

Ballscrew Lubrication Instructions

A ballscrew has to be thoroughly cleaned in white spirit and oil to protect against corrosion. Trichloroethylene is an acceptable degreasing agent, ensuring the ball track is free from dirt and damage free (Paraffin is not satisfactory). Great care must be taken to ensure that the ball track is protected from impacts caused by other components or tools, and that metallic debris does not enter the ball nut (Reference figures 4.1 & 4.3 below).



Fig 4.1 Carefully clean and protect



Fig 4.2 Oil Lubrication method.

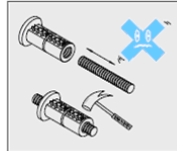


Fig 4.3 Carefully protect the nut

Select a suitable ballscrew grade for the application. Install with the corresponding mounting disciplines. For example, precision ground ballscrews such as those used in CNC machine tools demand accurate alignment and precision bearing arrangement, where the rolled ballscrews are used for the less precision applications, such as packaging machinery which require the less precise support bearing arrangement.

It is especially important to eliminate the misalignment between the bearing housing center and the ball nut center. This would result in unbalanced loads which include radial loads and moment loads. These can cause malfunction and reduce the service life (Reference figure 4.2(a) below).

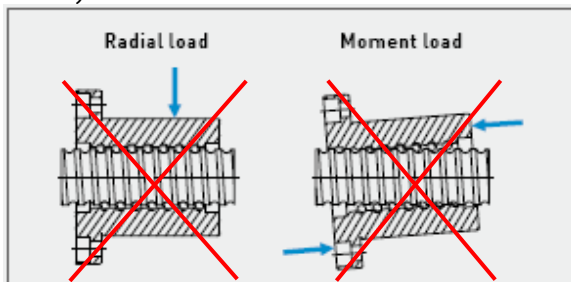


Fig 4.2(a) Unbalance load caused by misalignment of the support bearings and nut brackets, inaccurate alignment of the guide surface, inaccurate angle or alignment of the nut mounting surface

The selection of lubrication will directly influence the temperature rise of the ballscrew. The basic oil viscosity requirement depends on the speed, working temperature, and the load condition of the application. A generalization is to say that when the working speed is higher and the working load is lower, using a lower viscosity oil is better. This is inversely proportional. In high speed and heavy load applications, forced cooling may be necessary.

In view of the ballscrews life and efficiency, adequate lubrication is necessary. To achieve the maximum life, the use of antifriction bearing oils is recommended. DO NOT use lubricants containing MoS₂ or graphite. Normally, you can use lubricants according to the other machine components or lubricants commonly used for ball bearings. Oil mist baths or drip feeds are acceptable. However, direct application to the ball nut is recommended (Reference figure 4.2). A one time lubrication of a ballscrew is not sufficient.

- Greasing

We recommend that you use a mineral oil based grease with the quality K2K, DIN 51825. If the load is 10% higher than the dynamic load capacity, we recommend using greases with extreme pressure supplements (KP2K, DIN 51825). For high speed (DN Value > 50,000) we suggest that you use a quality K1K or KP1K type grease.

A DN Value under 2,000 needs grease that exhibits the consistency of a class 3 (K3K or KP3K, DIN 51825). DO NOT use greases of different specifications. The lubrication period depends on the ambient conditions. Generally, it is necessary to lubricate all ballscrews that have a run-time between 200~600hrs. The determining factor for re-lubrication is:

0.7~0.8cm³ of grease for each 10mm of spindle diameter for single ball nuts. 1cm³ of grease for each 10mm of spindle diameter for double ball nuts. Split the grease quantity into 2~3 parts and move the nut approximately 3 times the length of the nut while greasing to ensure that the ball nut is completely greased.

- Oil

For oil lubrication, oils of class CL (DIN 51517 part 2) are suitable. At the operating temperature, the oil should have a viscosity of 68~100mm²/s. For high speed (DN Value > 50,000) we recommend oils of the viscosity class ISO VG 150-460. If the load is higher than 10% of the dynamic load capacity, we recommend oils with supplements for increasing the loading capacity (class CLP, DIN 51517 part 3). In case of an oil bath lubrication, the spindle should hold 0.5~1.0mm above the oil level. The oil feed for a circulating lubrication system should be 3~8cm³/h for each ball turn.

Important Note: Unless otherwise indicated, ballscrews are shipped with anti-corrosion grease and should be lubricated prior to running the machine for the first time.