

3. Lubrication and Safety Design

3.1 Lubrication

For long-term use of a linear motion system under normal conditions, good lubrication is a must. If lubricant is not used, rolling parts wear quickly, and the service life of the system is shortened considerably.

A lubricant:

- 1) Reduces friction on moving parts, thereby preventing seizure and lessening wear;
- 2) Forms an oil film on rolling surfaces, thus decreasing stress that develops on the surfaces and safeguarding the system against rolling fatigue.
- 3) Covers metal surfaces with an oil film, thereby preventing rust.

To tap the full functionality of a linear motion system, it is essential to provide lubrication that best meets the system service conditions.

Note that linear motion systems, even if sealed, cannot completely eliminate leakage of lubricants no matter

how negligible the amount of leakage is at any given time. It is therefore necessary to replenish the lubricant periodically according to the operating conditions for the lubricant in question.

3.1.1 Classification of Lubricants

Primarily grease and sliding surface oil are used as lubricants for linear motion systems.

In general a lubricant must:

- 1) Form a strong oil film;
- 2) Reduce wear as much as possible;
- 3) Have high wear resistance;
- 4) Have high thermal stability;
- 5) Be noncorrosive;
- 6) Be highly rust-preventive;
- 7) Be free from dust and moisture; and
- 8) Be free from significant fluctuations in consistency against repeated agitation of grease.

The following products meet these requirements.

Table 2 Lubricants in General Use

Lubricant	Classification	Item
Grease	Lithium-based grease (JIS No. 2) Urea-based grease (JIS No. 2)	*) AFB Grease (THK) Albania Grease No. 2 (Showa Shell Sekiyu) Daphne Eponex Grease No. 2 (Idemitsu Kosan) or equivalent
Oil	Sliding surface oil or turbine oil ISOVG32 ~ 68	Super Multi 32 to 68 (Idemitsu Kosan) Vactra No. 2S (Mobile Oil) DT Oil (Mobile Oil) Tonner Oil (Showa Shell Sekiyu) or equivalent

For products marked “*”, see page A-9.