

1.5. Low Friction Coefficient

Since an LM system makes rolling motion via its rolling elements such as balls and rollers between the raceways, its frictional resistance is 1/20 to 1/40 smaller than a sliding guide. Its static friction is especially small and almost the same as dynamic friction, preventing the system from making a stick slip. Therefore, the system is capable of being fed by the submicron distance.

The frictional resistance of an LM system varies according to the type of the LM system, preload, viscosity resistance of the lubricant and the load applied on the LM system.

In particular, when a moment is given or a preload is applied to increase rigidity, the frictional resistance increases.

Normal frictional resistances by LM systems are indicated in Table 5.

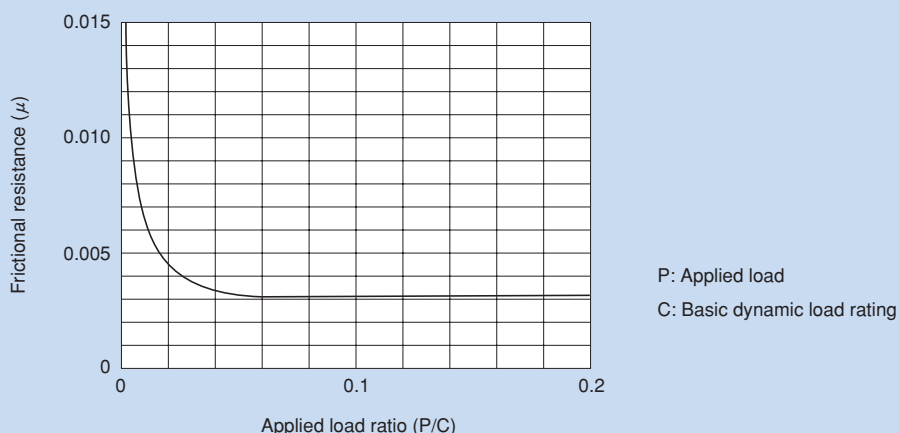


Fig. 8 Relationship between Applied Load Ratio and Frictional Resistance

Table 5 Frictional Resistances (μ) of LM Systems

Types of LM systems	Representative types	Frictional resistance (μ)
LM Guide	SSR, SHS, SNR/SNS, SRS, RSR, HSR, NR/NRS	0.002 to 0.003
	SRG, SRN	0.001 to 0.002
Ball Spline	LBS, LBF, LT, LF	0.002 to 0.003
Linear Bush	LM, LMK, LMF, SC	0.001 to 0.003
LM Stroke	MST, ST	0.0006 to 0.0012
LM Roller	LR, LRA	0.005 to 0.01
Flat Roller	FT, FTW	0.001 to 0.0025
Cross-roller Guide/Cross-roller Table	VR, VRU, VRT	0.001 to 0.0025
Linear Ball Slide	LS	0.0006 to 0.0012
Cam Follower/Roller Follower	CF, NAST	0.0015 to 0.0025