





# HepcoMotion®

## Ball Bushings Range



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## HepcoMotion Standard Ball Bushings

Standard ball bushings from HepcoMotion offer dimensional interchangeability with all major manufacturers and incorporate a rigid steel outer sleeve with between 3 and 6 ball circuits depending on size. Ball retainers are made from high grade polyamide for superior performance and low friction.

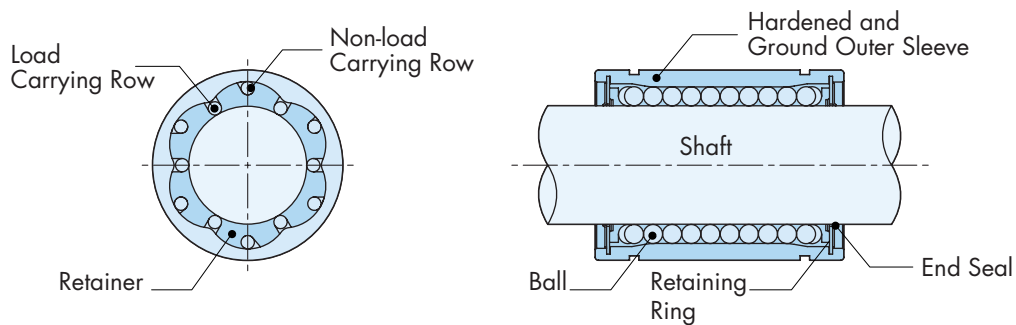


Fig 1. Linear Ball Bushing

## HepcoMotion Super Ball Bushings

Super ball bushings from HepcoMotion offer approximately 3 times load capacity which equates to 27 times the life of standard ball bushings with the same overall dimensions. These high quality units consist of hardened steel segmented load bearing plates with precision ground ball tracks combined with a  $\pm 0.5$  degree self alignment feature. This ensures a uniform load distribution over the entire row of balls, preventing point loading that shortens life.

### Self Alignment Feature

The outer surface of the steel load bearing plates are designed with a curved surface that in turn allows the bushing to absorb misalignment caused by inaccuracies between the shaft and ball bushing. In addition to ensuring equal load distribution, the feature provides smooth entry and exit of the balls in and out of the loading area.

The self alignment feature requires two super ball bushings to be mounted to one shaft in a conventional two parallel shaft arrangement.

- Super ball bushings are interchangeable with the ISO standard. (All main dimensions, outside diameter, bore and length are the same).
- Super ball bushings will reduce preparation and assembly time, as any shaft deflection and inaccuracies in the machining process will be accommodated by the self alignment feature.
- Easy entry and exit ball feature.
- Ball retainers are made from a high grade polyamide maintaining low friction over the entire travel length.
- Friction coefficient of 0.001 with oil lubrication.
- Can operate at temperatures up to 100°C and speeds up to 3m/sec.

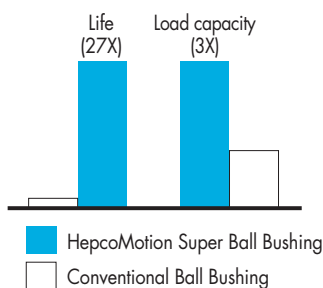


Fig 2. Comparing Life and Load Capacity

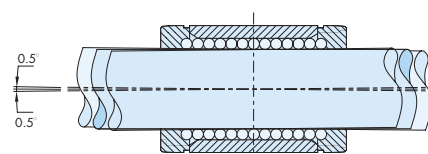
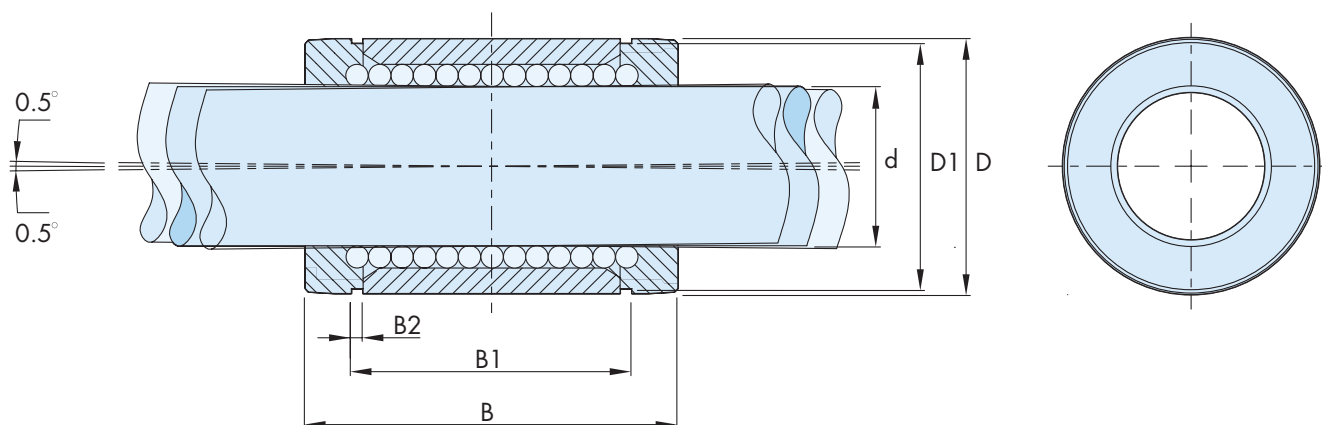


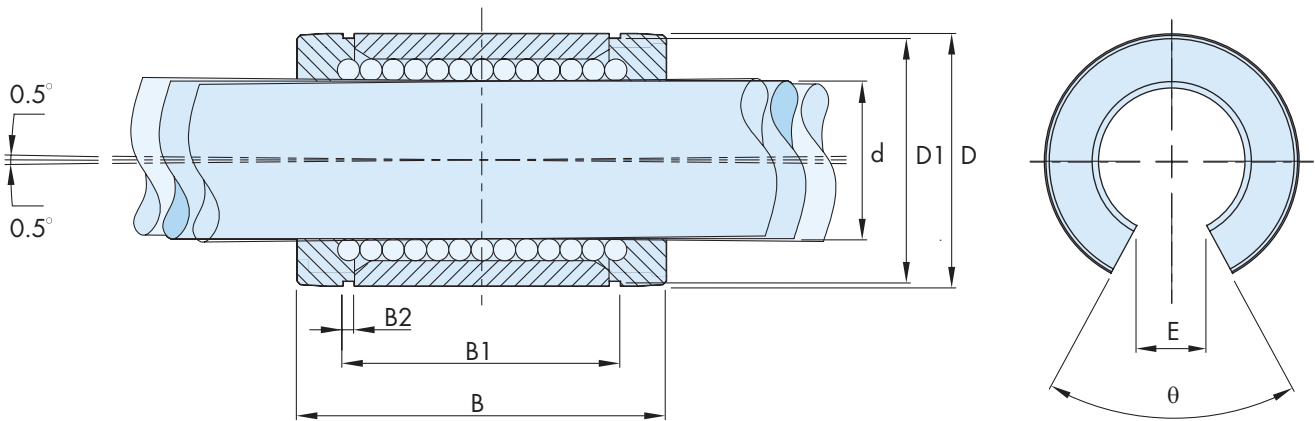
Fig 3.  $\pm 0.5^\circ$  of Self-Alignment

## SBE type - Super European Ball Bushing (self aligning) Closed Type



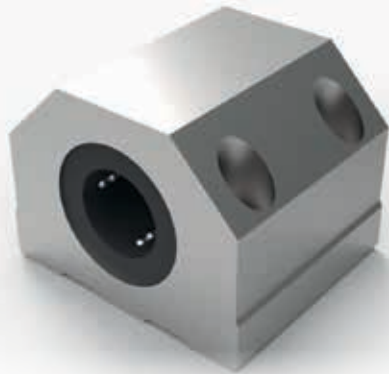
Part No.			Dimensions					Shaft	No. Ball Rows	Basic Load Ratings		Weight (g)
With Two Seals (Stock Range)	With One Seal	Without Seal	D	D1	B	B1	B2	d		dyn. C (N)	stat. Co (N)	
<b>SBE16UU</b>	<b>SBE16U</b>	<b>SBE16</b>	26	24.9	36	24.6	1.3	16	5	1176	607	26
<b>SBE20UU</b>	<b>SBE20U</b>	<b>SBE20</b>	32	30.5	45	31.2	1.6	20	6	2352	1254	60
<b>SBE25UU</b>	<b>SBE25U</b>	<b>SBE25</b>	40	38.5	58	43.7	1.85	25	6	4508	2195	120
<b>SBE30UU</b>	<b>SBE30U</b>	<b>SBE30</b>	47	44.5	68	51.7	1.85	30	6	5586	2959	184
<b>SBE40UU</b>	<b>SBE40U</b>	<b>SBE40</b>	62	58.5	80	60.3	2.15	40	6	9310	4312	342
<b>SBE50UU</b>	<b>SBE50U</b>	<b>SBE50</b>	75	71.5	100	77.3	2.65	50	6	13720	6762	586

# SBEO type - Super European Ball Bushing (self aligning) Open Type

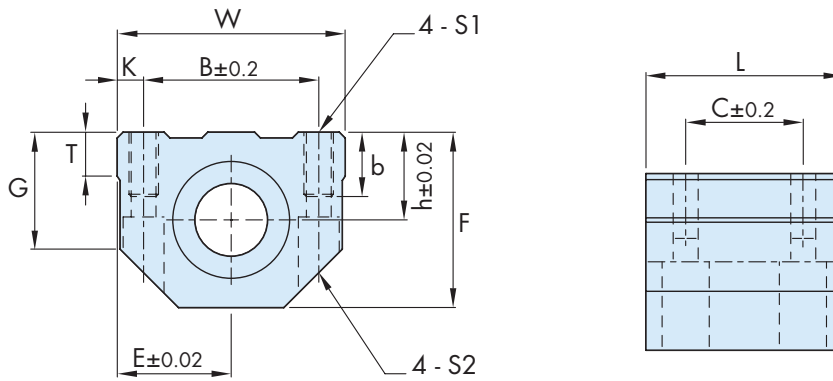


Part No.			Dimensions						Angle	Shaft	No. Ball Rows	Basic Load Ratings		Weight (g)
With Two Seals (Stock Range)	With One Seal	Without Seal	D	D1	B	B1	B2	E	$\theta$	d		dyn. C (N)	stat. Co (N)	
<b>SBEO16UU</b>	<b>SBEO16U</b>	<b>SBEO16</b>	26	24.9	36	24.6	1.3	9	68°	16	4	1176	607	20
<b>SBEO20UU</b>	<b>SBEO20U</b>	<b>SBEO20</b>	32	30.5	45	31.2	1.6	9	55°	20	5	2352	1254	50
<b>SBEO25UU</b>	<b>SBEO25U</b>	<b>SBEO25</b>	40	38.5	58	43.7	1.85	11.5	57°	25	5	4508	2195	100
<b>SBEO30UU</b>	<b>SBEO30U</b>	<b>SBEO30</b>	47	44.5	68	51.7	1.85	14	57°	30	5	5586	2959	154
<b>SBEO40UU</b>	<b>SBEO40U</b>	<b>SBEO40</b>	62	58.5	80	60.3	2.15	19.5	56°	40	5	9310	4312	286
<b>SBEO50UU</b>	<b>SBEO50U</b>	<b>SBEO50</b>	75	71.5	100	77.3	2.65	22.5	54°	50	5	13720	6762	486

## CS type - Super European Ball Bushing Pillow Block Closed Type

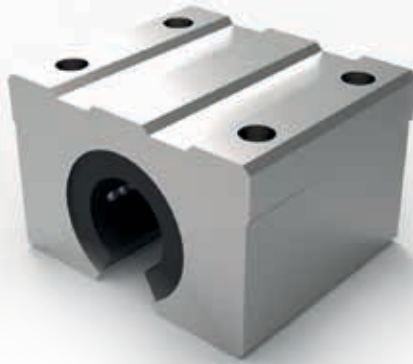


(with 1 pc self aligning SBE ball bushing)

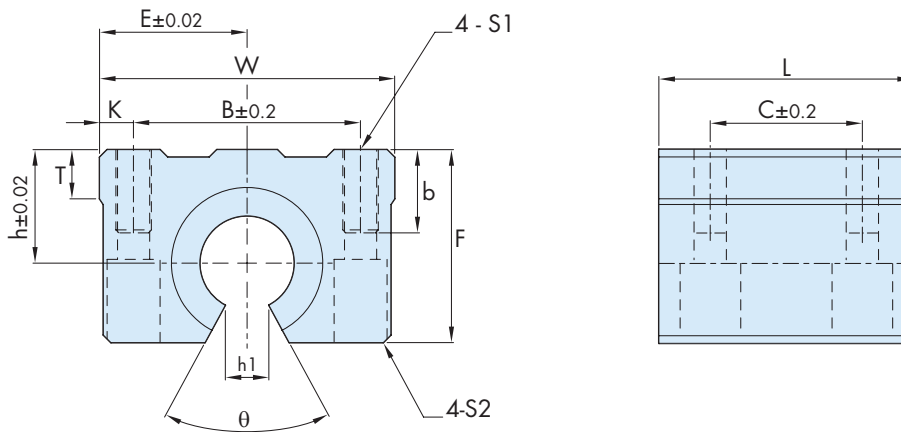


Part No.	Dimensions							Mounting Dimensions						Shaft	No. Ball Rows	Basic Load Ratings		Weight (g)
	h	E	W	L	F	G	T	B	C	K	b	S1	S2			dyn. C (N)	stat. Co (N)	
<b>CS16UUB</b>	22	26.5	53	43	42	29	10	40	26	6.5	13	M6	M5	16	5	1176	607	204
<b>CS20UUB</b>	25	30	60	54	50	34	12	45	32	7.5	18	M8	M6	20	6	2352	1254	340
<b>CS25UUB</b>	30	39	78	67	60	40	15	60	40	9	22	M10	M8	25	6	4508	2195	636
<b>CS30UUB</b>	35	43.5	87	79	70	48	17	68	45	9.5	22	M10	M8	30	6	5586	2959	970
<b>CS40UUB</b>	45	54	108	91	90	62	22	86	58	11	26	M12	M10	40	6	9310	4312	1740
<b>CS50UUB</b>	50	66	132	113	105	68	25	108	50	12	34	M16	M12	50	6	13720	6762	2922

# CSO type - Super European Ball Bushing Pillow Block Open Type



(with 1 pc self aligning SBEO ball bushing)



Part No.	Dimensions							Mounting Dimensions						Shaft	No. Ball Rows	Basic Load Ratings		Weight (g)
	h	E	W	L	F	T	h <sub>1</sub>	θ	B	C	b	S1	S2			dyn. C (N)	stat. C <sub>0</sub> (N)	
<b>CSO16UUB</b>	22	26.5	53	43	35	8	9	68°	40	26	13	M6	M5	16	4	1176	607	160
<b>CSO20UUB</b>	25	30	60	54	42	10	9	55°	45	32	18	M8	M6	20	5	2352	1254	280
<b>CSO25UUB</b>	30	39	78	67	51	13	11.5	57°	60	40	22	M10	M8	25	5	4508	2195	552
<b>CSO30UUB</b>	35	43.5	87	79	60	15	14	57°	68	45	22	M10	M8	30	5	5586	2959	846
<b>CSO40UUB</b>	45	54	108	91	77	20	19.5	56°	86	58	26	M12	M10	40	5	9310	4312	1516
<b>CSO50UUB</b>	50	66	132	113	88	25	22.5	54°	108	50	34	M16	M12	50	5	13720	6762	2546

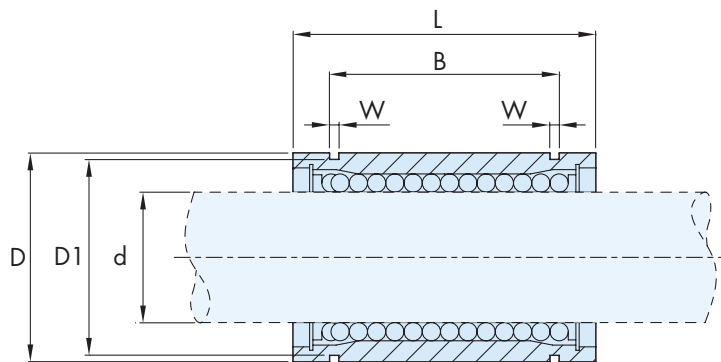
## LME Series - Standard European Ball Bushing



LME



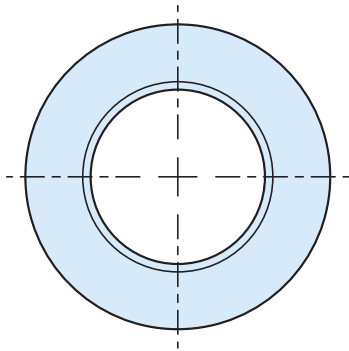
LME OP



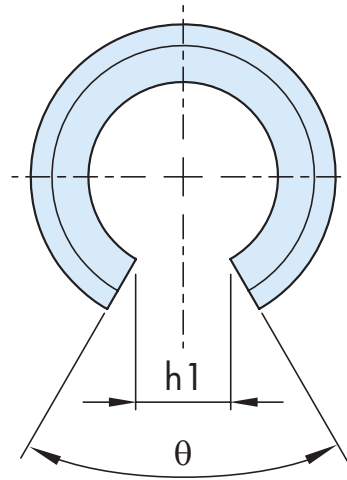
LME Series				Basic Load Ratings		Working Bore Diameter
Standard Type		Open Type		dyn. C (N)	stat. Co (N)	d (mm)
Part No.	No. of Ball Circuit	Part No.	No. of Ball Circuit			
<b>LME5UU</b>	4	-	-	200	260	5
<b>LME8UU</b>	4	-	-	260	400	8
<b>LME12UU</b>	4	<b>LME12UUOP</b>	3	410	590	12
<b>LME16UU</b>	5	<b>LME16UUOP</b>	4	770	1170	16
<b>LME20UU</b>	5	<b>LME20UUOP</b>	4	860	1370	20
<b>LME25UU</b>	6	<b>LME25UUOP</b>	5	980	1560	25
<b>LME30UU</b>	6	<b>LME30UUOP</b>	5	1560	2740	30
<b>LME40UU</b>	6	<b>LME40UUOP</b>	5	2150	4010	40
<b>LME50UU</b>	6	<b>LME50UUOP</b>	5	3280	7930	50
<b>LME60UU</b>	6	<b>LME60UUOP</b>	5	4700	9990	60



# LME Series - Standard European Ball Bushing



LME



LME OP

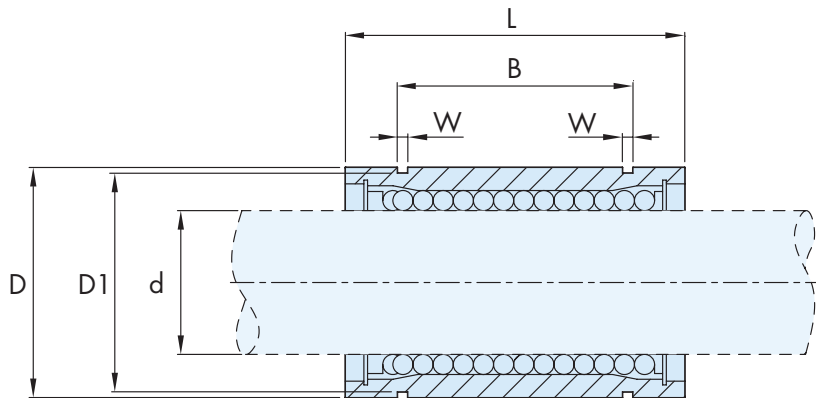
Part No.	Part No.	Dimensions (mm)										Weight (g)
		D		L		B		W	D1	h1	θ	
		(mm)	Tol. (μm)	(mm)	Tol. (mm)	(mm)	Tol. (mm)					
<b>LME5UU</b>	-	12	0	22	0 -0.2	14.5	0 -0.2	1.1	11.5	-	-	12
<b>LME8UU</b>	-	16	-8	25		16.5		1.1	15.2	-	-	20
<b>LME12UU</b>	<b>LME12UUOP</b>	22	0	32		22.9		1.3	21	7.5	78°	41
<b>LME16UU</b>	<b>LME16UUOP</b>	26	-9	36	24.9	1.3	24.9	10	78°	57		
<b>LME20UU</b>	<b>LME20UUOP</b>	32	0 -11	45	31.5	1.6	30.3	10	60°	91		
<b>LME25UU</b>	<b>LME25UUOP</b>	40		58	44.1	1.85	37.5	12.5	60°	215		
<b>LME30UU</b>	<b>LME30UUOP</b>	47		68	52.1	1.85	44.5	12.5	50°	325		
<b>LME40UU</b>	<b>LME40UUOP</b>	62	0	80	-0.3	60.6	-0.3	2.15	59	16.8	50°	705
<b>LME50UU</b>	<b>LME50UUOP</b>	75	-13	100	77.6	2.65	72	21	50°	1130		
<b>LME60UU</b>	<b>LME60UUOP</b>	90	0 -15	125	0 -0.4	101.7	0 -0.4	3.15	27.2	27.2	54°	2220

# LM Series - Standard Japanese Ball Bushing



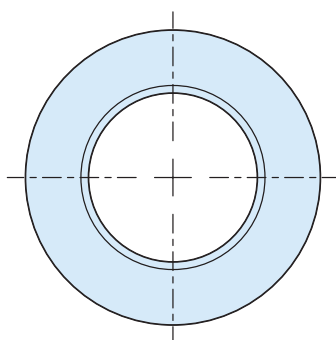
LM

LM OP

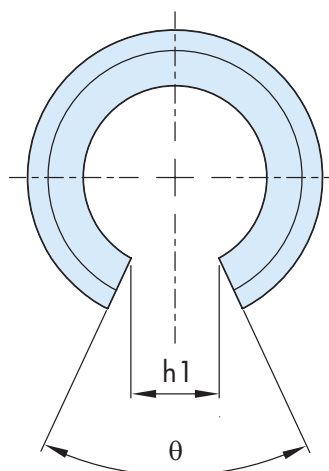


LM Series				Basic Load Ratings		Working Bore Diameter
Standard Type		Open Type		dyn. C (N)	stat. Co (N)	d (mm)
Part No.	No. of Ball Circuit	Part No.	No. of Ball Circuit			
<b>LM4UU</b>	4	-	-	88	108	4
<b>LM5UU</b>	4	-	-	167	206	5
<b>LM6UU</b>	4	-	-	200	260	6
<b>LM8SUU</b>	4	-	-	170	220	8
<b>LM8UU</b>	4	-	-	260	400	8
<b>LM10UU</b>	4	-	-	370	540	10
<b>LM12UU</b>	4	<b>LM12UUOP</b>	3	410	590	12
<b>LM13UU</b>	4	<b>LM13UUOP</b>	3	500	770	13
<b>LM16UU</b>	5	<b>LM16UUOP</b>	4	770	1170	16
<b>LM20UU</b>	5	<b>LM20UUOP</b>	4	860	1370	20
<b>LM25UU</b>	6	<b>LM25UUOP</b>	5	980	1560	25
<b>LM30UU</b>	6	<b>LM30UUOP</b>	5	1560	2740	30
<b>LM35UU</b>	6	<b>LM35UUOP</b>	5	1660	3130	35
<b>LM40UU</b>	6	<b>LM40UUOP</b>	5	2150	4010	40
<b>LM50UU</b>	6	<b>LM50UUOP</b>	5	3820	7930	50
<b>LM60UU</b>	6	<b>LM60UUOP</b>	5	4700	9990	60

# LM Series - Standard Japanese Ball Bushing



LM



LM OP

Part No.	Part No.	Dimensions (mm)										Weight (g)
		D		L		B		W	D1	h1	$\theta$	
		(mm)	Tol. ( $\mu\text{m}$ )	(mm)	Tol. (mm)	(mm)	Tol. (mm)					
<b>LM4UU</b>	-	8	0 -9	12	0 -0.12	-	-	-	-	-	-	1.9
<b>LM5UU</b>	-	10	0 -8	15	0 -0.12	10.2	0 -0.2	1.1	9.6	-	-	4
<b>LM6UU</b>	-	12	0 -11	19	0 -0.2	13.5		1.1	11.5	-	-	8
<b>LM8SUU</b>	-	15		17		11.5		1.1	14.3	-	-	11
<b>LM8UU</b>	-	15	24	17.5		1.1		14.3	-	-	16	
<b>LM10UU</b>	-	19	29	22		1.3		18	-	-	30	
<b>LM12UU</b>	<b>LM12UUOP</b>	21	0 -13	30		23		1.3	20	8	80°	31.5
<b>LM13UU</b>	<b>LM13UUOP</b>	23		32		23		1.3	22	9	80°	43
<b>LM16UU</b>	<b>LM16UUOP</b>	28		37		26.5		1.6	27	11	80°	69
<b>LM20UU</b>	<b>LM20UUOP</b>	32		42		30.5		1.6	30.5	11	60°	87
<b>LM25UU</b>	<b>LM25UUOP</b>	40	0 -16	59		41		0 -0.3	1.85	38	12	50°
<b>LM30UU</b>	<b>LM30UUOP</b>	45		64		44.5	1.85		43	15	50°	250
<b>LM35UU</b>	<b>LM35UUOP</b>	52	70	49.5	2.1	49	17		50°	390		
<b>LM40UU</b>	<b>LM40UUOP</b>	60	0 -19	80	60.5	2.1	57		20	50°	585	
<b>LM50UU</b>	<b>LM50UUOP</b>	80		100	74	2.6	76.5		25	50°	1580	
<b>LM60UU</b>	<b>LM60UUOP</b>	90	0 -22	110	85	3.15	86.5		30	50°	2000	

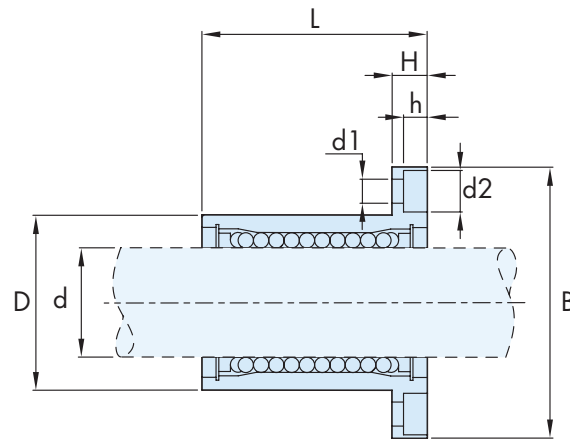
## LMF/K Series - Standard Flanged Units



LMF

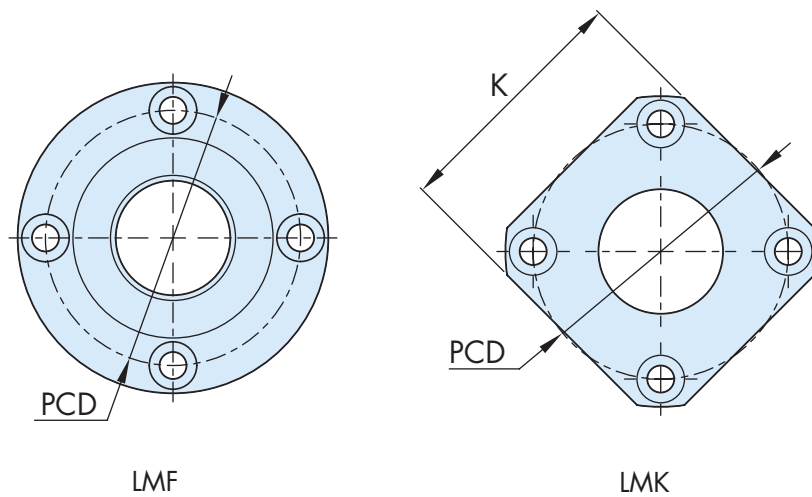


LMK



Part No.		No. of Ball Circuit	Weight (g)	Basic Load Ratings		Working Bore Diameter
Circular type	Square type			Dyn. C (N)	Stat. Co (N)	d (mm)
<b>LMF6UU</b>	<b>LMK6UU</b>	4	26.5	200	260	6
<b>LMF8SUU</b>	<b>LMK8SUU</b>	4	34.0	170	220	8
<b>LMF8UU</b>	<b>LMK8UU</b>	4	40.0	260	400	8
<b>LMF10UU</b>	<b>LMK10UU</b>	4	78.0	370	540	10
<b>LMF12UU</b>	<b>LMK12UU</b>	4	76.0	410	590	12
<b>LMF13UU</b>	<b>LMK13UU</b>	4	94.0	500	770	13
<b>LMF16UU</b>	<b>LMK16UU</b>	5	134.0	770	1170	16
<b>LMF20UU</b>	<b>LMK20UU</b>	5	180.0	860	1370	20
<b>LMF25UU</b>	<b>LMK25UU</b>	6	340.0	980	1560	25
<b>LMF30UU</b>	<b>LMK30UU</b>	6	460.0	1560	2740	30
<b>LMF35UU</b>	<b>LMK35UU</b>	6	795.0	1660	3130	35
<b>LMF40UU</b>	<b>LMK40UU</b>	6	1054.0	2150	4010	40
<b>LMF50UU</b>	<b>LMK50UU</b>	6	2200.0	3820	7930	50
<b>LMF60UU</b>	<b>LMK60UU</b>	6	2960.0	4700	9990	60

# LMF/K Series - Standard Flanged Units



Part No.		Dimensions (mm)									
		D		L		B		H	PCD	K	d1 x d2 x h
Circular type	Square type	(mm)	Tol. (µm)	(mm)	Tol. (mm)	(mm)	Tol. (mm)				
<b>LMF6UU</b>	<b>LMK6UU</b>	12	0 -11	19	0 -0.2	28	0 -0.2	5	20	22	3.4 x 6.5 x 3.3
<b>LMF8SUU</b>	<b>LMK8SUU</b>	15		17		32		5	24	25	3.4 x 6.5 x 3.3
<b>LMF8UU</b>	<b>LMK8UU</b>	15		24		32		5	24	25	3.4 x 6.5 x 3.3
<b>LMF10UU</b>	<b>LMK10UU</b>	19	0 -13	29		40		6	29	30	4.5 x 8 x 4.4
<b>LMF12UU</b>	<b>LMK12UU</b>	21		30		42		6	32	32	4.5 x 8 x 4.4
<b>LMF13UU</b>	<b>LMK13UU</b>	23		32		43		6	33	34	4.5 x 8 x 4.4
<b>LMF16UU</b>	<b>LMK16UU</b>	28	37	48	6	38	37	4.5 x 8 x 4.4			
<b>LMF20UU</b>	<b>LMK20UU</b>	32	0 -16	42	0 -0.3	54	0 -0.3	8	43	42	5.5 x 9.5 x 5.4
<b>LMF25UU</b>	<b>LMK25UU</b>	40		59		62		8	51	50	5.5 x 9.5 x 5.4
<b>LMF30UU</b>	<b>LMK30UU</b>	45		64		74		10	60	58	6.6 x 11 x 6.5
<b>LMF35UU</b>	<b>LMK35UU</b>	52	0 -19	70		82		10	67	64	6.6 x 11 x 6.5
<b>LMF40UU</b>	<b>LMK40UU</b>	60		80		96		13	78	75	9 x 14 x 8.6
<b>LMF50UU</b>	<b>LMK50UU</b>	80		100		116		13	98	92	9 x 14 x 8.6
<b>LMF60UU</b>	<b>LMK60UU</b>	90	0 -22	110	134	18	112	106	11 x 17.5 x 10.8		

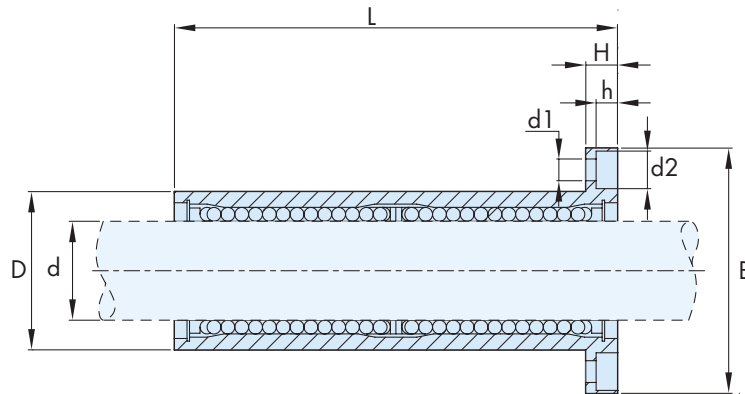
## LMF/KL Series - Extended Length Flanged Units



LMF L

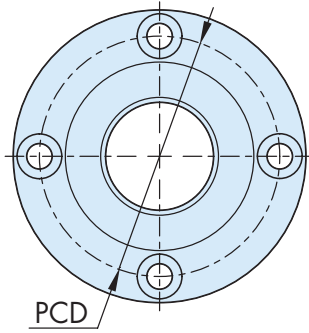


LMK L

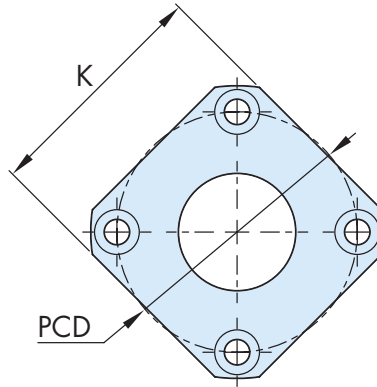


Part No.		No. of Ball Circuit	Weight (g)	Basic Load Ratings		Working Bore Diameter
Circular Type	Square Type			dyn. C (N)	stat. Co (N)	d (mm)
<b>LMF6LUU</b>	<b>LMK6LUU</b>	4	31	320	520	6
<b>LMF8SLUU</b>	<b>LMK8SLUU</b>	4	53	430	780	8
<b>LMF10LUU</b>	<b>LMK10LUU</b>	4	105	580	1100	10
<b>LMF12LUU</b>	<b>LMK12LUU</b>	4	100	650	1200	12
<b>LMF13LUU</b>	<b>LMK13LUU</b>	4	130	810	1570	13
<b>LMF16LUU</b>	<b>LMK16LUU</b>	5	187	1230	2350	16
<b>LMF20LUU</b>	<b>LMK20LUU</b>	5	260	1400	2750	20
<b>LMF25LUU</b>	<b>LMK25LUU</b>	6	515	1560	3140	25
<b>LMF30LUU</b>	<b>LMK30LUU</b>	6	655	2490	5490	30
<b>LMF35LUU</b>	<b>LMK35LUU</b>	6	970	2650	6470	35
<b>LMF40LUU</b>	<b>LMK40LUU</b>	6	1560	3430	8040	40
<b>LMF50LUU</b>	<b>LMK50LUU</b>	6	3500	6080	15900	50
<b>LMF60LUU</b>	<b>LMK60LUU</b>	6	4500	7650	20000	60

# LMF/KL Series - Extended Length Flanged Units



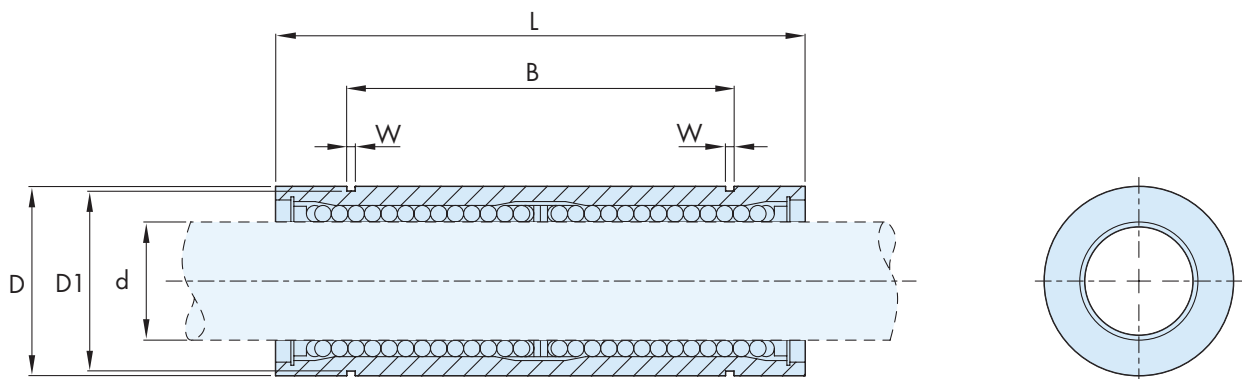
LMFL



LMKL

Part No.		Dimensions (mm)									
		D		L		B		H	PCD	K	d1 x d2 x h
Circular Type	Square Type	(mm)	Tol. (mm)	(mm)	Tol. (mm)	(mm)	Tol. (μm)				
<b>LMF6LUU</b>	<b>LMK6LUU</b>	12	0 -13	35	0 -0.3	28	0 -0.2	5	20	22	3.4x6.5x3.3
<b>LMF8SLUU</b>	<b>LMK8SLUU</b>	15		45		32		5	24	25	3.4x6.5x3.3
<b>LMF10LUU</b>	<b>LMK10LUU</b>	19	0 -16	55		40		6	29	30	4.5x8x4.4
<b>LMF12LUU</b>	<b>LMK12LUU</b>	21		57		42		6	32	32	4.5x8x4.4
<b>LMF13LUU</b>	<b>LMK13LUU</b>	23		61		43		6	33	34	4.5x8x4.4
<b>LMF16LUU</b>	<b>LMK16LUU</b>	28		70		48		6	38	37	4.5x8x4.4
<b>LMF20LUU</b>	<b>LMK20LUU</b>	32	0 -16	80		54		8	43	42	5.5x9.5x5.4
<b>LMF25LUU</b>	<b>LMK25LUU</b>	40		112		62		8	51	50	5.5x9.5x5.4
<b>LMF30LUU</b>	<b>LMK30LUU</b>	45		123		74		10	60	58	6.6x11x6.5
<b>LMF35LUU</b>	<b>LMK35LUU</b>	52	0 -19	135		0 -0.4		82	0 -0.3	10	67
<b>LMF40LUU</b>	<b>LMK40LUU</b>	60		154	96		13	78		75	9x14x8.6
<b>LMF50LUU</b>	<b>LMK50LUU</b>	80		192	116		13	98		92	9x14x8.6
<b>LMF60LUU</b>	<b>LMK60LUU</b>	90	0 -22	211		134		18	112	106	11x17.5x10.8

# LME Series - Extended Length Ball Bushing



LME Series		Working Bore Diameter	Dimensions (mm)								Weight (g)	Basic Load Ratings	
Part No.	No. of Ball Circuit		D		L		B		W	D <sub>1</sub>		dyn. C (N)	stat. C <sub>0</sub> (N)
		d (mm)	(mm)	Tol. (μm)	(mm)	Tol. (mm)	(mm)	Tol. (mm)					
<b>LME8LUU</b>	4	8	16	0 -9	45	0 -0.3	33	0 -0.3	1.1	15.2	31	430	780
<b>LME12LUU</b>	4	12	22	0 -11	57		45.8		1.3	21	80	650	1200
<b>LME16LUU</b>	5	16	26		70		49.8		1.3	24.9	145	1230	2350
<b>LME20LUU</b>	5	20	32	0 -13	80	0 -0.4	61	0 -0.4	1.6	30.3	180	1400	2750
<b>LME25LUU</b>	6	25	40		112		82		1.85	38	440	1560	3140
<b>LME30LUU</b>	6	30	47		123		104.5		1.85	44.5	580	2490	5490
<b>LME40LUU</b>	6	40	62	0 -15	154	0 -0.4	121.2	0 -0.4	2.15	59	1170	3430	8040
<b>LME50LUU</b>	6	50	75	192	155.2		2.65		72	3100	6080	15900	
<b>LME60LUU</b>	6	60	90	0 -20	211		170		3.15	86.5	3500	7650	20000



## Precision Linear Shaft

Correct shaft selection is vital if maximum performance is to be achieved from our linear system. Hepco Precision Shaft has been developed to provide excellent performance when used with either recirculating ball bushings or plain bearing technology.

An extensive range of shaft materials are available and HepcoMotion offers a full machining facility with fast turnaround.

Other types of shaft available include:

- Specials (up to 150mm Ø).
- Tubing (Please enquire).



Shaft Type: Metric	Part Ref.	Hardness RC	TOL	Diameter Options															
				4	5	6	8	10	12	13	16	20	25	30	35	40	50	60	80
Metric Carbon Steel CK53 Hardened and Ground	NIMxx	60	h6	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Metric Stainless Steel (400 series) Hardened and Ground	NIMxx-SS	50	h6	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Metric Soft Stainless Steel (300 Series) Ground	NIMxx-SS316	X	h6	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Metric Hardcoat Anodised Aluminium	NI-MAxx	X	h6	-	-	-	√	√	√	-	√	√	√	-	-	-	-	-	-

Shaft Type: Imperial	Part Ref.	Hardness RC	TOL	Diameter Options										
				3/16	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2	
Imperial Carbon Steel CK53 Hardened and Ground	NIlxx	60	Class L	√	√	√	√	√	√	√	√	√	√	√
Imperial Stainless Steel (400 Series) Hardened and Ground	NIlxx-SS	50	Class L	√	√	√	√	√	√	√	√	√	√	
Imperial Soft Stainless Steel (300 Series) Ground	NIlxx-SS316	X	Class L	√	√	√	√	√	√	√	√	√	√	
Imperial Hardcoat Anodised Aluminium	NIlAxx	X	Class L	√	√	√	√	√	√	√	√	√	√	

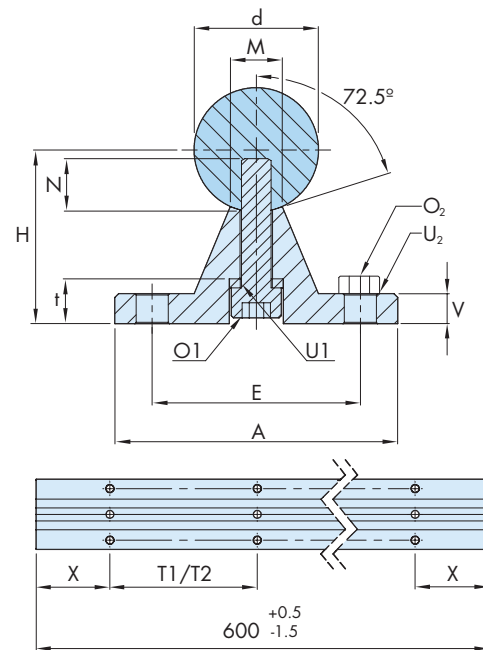
## Metric Shaft Support Rails

Shaft support rails will prevent shaft deflection under load and provide a high level of rigidity in order to achieve optimum performance from your open type Hepco Ball Bushing or any other open recirculating or plain linear bushing.

Support Rails are of low overall height making them particularly suitable for use with Hepco Pillow Blocks. The standard support rail is manufactured from aluminium alloy and comes in 600mm lengths only. These are then cut/butted together to fit to the overall length of the one piece shaft.

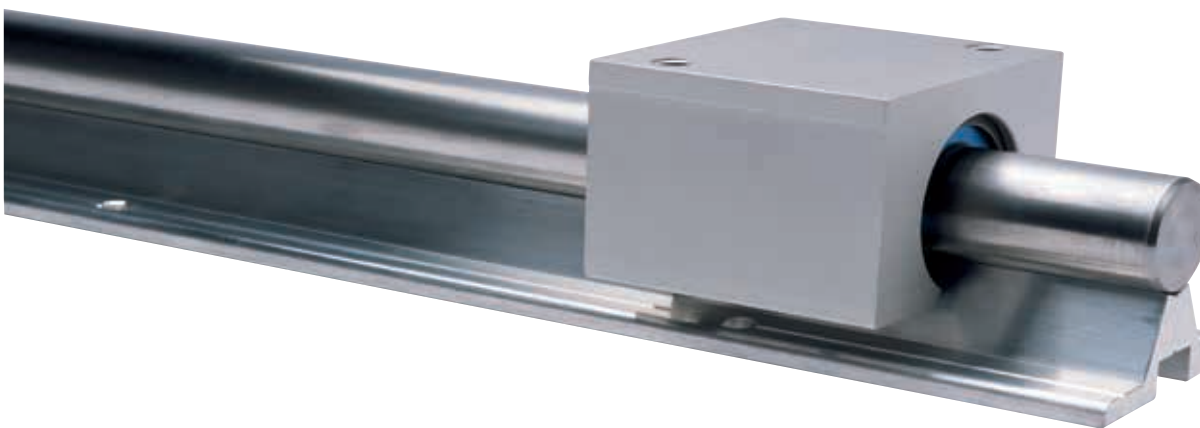
All types of shaft can be supplied drilled for customer assembly or fitted to the support rails for ease of supply.

For standard 600mm aluminium support rails, X = half of T1 or T2. For support rails which require cutting/butting, please confirm Dimension X when ordering.



X = 1/2 hole pitch T<sub>1</sub> or T<sub>2</sub>

For Shaft Diameter	d	H <sub>1</sub> ±0.01	A	V	M	O <sub>1</sub>	U <sub>1</sub>	N	E	t	O <sub>2</sub>	U <sub>2</sub>	T1	T2
12	12	22	40	5	5.8	M4X20	4	8	29	4.5	M4	4	75	120
16	16	26	45	5	7	M5X20	5	9	33	7.6	M5	5	100	150
20	20	32	52	6	8.3	M6X25	6	11	37	8.6	M6	6	100	150
25	25	36	57	6	10.8	M8X30	8	15	42	9	M6	6	120	200
30	30	42	69	7	11	M10X35	10	17	51	10	M8	8	150	200
40	40	50	73	8	15	M10X40	10	19	55	9.5	M8	8	200	300
50	50	60	84	9	19	M12X45	12	21	63	11.2	M10	10	200	300



## Ordering Shaft

### Shaft & Support Rail Fully Assembled

Simply prefix the shaft reference with AU.

Example – AU NIM 20 X L2000 T2

### Drilled Shaft Only

Simply state the shaft reference and add T1 or T2 depending upon shaft hole centres required.

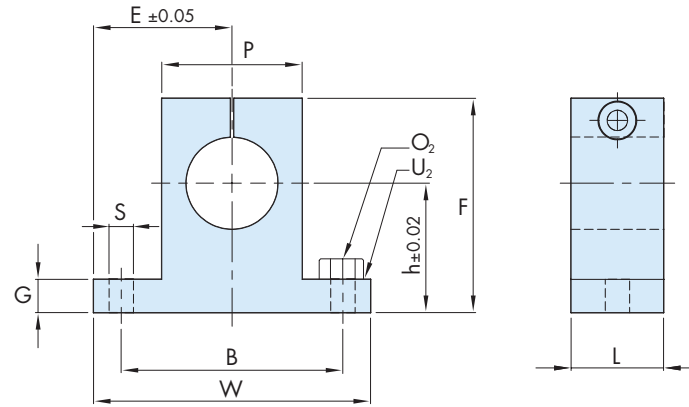
Example – NIM 20 X L2000 T2

### Support Rails Only

Aluminium Support Rails (SR) supplied in lengths up to 2000mm. Simply state whether T1 or T2 mounting hole spacing is required.

Example – Support Rail for 20mm Shaft T2  
Hole Centre – SR20 – T2

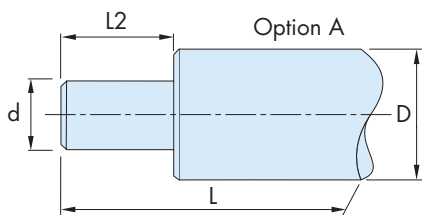
# Aluminium Shaft Supports



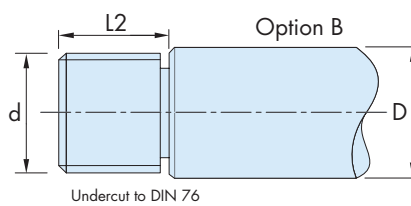
Part No.	Nominal Shaft Diameter	Major Dimensions									O <sub>2</sub>	U <sub>2</sub>	Weight (g)
		h	E	W	L	F	G	P	B	S			
<b>ASS10</b>	10	17	18.5	37	10	30	5	18	28	4.5	M4	4	24
<b>ASS12</b>	12	20	21	42	15	35	5.5	20	32	5.5	M5	5	30
<b>ASS16</b>	16	25	25	50	15	42	6	26	40	5.5	M5	5	40
<b>ASS20</b>	20	30	30	60	20	50	8	32	45	5.5	M5	5	70
<b>ASS25</b>	25	35	37	75	25	58	9	38	60	6.6	M6	6	130
<b>ASS30</b>	30	40	42	84	30	68	10	45	68	9	M8	8	180
<b>ASS40</b>	40	50	54	108	30	86	12	56	86	11	M10	10	420
<b>ASS50</b>	50	60	65	130	40	100	14	80	108	11	M10	10	750

## Machined Ends

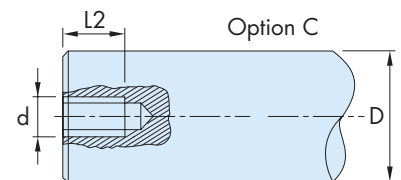
HepcoMotion can undertake shaft machining to standard ends as shown below or specials to customers' drawings.



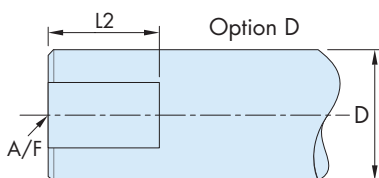
Spigot  
 One end  Both ends



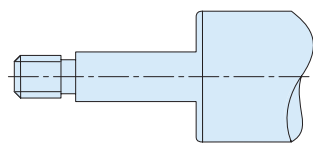
Threaded Spigot  
 One end  Both ends



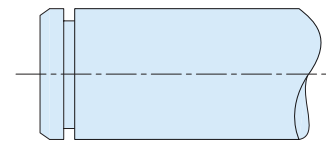
Drilled and Tapped  
 One end  Both ends



Single Flat  Double Flat   
 One end  Both ends



Please send drawing



Please send drawing

## Housing and Shaft Tolerance - Super Ball Bushing

The recommended housing and shaft tolerances for Super Ball Bushings are shown in table 1.

Table 1. Super Ball Bushing SBE/SBEO

Part No.	16	20	25	30	40	50
Outer Diameter (D)	26	32	40	47	62	75
Housing Bore (H7)	+0.021 0	+0.025 0			+0.030 0	
Shaft Tol (h6)	✓	✓			✓	

## Assembly - Super Ball Bushing

Use of a jig (see figure 5) is recommended for insertion into a housing. Care should be taken not to exert pressure on the ball retainer or seals.

The edge of the housing bore must be chamfered. Correct alignment is essential in order to prevent damage.

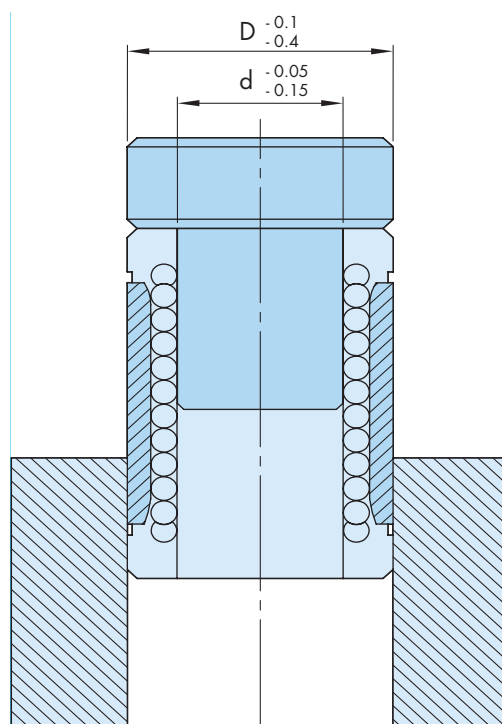


Fig 5. Use of a Jig

## Housing and Shaft Tolerance - Standard Ball Bushing

The recommended housing and shaft tolerances for Standard Ball Bushings are shown in table 2.

Table 2. Standard Ball Bushing LME/LME-OP

Part No.	5	8	12	16	20	25	30	40	50	60
Outer Diameter (D)	12	16	22	26	32	40	47	62	75	90
Housing Bore (H7)	+0.018 0		+0.021 0		+0.025 0			+0.030 0		+0.035 0
Shaft Tol (h6)	✓		✓		✓			✓		✓

## Assembly - Standard Bull Bushing

Possible mounting methods are illustrated in Figure 6. and Figure 7. with retaining rings and cover plates.

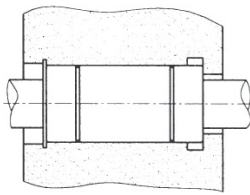


Fig 6. Mounting With Retaining Rings

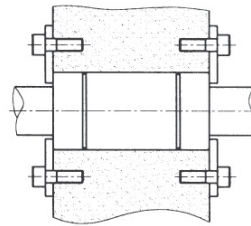
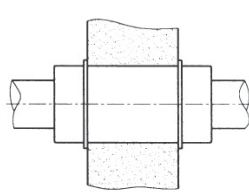


Fig 7. Mounting With Cover Plates

## Load / Life Calculation

### Basic Dynamic Rating (C)

The basic Dynamic Load Rating (C) is the maximum continuous load that can be applied to a bearing with a 90% probability that a working life of 50 km will be achieved.

There are two key factors to the load calculation that may need to be applied depending on the application conditions.

### Shaft hardness factor (FH)

The hardness of the shaft should be 60 RC +/- 2, refer to figure 8 for shaft hardness factors.

### Temperature factor (FT)

$$L = \left( \frac{C}{P} \cdot FH \cdot FT \right)^3 \cdot 50 \text{ (km)}$$

- L : Running distance life (km)  
C : Basic dynamic load rating (N)  
P : Applied load (N)  
FH : Hardness factor (figure 8.)  
FT : Temperature factor (figure 9.)

Ball bushings in this range are designed to work at a maximum temperature of 100 degrees C, for temperatures higher than this please apply the temperature factor as indicated in figure 9.

### Basic Static Load Rating (Co)

The Basic Static Load Rating (Co) is the static load that will permanently cause deformation of the bushing ball track equivalent to 0.01% of the ball diameter. It is good practice to limit the maximum static force to a maximum of 80%.

### Short Stroke Life Reduction

Where the stroke distance is less than a Ball Bushing length the calculated life will be reduced by up to 70%.

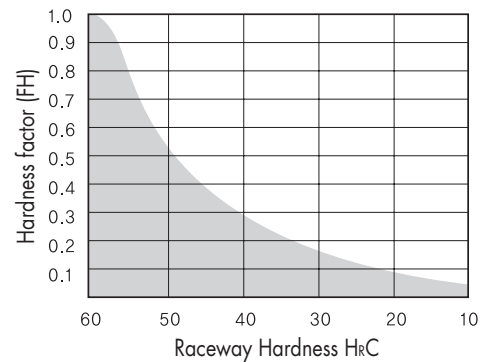


Fig 8. Hardness Factor (FH)

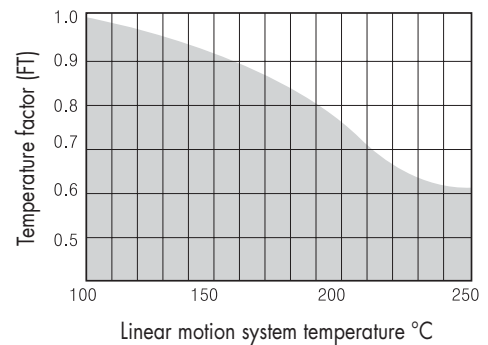


Fig 9. Temperature Factor (FT)

## Lubrication

For best performance, and to achieve a long and trouble free life, ball bushings require lubrication with either oil or grease.

### Grease Lubrication

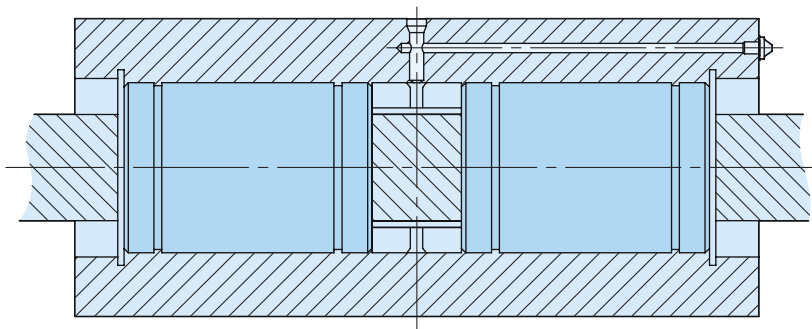
For grease lubrication the anticorrosive protection oil should be removed prior to assembly ensuring that the bearing is dry before applying grease.

Grease should be applied directly to the ball circuits prior to fitting, generally a lithium soap grease ISO viscosity grade 2 is recommended for general use.

### Oil Lubrication

For oil lubrication it is not necessary to remove the anticorrosive protection from the bushing. The viscosity grade will be dependent on the operating temperature, please see the chart below.

Operating Temp.	Viscosity
-30°C ~ 50°C	VG 15 ~ 46
50°C ~ 80°C	VG 46 ~ 100



**Fig 10. Two Assembled Bushings**

For most effective lubrication oil should be applied between two assembled bushings as shown in Figure 10 where seals are fitted only to the outside of each bearing.

Periodic checking of the installation is recommended whether oil or grease is used, in order to check that the bushing is not running dry.

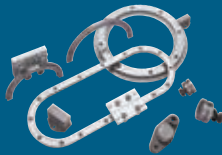
# HepcoMotion® Product Range



**GV3**  
Linear Guidance and  
Transmission System



**HDS2**  
Heavy Duty  
Slide System



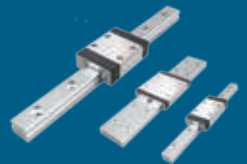
**PRT2**  
Precision Ring and  
Track System



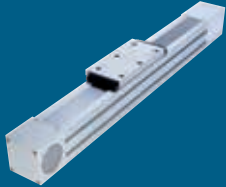
**HDRT**  
Heavy Duty Ring Slides  
and Track System



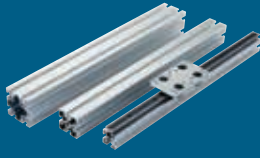
**SL2**  
Stainless Steel Based  
Slide System



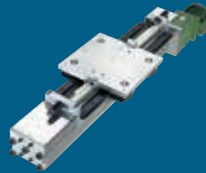
**HLG**  
Hepco Linear Guides



**SBD**  
Sealed Belt  
Drive



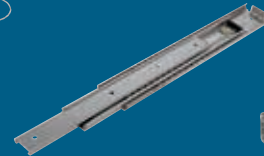
**MCS**  
Aluminium Frame  
and Machine  
Construction System



**HDLS**  
Heavy Duty Driven  
Linear System



**DLS**  
Linear Transmission and  
Positioning System



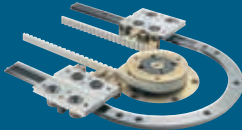
**HTS**  
Telescopic Ball Bearing  
Slides



**HPS**  
Powerslide-2 Guided  
Rodless Cylinder



**MHD**  
Heavy Duty Track Roller  
Guidance System



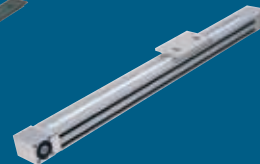
**DTS**  
Driven Track System



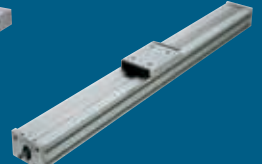
**BSP**  
Ballscrew Premier



**Simple Select®**  
Vee Slide Linear  
Guidance Systems



**PDU2**  
Profile Driven Unit



**PSD120**  
Profile Screw Driven Unit

For further information on HepcoMotion® products –  
please request our leaflet 'FPL'

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