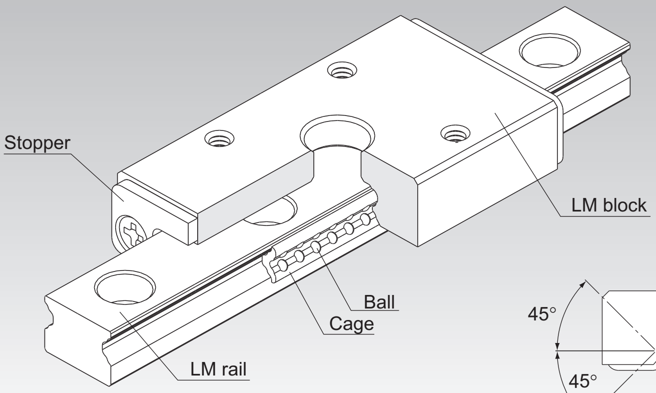
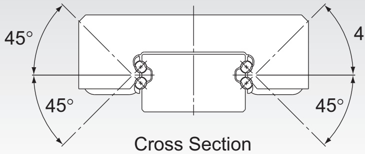
EPF

Finite Stroke Caged Ball LM Guide Model EPF





Cross Section
(DB configuration)

Note: For the ball cage, see A**1-90**.

Structure and Features

Balls are held in cages with spherical ball holders and they roll in four rows of circular-arc grooves in raceways precision-ground in LM rails and LM blocks.

Smooth Motion

Because a finite stroke is used, balls do not circulate and movement is smooth even with preload. Also, because variations in rolling resistance are small, this model is ideal for locations where smooth movement is required with a short stroke.

High Rigidity

Because model EPF uses a DB construction featuring four rows of circular-arc grooves, it offers particularly high rigidity with respect to moment in the M_c direction. This makes it ideal for locations where M_c moment is applied with one rail.

Miniature Type

Because the mounting method is compatible with the Miniature LM Guide Model RSR-N, the models are dimensionally interchangeable.

4-Way Equal Load

Each row of balls is configured at a contact angle of 45° so that the load ratings of the LM block are uniform in all directions (radial, reverse-radial, and lateral directions), enabling the LM Guide to be used in all orientations and in extensive applications.

Ball Cage Technology Application 1

Because the cage is formed out of plastic resin, there is no metal contact between the cage and the balls, providing excellent noise characteristics, low dust emissions, and long product life.

Ball Cage Technology Application 2

Forming the cage in a spherical shape out of plastic resin allows lubricant to be held in grease pockets, enabling long periods of maintenance-free operation.

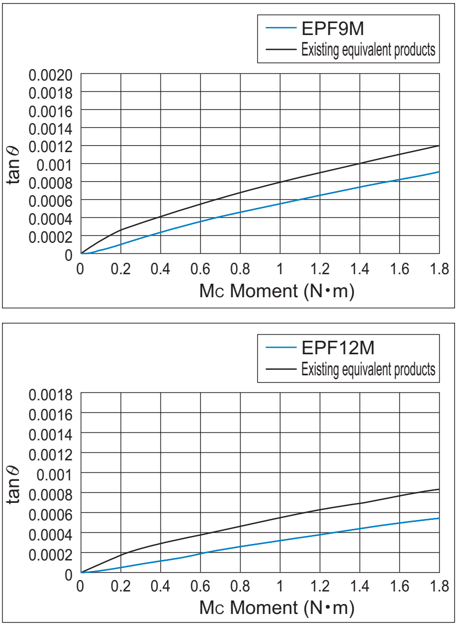


Fig. 1: Comparison of M_c Moment Test Data

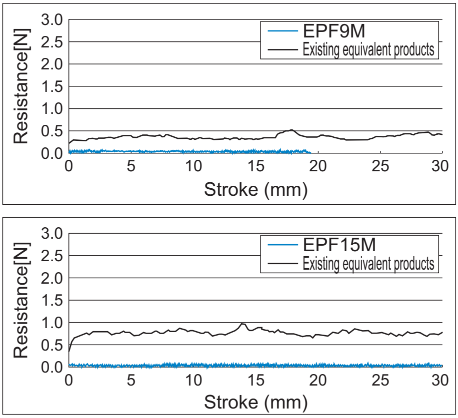
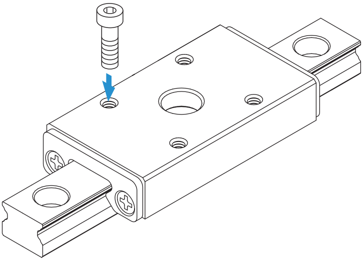


Fig. 2: Comparison of Rolling Resistance Test Data

Types and Features

Model EPF

Dimensional Table⇒A1-178



Accuracy of the Mounting Surface

If there is not sufficient precision in the LM rail and LM block mounting surfaces, the product may not function to its full potential. Machine to values no higher than those in Table 1. (Recommended value: 70% of Table 1)

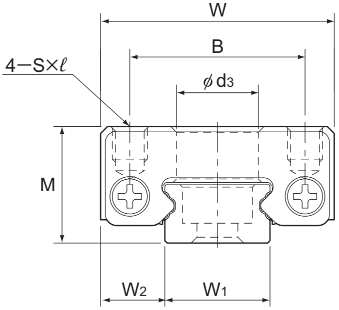
Table 1: Flatness of the LM Rail and the LM Block Mounting Surface

Unit: mm

Model No.	Flatness error
EPF 7M, 9M	0.015/200
EPF 12M	0.025/200
EPF 15M	0.035/200

Note: It is recommended that highly rigid materials such as steel or cast metal be used as the mounting material.
If a material with poor rigidity, such as aluminum, is used, unforeseen loads may be applied to the product. In such situations, contact THK.

Model EPF



Model No.	Outer dimensions			LM block dimensions					LM rail dimensions		
	Height M	Width W	Length L_B	B	C	d_3	S×ℓ	L_{B1}	W_1	W_2	M_1
EPF 7M	8	17	31.6	12	13	5	M2×2.3	29.6	7	5	5
EPF 9M	10	20	37.8	15	16	7	M3×2.8	35.8	9	5.5	5
EPF 12M	13	27	43.7	20	20	7	M3×3.2	41.7	12	7.5	6.75
EPF 15M	16	32	56.5	25	25	7	M3×3.5	54.5	15	8.5	9

Model number coding

EPF7M 16 +55L P M

Model No.

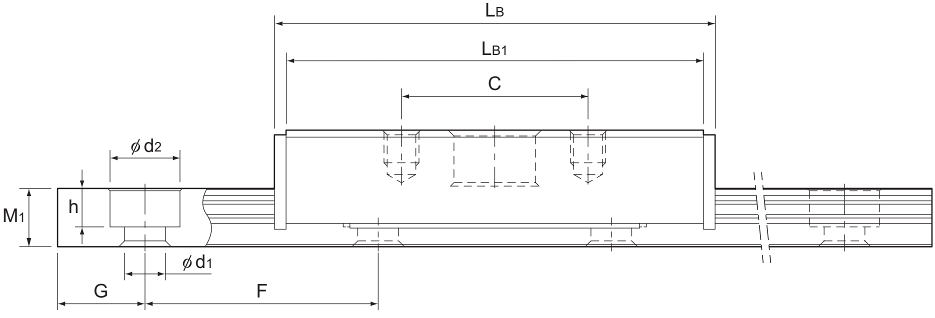
LM rail length (in mm)

Rail material: Stainless steel (standard)

Guaranteed stroke (in mm)

Accuracy symbol

Notes: This model number indicates that a single-rail unit constitutes one set.
See **A1-88** for accuracy symbol.



Unit: mm

				Guaranteed stroke	Basic load rating		Static permissible moment N·m[1]			Mass	
	G	F	$d_1 \times d_2 \times h$	S_T	C kN	C_0 kN	M_A	M_B	M_C	LM block kg	LM rail kg/m
	5	15	2.4×4.2×2.6	16	0.90	1.60	5.08	5.08	5.26	0.019	0.230
	7.5	20	3.5×6×3.3	21	1.00	1.87	6.81	6.81	7.89	0.036	0.290
	10	25	3.5×6×3.8	27	2.26	3.71	15.5	15.5	20.8	0.074	0.550
	15	40	3.5×6×4	34	3.71	5.88	33.0	33.0	41.3	0.136	0.940

[1] Static permissible moment 1 block: the static permissible moment with one LM block

Note: Since stainless steel is used in the LM block, LM rail, and balls, these models are highly resistant to corrosion and environment.

Recommended Tightening Torques of Mounting Bolts

Unit: N·m

Model No.	Nominal bolt	Rated tightening torque		
		Iron	Casting	Aluminum
EPF 7M	M2	0.588	0.392	0.294
EPF 9M	M3	1.96	1.27	0.98
EPF 12M				
EPF 15M				

Table 2: Maximum Slip Resistance

Unit: N

Model No.	Maximum slip resistance
EPF 7M	20
EPF 9M	20
EPF 12M	30
EPF 15M	30

Notes: While the cage used to hold the balls is designed to operate extremely precisely, factors such as impacts, inertial moment, or drive vibration from the machine can cause cage distortion.

If using the EPF LM Guide in the following conditions, contact THK.

- Vertical orientation
- Under a large moment load
- Butting the guide's external stopper with the table
- Applications with rapid acceleration or deceleration

If cage distortion occurs, the cage must be forcibly restored to its original shape.

Table 2 shows the required slip resistance in this event.

Set the thrust so that it is no less than the maximum value shown in the table.

Options⇒A1-507

Standard Lengths of LM Rails

Table 3 shows the standard LM rail lengths of model EPF.
For special rail lengths, it is recommended to use a value corresponding to the G and g dimensions from the table. As the G and g dimensions increase, this portion becomes less stable, and the accuracy performance is severely impacted.

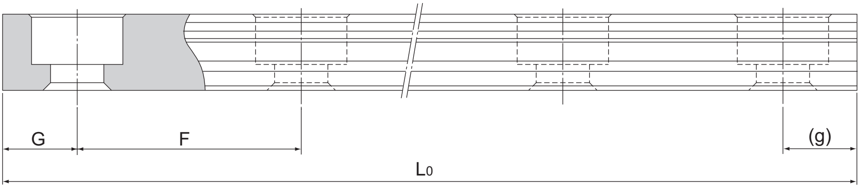


Table 3: Standard Lengths of LM Rails for Model EPF

Unit: mm

Model No.	EPF 7M	EPF 9M	EPF 12M	EPF 15M
LM rail standard lengths (L_0)	55	75	95	110
Standard pitch F	15	20	25	40
G, g	5	7.5	10	15

Note: Lengths other than the standard LM rail length (L_0) are also available. Contact THK for details.