Accuracy

The motion accuracy of an LM System is defined in running accuracy for applications that are fixed on a flat surface and in runout accuracy for applications whose shafts are supported, with accuracy grades established for each of them.
For details, see the page concerning the corresponding application.

Lubrication

To optimize the functionality of an LM System, it is necessary to provide lubrication that suits the operating conditions. Use without lubrication may increase wear on the rolling elements and shorten the service life.
Lubrication has the following effects:
(1) Minimizes friction between 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 metal surfaces with an oil film to prevent the formation of rust
Even when the LM System has seals, the internal lubricant gradually seeps out during operation. Therefore, the system needs to be lubricated at an appropriate interval according to the operating conditions.
For the lubrication, see the section beginning B**24-1**.

Types of Lubricants

A typical LM System uses grease or sliding surface oil for its lubricant.
The requirements that lubricants need to satisfy generally consist of the following:
(1) Extreme pressure resistance
(2) Reduces friction
(3) High wear resistance
(4) High thermal stability
(5) Excellent rust-proofing performance
(6) Excellent fluidity
(7) Stable consistency even with repeated stirring

Table 5: Lubricants for General Use

Lubricant	Type	Brand name
Oil	Sliding surface oil or turbine oil ISOVG32 to 68	Daphne Super Multi Oil (Idemitsu) Mobil Vactra Oil Numbered Series (Exxon Mobil) Mobil Vactra Oil No. 2 SLC (Exxon Mobil) Mobil DTE Oil Series (Exxon Mobil) Shell Tonna S3 M (Showa Shell Sekiyu) Equivalent product

Table 6: Lubricants Used in Special Environments

Operating environment/conditions	Lubrication	THK product
Environments with spattering coolant	– To stop the coolant from causing emulsification, use grease that does not easily wash away. – Use grease with extreme pressure and rust-proofing performance. Note: In environments where water-soluble coolants may spatter, there are occasions where certain types of coolant may cause emulsification or cause the grease to wash away, even if using medium-viscosity lubricant. This, in turn, may then reduce lubricity and prevent a proper oil film from forming. Check the compatibility between the lubricant and coolant. ● Daphne Super Multi Oil (Idemitsu) ● Mobil Vactra Oil No. 2 SLC (Exxon Mobil)	– Please note that applying coolant directly to THK products may have an adverse effect on components/parts made of resin, rubber, etc. – Consider using designs where coolant cannot come into direct contact with THK products (consider using covers or bellows). – Consider using some of the various contamination protection options available in order to prevent coolant from getting inside THK products.
High-temperature environments	– Please note that the higher the temperature, the greater the risk of the grease separating and the lubrication performance dropping.	– Contact THK for a range of products with high-temperature specifications.
Clean rooms	– THK also offers a range of grease products compatible with clean rooms. ● AFE-CA Grease (THK) ● AFF Grease (THK) ● L100 Grease (THK) Note: This product cannot be used in Europe.	– Two reasons for the generation of dust are metal-to-metal contact and mutual friction between rolling elements. THK offers a range of products with ball cages that minimize metal-to-metal contact and mutual friction between the rolling elements. Furthermore, the ball cage is also structured in a way that maintains the lubricity, making it suitable for use in clean rooms. – Anti-rust oil is applied as standard, so please specify if it is not required.
Vacuum environments	– Use fluorinated lubricants for vacuums (vapor pressure varies by brand). – Using vacuum grease will make it more likely that the oil film will break due to its low extreme pressure resistance compared to general industrial grease. Be sure that there is a reliable feeding of oil to the raceways (by increasing the number of relubrications, etc.) in order to ensure that the oil film does not break. Note: If using vacuum greases, please note that some brands have starting resistances several times greater than general-purpose grease.	– Please note that under vacuum environments, there is a risk that gas given off by resin and rubber materials may cause the vacuum level to decrease. – Please consider using stainless steel or surface-treated products as a rust-proofing measure.
High-speed moving parts	– Use a lubricant with a low base oil kinematic viscosity to prevent heat generated by resistance from the lubricant. – THK offers a range of grease products with excellent high-speed specifications. ● AFA Grease (THK) ● AFG Grease (THK) ● AFJ Grease (THK)	– Metal-to-metal contact and mutual friction between the rolling elements inside products may produce noise and lead to premature failure of the product. – THK offers a range of caged products with excellent high-speed and noise-dampening properties.
Environments with water	– Use grease with high water-proofing properties. – Use a lubricant with high extreme pressure resistance that does not easily wash away. ● L700 Grease (THK) Note: This product cannot be used in Europe. – Contact THK for instructions regarding lubricating in and around water.	– Consider using designs where water cannot come into contact with THK products. (Consider using bellows or covers.) – Consider using stainless steel or surface-treated products as a rust-proofing measure. – Consider using some of the various contamination protection options available in order to prevent water from getting inside the product.
Food machinery	– Consider using grease that is made for food processing and that is safe for people. ● L700 Grease (THK) (NSF H1 standard accredited)	– Consider using covers if there is the possibility of lubricant spattering.
Micro-vibrations	– THK offers a range of grease products that work particularly well under micro-vibrations. ● AFC Grease (THK) ● AFJ Grease (THK)	– Oil films formed at the points of contact between the rolling elements and raceway are likely to break in environments with micro-vibrations. – By periodically overstroking, the lubricant will form an oil film at the points of contact between the rolling elements and raceway.