

2. Friction Coefficient

A linear motion system has rolling elements, such as balls and rollers, placed between two raceways. The rolling motion that rolling elements give rise to reduces the frictional resistance to 1/20th to 1/40th of that in a slide guide. Static friction, in particular, is much lower in a linear motion system than in other systems, and there is little difference between static and dynamic friction, so that stick-slip does not occur. Such low friction makes submicron feeding possible.

Frictional resistance in a linear motion system varies

with the type of linear motion system, the magnitude of the preload, the viscosity resistance of the lubricant used, the load exerted on the system, and other factors.

Under the moment load and preload imposed to improve rigidity, frictional resistance increases.

Table 1 shows normal coefficients of friction classified by type of linear motion system.

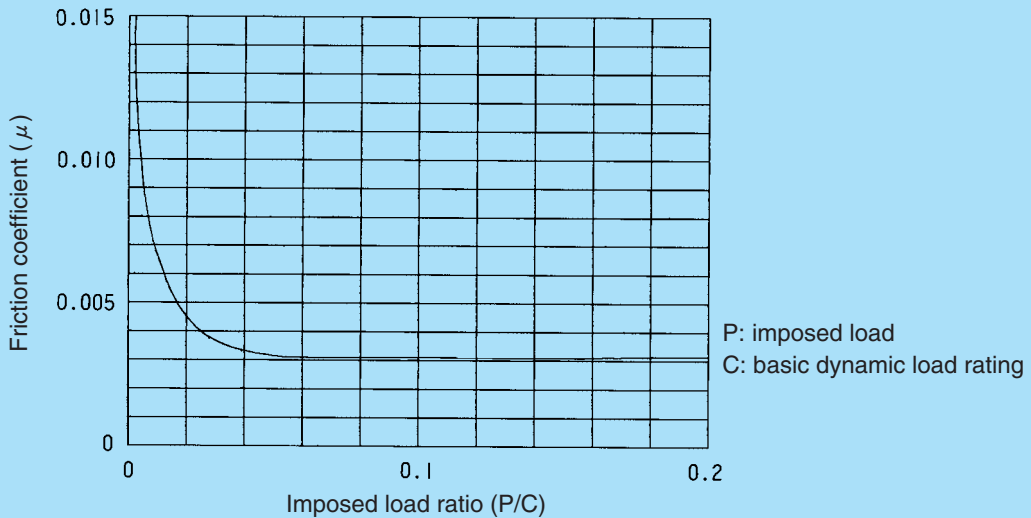


Fig. 2 Relationship Between Imposed Load Ratio and Friction Coefficient

Table 1 Friction Coefficient μ of Various Linear Motion Systems

Type of linear motion system	Major models	Friction coefficient μ
LM Guide	SSR, SR, HSR, HRW, NR, RSR	0.002 ~ 0.003
Ball Spline	LBS, LBF, LT, LF	0.002 ~ 0.003
LM Roller	LRU, LR-Z	0.0050 ~ 0.010
Flat Roller	FT, FTW	0.0010 ~ 0.0025
Cross Roller Guide	VR, VRU, VRT	0.0010 ~ 0.0025
Linear Ball Slide	LS	0.0006 ~ 0.0012