

Selection of rolling bearings for transmission shaft

1. load

The size, direction, nature and service life of the load are the main basis for selecting the bearing type.

(1) choose the bearing type according to the size of the load: (1) the roller bearing's rolling body is a line contact, which can bear large loads and bear little deformation after loading.

(2) choose the bearing type according to the direction of load: (1) pure thrust bearings are usually chosen for pure axial load; thrust ball bearings are used for smaller loads; thrust roller bearings are used for larger loads; (2) deep groove ball bearings, cylindrical roller bearings or needle roller bearings can be used for pure radial loads; When the axial load is small, deep groove ball bearings, angular contact bearings or tapered roller bearings can be selected. When the axial load is large, the structure with angular contact bearings, tapered roller bearings, or centripetal bearings and thrust bearings can be selected.

2. speed

Under general rotating speed, the choice of bearing type has little effect, and only when the speed is higher can it have a significant effect.

(1) ball bearing has a higher limit speed, so the ball bearings should be preferred when high speed.

(2) when the inner diameter is the same, the smaller the outer diameter is, the lighter the rolling body is, and the smaller the centrifugal inertia force on the raceway of the outer race is, so it is suitable for working at high speed.

(3) the material and structure of the cage have great influence on the rotational speed of the bearing, and the solid cage has higher rotational speed than the stamping cage.

(4) the limit speed of thrust bearing is very low. When the working speed is higher, the angular contact ball bearing can bear pure axial force if the axial load is not large.

(5) if the working speed slightly exceeds the prescribed limit speed, the tolerance grade of the bearing can be increased, or the radial clearance of the bearing should be increased properly, the cycle lubrication should be adopted, and the cooling of the circulating oil should be strengthened to improve the bearing performance.

3. aligning performance

When the center line of the axle does not coincide with the center line of the bearing seat, it has a height error or is bent or tilted due to axial force. It will cause the axis of the bearing to be

deflected. At this time, a self-aligning ball bearing or self-aligning roller bearing with certain alignment performance should be adopted.

4. installation and disassembly

(1) when bearings are not split, and bearing components must be installed and removed along the axial direction, bearings that can be separated from inside and outside can be preferred.

(2) when installing on the long shaft, in order to facilitate disassembly and assembly, the bearing with inner ring as the conical hole can be selected.