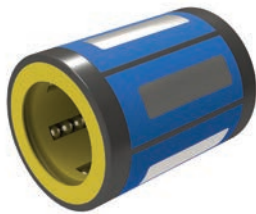
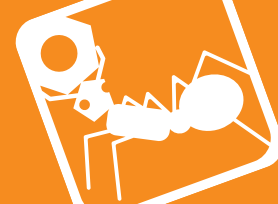


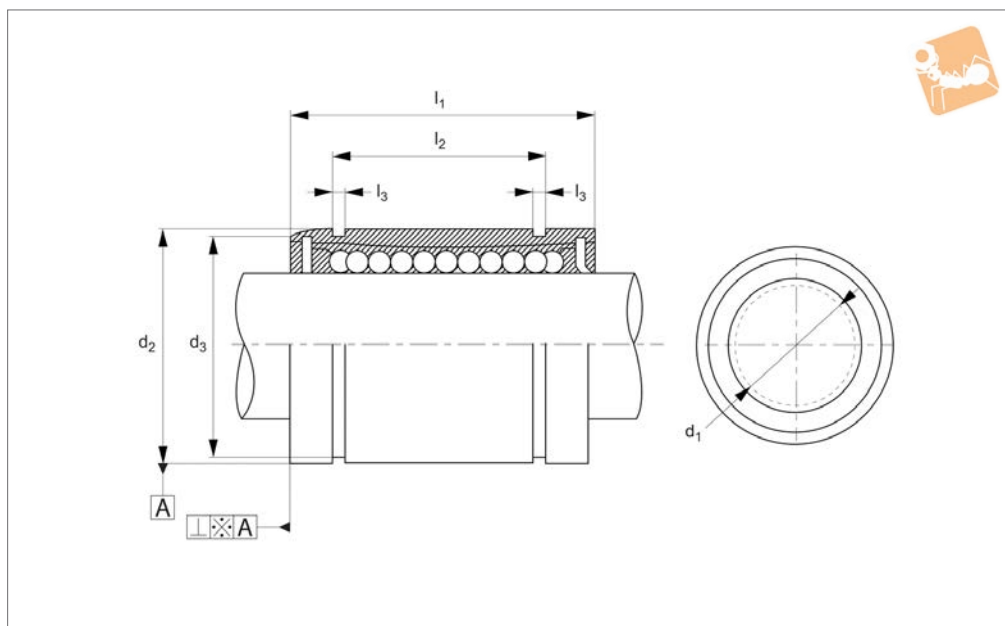


L1706  Closed, open + adjustable	L1712  Double compliment versions	L1715  Compact versions
L1718  Front flanged standard	L1723  Front flanged double compliment	L1731  Centre flanged double compliment
L1740  Superball bushings	L1750  Closed linear carriage	L1753  Open linear carriage

**For full technical information,
see end of product section.**



L1706



Material

Hardened and ground body from bearing steel. Single body resin retainer (POM). Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

For use with hardened shafts only (see part nos. L1770 - L1772) - tolerance h6.

Perpendicularity .A is better than 15μ.

For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: -20°C to +80°C.

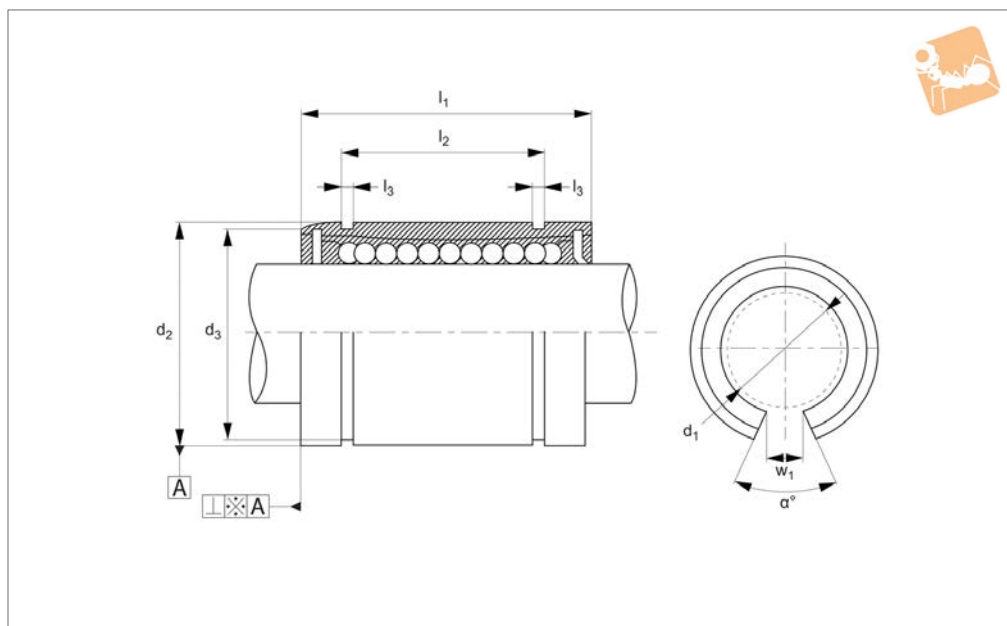
Steel ball retainers can be supplied for higher temperature applications up to 120°C - with no end seals. Please advise at time of ordering if this is required.

Tips

Superball linear bearings are also available (3 x load rating of standard bushings and 27 x travel life see part nos. L1740 and L1742.)

Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version no. L1709.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁ +0 -0.3	d ₃	l ₂ +0 -0.3	l ₃	No. of ball circuits	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1706.005	5	12	22	11.5	14.5	1.10	4	200	260	12
L1706.006-1	6	12	19	11.5	13.5	1.10	4	200	260	8
L1706.008	8	16	25	15.2	16.5	1.10	4	260	400	20
L1706.010-1	10	19	29	18.0	22.0	1.30	4	370	540	30
L1706.012	12	22	32	21.0	22.9	1.30	4	410	590	41
L1706.016	16	26	36	24.9	24.9	1.30	5	770	1170	57
L1706.020	20	32	45	30.3	31.5	1.60	5	860	1370	91
L1706.025	25	40	58	37.5	44.1	1.85	6	980	1560	215
L1706.030	30	47	68	44.5	52.1	1.85	6	1560	2740	325
L1706.040	40	62	80	59.0	60.6	2.15	6	2150	4010	705
L1706.050	50	75	100	72.0	77.6	2.65	6	3820	7930	1130
L1706.060	60	90	125	86.5	101.7	3.15	6	4700	9990	2220



L1707

LINEAR BEARINGS

Material

Hardened and ground body from bearing steel. Single body resin retainer (POM). Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

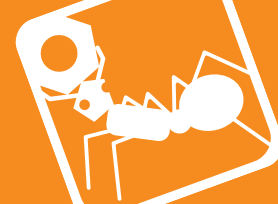
For use with hardened shafts only (see part

nos. L1770 - L1772) - tolerance h6. Perpendicularity . A is better than 15μ. Temperature range: -20°C to +80°C. Steel ball retainers can be supplied for higher temperature applications up to +120°C - with no end seals. Please advise at time of ordering if this is required.

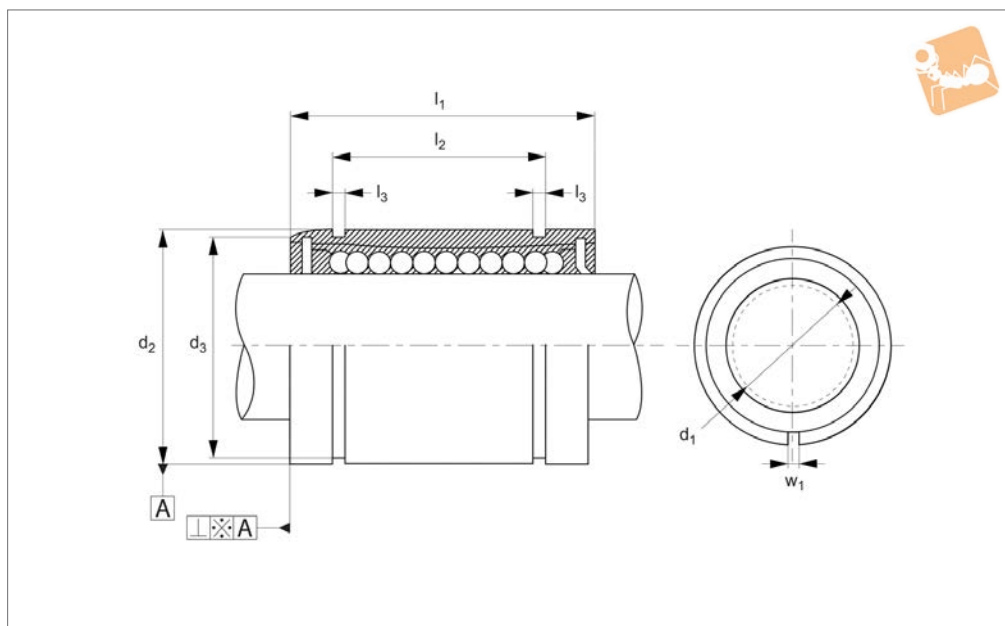
Tips

d_2 is the dimension before the bush has been slotted. Superball linear bearings are also available (3 x load rating of standard bushings and 27 x travel life see part nos. L1740 and L1742.)

Order No.	d_1 tol. h6	d_2 tol. h6	l_1 +0 -0.3	d_3	l_2 +0 -0.3	l_3	w_1	α °	No. of ball circuits	Dyn. load C N max.	Static load C_0 N max.	Weight g
L1707.012	12	22	32	21.0	22.9	1.30	7.3	78°	3	410	590	41
L1707.016	16	26	36	24.9	24.9	1.30	10.0	78°	4	770	1170	57
L1707.020	20	32	45	30.3	31.5	1.60	10.0	60°	5	860	1370	91
L1707.025	25	40	58	37.5	44.1	1.85	12.5	60°	6	980	1560	215
L1707.030	30	47	68	44.5	52.1	1.85	12.5	50°	6	1560	2740	325
L1707.040	40	62	80	59.0	60.6	2.15	16.8	50°	6	2150	4010	705
L1707.050	50	75	100	72.0	77.6	2.65	21.0	50°	6	3820	7930	1130
L1707.060	60	90	125	86.5	101.7	3.15	27.2	54°	6	4700	9990	2220



L1708



Material

Hardened and ground body from bearing steel. Single body resin retainer (POM). Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

For use with hardened shafts only (see part nos. L1770 - L1772) - tolerance h6. Perpendicularity TA is better than 15μ.

For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: -20°C to +80°C.

Steel ball retainers can be supplied for higher temperatures applications up to 120°C - with no end seals. Please advise at time of ordering if this is required.

Tips

d₂ is the dimension before the bush has

been slotted. Superball linear bearings are also available (3 x load rating of standard bushings and 27 x travel life see part nos. L1740 and L1742.)

Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version no. L1711.

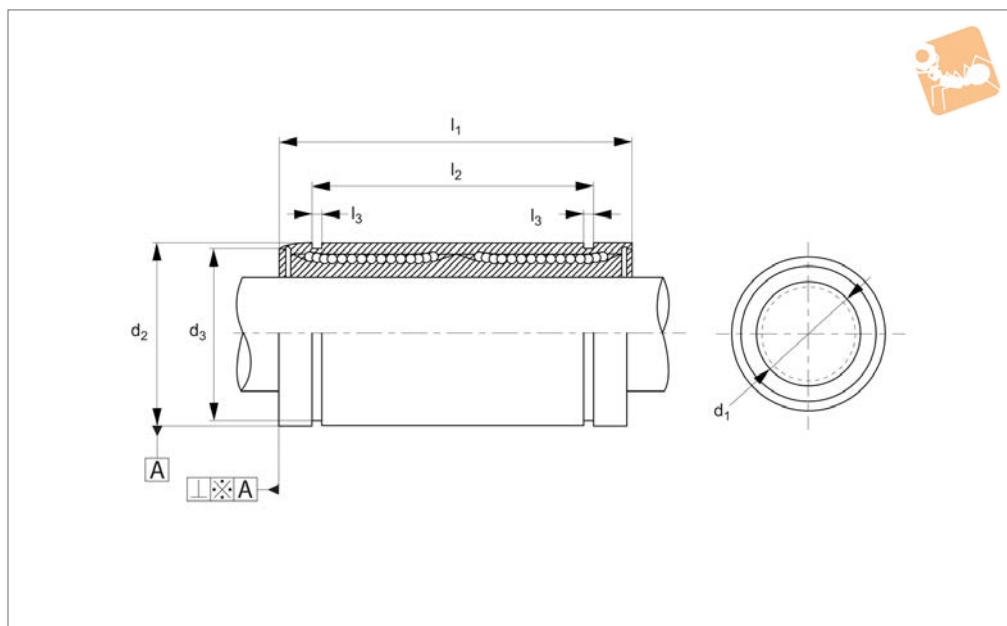
Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁	d ₃	l ₂	l ₃	w ₁	No. of ball circuits	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1708.005	5	12	22	11.5	14.5	1.10	1.0	4	200	260	12
L1708.006-1	6	12	19	11.5	13.5	1.10	1.0	4	200	260	8
L1708.008	8	16	25	15.2	16.5	1.10	1.0	4	260	400	20
L1708.010-1	10	19	29	18.0	22.0	1.30	1.0	4	370	540	30
L1708.012	12	22	32	21.0	22.9	1.30	1.5	4	410	590	41
L1708.016	16	26	36	24.9	24.9	1.30	1.5	5	770	1170	57
L1708.020	20	32	45	30.3	31.5	1.60	2.0	5	860	1370	91
L1708.025	25	40	58	37.5	44.1	1.85	2.0	6	980	1560	215
L1708.030	30	47	68	44.5	52.1	1.85	2.0	6	1560	2740	325
L1708.040	40	62	80	59.0	60.6	2.15	3.0	6	2150	4010	705
L1708.050	50	75	100	72.0	77.6	2.65	3.0	6	3820	7930	1130
L1708.060	60	90	125	86.0	101.7	3.15	3.0	6	4700	9990	2220



Long Linear Ball Bushings

double length

Linear Bearings



L1712

LINEAR BEARINGS

Material

Hardened and ground body from bearing steel.

Single body resin retainer (POM).

Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

For use with hardened shafts only (see part

nos. L1770 - L1772) - tolerance h6.

Perpendicularity A is better than 15μ.

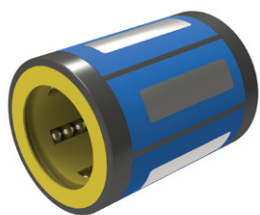
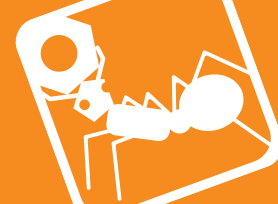
Temperature range: -20°C to +80°C.

Steel ball retainers can be supplied for higher temperature applications up to +120°C - with no end seals. Please advise at time of ordering if this is required.

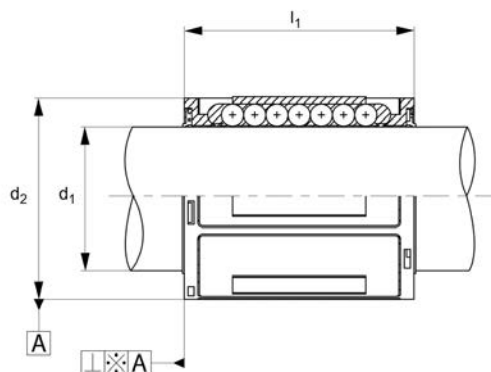
Tips

Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version no. L1713.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁	d ₃	l ₂	l ₃	No. of ball circuits	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1712.008	8	16	45	15.2	33.0	1.10	4	430	780	31
L1712.012	12	22	57	21.0	45.8	1.30	4	650	1200	80
L1712.012-1	12	22	61	21.0	45.8	1.30	4	830	1600	80
L1712.016	16	26	70	24.9	49.8	1.30	5	1230	2350	145
L1712.020	20	32	80	30.3	61.0	1.60	5	1400	2750	180
L1712.025	25	40	112	38.0	82.0	1.85	6	1560	3140	440
L1712.030	30	47	123	44.5	104.2	1.85	6	2490	5490	580
L1712.040	40	62	154	59.0	121.2	2.15	6	3430	8040	1170
L1712.050	50	75	192	72.0	155.2	2.65	6	6080	15900	3100
L1712.060	60	90	211	86.5	170.0	3.15	6	7650	20000	3500



L1715



Material

Durable plastic body with corrosion resistant hardened steel raceway segments.

Technical Notes

Advantages - Low cost, compact construc-

tion, press fit, oil resistant seal, corrosion resistant housing.

For use with hardened shafts only (see part nos. L1770 - L1772) - tolerance h6.

Perpendicularity A is better than 15μ.

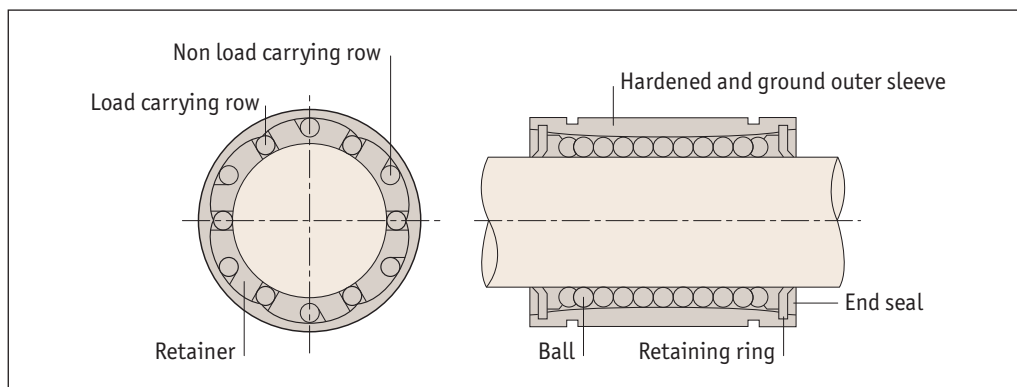
Temperature range: -20°C to +80°C.

Tips

Easy assembly by press fitting, no additional retention is required when fitted into a bore with a tolerance of J6 or J7.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁ ±0.2	No. of ball circuits	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1715.008	8	15	24	4	350	260	6.9
L1715.010	10	17	26	4	416	320	8.4
L1715.012	12	19	28	4	480	385	11.3
L1715.014	14	21	28	5	640	440	13.3
L1715.016	16	24	30	5	925	625	18.3
L1715.020	20	28	30	6	1165	790	22.1
L1715.025	25	35	40	6	2100	1370	51.2
L1715.030	30	40	50	6	2870	2100	70.6
L1715.040	40	52	60	7	5200	4100	90.2
L1715.050	50	62	70	8	6620	5600	110.2

Linear ball bushings



Applications

- Computers and peripheral equipment.
- Recording equipment.
- Linear motion systems.
- Multi-axis drilling machine.
- Printing machines.
- Food packaging machines.
- Punching presses.
- Tool grinders.
- Assembly systems.
- Card selectors.

Interchangeability

Our linear bushing systems are designed to have full interchangeability, with other manufacturers' parts. **For shafting see part numbers L1770 to L1785.**

High precision retainer

The single body retainer guides 4-6 ball circuits. It precisely guides the balls with a smooth motion.

Tolerance of housing bore

Normal fit is standard, pressed fit is for without clearance.

Type	Case	
Part no.	Normal fit	Pressed fit
L1706 to L1733	H7	K6, J6
L1706... ⁻¹ to L1733... ⁻¹	H7	J7

Rigid outer sleeve

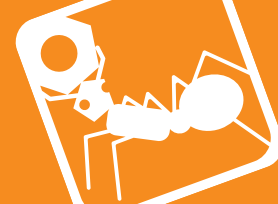
The hardened and precisely ground outer sleeve is made of bearing steel.

L1750 bushing carriages

Consists of light aluminium case and L1706 type linear bushing, so the installation can be finished simply by bolting. Longer life can be obtained by adjusting the orientation of the ball circuits in the linear carriage element against the direction of load.

Tolerance of shaft

Type	Shaft	
Part no.	Normal fit	Tight fit
L1706 to L1733	h6	k6
L1706... ⁻¹ to L1733... ⁻¹	f6, g6	h6



Basic dynamic load rating C

The basic dynamic load rating is defined as the constant load both in direction and magnitude under which a group of identical linear bushings are individually operated. 90% of the units can travel 50Km without failing due to rolling contact fatigue.

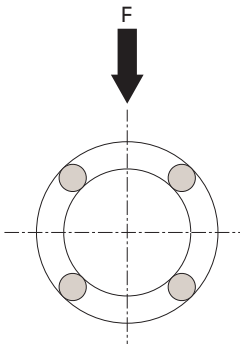
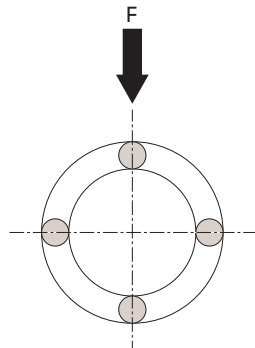
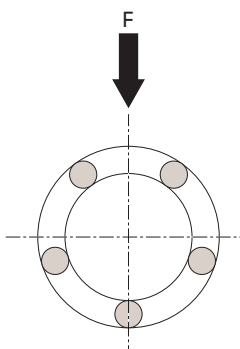
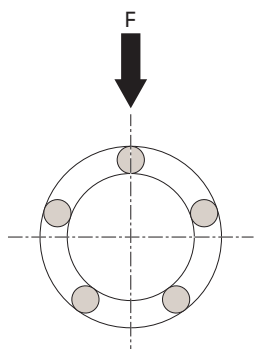
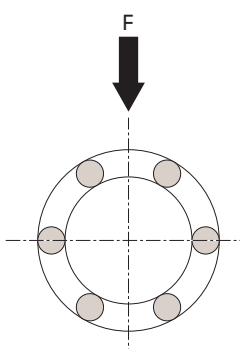
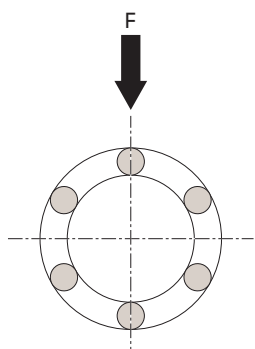
Basic static load rating C₀

If a linear bushing is subject to an excessive load or impact, a permanent deformation occurs between the raceway and the rolling element. The basic static load rating is defined as the static load that gives a prescribed constant contact stress at the centre of the contact area between the rolling element and raceway receiving the maximum load.

Relationships between load ratings and the position of ball circuits

Load ratings of linear bushing are affected by the position of the ball circuits as shown below.

Load ratings and orientation of balls.

No of ball rows	Orientation of balls	
	Maximum load rating	Minimum load rating
4		
	$F = 1.41 \times C$	$F = C$
5		
	$F = 1.46 \times C$	$F = C$
6		
	$F = 1.26 \times C$	$F = C$



Technical Information

Load rating important information

Linear Ball Bushings

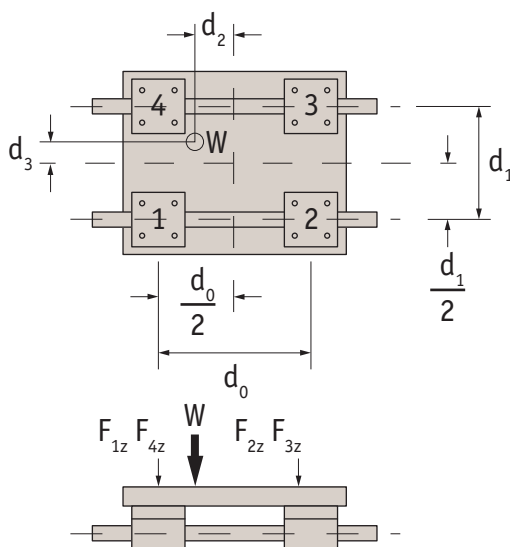
When designing a linear motion system it is necessary to consider how the application will affect performance. The following examples demonstrate how the position of the load and the centre of gravity can influence product selection. When evaluating your application, review each of the forces acting on your system and determine the product that best suits your needs.

$$F_{1z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) - \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{2z} = \frac{W}{4} - \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) - \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{3z} = \frac{W}{4} - \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) + \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{4z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) + \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$



Horizontal application

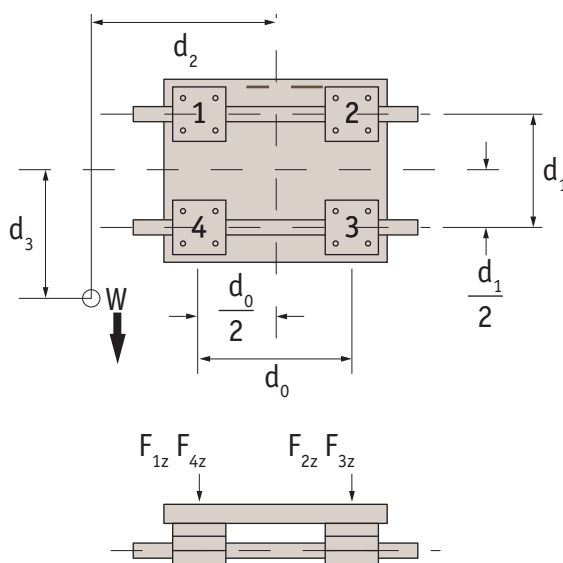
For uniform speed or when stopped.

$$F_{1z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) - \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{2z} = \frac{W}{4} - \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) - \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{3z} = \frac{W}{4} - \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) + \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{4z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) + \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$



Horizontal application

For uniform speed or when stopped.



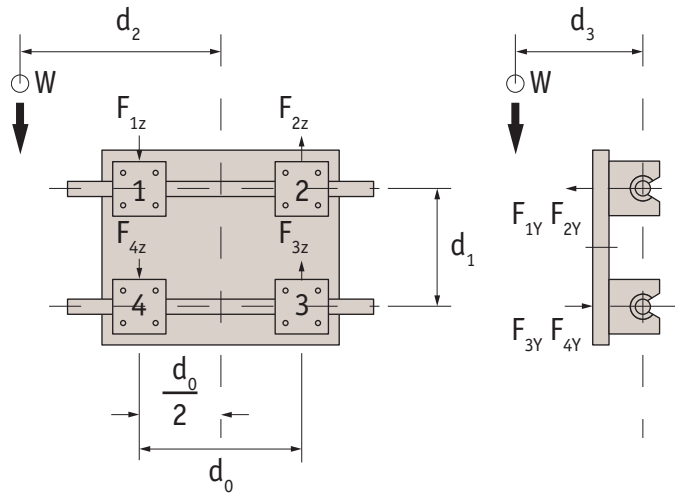
Side mounted application

For uniform speed or when stopped.

$$F_{1Y} \sim F_{4Y} = \left(\frac{W}{2} \cdot \frac{d_3}{d_0} \right)$$

$$F_{1Z} = F_{4Z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right)$$

$$F_{2Z} = F_{3Z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right)$$



Vertical application

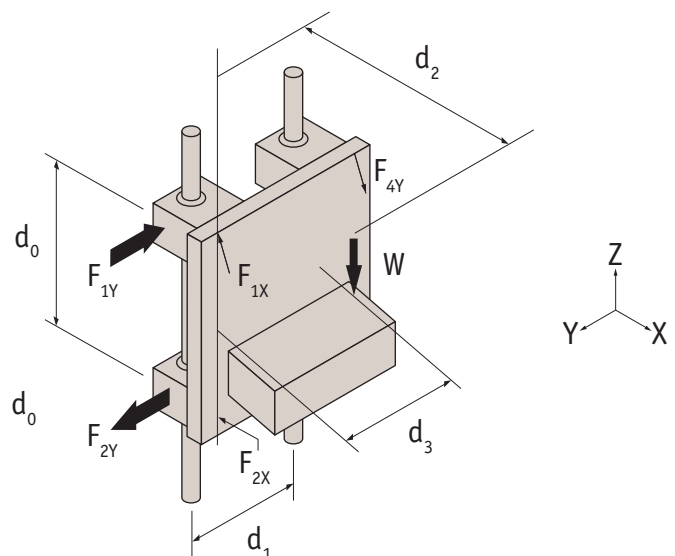
For uniform speed or when stopped. On start up/stop the load varies due to inertia in the system.

$$F_{1X} \sim F_{4X} = \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right)$$

$$F_{1Y} \sim F_{4Y} = \left(\frac{W}{2} \cdot \frac{d_3}{d_0} \right)$$

$$F_{1X} + F_{4X} \sim F_{2X} + F_{3X}$$

$$F_{1Y} + F_{4Y} \sim F_{2Y} + F_{3Y}$$



Friction

The coefficient of friction (μ) of Automotion Components ball bushings without seals is very low at approximately 0.001 to 0.003. When seals are used to retain lubricant or to prevent entry of foreign particles, friction resistance must be taken into account for determining total frictional drag. This protection measure adds to the frictional drag of the bearing system. There is a fine line between minimizing frictional drag and maximizing containment protection which is controlled by the addition or removal of seals, wipers or scrapers.

Linear bushings are used with grease or oil lubrication but in some cases can be used without any lubrication.

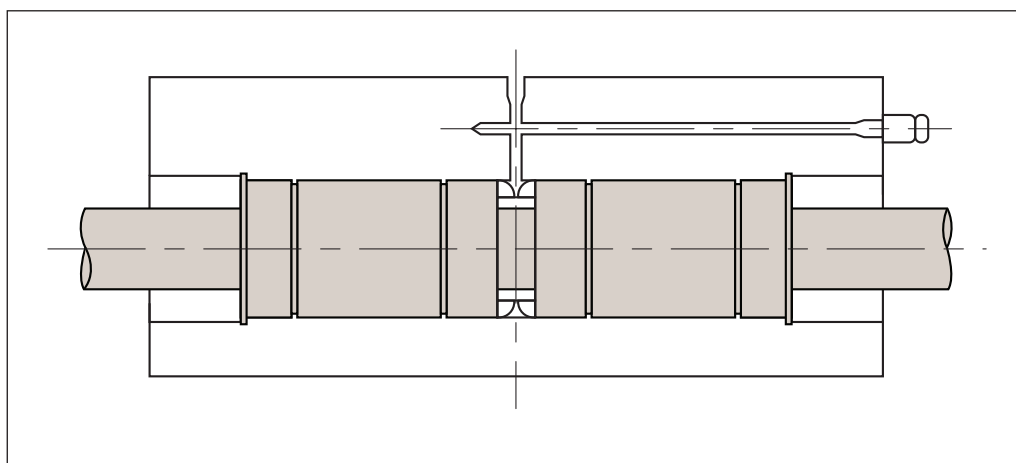
Grease lubrication

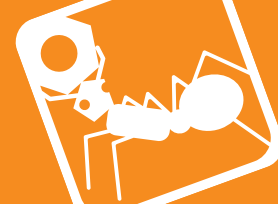
Before applying the grease, the anti-corrosive oil must be removed with kerosene or an organic solvent. The grease must be applied when the bushing is dry. Grease must be applied directly on the balls for linear bushing with seals. Lithium soap of viscosity mark (JIS No.2) is recommended for use.

Oil lubrication

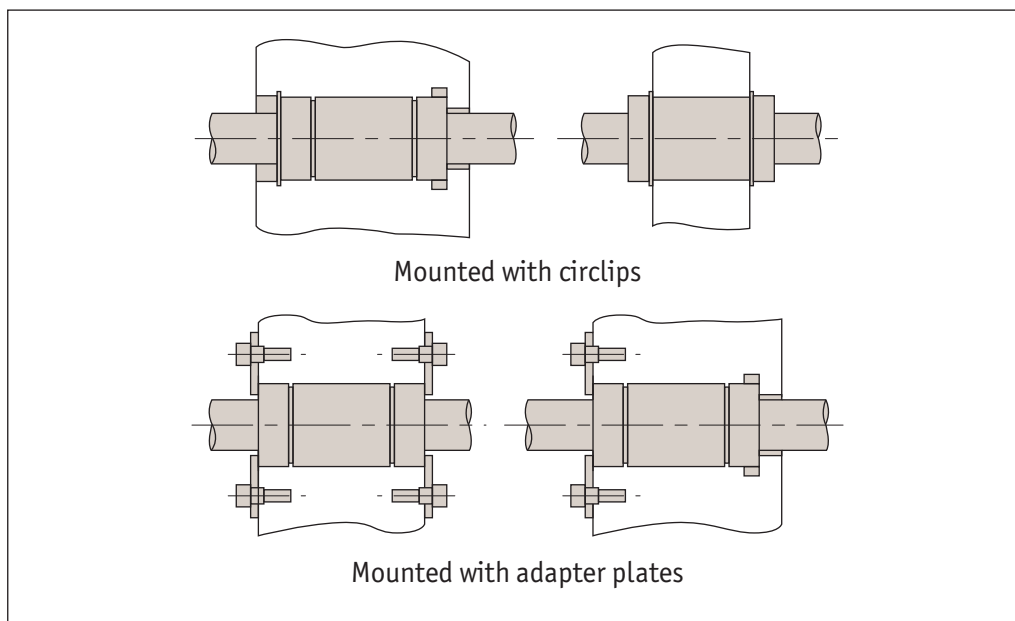
There is no need to to remove the anti-corrosive oil when oil is used for lubrication. ISO viscosity grade VG15~100 oil is usually used according to the temperature ranges below. Drop the oil onto the shaft for lubrication, or supply it through an oil hole provided on the housing (see illustration below). However, dropping lubrication cannot be used on linear bushings with seals as the seals remove the oil.

Operating temperature	Viscosity
-30°C to +50°C	VG 15 to 46
+50°C to +80°C	VG 46 to 100



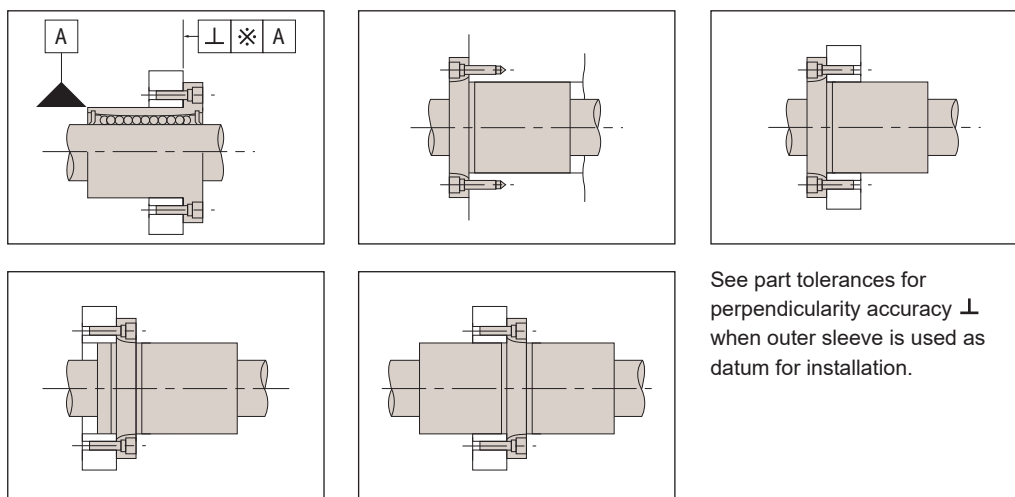


Standard type



For shaft Ø	Circlip	
	External (for Shaft)	Internal (for Bore)
5	P0380.012-A2	P0381.012-A2
6	P0380.012-A2	P0381.012-A2
8	P0380.016-A2	P0381.016-A2
10	P0380.019-A2	P0381.019-A2
12	P0380.022-A2	P0381.022-A2
16	P0380.026-A2	P0381.026-A2
20	P0380.032-A2	P0381.032-A2
25	P0380.040-A2	P0381.040-A2
30	P0380.048-A2	P0381.047-A2
40	P0380.065-A2	P0381.062-A2
50	P0380.075-A2	P0381.075-A2
60	P0380.090-A2	P0381.090-A2

Flanged type

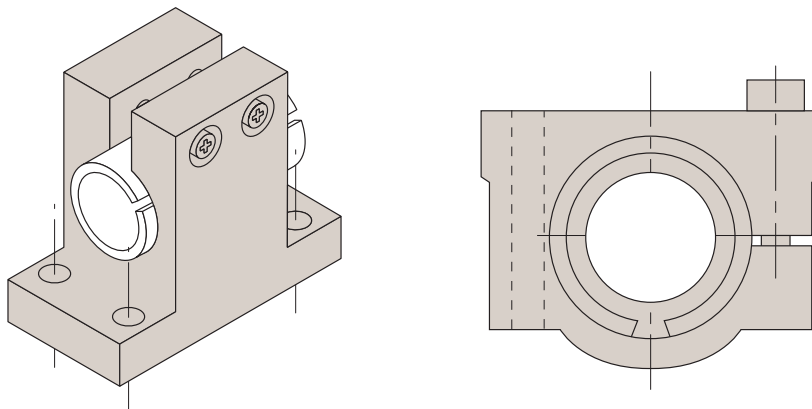




Adjustable type bearings

Adjustment of clearance (for adjustable type bearings and shafts), is achieved with an adjustable housing assembly (as shown below). In this case, the slotted side of linear bushing should be located at 90° to the open side of housing for equal radial deformation.

Mounting of adjustable type bearing



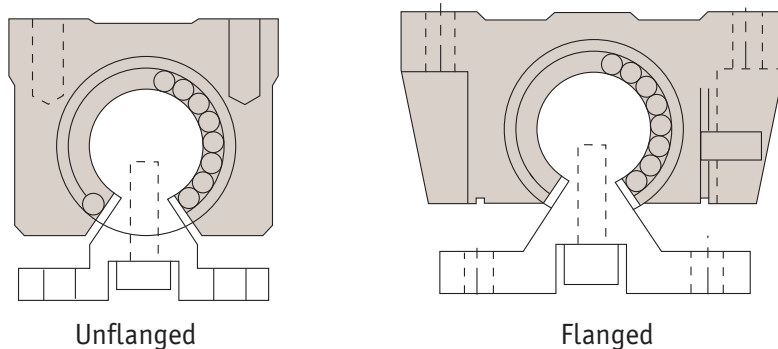
When moment load applies

External loads should be distributed uniformly on a linear bushing. When moment loads are applied, two or more linear bushings should be used on one shaft, and the distance between the two linear bushings should have adequate spacing. Calculate the equivalent load when the moment loads are applied and choose the correct linear bushing.

Open type bearings

Open type bearings can be used with a clearance adjustable housing as shown below. Light preload is applied for normal use, heavy preload should be avoided.

Mounting of open type bearing



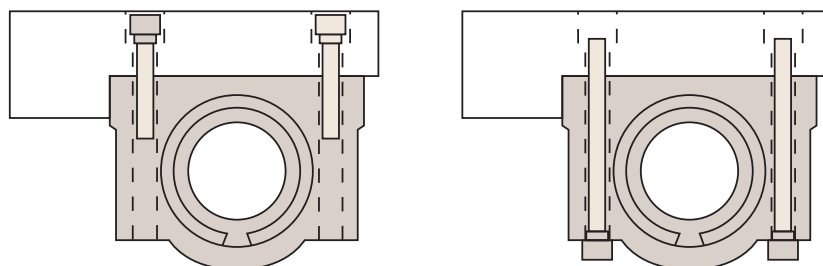
Unflanged

Flanged

L1750 Bushing carriages

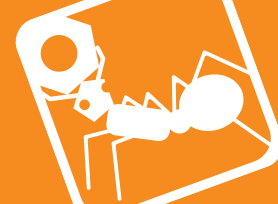
L1750 carriages can be mounted from both the top or the bottom, minimising assembly time.

Mounting of case unit



Fixing holes

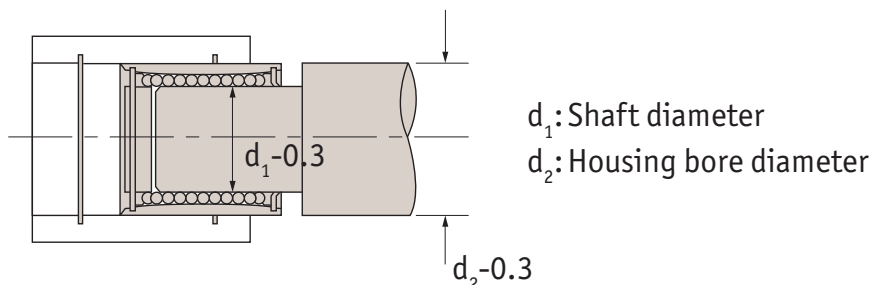
Carriage fixing holes are threaded from the top a certain distance down. Fixing holes from the bottom are through holes so the screw size when mounting from below needs to be smaller than the thread size if you were mounting from the top.



Application tips

For mounting a standard type linear bushing into a housing, a jig should be used to avoid directly striking the outer sleeve or seal during installation.

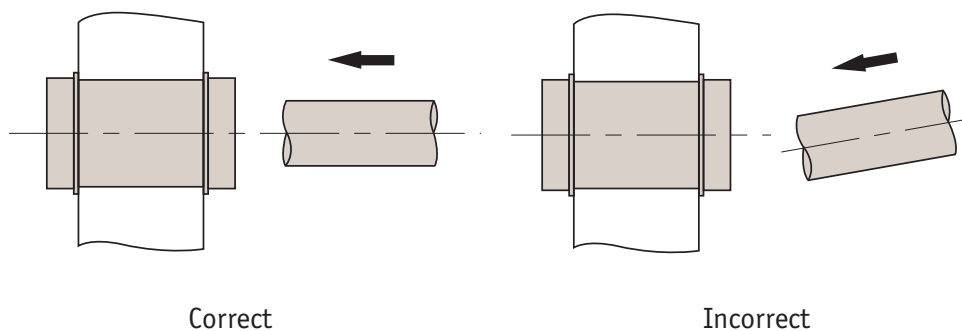
Mounting into housing



Insertion of shaft

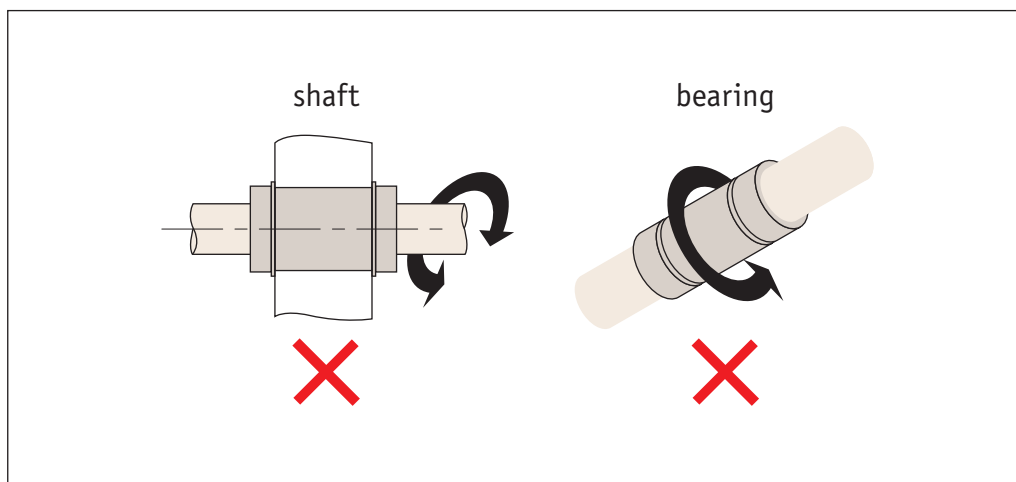
Care must be taken when inserting a shaft into a linear bushing. If the shaft is inserted incorrectly, the ball retaining cage may be damaged and the balls loosened from position.

Insertion of shaft into linear bushing



Rotational motion prohibited

Linear bushing are not suitable for rotational motion. If the linear bushing is exposed to rotational motion it may lead to unexpected accidents.



Static safety factor f_s

A linear motion system may receive an unpredictable external force due to vibration or impact while it is at rest or in motion, or inertia as a result of starting and stopping. It is, therefore, necessary to consider the static safety factor against operating loads. The static safety factor (f_s) indicates the ratio of a linear motion system load carrying capacity (basic static load rating, C_0) to the load exerted thereon.

$$f_s = \frac{C_0}{P} \quad \text{or} \quad f_s = \frac{M_0}{M}$$

f_s = Static safety factor

C_0 = Basic static load rating (N)

M_0 = Static permissible moment (Nmm)

P = Calculated load (N)

M = Calculated moment (Nmm)

To calculate a load exerted on the linear motion system, the mean load for calculating the service life and the maximum load for calculating the static safety factor must be obtained in advance. A system can receive unexpected excessive load when it is subject to frequent starts and stops, placed under machining loads, or when a severe moment is applied by overhanging loads. When selecting the correct type of a linear motion system for your application, be sure that the type you are considering can bear the maximum possible load when stopped and in operation. Both tables below specify the standard values for the static safety factors.

Machine used	Loading conditions	f_s Lower limit
Ordinary industrial machine	No vibration or impact	1,0 ~ 1,3
	Vibration and/or impact	2,0 ~ 3,0
Machine tool	No vibration or impact	1,0 ~ 1,5
	Vibration and/or impact	2,5 ~ 7,0

For large radial loads

$$\frac{f_h \cdot f_t \cdot f_c \cdot C_0}{P} \geq f_s$$

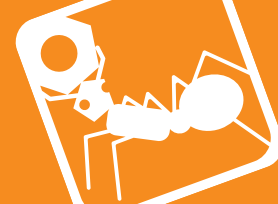
C_0 = Basic static load rating (N)

f_h = Hardness factor

f_c = Contact factor

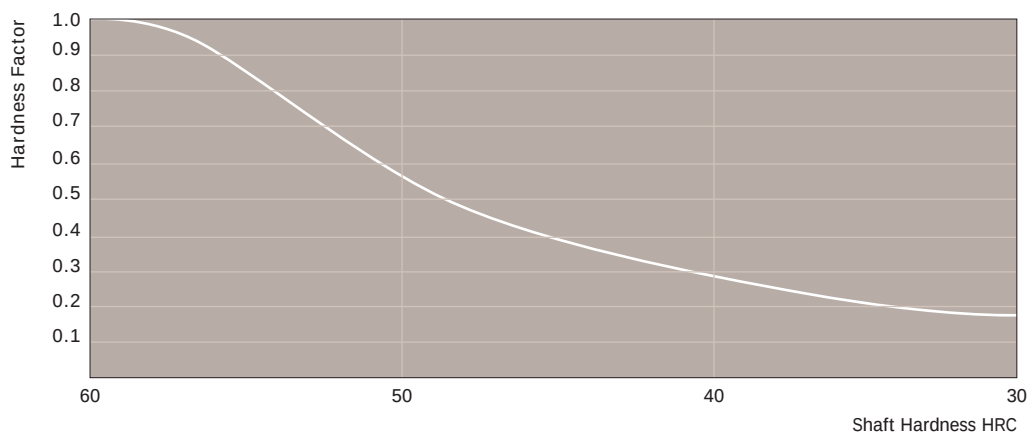
P = Calculated load (N)

f_t = Temperature factor



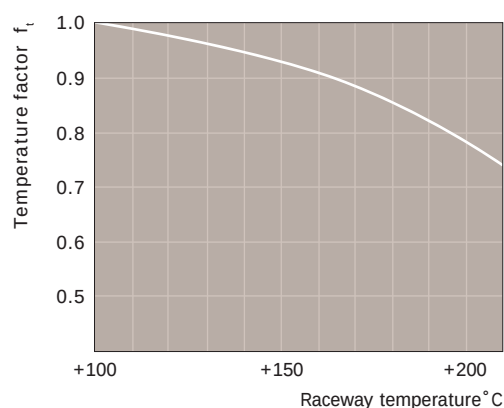
Hardness factor f_h

To achieve the optimum load rating of the linear ball bushings, the shaft hardness must be 58 to 64 HRC. At a hardness below this range, the basic dynamic and static load ratings decrease. The ratings must therefore be multiplied by the respective hardness factors (f_h).



Temperature factor f_t

For linear bushings used at ambient temperatures of over 100 °C, a temperature factor must be taken into consideration. For higher than 80 °C applications, the seals, end plates, and retainer must be changed for high temperature specifications. (Temperature range: -20 °C - +80 °C). Please note that the selected linear bushing in this case must be a model with high temperature specifications.



Contact factor f_c

When multiple linear bushings are used moments and mounting surface precision will affect operation, making it difficult to achieve uniform load distribution. In this case, multiply the basic load rating (C or C_0) by a contact factor selected from the table.

Number of linear bushing on a shaft	Contact factor f_c
2	0.81
3	0.72
4	0.66
5	0.61
Over 6	0.60
In normal use	1.00

Operating conditions f_w

Some machines may cause vibration. It is particularly difficult to determine the magnitude of vibration that develops during high-speed operation, as well as that of impact during repeated starting and stopping and stopping in normal use. Therefore, where the effects of speed and vibration are estimated to be significant, divide the basic dynamic load rating (C) by a load factor selected from the table.

Operating conditions		Load factor f_w
Load conditions	Speed	
No impact and vibration	Under 15m/min	1.0~1.5
Slight impact and vibration	Under 60m/min	1.5~2.0
Considerable impact and vibration	Over 60m/min	2.0~4.0

Linear bushings load ratings and travel life are influenced by load direction, ball circuit orientation, and hardness of the shaft.

Basic dynamic load rating (C) and travel life

The travel life of a linear bushing is determined largely by the quality of the shaft. The basic dynamic load rating is the maximum continuous load that can be applied to the linear bushing with 90% of reliability and achieving over 50km of operation under normal conditions. When calculating the nominal life for 100km, please divide the dynamic load rating C in the data tables by 1.26.

The nominal travel life can be calculated by the following equation.

$$L = \left(\frac{C}{P} \right)^3 \times 50 \quad L_{100} = \left(\frac{C_{100}}{P} \right)^3 \times 100$$

L = Nominal life in km (standard 50)

L₁₀₀ = Nominal life in km (100)

C = Basic dynamic load rating (at 50km) in Newtons

C₁₀₀ = Dynamic load rating (at 100km) in Newtons $\left(= \frac{C}{1.26} \right)$

P = Applied load (Newtons)

Other factors will affect the life as follows.

$$L = \left(\frac{f_h \times f_t \times f_c}{f_w} \times \frac{C}{P} \right)^3 \times 50 \quad L_{100} = \left(\frac{f_h \times f_t \times f_c}{f_w} \times \frac{C_{100}}{P} \right)^3 \times 100$$

f_h = Hardness factor

f_t = Temperature factor

f_w = Load factor

f_c = Contact factor

From the above equations, when the stroke and frequency are constant, the travel life can be calculated by the following equation.

Travel life

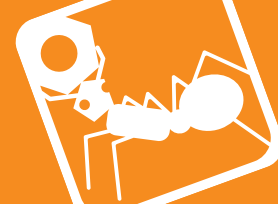
$$L_n = \frac{L \times 10^6}{2 \times L_s \times n_o \times 60}$$

L_s = Stroke (km)

L_n = Travel life

n_o = Number of strokes per minute

L = Nominal life (km)



Calculation example

The maximum applied load and the travel life are the most important factors for choosing the correct size of linear ball bushings. Below are sample calculations for expected travel life and selection of the correctly sized linear ball bushing.

Working conditions

Applied load (P):	250N
Stroke (L _s):	0,25 m
Number of strokes per minute (n _o):	60
Shaft hardness:	HRC 60 (f _h = 1,0)
Operating speed (V):	2 x L _s x n _o 2 x 0,25 x 60 30,000 mm/min (f _w = 1,6)

other factors (f_c, f_t) are considered as 1,0

Calculation of expected travel life

Assuming the basic dynamic load rating is based on travel life of 50km and all other factors are 1,0, you choose the linear bushing size for the life required.

Let's try Superball bushing L1740.020 with the above working conditions.

$$L = \left(\frac{1,0 \times 1,0 \times 1,0}{1,6} \times \frac{2,580}{250} \right)^3 \times 50 \quad L_n = \frac{13,417 \times 10^6}{2 \times 0,25 \times 60 \times 60}$$

$$= 13,417 \text{ km} \quad = 7,454 \text{ hours}$$

Choosing the correct linear ball bushing

Let's assume our design travel life is 15,000 hours.

$$L = 15,000 \times 2 \times 0,250 \times 10^{-6} \times 60 \times 60$$

$$= 27,000 \text{ km; and therefore}$$

$$C = \frac{250 \times 1,6}{1,0 \times 1,0 \times 1,0} \times \sqrt[3]{\frac{27,000}{50}}$$

$$= 3,257 \text{ N}$$

Choosing type L1740 and referring to the table, the correct Superball bushing for the above condition is L1740.025 which has 3,800N as the basic dynamic load rating.



Superball linear ball bushings

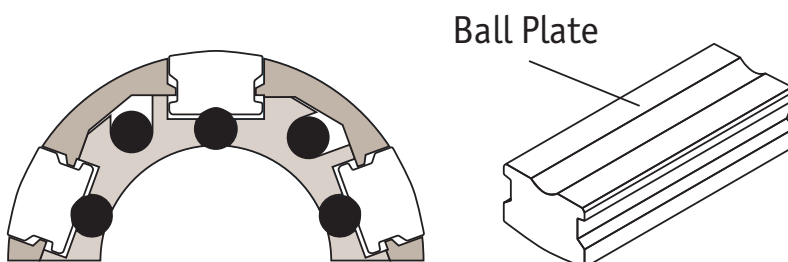
- 3 x the load rating and 27 x the travel life of conventional linear bushings
- Self-aligning feature



Features

Higher load ratings

The uniquely designed ball plate (in the outside diameter of the bushing), is made of hardened steel. The precision ground groove is slightly larger than the ball size, which provides greater contact area between the balls and the ball plate, and as a result, provides 3 x higher load ratings of conventional linear bushings.

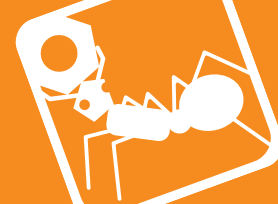


Self-alignment

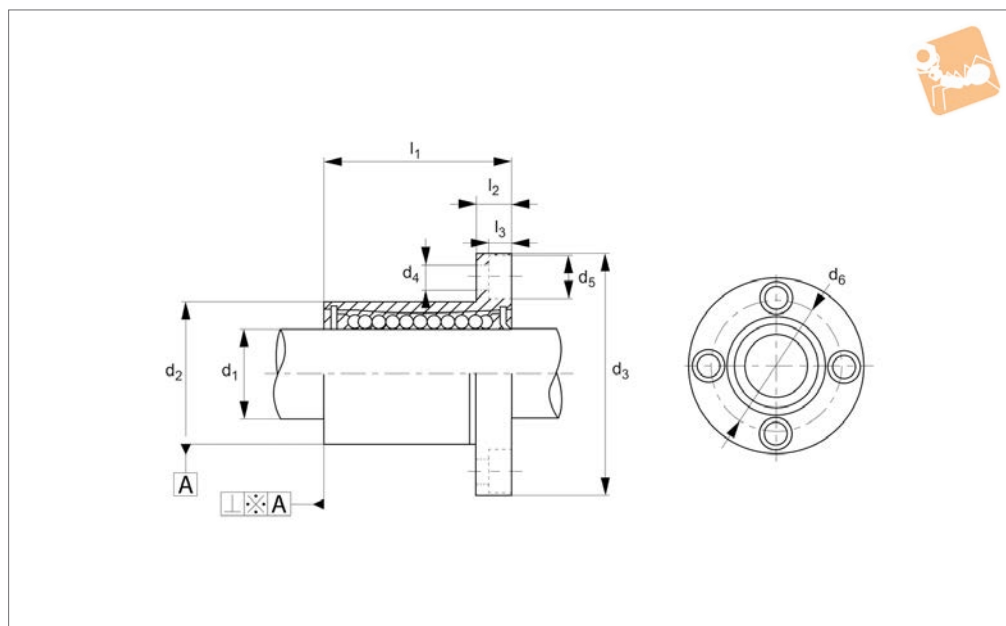
The ball plate has a convex shape to provide a pivot point at the centre which allows self-alignment up to $\pm 0.5^\circ$. This self-alignment capability eliminates any possibility of edge pressure caused by inaccurate machining, errors on mounting, or shaft deflection.

Tolerance of shaft and housing bore

Part no.	Shaft		Housing	
	Shaft $\varnothing d_1$	Tol. h6 μ	Housing bore $\varnothing d_2$	Tol. H7 μ
L1740.010	10	+0 to -9	19	+21 to -0
L1740.012	12	+0 to -11	22	
L1740.016	16		26	
L1740.020	20	+0 to -13	32	+25 to -0
L1740.025	25		40	
L1740.030	30		47	
L1740.040	40	+0 to -16	62	+30 to -0
L1740.050	50		75	



L1718



Material

Hardened and ground body from bearing steel.

Single body resin retainer (POM).

Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

For use with hardened shafts only (see part

nos. L1770 - L1772) - tolerance h6.

For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range : -20°C to +80°C.

Steel ball retainers can be supplied for higher temperature applications (up to +120°C - with no end seals. Please advise at time of ordering if this is required.

Tips

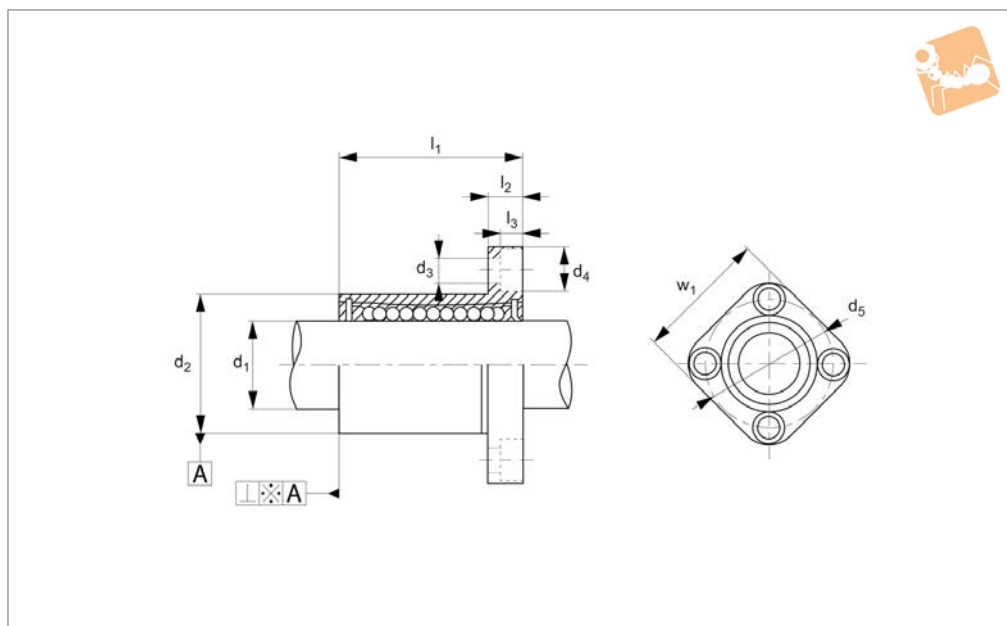
Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version no. L1720.

Order No.	d ₁	d ₂	l ₁	d ₃	d ₄	d ₅	d ₆	l ₂	l ₃	No. of ball circuits	Squareness A μm	Dyn. load C N	Static load C ₀ N	Weight g
L1718.006-1	6	12	19	28	3.4	6.5	20	5	3.3	4	12	200	260	26.5
L1718.008	8	16	25	32	3.4	6.5	24	5	3.3	4	12	260	400	44.0
L1718.010-1	10	19	29	40	4.5	8.0	29	6	4.4	4	12	370	540	78.0
L1718.012	12	22	32	42	4.5	8.0	32	6	4.4	4	12	410	590	86.0
L1718.016	16	26	36	46	4.5	8.0	36	6	4.4	5	12	770	1170	120.0
L1718.020	20	32	45	54	5.5	9.5	43	8	5.4	5	15	860	1370	184.0
L1718.025	25	40	58	62	5.5	9.5	51	8	5.4	6	15	980	1560	335.0
L1718.030	30	47	68	76	6.6	11.0	62	10	6.5	6	15	1560	2740	545.0
L1718.040	40	62	80	98	9.0	14.0	80	13	8.6	6	20	2150	4010	1185.0
L1718.050	50	75	100	112	9.0	14.0	94	13	8.6	6	20	3820	7930	1730.0
L1718.060	60	90	125	134	11.0	17.5	112	18	10.8	6	25	4700	9990	3180.0



Flanged Linear Ball Bushings square flange

Linear Bearings



L1719

LINEAR BEARINGS

Material

Hardened and ground body from bearing steel.

Single body resin retainer (POM).

Supplied with nitrile rubber (NBR) end-seals -UU as standard.

nos. L1770 - L1772) - tolerance h6.

For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range : -20°C to +80°C.

Steel ball retainers can be supplied for higher temperature applications (up to +120°C) - with no end seals. Please advise at time of ordering if this is required.

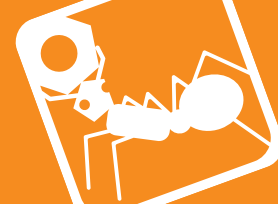
Tips

Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version no. L1721.

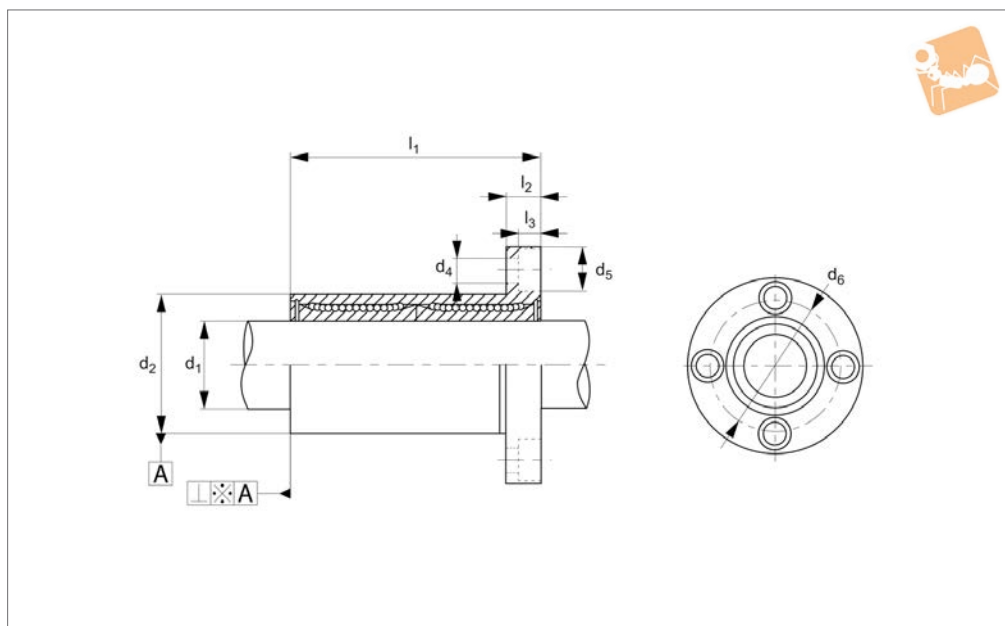
Technical Notes

For use with hardened shafts only (see part

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁	d ₃	d ₄	d ₅	l ₂	l ₃	No. of ball circuits	w ₁	Squareness A μm	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1719.006-1	6	12	19	3,4	6,5	20	5	3,3	4	22	12	200	260	26,5
L1719.008	8	16	25	3,4	6,5	24	5	3,3	4	25	12	260	400	44,0
L1719.010-1	10	19	29	4,5	8,0	29	6	4,4	4	30	12	370	540	78,0
L1719.012	12	22	32	4,5	8,0	32	6	4,4	4	32	12	410	590	86,0
L1719.016	16	26	36	4,5	8,0	36	6	4,4	5	35	12	770	1170	120,0
L1719.020	20	32	45	5,5	9,5	43	8	5,4	5	42	15	860	1370	184,0
L1719.025	25	40	58	5,5	9,5	51	8	5,4	6	50	15	980	1560	335,0
L1719.030	30	47	68	6,6	11,0	62	10	6,5	6	60	15	1560	2740	545,0
L1719.040	40	62	80	9,0	14,0	80	13	8,6	6	75	20	2150	4010	1185,0
L1719.050	50	75	100	9,0	14,0	94	13	8,6	6	88	20	3820	7930	1730,0
L1719.060	60	90	125	11	17,5	112	18	10,8	6	106	25	4700	9990	3180,0



L1722



Material

Hardened and ground body from bearing steel.

Single body resin retainer (POM).

Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

For use with hardened shafts only (see part

nos. L1770 - L1772) - tolerance h6. For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range : -20°C to +80°C.

Steel ball retainers can be supplied for higher temperature applications (up to +120°C - with no end seals. Please advise at time of ordering if this is required.

Tips

Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version part no. L1724.

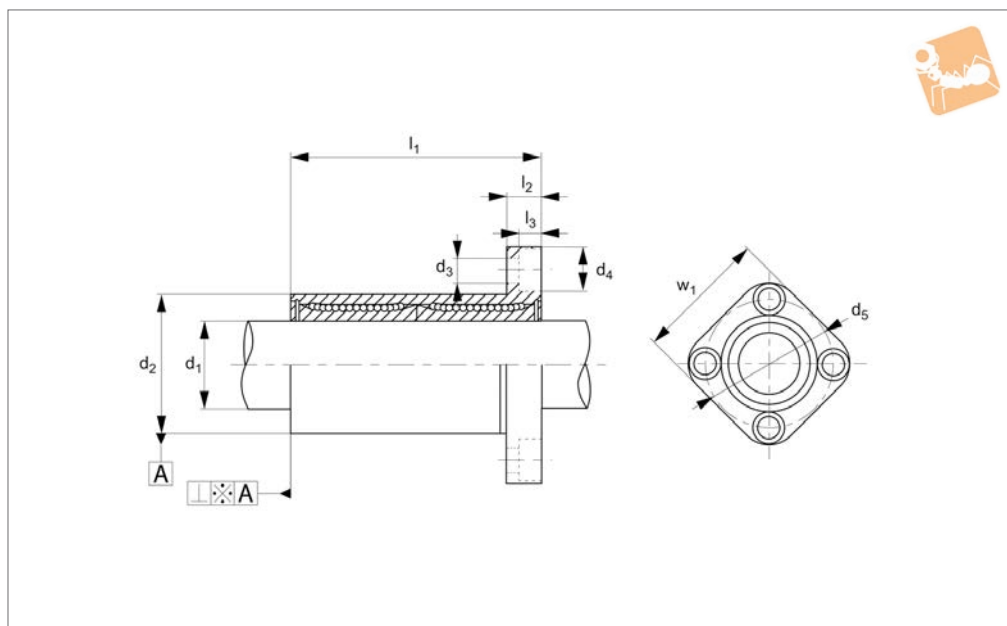
Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁	d ₃ tol. h4	d ₄	d ₅	d ₆	l ₂	l ₃	No. of ball circuits	Squareness A μm	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1722.006-1	6	12	35	28	3,4	6,5	20	5	3,3	4	12	320	520	31
L1722.008	8	16	45	32	3,4	6,5	24	5	3,3	4	12	430	780	53
L1722.010-1	10	19	55	40	4,5	8,0	29	6	4,4	4	12	580	1100	105
L1722.012	12	22	57	42	4,5	8,0	32	6	4,4	4	12	650	1200	100
L1722.016	16	26	70	46	4,5	8,0	36	6	4,4	5	12	1230	2350	187
L1722.020	20	32	80	54	5,5	9,5	43	8	5,4	5	15	1400	2750	260
L1722.025	25	40	112	62	5,5	9,5	51	8	5,4	6	15	1560	3140	515
L1722.030	30	47	123	76	6,6	11,0	62	10	6,5	6	15	2490	5490	655
L1722.040	40	62	154	98	9,0	14,0	80	13	8,6	6	20	3430	8040	1560
L1722.050	50	75	192	112	9,0	14,0	94	13	8,6	6	20	6080	15900	3500
L1722.060	60	90	211	134	11,0	17,5	112	18	10,8	6	25	7650	20000	4500



Long Flanged Linear Ball Bushings

double length

Linear Bearings



L1723

LINEAR BEARINGS

Material

Hardened and ground body from bearing steel.

Single body resin retainer (POM).

Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

For use with hardened shafts only (see part

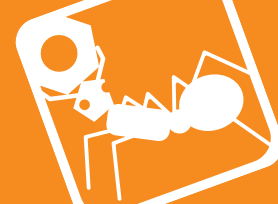
nos. L1770 - L1772) - tolerance h6. For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range : -20°C to +80°C.

Steel ball retainers can be supplied for higher temperature applications (up to +120°C - with no end seals. Please advise at time of ordering if this is required.

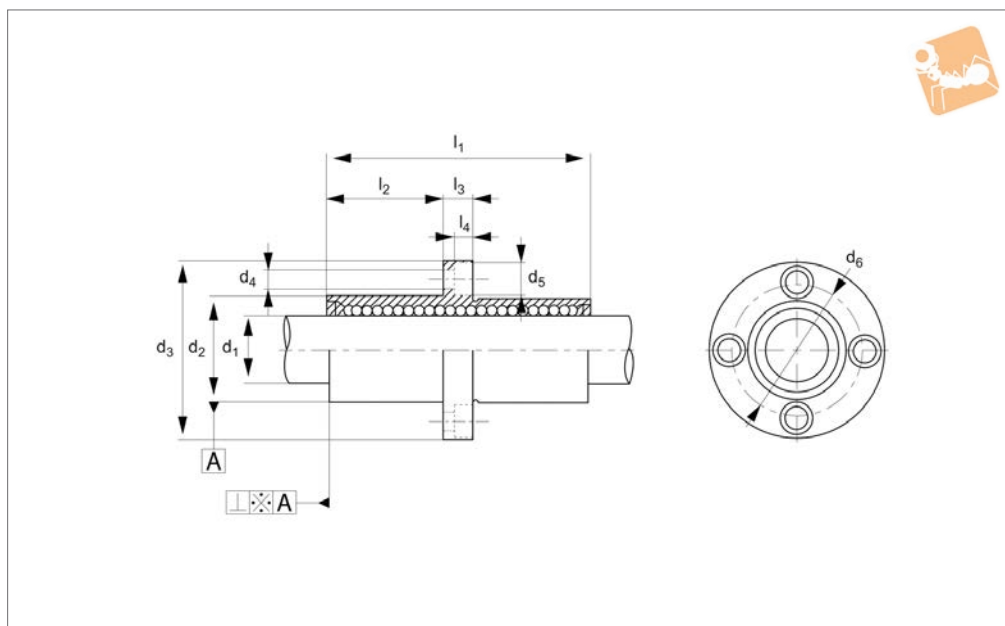
Tips

Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version no. L1725.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁	d ₃	d ₄	d ₅	l ₂	l ₃	No. of ball circuits	w ₁	Squareness A µm	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1723.006-1	6	12	35	3.4	6.5	20	5	3.3	4	22	15	320	520	31
L1723.008	8	16	45	3.4	6.5	24	5	3.3	4	25	15	430	780	53
L1723.010-1	10	19	55	4.5	8.0	29	6	4.4	4	30	15	580	1100	105
L1723.012	12	22	57	4.5	8.0	32	6	4.4	4	32	15	650	1200	100
L1723.016	16	26	70	4.5	8.0	36	6	4.4	5	35	15	1230	2350	187
L1723.020	20	32	80	5.5	9.5	43	8	5.4	5	42	17	1400	2750	260
L1723.025	25	40	112	5.5	9.5	51	8	5.4	6	50	17	1560	3140	515
L1723.030	30	47	123	6.6	11.0	62	10	6.5	6	60	17	2490	5490	655
L1723.040	40	62	154	9.0	14.0	80	13	8.6	6	75	20	3430	8040	1560
L1723.050	50	75	192	9.0	14.0	94	13	8.6	6	88	20	6080	15900	3500
L1723.060	60	90	211	11.0	17.5	112	18	10.8	6	106	25	7650	20000	4500



L1730



Material

Hardened and ground body from bearing steel.

Single body resin retainer (POM).

Supplied with nitrile rubber (NBR) end-seals -UU as standard.

nos. L1770 - L1772) - tolerance h6.

Temperature range : -20°C to +80°C.

Steel ball retainers can be supplied for higher temperature applications (up to +120°C) - with no end seals. Please advise at time of ordering if this is required.

balls (for corrosion resistance) on request
- or stainless steel version no. L1732.

Technical Notes

For use with hardened shafts only (see part

Tips

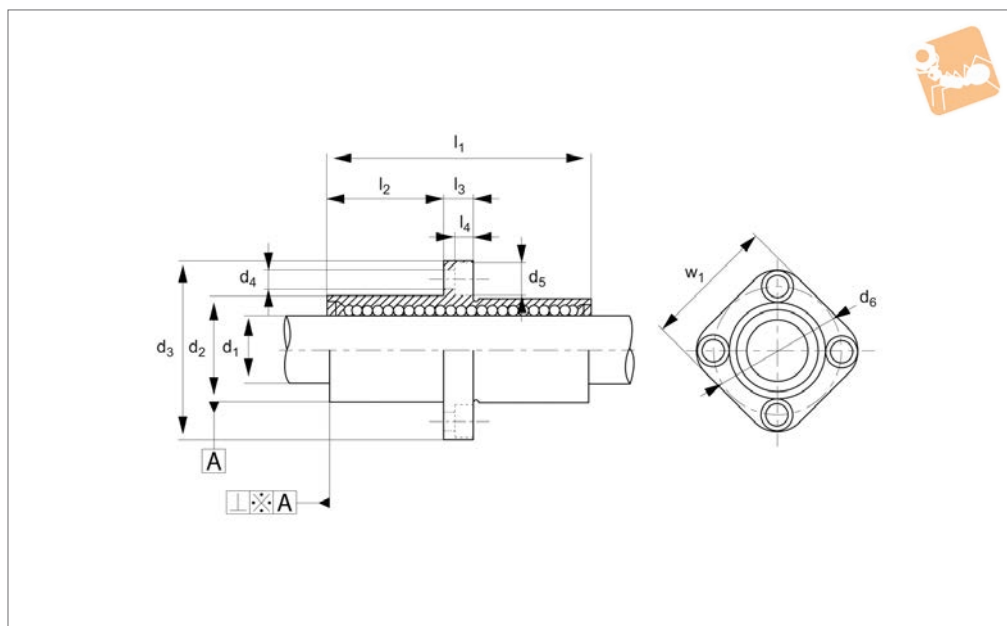
Nickel plated version with stainless steel

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁	d ₃ tol. h4	d ₄	d ₅	d ₆	l ₂	l ₃	l ₄	No. of ball circuits	Squareness A µm	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1730.008	8	16	45	32	3,4	6,5	24	20,0	5	3,3	4	15	430	780	53
L1730.012	12	22	57	42	4,5	8,0	32	25,5	6	4,4	4	15	650	1200	100
L1730.016	16	26	70	46	4,5	8,0	36	32,0	6	4,4	5	15	1230	2350	187
L1730.020	20	32	80	54	5,5	9,5	43	36,0	8	5,4	5	17	1400	2750	260
L1730.025	25	40	112	62	5,5	9,5	51	52,0	8	5,4	6	17	1560	3140	515
L1730.030	30	47	123	76	6,6	11,0	62	56,5	10	6,5	6	17	2940	5490	655
L1730.040	40	62	154	98	9	14,0	80	70,5	13	8,6	6	20	3430	8040	1560
L1730.050	50	75	192	112	9	14,0	94	89,5	13	8,6	6	20	6080	15900	3500
L1730.060	60	90	211	134	11	17,5	112	96,5	18	10,8	6	30	7650	20000	4500



Linear Ball Bushings double length

Linear Bearings



L1731

LINEAR BEARINGS

Material

Hardened and ground body from bearing steel.

Single body resin retainer (POM).

Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

For use with hardened shafts only (see part

nos. L1770 - L1772) - tolerance h6.

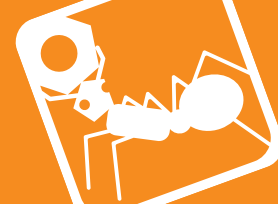
Temperature range: -20°C to +80°C.

For applications requiring higher temperatures we can make the bushings suitable for use up to +120°C by changing the ball retainers, end plates, and seals. Please advise at time of ordering if this is required.

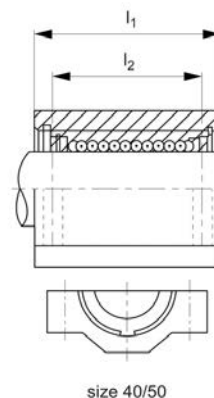
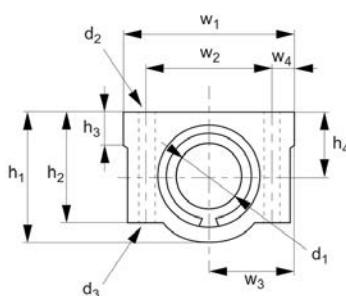
Tips

Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version no. L1733.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁	d ₃	d ₄	d ₅	d ₆	l ₂	l ₃	l ₄	No. of ball circuits	w ₁	Squareness A μm	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1731.008	8	16	45	32	3,4	6,5	24	20,0	5	3,3	4	25	15	430	780	53
L1731.012	12	22	57	42	4,5	8,0	32	25,5	6	4,4	4	32	15	650	1200	100
L1731.016	16	26	70	46	4,5	8,0	36	32,0	6	4,4	5	35	15	1230	2350	187
L1731.020	20	32	80	54	5,5	9,5	43	36,0	8	5,4	5	42	17	1400	2750	260
L1731.025	25	40	112	62	5,5	9,5	51	52,0	8	5,4	6	50	17	1560	3140	515
L1731.030	30	47	123	76	6,6	11,0	62	56,5	10	6,5	6	60	17	2940	5490	655
L1731.040	40	62	154	98	9	14,0	80	70,5	13	8,6	6	75	20	3430	8040	1560
L1731.050	50	75	192	112	9	14,0	94	89,5	13	8,6	6	88	20	6080	15900	3500
L1731.060	60	90	211	134	11	17,5	112	96,5	18	10,8	6	106	30	7650	20000	4500



L1750



Material

Aluminium body, with linear bearing L1706 (steel shell) installed. Bearing has a resin retainer (POM).

Supplied with nitrile rubber (NBR) end seals -UU as standard.

Long versions have L1712 linear bearing installed, short versions have L1715 Linear bearing installed.

Technical Notes

For use with hardened shafts only (see part

nos. L1770 - L1772).

Temperature range: -20°C to +80°C.

Steel ball retainers can be supplied for higher temperature applications (up to 120°C - with no end seals. Please advise at time of ordering if this is required.

Order No.	Type	d ₁ tol. h6	l ₁	d ₂	d ₃	h ₁	h ₂	h ₃	Weight g
L1750.008	Standard	8	30.0	M 4x8	3.4	22.0	18.0	6	60
L1750.012	Standard	12	39.0	M 5x10	4.3	30.0	24.5	8	118
L1750.016	Standard	16	44.0	M 5x12	4.3	38.5	32.5	9	180
L1750.020	Standard	20	53.0	M 6x12	5.2	41.0	35.0	11	245
L1750.025	Standard	25	67.0	M 8x18	6.8	51.5	41.0	12	550
L1750.030	Standard	30	76.0	M 8x18	6.8	59.5	49.0	15	760
L1750.040	Standard	40	90.0	M10x25	8.6	78.0	62.0	20	1700
L1750.050	Standard	50	110.0	M10x25	8.6	102.0	80.0	24	2950
L1750.008-L	Long	8	58.0	M 4x8	3.4	22.0	18.0	6	98
L1750.012-L	Long	12	77.0	M 5x10	4.3	30.0	24.5	8	232
L1750.016-L	Long	16	89.0	M 5x12	4.3	38.5	32.5	9	360
L1750.020-L	Long	20	106.0	M 6x12	5.2	41.0	35.0	11	490
L1750.025-L	Long	25	136.0	M 8x18	6.8	51.5	41.0	12	1100
L1750.030-L	Long	30	154.0	M 8x18	6.8	59.5	49.0	15	1525
L1750.040-L	Long	40	180.0	M10x25	8.6	78.0	62.0	20	3400
L1750.050-L	Long	50	230.0	M10x25	8.6	102.0	80.0	24	5920
L1750.008-S	Short	8	14.4	M 4x8	3.4	22.0	18.0	6	40
L1750.012-S	Short	12	20.3	M 5x10	4.3	30.0	24.5	8	82
L1750.016-S	Short	16	22.3	M 5x12	4.3	38.5	32.5	9	122
L1750.020-S	Short	20	28.3	M 6x12	5.2	41.0	35.0	11	176
L1750.025-S	Short	25	40.4	M 8x18	6.8	51.5	41.0	12	400
L1750.030-S	Short	30	48.4	M 8x18	6.8	59.5	49.0	15	570
L1750.040-S	Short	40	56.4	M10x25	8.6	78.0	62.0	20	1320
L1750.050-S	Short	50	72.3	M10x25	8.6	102.0	80.0	24	1900

Order No.	h ₄ ±0.02	l ₂ ±0.2	w ₁	w ₂ ±0.2	w ₃ ±0.02	w ₄	Dyn. load C N max.	Static load C ₀ N max.	Linear ball bushing used
L1750.008	11	18	34	24	17	5.0	260	400	L1706.008
L1750.012	15	26	44	33	22	5.5	410	590	L1706.012
L1750.016	19	34	50	36	25	7.0	770	1170	L1706.016
L1750.020	21	40	54	40	27	7.0	860	1370	L1706.020

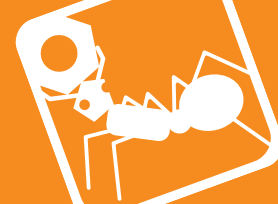


Linear Carriages closed

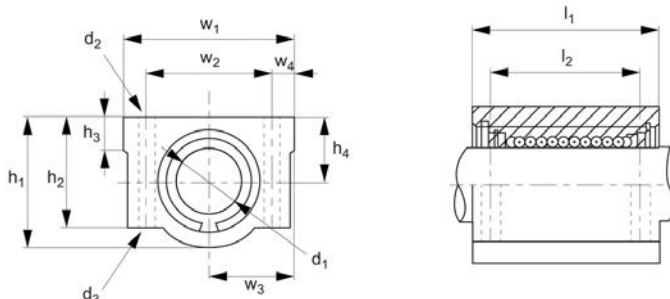
Linear Bearings



Order No.	h_4 ± 0.02	l_2 ± 0.2	w_1	w_2 ± 0.2	w_3 ± 0.02	w_4	Dyn. load C N max.	Static load C_0 N max.	Linear ball bushing used
L1750.025	26	50	76	54	38	11.0	980	1560	L1706.025
L1750.030	30	58	78	58	39	10.0	1560	2740	L1706.030
L1750.040	40	60	102	80	51	11.0	2150	4010	L1706.040
L1750.050	52	80	122	100	61	11.0	3820	7930	L1706.050
L1750.008-L	11	42	34	24	17	5.0	410	800	2 x L1706.008
L1750.012-L	15	64	44	33	22	5.5	650	1180	2 x L1706.012
L1750.016-L	19	79	50	36	25	7.0	1230	2340	2 x L1706.016
L1750.020-L	21	90	54	40	27	7.0	1370	2740	2 x L1706.020
L1750.025-L	26	119	76	54	38	11.0	1560	3120	2 x L1706.025
L1750.030-L	30	132	78	58	39	10.0	2490	5480	2 x L1706.030
L1750.040-L	40	150	102	80	51	11.0	3440	8020	2 x L1706.040
L1750.050-L	52	200	122	100	61	11.0	6110	15860	2 x L1706.050
L1750.008-S	11	-	34	24	17	5.0	260	400	L1706.008
L1750.012-S	15	-	44	33	22	5.5	410	590	L1706.012
L1750.016-S	19	-	50	36	25	7.0	770	1170	L1706.016
L1750.020-S	21	-	54	40	27	7.0	860	1370	L1706.020
L1750.025-S	26	-	76	54	38	11.0	980	1560	L1706.025
L1750.030-S	30	-	78	58	39	10.0	1560	2740	L1706.030
L1750.040-S	40	-	102	80	51	11.0	2150	4010	L1706.040
L1750.050-S	52	-	122	100	61	11.0	3820	7930	L1706.050



L1751



Material

Aluminium carriage housing with L1709, stainless steel (440C) linear bushing installed.
Bushing has a resin -RS (POM) or stainless

steel -SS (316) retainer and nitrile rubber (NBR) end seals -UU.
Stainless steel balls 440C.
Long versions have L1713 linear bearing installed.

Technical Notes

For use with corrosion resistant hardened shafts (see part no. L1772).
Temperature range: -20°C to +120°C.

Order No.	Type	Ball cage	d_1 tol. h6	l_1	d_2	d_3	h_1	h_2	Weight g
L1751.008-RS	Normal	Resin	8	30.0	M4x 8	3.4	22.0	18.0	60
L1751.012-RS	Normal	Resin	12	39.0	M5x10	4.3	30.0	24.5	118
L1751.016-RS	Normal	Resin	16	44.0	M5x12	4.3	38.5	32.5	180
L1751.020-RS	Normal	Resin	20	53.0	M6x12	5.2	41.0	35.0	245
L1751.025-RS	Normal	Resin	25	67.0	M8x18	6.8	51.5	41.0	550
L1751.008-SS	Normal	Stainless	8	30.0	M4x 8	3.4	22.0	18.0	60
L1751.012-SS	Normal	Stainless	12	39.0	M5x10	4.3	30.0	24.5	118
L1751.016-SS	Normal	Stainless	16	44.0	M5x12	4.3	38.5	32.5	180
L1751.020-SS	Normal	Stainless	20	53.0	M6x12	5.2	41.0	35.0	245
L1751.025-SS	Normal	Stainless	25	67.0	M8x18	6.8	51.5	41.0	550
L1751.008-L-RS	Long	Resin	8	58.0	M4x 8	3.4	22.0	18.0	98
L1751.012-L-RS	Long	Resin	12	77.0	M5x10	4.3	30.0	24.5	232
L1751.016-L-RS	Long	Resin	16	89.0	M5x12	4.3	38.5	32.5	360
L1751.020-L-RS	Long	Resin	20	106.0	M6x12	5.2	41.0	35.0	490
L1751.025-L-RS	Long	Resin	25	136.0	M8x18	6.8	51.5	41.0	1100
L1751.008-L-SS	Long	Stainless	8	58.0	M4x 8	3.4	22.0	18.0	98
L1751.012-L-SS	Long	Stainless	12	77.0	M5x10	4.3	30.0	24.5	232
L1751.016-L-SS	Long	Stainless	16	89.0	M5x12	4.3	38.5	32.5	360
L1751.020-L-SS	Long	Stainless	20	106.0	M6x12	5.2	41.0	35.0	490
L1751.025-L-SS	Long	Stainless	25	136.0	M8x18	6.8	51.5	41.0	1100
L1751.008-S-RS	Short	Resin	8	14.4	M4x 8	3.4	22.0	18.0	40
L1751.012-S-RS	Short	Resin	12	20.3	M5x10	4.3	30.0	24.5	82
L1751.016-S-RS	Short	Resin	16	22.3	M5x12	4.3	38.5	32.5	122
L1751.020-S-RS	Short	Resin	20	28.3	M6x12	5.2	41.0	35.0	176
L1751.025-S-RS	Short	Resin	25	40.4	M8x18	6.8	51.5	41.0	400
L1751.008-S-SS	Short	Stainless	8	14.4	M4x 8	3.4	22.0	18.0	40
L1751.012-S-SS	Short	Stainless	12	20.3	M5x10	4.3	30.0	24.5	82
L1751.016-S-SS	Short	Stainless	16	22.3	M5x12	4.3	38.5	32.5	122
L1751.020-S-SS	Short	Stainless	20	28.3	M6x12	5.2	41.0	35.0	176
L1751.025-S-SS	Short	Stainless	25	40.3	M8x18	6.8	51.5	41.0	400



Stainless Linear Carriages

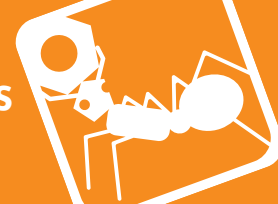
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Linear Bearings

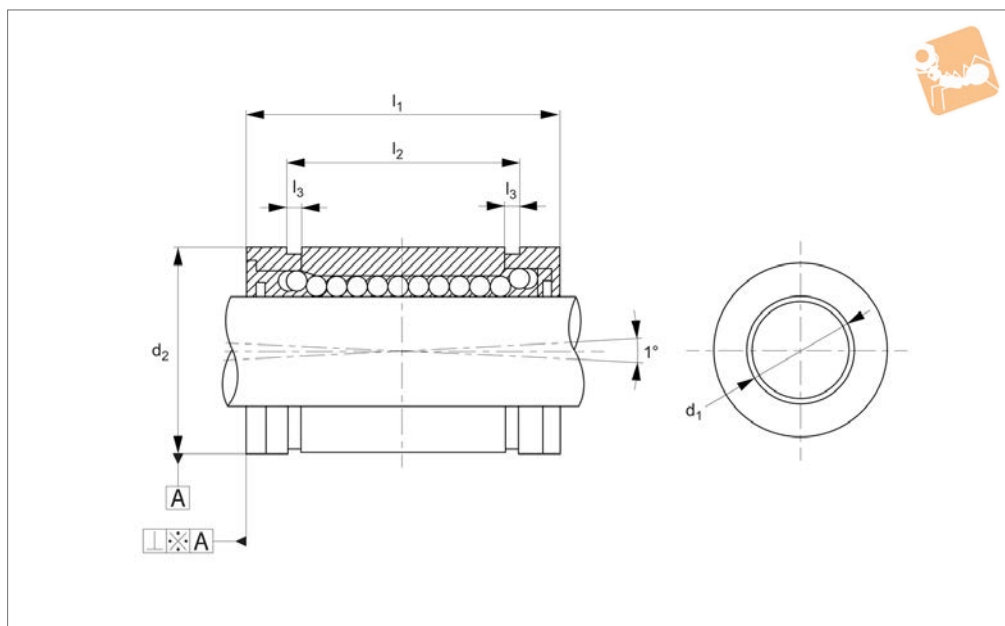


Order No.	h_3	h_4 ± 0.02	l_2 ± 0.2	w_1	w_2 ± 0.2	w_3 ± 0.02	w_4	Dyn. load C N max.	Static load C_0 N max.	Linear ball bushing used
L1751.008-RS	6	11	18	34	24	17	5.0	260	400	L1709.008
L1751.012-RS	8	15	26	44	33	22	5.5	410	590	L1709.012
L1751.016-RS	9	19	34	50	36	25	7.0	770	1170	L1709.016
L1751.020-RS	11	21	40	54	40	27	7.0	860	1370	L1709.020
L1751.025-RS	12	26	50	76	54	38	11.0	980	1560	L1709.025
L1751.008-SS	6	11	18	34	24	17	5.0	260	400	L1709.508
L1751.012-SS	8	15	26	44	33	22	5.5	410	590	L1709.512
L1751.016-SS	9	19	34	50	36	25	7.0	770	1170	L1709.516
L1751.020-SS	11	21	40	54	40	27	7.0	860	1370	L1709.520
L1751.025-SS	12	26	50	76	54	38	11.0	980	1560	L1709.525
L1751.008-L-RS	6	11	42	34	24	17	5.0	410	800	2 x L1709.008
L1751.012-L-RS	8	15	64	44	33	22	5.5	650	1180	2 x L1709.012
L1751.016-L-RS	9	19	79	50	36	25	7.0	1230	2340	2 x L1709.016
L1751.020-L-RS	11	21	90	54	40	27	7.0	1370	2740	2 x L1709.020
L1751.025-L-RS	12	26	119	76	54	38	11.0	1560	3120	2 x L1709.025
L1751.008-L-SS	6	11	42	34	24	17	5.0	410	800	2 x L1709.508
L1751.012-L-SS	8	15	64	44	33	22	5.5	650	1180	2 x L1709.512
L1751.016-L-SS	9	19	79	50	36	25	7.0	1230	2340	2 x L1709.516
L1751.020-L-SS	11	21	90	54	40	27	7.0	1370	2740	2 x L1709.520
L1751.025-L-SS	12	26	119	76	54	38	11.0	1560	3120	2 x L1709.525
L1751.008-S-RS	6	11	-	34	24	17	5.0	260	400	L1709.008
L1751.012-S-RS	8	15	-	44	33	22	5.5	410	590	L1709.012
L1751.016-S-RS	9	19	-	50	36	25	7.0	770	1170	L1709.016
L1751.020-S-RS	11	21	-	54	40	27	7.0	860	1370	L1709.020
L1751.025-S-RS	12	26	-	76	54	38	11.0	980	1560	L1709.025
L1751.008-S-SS	6	11	-	34	24	17	5.0	260	400	L1709.508
L1751.012-S-SS	8	15	-	44	33	22	5.5	410	590	L1709.512
L1751.016-S-SS	9	19	-	50	36	25	7.0	770	1170	L1709.516
L1751.020-S-SS	11	21	-	54	40	27	7.0	860	1370	L1709.520
L1751.025-S-SS	12	26	-	76	54	38	11.0	980	1560	L1709.525

LINEAR BEARINGS



L1740



Material

Hardened and ground steel ball plate from bearing steel.
Floating plate feature offers self-alignment and clearance adjustment.
Single body resin retainer (POM).
Supplied with nitrile rubber (NBR) end

seals -UU as standard.

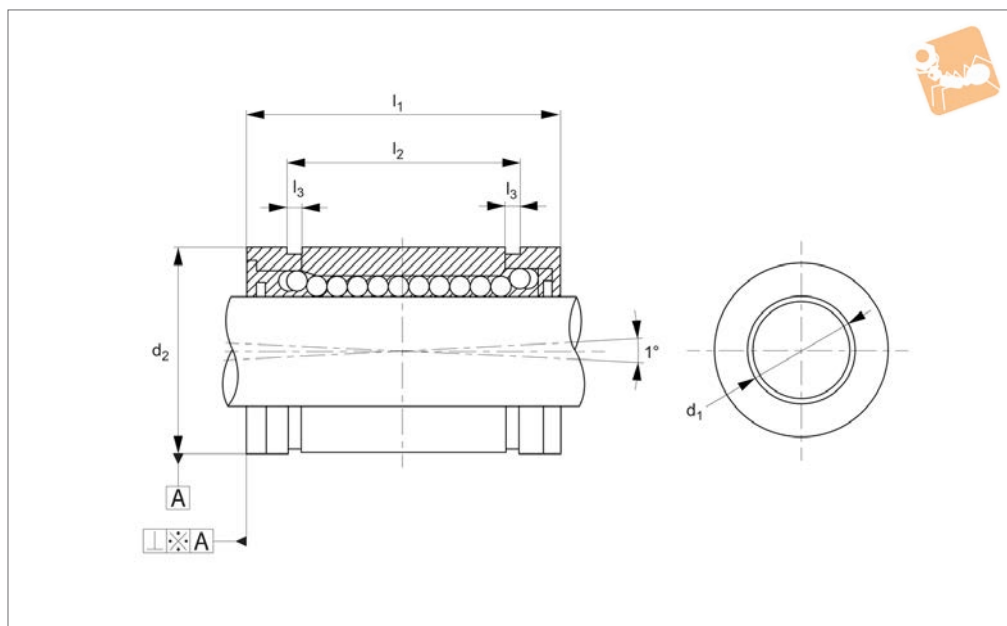
Technical Notes

The superball series has 3 x the load rating and 27 x the travel life of conventional linear bushings.
They offer self-alignment - prolonging

travel life by reducing the friction between shaft and balls.

For use with hardened shafts only (see part nos. L1770 - L1772) - tolerance h6.
Perpendicularity A is better than 15μ.
Temperature range: -20°C to +80°C.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁ ±0.2	l ₂ ±0.2	l ₃ min.	No. of ball circuits	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1740.010	10	19	29	21.7	1.35	5	550	750	17
L1740.012	12	22	32	22.7	1.35	5	1100	1230	23
L1740.016	16	26	36	24.7	1.35	5	1250	1550	28
L1740.020	20	32	45	31.3	1.65	6	1670	2580	61
L1740.025	25	40	58	43.8	1.90	6	2750	3800	122
L1740.030	30	47	68	51.8	1.90	6	2800	4710	185
L1740.040	40	62	80	60.4	2.20	6	5720	6500	360
L1740.050	50	75	100	77.4	2.70	6	7940	11460	580



L1741

LINEAR BEARINGS

Material

Hardened and ground body from bearing steel - nickel plated.
Stainless steel balls 440C.
Floating plate feature offers self-alignment and clearance adjustment.
Single body resin retainer (POM).
Supplied with nitrile rubber (NBR) end seals -UU as standard.

Technical Notes

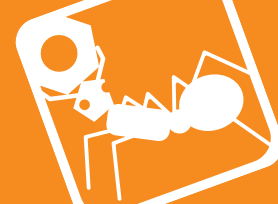
The superball series has 3 x the load rating and 27 x the travel life of conventional linear bushings.
They offer self-alignment - prolonging travel life by reducing the friction between shaft and balls.
For use with hardened shafts only (see part nos. L1770 - L1772) - tolerance h6.

Perpendicularity A is better than 15μ.
Temperature range: -20°C to +80°C.

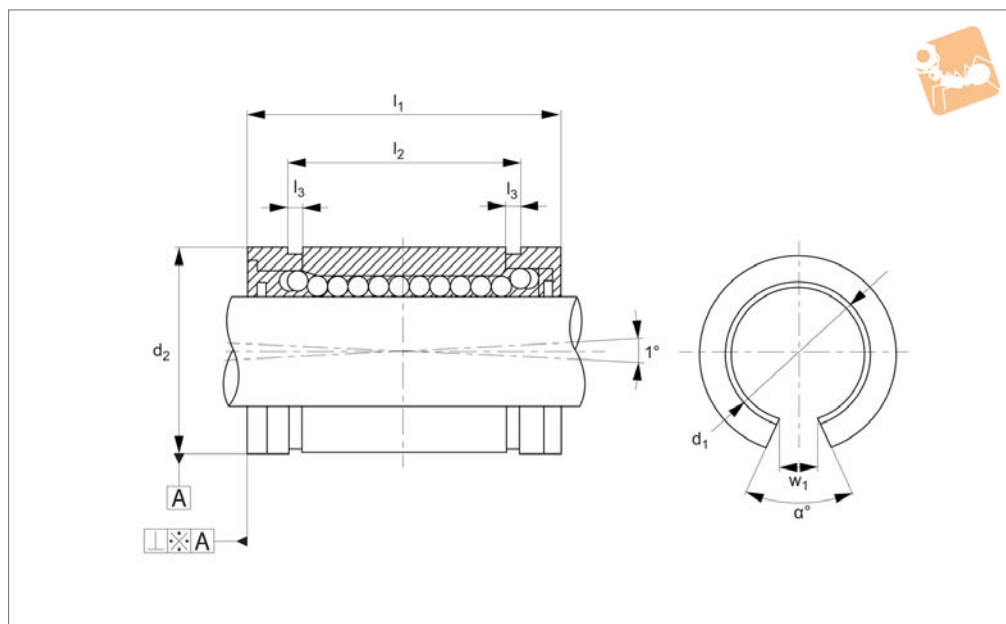
Tips

The nickel plated bearing plates and the stainless steel bearing balls provide a good degree of corrosion protection.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁ ±0.2	l ₂ ±0.2	l ₃ min.	No. of ball circuits	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1741.010	10	19	29	21.7	1.35	5	550	750	17
L1741.012	12	22	32	22.7	1.35	5	1100	1230	23
L1741.016	16	26	36	24.7	1.35	5	1250	1550	28
L1741.020	20	32	45	31.3	1.65	6	1670	2580	61
L1741.025	25	40	58	43.8	1.90	6	2750	3800	122
L1741.030	30	47	68	51.8	1.90	6	2800	4710	185
L1741.040	40	62	80	60.4	2.20	6	5720	6500	360
L1741.050	50	75	100	77.4	2.70	6	7940	11460	580



L1742



Material

Hardened and ground steel ball plate from bearing steel.
Floating plate feature offers self-alignment and clearance adjustment.
Single body resin retainer (POM).
Supplied with nitrile rubber (NBR) end

seals -UU as standard.

Technical Notes

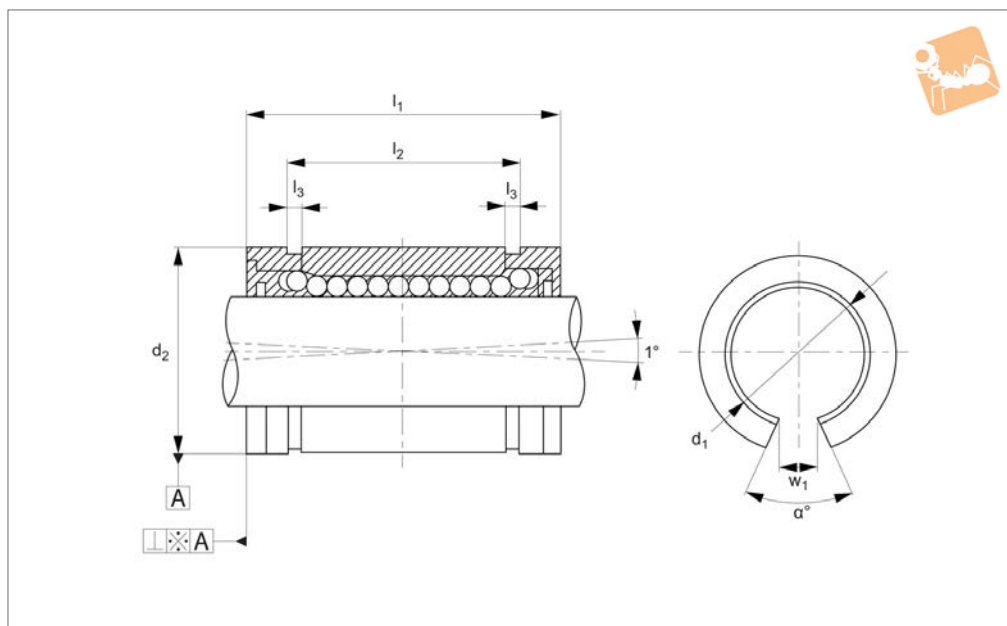
The superball series has 3 x the load rating and 27 x the travel life of conventional linear bushings.
For use with hardened shafts only (see part

nos. L1770 - L1772) - tolerance h6.
Perpendicularity A is better than 15μ.
Temperature range: -20°C to +80°C.

Tips

d₂ is the dimension before the bush has been slotted.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁ ±0.2	l ₂ ±0.2	l ₃ min.	Dyn. load C N max.	w ₁	α °	Static load C ₀ N max.	Weight g
L1742.012	12	22	32	22.7	1.35	1260	6.5	66	1290	18
L1742.016	16	26	36	24.7	1.35	1320	9.0	68	1640	22
L1742.020	20	32	45	31.3	1.65	1720	9.0	55	2630	51
L1742.025	25	40	58	43.8	1.90	2850	11.5	57	3910	102
L1742.030	30	47	68	81.8	1.90	2900	14.0	57	4850	155
L1742.040	40	62	80	60.4	2.20	5900	19.5	56	6700	300
L1742.050	50	75	100	77.4	2.70	8100	22.5	54	11700	480



L1743

LINEAR BEARINGS

Material

Hardened and ground body from bearing steel - nickel plated.
Stainless steel balls 440C.
Floating plate feature offers self-alignment and clearance adjustment.
Single body resin retainer (POM).
Supplied with nitrile rubber (NBR) end seals -UU as standard.

and 27 x the travel life of conventional linear bushings.
They offer self-alignment - prolonging travel life by reducing the friction between shaft and balls.
For use with hardened shafts only (see part nos. L1770 - L1772) - tolerance h6.
Perpendicularity A is better than 15μ.
Temperature range: -20°C to +80°C.

stainless steel bearing balls provide a good degree of corrosion protection. d_2 is the dimension before the bush has been slotted.

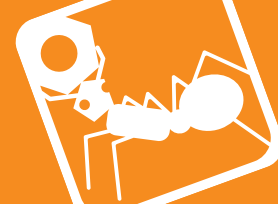
Technical Notes

The superball series has 3 x the load rating

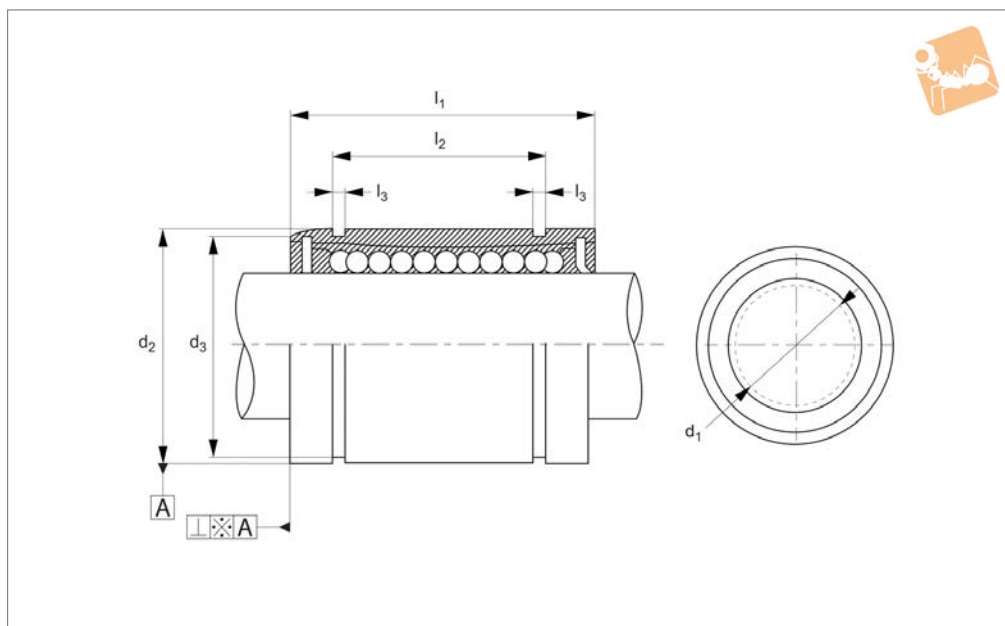
Tips

The nickel plated bearing plates and the

Order No.	d_1 tol. h6	d_2 tol. h6	l_1 ± 0.2	l_2 ± 0.2	l_3 min.	Dyn. load C N max.	w_1	α °	Static load C_0 N max.	Weight g
L1743.012	12	22	32	22.7	1.35	1260	6.5	66	1290	18
L1743.016	16	26	36	24.7	1.35	1320	9.0	68	1640	22
L1743.020	20	32	45	31.3	1.65	1720	9.0	55	2630	51
L1743.025	25	40	58	43.8	1.90	2850	11.5	57	3910	102
L1743.030	30	47	68	81.8	1.90	2900	14.0	57	4850	155
L1743.040	40	62	80	60.4	2.20	5900	19.5	56	6700	300
L1743.050	50	75	100	77.4	2.70	8100	22.5	54	11700	480



L1709



Material

Stainless steel body (440C) with a resin (POM) retainer.

Stainless steel balls (440C).

Supplied with nitrile rubber (NBR) end

seals.

Technical Notes

For use with corrosion resistant hardened shafts (see part no. L1772) - tolerance h6.

Perpendicularity A is better than 15μ.

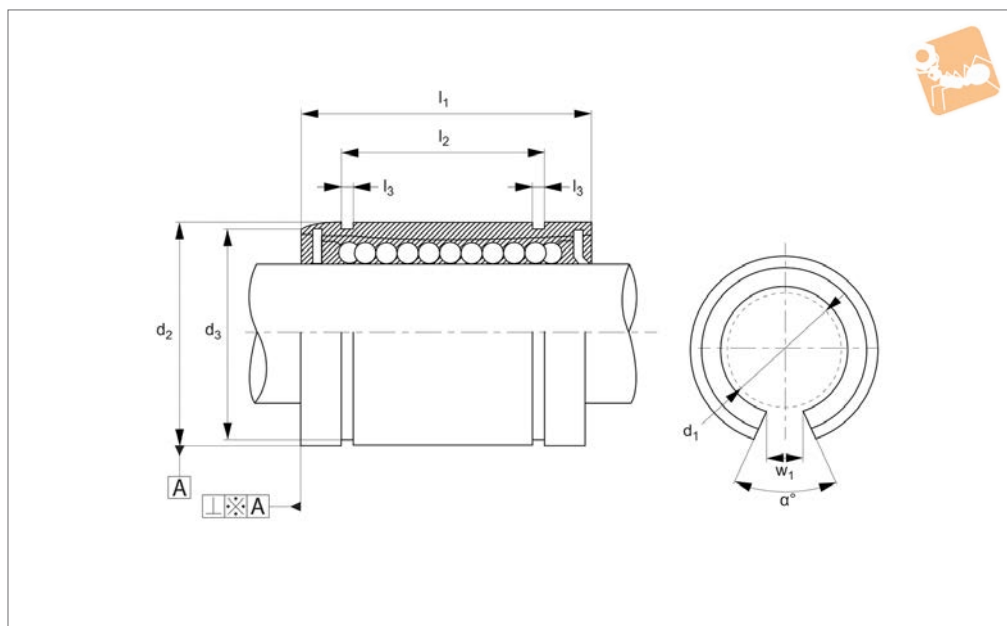
For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: For resin ball cage -20°C to +80°C.

Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	d ₃	Dyn. load C N max.	No. of ball circuits	Static load C ₀ N max.	Weight g
L1709.005-RS	Resin	5	12	22	14.5	1.10	11.5	200	4	260	12
L1709.006-RS-1	Resin	6	12	19	13.5	1.10	11.5	200	4	260	8
L1709.008-RS	Resin	8	16	25	16.5	1.10	15.2	260	4	400	20
L1709.010-RS-1	Resin	10	19	29	22.0	1.30	18.0	370	4	540	30
L1709.012-RS	Resin	12	22	32	22.9	1.30	21.0	410	4	590	41
L1709.016-RS	Resin	16	26	36	24.9	1.30	24.9	770	5	1170	57
L1709.020-RS	Resin	20	32	45	31.5	1.60	30.3	860	5	1370	91
L1709.025-RS	Resin	25	40	58	44.1	1.85	37.5	980	6	1560	215
L1709.030-RS	Resin	30	47	68	52.1	1.85	44.5	1584	6	2740	360
L1709.040-RS	Resin	40	62	80	60.6	2.15	59	2357	6	4020	770
L1709.050-RS	Resin	50	75	100	77.6	2.65	72	4702	6	7940	1250
L1709.060-RS	Resin	60	90	125	101.7	3.15	86.5	6085	6	9800	2220



Stainless Ball Bushings open

Linear Bearings



L1710

LINEAR BEARINGS

Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.
Stainless steel balls (440C).

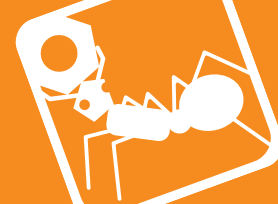
Supplied with nitrile rubber (NBR) end seals.

Technical Notes

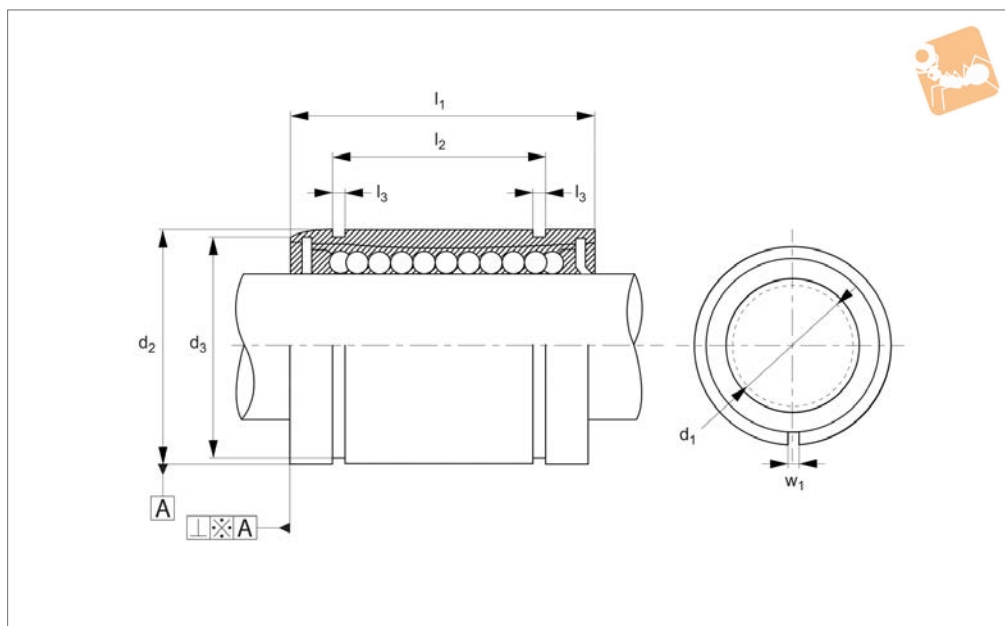
For use with corrosion resistant hardened

shafts (see part no. L1772) - tolerance h6.
Perpendicularity A is better than 15μ.
Temperature range: For resin ball cage - 20°C to +80°C.
For stainless ball cage -20°C to +120°C.

Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	d ₃	w ₁	Dyn. load C N max.	α °	No. of ball circuits	Static load C ₀ N max.	Weight g
L1710.012-RS	Resin	12	22	32	22.9	1.30	21.0	7.5	510	78	3	784	35
L1710.016-RS	Resin	16	26	36	24.9	1.30	24.9	10.0	578	78	3	892	48
L1710.020-RS	Resin	20	32	45	31.5	1.60	30.3	10.0	862	60	4	1370	84
L1710.025-RS	Resin	25	40	58	44.1	1.85	37.5	12.5	980	60	5	1570	195
L1710.012-SS	St. Steel	12	22	32	22.9	1.30	21.0	7.5	510	78	3	784	35
L1710.016-SS	St. Steel	16	26	36	24.9	1.30	24.9	10.0	578	78	3	892	48
L1710.020-SS	St. Steel	20	32	45	31.5	1.60	30.3	10.0	862	60	4	1370	84
L1710.025-SS	St. Steel	25	40	58	44.1	1.85	37.5	12.5	980	60	5	1570	195



L1711



Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.
Stainless steel balls (440C).
Supplied with nitrile rubber (NBR) end seals.

Technical Notes

For use with corrosion resistant hardened shafts (see part no. L1772) - tolerance h6. Perpendicularity A is better than 15μ.
For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: For resin ball cage -20°C to +80°C.

For stainless ball cage -20°C to +120°C.

Tips

d₂ is the dimension before the bush has been slotted.

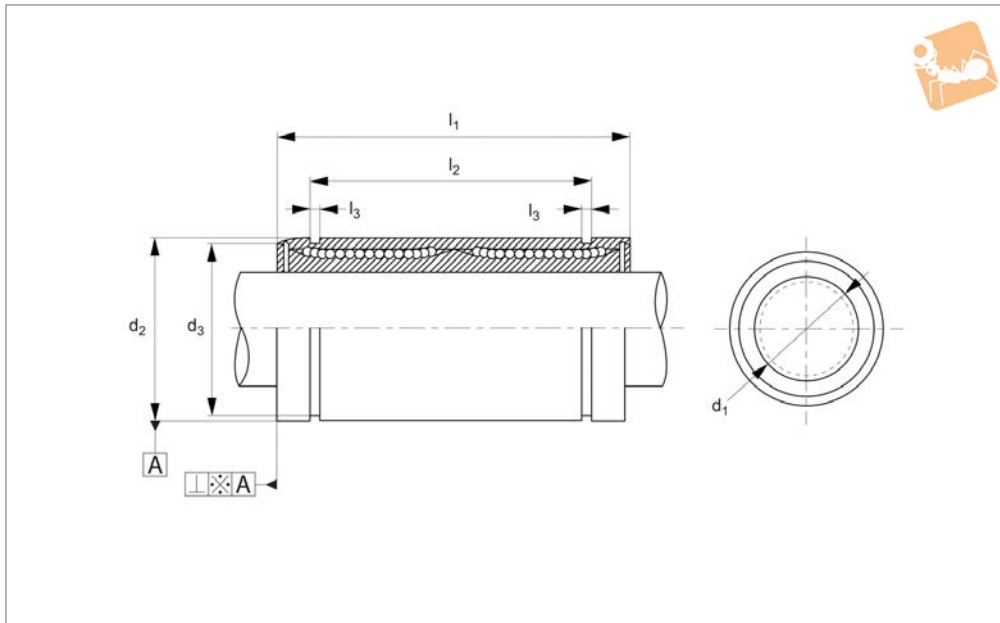
Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	d ₃	w ₁	Dyn. load C N max.	No. of ball circuits	Static load C ₀ N max.	Weight g
L1711.005-RS	Resin	5	12	22	14.5	1.10	11.5	1.0	200	4	260	12
L1711.006-RS-1	Resin	6	12	19	13.5	1.10	11.5	1.0	200	4	260	8
L1711.008-RS	Resin	8	16	25	16.5	1.10	15.2	1.0	260	4	400	20
L1711.010-RS-1	Resin	10	19	29	22.0	1.30	18.0	1.0	370	4	540	30
L1711.012-RS	Resin	12	22	32	22.9	1.30	21.0	1.5	410	4	590	41
L1711.016-RS	Resin	16	26	36	24.9	1.30	24.9	1.5	770	5	1170	57
L1711.020-RS	Resin	20	32	45	31.5	1.60	30.3	2.0	860	5	1370	91
L1711.025-RS	Resin	25	40	58	44.1	1.85	37.5	2.0	980	6	1560	215
L1711.006-SS-1	Stainless	6	12	19	13.5	1.10	11.5	1.0	200	4	260	8
L1711.008-SS	Stainless	8	16	25	16.5	1.10	15.2	1.0	260	4	400	20
L1711.010-SS-1	Stainless	10	19	29	22.0	1.30	18.0	1.0	370	4	540	30
L1711.012-SS	Stainless	12	22	32	22.9	1.30	21.0	1.5	410	4	590	41
L1711.016-SS	Stainless	16	26	36	24.9	1.30	24.9	1.5	770	5	1170	57
L1711.020-SS	Stainless	20	32	45	31.5	1.60	30.3	2.0	860	5	1370	91
L1711.025-SS	Stainless	25	40	58	44.1	1.85	37.5	2.0	980	6	1560	215



Stainless Ball Bushings

long version

Linear Bearings



L1713

LINEAR BEARINGS

Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.
Stainless steel balls (440C).

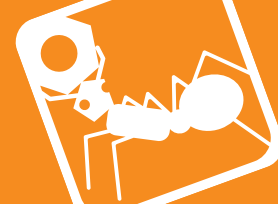
Supplied with nitrile rubber (NBR) end seals.

Technical Notes

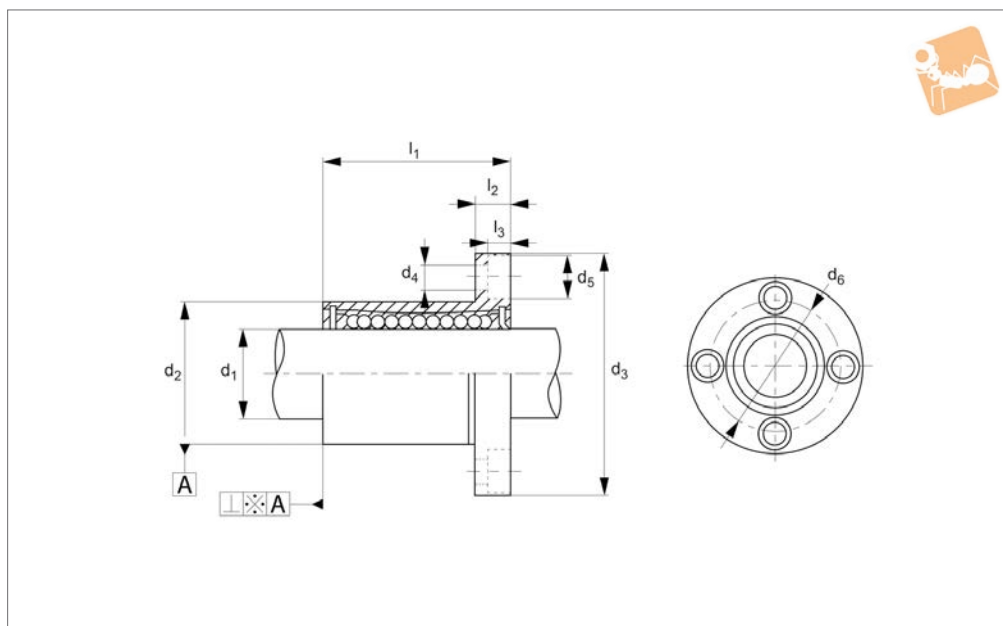
For use with corrosion resistant hardened

shafts (see part no. L1772) - tolerance h6.
Perpendicularity A is better than 15μ.
Temperature range: For resin ball cage - 20°C to +80°C.
For stainless ball cage -20°C to +120°C.

Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	d ₃	Dyn. load C N max.	No. of ball circuits	Static load C ₀ N max.	Weight g
L1713.008-RS	Resin	8	16	45	33.0	1.10	15.2	430	4	780	31
L1713.012-RS	Resin	12	22	57	45.8	1.30	21.0	650	4	1200	80
L1713.016-RS	Resin	16	26	70	49.8	1.30	24.9	1230	5	2350	145
L1713.020-RS	Resin	20	32	80	61.0	1.60	30.3	1400	5	2750	180
L1713.025-RS	Resin	25	40	112	82.0	1.85	38.0	1560	6	3140	440
L1713.008-SS	Stainless	8	16	45	33.0	1.10	15.2	430	4	780	31
L1713.012-SS	Stainless	12	22	57	45.8	1.30	21.0	650	4	1200	80
L1713.016-SS	Stainless	16	26	70	49.8	1.30	24.9	1230	5	2350	145
L1713.020-SS	Stainless	20	32	80	61.0	1.60	30.3	1400	5	2750	180
L1713.025-SS	Stainless	25	40	112	82.0	1.85	38.0	1560	6	3140	440



L1720



Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.
Stainless steel balls (440C).

Supplied with nitrile rubber (NBR) end seals.

Technical Notes

For use with corrosion resistant hardened

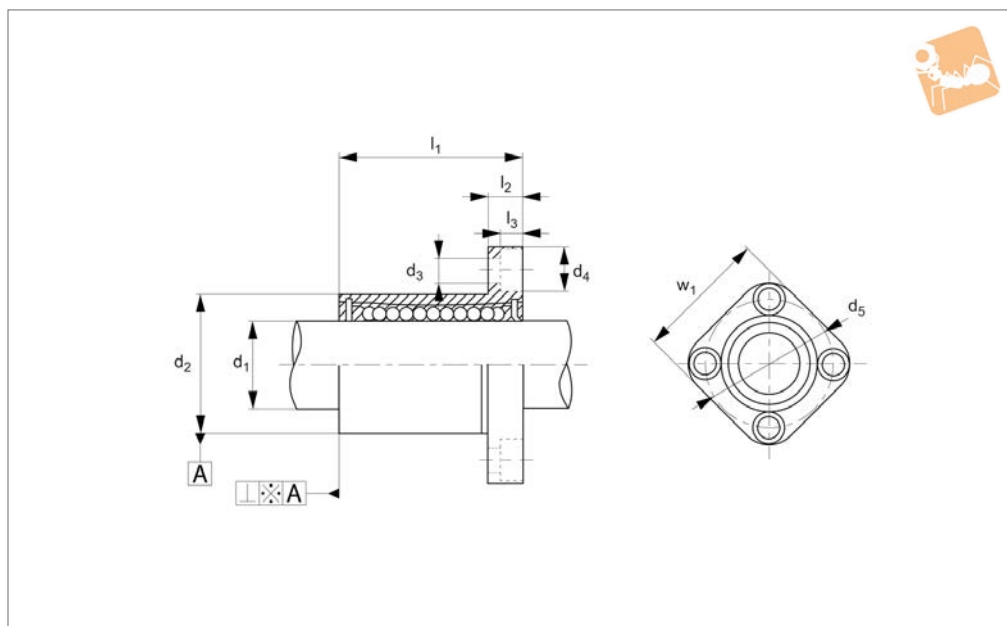
shafts (see part no. L1772) - tolerance h6.
For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: For resin ball cage -20°C to +80°C.
For stainless ball cage -20°C to +120°C.

Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	d ₃ tol. h4	d ₄	d ₅	d ₆	Dyn. load C N max.	No. of ball circuits	Static load C ₀ N max.	Squareness A µm	Weight g
L1720.006-RS-1	Resin	6	12	19	5	3,3	28	3,4	6,5	20	200	4	260	12	26,5
L1720.008-RS	Resin	8	16	25	5	3,3	32	3,4	6,5	24	260	4	400	12	44,0
L1720.010-RS-1	Resin	10	19	29	6	4,4	40	4,5	8,0	29	370	4	540	12	78,0
L1720.012-RS	Resin	12	22	32	6	4,4	42	4,5	8,0	32	410	4	590	12	86,0
L1720.016-RS	Resin	16	26	36	6	4,4	46	4,5	8,0	36	770	5	1170	12	120,0
L1720.020-RS	Resin	20	32	45	8	5,4	54	5,5	9,5	43	860	5	1370	15	184,0
L1720.025-RS	Resin	25	40	58	8	5,4	62	5,5	9,5	51	980	6	1560	15	335,0
L1720.006-SS-1	Stainless	6	12	19	5	3,3	28	3,4	6,5	20	200	4	260	12	26,5
L1720.008-SS	Stainless	8	16	25	5	3,3	32	3,4	6,5	24	260	4	400	12	44,0
L1720.010-SS-1	Stainless	10	19	29	6	4,4	40	4,5	8,0	29	370	4	540	12	78,0
L1720.012-SS	Stainless	12	22	32	6	4,4	42	4,5	8,0	32	410	4	590	12	86,0
L1720.016-SS	Stainless	16	26	36	6	4,4	46	4,5	8,0	36	770	5	1170	12	120,0
L1720.020-SS	Stainless	20	32	45	8	5,4	54	5,5	9,5	43	860	5	1370	15	184,0
L1720.025-SS	Stainless	25	40	58	8	5,4	62	5,5	9,5	51	980	6	1560	15	335,0



Stainless Ball Bushings square flange

Linear Bearings



L1721

LINEAR BEARINGS

Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.
Stainless steel balls (440C).

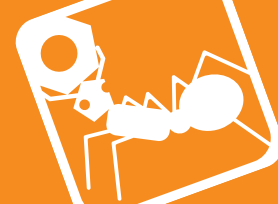
Supplied with nitrile rubber (NBR) end seals.

Technical Notes

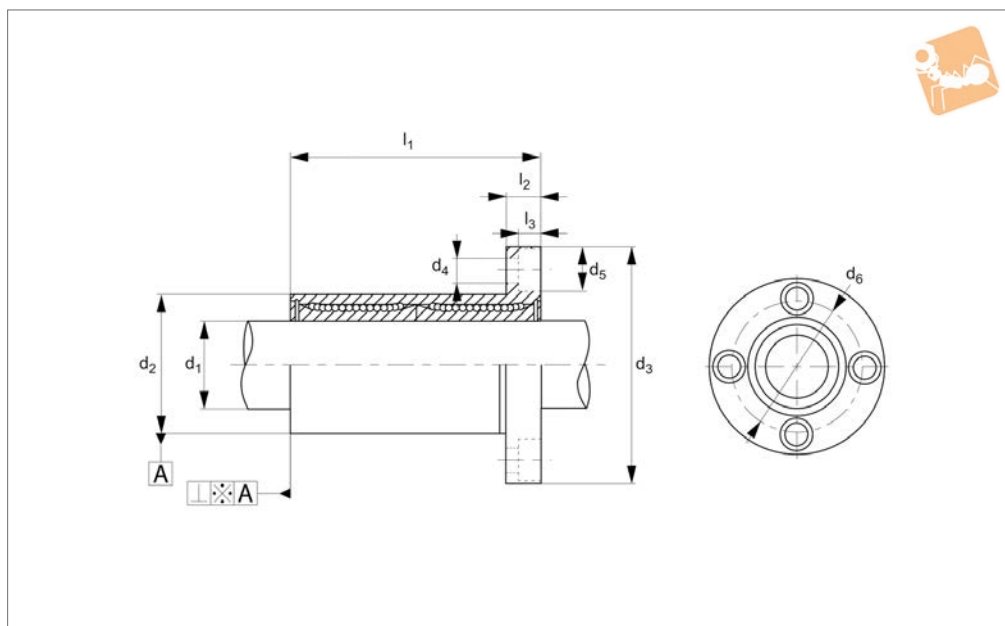
For use with corrosion resistant hardened

shafts (see part no. L1772) - tolerance h6.
For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: For resin ball cage -20°C to +80°C.
For stainless ball cage -20°C to +120°C.

Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	d ₃	d ₄	d ₅	w ₁	Dyn. load C N max.	No. of ball circuits	Static load C ₀ N max.	Squareness A μm	Weight g
L1721.006-RS-1	Resin	6	12	19	5	3,3	3,4	6,5	20	22	200	4	260	12	26,5
L1721.008-RS	Resin	8	16	25	5	3,3	3,4	6,5	24	25	260	4	400	12	44,0
L1721.010-RS-1	Resin	10	19	29	6	4,4	4,5	8,0	29	30	370	4	540	12	78,0
L1721.012-RS	Resin	12	22	32	6	4,4	4,5	8,0	32	32	410	4	590	12	86,0
L1721.016-RS	Resin	16	26	36	6	4,4	4,5	8,0	36	35	770	5	1170	12	120,0
L1721.020-RS	Resin	20	32	45	8	5,4	5,5	9,5	43	42	860	5	1370	15	184,0
L1721.025-RS	Resin	25	40	58	8	5,4	5,5	9,5	51	50	980	6	1560	15	335,0
L1721.006-SS-1	Stainless	6	12	19	5	3,3	3,4	6,5	20	22	200	4	260	12	26,5
L1721.008-SS	Stainless	8	16	25	5	3,3	3,4	6,5	24	25	260	4	400	12	44,0
L1721.010-SS-1	Stainless	10	19	29	6	4,4	4,5	8,0	29	30	370	4	540	12	78,0
L1721.012-SS	Stainless	12	22	32	6	4,4	4,5	8,0	32	32	410	4	590	12	86,0
L1721.016-SS	Stainless	16	26	36	6	4,4	4,5	8,0	36	35	770	5	1170	12	120,0
L1721.020-SS	Stainless	20	32	45	8	5,4	5,5	9,5	43	42	860	5	1370	15	184,0
L1721.025-SS	Stainless	25	40	58	8	5,4	5,5	9,5	51	50	980	6	1560	15	335,0



L1724



Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.

Stainless steel balls (440C).

Supplied with nitrile rubber (NBR) end

seals.

Technical Notes

For use with corrosion resistant hardened shafts (see part no. L1772).

Tolerance h6. For part numbers with ⁻¹ shaft

tolerance required for these is g6.

Temperature range: For resin ball cage - 20°C to +80°C.

For stainless ball cage -20°C to +120°C.

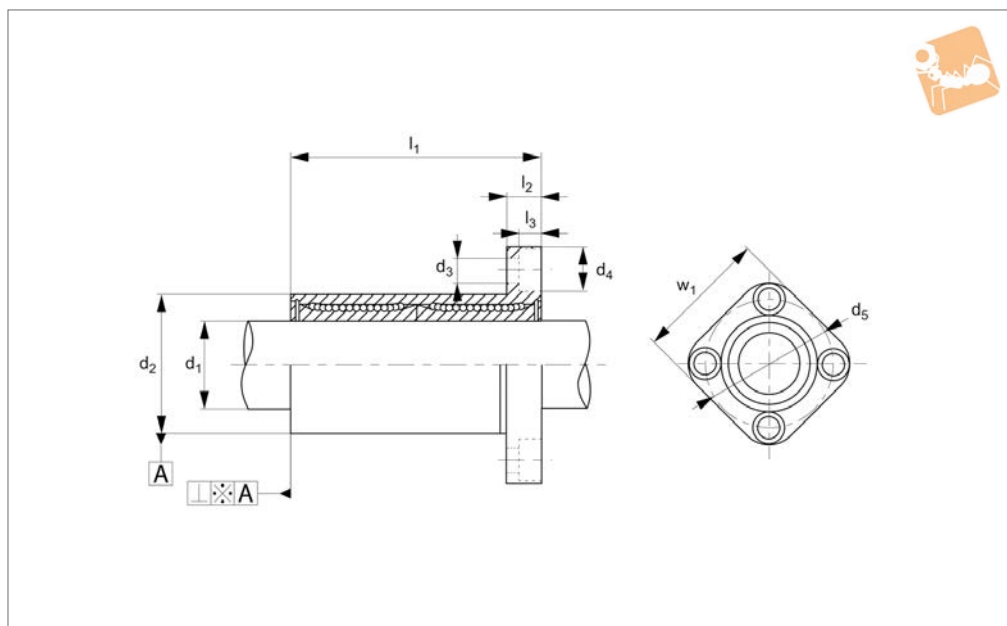
Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	d ₃ tol. h4	d ₄	d ₅	d ₆	Dyn. load C N max.	No. of ball circuits	Static load C ₀ N max.	Squareness A µm	Weight g
L1724.006-RS-1	Resin	6	12	35	5	3,3	28	3,4	6,5	20	320	4	520	15	31
L1724.008-RS	Resin	8	16	45	5	3,3	32	3,4	6,5	24	430	4	780	15	53
L1724.010-RS-1	Resin	10	19	55	6	4,4	40	4,5	8,0	29	580	4	1100	15	105
L1724.012-RS	Resin	12	22	57	6	4,4	42	4,5	8,0	32	650	4	1200	15	100
L1724.016-RS	Resin	16	26	70	6	4,4	46	4,5	8,0	36	1230	5	2350	15	187
L1724.020-RS	Resin	20	32	80	8	5,4	54	5,5	9,5	43	1400	5	2750	17	260
L1724.025-RS	Resin	25	40	112	8	5,4	62	5,5	9,5	51	1560	6	3140	17	515
L1724.006-SS-1	Stainless	6	12	35	5	3,3	28	3,4	6,5	20	320	4	520	15	31
L1724.008-SS	Stainless	8	16	45	5	3,3	32	3,4	6,5	24	430	4	780	15	53
L1724.010-SS-1	Stainless	10	19	55	6	4,4	40	4,5	8,0	29	580	4	1100	15	105
L1724.012-SS	Stainless	12	22	57	6	4,4	42	4,5	8,0	32	650	4	1200	15	100
L1724.016-SS	Stainless	16	26	70	6	4,4	46	4,5	8,0	36	1230	5	2350	15	187
L1724.020-SS	Stainless	20	32	80	8	5,4	54	5,5	9,5	43	1400	5	2750	17	260
L1724.025-SS	Stainless	25	40	112	8	5,4	62	5,5	9,5	51	1560	6	3140	17	515



Stainless Ball Bushings

double compliment

Linear Bearings



L1725

LINEAR BEARINGS

Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.
Stainless steel balls (440C).

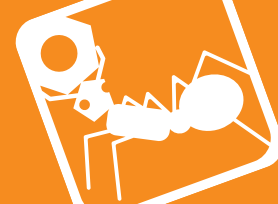
Supplied with nitrile rubber (NBR) end seals.

Technical Notes

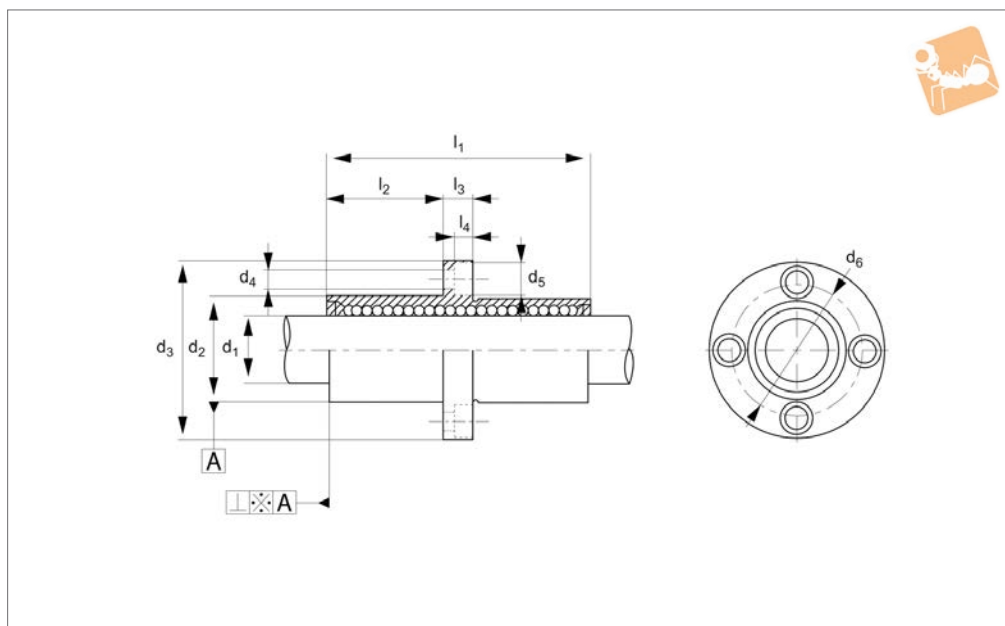
For use with corrosion resistant hardened

shafts (see part no. L1772) - tolerance h6.
For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: For resin ball cage -20°C to +80°C.
For stainless ball cage -20°C to +120°C.

Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	d ₃	d ₄	d ₅	w ₁	Dyn. load C N max.	No. of ball circuits	Static load C ₀ N max.	Squareness A µm	Weight g
L1725.006-RS-1	Resin	6	12	35	5	3,3	3,4	6,5	20	22	320	4	520	15	31
L1725.008-RS	Resin	8	16	45	5	3,3	3,4	6,5	24	25	430	4	780	15	53
L1725.010-RS-1	Resin	10	19	55	6	4,4	4,5	8,0	29	30	580	4	1100	15	105
L1725.012-RS	Resin	12	22	57	6	4,4	4,5	8,0	32	32	650	4	1200	15	100
L1725.016-RS	Resin	16	26	70	6	4,4	4,5	8,0	36	35	1230	5	2350	15	187
L1725.020-RS	Resin	20	32	80	8	5,4	5,5	9,5	43	42	1400	5	2750	17	260
L1725.025-RS	Resin	25	40	112	8	5,4	5,5	9,5	51	50	1560	6	3140	17	515
L1725.006-SS-1	Stainless	6	12	35	5	3,3	3,4	6,5	20	22	320	4	520	15	31
L1725.008-SS	Stainless	8	16	45	5	3,3	3,4	6,5	24	25	430	4	780	15	53
L1725.010-SS-1	Stainless	10	19	55	6	4,4	4,5	8,0	29	30	580	4	1100	15	105
L1725.012-SS	Stainless	12	22	57	6	4,4	4,5	8,0	32	32	650	4	1200	15	100
L1725.016-SS	Stainless	16	26	70	6	4,4	4,5	8,0	36	35	1230	5	2350	15	187
L1725.020-SS	Stainless	20	32	80	8	5,4	5,5	9,5	43	42	1400	5	2750	17	260
L1725.025-SS	Stainless	25	40	112	8	5,4	5,5	9,5	51	50	1560	6	3140	17	515



L1732



Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.
Stainless steel balls (440C).

Supplied with nitrile rubber (NBR) end seals.

Technical Notes

For use with hardened shafts only (see part

nos. L1770 - L1772) - tolerance h6. For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: For resin ball cage -20°C to +80°C. For stainless ball cage -20°C to +120°C.

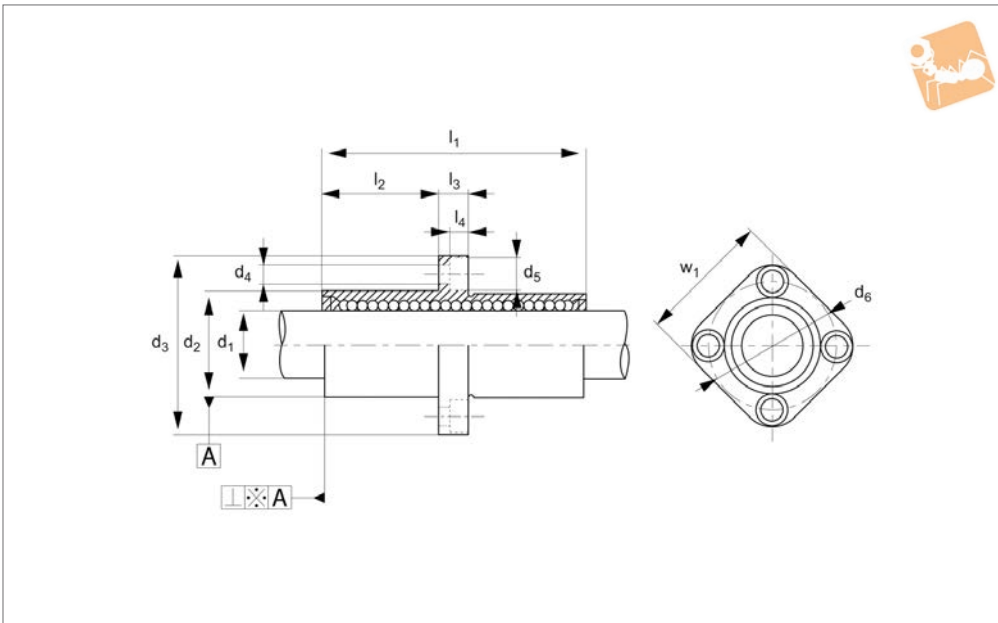
Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	l ₄	d ₃ tol. h4	d ₄	d ₅	d ₆	Dyn. load C N max.	No. of ball circuits	Static load C ₀ N max.	Squareness A µm	Weight g
L1732.006-RS-1	Resin	6	12	35	15,0	5	3,3	28	3,4	6,5	20	320	4	520	15	31
L1732.008-RS	Resin	8	15	45	20,0	5	3,3	32	3,4	6,5	24	430	4	780	15	53
L1732.010-RS-1	Resin	10	19	55	24,5	6	4,4	40	4,5	8,0	29	580	4	1100	15	105
L1732.012-RS	Resin	12	21	57	25,5	6	4,4	42	4,5	8,0	32	650	4	1200	15	100
L1732.016-RS	Resin	16	26	70	32,0	6	4,4	46	4,5	8,0	36	1230	5	2350	15	187
L1732.020-RS	Resin	20	32	80	36,0	8	5,4	54	5,5	9,5	43	1400	5	2750	17	260
L1732.025-RS	Resin	25	40	112	52,0	8	5,4	62	5,5	9,5	51	1560	6	3140	17	515
L1732.006-SS-1	Stainless	6	12	35	15,0	5	3,3	28	3,4	6,5	20	320	4	520	15	31
L1732.008-SS	Stainless	8	15	45	20,0	5	3,3	32	3,4	6,5	24	430	4	780	15	53
L1732.010-SS-1	Stainless	10	19	55	24,5	6	4,4	40	4,5	8,0	29	580	4	1100	15	105
L1732.012-SS	Stainless	12	21	57	25,5	6	4,4	42	4,5	8,0	32	650	4	1200	15	100
L1732.016-SS	Stainless	16	26	70	32,0	6	4,4	46	4,5	8,0	36	1230	5	2350	15	187
L1732.020-SS	Stainless	20	32	80	36,0	8	5,4	54	5,5	9,5	43	1400	5	2750	17	260
L1732.025-SS	Stainless	25	40	112	52,0	8	5,4	62	5,5	9,5	51	3140	6	3140	17	515



Stainless Ball Bushings

long version, square centre flange

Linear Bearings



L1733

LINEAR BEARINGS

Material

Stainless steel body (440C) with either a resin (POM) or stainless steel (316) retainer.
Stainless steel balls (440C).

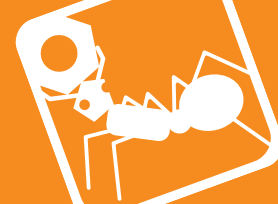
Supplied with nitrile rubber (NBR) end seals.

Technical Notes

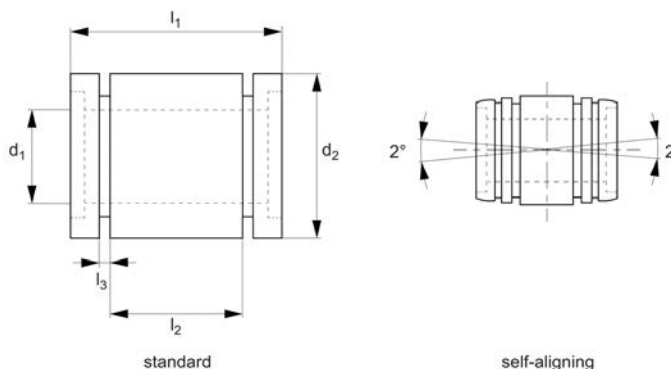
For use with corrosion resistant hardened

shafts (see part no. L1772) - tolerance h6.
For part numbers with ⁻¹ shaft tolerance required is g6. Temperature range: For resin ball cage -20°C to +80°C.
For stainless ball cage -20°C to +120°C.

Order No.	Ball cage	d ₁ tol. h6	d ₂ tol. h6	l ₁	l ₂	l ₃	l ₄	d ₃	d ₄	d ₅	d ₆	w ₁	Dyn. load N max.	C No. of ball circuits	Static load C ₀ N max.	Squareness A µm	Weight g
L1733.006-RS-1	Resin	6	12	35	15,0	5	3,3	20	3,4	6,5	20	22	320	4	520	15	31
L1733.008-RS	Resin	8	15	45	20,0	5	3,3	24	3,4	6,5	24	25	430	4	780	15	53
L1733.010-RS-1	Resin	10	19	55	24,5	6	4,4	29	4,5	8,0	29	30	580	4	1100	15	105
L1733.012-RS	Resin	12	21	57	25,5	6	4,4	32	4,5	8,0	32	32	650	4	1200	15	100
L1733.016-RS	Resin	16	26	70	32,0	6	4,4	36	4,5	8,0	35	35	1230	5	2350	15	187
L1733.020-RS	Resin	20	32	80	36,0	8	5,4	43	5,5	9,5	42	42	1400	5	2750	20	260
L1733.025-RS	Resin	25	40	112	52,0	8	5,4	51	5,5	9,5	50	51	1560	6	3140	20	515
L1733.006-SS-1	Stainless	6	12	35	15,0	5	3,3	20	3,4	6,5	20	22	320	4	520	15	31
L1733.008-SS	Stainless	8	15	45	20,0	5	3,3	24	3,4	6,5	24	25	430	4	780	15	53
L1733.010-SS-1	Stainless	10	19	55	24,5	6	4,4	29	4,5	8,0	29	30	580	4	1100	15	105
L1733.012-SS	Stainless	12	21	57	25,5	6	4,4	32	4,5	8,0	32	32	650	4	1200	15	100
L1733.016-SS	Stainless	16	26	70	32,0	6	4,4	36	4,5	8,0	35	35	1230	5	2350	15	187
L1733.020-SS	Stainless	20	32	80	36,0	8	5,4	43	5,5	9,5	42	42	1400	5	2750	20	260
L1733.025-SS	Stainless	25	40	112	52,0	8	5,4	51	5,5	9,5	50	51	1560	6	3140	20	515



L1764



Material

Aluminium with aluminium-oxide ceramic coating (4-7µ). Hardness >80 HRC.

Technical Notes

Concentricity is better than 15µ.

Available with or without seals, if seals are required, please contact our sales team.

Temperature range: -130°C to +200°C.

Tips

Can be run on hardened or soft steel shafts, tolerance h6, all part no. L1770-L1776.

For dynamic load ratings, this is linked to PV (pressure velocity) - see technical pages for calculations.

Load ratings are straight compressive loads

on a horizontal. They do not take into account moment loads or orientations such as inverse or vertical arrangements.

*** Bore tolerances where d_1 is:**

5-16: +0.0, -0.04 to -0.07

20-30: +0.0, 0.05 to -0.07

40-60: +0.0, 0.05 to -0.09

80: +0.0, 0.12 to -0.17

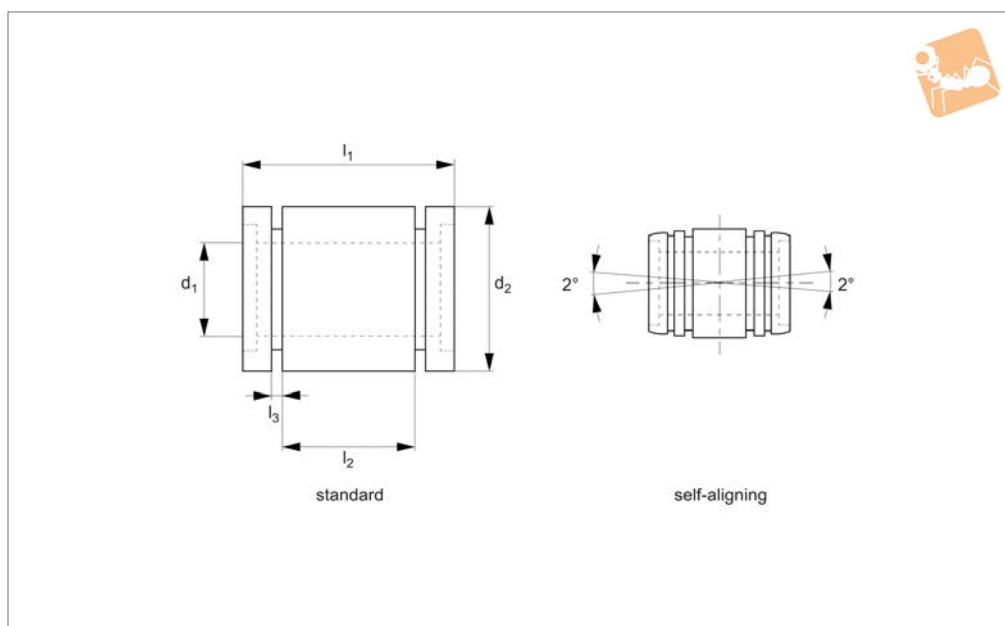
Order No.	Type	d_1^*	d_2 tol. h7	l_1 tol. h14	l_2 tol. h13	l_3	Static load C_0 kN max.
L1764.005	Standard	5	12	22	12	1.10	2.4
L1764.008	Standard	8	16	25	14	1.10	4.3
L1764.012	Standard	12	22	32	20	1.30	8.2
L1764.016	Standard	16	26	36	22	1.30	12.0
L1764.020	Standard	20	32	45	28	1.60	19.0
L1764.025	Standard	25	40	58	40	1.85	35.0
L1764.030	Standard	30	47	68	48	1.85	43.0
L1764.040	Standard	40	62	80	58	2.15	68.0
L1764.050	Standard	50	75	100	72	2.65	106.0
L1764.060	Standard	60	90	125	95	3.20	159.0
L1764.080	Standard	80	120	165	125	4.20	277.0
L1764.008-SA	Self Align.	8	16	25	14	1.10	4.3
L1764.012-SA	Self Align.	12	22	32	20	1.30	8.2
L1764.016-SA	Self Align.	16	26	36	22	1.30	12.0
L1764.020-SA	Self Align.	20	32	45	28	1.60	19.0
L1764.025-SA	Self Align.	25	40	58	40	1.85	35.0
L1764.030-SA	Self Align.	30	47	68	48	1.85	43.0
L1764.040-SA	Self Align.	40	62	80	58	2.15	68.0
L1764.050-SA	Self Align.	50	75	100	72	2.65	106.0
L1764.060-SA	Self Align.	60	90	125	95	3.20	159.0
L1764.080-SA	Self Align.	80	120	165	125	4.20	277.0



Ceramic Closed Linear Bearings

self-lubricating

Linear Bearings



L1765

LINEAR BEARINGS

Material

Aluminium with aluminium-oxide ceramic coating (4-7 μ). Hardness >80 HRC. PTFE insert.

Technical Notes

Concentricity is better than 15 μ . Available with or without seals, if seals are required, please contact our sales team. Temperature range: -130°C to +200°C.

Tips

Can be run on hardened or soft steel shafts, tolerance h6, all part no. L1770-L1776.

Self lubricating versions can also be run on ceramic coated aluminium shafts (see part no. L1778.)

Load ratings are straight compressive loads on a horizontal. They do not take into

account moment loads or orientations such as inverse or vertical arrangements.

*** Bore tolerances where d_1 is:**

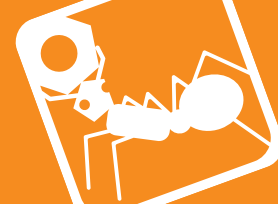
5-16: +0.0, -0.04 to -0.07

20-30: +0.0, 0.05 to -0.07

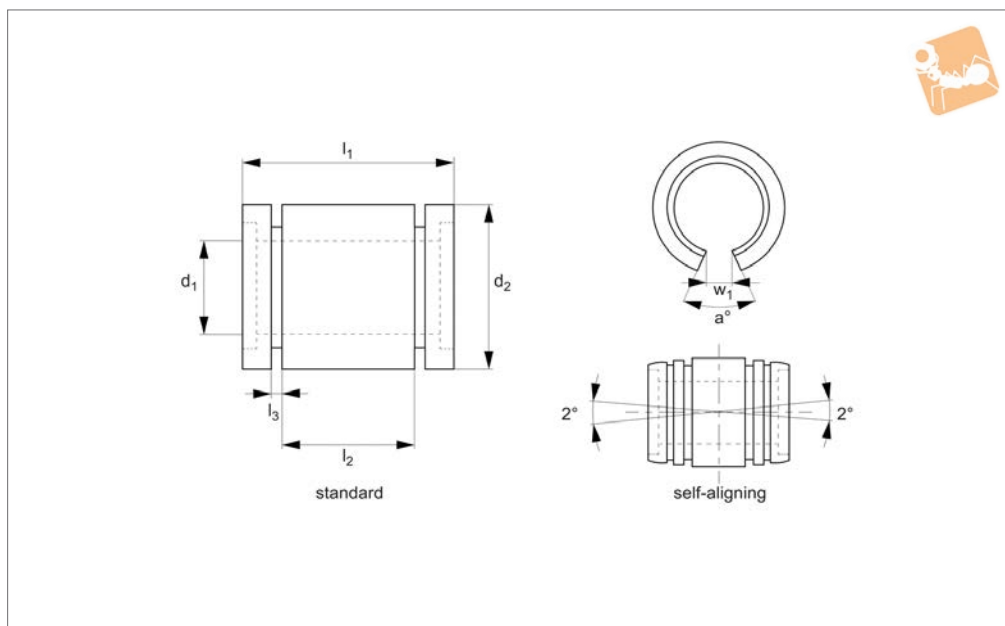
40-60: +0.0, 0.05 to -0.09

80: +0.0, 0.12 to -0.17

Order No.	Type	d_1^*	d_2 tol. h7	l_1 tol. h14	l_2 tol. h13	l_3	Static load C_0 kN max.
L1765.005	Self Lub.	5	12	22	12	1.10	2.3
L1765.008	Self Lub.	8	16	25	14	1.10	4.3
L1765.012	Self Lub.	12	22	32	20	1.30	8.3
L1765.016	Self Lub.	16	26	36	22	1.30	12.0
L1765.020	Self Lub.	20	32	45	28	1.60	18.0
L1765.025	Self Lub.	25	40	58	40	1.85	35.0
L1765.030	Self Lub.	30	47	68	48	1.85	43.0
L1765.040	Self Lub.	40	62	80	58	2.15	68.0
L1765.050	Self Lub.	50	75	100	72	2.65	106.0
L1765.060	Self Lub.	60	90	125	95	3.20	159.0
L1765.080	Self Lub.	80	120	165	125	4.20	277.0
L1765.008-SA	Self Lub/align	8	16	25	14	1.10	4.3
L1765.012-SA	Self Lub/align	12	22	32	20	1.30	8.3
L1765.016-SA	Self Lub/align	16	26	36	22	1.30	12.0
L1765.020-SA	Self Lub/align	20	32	45	28	1.60	18.0
L1765.025-SA	Self Lub/align	25	40	58	40	1.85	35.0
L1765.030-SA	Self Lub/align	30	47	68	48	1.85	43.0
L1765.040-SA	Self Lub/align	40	62	80	58	2.15	68.0
L1765.050-SA	Self Lub/align	50	75	100	72	2.65	106.0
L1765.060-SA	Self Lub/align	60	90	125	95	3.20	159.0
L1765.080-SA	Self Lub/align	80	120	165	125	4.20	277.0



L1766



Material

Aluminium with aluminium-oxide ceramic coating (4-7 μ). Hardness >80 HRC.

Technical Notes

Concentricity is better than 15 μ .

Available with or without seals, if seals are required, please contact our sales team.

Temperature range: -130°C to +200°C.

Tips

Can be run on hardened or soft steel shafts, tolerance h6, all part no. L1770-L1776.

Inverting (hanging upside down) open

style bearings is not recommended.

*** Bore tolerances where d_1 is:**

12-16: +0.0, -0.04 to -0.07

20-30: +0.0, 0.05 to -0.07

40-60: +0.0, 0.05 to -0.09

80: +0.0, 0.12 to -0.17

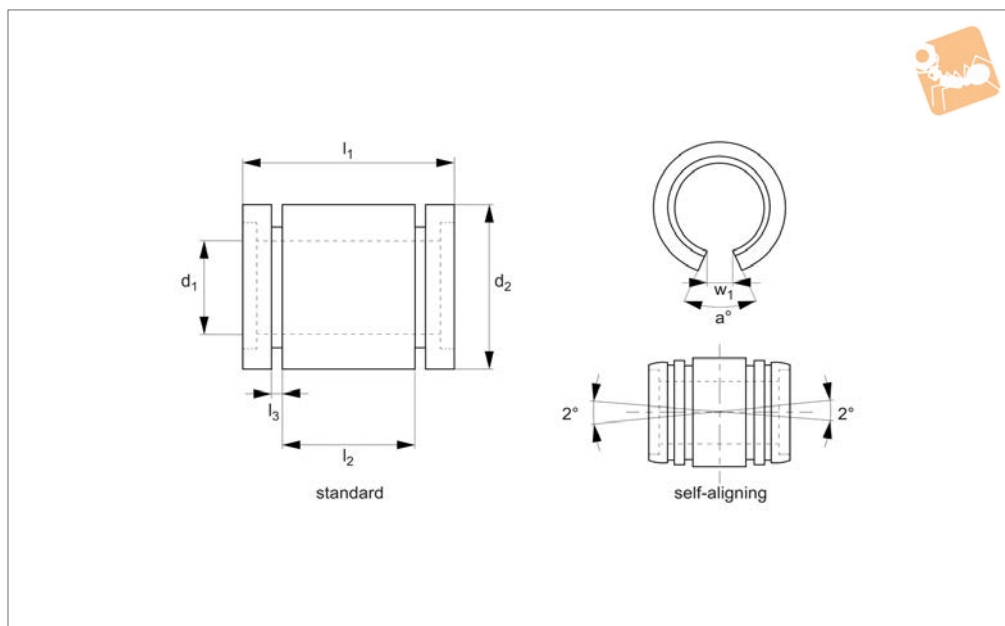
Order No.	Type	d_1^*	d_2 tol. h7	l_1 tol. h14	l_2	l_3	w_1	α °	Static load C_0 kN max.
L1766.012	Standard	12	22	32	20	1.30	7.6	78°	8.2
L1766.016	Standard	16	26	36	22	1.30	10.8	78°	12.0
L1766.020	Standard	20	32	45	28	1.60	10.8	60°	18.0
L1766.025	Standard	25	40	58	40	1.85	13.2	60°	35.0
L1766.030	Standard	30	47	68	48	1.85	14.2	50°	43.0
L1766.040	Standard	40	62	80	58	2.15	18.7	50°	67.0
L1766.050	Standard	50	75	100	72	2.65	23.8	50°	106.0
L1766.060	Standard	60	90	125	95	3.20	29.8	54°	159.0
L1766.080	Standard	80	120	165	125	4.20	38.4	54°	227.0
L1766.012-SA	Self Align.	12	22	32	20	1.30	7.6	78°	8.2
L1766.016-SA	Self Align.	16	28	36	22	1.30	10.8	78°	12.0
L1766.020-SA	Self Align.	20	32	45	28	1.60	10.8	60°	18.0
L1766.025-SA	Self Align.	25	40	58	40	1.85	13.2	60°	35.0
L1766.030-SA	Self Align.	30	47	68	48	1.85	14.2	50°	43.0
L1766.040-SA	Self Align.	40	62	80	58	2.15	18.7	50°	67.0
L1766.050-SA	Self Align.	50	75	100	72	2.65	23.8	50°	106.0
L1766.060-SA	Self Align.	60	90	125	95	3.20	29.8	54°	159.0
L1766.080-SA	Self Align.	80	120	165	125	4.20	38.4	54°	277.0



Ceramic Open Linear Bearings

self-lubricating

Linear Bearings



L1767

LINEAR BEARINGS

Material

Aluminium with aluminium-oxide ceramic coating (4-7 μ). Hardness >80 HRC. PTFE insert.

Technical Notes

Concentricity is better than 15 μ . Available with or without seals, if seals are required, please contact our sales team.

Temperature range: -130°C to +200°C.

Tips

Can be run on hardened or soft steel shafts, tolerance h6, all part no. L1770-L1776.

Self lubricating versions can also be run on ceramic coated aluminium shafts (see part no. L1778).

Inverting (hanging upside down) open style bearing use is not recommended.

*** Bore tolerances where d_1 is:**

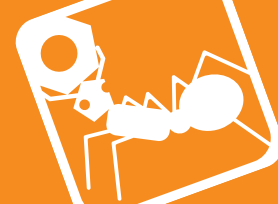
12-16: +0.0, -0.04 to -0.07

20-30: +0.0, 0.05 to -0.07

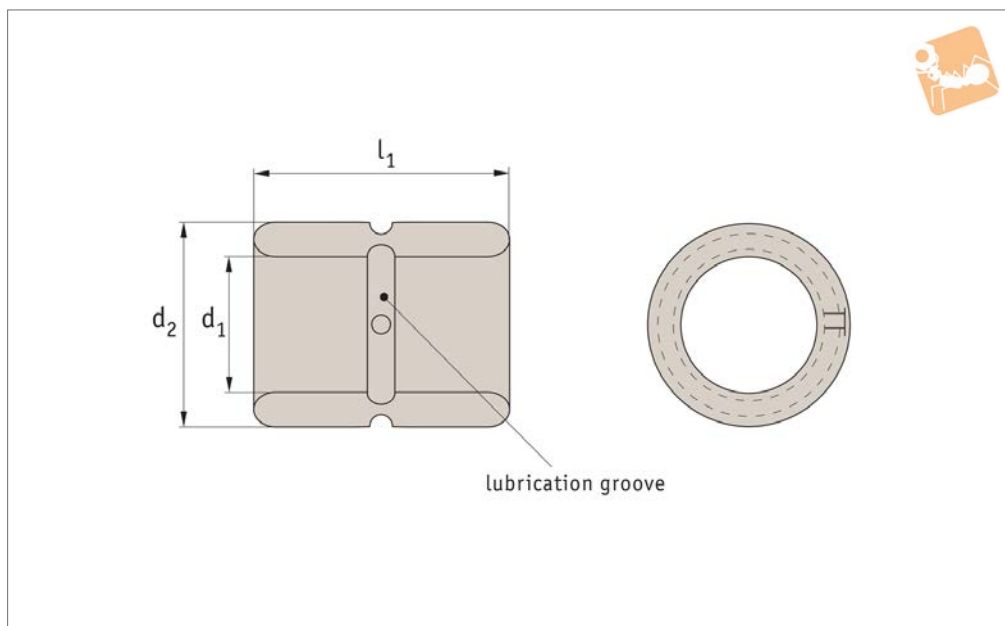
40-60: +0.0, 0.05 to -0.09

80: +0.0, 0.12 to -0.17

Order No.	Type	d_1^*	d_2 tol. h7	l_1 tol. h14	l_2	l_3	w_1	α °	Static load C_0 kN max.
L1767.012	Self Lub.	12	22	32	20	1.30	7.6	78°	8.2
L1767.016	Self Lub.	16	26	36	22	1.30	10.8	78°	12.0
L1767.020	Self Lub.	20	32	45	28	1.60	10.8	60°	18.0
L1767.025	Self Lub.	25	40	58	40	1.85	13.2	60°	35.0
L1767.030	Self Lub.	30	47	68	48	1.85	14.2	50°	43.0
L1767.040	Self Lub.	40	62	80	58	2.15	18.7	50°	67.0
L1767.050	Self Lub.	50	75	100	72	2.65	23.8	50°	106.0
L1767.060	Self Lub.	60	90	125	95	3.20	29.8	54°	159.0
L1767.080	Self Lub.	80	120	165	125	4.20	38.4	54°	277.0
L1767.012-SA	Self Lub/align	12	22	32	20	1.30	7.6	78°	8.2
L1767.016-SA	Self Lub/align	16	26	36	22	1.30	10.8	78°	12.0
L1767.020-SA	Self Lub/align	20	32	45	28	1.60	10.8	60°	18.0
L1767.025-SA	Self Lub/align	25	40	58	40	1.85	13.2	60°	35.0
L1767.030-SA	Self Lub/align	30	47	68	48	1.85	14.2	50°	43.0
L1767.040-SA	Self Lub/align	40	62	80	58	2.15	18.7	50°	67.0
L1767.050-SA	Self Lub/align	50	75	100	72	2.65	23.8	50°	106.0
L1767.060-SA	Self Lub/align	60	90	125	95	3.20	29.8	54°	159.0
L1767.080-SA	Self Lub/align	80	120	165	125	4.20	38.4	54°	277.0



L1768



Material

Aluminium with aluminium-oxide ceramic coating (4-7 μ). Hardness >80 HRC.

Technical Notes

Concentricity is better than 15 μ .

Available with or without seals, if seals are

required, please contact our sales team.

Temperature range: -130°C to +200°C.

Tips

Can be run on hardened or soft steel shafts, tolerance h6, all part no. L1770-L1776.

Bore tolerances where d_1 is:

6-16: +0.0, -0.04 to -0.07

20-30: +0.0, 0.05 to -0.07

40-50: +0.0, 0.05 to -0.09

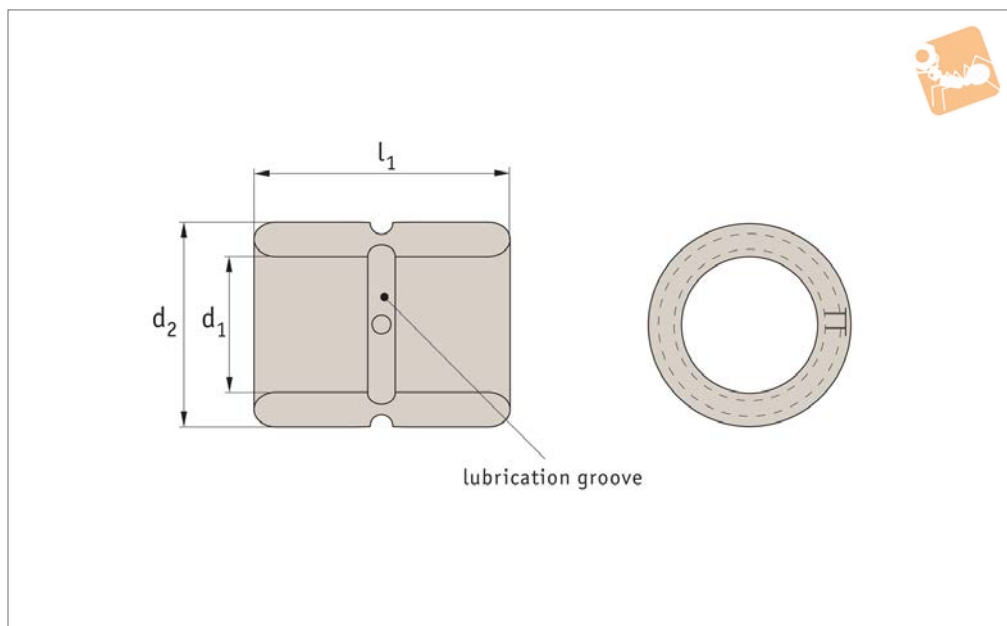
Order No.	d_1	d_2 tol. H7	l_1 tol. h14	Dyn. load C kN max.	Static load C_0 kN max.
L1768.006	6	12	22	0.21	0.79
L1768.008	8	15	24	0.32	1.38
L1768.010	10	17	26	0.47	1.89
L1768.012	12	19	28	0.62	2.64
L1768.014	14	21	28	0.77	3.02
L1768.016	16	24	30	0.92	3.96
L1768.020	20	28	30	1.44	6.19
L1768.025	25	35	40	2.31	9.98
L1768.030	30	40	50	3.25	14.03
L1768.040	40	52	60	5.10	22.02
L1768.050	50	62	70	7.96	34.40



Thin Wall Ceramic Linear Bearings

self-lubricating

Linear Bearings



L1769

LINEAR BEARINGS

Material

Aluminium with aluminium-oxide ceramic coating (4-7 μ). Hardness >80 HRC. PTFE insert.

Technical Notes

Concentricity is better than 15 μ . Available with or without seals, if seals are

required, please contact our sales team. Temperature range: -130°C to +200°C.

Tips

Can be run on hardened or soft steel shafts, tolerance h6, all part no. L1770-L1776.

Self lubricating versions can also be run on

ceramic coated aluminium shafts (see part no. L1788.)

Bore tolerances where d_1 is:

6-16: +0,0, -0.04 to -0.07
20-30: +0.0, 0.05 to -0.07
40-50: +0.0, 0.05 to -0.09

Order No.	d_1	d_2 tol. H7	l_1 tol. h14	Dyn. load C kN max.	Static load C_0 kN max.
L1769.006	6	12	22	0.08	0.64
L1769.008	8	15	24	0.18	1.04
L1769.010	10	17	26	0.23	1.41
L1769.012	12	19	28	0.34	2.00
L1769.014	14	21	28	0.44	2.42
L1769.016	16	24	30	0.51	3.00
L1769.020	20	28	30	0.80	4.68
L1769.025	25	35	40	1.29	7.54
L1769.030	30	40	50	1.83	10.81
L1769.040	40	52	60	2.88	16.64
L1769.050	50	62	70	4.48	26.00



Self-lubricating

These ceramic coated linear bearings are lined with a self-lubricating composite which is bonded to the aluminium shell. This composite is a combination of Teflon® and non-abrasive, polyamide fillers for both load carrying capability and dynamic coefficient of friction.

As the self-liner is non-abrasive, it runs equally well on either hardened steel or on soft steel or stainless steel shafting (303 or 316).

Ceramic coated

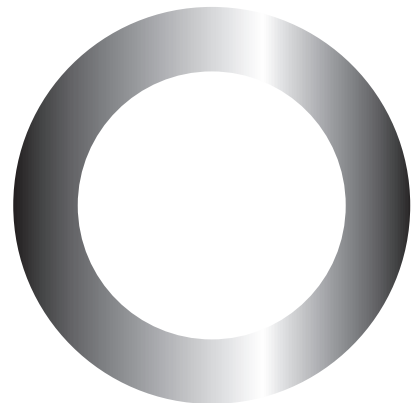
Ceramic coated linear bearings are a one piece construction, employing a file-hard ceramic coating over an aluminium shell. Our ceramic coating is not an anodised or surface coating that can fracture, flake, chip or wash-off in corrosive environments. The ceramic coating is FDA compliant.

These bearings require lubrication (grease or light oil is sufficient - no silicone based lubricants).

Ceramic bearings



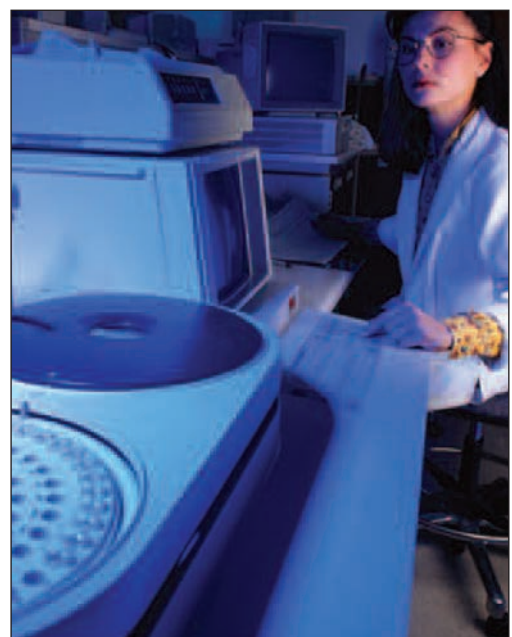
Self-lubricating with teflon liner



Ceramic coated

Applications

- Automated assembly.
- Packaging machines.
- Food processing equipment.
- Pharmaceutical equipment.
- Medical equipment.
- Wash-down systems.



Ceramic coated bearings

These are manufactured from a special grade of aluminium, then ceramic coated. Surface hardness is 85HRC, which is why the bearings have extremely long wear life. Their extreme hardness prevents particles from entering into the surface of the shafting, (this is the primary cause of bearing and shaft failure).

The ceramic series must be lubricated with a thin film of oil in order to perform correctly.

- Lasting precision alignment.
- Abrasion resistance.
- Elimination of noise.
- Interchangeable with ball bushings.
- Minimal lubrication is required.
- Design economies.
- Rotary/linear motion capabilities.
- Zero shake or play.
- Elimination of galvanic action.
- High operation speeds.
- Excellent electrical insulating abilities.
- Oscillatory motion & rapid directional change.
- Unaffected by salt water or corrosion.
- Cleanliness.
- Vacuum applications.
- No catastrophic failure.
- Low friction.
- Food machinery (FDA approved materials available).

Self-lubricating bearings

- Tough
- Resource free
- Quiet
- Cost-effective

These are maintenance free bearings, manufactured to the same standards as our ceramic coated series, but the inside diameter is lined with a special blended Teflon-material; eliminating the need for lubrication. It also allows the use of soft shaft materials such as unhardened steel, 300 series stainless steel or aluminium.

Parallel shafting and edge loading

Sleeve-type linear motion bearings, more so than ball bushings, require parallel shafting to be aligned as closely as possible to avoid edge loading. Edge loading can cause higher than expected friction and subsequent wear.

To combat shaft misalignment, we offer two options:

1. Self-aligning bearings: a subtle o/d radius allows the bearing to pivot on the bearing crown
2. Bearings can be supplied with self-aligning O-rings to provide for a "full float bearing". Unlike our self-aligning bearings, floating bearings on O-rings result in changes between shaft centreline to housing tolerances due to deflection and possible mechanical sets

Breakaway force requirements - static	
Self lube PTFE dry	Ceramic coated lubricated
30% of static load	10% of static load

Example

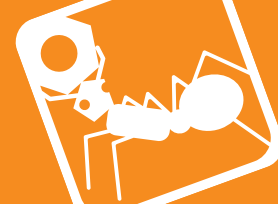
For a linear slide employing 2 rails and 4 self lubricating PTFE pillow block assemblies and supporting a horizontal, centred load of 250N

Static self-lubricating linear bearings 30% of system load to get the system moving

$$250\text{N} \times 0.3 = 75\text{N}$$

Dynamic self-lubricating linear bearings (in motion) 10% of system load

$$250\text{N} \times 0.1 = 25\text{N}$$



Comparison between ceramic coated and self-lubricating bearings

Linear bearing categories	Self-lubricating bearings	Ceramic coated bearings
Max PV (continuous) N/mm ² x m/s	63,05	84,06
Max. pressure N/mm ²	34,47	34,47
Max. speed (no load) m/s	2	Unlimited
Shaft hardness (minimum)	25HRB	35HRB
Coefficient of friction	0,09 - 0,12	0,04 - 0,08
Temperature range - Typical limits	-240°C to +190°C	-125°C to +200°C

Pressure velocity (PV) calculations

The load factor PV has a considerable influence on determining the bearing's useful operating life. PV is determined by multiplying the specific bearing load or pressure (P) by the sliding speed (V).

Bearing materials are rated by a PV limit, with the PV limit representing the highest combination of load and speed under which the bearing material will operate. The PV unit of measure is N/mm² x m/s.

To determine P in an application: the specific bearing load (P) is found by dividing the bearing load by the pressure supporting area of the bearing. The units for P are N/mm².

The pressure supporting area depends on the the specific geometry of the bearing.

The following are formulae for the most common types of bearing geometry.

Specific bearing load P (N/mm²)

$$P = \frac{Wr}{d_1 \times l_1}$$

Sliding speed V (m/s) rotation

$$V = \frac{\pi \times d_1 \times N}{60 \times 10^3}$$

Where;

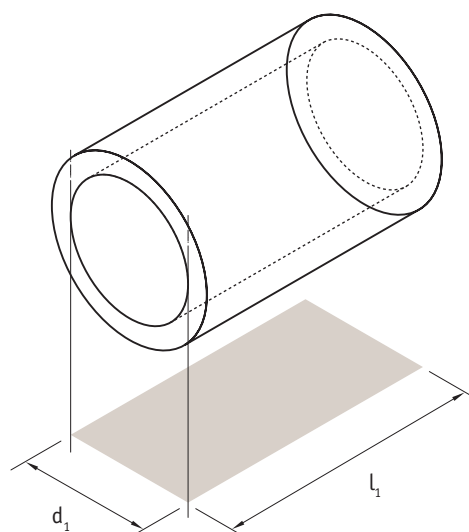
P = Specific bearing load (N/mm²)

Wr = Load on bushing (N)

d₁ = Bearing inside diameter (mm)

N = Speed of rotation (rpm)

l₁ = Bearing length



Open bearing load capacity

Inverting (hanging upside down) open style sleeve bearings is not an optimal design configuration. System load is forced into the bearing slot - the weakest part of the bearing. Depending on the load and possible moments, point loading on the edges of the slot can result in hot spots, liner cold flow and excessive wear. If the bearings are being used in this way the percentage of the load stated in the data table they can take is shown below.

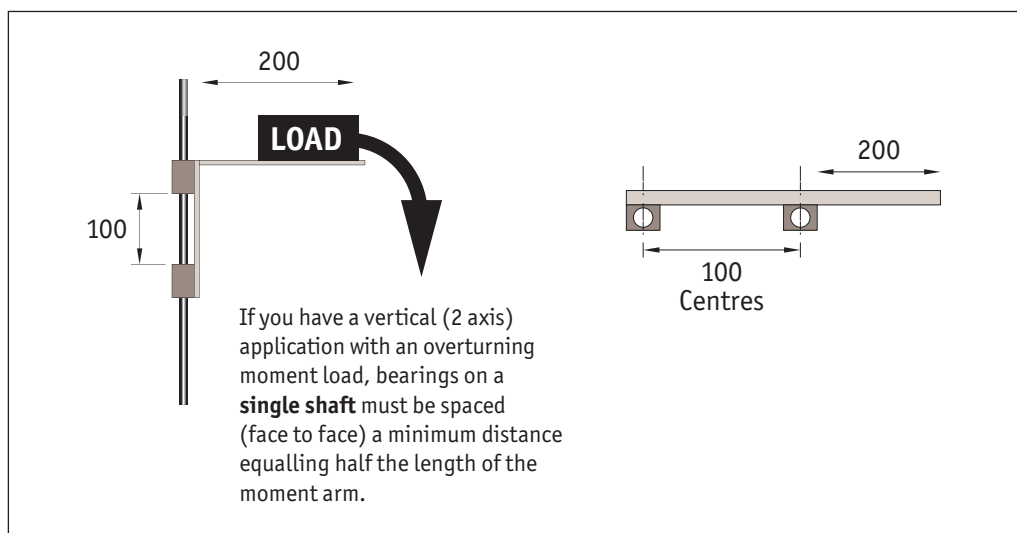
Straight downward compressive	Side mounted	Inverted (upside down)
100%	70%	30%

Cantilevered loading

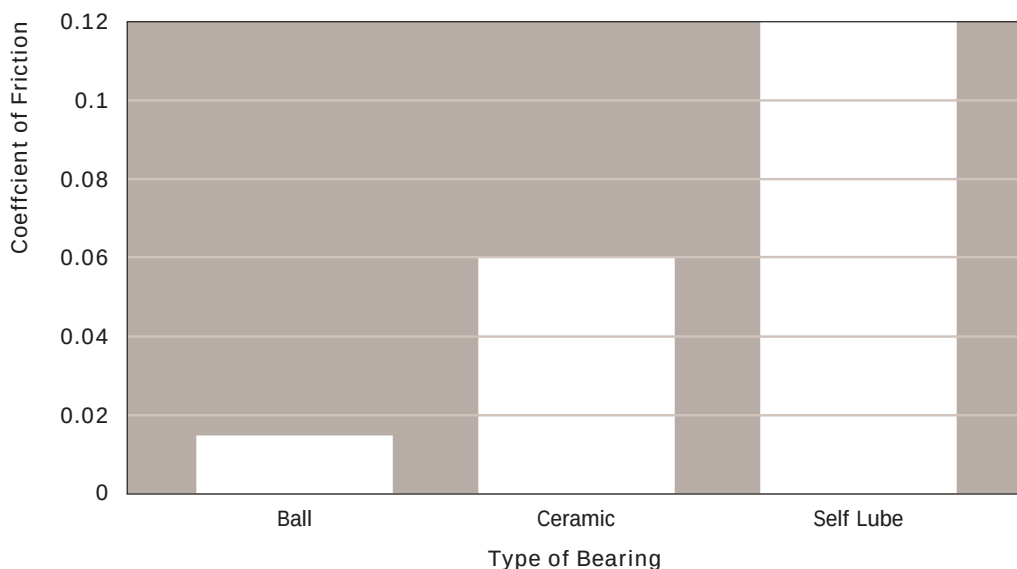
When you have a cantilevered load **you must observe the 2:1 ratio rule.**

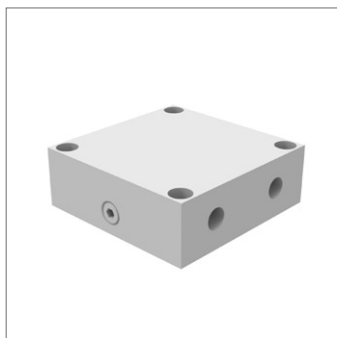
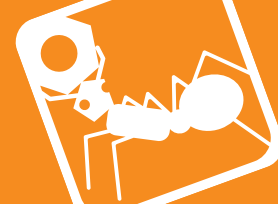
Moment loading can result in edge loading of sleeve-type linear bearings, so the correct spacing between bearings on a single shaft (vertical or Z axes) and spacing between shafting on horizontal applications (X,Y axes) must meet the 2:1 ratio rule.

If this rule is not observed the friction will increase, the system will bind and the bearings will ultimately fail.

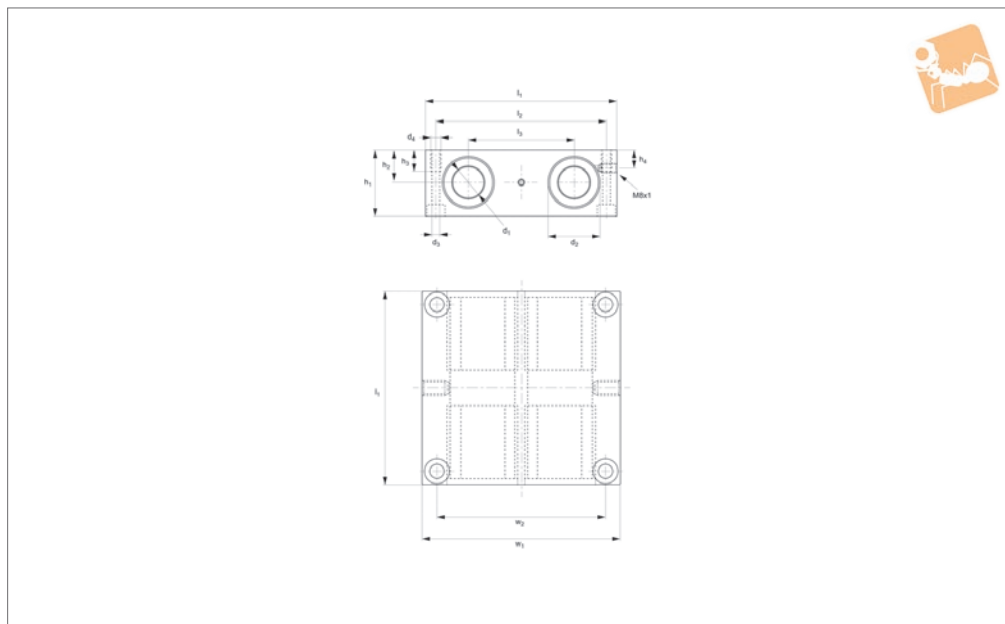


Coefficient of friction





L1758



Material

Aluminium alloy body.
Steel bearings with plastic ball retainer and end seals.

Technical Notes

Quadruple, closed, self-aligning linear ball

bearings with two integral seals and lubrication hole.
Bearings are fixed in the housing by retaining rings (DIN 472).
For use with hardened shafts only (see part no.s L1770 - L1772). Load ratings apply for hardened and ground shafts only.
Temperature range: -20°C to +80°C.

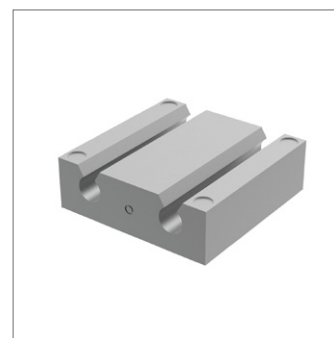
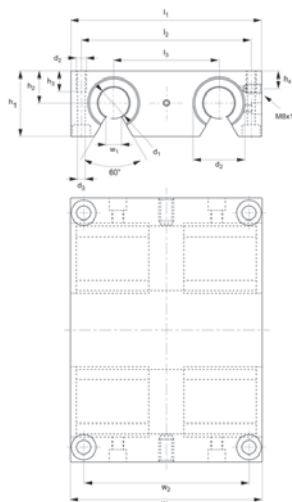
For applications requiring higher temperatures we can make the bushings suitable for use up to +120°C by changing the ball retainers, end plates, and seals. Please advise at time of ordering if this is required.

Order No.	d_1 for h_7	d_2 tol. h_6	w_1	h_1	h_2 +0.01 -0.02	h_3	h_4	l_1	l_2 & w_2	l_3 ± 0.02	d_3	d_4	Dyn. load C kN max.	Static load C_0 kN max.	Weight kg
L1758.012	12	22	85	32	16	13	13	85	73	42	5.3	M 6	1.3	2.0	0.70
L1758.016	16	26	100	36	18	13	15	100	88	54	5.3	M 6	1.4	2.2	1.02
L1758.020	20	32	130	46	23	18	19	130	115	72	6.8	M 8	3.2	4.9	2.15
L1758.025	25	40	160	56	28	22	24	160	140	88	9.0	M10	5.5	8.5	4.07
L1758.030	30	47	180	64	32	26	27	180	158	96	10.5	M12	6.2	9.5	5.87
L1758.040	40	62	230	80	40	34	35	230	202	122	13.5	M16	10.5	14.0	11.78



Quadro Carriages open type bearings

Linear Bearings



L1759

LINEAR BEARINGS

Material

Aluminium alloy body.
Steel bearings with plastic ball retainer
and end seals.

Technical Notes

Quadruple, closed, self-aligning linear ball

bearings with two integral seals and lubrication hole.

Bearings are fixed in the housing by retaining rings (DIN 472).

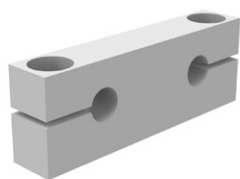
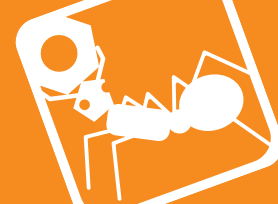
For use with hardened shafts only (see part no.s L1770 - L1772). Load ratings apply for hardened and ground shafts only.

Temperature range: -20°C to +80°C.

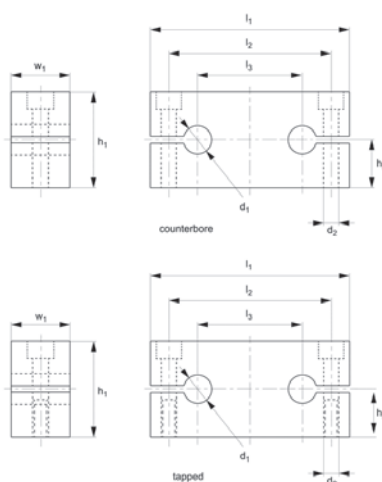
For applications requiring higher tempera-

tures we can make the bushings suitable for use up to +120°C by changing the ball retainers, end plates, and seals. Please advise at time of ordering if this is required.

Order No.	d_1 for h_7	d_2 tol. h_6	w	w_1	h_1	h_2 +0.01 -0.02	h_3	h_4	l_1	l_2 & w_2	l_3 ±0.02	d_3	d_4	Dyn. load C kN max.	Static load C_0 kN max.	Weight kg
L1759.012	12	22	7.0	85	30	18	13	13	85	73	42	5.3	M 6	1.3	2.0	0.59
L1759.016	16	26	9.4	100	35	22	13	15	100	88	54	5.3	M 6	1.4	2.2	0.92
L1759.020	20	32	10.2	130	42	25	18	19	130	115	72	6.8	M 8	3.2	4.9	1.82
L1759.025	25	40	12.9	160	51	30	22	24	160	140	88	9.0	M10	5.5	8.5	3.46
L1759.030	30	47	13.9	180	60	35	26	27	180	158	96	10.5	M12	6.2	9.5	5.19
L1759.040	40	62	18.2	230	77	45	34	35	230	202	122	13.5	M16	10.5	14.0	10.78



L1760



Material

Aluminium alloy.

Technical Notes

For use with parts L1758 and L1759.

Order No.	Type	d_1	d_2	w_1	h_1	h_2 ± 0.015	l_1	l_2	l_3	Weight kg
L1760.008-C	Clearance	8	5.5	12	23	12.5	65	52	32	0.04
L1760.012-C	Clearance	12	6.6	14	32	18.0	85	70	42	0.07
L1760.016-C	Clearance	16	9.0	18	36	20.0	100	82	54	0.13
L1760.020-C	Clearance	20	11.0	20	46	25.0	130	108	72	0.22
L1760.025-C	Clearance	25	13.5	25	56	30.0	160	132	88	0.44
L1760.030-C	Clearance	30	13.5	25	64	35.0	180	150	96	0.56
L1760.040-C	Clearance	40	17.5	30	80	44.0	230	190	122	1.00
L1760.008-T	Tapped	8	M 5	12	22	11	65	52	32	0.04
L1760.012-T	Tapped	12	M 6	14	28	14	85	70	42	0.07
L1760.016-T	Tapped	16	M 8	18	32	16	100	82	54	0.13
L1760.020-T	Tapped	20	M10	20	42	21	130	108	72	0.22
L1760.025-T	Tapped	25	M12	25	52	26	160	132	88	0.44
L1760.030-T	Tapped	30	M12	25	58	29	180	150	96	0.56
L1760.040-T	Tapped	40	M16	30	72	36	230	190	122	1.00