

Introduction to the basic elements of purchasing INA rolling bearings

When designing a new spindle, before selecting an INA bearing, consider the spindle performance parameters to roughly determine the most critical performance and then proceed to further exploration. (Includes: spindle speed, spindle accuracy, spindle stiffness, spindle life, spindle heating, spindle reliability)

After determining the spindle parameters, probe the actual size of the spindle (shaft diameter, length, bearing span).

According to the bearing form (ball or cylindrical roller bearing), the arrangement (number of columns), the driving method (drive belt, gear, motor, built-in motor), lubrication (grease, oil, oil mist, injection) and other spindle parameters are determined its structure.

1, bearing radial load

The INA bearing that is mainly subjected to radial load is a radial bearing. The nominal contact angle of such bearings is $\alpha_0 \approx 45^\circ$. Thrust bearings and thrust angular contact ball bearings can withstand axial forces in one or two directions depending on the structure. A thrust cylindrical roller bearing and a thrust spherical roller bearing are preferably used when the bearing force is particularly high.

Thrust spherical roller bearings and one-way thrust angular contact ball bearings can withstand both axial and radial loads. Other thrust bearings can only withstand axial loads.

3, the length compensation of the bearing itself

Supporting a shaft and bearing usually adopts a structure in which a fixed bearing and a running bearing are combined. The swimming INA bearing compensates for the length error and thermal expansion of the shaft.

NU and N cylindrical roller bearings are ideal for running bearings, which themselves compensate for length. The inner and outer rings of the bearing can be tightly fitted.

4, the length compensation of the sliding fit

Non-separable bearings can also be used as swimming bearings. One of the two ferrules of this type of bearing is fitted with no axial fixing surface. Therefore, a ferrule of the bearing can move on its support surface.

After determining the size and type of the precision bearing, consider the specific design of the bearing.

Fully consider bearing fatigue life, rigidity, heat and other factors, choose the most appropriate bearing clearance (preload).

Due to the bearing clearance and preload, the performance of the INA bearing is the most critical. The higher the speed, the more critical it is, so it must be carefully considered. If it is not properly selected, problems such as early damage or sintering may occur. It is necessary to consider it from step 4 to step 3, or from step 4 to step 2.

After determining the design of the spindle structure, consider the necessary conditions for actual installation.

The precision of the mounting shaft and the bearing housing of the high-precision bearing, the tolerance fit, the tightening force of the tightening nut required for the mounting and fixing, the INA bearing preload after the actual installation, and the confirmation of the internal clearance.