

# Bearing Types Used in Pumps

Bearings are used to support the rotating shafts of pumps. Bearings are made up of a bearing cage, a bearing retainer and an outer ring. Bearings can be solid or ball bearings.

In general, most pumps use a combination of different types of bearings to support their shafts. For example, gas turbine pumps use ball bearings for high speed and low torque applications, whereas centrifugal pumps use roller bearings for low speed and high torque applications.

## Thrust bearings

Thrust bearings are designed to support radial loads in the axial direction. The thrust load is transferred from the shaft to the housing via a small number of rollers which are located in grooves machined into the inner ring of the bearing.

The most common type of thrust bearing is a single-row deep groove ball bearing, but there are other types such as spherical roller bearings and tapered roller bearings.

In pumps, thrust bearings are used to support the weight of the pump shafts and also transmit the torque generated by the motor (or turbine) through its rotational movement.

Thrust bearings can be used with both liquid and gas applications, although they tend to be more commonly used in liquid applications due to their reliability and durability.

## Sleeve bearing

Sleeve bearings are the most common type of bearing used in pumps. They are less expensive than other types of bearings and they have a high load-carrying capacity.

Sleeve bearings come in two different designs: single row and double row. Single row sleeve bearings have the advantage of being lighter than double row sleeve bearings, but they have lower load-carrying capacity. Double row sleeve bearings have a higher load-carrying capacity than single row sleeve bearings, but they are heavier.

Sleeve bearings are typically mounted on a shaft with a keyway or key slot at each end of the shaft to prevent rotation. The inner ring of a sleeve bearing is made up of two parts: an outer race (which is mounted on the shaft) and an inner race (which is pressed against the shaft). The outer race has two holes drilled through it so that oil can flow through it to cool the bearing. The inner ring also has two holes drilled through it so that oil can flow through it to cool the bearing as well.

## **Ball Bearing**

Ball bearings are used in pumps because they are low in friction and high in load capacity. They are also very reliable and easy to maintain. The main purpose of using ball bearings is to reduce the load on the shaft, so that it does not need to be reinforced with heavy steel plate.

Ball bearings are available in a wide range of sizes, from less than 0.4 millimeters up to about 50 millimeters (diameter). The most common size for pumps is 15 millimeters, or 0.6 inches. Larger bearings can be used if required, but they become more expensive because they require larger housings and shafts.

The most common type of ball bearing used in pumps is called an "open" bearing because it has no protective ring around the balls or rollers inside it. Open ball bearings are generally more expensive than shielded types, but there is also less chance that contaminants such as oil will reach the balls or rollers inside them because there is nothing to stop them from

falling out of their pockets when there is little pressure on them during normal operation of the pump.

## **Tapered Roller Bearings**

Tapered Roller Bearings are used in pumps that rely on the fluid power of water or steam. These bearings allow for a high load capacity and long life as well as high speeds. They are also very easy to maintain and clean. The bearings are made of steel with a hard chrome plating, which provides extra wear resistance. The bearing's inner ring is split so that it can be disassembled without damaging it.

The tapered roller bearings have an inner ring with several roller races (roller bearings) inside it. A cage, which is made from hardened steel, surrounds the inner ring and holds the rollers in place. The outer ring has holes for mounting the bearing on a shaft or spindle.

The rollers rotate inside their own races and are held to their races by friction and pressure from grease applied between them at assembly time.

## **Plain bearing**

There are many types of bearings used in pumps. One of the most popular types is the plain bearing. This type of bearing is made from a steel shaft with a cylinder made of metal or plastic that rotates inside it. The main advantages of this type of bearing are that it is inexpensive and easy to maintain. Although they do not last as long as other types, they are still an excellent choice for most applications.

The major disadvantage of a plain bearing is that it requires lubrication to prevent damage and wear. This can be done through either grease or oil, but both have drawbacks:

Grease will eventually dry out and need to be replaced, while

oil needs to be changed regularly to prevent dirt from getting into the system.

Another disadvantage is that grease causes corrosion on metal parts because it contains acids and other corrosive chemicals that can damage them over time if not removed before use.

## **Pumps rely on bearings to reduce friction and increase service life.**

All pumps have bearings. The internal components of a pump are designed to operate within a specific range of operating speeds, pressures and temperatures. This means that the bearing must be able to withstand these same conditions for the lifetime of the pump.

Bearings are designed to operate in an environment where there is no lubrication. The lubricant used by a bearing is pumped through the bearing with the fluid. Lubrication reduces friction between the rolling element and raceway, which increases service life by reducing wear.

Bearings are among the most important parts in pumps and other machines. The types of diameters and constructions of centrifugal pump bearings are more than ten, and the bearings for other kinds of pumps bear different numbers. Although there are a lot of varieties, these designations generally depend on a few parameters such as capacity, function, manufacturing material, and speed. So, knowing the different bearing types used in pumps can be quite useful for designers to make better use of them.