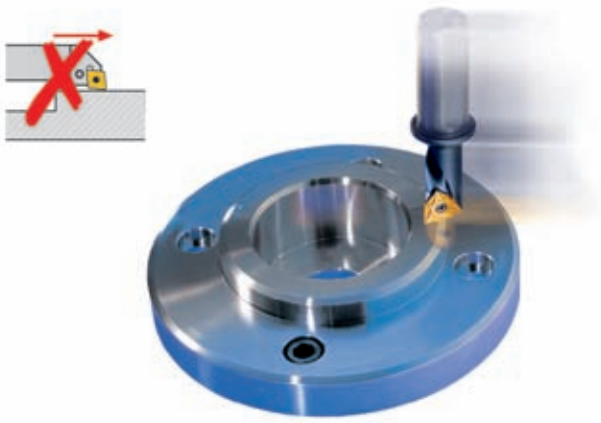
■ Main application

□ Further applications

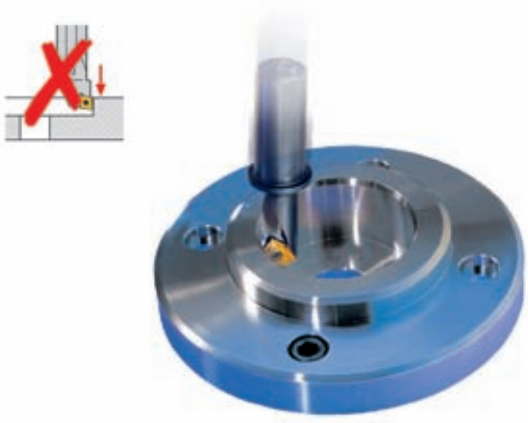
● Standard grade

PENTATEC® Turning-Drilling-Tool

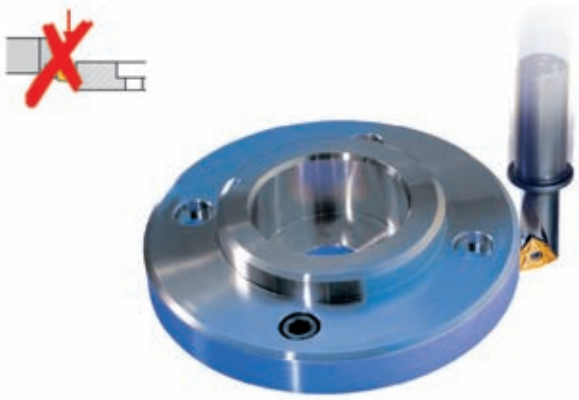
1. Facing



4. Boring

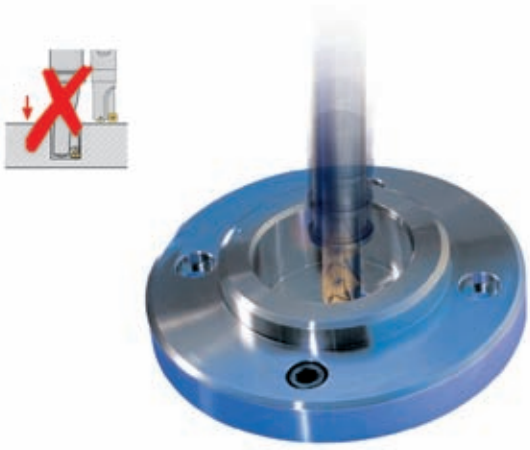


2. External turning



5. Counter Boring

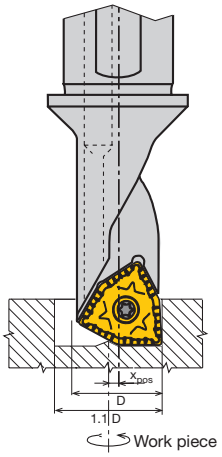
3. Drilling into solid



Five machining operations, one tool
The universal turning-drilling-tool substitutes up to 5 standard tools and reduces machining times up to 30% by reducing tool changing times and unnecessary tool movements.

PENTATEC® Additional application possibilities

Drilling off center, positive offset



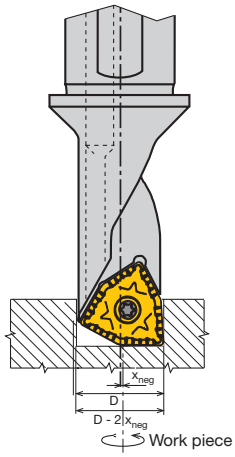
X_{pos}: Offset, positive
D: Nominal tool diameter

Steel $$X_{pos} = \frac{(1.1 \times D) - D}{2}$$

Aluminum $$X_{pos} = \frac{(1.5 \times D) - D}{2}$$

D	Toolholder Description	Steel (mm/inch)		Aluminum (mm/inch)	
		D_{max}	X_{pos}	D_{max}	X_{pos}
8 (0.315)	PTR 08-150D-04-12.7	8.8 (0.346)	0.40 (0.016)	12.0 (0.472)	2.00 (.0790)
8 (0.315)	PTR 08-225D-04-12.7	8.8 (0.346)	0.40 (0.016)	12.0 (0.472)	2.00 (.0790)
10 (0.394)	PTR 10-150D-05-12.7	11 (0.433)	0.50 (0.020)	15.0 (0.591)	2.50 (0.098)
10 (0.394)	PTR 10-225D-05-12.7	11 (0.433)	0.50 (0.020)	15.0 (0.591)	2.50 (0.098)
11 (0.433)	PTR 11-150D-06-15.87	12.1 (0.476)	0.55 (0.022)	16.5 (0.650)	2.75 (0.108)
11 (0.433)	PTR 11-225D-06-15.87	12.1 (0.476)	0.55 (0.022)	16.5 (0.650)	2.75 (0.108)
15 (0.590)	PTR 15-150D-07-19.05	16.5 (0.650)	0.75 (0.030)	22.5 (0.886)	3.75 (0.148)
15 (0.590)	PTR 15-225D-07-19.05	16.5 (0.650)	0.75 (0.030)	22.5 (0.886)	3.75 (0.148)
18 (0.709)	PTR 18-150D-09-25.4	19.8 (0.780)	0.90 (0.035)	27.0 (1.063)	4.50 (0.177)
18 (0.709)	PTR 18-225D-09-25.4	19.8 (0.780)	0.90 (0.035)	27.0 (1.063)	4.50 (0.177)
20 (0.787)	PTR 20-150D-10-25.4	22 (0.866)	1.00 (0.039)	30.0 (1.181)	5.00 (0.197)
20 (0.787)	PTR 20-225D-10-25.4	22 (0.866)	1.00 (0.039)	30.0 (1.181)	5.00 (0.197)

Drilling off center, negative offset

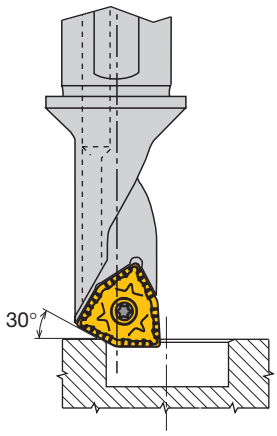


X_{neg}: Offset, negative
D: Nominal tool diameter

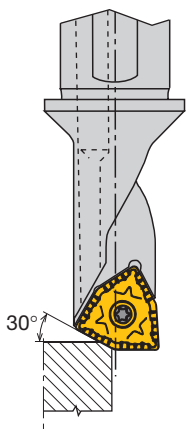
$$X_{neg} = \frac{D_{min} - D}{2}$$

D	Toolholder Description	(mm/inches)	
		D_{max}	X_{neg}
8 (0.315)	PTR 08-150D-04-12.7	7.8 (0.307)	0.10 (0.004)
8 (0.315)	PTR 08-225D-04-12.7	7.8 (0.307)	0.10 (0.004)
10 (0.394)	PTR 10-150D-05-12.7	9.8 (0.386)	0.10 (0.004)
10 (0.394)	PTR 10-225D-05-12.7	9.8 (0.386)	0.10 (0.004)
11 (0.433)	PTR 11-150D-06-15.87	10.8 (0.425)	0.10 (0.004)
11 (0.433)	PTR 11-225D-06-15.87	10.8 (0.425)	0.10 (0.004)
15 (0.590)	PTR 15-150D-07-19.05	14.7 (0.579)	0.15 (0.006)
15 (0.590)	PTR 15-225D-07-19.05	14.7 (0.579)	0.15 (0.006)
18 (0.709)	PTR 18-150D-09-25.4	17.7 (0.697)	0.15 (0.006)
18 (0.709)	PTR 18-225D-09-25.4	17.7 (0.697)	0.15 (0.006)
20 (0.787)	PTR 20-150D-10-25.4	19.7 (0.776)	0.15 (0.006)
20 (0.787)	PTR 20-225D-10-25.4	19.7 (0.776)	0.15 (0.006)

Internal chamfering



External chamfering



PENTATEC® Features and Benefits
Counter-boring with PENTATEC® tools

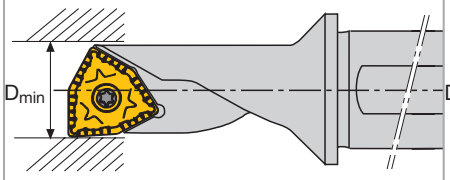
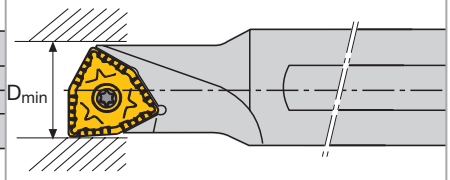
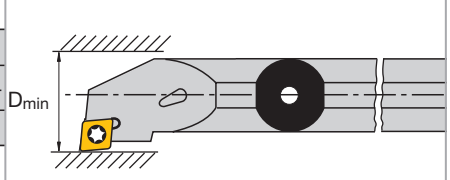
The diameters of the PENTATEC® tools are designed to produce counter-bores according to DIN 74 forms H3, J3 and K3 in one operation.

Form H3 for: cheese head screws according to DIN 84
socket head cap screws to DIN 7984
cheese head screws according to DIN 7513 form B
cheese head screws according to DIN 7500 part 1 form A
Form J3 for: socket head cap screws according to DIN 6912
(low screw head, key guide)
Form K3 for: socket head cap screws according to DIN 912

with lock washer according to DIN 7980

D	Toolholder Description	Nominal Thread Diameter	H13 (mm/inch)
8 (0.315)	PTR 08-150D-04-12.7	M4	0/+0.220 (0.009)
8 (0.315)	PTR 08-225D-04-12.7	M4	0/+0.220 (0.009)
10 (0.394)	PTR 10-150D-05-12.7	M5	0/+0.220 (0.009)
10 (0.394)	PTR 10-225D-05-12.7	M5	0/+0.220 (0.009)
11 (0.433)	PTR 11-150D-06-15.87	M6	0/+0.270 (0.011)
11 (0.433)	PTR 11-225D-06-15.87	M6	0/+0.270 (0.011)
15 (0.590)	PTR 15-150D-07-19.05	M8	0/+0.270 (0.011)
15 (0.590)	PTR 15-225D-07-19.05	M8	0/+0.270 (0.011)
18 (0.709)	PTR 18-150D-09-25.4	M10	0/+0.330 (0.013)
18 (0.709)	PTR 18-225D-09-25.4	M10	0/+0.330 (0.013)
20 (0.787)	PTR 20-150D-10-25.4	M12	0/+0.330 (0.013)
20 (0.787)	PTR 20-225D-10-25.4	M12	0/+0.330 (0.013)

Large Mounting Diameter and Location Face

	PENTATEC®		ISO-boring bar
	PTR20-2.25D	PTR20-1.50D	
			
D_{min}	20	20	21
d Shank	25/32* *Diameter of the flange	25	16
Seating face	Yes	No	No

PENTATEC® Benefits

Increased stability and reduced tendency for vibration through larger locating diameters and the additional seating face for PT-2.25D.

Cutting Data Recommendations

ISO Code	Material	Material Examples	LC235C Cutting HRC	LW610 Cutting Speed (SFM)	Speed (SFM)
P	Unalloyed Carbon Steels	A36, 1005–1029 1213, 12L14 1030–1055	< 16	850	
	Alloyed Steels	4140, 6150	< 30	700 - 920	
	Heat Treatable Steel, medium strength	4140, 4340	< 30	650 - 920	
	Heat Treatable Steel, high strength		30 - 42 Rc	525 - 650	
	Cast Steel		< 30		
	Nitriding Steel	H13	30 - 42 Rc	525 - 650	
	Tool Steel	A2, S7	30 - 42 Rc		
	Case Hardening Steel	8620, 52100	< 30	820 - 880	
	Stainless Steel, Martensitic annealed				
	Stainless Steel, Martensitic hardended tempered				
M	Stainless Steel, austenitic	304, 316	< 30	720 - 900	
K	Grey Cast Iron	Class 30	< 16	780	
	Alloyed Grey Cast Iron		< 20	750	
	Nodular Iron		< 16	720	
N	Aluminum Wrought Alloys	unhardenable			1300 - 4500
		hardenable, hardened			525 - 4000
	Aluminum Cast Alloys	< 12% Si. unhardenable			1050 - 4000
		< 12% Si. hardenable, hardened			790 - 3125
		> 12% Si. unhardenable			525 - 2625
	Copper and Copper Alloys	Free Cutting alloys Pb>1%			650 - 1700
	Bronze / Brass	Brass, Red bronze Bronze, non leaded copper electrolitic copper			656 - 2625 400 - 1050

Recommended Depth of Cut Range (A_p) for PENTATEC® 1.5 x D

	Steel			Aluminum		
	Turning	Boring	Facing	Turning	Boring	Facing
PTR/L08	.005 - .125	.005 - .125	.005 - .080	.005 - .125	.005 - .125	.005 - .080
PTR/L10	.005 - .188	.005 - .188	.005 - .118	.005 - .188	.005 - .188	.005 - .118
PTR/L11	.005 - .188	.005 - .188	.005 - .118	.005 - .188	.005 - .188	.005 - .118
PTR/L15	.005 - .250	.005 - .250	.005 - .157	.005 - .250	.005 - .250	.005 - .157
PTR/L18	.005 - .275	.005 - .275	.005 - .200	.005 - .275	.005 - .275	.005 - .200
PTR/L20	.005 - .300	.005 - .300	.005 - .225	.005 - .300	.005 - .300	.005 - .225

Recommended Feed Rate Range (F_n) for PENTATEC® 1.5 x D

	Steel			Aluminum		
	Turning	Boring	Facing	Turning	Boring	Facing
PTR/L08	.001 - .006	.001 - .006	.001 - .004	.001 - .008	.001 - .008	.001 - .006
PTR/L10	.001 - .008	.001 - .008	.001 - .007	.001 - .012	.001 - .012	.001 - .010
PTR/L11	.001 - .008	.001 - .008	.001 - .007	.001 - .012	.001 - .012	.001 - .010
PTR/L15	.001 - .010	.001 - .010	.001 - .008	.001 - .014	.001 - .014	.001 - .012
PTR/L18	.001 - .011	.001 - .011	.001 - .009	.001 - .016	.001 - .016	.001 - .013
PTR/L20	.001 - .012	.001 - .012	.001 - .010	.001 - .018	.001 - .018	.001 - .014

Recommended Depth of Cut Range (A_p) for PENTATEC® 2.25 x D

	Steel			Aluminum		
	Turning	Boring	Facing	Turning	Boring	Facing
PTR/L08	.005 - .100	.005 - .100	.005 - .060	.005 - .100	.005 - .100	.005 - .060
PTR/L10	.005 - .125	.005 - .125	.005 - .080	.005 - .125	.005 - .125	.005 - .080
PTR/L11	.005 - .125	.005 - .125	.005 - .080	.005 - .125	.005 - .125	.005 - .080
PTR/L15	.005 - .188	.005 - .188	.005 - .118	.005 - .188	.005 - .188	.005 - .118
PTR/L18	.005 - .200	.005 - .200	.005 - .125	.005 - .200	.005 - .200	.005 - .125
PTR/L20	.005 - .225	.005 - .225	.005 - .157	.005 - .225	.005 - .225	.005 - .157

Recommended Feed Rate Range (F_n) for PENTATEC® 2.25 x D

	Steel			Aluminum		
	Turning	Boring	Facing	Turning	Boring	Facing
PTR/L08	.001 - .006	.001 - .006	.001 - .004	.001 - .008	.001 - .008	.001 - .006
PTR/L10	.001 - .008	.001 - .008	.001 - .007	.001 - .012	.001 - .012	.001 - .010
PTR/L11	.001 - .008	.001 - .008	.001 - .007	.001 - .012	.001 - .012	.001 - .010
PTR/L15	.001 - .010	.001 - .010	.001 - .008	.001 - .014	.001 - .014	.001 - .012
PTR/L18	.001 - .011	.001 - .011	.001 - .009	.001 - .016	.001 - .016	.001 - .013
PTR/L20	.001 - .012	.001 - .012	.001 - .010	.001 - .018	.001 - .018	.001 - .014

Recommended Feed Rate Range (F_z) for Drilling with PENTATEC®*

	Steel	Aluminum
PTR/L08	.0005 - .0010	.0005 - .0020
PTR/L10	.0005 - .0016	.0005 - .0022
PTR/L11	.0005 - .0016	.0005 - .0022
PTR/L15	.0006 - .0024	.0007 - .0035
PTR/L18	.0007 - .0030	.0008 - .0044
PTR/L20	.0008 - .0035	.0008 - .0050

*Note: When drilling in harder materials > 30 Rc, start with the lowest feed rates until you reach a depth of .040".

NEW SBR Reamers

Products

LMT-Fette is pleased to announce our new line of SBR Reamers. The new single bladed reamer line is one body for two types of applications that require use of carbide PCD and CBN insert blades. The new SBR reamers have the ultimate economic advantage of an insert tool with quick interchangeability and the precision of an adjustable reamer.

Application Area

The new SBR reamers are primarily designed for applications were high-precision quality holes are required along with superior micro finishes. The SBR reamers are axial and radial adjustable for through-hole boring or blind-hole boring applications. The SBR reamer insert blades are available in Carbide, PCD inserts for nonferrous applications, or CBN inserts for hard milling applications. Insert blades are available in a wide selection of lead-in angles and cutting geometry angles, engineered for specific material groups. SBR reamer shanks are designed with internal coolant holes for through-hole boring or blind-hole boring, and feature maximum fluting allowing for maximum chip evacuation. SBR 270 series reamers are available with a directional coolant flow valve for maximum coolant at the cutting edge.

Materials

SBR reamers are designed for a long list of material groups including carbon steels, alloy steels, tool steels, stainless steels, and cast irons, as well as aluminum materials. Additionally, SBR reamers perform exceptionally well on aluminum cast, automotive braking components.

Advantages

SBR reamers deliver the optimum solution where hole and surface quality is a problem stemming from the materials ability to be machined. SBR reamers have wide guide pads made from ultra fine carbide substrate providing high quality hole quality and surface finishes.

SBR reamers are designed with a fine axial and radial adjustment setting, giving you precise bored-holes and allowing you to increase feed rates. High rigidity and stability is achieved by the dual-point insert-clamping piece.

Single-Blade Reamer SBR 350, SBR 360

Illustration shows SBR 360

SBR 350

SBR 360

Developed for NC-machining
internal cooling for through-hole boring
or pocket-hole boring
cylindrical arbor
additional cut-out for chip flow

d_1 (H7)	SBR 350 EDP	SBR 360 EDP	Dimensions (mm/inches)				Insert Size	Stock
			l_1	l_2	l_3	l_4		
8.00 (.315)	35001	35002	133 (5.236)	48 (1.890)	85 (3.346)	27 (1.063)	D2	■
10.00 (.394)	35006	35005	133 (5.236)	48 (1.890)	85 (3.346)	27 (1.063)	D2	■
7.80 - 8.29 (.307 - .326)	See Order Example		133 (5.236)	48 (1.890)	85 (3.346)	27 (1.063)	D2	□
8.30 - 8.79 (.327 - .346)	See Order Example		133 (5.236)	48 (1.890)	85 (3.346)	27 (1.063)	D2	□
8.8 - 9.29 (.346 - .366)	See Order Example		133 (5.236)	48 (1.890)	85 (3.346)	27 (1.063)	D2	□
9.30 - 11.29 (.366 - .444)	See Order Example		133 (5.236)	48 (1.890)	85 (3.346)	27 (1.063)	D2	□
11.30 - 11.79 (.444 - .464)	See Order Example		133 (5.236)	48 (1.890)	85 (3.346)	27 (1.063)	D2	□

■ Stock Sizes Available

□ Available Upon Request

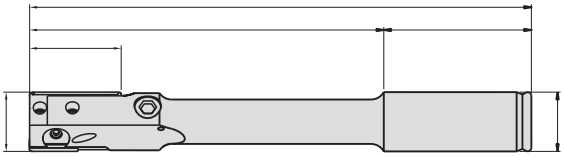
Delivery of the SBR reamers include 1 insert. Completely mounted and preset (Standard H7) The assembled insert will be seperately invoiced

Inserts see page 105, Spare Parts see page 107

Order Example

Type	d_1 Diameter	Tolerance	l_1 Total Length	Cutting Material
SBR 350	9.30 (.366)	H7	133	Aluminum

Single-Blade Reamer SBR 370



SBR 370: Axial and radial adjustable, with a modulating valve for through-hole boring and pocket-hole boring

The type of machining (through-hole boring or pocket-hole boring) can easily be changed by turning the modulatng valve for coolange.

Developed for NC-machining
internal cooling for through-hole borng and pocket-hole boring
cylindrical arbor
additional cut-out for chip flow

d_1	EDP No.	Dimensions (mm/inches)					Insert Size	Stock
		l_1	l_2	l_3	l_4	d_2		
12.00 (0.472)	35009	168.00 (6.614)	48.00 (1.890)	120.00 (4.724)	27.00 (1.063)	16.00 (0.630)	D2	■
16.00 (0.630)	35013	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D3	■
18.00 (0.709)	35015	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D4	■
20.00 (0.787)	35017	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D4	■
24.00 (0.945)	35021	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D4	■
25.00 (0.984)	35022	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D5	■
30.00 (1.181)	35027	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D5	■
11.80 - 12.29 (0.465 - 0.484)	–	168.00 (6.614)	48.00 (1.890)	120.00 (4.724)	27.00 (1.063)	16.00 (0.630)	D2	□
12.30 - 14.29 (0.484 - 0.563)	–	168.00 (6.614)	48.00 (1.890)	120.00 (4.724)	31.00 (1.220)	16.00 (0.630)	D3	□
14.30 - 16.29 (0.563 - 0.641)	–	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D3	□
16.30 - 17.29 (0.642 - 0.681)	–	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D4	□
17.30 - 19.79 (0.681 - 0.779)	–	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D4	□
19.80 -24.79 (0.779 - 0.976)	–	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D4	□
24.80 - 27.79 (0.976 - 1.094)	–	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D5	□
27.80 - 28.79 (1.094 - 1.133)	–	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D5	□
28.80 - 31.79 (1.133 - 1.252)	–	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D5	□
31.80 - 37.79 (1.252 - 1.488)	–	170.00 (6.693)	50.00 (1.969)	120.00 (4.724)	31.00 (1.220)	20.00 (0.787)	D5	□
37.80 - 50.29 (1.488 - 1.980)	–	176.00 (6.929)	56.00 (2.205)	120.00 (4.724)	31.00 (1.220)	25.00 (0.984)	D5	□

■ Stock Sizes Available
□ Available Upon Request

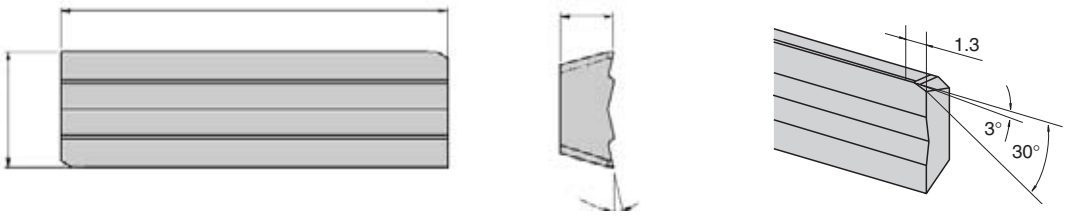
Delivery of the SBR reamers include 1 insert. Completely mounted and preset (Standard H7) The assembled insert will be seperately invoiced

Inserts see page 105, Spare Parts see page 107

Order Example

Type	d_1 Diameter	Tolerance	l_1 Total Length	Cutting Mat'l
SBR 370	9.30 (.366)	H7	133 (5.236)	Aluminum

Indexable Inserts



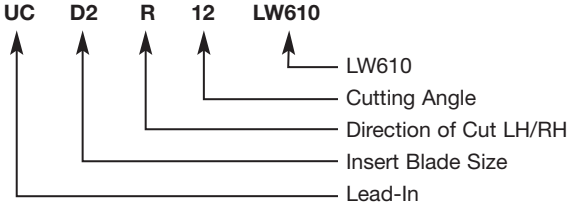
First choice Reamer Insert Blades designed for all material groups in providing superior finishes at high cutting speeds.

Lead-In	Size	EDP No.	Cutting Angle W	Grade	Description				
UC	D2	35185	0	LW610	UC	D2	R	0	LW610
		35199	0	LC610Z	UC	D2	R	0	LC610Z
		35195	6	LW610	UC	D2	R	6	LW610
		35200	6	LC610Z	UC	D2	R	6	LC610Z
		35202	12	LW610	UC	D2	R	12	LW610
		35201	12	LC610Z	UC	D2	R	12	LC610Z
		35191	0	PCD	UC	D2	R	0	PCD
		35183	0	CBN	UC	D2	R	0	CBN
UC	D3	35186	0	LW610	UC	D3	R	0	LW610
		35203	0	LC610Z	UC	D3	R	0	LC610Z
		35196	6	LW610	UC	D3	R	6	LW610
		35204	6	LC610Z	UC	D3	R	6	LC610Z
		35206	12	LW610	UC	D3	R	12	LW610
		35205	12	LC610Z	UC	D3	R	12	LC610Z
		35188	0	PCD	UC	D3	R	0	PCD
		35192	0	CBN	UC	D3	R	0	CBN
UC	D4	35184	0	LW610	UC	D4	R	0	LW610
		35207	0	LC610Z	UC	D4	R	0	LC610Z
		35197	6	LW610	UC	D4	R	6	LW610
		35208	6	LC610Z	UC	D4	R	6	LC610Z
		35209	12	LW610	UC	D4	R	12	LW610
		35213	12	LC610Z	UC	D4	R	12	LC610Z
		35189	0	PCD	UC	D4	R	0	PCD
		35193	0	CBN	UC	D4	R	0	CBN
UC	D5	35187	0	LW610	UC	D5	R	0	LW610
		35210	0	LC610Z	UC	D5	R	0	LC610Z
		35198	6	LW610	UC	D5	R	6	LW610
		35211	6	LC610Z	UC	D5	R	6	LC610Z
		35214	12	LW610	UC	D5	R	12	LW610
		35212	12	LC610Z	UC	D5	R	12	LC610Z
		35190	0	PCD	UC	D5	R	0	PCD
		35194	0	CBN	UC	D5	R	0	CBN

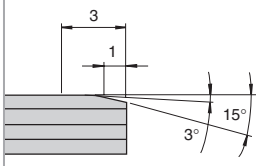
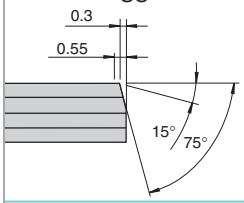
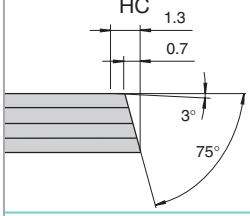
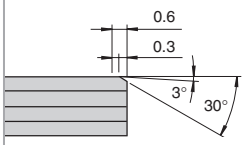
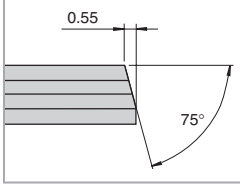
All cutter Inserts cut in right hand direction

Order Example

EDP
12345

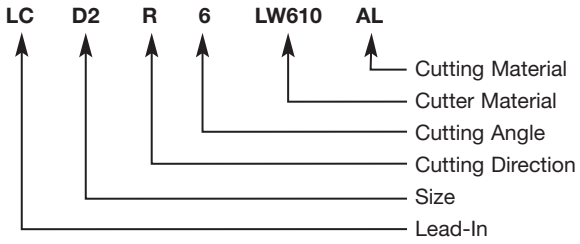


Special Lead-In Inserts – *Available Upon Request*

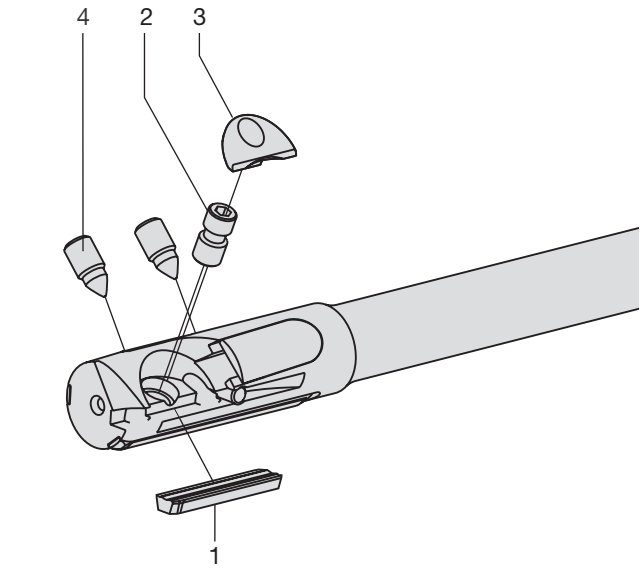
Available Upon Request Special Profiles	Size	Cutting Angle			Grade			
LC 	D2	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D3	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D4	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D5	0°	6°	12°	LW610	LC610Z	PCD	CBN
SC 	D2	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D3	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D4	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D5	0°	6°	12°	LW610	LC610Z	PCD	CBN
HC 	D2	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D3	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D4	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D5	0°	6°	12°	LW610	LC610Z	PCD	CBN
CC 	D2	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D3	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D4	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D5	0°	6°	12°	LW610	LC610Z	PCD	CBN
GC 	D2	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D3	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D4	0°	6°	12°	LW610	LC610Z	PCD	CBN
	D5	0°	6°	12°	LW610	LC610Z	PCD	CBN

Order Example

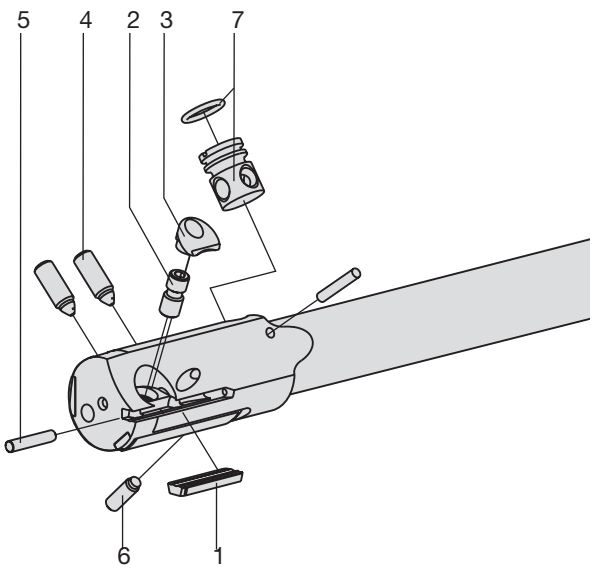
EDP
12345



Spare Parts



SBR 350 = radial adjustable, for pocket-boring
SBR 360 = radial adjustable, for through-boring



SBR 370 = axial and radial adjustable, with a modulating valve for thrugh-hole boring and pocket-hole boring

Spare Parts No.	1	2	3	4	5	6	7
d_1 (H7)	Insert Blade	Insert Screw EDP	Clamping Piece EDP	Adjustable element EDP	Axial Pin EDP	Axial Setting Screw EDP	Coolant mounting valve (set)* EDP
SBR 350, SBR 360							
7.80 - 8.29 (0.307 - 0.326)	D2	13192	13194	13206	–	–	–
8.30 - 8.79 (0.327 - 0.346)	D2	13192	13194	13207	–	–	–
8.80 - 9.29 (0.346 - 0.366)	D2	13192	13194	13207	–	–	–
9.30 - 11.29 (0.366 - 0.444)	D2	13193	13195	13208	–	–	–
11.30 - 11.79 (0.444 - 0.464)	D2	13193	13195	13209	–	–	
SBR 370							
11.80 - 12.29 (0.465 - 0.484)	D2	13193	13195	13209	13216	13221	13199
12.30 - 14.29 (0.484 - 0.563)	D3	13193	13196	13209	13220	13221	13199
14.30 - 16.29 (0.563 - 0.641)	D3	13193	13196	13210	13217	13222	13200
16.30 - 17.29 (0.642 - 0.681)	D4	13191	13197	13211	13218	13223	13201
17.30 - 19.79 (0.681 - 0.779)	D4	13191	13197	13212	13218	13223	13201
19.80 -24.79 (0.779 - 0.976)	D4	13191	13197	13213	13218	13223	13202
24.80 - 27.79 (0.976 - 1.094)	D5	13191	13198	13214	13219	13224	13203
27.80 - 28.79 (1.094 - 1.133)	D5	13191	13198	13214	13219	13224	13203
28.80 - 31.79 (1.133 - 1.252)	D5	13191	13198	13215	13219	13224	13203
31.80 - 37.79 (1.252 - 1.488)	D5	13191	13198	13215	13219	13224	13204
37.80 - 50.29 (1.488 - 1.980)	D5	13191	13198	13215	13219	13224	13205

*coolant mounting valve, O-ring, locking pin

Cutting Data Recommendations for *External* Coolant Supply

ISO Code	Material	Rm/UTS (N/mm²)	Feed IPR	Cutting Angle			Cutting Speed for External Coolant Supply			
				0	6	12	HM	HM coated	PCD	CBN
P	Plain Carbon Steel	< 950	.004-.012		■	□	70-130	70-130		*
							70-130	70-130		
	Free Cutting Steel	< 950	.004-.012		■	□	70-130	70-130		*
							70-130	70-130		
	Structural Low Alloy Steel	500-950	.004-.012		■	□	70-130	70-130		*
							70-130	70-130		
	Heat-Treatable Steel	500-950	.004-.012		■	□	70-130	70-130		*
							70-130	70-130		
	Cast Steel	< 950	.004-.012		□	■	70-130	70-130		*
							70-130	70-130		
	Case Hardening Steel	< 950	.004-.012		■	□	70-130	70-130		*
							70-130	70-130		
	Stainless Steel, ferritic, martensitic	500-950	.004-.008		■	□	70-130	70-130		*
							70-130	70-130		
	Nitriding Steel	950-1400	.004-.012		■	□	70-130	70-130		*
							70-130	70-130		
	Tool Steel	950-1400	.004-.012		■	□	70-130	70-130		*
							70-100	70-100		
M	Stainless Steel, austenitic	500 - 950	.004-.008		□	■	70-100	70-130		
K	Grey Cast Iron	100-400 (120-260 HB)	.004-.012	□	■		100-130	130-160		*
	Alloyed Grey Cast Iron	150-250 (160-230 HB)	.004-.012		□		100-130	130-160		*
	Nodular Cast Iron	400 - 800 (120-310 HB)	.004-.012		□	■	100-130	130-160		*
	Malleable Cast Iron	350 - 700 (150-280 HB)	.004-.012		□	■	100-130	130-160		*
N	Pure Metals, soft	< 500	.004-.012	□	■	□	100-130		*	
	Aluminum Alloys, long chipping	< 500	.004-.012	■	■	□	100-130		*	
	Aluminum Alloys, short chipping	< 400	.003-.012		■	□	100-130		*	
	Copper Alloys, long chipping	300-700	.004-.0085		■	□	100-130		*	
	Copper Alloys, short chipping	< 500	.004-.012	□	■		100-130		*	
	Magnesium Alloys	150 - 300	.004-.012		■	□	100-130		*	
	Thermoplastics	40 - 70					*			
	Duroplastics	20 - 40								
S	Titanium Alloys, medium strength	< 950	.003-.006		■	□	70-130			
	Titanium Alloys, high strength	900-1400	.003-.006		■	□	70-130			
H	Hardened Steel	45-52 HRC	*					*		*
		53-59 HRC						*		*
		60-65 HRC						*		*

* Please enquire for cutting data
□ Preferred cutting angle
■ Recommended in special applications
Cutting data are guidelines which may need to be optimized in operation.

Cutting Data Recommendations for *Internal* Coolant Supply

ISO Code	Material	Rm/UTS (N/mm²)	Feed IPR	Cutting Angle			Cutting Speed for Internal Coolant Supply			
				0	6	12	HM	HM coated	PCD	CBN
P	Plain Carbon Steel	< 950	.004-.012		■	□	200-260	200-260		*
							200-260	200-260		
	Free Cutting Steel	< 950	.004-.012		■	□	200-260	200-260		*
							200-260	200-260		
	Structural Low Alloy Steel	500-950	.004-.012		■	□	200-260	200-260		*
							200-260	200-260		
	Heat-Treatable Steel	500-950	.004-.012		■	□	200-260	200-260		*
							200-260	200-260		
	Cast Steel	< 950	.004-.012		□	■	200-260	200-260		*
							200-260	200-260		
	Case Hardening Steel	< 950	.004-.012		■	□	200-260	200-260		*
							200-260	200-260		
	Stainless Steel, ferritic, martensitic	500-950	.004-.008		■	□	200-260	200-260		*
							200-260	200-260		
	Nitriding Steel	950-1400	.004-.012		■	□	200-260	200-260		*
							200-260	200-260		
	Tool Steel	950-1400	.004-.012		■	□	200-260	200-260		*
							130-200	130-200		
M	Stainless Steel, austenitic	500 - 950	.004-.008		□	■	130-200	200-260		
K	Grey Cast Iron	100-400 (120-260 HB)	.004-.012	□	■		330-390	260-390		*
	Alloyed Grey Cast Iron	150-250 (160-230 HB)	.004-.012		□		330-390	260-390		*
	Nodular Cast Iron	400 - 800 (120-310 HB)	.004-.012		□	■	330-390	260-390		*
	Malleable Cast Iron	350 - 700 (150-280 HB)	.004-.012		□	■	330-390	260-390		*
N	Pure Metals, soft	< 500	.004-.012	□	■	□	330-390		*	
	Aluminum Alloys, long chipping	< 500	.004-.012	■	■	□	330-390		*	
	Aluminum Alloys, short chipping	< 400	.003-.012		■	□	330-390		*	
	Copper Alloys, long chipping	300-700	.004-.0085		■	□	330-390		*	
	Copper Alloys, short chipping	< 500	.004-.012	□	■		330-390		*	
	Magnesium Alloys	150 - 300	.004-.012		■	□	330-390		*	
	Thermoplastics	40 - 70					*			
	Duroplastics	20 - 40								
S	Titanium Alloys, medium strength	< 950	.003-.006		■	□	200-260			
	Titanium Alloys, high strength	900-1400	.003-.006		■	□	200-260			
H	Hardened Steel	45-52 HRC	*					*		*
		53-59 HRC						*		*
		60-65 HRC						*		*

* Please enquire for cutting data
□ Preferred cutting angle
■ Recommended in special applications
Cutting data are guidelines which may need to be optimized in operation.

Pre-Machining
The oversize for the reaming process should be chosen that the maximum roughness depth resulting from pre-machining is less than the cutting depth of the reamer. The safest value from a process viewpoint is a cutting depth of approx. 0.15 mm (0.3 mm increase in diameter).

Coolants and Lubricants
Our reamers give the best results when used with normal coolants in mixing proportions 1:9. The guide bars should always have a film of lubricant. Cutting data are guide-lines which may need to be optimized in operations.

Changing the Insert

Unscrew the setting screws
loosen both radial setting screws (1 full rotation)

Unscrew the insert holder
unscrew the fixing screws for the insert holder

Changing insert
- take out the insert
- cleaning the insert seat
- set in the cleaned or the new insert

Assembling the insert
- push in the insert (axial and radial)
- Screw in the fixing screws for the insert holder
- insert will be moved in the insert seat automatically

Radial Pre-Adjustment
Screw in the radial setting screw (approx. 1 rotation)
with a hexagon key

Axial Pre-Adjustment
axial adjustment of the insert by screwing the setting
screw with a hexagon key

Fine-Adjustment
- for the fine-adjustment we recommend a micrometer
- adjust the front and back setting-dimension in turn.
  Fine adjust to the back approx. 0.01-0.015 mm

NEW FORMBORE System Tools – A new development in technology and economy

Products

LMT-Fette is pleased to announce the introduction of our new FORMBORE System Tools. This unique line consists of three components: a driven shaft, body casing, and drill chuck. The rotating drive shaft is located in the body case. FORMBORE's torque-driven control determines the movement sequence of the drill chuck. The movement of the cutting tool is by means of rolling-element sequences. FORMBORE System Tools are designed for different profiles, whether square or hexagon. FORMBORE makes it possible to make changes in the manufacturing process, potentially removing reaming, EDM or milling operations. FORMBORE System Tools are designed to operate virtually wear and maintenance-free, and making it possible to machine materials up to 27 Rc.

Application Area

FORMBORE System Tools are designed for use on turning lathes and machining centers as well as drilling machines. Examples of special tooling systems vary from right-angled head units and machining center v-flange head units to VDI holder types for turning lathes. FORMBORE System Tools are available in two sizes. Size 1 is suitable for speeds up to 1000 maximum rpm, and forms squares from 4–14mm (0.157″–0.551″), and hexagons from 4–21mm (0.157″–0.827″). Size 2 is suitable for speeds up to 500 maximum rpm, and forms squares from 4–22mm (0.157″–0.866″), and hexagons from 4–38mm (0.157″–0.1.496″).

Materials

As stated above, FORMBORE System Tools are designed for a broad range of material groups and Rockwell hardness up to 27 Rc. FORMBORE System Tools are designed as application-specific tooling for all manufacturing markets, whether job shop, automotive, or even aerospace.

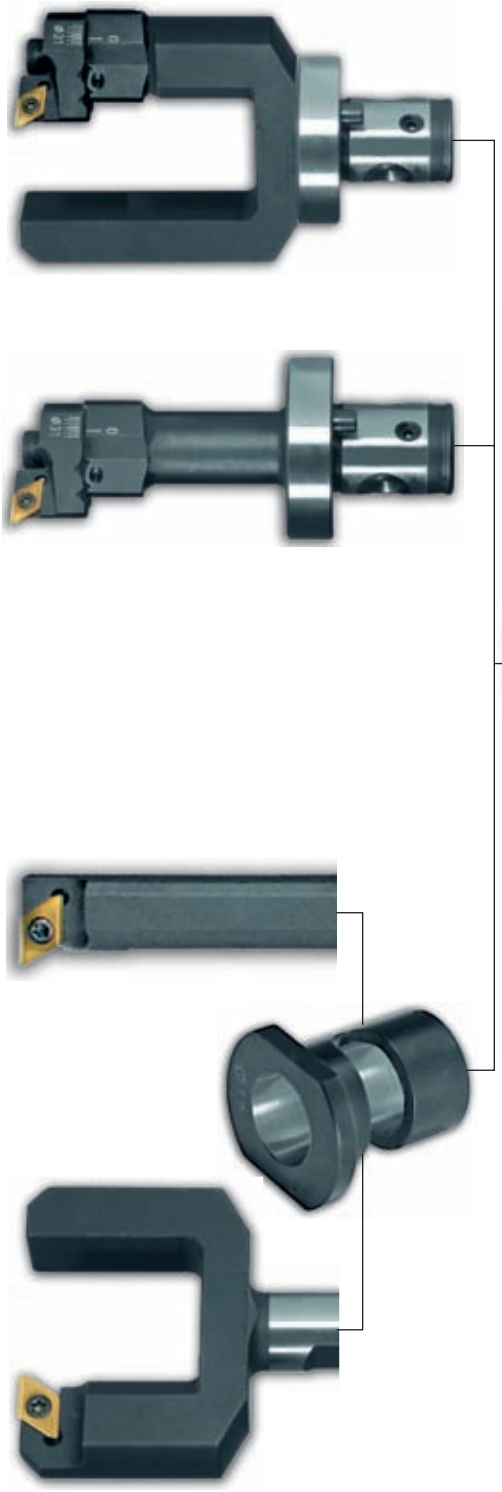
Advantages

For the first time you can produce a large variety of inner and outer profiles with the highest precision using a drilling machine, turning lathe, or machining center. FORMBORE tools work independently from the machining spindle. It is not necessary to calculate and program the synchronized coordinates for a square or hexagon shape. FORMBORE System Tools are designed for many unique profiles and profile sizes, and can potentially remove costly process steps in the manufacturing operation, such as reaming, EDM, or extra milling operations.

Engineered to your specific application requirements

Contact your local LMT-Fette representative for details

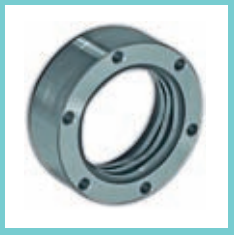
S I M P L Y V E R S A T I L E



Shown: Ordering recommendation for a formbore system tool with cam block, eccentric bushing, insert holder and cutting bodies.

Designed for use on turning lathes and machining centers as well as drilling machines, formbore system tools provide practical versatility, flexibility, time saving and cost reduction in daily work.

The formbore system consists of three components: a driver shaft, body casing and drill chuck, making it possible to make changes in the manufacturing process and to potentially remove reaming, EDM or milling operations.



formbore cam block

with formbore, you can produce a large variety of inner & outer profiles with high precision

Let us know your processing requirements. You will receive our specific tool recommendation and our offer will convince you of the advantages of the new formbore development.

CAT 40 SHANK

SHANK DRIVE VDI 40

RIGHT-ANGLE DRIVE

NEW Tangential Rolling Heads

Products

LMT-Fette is pleased to announce the expansion to its Tangential Thread Rolling system with the addition of the new T120F, T160F, T220F, and T350F Thread Rolling Heads. LMT-Fette rolling attachments have been recognized around the world for economically providing cold forming thread profiles on screw machines and CNC lathes. LMT-Fette has developed the new T3 digit F series rolling attachments to enhance the already wide range of sizes available to thread roll. The new T3 digit F series heads are capable of rolling 5/64″–2″ thread sizes.

Application Area

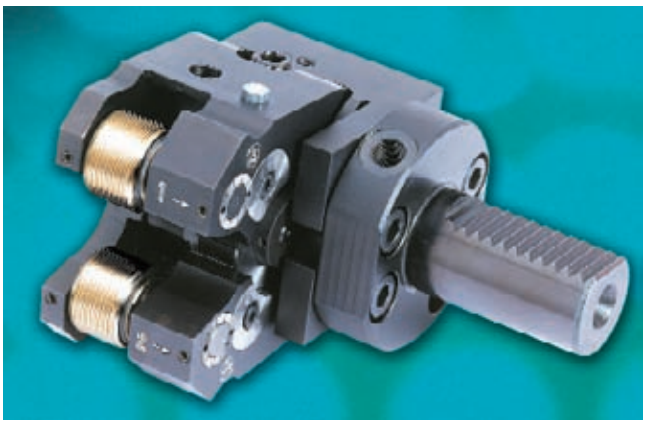
The T3 digit F series heads features fine adjustment for accurate sizing of fine-pitch threads. T350F Tangential Thread Rolling system is designed as a large capacity head capable of rolling sizes from 1/4″–2″ threads. All the T3 digit F series attachments can be setup quickly even outside the machine. Because of the symmetrical adjustment of the rolls with the setting screw, it can be adjusted to the exact setting. The body of the T3 digit F series attachments has been improved with more than 20% less structural length, making installation on all CNC lathes possible.

Materials

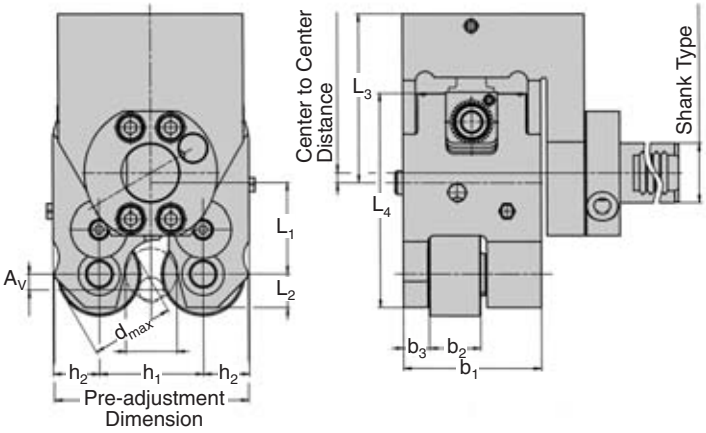
The T3 digit F series Tangential Thread Rolling attachments can be applied to materials that have an elongation factor of greater than 5% and material hardness up to 32 Rc. These conditions provide optimum roll life, depending on the number parts produced.

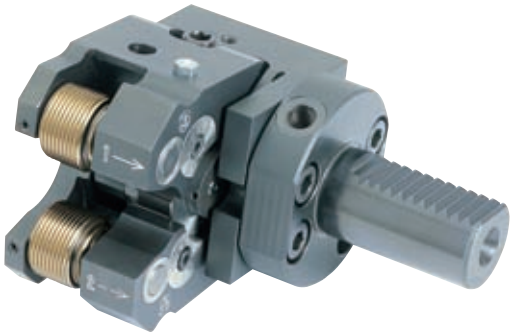
Advantages

The heads in LMT-Fette's full line of Tangential systems are known for easy, quick setup. The T3 digit F series is the answer fine pitch profiles and large profile sizes. The new T3 digit F series Thread Rolling system is designed to cover a wide range of thread sizes and widths. The T3 digit F series is capable of rolling thread behind the shoulder. They are the optimal solution for threads that are short in length. The T3 digit F series are also designed for the NPT (NPTF) thread family from 1/16″–1-1/2″. They have been optimized with new, safe setup roll drives, and new carbide drive axes for high stability and long head life.



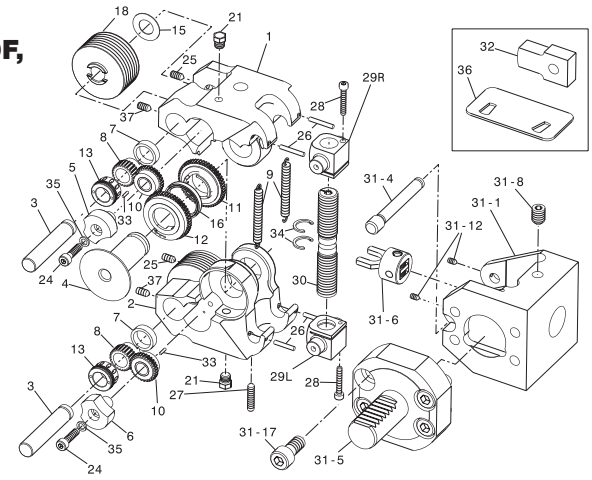
Tangential Side Thread Rolling Attachment T120F, T160F, T220F, T350F





Rolling Attachment	T120F	T160F	T220F	T350F
Model No.	**2408491**	**2408423**	**2407499**	**2408020**
b_1 mm/inch	43.0/1.693	50.0/1.969	70.0/2.756	99.0/3.898
b^2 mm/inch/max.	15.5/0.610	18.5/0.728	26.0/1.024	36.0/1.417
b_3 mm/inch	7.20/0.283	8.50/0.335	13.3/0.524	18.0/0.709
L_1 mm/inch/min.	23.2/0.913	28.2/1.110	37.2/1.465	61.2/2.407
L_1 mm/inch/max.	27.6/1.087	33.4/1.315	46.9/1.846	73.3/2.886
L_2 mm/inch	10.0/0.394	13.0/0.512	17.0/0.669	27.0/1.063
L_3 mm/inch/min.	50.0/1.969	53.0/2.087	74.0/2.913	110.0/4.331
L_4 mm/inch	66.0/2.598	75.2/2.961	107.5/4.232	169.5/6.673
h_1 mm/inch/min.	26.5/1.043	32.0/1.260	48.0/1.890	68.0/2.677
h_1 mm/inch/max.	40.0/1.575	48.0/1.890	74.4/2.929	105.5/4.154
h_2 mm/inch	16.3/0.642	19.9/0.783	23.5/0.925	39.7/1.563
d mm/inch/max.	31.5/1.240	37.5/1.476	53.0/2.087	80.0/3.150
Rolling Attachment – Kg/lbs.	0.65/1.430	1.30/2.870	3.20/7.060	12.5/27.56
Rolling Attachment Holder – Kg/lbs.	0.75/1.650	1.70/3.750	4.30/9.480	7.00/15.44
Thread Roll – Kg/lbs.	0.17/0.370	0.30/0.660	0.85/1.870	2.60/5.730
Total – Kg/lbs.	1.57/3.460	3.30/7.280	8.35/18.41	22.1/48.73

Spare Parts of Rolling Attachments T120F, T160F, T220F, T350F



Part No.	Qty.	Part Description	T120F EDP No.	T160F EDP No.	T220F EDP No.	T350F EDP No.
1		Rolling attachment without Holder	2408491	2408423	2407499	2408020
1[1)]	1	Upper arm	2401302	2172710	2172146	2408023
2[1)]	1	Lower are with pin				
3	2	Shaft	2401305	2172305	2172149	2408026
4	1	Center shaft	2173414	2170305	2172150	2408027
5	1	Bushing	2408655	2408464	2407438	2408028
6	1	Bushing	2408656	2408465	2407439	2408029
7	2	Bearing bushing	2173417	2170308	2172153	2408030
8	2	Pinion	2401306	2170309	2172154	2408031
9	2	Tension Spring	2401307	2172731	2172155	2408043
10	2	Gear with bushing	2173420	2170310	2172156	2408032
11	1	Gear set with coil spring (Parts 11, 12, 16)	2174927	2170311	2172157	2408033
13	2	Bushing	2408647	2408466	2407382	2408037
15	2	Thrust Washer	2173425	2170316	2172161	2408038
16	1	Balance spring (see part no. 11)	2173426	2170317	2172162	2408035
18	2	Thread Roll	See Individual Config.			
21	2	Grease Nipple	2149168	2149168	2149168	2149168
24	2	Cap screw	2141877	2141885	2141899	2141915
25	2	Set screw	2142157	2142157	2142159	2142175
26	4	Straight pin resp. clamping sleeve	2400230	2142565	2213197	2408042
27	1	Set screw	2142118	2148369	2148369	2142130
28	2	Locking screw	2141877	2141878	2408449	2141904
29 L	1	Spindle nut (LH)	2401308	2170323	2172163	2408039
29 R	1	Spindle nut (RH)	2401309	2170322	2172164	2408040
30	1	Spindle	2401310	2172827	2404015	2408041
33	2	DIN 1474 pin (see part no. 2 and 5)	2148843	2148843	2148843	2148842
34	2	Centering ring	–	2172080	2172778	2408044
35	2	Lock washer	2149270	2149269	2149271	2149274
36	1	Reference gage	2401311	2170320	2172166	2408045
37	2	Set screw	2142114	2142115	2142119	2142127
31	1	Attachment Holder Complete, depending on type of machine				
31 - 1	1	Basic Housing	Individual			
31 - 4	1	Bolt	Individual			
31 - 5	1	For Example VDI-shank	Individual			
31 - 6	1	Spring Clip holder complete	2401352	2172817	2172817	2408695
31 - 8	1	Set Screw	2142173	2142138	2142138	2142094
31 - 12	2	Set Screw	2142112	2142112	2142112	2142129
31 - 17	1	Cap Screw	Individual			
32	1	Setting gage	Individual			

[1)] To be used and available only in one piece

NEW Axial Rolling Heads

Products

LMT-Fette is pleased to announce the new Axial F Series and K Series Thread Rolling Heads with flexible-shank connections. This new connection allows one head to fit on several shank types, and on different machines. Shank types available are straight, VDI, HSK, Cat, and Capto.

Application Area

The Axial F Series and K Series Thread Rolling Heads are ideal for shops that require flexibility from one machine to another without purchasing dedicated heads for each machine.

Advantages

LMT-Fette's full line of Thread Rolling Heads with new, flexible connections allow use on multiple machines, whether a Lathe Center or Machining Center, requiring specific shanks.

for right-hand threads

Type F0 C1
to be used stationary only

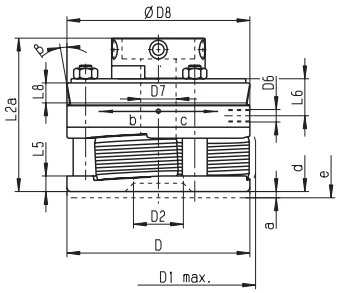
Type K0 C1
used stationary or rotating

inclined position of rolls = 4°
weight without rolls = approx. 0.5kg (1.1 lbs.)

Cat. No. 7101

for left-hand threads

Type F0L C1 resp. K0L C1
Dimensions as right-hand threads



Rolling Head	EDP No.
F0 C1	2430900
F0L C1	2430901
K0 C1	2430902
K0L C1	2430903

Dimensions mm/inch	
D	50mm/1.968
D1max.	54.5mm/2.146
D2	11.5mm/.453
D6	M5
D8[1)]	55mm/2.165
D7	6.5mm/.256
L2a	46mm/1.811
L5	5mm/.197
L6	5.7mm/.224
L8[1)]	13.9mm/.547
a	2mm/.079
α	50°
ß[1)]	10°

[1)] only for Type K

Change Shanks

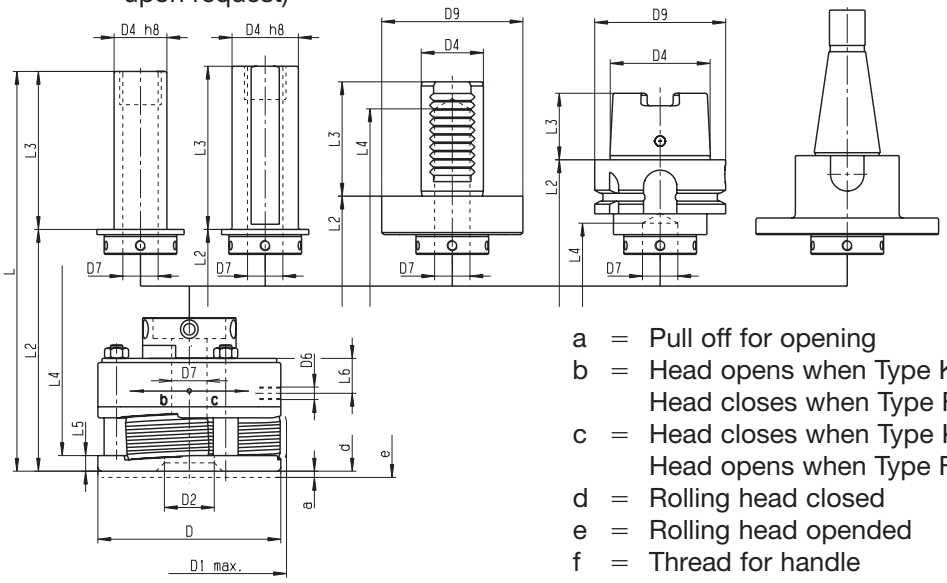
Type . . . -C1
Cat. No. 71510

Straight Shank (with Flat upon request)

VDI Shank

HSK Shank

Others e.g. Tapered Shanks (upon request)

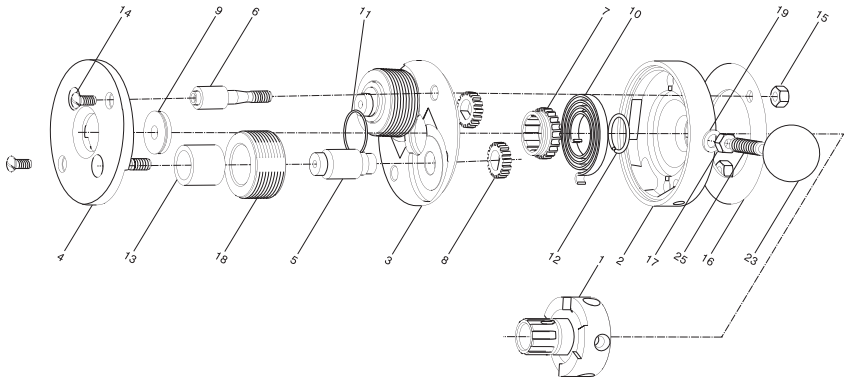


a = Pull off for opening
b = Head opens when Type K0 or F0L
Head closes when Type F0 or K0L
c = Head closes when Type K0 or F0L
Head opens when Type F0 or K0L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R20-C1	R25-C1	R3/4-C1	R1-C1	R1 1/4-C1	VDI20-C1	VDI25-C1	VDI30-C1	HSK-A63-C1
Dimensions mm/inch	**Shank 20mm Ø /.787**	**Shank 25mm Ø / .984**	**Shank 3/4″ Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank VDI20**	**Shank VDI25**	**Shank VDI30**	**Shank HSK-A63**
D4	20mm/.787	25mm/.984	19.05mm..750	25.4mm/1.000	31.75mm/1.250	20mm/.787	25mm/.984	30mm/1.181	48mm/1.890
D9	–	–	–	–	–	50mm/1.969	58mm/2.283	68mm/2.677	63mm/2.480
L	108.5mm/4.272	108.5mm/4.272	108.5mm/4.272	108.5mm/4.272	108.5mm/4.272	104.5mm/4.114	112.5mm/4.429	119.5mm/4.705	121mm/4.764
L2	48.5mm/1.909	48.5mm/1.909	48.5mm/1.909	48.5mm/1.909	48.5mm/1.909	64.5mm/2.539	64.5mm/2.539	64.5mm/2.539	89mm/3.504
L3	60mm/2.362	60mm/2.362	60mm/2.362	60mm/2.362	60mm/2.362	40mm/1.575	48mm/1.890	55mm/2.165	32mm/1.260
L4	–	–	–	–	–	62mm/2.440	97mm/3.819	104mm/4.094	54mm/2.126
EDP No.	**2430980**	**2430973**	**2430981**	**2430977**	**2430982**	**2430984**	**2430986**	**2430988**	**2430990**

Shanks will be delivered with the according fastening screws.

Spare Parts for Rolling Heads F0 C1 and K0 C1



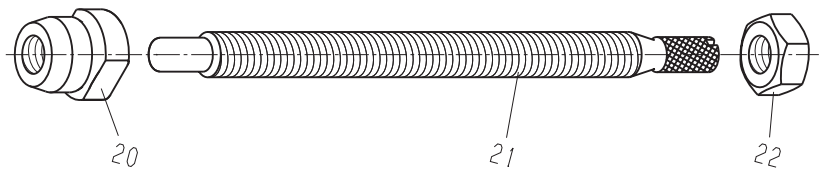
Rolling Head			F0 C1	F0L C1 [1]	K0 C1	K0L C1 [1]
Catalog Number			7101	7101	7101	7101
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2430900	2430901	2430902	2430903
1	1	Clutch	2430904	2430905		2430904
2	1	Spring housing	2164502	2164511	2164543	2168919
3	1	Centre plate	2164503	2164516	2164544	2168920
4	1	Front plate	2164504	2164519	2164545	2168921
5	2	Eccentric spindles	2164505			
6	2	Spacer studs	2164506			
7	1	Centre gear	2164507	2164520	2164507	2164520
8	2	Spur gear	2164508			
9	1	Guide bushing	individual			
10	1	Coil spring	2164512	2164521		2164512
11	1	Circlip	2164513			
12	1	Circlip	2164514			
13	2	Carbide bushing	2167472			
14	2	Front plate screw	2142488			
15	2	Hexagon nut	2148397			
16	1	Ring washer	2164515			
17	1	Hexagon nut	2148397			
18	2	Thread roll	individual			
19	1	Washer	2148867			
23	1	Ball	2141699			
24	2	Set screw [3]			2142064 + 2142062 + 2142065	
25	1	Handle	2148840			

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 70. Please order seperate.
[3] Part 24 not shown in the view (Locking screws for Adjustment with Type K)



Internal stop*			IS0-C1	IS0L-C1 [1]
Catalog Number			71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.
		Internal stop complete	2430906	2430908
20	1	Stop screw body	2430907	2430909
21	1	Stop screw	2164518	2164523
22	1	Hexagon nut	2168387	2168389

*Only required for machines without controlled feed stop. If required, please order additionally.
[1] L = For Left-hand threads

for right-hand threads

Type F1 C1
to be used stationary only

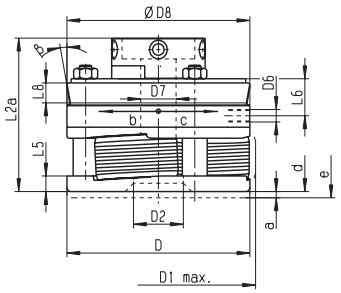
Type K1 C1
used stationary or rotating

inclined position of rolls = 3° 30′
weight without rolls = approx. 0.8kg (1.76 lbs.)

Cat. No. 7104

for left-hand threads

Type F1L C1 resp. K1L C1
Dimensions as right-hand threads



Rolling Head	EDP No.
F1 C1	2430910
F1L C1	2430911
K1 C1	2430912
K1L C1	2430913

D	64mm/2.520
D1max.	70mm/2.756
D2	17mm/.669
D6	M5-Type “K” / M6-Type “F”
D7	11.4mm/.449
D8 [1]	64mm/2.520
L2a	57mm/2.244
L5	6mm/.236
L6	7.5mm/.295
L8 [1]	9.5mm/.374
a	2mm/.079
α	60°
β [1]	10°

[1] only for Type K

Change Shanks

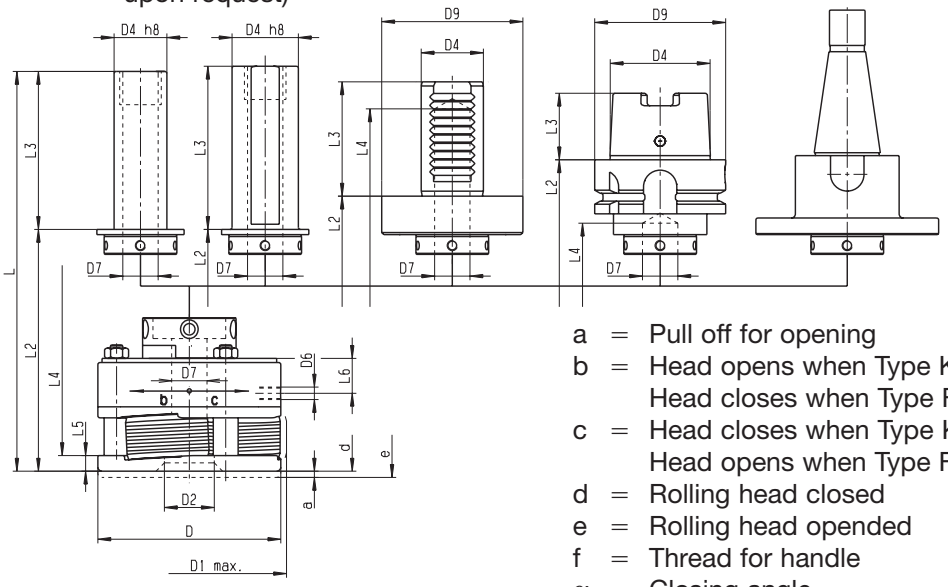
Type . . . -C1
Cat. No. 71510

Straight Shank (with Flat upon request)

VDI Shank

HSK Shank

Others e.g. Tapered Shanks (upon request)

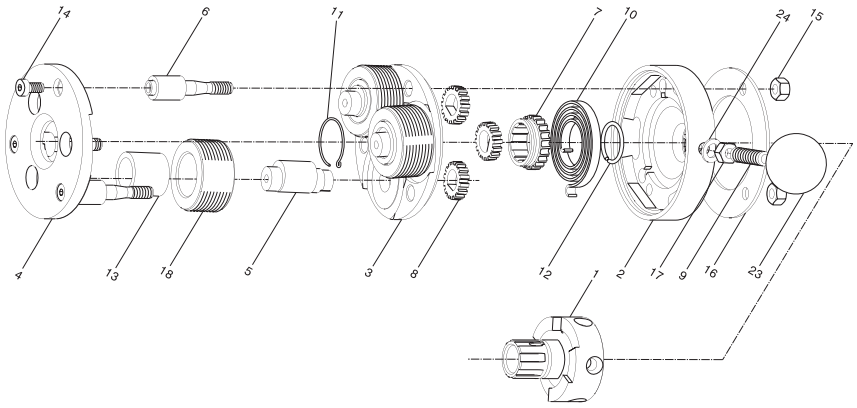


a = Pull off for opening
b = Head opens when Type K1 or F1L
Head closes when Type F1 or K1L
c = Head closes when Type K1 or F1L
Head opens when Type F1 or K1L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R20-C1	R25-C1	R3/4-C1	R1-C1	R1 1/4-C1	VDI20-C1	VDI25-C1	VDI30-C1	HSK-A63-C1
Dimensions mm/inch	**Shank 20mm/.787 Ø**	**Shank 25mm/.984 Ø**	**Shank 3/4″ Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank VDI20**	**Shank VDI25**	**Shank VDI30**	**Shank HSK-A63**
D4	20mm/.787	25mm/.984	19.05mm/.750	25.4mm/1.000	31.75mm/1.250	20mm/.787	25mm/.984	30mm/1.181	48mm/1.890
D9	–	–	–	–	–	50mm/1.969	58mm/2.283	68mm/2.677	63mm/2.480
L	119.5mm/4.705	119.5mm/4.705	119.5mm/4.705	119.5mm/4.705	119.5mm/4.705	115.5mm/4.547	123.5mm/4.862	130.5mm/5.138	132mm/5.197
L2	59.5mm/2.343	59.5mm/2.343	59.5mm/2.343	59.5mm/2.343	59.5mm/2.343	75.5mm/2.972	75.5mm/2.972	75.5mm/2.974	100mm/3.937
L3	60mm/2.362	60mm/2.362	60mm/2.362	60mm/2.362	60mm/2.362	40mm/1.575	48mm/1.890	55mm/2.165	32mm/1.260
L4	–	–	–	–	-	72mm/2.835	107mm/4.213	114mm/4.488	64mm/2.520
EDP No.	**2430980**	**2430973**	**2430981**	**2430977**	**2430982**	**2430984**	**2430986**	**2430988**	**2430990**

Shanks will be delivered with the according fastening screws.

Spare Parts for Rolling Heads F1 C1 and K1 C1



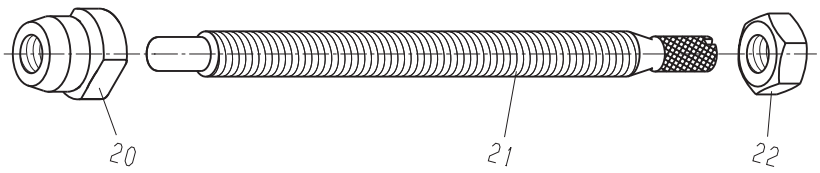
Rolling Head			F1 C1	F1L C1 [1]	K1 C1	K1L C1 [1]
Catalog Number			7104	7104	7104	7104
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2430910	2430911	2430912	2430913
1	1	Clutch	2430914	2430915		2430914
2	1	Spring housing	2164634	2164649	2164719	2164722
3	1	Centre plate	2164635	2164650	2164720	2164723
4	1	Front plate	2164636	2164651	2164721	2164724
5	3	Eccentric spindles	2164637			
6	3	Spacer studs	2164638			
7	1	Centre gear	2164639	2164652	2164639	2164652
8	3	Spur gear	2164640			
9	1	Handle	2148841		2148840	
10	1	Coil spring	2164641	2164653		2164641
11	1	Circlip	2164642			
12	1	Circlip	2164643			
13	3	Carbide bushing	2164705			
14	3	Cap screw	2148736			
15	3	Hexagon nut	2148397			
16	1	Ring washer	2164644			
17	1	Hexagon nut	2148393		2148397	
18	3	Thread roll	individual			
19	2	Set screw [3]			2142064	
19	1	Set screw [3]			2142062	
19	1	Set screw [3]			2142065	
23	1	Ball	2141700		2141699	
24	1	Washer	2144250		2148867	

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 72. Please order seperate.
[3] Part 19 not shown in the view (Locking screws for Adjustment with Type K)



Internal stop*			IS1-C1	IS1L-C1 [1]
Catalog Number			71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.
		Internal stop complete	2430916	2430917
20	1	Stop screw body	2164645	2164654
21	1	Stop screw	2164646	2164655
22	1	Hexagon nut	2166124	2166125

*Only required for machines without controlled feed stop. If required, please order additionally.
[1] L = For Left-hand threads

for right-hand threads

Type F12 C1
to be used stationary only

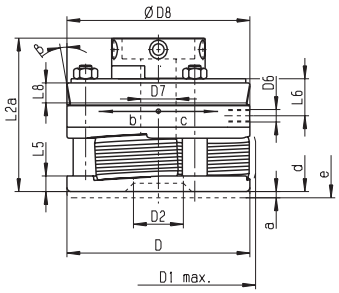
Type K12 C1
used stationary or rotating

inclined position of rolls = 1° 50′
weight without rolls = approx. 0.8kg (1.76 lbs.)

Cat. No. 7105

for left-hand threads

Type F12L C1 resp. K12L C1
Dimensions as right-hand threads



Rolling Head	EDP No.
F12 C1	2430918
F12L C1	2430919
K12 C1	2430938
K12L C1	2430939

Dimensions mm/inch	
D	64mm/2.520
D1max.	70mm/2.756
D2	20mm/.787
D6	M5-Type “K” / M6-Type “F”
D7	11.4mm/.449
D8 [1]	64mm/2.520
L2a	58mm/2.283
L5	6mm/.236
L6	7.5mm/.295
L8 [1]	9.5mm/.375
a	2mm/.079
α	60°
β [1]	10°

[1] only for Typ K

Change Shanks

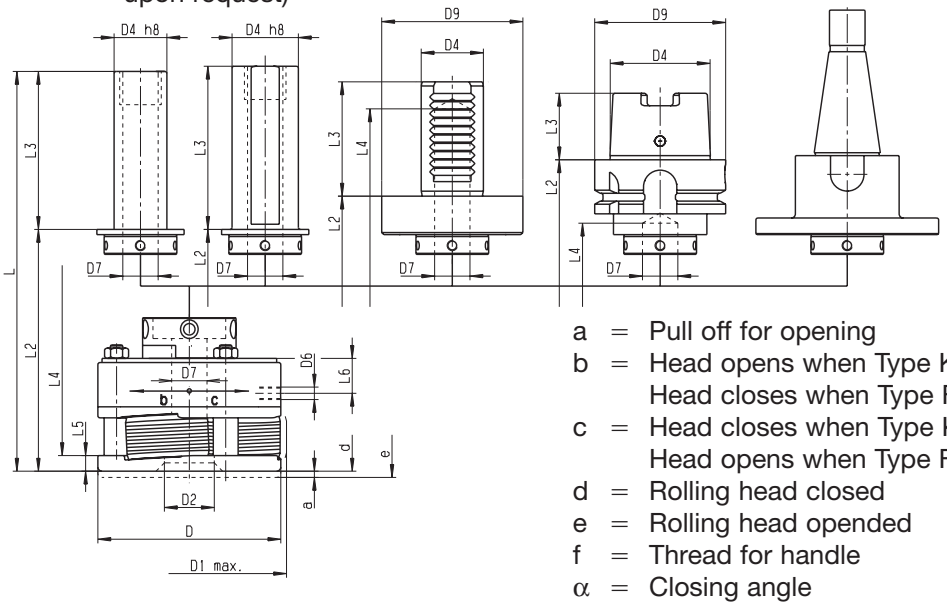
Type . . . -C1
Cat. No. 71510

Straight Shank (with Flat upon request)

VDI Shank

HSK Shank

Others e.g. Tapered Shanks (upon request)

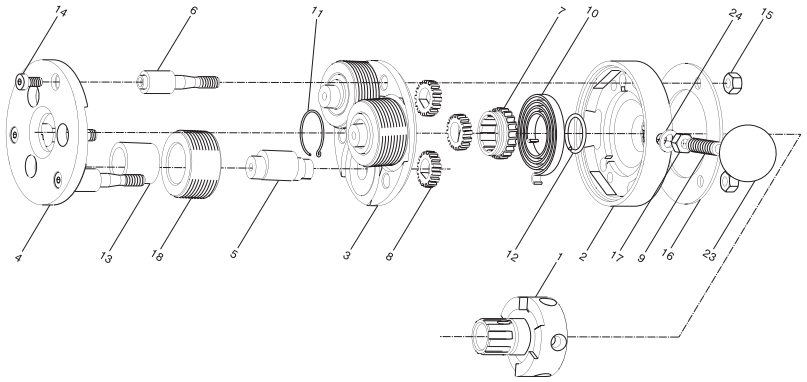


a = Pull off for opening
b = Head opens when Type K12 or F12L
Head closes when Type F12 or K12L
c = Head closes when Type K12 or F12L
Head opens when Type F12 or K12L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R20-C1	R25-C1	R3/4-C1	R1-C1	R1 1/4-C1	VDI20-C1	VDI25-C1	VDI30-C1	HSK-A63-C1
Dimensions mm/inch	**Shank 20mm/.787 Ø**	**Shank 25mm/.984 Ø**	**Shank 3/4″ Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank VDI20**	**Shank VDI25**	**Shank VDI30**	**Shank HSK-A63**
D4	20mm/.787	25mm/.984	19.05mm/.750	25.4mm/1.000	31.75mm/1.250	20mm/.787	25mm/.984	30mm/1.181	48mm/1.890
D9	–	–	–	–	–	50mm/1.969	58mm/2.283	68mm/2.677	63mm/2.480
L	120.5mm/4.744	120.5mm/4.744	120.5mm/4.744	120.5mm/4.744	120.5mm/4.744	116.5mm/4.587	124.5mm/4.902	131.5mm/5.177	133mm/5.236
L2	60.5mm/2.381	60.5mm/2.381	60.5mm/2.381	60.5mm/2.381	60.5mm/2.381	76.5mm/3.012	76.5mm/3.012	76.5mm/3.012	101mm/3.976
L3	60mm/2.362	60mm/2.362	60mm/2.362	60mm/2.362	60mm/2.362	40mm/1.575	48mm/1.890	55mm/2.165	32mm/1.260
L4	–	–	–	–	–	73mm/2.874	108mm/4.252	115mm/4.528	65mm/2.559
EDP No.	**2430980**	**2430973**	**2430981**	**2430977**	**2430982**	**2430984**	**2430986**	**2430988**	**2430990**

Shanks will be delivered with the according fastening screws.

Spare Parts for Rolling Heads F12 C1 and K12 C1



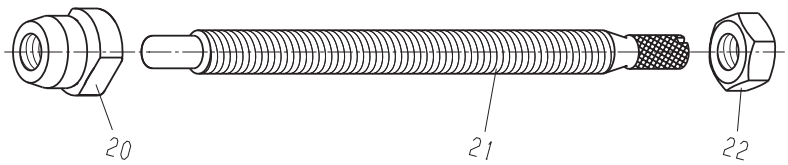
Rolling Head			F12 C1	F12L C1 [1]	K12 C1	K12L C1 [1]
Catalog Number			7105	7105	7105	7105
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2430918	2430919	2430938	2430939
1	1	Clutch	2430914	2430915		2430914
2	1	Spring housing	2164634	2164649	2164719	2164722
3	1	Centre plate	2164735	2164742	2164756	2164758
4	1	Front plate	2164736	2164743	2164757	2164759
5	3	Eccentric spindles	2164737			
6	3	Spacer studs	2164738			
7	1	Centre gear	2164739	2164744	2164739	2164744
8	3	Spur gear	2164740			
9	1	Handle	2148841		2148840	
10	1	Coil spring	2164641	2164653		2164641
11	1	Circlip	2164642			
12	1	Circlip	2164643			
13	3	Carbide bushing	2173512			
14	3	Cap screw	2148736			
15	3	Hexagon nut	2148397			
16	1	Ring washer	2164644			
17	1	Hexagon nut	2148393		2148397	
18	3	Thread roll	individual			
19	2	Set screw [3]			2142064	
19	1	Set screw [3]			2142062	
19	1	Set screw [3]			2142065	
23	1	Ball	2141700		2141699	
24	1	Washer	2144250		2148867	
25	3	Washer	2164741			

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 74. Please order seperate.
[3] Part 19 not shown in the view (Locking screws for Adjustment with Type K)



Internal stop*			IS1-C1	IS1L-C1 [1]
Catalog Number			71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.
		Internal stop complete	2430916	2430917
20	1	Stop screw body	2164645	2164654
21	1	Stop screw	2164646	2164655
22	1	Hexagon nut	2166124	2166125

*Only required for machines without controlled feed stop. If required, please order additionally.
[1] L = For Left-hand threads

for right-hand threads

Type F1223 C1
to be used stationary only

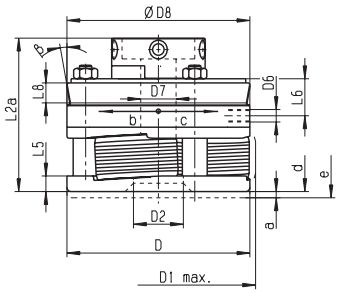
Type K1223 C1
used stationary or rotating

inclined position of rolls = 1° 50′
weight without rolls = approx. 0.8kg
(1.76 lbs.)

Cat. No. 7106

for left-hand threads

Type F1223L C1 resp. K1223L C1
Dimensions as right-hand threads



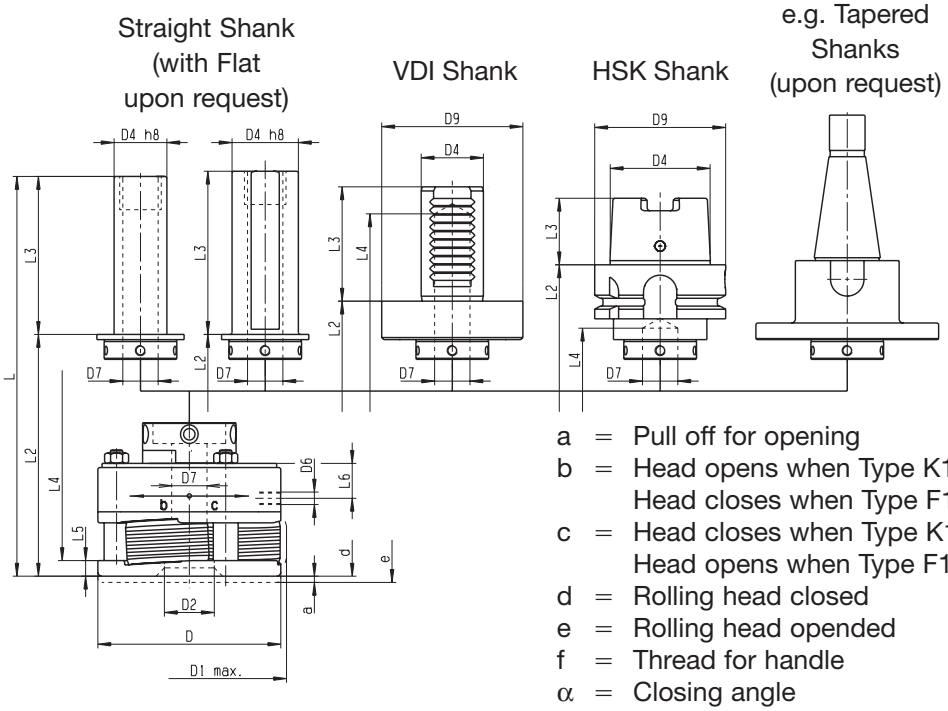
Rolling Head	EDP No.
F1223 C1	2430920
F1223L C1	2430921
K1223 C1	2430922
K1223L C1	2430923

Dimensions mm/inch	
D	56mm/2.205
D1max.	58mm/2.283
D2	16mm/.630
D6	M5-Type “K” / M8x1-Type “F”
D7	8.2mm/.323
D8 [1]	56mm/2.205
L2a	58mm/2.283
L5	5mm/.197
L6	7.5mm/.295
L8 [1]	9.5mm/.375
a	2mm/.079
α	50°
β [1]	10°

[1] only for Type K

Change Shanks

Type . . . -C1
Cat. No. 71510

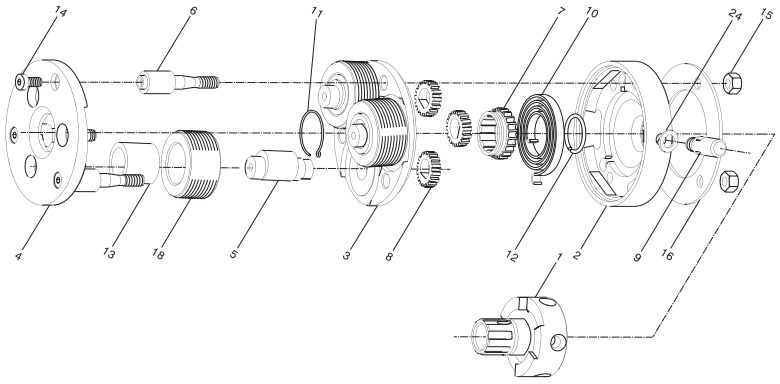


a = Pull off for opening
b = Head opens when Type K1223 or F1223L
Head closes when Type F1223 or K1223L
c = Head closes when Type K1223 or F1223L
Head opens when Type F1223 or K1223L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R20-C1	R25-C1	R3/4-C1	R1-C1	R1-1/4-C1	VDI20-C1	VDI25-C1	VDI30-C1	HSK-A63-C1
Dimensions mm/inch	**Shank 20mm/.787 Ø**	**Shank 25mm/.984 Ø**	**Shank 3/4″ Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank VDI20**	**Shank VDI25**	**Shank VDI30**	**Shank HSK-A63**
D4	20mm/.787	25mm/.984	19.05mm/.750	25.4mm/1.000	31.75mm/1.250	20mm/.787	25mm/.984	30mm/1.181	48mm/1.890
D9	–	–	–	–	–	50mm/1.969	58mm/2.283	68mm/2.677	63mm/2.480
L	120.5mm/4.744	120.5mm/4.744	120.5mm/4.744	120.5mm/4.744	120.5mm/4.744	116.5mm/4.587	124.5mm/4.902	131.5mm/5.177	133mm/5.236
L2	60.5mm/2.381	60.5mm/2.381	60.5mm/2.381	60.5mm/2.381	60.5mm/2.381	76.5mm/3.012	76.5mm/3.012	76.5mm/3.012	101mm/3.976
L3	60mm/2.362	60mm/2.362	60mm/2.362	60mm/2.362	60mm/2.362	40mm/1.575	48mm/1.890	55mm/2.165	32mm/1.260
L4	–	–	–	–	–	74mm/2.913	109mm/2.291	116mm/4.670	66mm/2.598
EDP No.	**2430980**	**2430973**	**2430981**	**2430977**	**2430982**	**2430984**	**2430986**	**2430988**	**2430990**

Shanks will be delivered with the according fastening screws

Spare Parts for Rolling Heads F1223 C1 and K1223 C1



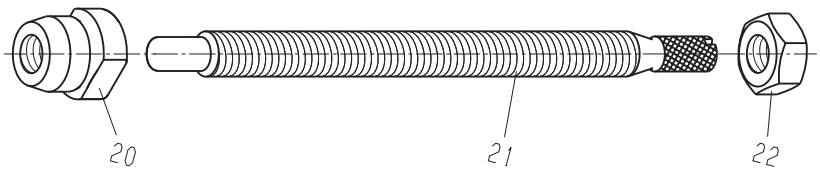
Rolling Head			F1223 C1	F1223L C1 [1]	K1223 C1	K1223L C1 [1]
Catalog Number			7106	7106	7106	7106
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2430920	2430921	2430922	2430923
1	1	Clutch	2430924	2430925		2430924
2	1	Spring housing	2164821	2168914	2164837	2167219
3	1	Centre plate	2164822	2168909	2164838	2241552
4	1	Front plate	2164823	2168910	2164839	2241553
5	3	Eccentric spindles	2164824			
6	3	Spacer studs	2164825			
7	1	Centre gear	2164826	2168911	2164826	2168911
8	3	Spur gear	2164827			
9	1	Closing rod / Handle	2164828		2148840	
10	1	Coil spring	2164829	2164840		2164829
11	1	Circlip	2164830			
12	1	Circlip	2164831			
13	3	Carbide bushing	2168892			
14	3	Cap screw	2148736			
15	3	Hexagon nut	2148397			
16	1	Ring washer	2164832			
17	1	Hexagon nut			2148397	
18	3	Thread roll	individual			
19	2	Set screw 3)			2142063	
19	1	Set screw 3)			2142061	
19	1	Set screw 3)			2142065	
23	1	Ball			2141699	
24	1	Washer	2144251		2148867	

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 76. Please order seperate.
[3] Part 19 not shown in the view (Locking screws for Adjustment with Type K)



Internal stop*			IS1223-C1	IS1223L-C1 [1]
Catalog Number			71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.
		Internal stop complete	2430926	2430928
20	1	Stop screw body	2164833	2168912
21	1	Stop screw	2430927	2430929
22	1	Hexagon nut	2168388	2168398

*Only required for machines without controlled feed stop. If required, please order additionally.
[1] L = For Left-hand threads

for right-hand threads

Type F2 C2
to be used stationary only

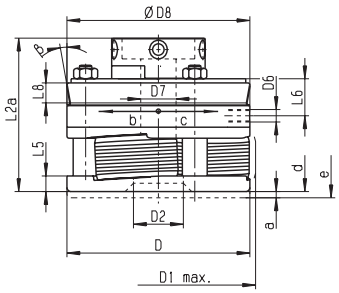
Type K2 C2
used stationary or rotating

inclined position of rolls = 3°
weight without rolls = approx. 1.8kg (3.96 lbs.)

Cat. No. 7107

for left-hand threads

Type F2L C2 resp. K2L C2
Dimensions as right-hand threads



Rolling Head	EDP No.
F2 C2	2249894
F2L C2	2430931
K2 C2	2430932
K2L C2	2430933

Dimensions mm/inch	
D	88mm/3.465
D1max.	93.5mm/3.681
D2	24mm/.944
D6	M6
D7	17mm
D8 [1]	88mm/3.465
L2a	74.5mm/2.933
L5	7.5mm/.295
L6	16.8mm/.661
L8 [1]	9mm/.354
a	3mm/.118
α	60°
β [1]	10°

[1] only for Typ K

Change Shanks

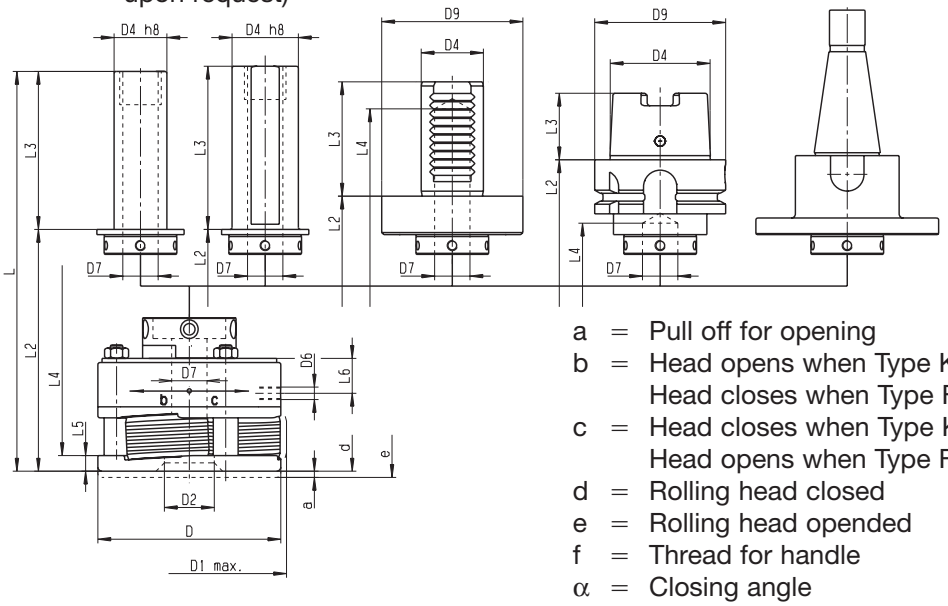
Type . . . -C2
Cat. No. 71510

Straight Shank (with Flat upon request)

VDI Shank

HSK Shank

Others e.g. Tapered Shanks (upon request)

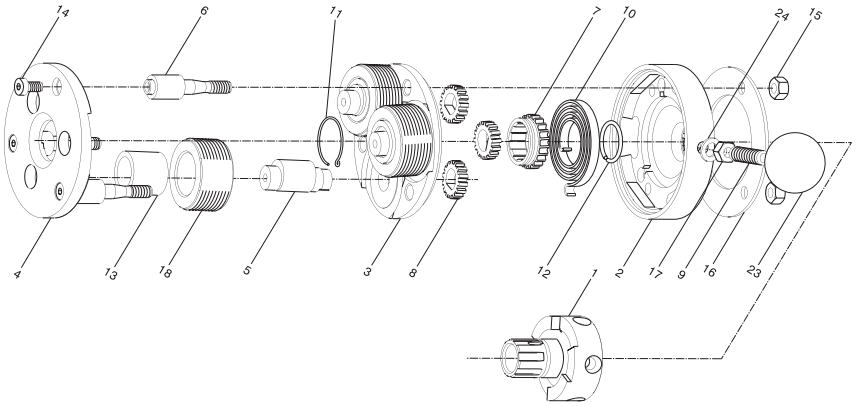


a = Pull off for opening
b = Head opens when Type K2 or F2L
Head closes when Type F2 or K2L
c = Head closes when Type K2 or F2L
Head opens when Type F2 or K2L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R25-C2	R30-C2	R1-C2	R1 1/4-C2	R1 1/2-C2	VDI25-C2	VDI30-C2	VDI40-C2	HSK-A63-C2
Dimensions mm/inch	**Shank 25mm/.984 Ø**	**Shank 30mm/1.181 Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank 1-1/2″ Ø**	**Shank VDI25**	**Shank VDI30**	**Shank VDI40**	**Shank HSK-A63**
D4	25mm/.984	30mm/1.181	25.4mm/1.000	31.75mm/1.250	38.1mm/1.500	25mm/.984	30mm/1.181	40mm/1.575	48mm/1.890
D9	–	–	–	–	–	58mm/2.283	68mm/2.677	83mm/3.268	63mm/2.481
L	152mm/5.984	176mm/6.574	152mm/5.984	167mm/6.574	167mm/6.574	141mm/5.612	148mm/5.787	156mm/6.141	150mm/5.905
L2	77mm/3.032	77mm/3.032	77mm/3.032	77mm/3.032	77mm/3.032	93mm/2.874	93mm/2.874	93mm/2.874	118mm/4.646
L3	75mm/2.953	90mm/3.543	75mm/2.953	90mm/3.543	90mm/3.543	48mm/1.890	55mm/2.166	63mm/2.481	32mm/1.260
L4	–	–	–	–	–	90mm/3.543	123mm	134mm	84mm
EDP No.	**2249897**	**2430967**	**2249899**	**2430969**	**2430971**	**2249901**	**2249903**	**2249905**	**2249907**

Shanks will be delivered with the according fastening screws

Spare Parts for Rolling Heads F2 C2 and K2 C2



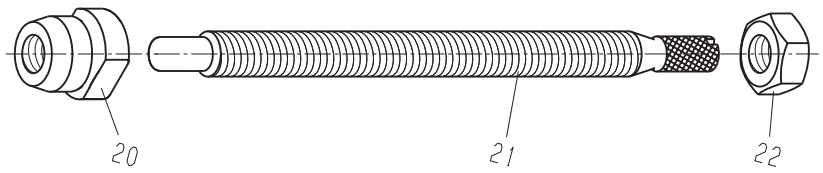
Rolling Head			F2C2	F2L C2 [1]	K2 C2	K2L C2 [1]
Catalog Number			7107	7107	7107	7107
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2249894	2430931	2430932	2430933
1	1	Clutch	2249896	2430935		2249896
2	1	Spring housing	2164767	2164782	2164896	2164899
3	1	Centre plate	2164768	2164783	2164897	2164900
4	1	Front plate	2164769	2164784	2164898	2164901
5	3	Eccentric spindles	2164770			
6	3	Spacer studs	2164771			
7	1	Centre gear	2164772	2164785	2164772	2164785
8	3	Spur gear	2164773			
9	1	Handle	2148841			
10	1	Coil spring	2164774	2164786		2164774
11	1	Circlip	2164775			
12	1	Circlip	2164776			
13	3	Carbide bushing	2164887			
14	3	Cap screw	2142999			
15	3	Hexagon nut	2148393			
16	1	Ring washer	2164777			
17	1	Hexagon nut	2148393			
18	3	Thread roll	individual			
19	2	Set screw 3)			2142077	
19	1	Set screw 3)			2142075	
19	1	Set screw 3)			2142078	
23	1	Ball	2141700			
24	1	Washer	2144250			

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 78. Please order seperate.
[3] Part 19 not shown in the view (Locking screws for Adjustment with Type K)



Internal stop*			IS2-C2	IS2L-C2 [1]
Catalog Number			71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.
		Internal stop complete	2430936	2430937
20	1	Stop screw body	2164779	2164787
21	1	Stop screw	2164778	2164788
22	1	Hexagon nut	2148390	2148700

*Only required for machines without controlled feed stop. If required, please order additionally.
[1] L = For Left-hand threads

Axial Rolling Heads

for right-hand threads

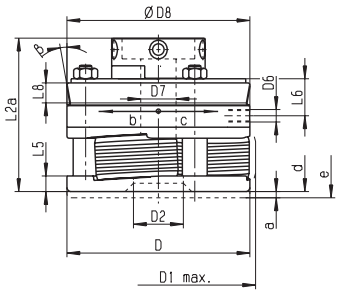
Type F23 C2
to be used stationary only

Type K23 C2
used stationary or rotating

inclined position of rolls = 1° 25′
weight without rolls = approx. 1.8 kg (3.97 lbs.)
Cat. No. 7109

for left-hand threads

Type F23L C2 resp. K23L C2
Dimensions as right-hand threads



Rolling Head	EDP No.
F23 C2	2430940
F23L C2	2430941
K23 C2	2430942
K23L C2	2430943

Dimensions mm/inch	
D	88mm/3.465
D1max.	93.5mm/3.682
D2	28mm/1.103
D6	M6
D7	17mm/.670
D8 [1]	88mm/3.465
L2a	75.5mm/2.980
L5	7.5mm/.296
L6	16.8mm/.662
L8 [1]	9mm/.355
a	3mm/.118
α	60°
β [1]	10°

[1] only for Type K

Change Shanks

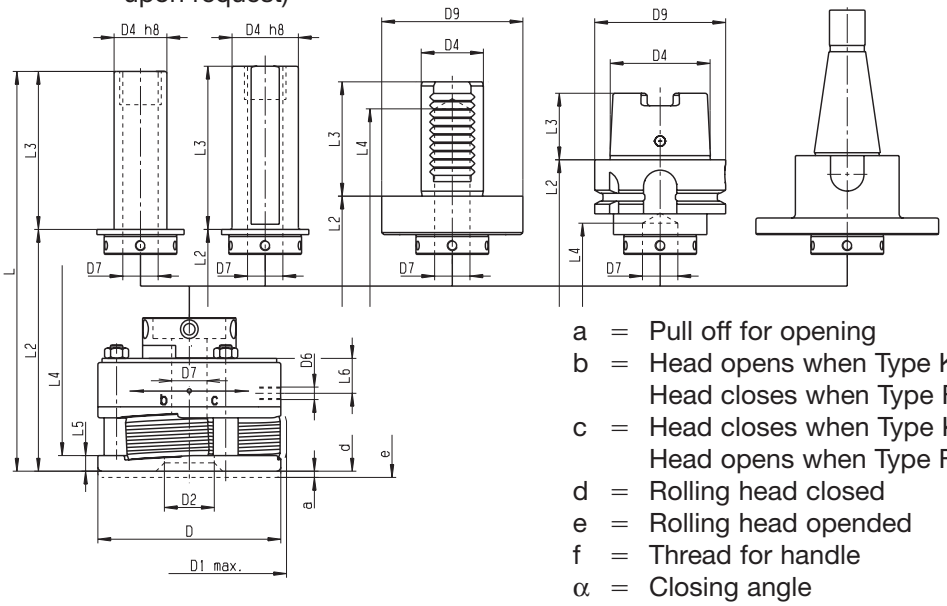
Type . . . -C2
Cat. No. 71510

Straight Shank (with Flat upon request)

VDI Shank

HSK Shank

Others e.g. Tapered Shanks (upon request)

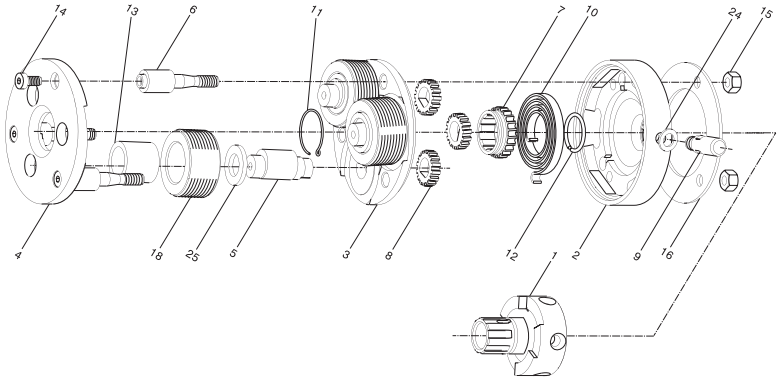


a = Pull off for opening
b = Head opens when Type K23 or F23L
Head closes when Type F23 or K23L
c = Head closes when Type K23 or F23L
Head opens when Type F23 or K23L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R25-C2	R30-C2	R1-C2	R1 1/4-C2	R1 1/2-C2	VDI25-C2	VDI30-C2	VDI40-C2	HSK-A63-C2
Dimensions mm/inch	**Shank 25mm/.984 Ø**	**Shank 30mm/1.182 Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank 1-1/2″ Ø**	**Shank VDI25**	**Shank VDI30**	**Shank VDI40**	**Shank HSK-A63**
D4	25mm/.984	30mm/1.182	25.4mm/1.000	31.75mm/1.250	38.1mm/1.500	25mm/.984	30mm/1.182	40mm/1.575	48mm/1.890
D9	–	–	–	–	–	58mm/2.284	68mm/2.678	83mm/3.268	63mm/2.481
L	153mm/6.030	168mm/6.620	153mm/6.030	168mm/6.620	168mm/6.620	142mm/5.590	149mm/5.870	157mm/6.190	151mm/5.950
L2	78mm/3.070	78mm/3.070	78mm/3.070	78mm/3.070	78mm/3.070	94mm/3.700	94mm/3.700	94mm/3.700	119mm/4.690
L3	75mm/2.953	90mm/3.544	75mm/2.953	90mm/3.544	90mm/3.544	48mm/1.890	55mm/2.166	63mm/2.481	32mm/1.260
L4	–	–	–	–	–	91mm/3.583	124mm/4.882	135mm/5.315	85mm/3.347
EDP No.	**2249897**	**2430967**	**2249899**	**2430969**	**2430971**	**2249901**	**2249903**	**2249905**	**2249907**

Shanks will be delivered with the according fastening screws

Spare Parts for Rolling Heads F23 C2 and K23 C2



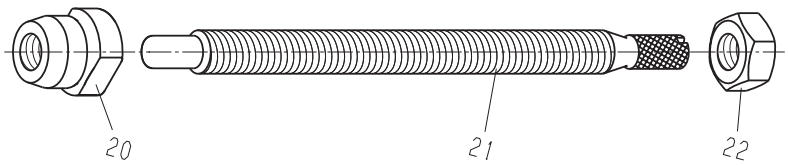
Rolling Head			F23 C2	F23L C2 [1]	K23 C2	K23L C2 [1]
Catalog Number			7108	7108	7108	7108
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2430940	2430941	2430942	2430943
1	1	Clutch	2249896	2430935		2249896
2	1	Spring housing	2164767	2164782	2164896	2164899
3	1	Centre plate	2164929	2164936	2164927	2167284
4	1	Front plate	2164930	2164937	2164928	2167285
5	3	Eccentric spindles	2164931			
6	3	Spacer studs	2164932			
7	1	Centre gear	2164933	2164938	2164933	2164938
8	3	Spur gear	2164934			
9	1	Handle	2148841			
10	1	Coil spring	2164774	2164786		2164774
11	1	Circlip	2164775			
12	1	Circlip	2164776			
13	3	Carbide bushing	2164705			
14	3	Cap screw	2142999			
15	3	Hexagon nut	2148393			
16	1	Ring washer	2164777			
17	1	Hexagon nut	2148393			
18	3	Thread roll	individual			
19	2	Set screw [3]	2142077			
19	1	Set screw [3]	2142075			
19	1	Set screw [3]	2142078			
23	1	Ball	2141700			
24	1	Washer	2144250			
25	3	Washer	2164935			

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 80. Please order seperate.
[3] Part 19 not shown in the view (Locking screws for Adjustment with Type K)



Internal stop*			IS2-C2	IS2L-C2 [1]
Catalog Number			71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.
		Internal stop complete	2430936	2430937
20	1	Stop screw body	2164779	2164787
21	1	Stop screw	2164778	2164788
22	1	Hexagon nut	2148390	2148700

*Only required for machines without controlled feed stop. If required, please order additionally.
[1] L = For Left-hand threads

for right-hand threads

Type F233400 C2
to be used stationary only

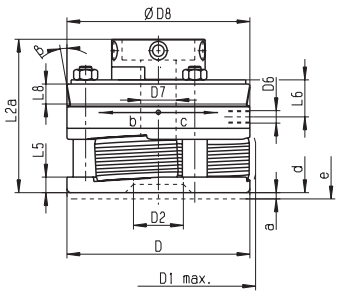
Type K233400 C2
used stationary or rotating

inclined position of rolls = 1° 15′
weight without rolls = approx. 2.7kg (5.95 lbs.)

Cat. No. 7109

for left-hand threads

Type F233400L C2 resp. K233400L C2
Dimensions as right-hand threads



Rolling Head	EDP No.
F233400 C2	2430944
F233400L C2	2430945
K233400 C2	2430946
K233400L C2	2430947

Dimensions mm/inch	
D	96mm/3.780
D1max.	115mm/4.528
D2	39mm/1.536
D6	M6-Type “K” / M8-Type “F”
D7	28mm/1.110 [2] 22.5mm/.890 [2]
D8 [1]	96mm/3.780
L2a	91mm/3.590
L5	8mm/.315
L6	9mm/.355
L8 [1]	9.5mm/.375
a	3mm/.118
α	30°
β [1]	10°

[1] only for Typ K

Change Shanks

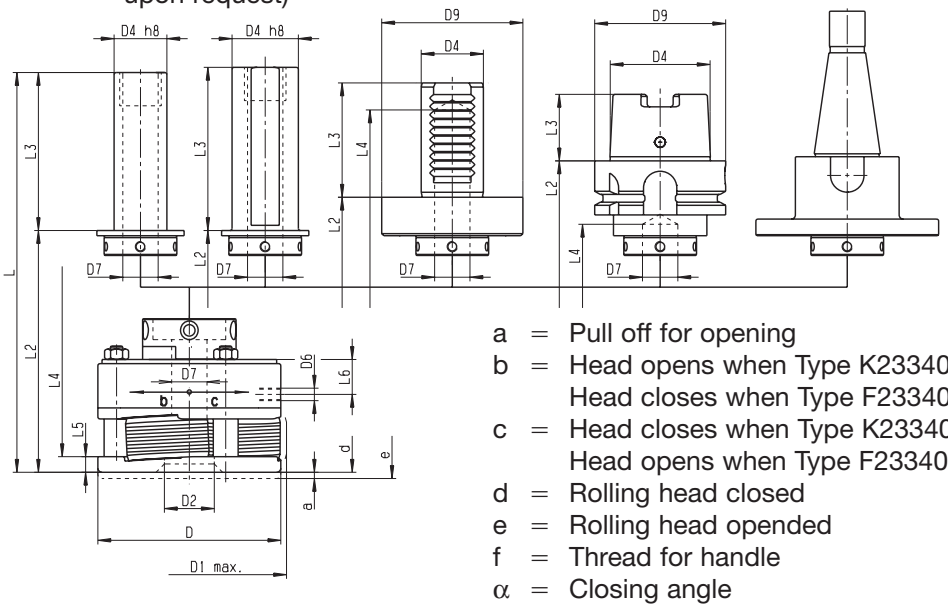
Type . . . -C2
Cat. No. 71510

Straight Shank (with Flat upon request)

VDI Shank

HSK Shank

Others e.g. Tapered Shanks (upon request)



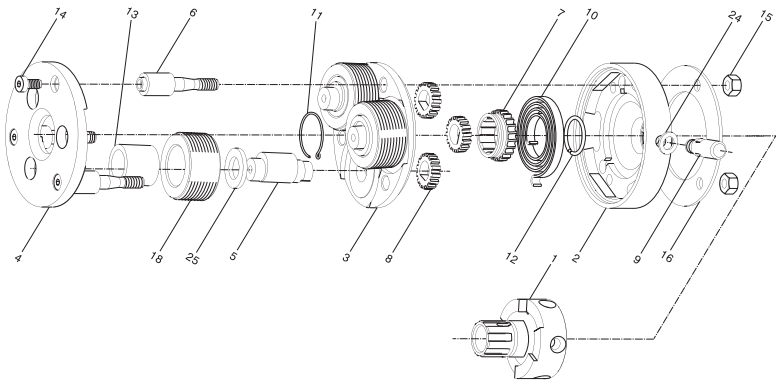
a = Pull off for opening
b = Head opens when Type K233400 or F233400L
Head closes when Type F233400 or K233400L
c = Head closes when Type K233400 or F233400L
Head opens when Type F233400 or K233400L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R25-C2	R30-C2	R1-C2	R1 1/4-C2	R1 1/2-C2	VDI25-C2	VDI30-C2	VDI40-C2	HSK-A63-C2
Dimensions mm/inch	**Shank 25mm/.984 Ø**	**Shank 30mm/1.182 Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank 1-1/2″ Ø**	**Shank VDI25**	**Shank VDI30**	**Shank VDI40**	**Shank HSK-A63**
D4	25mm/.984	30mm/1.182	25.4mm/1.000	31.75mm/1.250	38.1mm/1.500	25mm/.984	30mm/1.182	40mm/1.575	48mm/1.890
D9	–	–	–	–	–	58mm/2.284	68mm/2.678	83mm/3.268	63mm/2.481
L	168.5mm/6.640	183.5mm/7.230	168.5mm/6.640	183.5mm/7.230	183.5mm/7.230	157.5mm/6.200	164.5mm/6.480	172.5mm/6.800	166mm/6.540
L2	93.5mm/3.690	93.5mm/3.690	93.5mm/3.690	93.5mm/3.690	93.5mm/3.690	109.5mm/4.320	109.5mm/4.320	109.5mm/4.320	134mm/5.280
L3	75mm/2.953	90mm/3.544	75mm/2.953	90mm/3.544	90mm/3.544	48mm/1.890	55mm/2.166	63mm/2.481	32mm/1.260
L4	73mm/2.874	[3]	73mm/2.874	[3]	[3]	73mm/2.874	98mm/3.859	150mm/5.966	100mm/3.937
EDP No.	**2249897**	**2430967**	**2249899**	**2430969**	**2430971**	**2249901**	**2249903**	**2249905**	**2249907**

Shanks will be delivered with the according fastening screws

[3] L4 = 73mm for threads, which are larger than 22.2mm (major diameter)

Spare Parts for Rolling Heads F233400C2 and K233400C2



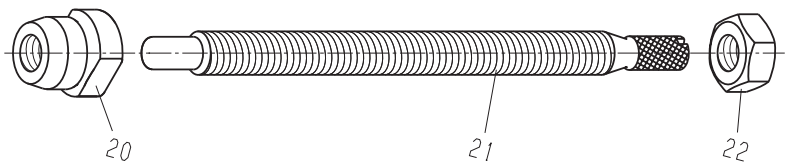
Rolling Head			F233400 C2	F233400L C2 [1]	K233400 C2	K233400L C2 [1]
Catalog Number			7109	7109	7109	7109
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2430944	2430945	2430946	2430947
1	1	Clutch	2430948	2430949		2430948
2	1	Spring housing	2164966	2164983	2165004	2168595
3	1	Centre plate	2164967	2164984	2165005	2240614
4	1	Front plate	2164968	2164985	2165006	2240613
5	3	Eccentric spindles	2164969			
6	3	Spacer studs	2164970			
7	1	Centre gear	2164971	2164986	2164971	2164986
8	3	Spur gear	2164972			
9	1	Closing rod / Handle	2164973		2148841	
10	1	Coil spring	2164974	2164987		2164974
11	1	Circlip	2164975			
12	1	Circlip	2164976			
13	3	Carbide bushing	2168237			
14	3	Cap screw	2143007			
15	3	Hexagon nut	2148398			
16	1	Ring washer	2164977			
17	1	Hexagon nut			2148393	
18	3	Thread roll	individual			
19	2	Set screw 3)			2142078	
19	1	Set screw 3)			2142076	
19	1	Set screw 3)			2142079	
23	1	Ball			2141700	
24	1	Washer	2144251		2144250	
25	3	Washer	2164978			

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 82. Please order seperate.
[3] Part 19 not shown in the view (Locking screws for Adjustment with Type K)



			for shank-diameter			
			25mm, 25.4mm		30mm, 31.75mm, 38.1mm	
Internal stop*			IS233400-C2	IS233400L-C2	IS3-C2	IS3L-C2
Catalog Number			71511	71511	71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Internal stop complete	2430950	2430951	2430954	2430955
20	1	Stop screw body	2164779	2164787	2165036	2165046
21	1	Stop screw	2430952	2430953	2165037	2165047
22	1	Hexagon nut	2148390	2148700	2148391	2148702

*Only required for machines without controlled feed stop. If required, please order additionally.

for right-hand threads

Type F3 C2
to be used stationary only

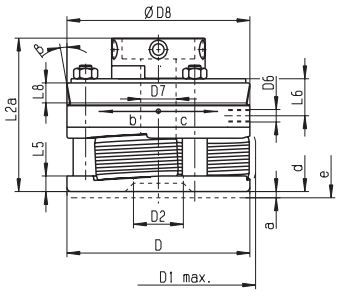
Type K3 C2
used stationary or rotating

inclined position of rolls = 2° 40′
weight without rolls = approx. 3.5kg (7.71 lbs.)

Cat. No. 7110

for left-hand threads

Type F3L C2 resp. K3L C2
Dimensions as right-hand threads



Rolling Head	EDP No.
F3 C2	2430956
F3L C2	2430957
K3 C2	2430958
K3L C2	2430959

Dimensions mm/inch	
D	117mm/4.607
D1max.	131mm/5.158
D2	38mm/1.496
D6	M8
D7	22.5mm/.886
D8 [1]	117mm/4.607
L2a	89.5mm/3.530
L5	8mm/.315
L6	17.5mm/.689
L8 [1]	9.5mm/.375
a	4mm/.158
α	60°
β [1]	10°

[1] only for Type K

Change Shanks

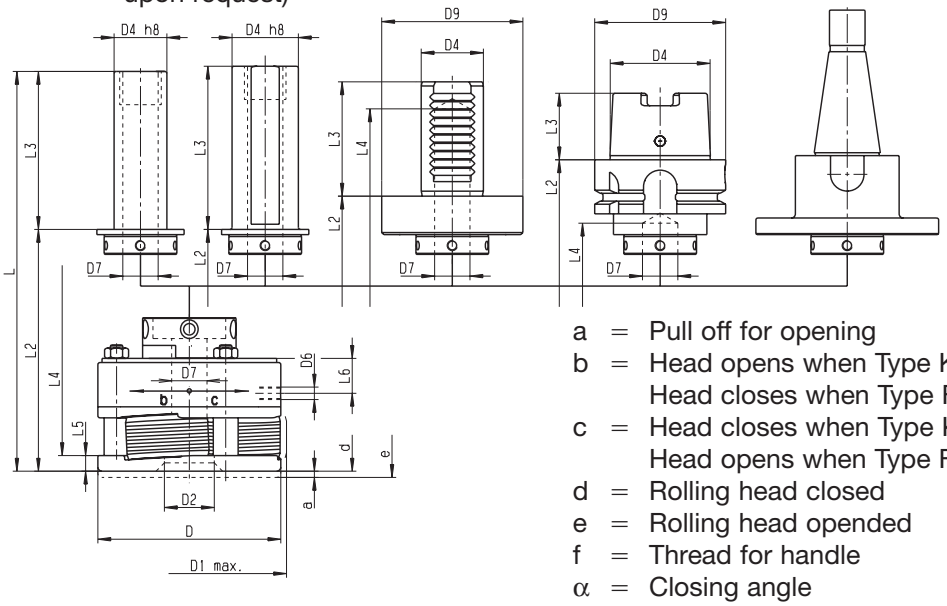
Type . . . -C2
Cat. No. 71510

Straight Shank (with Flat upon request)

VDI Shank

HSK Shank

Others e.g. Tapered Shanks (upon request)

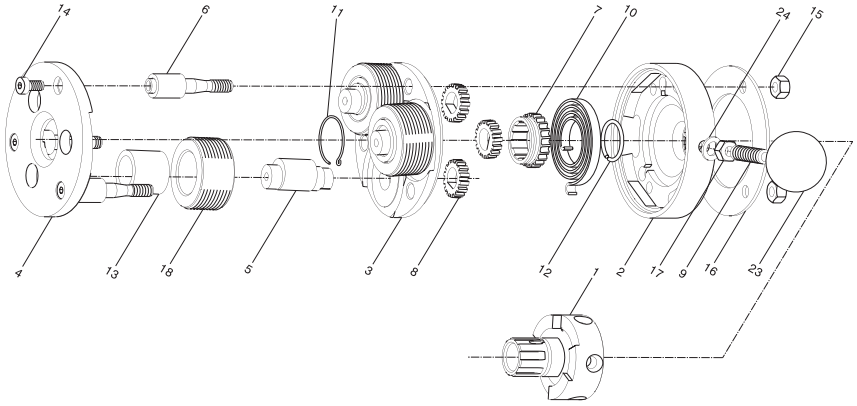


a = Pull off for opening
b = Head opens when Type K3 or F3L
Head closes when Type F3 or K3L
c = Head closes when Type K3 or F3L
Head opens when Type F3 or K3L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R25-C2	R30-C2	R1-C2	R1 1/4-C2	R1 1/2-C2	VDI25-C2	VDI30-C2	VDI40-C2	HSK-A63-C2
Dimensions mm/inch	**Shank 25mm/.984 Ø**	**Shank 30mm/1.182 Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank 1-1/2″ Ø**	**Shank VDI25**	**Shank VDI30**	**Shank VDI40**	**Shank HSK-A63**
D4	25mm/.984	30mm/1.182	25.4mm/1.000	31.75mm/1.250	38.1mm/1.500	25mm/.984	30mm/1.182	40mm/1.575	48mm/1.890
D9	–	–	–	–	–	58mm/2.284	68mm/2.678	83mm/3.268	63mm/2.481
L	167mm/6.580	182mm/7.170	167mm/6.580	182mm/7.170	182mm/7.170	156mm/6.150	163mm/6.420	171mm/6.750	167mm/6.580
L2	92mm/3.630	92mm/3.630	92mm/3.630	92mm/3.630	92mm/3.630	108mm/4.250	108mm/4.250	108mm/4.250	133mm/5.240
L3	75mm/2.953	90mm/3.544	75mm/2.953	90mm/3.544	90mm/3.544	48mm/1.890	55mm/2.166	63mm/2.481	32mm/1.260
L4	–	–	–	–	–	72mm/2.840	96mm/3.780	148mm/5.830	99mm/3.900
EDP No.	**2249897**	**2430967**	**2249899**	**2430969**	**2430971**	**2249901**	**2249903**	**2249905**	**2249907**

Shanks will be delivered with the according fastening screws

Spare Parts for Rolling Heads F3 C2 and K3 C2



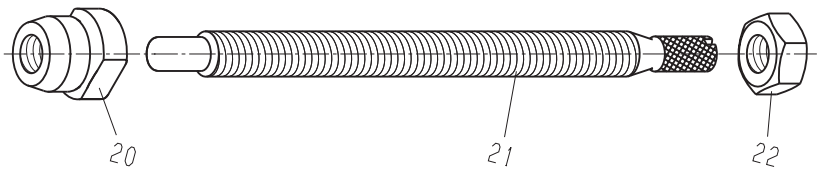
Rolling Head			F3 C2	F3L C2 [1]	K3 C2	K3L C2 [1]
Catalog Number			7110	7110	7110	7110
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2430956	2430957	2430958	2430959
1	1	Clutch	2430960	2430961		2430960
2	1	Spring housing	2165025	2165042	2165453	2165456
3	1	Centre plate	2165026	2165041	2165454	2165457
4	1	Front plate	2165027	2165043	2165455	2165458
5	3	Eccentric spindles	2165028			
6	3	Spacer studs	2165029			
7	1	Centre gear	2165030	2165044	2165030	2165044
8	3	Spur gear	2165031			
9	1	Handle	2167020			
10	1	Coil spring	2165032	2165045		2165032
11	1	Circlip	2165033			
12	1	Circlip	2165034			
13	3	Carbide bushing	2165072			
14	3	Cap screw	2143007			
15	3	Hexagon nut	2148398			
16	1	Ring washer	2165035			
17	1	Hexagon nut	2148398			
18	3	Thread roll	individual			
19	2	Set screw 3)			2167148	
19	1	Set screw 3)			2142076	
19	1	Set screw 3)			2142080	
23	1	Ball	2141701			
24	1	Washer	2144251			

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 84. Please order seperate.
[3] Part 19 not shown in the view (Locking screws for Adjustment with Type K)



Internal stop*			IS3-C2 [4]	IS3L-C2 [1] [4]
Catalog Number			71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.
		Internal stop complete	2430954	2340955
20	1	Stop screw body	2165036	2165046
21	1	Stop screw	2165037	2165047
22	1	Hexagon nut	2148391	2148702

*Only required for machines without controlled feed stop. If required, please order additionally.
[1] L = For Left-hand threads
[4] not available for shank-diameter 25mm and 1.000

for right-hand threads

Type F34 C2
to be used stationary only

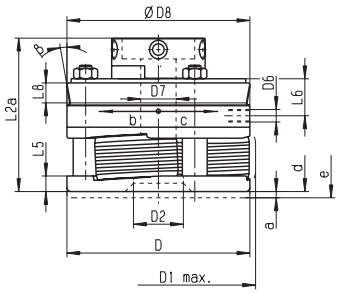
Type K34 C2
used stationary or rotating

inclined position of rolls = 1° 15′
weight without rolls = approx. 3.5kg (7.71 lbs.)

Cat. No. 7111

for left-hand threads

Type F34L C2 resp. K34L C2
Dimensions as right-hand threads



Rolling Head	EDP No.
F34 C2	2430962
F34L C2	2430963
K34 C2	2430964
K34L C2	2430965

Dimensions mm/inch	
D	117mm/4.607
D1max.	128mm/5.040
D2	44mm/1.733
D6	M8
D7	22.5mm/.886
D8 [1]	117mm/4.607
L2a	91mm/3.590
L5	8mm/.315
L6	17.5mm/.689
L8 [1]	9.5mm/.375
a	4mm/.158
α	60°
β [1]	10°

[1] only for Type K

Change Shanks

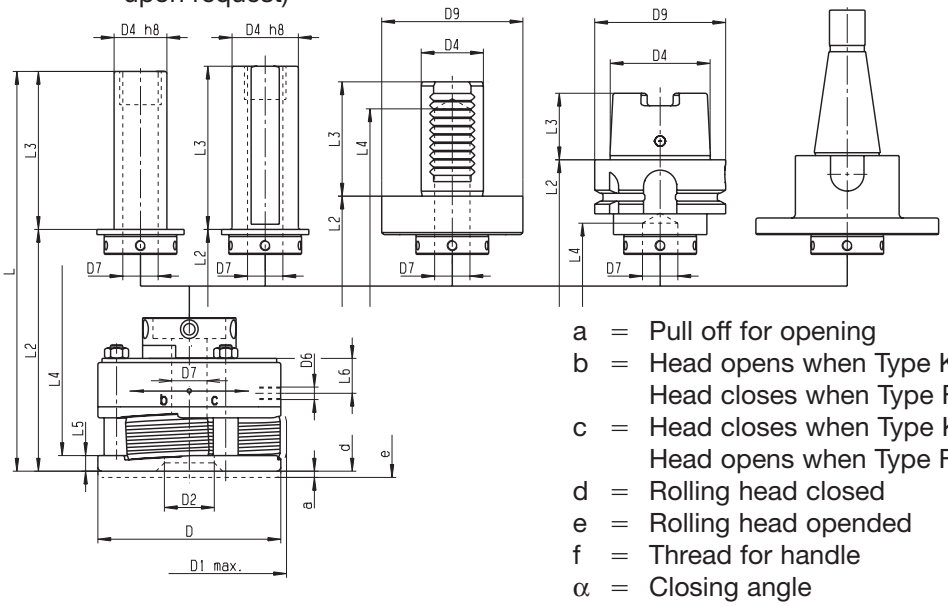
Type . . . -C2
Cat. No. 71510

Straight Shank (with Flat upon request)

VDI Shank

HSK Shank

Others e.g. Tapered Shanks (upon request)

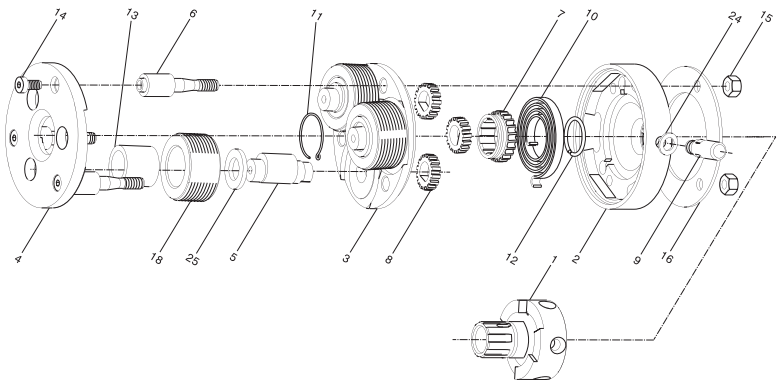


a = Pull off for opening
b = Head opens when Type K34 or F34L
Head closes when Type F34 or K34L
c = Head closes when Type K34 or F34L
Head opens when Type F34 or K34L
d = Rolling head closed
e = Rolling head opended
f = Thread for handle
α = Closing angle

	R25-C2	R30-C2	R1-C2	R1 1/4-C2	R1 1/2-C2	VDI25-C2	VDI30-C2	VDI40-C2	HSK-A63-C2
Dimensions mm/inch	**Shank 25mm/.984 Ø**	**Shank 30mm/1.182 Ø**	**Shank 1″ Ø**	**Shank 1-1/4″ Ø**	**Shank 1-1/2″ Ø**	**Shank VDI25**	**Shank VDI30**	**Shank VDI40**	**Shank HSK-A63**
D4	25mm/.984	30mm/1.182	25.4mm/1.000	31.75mm/1.250	38.1mm/1.500	25mm/.984	30mm/1.182	40mm/1.575	48mm/1.890
D9	–	–	–	–	–	58mm/2.284	68mm/2.678	83mm/3.268	63mm/2.481
L	168.5mm/6.640	183.5mm/7.230	168.5mm/6.640	183.5mm/7.250	183.5mm/7.250	157.5mm/6.200	164.5mm/6.480	172.5mm/6.800	168.5mm/6.640
L2	93.5mm/3.690	93.5mm/3.690	93.5mm/3.690	93.5mm/3.690	93.5mm/3.690	109.5mm/3.690	109.5mm/3.690	109.5mm/3.690	134.5mm/5.300
L3	75mm/2.953	90mm/3.544	75mm/2.953	90mm/3.544	90mm/3.544	48mm/1.890	55mm/2.166	63mm/2.481	32mm/1.260
L4	–	–	–	–	–	73mm/2.880	97mm/3.820	149mm/5.870	100mm/3.940
EDP No.	**2249897**	**2430967**	**2249899**	**2430969**	**2430971**	**2249901**	**2249903**	**2249905**	**2249907**

Shanks will be delivered with the according fastening screws

Spare Parts for Rolling Heads F34C2 and K34C2



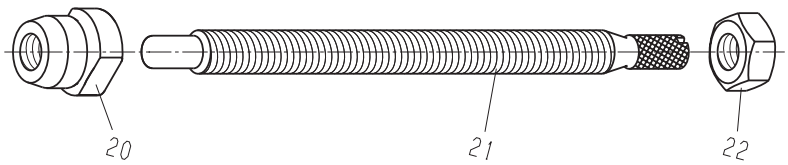
Rolling Head			F34 C2	F34L C2 [1]	K34 C2	K34L C2 [1]
Catalog Number			7111	7111	7111	7111
Part No.	Qty.	Part Description	EDP No.	EDP No.	EDP No.	EDP No.
		Rolling head complete without shank [2]	2430962	2430963	2430964	2430965
1	1	Clutch	2430960	2430961		2430960
2	1	Spring housing	2165025	2165042	2165453	2165456
3	1	Centre plate	2165532	2165540	2165571	2168383
4	1	Front plate	2165533	2165541	2165572	2168384
5	3	Eccentric spindles	2165534			
6	3	Spacer studs	2165535			
7	1	Centre gear	2165536	2165542	2165536	2165542
8	3	Spur gear	2165537			
9	1	Handle	2167020			
10	1	Coil spring	2165032	21655045		2165032
11	1	Circlip	2165033			
12	1	Circlip	2165034			
13	3	Carbide bushing	2164887			
14	3	Cap screw	2143007			
15	3	Hexagon nut	2148398			
16	1	Ring washer	2165035			
17	1	Hexagon nut	2148398			
18	3	Thread roll	individual			
19	2	Set screw 3)	2167148			
19	1	Set screw 3)	2142076			
19	1	Set screw 3)	2142080			
23	1	Ball	2141701			
24	1	Washer	2144251			
25	3	Washer	2165539			

Part 1 (Clutch) combined with the according shank from the selection list (see page before) are the replacement for the previously known shaft. Existent rolling heads can be easily retrofitted.

Rolling Heads can also be delivered with closing rod, closing roller and closing spring, instead of handle.

When ordering spare parts, please state Thread Rolling Head Type, Part No. and EDP No.

[1] L = For Left-hand threads
[2] The shank which fits your application you see in the selection on page 86. Please order seperate.
[3] Part 19 not shown in the view (Locking screws for Adjustment with Type K)



Internal stop*			IS3-C2 [4]	IS3L-C2 [1] [4]
Catalog Number			71511	71511
Part No.	Qty.	Part Description	EDP No.	EDP No.
		Internal stop complete	2430954	2340955
20	1	Stop screw body	2165036	2165046
21	1	Stop screw	2165037	2165047
22	1	Hexagon nut	2148391	2148702

*Only required for machines without controlled feed stop. If required, please order additionally.
[1] L = For Left-hand threads
[4] not available for shank-diameter 25mm and 1.000

BILZ THERMO-GRIP™ Shrink-Fit Units and Holders

Products

LMT-Fette is pleased to announce the introduction of Bilz' superior THERMO-GRIP™ technology to our product offering. The Bilz company, another member of the LMT group, is world renowned for their tap holding product line, as well as the industry leader in Shrink-Fit tool holding technology. This new THERMO-GRIP product addition marks LMT-Fette's debut in the tool holding market. The new technology compliments LMT-Fette's complete solid carbide and indexable milling product line for both the die and mold and aerospace industries.

Application Area

Shrink-Fit technology was introduced primarily to compliment the relatively new introduction of high-speed machining to the North American market. In the die and mold industry, as well as in aerospace, the tremendous accuracy and repeatability of the Shrink-Fit concept has significantly reduced cycle times, improved work piece accuracy, and offered tremendous tool life. Because of these dramatic results, this technology is now showing up in the automotive industry, as well as the general machining market. Any high-volume, or tight tolerance milling or drilling application will benefit from the merits of Shrink-Fit technology. When used with solid carbide end mills or drills, one can expect to see improved work piece accuracy, and the noticeably improved tool life outlined above.

Materials

Bilz THERMO-GRIP™ technology performs exceptionally in all materials. It is commonly used for machining P20, H13, and S7 in the die and mold industry, but also is heavily used in the machining of aluminum components in the aerospace and automotive industries.

Advantages

As shown, THERMO-GRIP™ technology provides unsurpassed work piece accuracy, as well as tremendous tool life. The Bilz product line offers a choice of inexpensive units for the beginner in the ISG2200, as well as the universal, and slightly more expensive unit in the ISG3200. The ISG3200 features a unique coil changing system that allows you to optimize the performance of the unit for the tools you are using. Additionally, both products feature an automatic return mechanism for the coil, eliminating the possibility of overheating.

ISG 2200 – The starter model in the class of Shrink-Fit Units

ISG 2200

Clamping range	6–20 mm (1/4″–3/4″)
Suitable tool shanks	carbide tools
Operation	manual
Tool setting	measuring adaptor
Coil	integrated
Plate	–
Max. tool length (from gauge line)	290 mm (11.417″)
Cooling stations	1
Air pressure	–
Electric current supply	3 x 208 V

Mobile Unit for use in the tool presetting area or locally at the machine.

The mobile unit type ISG 2200, represents an inexpensive initial move into inductive shrinking technology. The low weight means that it can be used flexibly wherever it is required. Despite the compact design, it allows tool changing for diameters 1/4″–3/4″ within seconds. The clamping range can be reduced down to 3 mm with the optional available plate changing kit. The integrated fan cools down the clamping chucks quickly. The ISG 2200 offers all the features for easy and safe use of shrinking technology in your facility. Suitable for carbide tools only.

The coil is moved manually to the required heating position. There it is fixed by pressing the button. After the heating operation the coil returns automatically. Overheating of the coil and clamping chuck is therefore avoided.

Technical Data: ISG 2200

EDP No.	D	W	H	Clamping range	Suitable tool materials	Electric current supply	Power kW	Weight lbs.
79010	15.35	12.20	25.19	3 – 20 mm 1/4″ – 3/4″	Carbide	3 x 208 V/16 A	3	55

ISG 3200 – The performance class for continual tool changing

ISG 3200
the universal unit

Clamping range	3–6 mm (1/8″–1/4″ carbide)
Clamping range	6–32 mm (1/4″–1-1/4″ carbide+HSS)
Clamping range	32–50 mm (1-1/4″–2″ - optional) carbide+HSS
Operation	automatic
Tool setting	measuring adaptor
Coil	exchangeable
Plate	–
Max. tool length (from gauge line)	450 mm (17.71″)
Cooling stations	4
Air pressure	87 PSI
Electric current supply	3 x 400 V

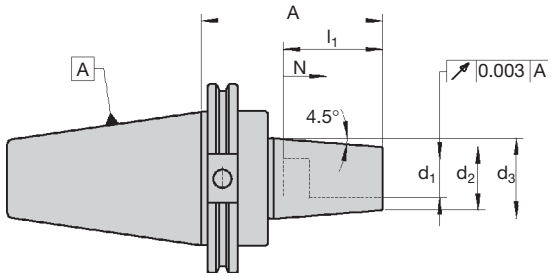
Universal table unit
On the fully automatically controlled ISG 3200 unit all that needs to be done is simply to select the tool diameter range. After the start button is pressed, the induction coil moves automatically to the toolholder, heats this sufficiently and moves back again automatically.

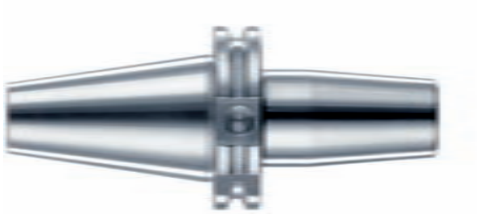
ISG 3200 is a universal shrinking unit for the professional use of shrinking technology. With its unique coil changing system, the power transfer adjusted to the different clamping chucks is guaranteed within a short period of time. Compared to other systems, this makes it possible to clamp the smallest diameters Ø 6-50 mm (1/4″–2″) with high speed tools as well as down to Ø 3 mm (1/8″) with carbide tools. With a range of special coils, the unit can be suited to other special tools. Four integrated fans make it possible to cool down the clamping chucks evenly in a short time. The fans are activated automatically by a light barrier as soon as the chuck is pushed into the cooling position. This means that constant preparation of a high number of tools can be guaranteed.

Technical Data: ISG 3200

EDP No.	D	W	H	Clamping range	Suitable tool materials	Electric current supply	Power kW	Weight lbs.
55781	22.99	23.31	40.55	3 – 50 mm 1/8″ – 2″	Carbide+HSS	3 x 400 V/16 A	10	95

CAT40 THERMO-GRIP™ Clamping Chuck – Inch Diameter



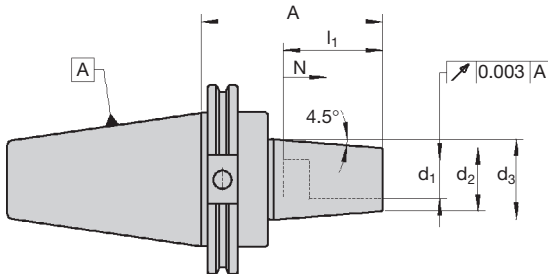


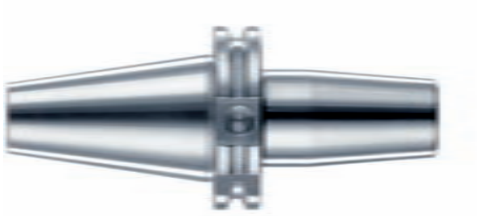
d_1	EDP No.	Dimensions (inches)				
		A	d_2	d_3	l_1	N
0.250	79087	3.740	0.787	1.063	1.417	0.394
0.375	50765	3.740	0.945	1.260	1.653	0.394
0.500	50764	3.740	1.063	1.339	1.850	0.394
0.625	79089	3.740	1.063	1.339	1.968	0.394
0.750	79090	3.740	1.299	1.653	2.047	0.394
1.000	79091	4.330	1.732	2.087	2.283	0.394

Length adjustment N: 10 mm for all clamping diameters
All clamping chucks can be run with internal coolant

Shank tolerance h6.

CAT40 THERMO-GRIP™ Clamping Chuck – Metric Diameter



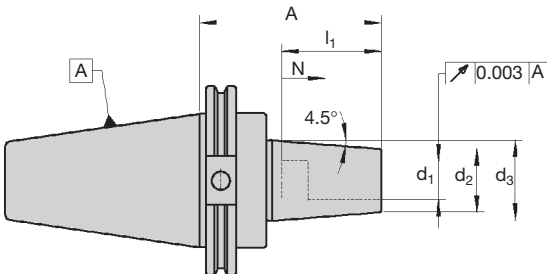


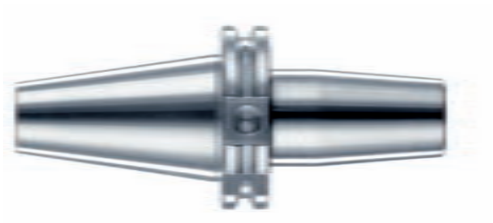
d_1	EDP No.	Dimensions (inches)				
		A	d_2	d_3	l_1	N
6.0mm (0.236)	79045	3.150	0.787	1.063	1.417	0.394
8.0mm (0.315)	53841	3.150	0.787	1.063	1.417	0.394
10.0mm (0.394)	79046	3.150	0.945	1.260	1.653	0.394
12.0mm (0.472)	53842	3.150	0.945	1.260	1.850	0.394
16.0mm (0.630)	53843	3.150	1.063	1.339	1.968	0.394
20.0mm (0.787)	79047	3.150	1.181	1.339	2.047	0.394
25.0mm (0.984)	53844	3.937	1.732	2.087	2.283	0.394

Length adjustment N: 10 mm for all clamping diameters
All clamping chucks can be run with internal coolant

Shank tolerance h6.

CAT50 THERMO-GRIP™ Clamping Chuck – Inch Diameter



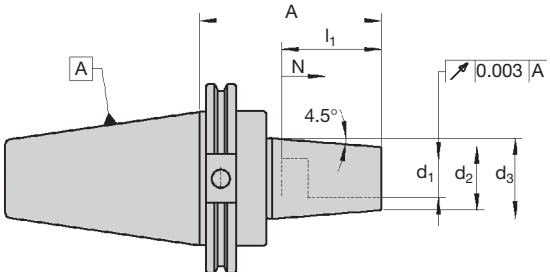


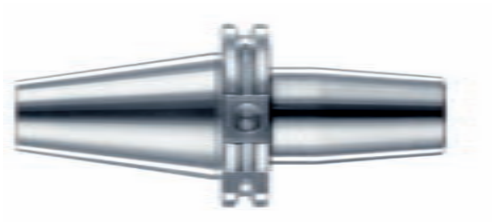
d_1	EDP No.	Dimensions (inches)				
		A	d_2	d_3	l_1	N
0.250	79092	3.740	0.787	1.063	1.417	0.394
0.375	79093	3.740	0.945	1.260	1.653	0.394
0.500	79094	3.740	1.063	1.339	1.850	0.394
0.625	79098	3.740	1.063	1.339	1.968	0.394
0.750	79095	3.740	1.299	1.653	2.047	0.394
1.000	79096	4.134	1.732	2.087	2.283	0.394
1.250	79097	4.134	1.732	2.087	2.283	0.394

Length adjustment N: 10 mm for all clamping diameters
All clamping chucks can be run with internal coolant
Please order coolant tube separately

Shank tolerance h6

CAT50 THERMO-GRIP™ Clamping Chuck – Metric Diameter



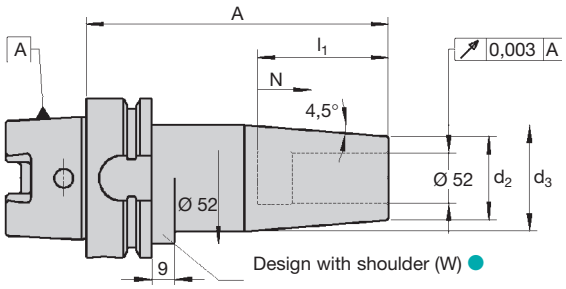


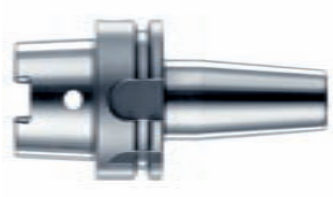
d_1	EDP No.	Dimensions (inches)				
		A	d_2	d_3	l_1	N
6.0mm (0.236)	79058	3.740	0.787	1.063	1.417	0.394
8.0mm (0.315)	79059	3.740	0.787	1.063	1.417	0.394
10.0mm (0.394)	79060	3.740	0.945	1.260	1.653	0.394
12.0mm (0.472)	79061	3.740	0.945	1.260	1.850	0.394
16.0mm (0.630)	79063	3.740	1.063	1.339	1.850	0.394
20.0mm (0.787)	79065	3.740	1.299	1.339	2.047	0.394
25.0mm (0.984)	79066	4.134	1.732	2.087	2.283	0.394
32.0mm (1.260)	79067	4.134	1.732	2.087	2.283	0.394

Length adjustment N: 10 mm for all clamping diameters
All clamping chucks can be run with internal coolant
Please order coolant tube separately

Shank tolerance h6

HSK-A63 THERMO-GRIP™ Clamping Chuck – Inch Diameter



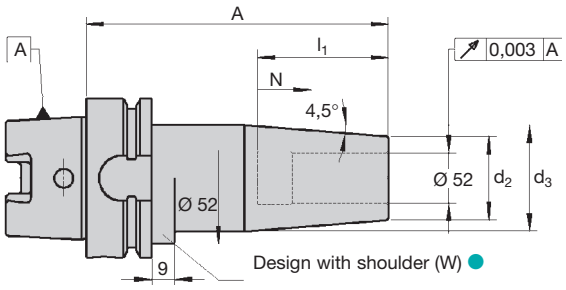


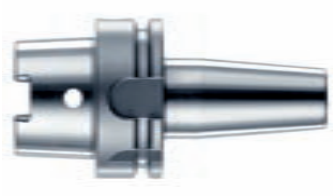
d_1	EDP No.	Dimensions (inches)				
		A	d_2	d_3	l_1	N
0.250	79069	3.150	0.787	1.063	1.417	0.394
0.312	79070	3.150	0.787	1.063	1.417	0.394
0.375	79071	3.346	0.945	1.260	1.653	0.394
0.500	79073	3.543	1.063	1.338	1.850	0.394
0.625	79075	3.740	1.063	1.338	1.968	0.394
0.750	79076	3.937	1.299	1.653	2.047	0.394
1.000	79078	4.724	1.732	2.086	2.283	0.394
1.250	79079	4.724	1.732	2.086	2.283	0.394

All clamping chucks can be run with internal coolant
Please order coolant tube separately

* Shank tolerance h4 or better.
Shank tolerance h6

HSK-A63 THERMO-GRIP™ Clamping Chuck – Metric Diameter



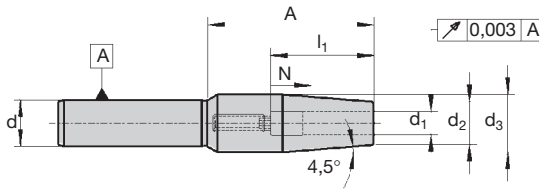


d_1	EDP No.	Dimensions (inches)				
		A	d_2	d_3	l_1	N
6.0mm (0.236)	79048	3.150	0.787	1.063	1.417	0.394
8.0mm (0.315)	79049	3.150	0.787	1.063	1.417	0.394
10.0mm (0.394)	79050	3.346	0.945	1.260	1.653	0.394
12.0mm (0.472)	79051	3.543	0.945	1.338	1.850	0.394
16.0mm (0.630)	79053	3.740	1.063	1.338	1.968	0.394
20.0mm (0.787)	79054	3.937	1.299	1.653	2.047	0.394
25.0mm (0.984)	79055	4.527	1.732	2.086	2.283	0.394
32.0mm (1.260)	79056	4.724	1.732	2.086	2.283	0.394

All clamping chucks can be run with internal coolant
Please order coolant tube separately

* Shank tolerance h4 or better.
Shank tolerance h6

Straight Shank THERMO-GRIP™ Extensions for Clamping Chuck – Inch Diameter

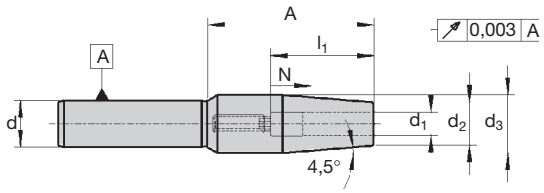


d1	EDP No.	Dimensions (inches)					
		d	d2	d3	N	A	l1
0.250	79145	0.472	0.591	0.787	0.394	2.362	1.417
0.375	79146	0.787	0.787	1.063	0.394	2.362	1.653
0.500	79147	0.787	0.945	1.260	0.394	2.362	1.850
0.625	79148	0.984	0.945	1.260	0.394	2.362	1.968

Length adjustment N for diameter 3, 4, 5: 5mm
Length adjustment N for diameter 6-16: 10mm
All extensions can be run with internal coolant

For diameter 3, 4 and 5 shank tolerance h4 or better
For diameter 6–16 shank tolerance h6

Straight Shank THERMO-GRIP™ Extensions for Clamping Chuck – Metric Diameter



d1	EDP No.	Dimensions (inches)					
		d	d2	d3	N	A	l1
3.0mm (0.118)	53473	0.472	0.354	0.591	0.394	2.362	0.787
4.0mm (0.157)	53474	0.472	0.354	0.591	0.394	2.362	0.787
5.0mm (0.197)	53475	0.472	0.354	0.591	0.394	2.362	0.787
6.0mm (0.236)	53476	0.472	0.591	0.748	0.394	2.362	1.417
8.0mm (0.315)	53477	0.472	0.591	0.748	0.394	2.362	1.417
10.0mm (0.394)	53478	0.787	0.787	1.063	0.394	2.362	1.653
12.0mm (0.472)	53479	0.787	0.787	1.063	0.394	2.362	1.653
16.0mm (0.630)	53480	0.984	0.945	1.260	0.394	.2.362	1.968

Length adjustment N for diameter 3, 4, 5: 5mm
Length adjustment N for diameter 6-16: 10mm
All extensions can be run with internal coolant

For diameter 3, 4 and 5 shank tolerance h4 or better
For diameter 6–16 shank tolerance h6

Accessories

Coolant pipe for HSK chuck
For optimizing the internal coolant supply for HSK tools incl. round gasket DIN 3770 and union nut.

HSK sizes	Designation	EDP No.
HSK 32	HSK 32-10	56163
HSK 40	HSK 40-12	56164
HSK 50	HSK 50-16	56165
HSK 63	HSK 63-18	56166
HSK 80	HSK 80-20	56167
HSK 100	HSK 100-24	56168

Installation wrench for coolant pipe

HSK sizes	EDP No.
HSK 32	56169
HSK 40	56170
HSK 50	56171
HSK 63	56172
HSK 80	56173
HSK 100	56174

Tool Cart for ISG 3200/ISG 2000 – EDP No. 56175

The tool cart makes the ISG mobile. All accessories such as oils, tool holders, cooling and measuring adaptors, as well as the clamping chucks fit in the sliding racks.

Accessories

Ejection device for broken tools

The newly developed ejection unit enables broken tools to be removed simply from chucks. Even tools where the point of breakage is within the toolholder can be removed without difficulty. The basic toolholder can be adapted to all customary machine interfaces (HSK, CAT) by means of different adapters.* Even with a tight fit (bore diameter/tool shank) the shrunk-in shanks can be removed without difficulty. Further interfaces on request.

*Available upon request.

Basic Toolholder	
Designation	**EDP No.**
T3-WSG	56153

Compressed air unit

Designation	EDP No.
T3-WSD	56162

Accessories

THERMO-GRIP™ Quick Change System

The ISG 3200 Shrink-Fit Unit already has a coil with a quick change mechanism in the standard version. This enables even tools in special dimensions to be shrunk in and out with correspondingly adapted coils. The area of application of the induction units can thus be extended permanently without having to invest constantly in new unit technology.

The large number of special coils available for different special tools illustrate benefits of the unique THERMO-GRIP® changing system. In the case of the universal coil already included with the unit, the different clamping ranges are obtained using 3 changing plates. Thus the most important clamping diameters of 6 - 32 mm can be covered with one coil.

Induction Coils

Changing Plates

Clamping Ø	Designation	EDP No.
Induction Coil for ISG 3200		
3–32	ISGS 3200-1	55782
32–50	ISGS 3200-2	55783
Changing Plates for ISG 3200 for Coil ISG 3200-1		
3–6	ISGS 3201-0	56182
6–12	ISGS 3201-1	55784
>12–20	ISGS 3201-2	55785
>20–32	ISGS 3201-3	55786

Accessories

Tool Holders

Designation	EDP No.
for HSK clamping chucks	
T3-W/HSK 32	79017
T3-W/HSK 40	79018
T3-W/HSK 50	79019
T3-W/HSK 63	79020
T3-W/HSK 80	79021
T3-W/HSK 100	79016
for CAT clamping chucks	
T3-W/SK 40	50756
T3-W/SK 50	79022
for ABS/Capto/clamping chucks	
T3-W/25	55746
T3-W/32	55747
T3-W/40	55748
T3-W/50	55749
T3-W/63	55750

Notes

Notes

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