When using an LM system, it is necessary to provide effective lubrication. Without lubrication, the rolling elements or the raceway may be worn faster and the service life may be shortened. A lubricant has effects such as the following.

(1) Minimizes friction in moving elements to prevent seizure and reduce wear.
(2) Forms an oil film on the raceway to decrease stress acting on the surface and extend rolling fatigue life.
(3) Covers the metal surface to prevent rust formation.

To fully bring out an LM system's functions, it is necessary to provide lubrication according to the conditions. It is necessary to study the mounting positions of the grease nipple and piping joint according to the installation direction.

(If the mounting orientation of the LM Guide is other than horizontal installation, the lubricant may not reach the raceway completely. Be sure to let THK know the installation direction and the exact position in each LM block where the grease nipple or the piping joint should be attached. For the mounting position of the LM Guide, see A1-12.)

Even with an LM system with seals, the internal lubricant gradually seeps out during operation. Therefore, the system needs to be lubricated at an appropriate interval according to the conditions.

**Types of Lubricants**

LM systems mainly use grease or sliding surface oil for their lubricants. The requirements that lubricants need to satisfy generally consist of the following.

(1) High oil film strength
(2) Low friction
(3) High wear resistance
(4) High thermal stability
(5) Non-corrosive
(6) Highly anti-corrosive
(7) Minimal dust/water content
(8) Consistency of grease must not be altered to a significant extent even after it is repeatedly stirred.

For lubricants that meet these requirements, see A24-3.
Grease Lubrication

Greasing intervals vary depending on the conditions and environments. For normal use, we recommend greasing the system approximately every 100 km of travel distance. Normally, replenish grease of the same group from the grease nipple or greasing hole provided on the LM system. Mixing different types of grease may deteriorate the system’s performance, such as increased consistency.

<table>
<thead>
<tr>
<th>Lubricant</th>
<th>Type</th>
<th>Brand name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>Lithium-based grease (JIS No. 2) Urea-based grease (JIS No. 2)</td>
<td>AFA Grease (THK) see 24-7 AFB-LF Grease (THK) see 24-8 AFC Grease (THK) see 24-10 AFE-CA Grease (THK) see 24-12 AFF Grease (THK) see 24-14 AFG Grease (THK) see 24-18 AFJ Grease (THK) see 24-20 Alvania Grease S No.2 (Showa Shell Sekiyu) Eponex Grease No.2 (Idemitsu) or equivalent</td>
</tr>
</tbody>
</table>

*Recommended greases vary according to the conditions and environment. See 24-6 to 24-23 for details.

Oil Lubrication

LM systems that require oil lubrication are shipped with only anti-rust oil applied. When placing an order, specify the required lubricant oil.

(If the installation direction of the LM Guide is other than horizontal installation, the lubricant may not reach the raceway completely. Be sure to let THK know the installation direction of the LM Guide. For the mounting position of the LM Guide, see 1-12.)

- The amount of oil to be supplied varies with stroke length. For a long stroke, increase the lubrication frequency or the amount of oil so that an oil film reaches the stroke end of the raceway.
- In environments where a liquid coolant is spattered, the lubricant will be mixed with the coolant, and this can result in the lubricant being emulsified or washed away, causing significantly degraded lubrication performance. In such settings, apply a lubricant with high viscosity (kinematic viscosity: approx. 68 cst) and high emulsification-resistant, and adjust the lubrication frequency or the amount of the feed lubricant.
  For machine tools and similar devices that are subject to heavy loads and require high rigidity and operate at high speed, it is advisable to apply oil lubrication.
- Make sure that lubrication oil normally discharges from the ends of your lubrication piping, i.e., the oiling ports that connect to your LM system.

<table>
<thead>
<tr>
<th>Lubricant</th>
<th>Type</th>
<th>Brand name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>Sliding surface oil or turbine oil ISO VG 32 to 68</td>
<td>Super Multi 32 to 68 (Idemitsu) Vactra No.2SLC (Exxon Mobil) DTE Oil (Exxon Mobil) Tonna Oil S (Showa Shell Sekiyu) or equivalent</td>
</tr>
</tbody>
</table>