Friction Coefficient

Since an LM System achieves rolling motion via rolling elements such as balls and rollers placed between the raceways, its frictional resistance is 1/20 to 1/40 that of a sliding guide. Its static friction is especially small and almost the same as dynamic friction, preventing the system from experiencing stick-slip. Therefore, the system is capable of being moved by submicron increments.
The frictional resistance of an LM System varies according to the type of the LM System, its preload, the 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.
The normal friction coefficient for each LM System is indicated in Table 4.

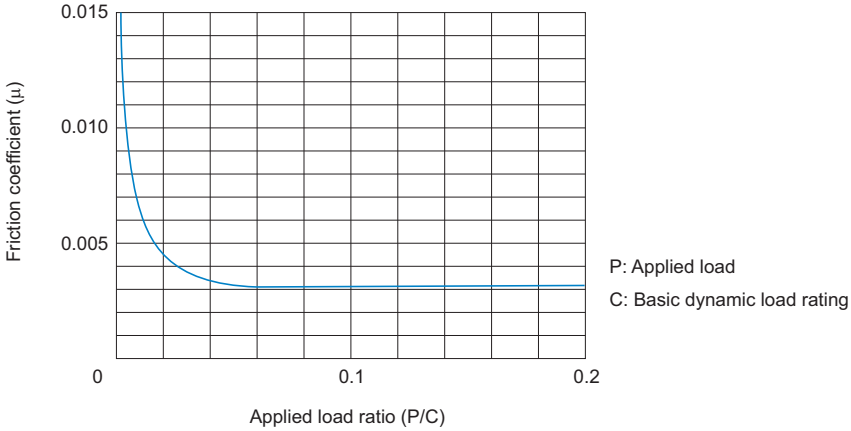

Fig. 7: Relationship between Applied Load Ratio and Frictional Resistance

Table 4: Frictional Resistances (μ) of each type of LM System

Type of LM System	Representative models	Frictional resistance (μ)
LM Guide	SHS, SSR, SRS, HSR, NR/NRS, RSR	0.002 to 0.003
	SRG, SRN	0.001 to 0.002
Ball spline	LBS, LBF, LT, LF	0.002 to 0.003
Linear bushing	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