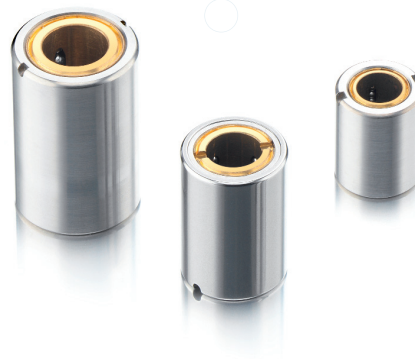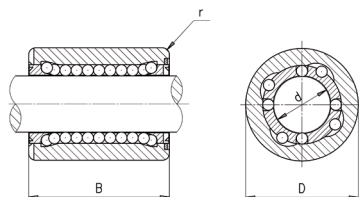# LINEAR MOVEMENT
LINEAR BEARINGS

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

Reference	d (mm)	D (mm)	B (mm)	r min (mm)	Ø balls (mm)	Load ratings	
						stat. Co N	dyn. C N
L 204X	2	4	5	0.02	0.500	8	10
L 306X	3	6	7	0.13	0.600	31	30
L 408X	4	8	10	0.24	0.794	66	61
L 510X	5	10	14	0.24	1.250	131	132
L 612X	6	12	18	0.39	1.588	250	245

Materials
Housing: stainless steel AISI 440C
Cage: brass
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
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

Calculation of the theoretical life expectancy for linear bearings
In Europe we consider a nominal life of 100'000 meters travel distance; that is the reason of the 10^5 factor in the following formula (in Japan: 50'000 meters). The load rating is calculated according to DIN 636.

General formulas
The theoretical life has no practical value unless the following conditions are scrupulously observed:
• Magnitude and direction of constant load carefully determined
• Constant speed
• 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: Dynamic load rating [N]
P: Equivalent dynamic load [N]

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

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]

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

Specifications subject to change without notice

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We create motion