

## 2. Technical Data

### 2.3 Lubrication

#### Function

The loaded rolling elements and the raceway will be separated at the contact zone by an oil-film of microscopic thickness. The lubrication will therefore

- Reduce friction
- Reduce wear
- Prevent corrosion
- Dissipate heat and increase service life

#### Lubrication Cautions

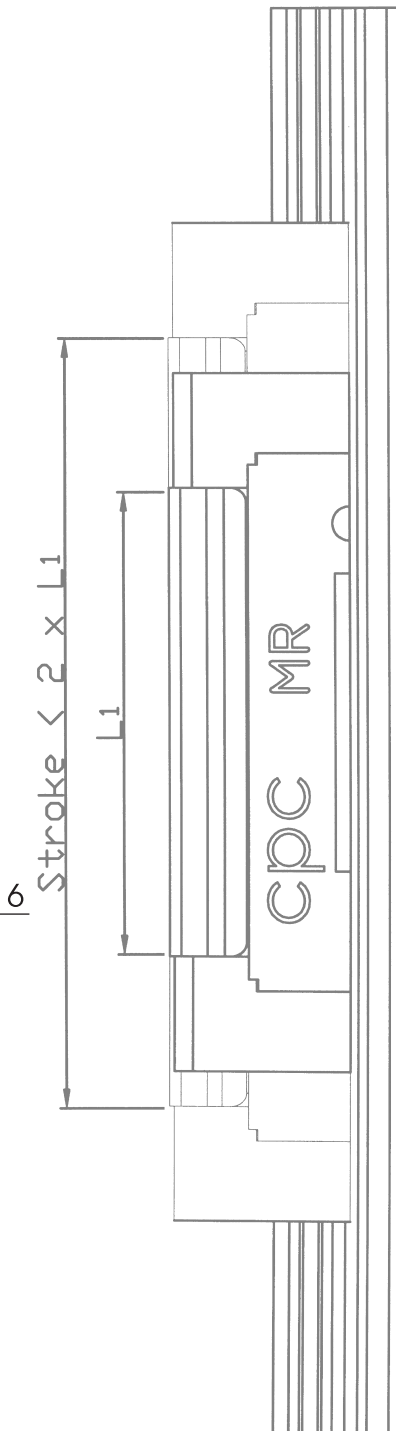
- The MR Linear Guide must be lubricated use.
- The runner block should be moved back and forth during the lubrication.
- Generally the lubricant is added onto rail raceway by the miniature linear guide.
- The lubricant can be injected into the lubrication holes on either end of the runner block.
- A thin film of lubricant should be maintained on the surface of the raceway.
- Re-lubricate before contamination, or discoloration of the lubricant occurs.
- Notify us in advance if acids and alkali are used the application, or if the application will be utilized in a clean room.
- Consult our technical department if oil lubrication is used when the runner block is in a wall mount configuration.
- The re-lubrication interval must be shortened if the travel stroke is  $<2$  or  $>15$  times the length of the steel body of the runner block.

#### Grease lubrication

- When grease lubrication is used, we recommend mineral oil based lithium-soap grease with a viscosity between ISO VG32-100.

#### Oil lubrication

- We recommend the mineral oil CLP or CGLP based on DIN 51517 or HLP based on DIN51524 and the viscosity ranges between ISO VG32-100 by the working temperature between  $0^{\circ}\text{C} \sim +70^{\circ}\text{C}$  are recommended.(We recommend ISO VG 10 for use in lower temperature environment.)



## 2. Technical Data

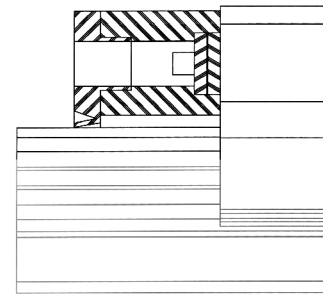
### 2.4 Friction

#### Friction

The MR Miniature Linear Guides have low friction characteristics, with a stable and consistent operation friction and a slight starting friction.

#### Sealing

The MR Miniature linear Guides are sealed by endseals on both ends of the runner block. Optional side seals build an all-around closed sealing system.



Friction		Friction with endseals under lubrication		
$F_{rn} = \mu \cdot F$	— (1)	MR	Friction with endseals(Nmax) (under lubrication)	
		Size	M	W
F	load (N)	3	0.08	0.2
F <sub>m</sub>	friction (N)	5	0.08	0.2
		7	0.1	0.4
		9	0.1	0.8
		12	0.4	1.0
		15	1.0	1.0

MR Miniature Linear Guide series  
friction factor is about  $\mu=0.002\sim 0.003$

#### Source of friction

- Resistance of the sealing system
- Resistance of the collision between the balls during operation
- Resistance from the collision between the balls and the return path
- Rolling resistance of the balls in the gothic arch load zone
- Resistance from the churning of the lubricant in the runner block
- Resistance from the penetrated contaminant