

# Classficaion of Cylindrical roller bearings

[Cylindrical roller bearings are radial roller bearings of cylindrical rollers.](#) The internal structure of the cylindrical roller bearing is arranged in parallel by rollers, and spacers or spacers are arranged between the rollers to prevent the rollers from tilting or friction between the rollers, thereby effectively preventing an increase in the rotational torque.



First, the classiication of cylindrical roller bearings  
1, the structure typ The outer ring has no rib N0000 type and the inner ring has no rib NU0000 type. The cylindrical roller bearing can accept large radial load, the limit rotation speed is high, the axial displacement of the shaft or the outer casing is not restrained, and the axial direction cannot be accepted. Load.

Cylindrical roller bearings with ribs on the inner and outer rings NJ and NF bearings can axially displace the shaft or housing in one direction and accept small one-way axial loads. NU+HJ, NJ+HJ, NUP bearings can axially displace the shaft or housing in the axial clearance of the imported bearings and accept small bidirectional axial loads.

## 2, bearing category

Cylindrical roller bearings are separate bearings that are easy to install and disassemble.

Cylindrical roller bearings can withstand large radial loads and are suitable for use in high speed applications.

This type of bearing allows the angular error (inclination) of the inner ring axis and the outer ring axis to be small, only 2' to 4'. Therefore, the machining accuracy of the shaft and the bearing housing is relatively high, otherwise uneven load or stress concentration is likely to occur at the contact portion of the raceway. However, the correction of the roller or raceway contact busbar can reduce the occurrence of stress concentration.

Cylindrical roller bearings can be divided into single-row, double-row and multi-row cylindrical roller bearings according to the number of rows of rolling elements. Different structural bearings are also shown in the design of the ribs. Among them, cylindrical roller bearings are commonly used in the following forms:

Single row cylindrical roller bearings: Single row cylindrical roller bearings are separable bearings for easy installation and disassembly. Both ferrules can be tightly fitted. The modified contact line between the roller and the raceway reduces stress concentration.

Double row cylindrical roller bearings: Double row cylindrical roller bearings are floating bearings, and their separability makes installation and disassembly convenient. A tight fit can be used for both ferrules. Double row cylindrical roller bearings have almost no inclination angle.

## 3, single row bearing

### 1N, NU type

The outer ring of the N-type bearing has no ribs, and the inner ring has ribs on both sides. It is possible to allow displacement of the shaft in the axial direction relative to the bearing housing. The NU type bearing has a rib on both sides of the outer ring, and the inner ring has no ribs. It is also possible to allow displacement of the shaft in the axial direction relative to the bearing housing. Therefore, this type of structure is suitable for use as a swim end bearing.

### 2NJ, NF type

NJ-type bearings have ribs on both sides of the outer ring, and the inner ring has ribs on one side. Can withstand a certain amount of one-way axial load. The outer ring of the NF type has a rib on one side and a rib on both sides of the inner ring. It can also withstand a certain amount of one-way axial load. Therefore, this type of structure is suitable for use as a unidirectional axially oriented bearing.

### 3NUP, NFP type

The NUP type bearing has a rib on both sides of the outer ring, a (fixed) single rib on one side of the inner ring, and a detachable flat ring on the other side. Can withstand a certain amount of bidirectional axial load.

The NFP type bearing has a (fixed) single rib on one side and a detachable flat ring on the other side, and ribs on both sides of the inner ring. It can also withstand a certain amount of bidirectional axial load. Such structural bearings can limit the displacement of the shaft in both axial directions relative to the bearing housing. Therefore, it is suitable for use as a fixed end bearing.

#### 4NH (NJ+HJ) type

The NH type bearing is a combination of the NJ type bearing and the HJ type slanting ring. Since the inner ring of the NUP type bearing is short, and the flat ring is not fixed, it is inconvenient to use, and the NH type bearing can utilize the width of the entire inner ring of the NJ type bearing to maintain a tighter fit with the shaft. Moreover, the NH type bearing is more convenient to install and disassemble.

The NH type bearing can limit the displacement of the shaft in the axial direction relative to the bearing housing. Therefore, it is suitable for use as a fixed end bearing.

#### 4, double row bearing

Double row cylindrical roller bearings have a cylindrical inner bore and a conical inner bore (bearing rear code plus K). This kind of bearing has the advantages of compact structure, large rigidity, large bearing capacity, small deformation after load, etc., and is especially suitable for machine tool spindle support. The conical inner hole can also play a role of slightly adjusting the play, and can simplify the structure of the positioning device, and is convenient for installation and disassembly. Commonly used double row cylindrical roller bearings have the following forms:

##### 1NN, NNU type

The outer ring of the NN bearing has no ribs, and the inner ring has a middle rib in the middle of the rib. It is possible to allow displacement of the shaft in the axial direction relative to the bearing housing in both directions.

NNU-type bearings have a middle rib on the outer side of the rib on both sides, and the inner ring has no rib. It is possible to allow displacement of the shaft in the axial direction relative to the bearing housing in both directions. Therefore, such a structure is suitable as a swim end bearing. Most of the cages of this type of bearing use a vehicle-made solid cage.

##### 2NNF type

The NNF type bearing is a double row full complement cylindrical roller bearing. The bearing consists of a structure with a middle rib outer ring and two double rib inner rings. The rollers are guided by the ribs of the inner ring and the two inner rings are fastened together by fastening rings. In addition to being able to withstand large radial and axial loads, the structure can withstand overturning moments and is therefore often used as a fixed end bearing.

Contact seals are used on both sides of the NNF type bearing. The bearings are filled with grease. The operating temperature of the grease is  $-50^{\circ}\text{C}$  to  $+110^{\circ}\text{C}$ , but due to the limitations of the sealing material, the operating temperature of the bearing is limited to  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ . In the case of better working conditions, the sealed NNF bearing does not need maintenance. If the bearing is in water vapor or polluted environment for a long time, and it is running at medium and high speed, it can pass through the lubricating oil groove and the lubricating oil hole on the outer ring. The bearings are relubricated.

#### 5, four-row bearing

Four-row cylindrical roller bearings are mainly used in rolling mill machinery such as cold and hot rolling mills and blanking machines. The bearings are separated structures, and the bearing rings and rolling element assemblies can be easily separated. Therefore, the bearings are cleaned, inspected or It is very convenient to install and disassemble.

##### 1FC type

The FC type bearing is composed of two outer rings and one inner ring, and each of the outer

rings has a middle rib in the middle of the rib, and the inner ring has no rib.

#### 2FCD type

The FCD type bearing is actually a combination of two NN type bearings.

FC and FCD bearings allow for axial displacement in the axial direction relative to the housing. Therefore, such a structure is suitable as a swim end bearing. The cage of this type of bearing mostly uses the car body 13:58.

#### Second, the application of cylindrical roller bearings

Large and medium-sized motors, rolling stock, machine tool spindles, internal combustion engines, generators, gas turbines, gearboxes, rolling mills, vibrating screens, and lifting and transporting machinery.

#### Third, the characteristics of cylindrical roller bearings

1. The roller and the raceway are in contact with the line or repaired, and have a large radial load capacity, and are suitable for bearing heavy loads and impact loads.
- 2, the friction coefficient is small, suitable for high speed, the limit speed is close to the deep groove ball bearing.
- 3, N-type and NU-type can be moved axially, can adapt to the change of the relative position of the shaft and the shell caused by thermal expansion or installation error can be used for free end support.
4. The machining requirements of the shaft or the seat hole are relatively high. After the bearing is installed, the relative deflection of the outer ring axis should be strictly controlled to avoid contact stress concentration.
5. The inner ring or outer ring can be separated for easy installation and disassembly.