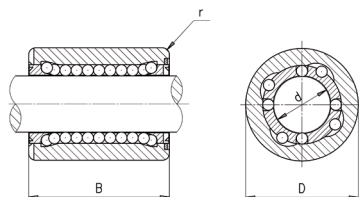# microlinea

mps

LINEAR MOVEMENT
LINEAR BEARINGS

Standard product line - microlinea
Miniature high precision linear bearings.
L – series with stainless steel housing and
brass retainer.

On request
- All stainless steel execution
- With reduced bore tolerance

						Load ratings ISO 14728 (N)	
Reference	d (mm)	D (mm)	B (mm)	r min (mm)	Ø balls (mm)	stat. (Co)	dyn. (C_{100b})
L 204X	2	4	5	0.02	0.500	8.4	9.0
L 306X	3	6	7	0.13	0.600	31	26
L 307X	3	7	10	0.20	0.794	73	56
L 408X	4	8	10	0.24	0.794	66	53
L 510X	5	10	14	0.24	1.250	131	118
L 612X	6	12	18	0.39	1.588	250	220

Materials
Housing:	stainless steel AISI 440C
Cage:	brass or stainless steal AISI 303
Shields:	stainless steel AISI 302 or AISI 303
Balls:	stainless steel AISI 440C
Lubrication:	standard: Winsor Lube L245X (other oils on request)
Temperature:	-40°C to +80°C or more with the appropriate lubricant
Bearings tolerances:	bore diameter d +8/0 [µm]
	outside diameter D 0/-8 [µm]

Recommended tolerances for shaft: 0/-6 µm
Recommended hardness for shaft: min. 58 HRC
Max. press fit between the outer ring and housing: 1 to 3 µm

Example of part number definition
L 204X-L23ar	miniature precision linear bearing
L 204X-L23ar	bore diameter = 2 mm
L 204X-L23ar	outer diameter = 4 mm
L 204X-L23ar	stainless steel
L 204X-L23ar	lubricant: L = oil; G = grease
L 204X-L23ar	type of lubricant
L 204X-L23ar	rust protection, dipped in oil

Linear bearings calculation

C_{100B} is calculated according to ISO 14728. 100 stands for a nominal life expectancy of 100 km and B for linear ball bearing. Without any precision, a C value may also correspond to C_{50B} ($C_{50B} = 1.26 \cdot C_{100B}$).

General formulas

The theoretical life has no practical value unless the following conditions are scrupulously observed:
• Magnitude and direction of constant load carefully determined
• Suitable hardness of shaft
• Constant temperature not exceeding 100°C
• Rigorous cleanliness in mounting and during running
• Careful choice and dosage of lubricant

Life in achievable distance

L_m: Life expectancy in meters [m]
C_{100B}: Dynamic load rating [N]
P: Equivalent dynamic load [N]

$$L_m = \left(\frac{C_{100B}}{P}\right)^3 \cdot 10^5$$

Life in hours

L_h: Life expectancy in hours [h]
f: Number of double strokes per minute [min⁻¹]
s: Length of a double stroke [m]

$$L_h = \left(\frac{C_{100B}}{P}\right)^3 \cdot \frac{10^5}{f \cdot s \cdot 60}$$

According to ISO 14728, one shall consider a static safety factor so that the actual load does not exceed half of the C_0 value.

FAULHABER GROUP
We create motion