



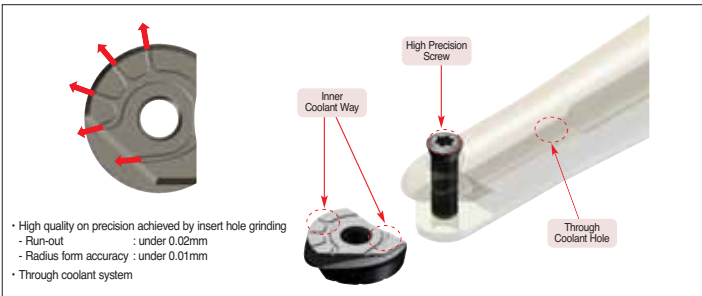
Technical Guide for Laser Mill

Special Features

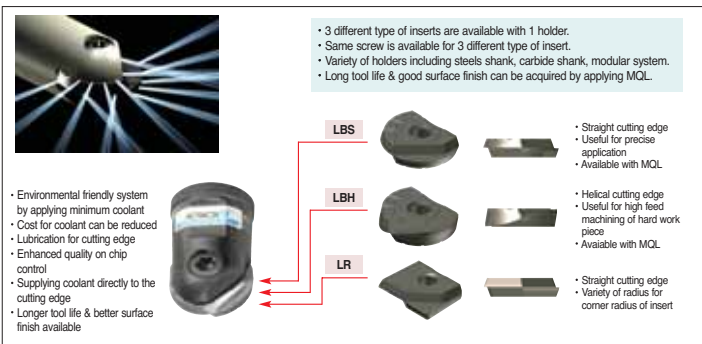
- Indexable ball endmill for precise mould finishing.
- Longer tool life by combination of various grades.
- Optimum machining is available by applying minimum coolant.
- Simple clamping of insert with a screw.
- Variety of holders including steels shank, carbide shank, modular system.



Clamping System

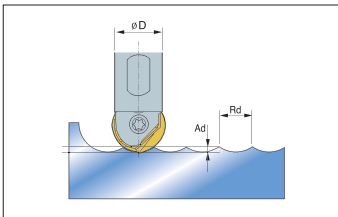


Special Merits of Laser Ball Endmill





Important Cutting Formula



- V = Cutting speed (m/min)
- D = Cutting diameter (mm)
- F = Feed per a minute (mm/min)
- fz = Feed per tooth (mm/tooth)
- Z_n = Number of tooth
- W = Power requirement (kW)
- H = Horsepower requirement (Hp)
- Q = Chip removal amount (cm³/min)
- A_d = Axial depth (mm)
- R_d = Radial depth (mm)
- K_s = Specific cutting resistance (kg/mm²)
- η = Mechanical efficiency (%)

Cutting speed

$$V = \frac{\eta \times D \times N}{1000} \quad (\text{m/min})$$

Feed

$$F = f_z \times N \times Z_n \quad (\text{mm/min})$$

RPM

$$N = \frac{V \times 1000}{\eta \times D} \quad (\text{rev/min})$$

Chip removal rate

$$Q = \frac{A_d \times R_d \times F}{1000} \quad (\text{cm}^3/\text{min})$$

Feed per tooth

$$f_z = \frac{F}{N \times Z_n} \quad (\text{mm/tooth})$$

Machine power requirement

$$W = \frac{Q \times K_s}{60 \times 102 \times \eta} \quad (\text{kW}) \quad \quad H = \frac{W}{0.75} \quad (\text{Hp})$$

Recommended Cutting Conditions

Work piece	Hardness (HRC)	Speed V (m/min)	Feed fz (mm/tooth)	Cutter diameter : D(mm)								Depth on axial direction A _d (mm)	Radial depth of cut R _d (mm)
				Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø30	Ø32		
Steel (carbon, alloy)	under 30	100-200	0.2-0.25	6370	5090	4240	3200	2550	2050	1700	1700	D/10	D/10
Steel (carbon, alloy)	30-40	80-150	0.2-0.25	4770	3820	3180	2400	1910	1530	1280	1280	D/15	D/15
Alloy steel for mould	30-40	70-100	0.1-0.15	3180	2550	2120	1600	1280	1020	850	850	D/15	D/15
Cast iron(FC, FCD)	20-30	100-200	0.3-0.35	6370	5090	4240	3200	2550	2050	1700	1700	D/10	D/10
Heat treated steel	55-65	200-250	0.2-0.3	9150	7320	6100	4575	3660	2930	2440	2440	D/30	D/30



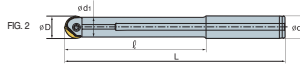
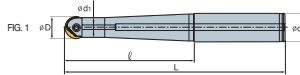
Laser Mill



MILLING TOOLS

LBE(Steel Shank)

T stand for Taper type, S stand for Straight type



(mm)

Designation	2007 £	Fig	ØD	l	L	Ød1	Ød
LBE 080035T-S12	52.00	1	8	35	91	7.2	12
080055T-S12	55.00	1	8	55	111	7.2	12
080075T-S12	57.00	1	8	75	131	7.2	12
100035T-S12	52.00	1	10	35	91	9	12
100055T-S12	55.00	1	10	55	111	9	12
100075T-S12	57.00	1	10	75	131	9	12
120035S-S12	52.00	2	12	35	91	10.4	12
120055T-S12	55.00	1	12	55	111	10.4	12
120085T-S16	57.00	1	12	85	145	10.4	16
160035S-S16	55.00	2	16	35	95	14	16
160065T-S16	59.00	1	16	65	125	14	16
160100T-S20	65.00	1	16	100	170	14	20
200040S-S20	55.00	2	20	40	110	17.5	20
200075T-S20	59.00	1	20	75	145	17.5	20
200115T-S25	65.00	1	20	115	195	17.5	25
250045S-S25	75.00	2	25	45	125	22	25
250090T-S25	79.00	1	25	90	170	22	25
250135T-S32	85.00	1	25	135	225	22	32
300055S-S32	77.00	2	30	55	145	27	32
300105T-S32	82.00	1	30	105	195	27	32
300160T-S32	85.00	1	30	160	250	27	32
320055S-S32	79.00	2	32	55	145	29	32
320105T-S32	87.00	1	32	105	195	29	32
320160T-S32	95.00	1	32	160	250	29	32

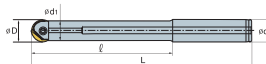
For inserts see page 86

Holder	Insert			Part		
	LBE	LBS	LBH	LR	Screw	Wrench
LBE 080	LBS080	LBH080	-	ETND0206F	TWP07S	
100	LBS100	LBH100	LR100	ETND0307F	TWP08S	
120	LBS120	LBH120	LR120	ETND03509	TWP10S	
160	LBS160	LBH160	LR160	ETND0413	TWP15S	
200	LBS200	LBH200	LR200	ETKD0516	TWP20	
250	LBS250	LBH250	LR250	ETKD0620	TWP25	
300	LBS300	LBH300	LR300	ETGD0825	TWP40	
320	LBS320	LBH320	LR320	ETGD0825	TWP40	

For full insert range please see page 86

INDEXABLE MILLING TOOLS Laser Mill

LBE(Carbide Shank)



(mm)

Designation	2007 £	OD	ℓ	L	ϕd_1	ϕd	Insert	Screw
LBE 080080S-S08C	99.00	08	80	136	7.2	08	LBS080, LBH080	ETND02506F
080100S-S08C	109.00	08	100	156	7.2	08	LBS080, LBH080	ETND02506F
100080S-S10C	99.00	10	80	136	9	10	LBS100, LBH100, LR100-R□□	ETND0307F
100120S-S10C	109.00	10	120	176	9	10	LBS100, LBH100, LR100-R□□	ETND0307F
120100S-S12C	115.00	12	100	156	10.4	12	LBS120, LBH120, LR120-R□□	ETND03509
120150S-S12C	125.00	12	150	206	10.4	12	LBS120, LBH120, LR120-R□□	ETND03509
160100S-S16C	175.00	16	100	160	14	16	LBS160, LBH160, LR160-R□□	ETND0413
160150S-S16C	199.00	16	150	210	14	16	LBS160, LBH160, LR160-R□□	ETND0413
200120S-S20C	230.00	20	120	190	17.5	20	LBS200, LBH200, LR200-R□□	ETKD0516
200170S-S20C	250.00	20	170	240	17.5	20	LBS200, LBH200, LR200-R□□	ETKD0516
250140S-S25C	336.00	25	140	220	22	25	LBS250, LBH250, LR250-R□□	ETGD0825
250170S-S25C	350.00	25	170	250	22	25	LBS250, LBH250, LR250-R□□	ETGD0825
300140S-S32C	499.00	30	140	230	27	32	LBS300, LBH300, LR300-R□□	ETGD0825
300170S-S32C	599.00	30	170	260	27	32	LBS300, LBH300, LR300-R□□	ETGD0825
320140S-S32C	499.00	32	140	230	29	32	LBS320, LBH320, LR320-R□□	ETGD0825
320170S-S32C	599.00	32	170	260	29	32	LBS320, LBH320, LR320-R□□	ETGD0825

For inserts see page 86

Do you want a FREE milling body? Please phone for more information



- Same day despatch until 6 pm
- Next day delivery
- 10,000 lines ex-stock
- Pre-discounted prices



why not visit
our website?
www.cutwel.com
E.Mail sales@cutwel.net

