The Design of Joint Bearing

The joint bearing generally performs swinging, tilting and rotating motion at a low speed, and the basic structure is a spherical surface. It is characterized by simple structure, small size and large carrying capacity. It is widely used in engineering, lifting, printing, textile, agricultural machinery, trucks, rolling stock, metallurgical rolling, satellite ground receiving equipment, rocket launching and other military equipment. The type of joint bearing can be divided according to different ways, divided into centripetal, angular contact and thrust joint bearing according to the direction of force; can be divided into general and rod end joint bearing according to whether it is extended with screw; Seam, split, double, extruded, insert and grooved. The calculation and analysis of the joint bearing is mainly based on the strength calculation, and the reliability of the calculation is simplified for the aerodynamic working bearing at the same time.

Working characteristics and selection principles of joint bearings
The joint bearing of the general structure is shown in Fig. 1. From the overall structure, the composition of the joint bearing is relatively simple, and the specific structural form of the working surface is determined according to the form of lubrication in the work. Since the joint bearings are mostly used at low speeds, self-lubricating and liquid lubrication are the main lubrication states. The direction of the load is within the arc of action and has a self-positioning effect. The bearing capacity is higher than that of the general bearing. If oil lubrication is used, the lubrication temperature is increased due to the arc surface contact, and the lubrication calculation is complicated. The relationship between the lubrication parameters should be established by the spherical coordinates. The selection principle in the work is usually based on the load, sliding speed, working temperature and environmental requirements, and select the appropriate structure, material, surface anti-corrosion, and a certain size of bearing that can meet the working conditions.

1 structure type
Select the joint bearing according to the type of load bearing: the radial bearing is mainly used for the radial load; the angular contact joint bearing is used for the load bearing the radial axial joint; the thrust joint bearing is mainly used for the axial load.
Select the joint bearing in the direction of the load bearing: The load on the joint bearing has three kinds of load: alternating load, alternating load and pulse load. All kinds of bearings in fixed direction load are applicable; the alternating load is the joint bearing of metal to metal friction pair. Joint bearings of the same size are best suited for single-slot bearing capacity.

Due to the special use of the joint bearing, the lubrication requirements are quite different from those of the general bearing. In general, it is determined according to the conditions of use. The high speed is oil lubricated, most of which are greased, and the special requirements are solid lubrication. Solid lubrication is mostly made into self-lubricating bearings.
Working temperature and environmental conditions
The working temperature is mainly concerned with the material selection of the joint bearing, so as to avoid thermal damage of the joint bearing. Environmental conditions mainly include whether it has dustproof and anti-corrosion requirements, and special structures and special

materials are selected.

Clearance

The clearance of the joint bearing is determined by the working conditions of the bearing, such as load, sliding speed, temperature difference, lubrication requirements, and fit and materials. Under normal circumstances, high-speed heavy-duty selection of large clearance; high temperature and temperature difference to choose large clearance; light load and high precision when motion accuracy is selected.

2 joint bearing lubrication characteristics

According to the structural characteristics and use characteristics of the joint bearing, the lubrication of the joint bearing mainly includes self-lubrication, liquid lubrication and grease lubrication. The design is determined according to the working conditions. The self-lubrication mainly takes measures from the structure to achieve the purpose of lubrication. It is mainly composed of inner and outer rings and solid lubricant. It is a typical solid lubricated joint bearing. Solid lubrication can withstand large pressure and has good lubrication. The friction coefficient is 0.08 ~ 0.12.