

## Handling and installation of Ballscrews

1. A ballscrew must be thoroughly cleaned in white spirit and oil to protect against corrosion. Trichloroethylene is an acceptable degreasing agent (paraffin is not satisfactory). Ensure the ball track is free from dirt and damage. Great care must be taken to ensure that the ball track is not struck by a sharp edged component or tool and that metallic debris does not enter the ball nut.
2. Use suitable supports for the application. Precision ground ballscrews for CNC applications require accurate alignment and precision bearing arrangements. Rolled ballscrews for general machinery require less precise support bearings.

It is especially important to eliminate misalignment between the bearing housing centre and the ball nut centre. This will cause an unbalanced load reducing the service life. Axial loads should be the only loads present on the nut. Radial or moment load will reduce the service life and may cause premature failure.

3. Angular contact ball bearings (angle =  $60^\circ$ ) bearings are recommended for CNC machinery. These bearings can provide a clearance free or even a preloaded assembly.
4. Support bearings must have a chamfer to allow it to seat properly and maintain alignment.
5. To achieve the ballscrews' maximum life use of antifriction oil is required. Oil with graphite and  $MoS_2$  additives must not be used. The oil should be maintained over the balls and ball tracks.
6. Preload increases the friction torque and generates heat that in turn reduces life expectancy. Insufficient preload reduces system stiffness and may be a source of lost motion. Preload should not exceed 8% of the basic dynamic load.
7. Direct oil lubrication of the ball nut is preferred but oil mist bath or drip feeds are also acceptable. Grease lubrication is also acceptable but should be water resistant to class K2K20.
8. A dog stopper or safety nut should be considered to prevent ball nut damage in over travel situations. This is especially important in vertical applications.
9. In dusty or contaminated environments ballscrews should be shielded using bellows or covers. Penetration of debris into the nut greatly reduces the life of the nut.
10. The ball tracks on the shafts are hardened by heat treatment. Machining of the end journals can be made easier by grinding or annealing. Avoid damaging or annealing the travel section of the shaft.
11. Shafts can be straightened if required.
12. To release or connect the nut to the shaft a tube with an outer diameter 0.2-0.4mm less than the root diameter of the ball tracks should be used. The nut should be transferred from tube to shaft by directly holding the tube against the end of the shaft and winding the nut from shaft to tube or tube to nut. This prevents the balls from falling from the nut.
13. Disassembly of the balls from the nuts should be avoided.

