

High Temperature Problem Solving of Compressor Main Engine Bearing

For the industrial sector, continuously reducing production costs, improving the quality and efficiency of daily operations, and continuously improving the comprehensive competitiveness, thus in the fierce market

The competition is in an invincible position. The high temperature problem of the compressor main engine bearing is one of the common faults in the operation of the screw compressor, and must be highly valued if

High temperature problems cannot be discovered or solved in time, which will lead to unbalanced rotor operation, which will accelerate the wear rate, affect the service life and the overall operation quality.

1 Compressor [main engine bearing](#) related principle and situation analysis

With the increasing supervision and control of industrial production in the country, for industrial enterprises, reduce operating costs, select a small displacement screw compressor main engine, adjust its gears, belts, etc., and then the speed The situation is dynamically adjusted to ensure normal production. For the whole operation process, it is necessary to correctly select the bearing, effectively balance the axial force and radial force of the rotor, in order to continuously improve the running quality of the main engine, prolong the service life and reduce the running cost.

In the screw compressor design structure, in order to ensure the efficiency of the main engine, it is necessary to ensure that the rotor always ensures a stable minimum clearance at the exhaust end. Usually, the fixed end of the main machine is disposed at the exhaust position, and a large axial gap is maintained at the suction position, thereby Achieve free expansion. The suction end is provided with a radial force applied to the NU type bearing. In the design of fixed-end bearing, the main design mode is: four-point angular contact ball bearing / back-to-back tapered roller bearing / back-to-back angular contact ball bearing for fixed end and suction end - cylindrical roller bearing corresponding, three modes are required According to the specific production process operation needs to be determined.

Due to the large radial and axial combined load force of the tapered roller bearing in the whole structure, the inner and outer rings can be separated, which can be disassembled at any time, and the operation is simple, so it is widely used, usually in pairs. in use. At present, the common application is that the fixed end and the suction end adopt the back-to-back tapered roller bearing-cylindrical roller bearing mode. In order to further improve the stable operation effect and avoid the machine reversal, it is usually necessary to adopt the exhaust end. The bearing is fixed in the form of a corrugated spring, an addition of a rigid body and a gasket.

2 Compressor main engine bearing [high temperature problem](#) solving analysis

In view of the high temperature situation of the compressor main bearing, it can be summarized as four aspects: poor oil return, insufficient fuel injection, excessive preload and insufficient precision. The main solutions need to be combined with the whole process operation and actual

conditions for item-by-item elimination and analysis.

The main measures are as follows:

The first is to stop the operation, disassemble the host, and perform disassembly analysis one by one. The first consideration is to check the lubricating oil hole and oil return hole of the bearing, whether there is any unsatisfactory, and perform reassembly analysis after reaming cleaning. If the temperature does not reach the established standard within a certain time, it needs to be considered. The corrugated spring is replaced, so that the bearing clearance can be reasonably controlled, thereby playing a role of rapid and effective cooling. It is necessary to repeatedly test and record the analysis to explore the law and form a feasibility verification report.

The second is to further improve the selection of [bearing scientific design](#). During the rotation process, the bearing needs to constantly overcome the frictional force, so as to take away the heat generated during the operation in time to avoid temperature concentration and cause high temperature. Therefore, on the one hand, scientific calculation and analysis of bearing lubrication should be carried out. In the design of the bearing, it is necessary to fully consider the amount of fuel injection, and also to dynamically control the amount of lubricant, thereby reducing the possibility of heat accumulation and reducing the probability of occurrence of high temperature. For the bearing injection quantity, it is necessary to determine the corresponding standard of the bearing inner diameter parameter. Under normal circumstances, the friction torque and the bearing oil demand have relevant calculation formulas for reference. Therefore, it is only necessary to determine the standard implementation after the calculation according to the formula. The friction torque is related to the bearing friction factor, the bearing load, the bearing inner diameter, etc. (0.5 times the product), and the required oil quantity is related to the bearing inner diameter and the bearing width (0.075 times the product). For the calculation of the inner diameter of the lubricating oil pipe, it usually has a certain relationship with the amount of [lubricating oil](#) and the flow rate of the pipe (4.63 times the product). On the other hand, it is necessary to scientifically select the bearing pre-tightening force, thereby further improving the rigidity and rotation accuracy of the bearing, reducing the vibration intensity and frequency of occurrence. The preload force of the bearing needs to be achieved by controlling the spring pressure on the outer ring of the bearing or adjusting the way of the gasket to change the bearing clearance. The preload is usually related to the axial force (for the same type of cone installed in pairs) For roller bearings, the preload should not be less than 0.5 times the axial force).

In short, [the screw compressor main engine bearing](#) is an important support link in the whole operation process. It is necessary to carry out item-by-item investigation and analysis on the possible high temperature of the main bearing, so as to continuously reduce the wear and vibration, thereby improving the bearing operation efficiency and ensuring. Production is stable.