

1.5 High Permissible Load

The LM Guide has raceways containing a groove of a radius approximately equal to the ball radius. This design is completely different from the linear bush. As shown in Fig. 4, which compares size between the LM Guide and a linear bush for comparable basic dynamic load ratings, the LM Guide is far smaller than the linear bush, and so the LM Guide permits a significantly more compact system design.

The reason for this saving in space is the great difference in permissible load between the R-groove contact structure and the surface contact structure. The R-groove contact structure (radius: 52% of the ball radius) can bear thirteen times as great a load per ball as can a surface contact structure. Because service life is proportional to the cube of the permissible load, this increased ball-bearing load translates into a service life that is some 2,200 times longer.

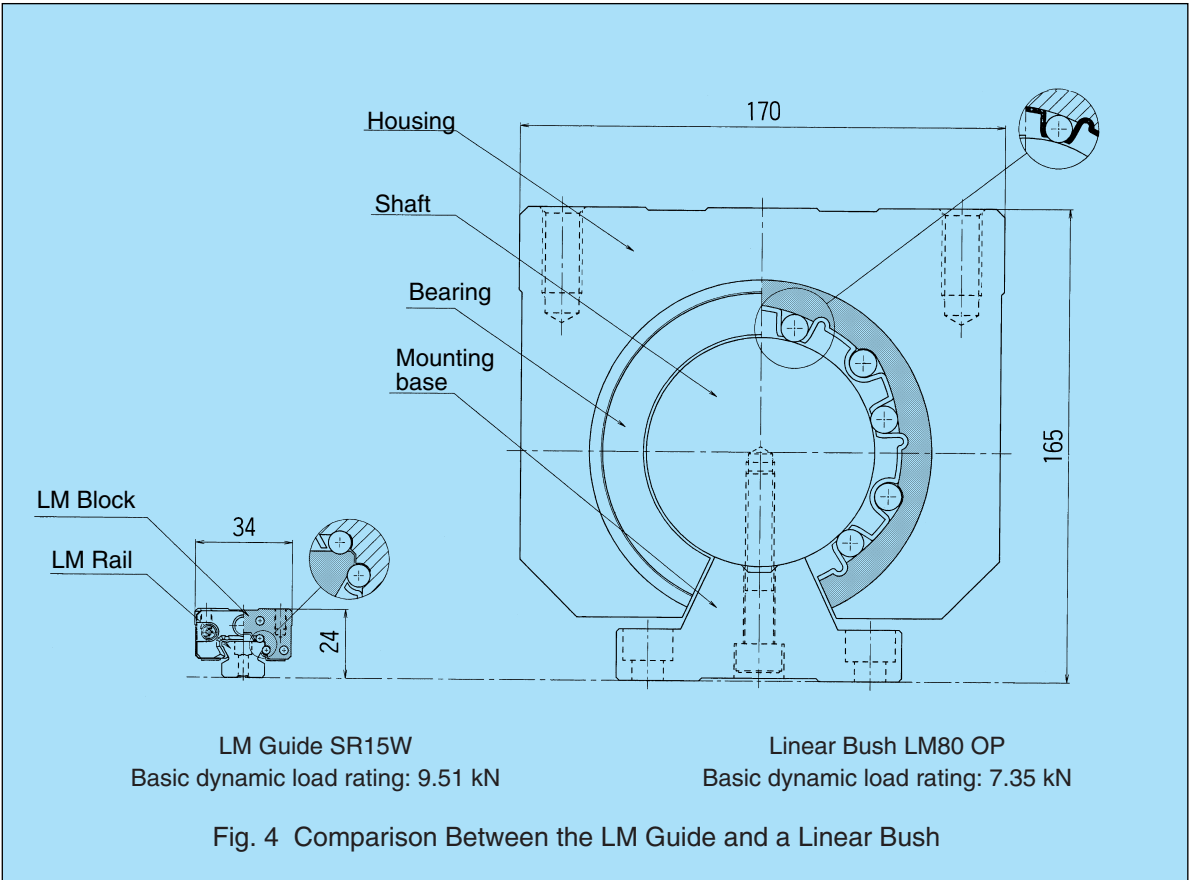


Table 3 Load Bearing Capacity per Ball (P and P₁)

Permissible contact surface pressure: 4200 MPa

	P = R-groove	P ₁ = flat surface	P/P ₁
Ø3.175 (1/ 8")	0.9 kN	0.07 kN	13
Ø4.763 (3/16")	2.03 kN	0.16 kN	13
Ø6.350 (1/ 4")	3.61 kN	0.28 kN	13
Ø7.938 (5/16")	5.64 kN	0.44 kN	13
Ø11.906 (15/32")	12.68 kN	0.98 kN	13

