

Inch Roller Bearing Units

Detail Introduction :

Versatile and cost-effective, roller bearing units are used in many industrial applications. SKF roller bearing units are rugged, ready-to-use units that are factory assembled, lubricated and sealed for maximum service life. They are an excellent alternative to sleeve-mounted bearings in split housings because they are simple, secure and easy to align.

Roller bearing units are available in metric and inch sizes, and they consist of housings, spherical or tapered roller bearings, seals and lubricants. Both the metric and inch series of SKF bearings are available in cage, full complement and sealed versions, with or without inner rings. Inner ring configuration structure, high rotational accuracy, inner ring using the center shaft, can achieve miniaturization.

Inch roller bearing units are bearings that support the rotating body of machinery and reduce the coefficient of friction during its movement. It consists of machined outer ring, needle roller and cage assembly and removable inner ring. The temperature of the inch roller bearing starts to rise slowly with the operation of the bearing and reaches a stable state after one to two hours. The normal bearing temperature varies depending on the heat capacity of the machine, heat dissipation, speed and load.

Features of Inch roller bearing units.

1?Have higher load capacity despite smaller cross section.

2?Equipped with slim needle roller bearing rollers, so the radial structure is compact.

3?With small cross-sectional height, high load carrying capacity, high rigidity, compact structure, small size, etc.

4?Inch roller bearing units have the same diameter size and bearing capacity as other types of bearings with the smallest diameter, especially suitable for the radial installation size limited support structure.

5?The rollers and steel balls of high precision bearings processed by rolling technology can extend the working life of the bearings, and the hardness and dimensional stability will be improved.

6?In order to avoid cracking and ensure hardness, the mode of high temperature and long time is adopted. The high-precision bearing cage reaches the domestic advanced level in terms of surface wear resistance and fatigue strength.

Applications of Inch roller bearing units.

Roller bearing units can be used in automobile front wheels, rear wheels, transmissions, differentials, pinion shafts, machine tool spindles, construction machinery, large agricultural machinery, railroad vehicle gear reduction devices, steel rolling mill roll neck small reduction devices. The products are widely used in all kinds of transmission equipment, mining machinery, engineering machinery, textile machinery, agricultural machinery, forestry machinery, engineering machinery, etc.

According to different occasions, no inner ring bearing or needle roller and cage assembly can be used, when the journal bearing surface and housing hole as the surface of the bearing and the outer rolling surface directly with, in order to ensure the bearing capacity and operating performance and have the same bearing collar, shaft or bearing housing hole raceway surface hardness, machining accuracy and surface quality should be similar to the roller bearing collar.

Inch roller bearing units are suitable for a variety of imperial size industrial machines, small rotary machines, etc., mostly used in imported machinery or special needs of the industry. For example, miniature motor testing equipment, office equipment stepping motor, medical equipment robot, optical imaging equipment speed reduction and speed change device, etc.

SKF bearing quality is very high, whether Inch roller bearing units or other types of bearings, have very good performance, advanced manufacturing technology, high precision, wide range of applications, in many industries can see the figure of this type of bearing, highly praised by customers.

Benefits

Compared to sleeve-mounted bearing units in split housings, SKF ConCentra roller bearing units deliver:

- Quicker and simpler mounting
- Longer service life
- Higher operational reliability
- Simplified replacement

Features

- Factory assembled and lubricated units ready for use
- Patented SKF concentric locking technology
- Available in 3 pillow block designs and 3 langed designs
- Suitable for located (.. NH) and non-located (.. N) positions
- Seal types optimized for a range of operating conditions
- SYE, SYR, FSYE, FYR and FYE housings with designation suffix N are suitable for condition monitoring

Ready to mount, lock, operate and save time

Maintaining a 360° concentric grip around the shaft, SKF ConCentra roller bearing units offer a highly reliable, time-saving alternative to sleeve-mounted bearings in split housings that require assembly. SKF ConCentra roller bearing units are factory-assembled, sealed and greased for maximum service life. These single units are “shaft-ready” and require far less time and skill to install than a split pillow block housing assembly.

Installers simply slide an SKF ConCentra roller bearing unit onto the shaft and tighten the screws to lock it in place. It's fast and helps provide proper alignment while reducing the risk of assembly-related contamination and mounting errors.

Because SKF ConCentra roller bearing units can be mounted quickly, they help maintenance teams save valuable time.

An upgraded, expanded range

Designed to enable mounting and dis-mounting on the same side, SKF ConCentra inch roller bearing units now feature an expanded range of inch sizes. The components that comprise each unit include:

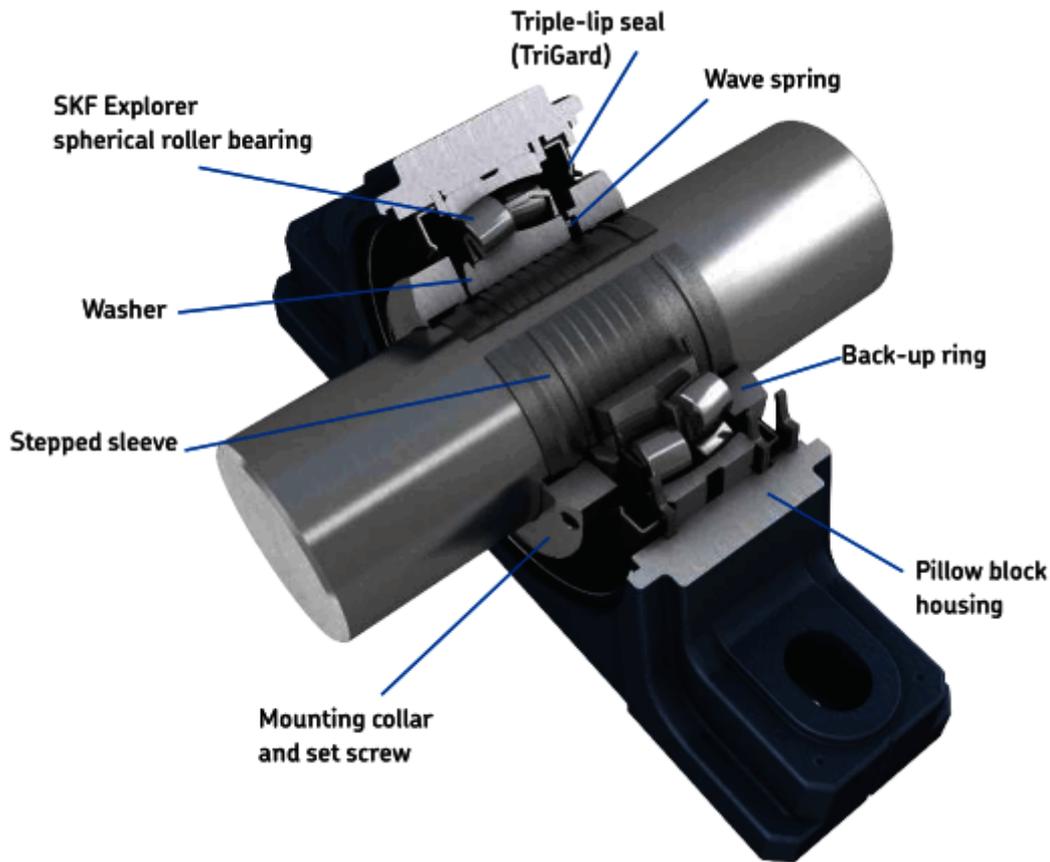
- A pillow block or langed housing
- An SKF Explorer spherical roller bearing
- An SKF ConCentra stepped sleeve
- An integral seal fitted on both sides
- An adequate grease fill

True concentric locking technology

SKF ConCentra roller bearing units allow the bearings within them to operate reliably and maximize service life. The key is SKF's patented locking concept, which enables a near perfect 360° grip of the bearing on the shaft, reducing radial run-out and virtually eliminating the possibility of fretting corrosion.

Designed to perform in harsh conditions

SKF ConCentra roller bearings can handle punishing outdoor conditions as well as heavy loads, shock loads and contaminants. Whenever low noise and minimal maintenance are key requirements, SKF ConCentra roller bearings can provide a cost-effective alternative to conventional bearing and housing arrangements.



Applications

- Belt, bucket and chain conveyors
- Mining and metallurgical equipment
- Industrial air handling units
- Fans, pumps and blowers
- Textile machinery
- Agricultural and forestry machinery
- Food and beverage processing equipment
- Wastewater treatment equipment
- Reining equipment
- Commercial laundry equipment

Application requirements

- Ready-to-mount and ready-to-operate
- Robust design and reliable solution
- Effective sealing
- Filled with premium grease
- Allows 1,5° of misalignment
- Accommodate thermal elongation of the Shaft

Introducing SKF mounted tapered roller bearings

The mounted tapered roller bearings at work in conveyors and other material handling equipment must withstand extremely punishing conditions. Unfortunately, most mounted tapered roller bearing seals are not up to the challenge. In fact, most mounted tapered roller bearings fail because their seals have failed first and allowed contaminants inside. The resulting downtime can devastate productivity and profitability, which is why SKF developed a mounted tapered roller bearing with sealing performance that's exponentially better than the competition.

As our first-ever mounted tapered roller bearing – commonly known as Type E – these new units combine SKF bearing expertise with proven CR Seals technology.

The result is a bearing built to deliver longer service life through superior contamination exclusion.

SKF tests show that the CR Seals will resist contaminant ingress for significantly longer than our next

best competitor. Interchangeable with all Type E sizes, SKF mounted tapered roller bearings are also competitively priced. All of which means that the world's toughest process industries now have a Type E bearing that supports reliable rotation and a better bottom line.

SKF bearings + CR seals = An exponentially

The tapered roller bearings in our new Type E units are among the world's best. But the reason that they're the best choice for heavily contaminated applications is because we've paired them with CR Seals technology.

Backed by over a century of proven sealing expertise, the CR seals in SKF mounted tapered roller bearings provide robust, long-lasting protection against contaminant ingress and lost productivity, backed by our performance warranty.



* See page 26 for details.

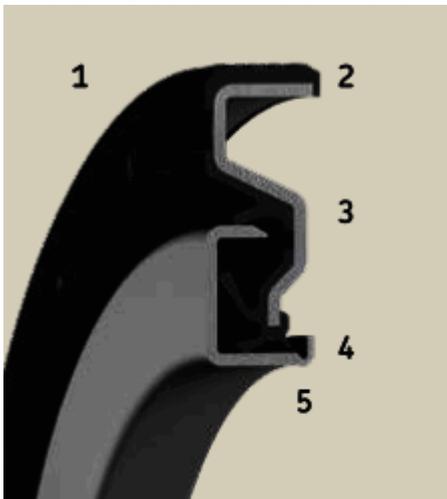
SKF mounted tapered roller bearing; four bolt flange (F4BE)

An improved mix of technologies

As a bearing manufacturer that also manufactures seals, SKF has a deep understanding of how temperatures, speeds, pressures, lubricants, shaft surfaces and other conditions impact seal life and performance. This knowledge, backed by years of R&D in sealing materials, design and tribology, goes into every bearing and sealing solution we develop.

For our first-ever Type E bearing, we started with SKF tapered roller bearings. Built with world class manufacturing techniques, optimized rolling contact surfaces and high loading capacity, these bearings run at higher speeds with lower operating temperatures. In the application, they deliver longer service life, less maintenance, and lower operating costs.

The CR Seals in the unit offer several lines of defense against contamination



1) Hydrogenated nitrile rubber (HNBR): The high performance HNBR sealing material provides excellent resistance to wear and high temperatures for long service life.

2) Full rubber outside diameter: Improves static sealing inside the housing.

3) Multiple sealing lips: Designed to exclude the harshest contamination (dirt, mud, water, sand, and powder) for maximum protection in the toughest environments.

4) Relubrication: Seal is designed to accommodate bearing relubrication without risk of damage to the sealing lips. The seal is grease purgeable.

5) Unitized design: Rotating wear sleeve is integrated with the seal body to create a very robust cassette seal.

better Type E bearing unit

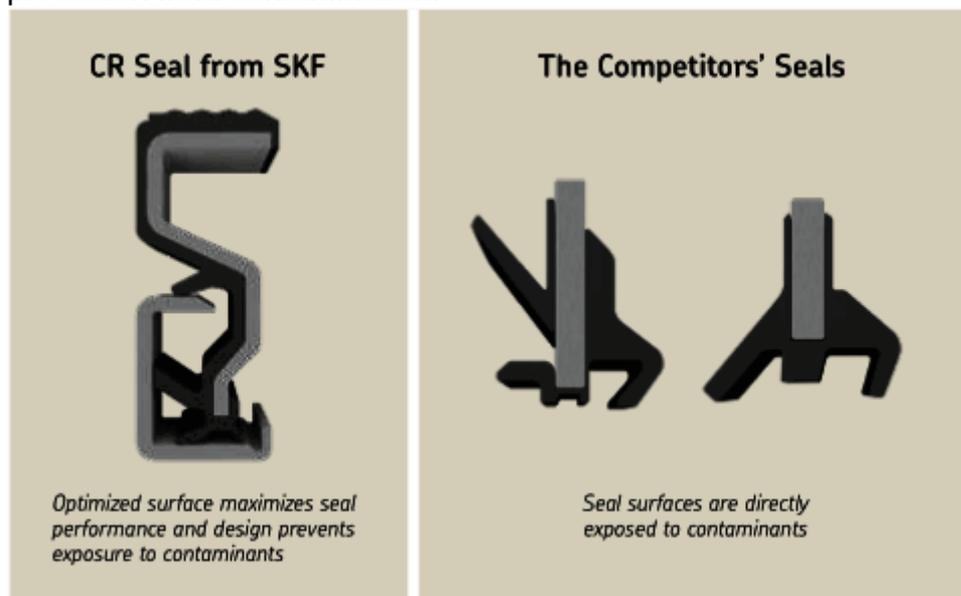
Superior sealing performance

Field reports indicate that contamination is the primary mode of failure for Type E units. As a leading bearing supplier that also manufactures seals, SKF understands how seals play a critical role in a Type E's performance.

To make sure our units perform in the demanding environments they're in, we subjected our seals and our competitors' seals to worst-case industrial environments. On the competitors' seals, the test had to be stopped anywhere from 5 – 50 hours due to seal leakage while the CR Seal from SKF performed over 10x the next best competitor.

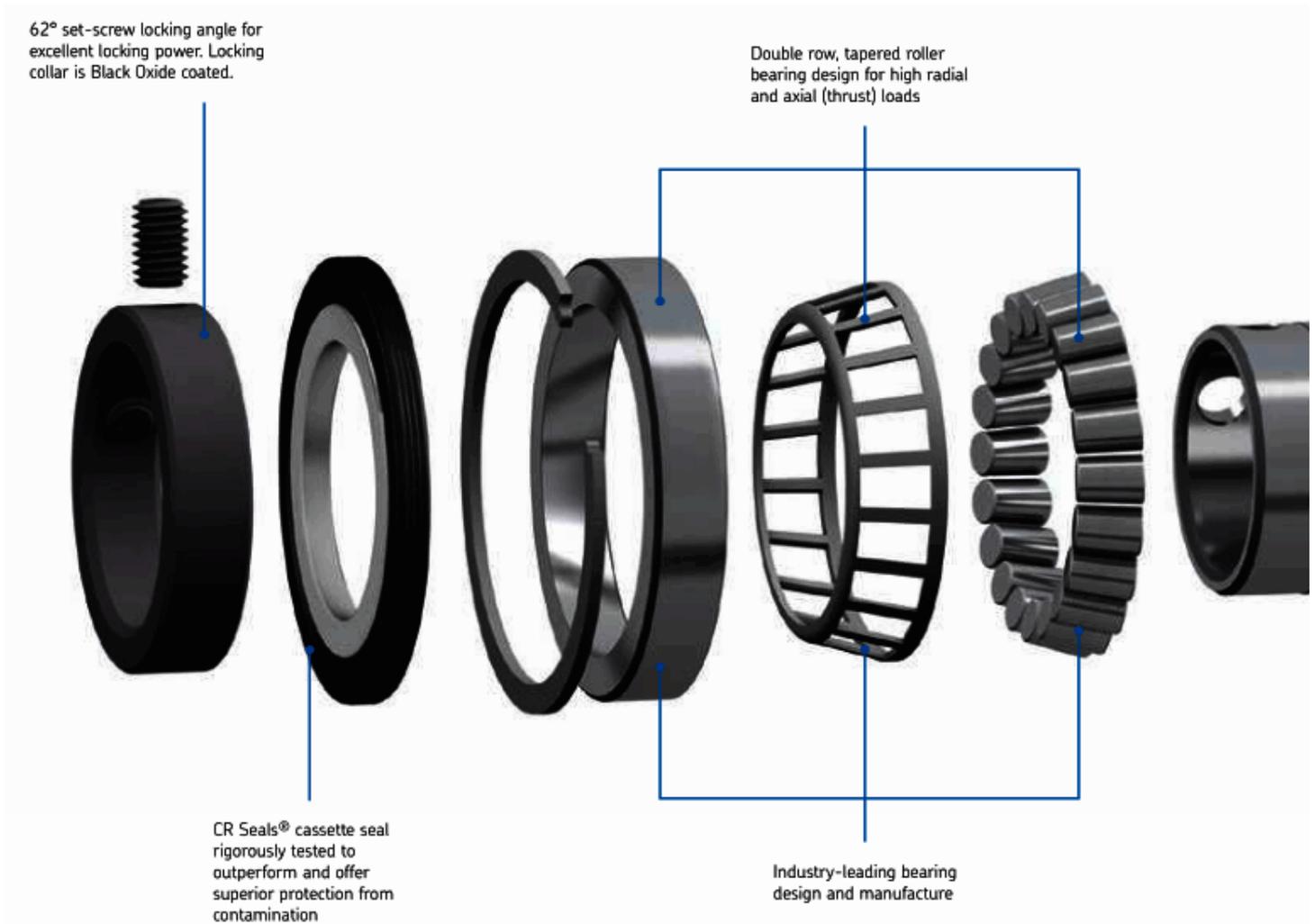
Trust the robust reliability of CR Seals

A Type E bearing needs a seal that not only can handle the rigorous contamination demands, but truly performs. With CR Seals, SKF delivers just that. A seal with multiple lips to provide excellent protection from contamination.



What sets SKF apart?

SKF has taken its expertise in rotational equipment to manufacture a world-class mounted tapered roller bearing that the industry can rely on. The new Type E from SKF has quality components that can not only withstand, but truly perform, in the industry's dirtiest applications. Take a closer look at the engineering expertise that went in to delivering a Type E that you can depend on.



Complete guide to Inch roller bearing units.

Inch roller bearing units as one of SKF bearings are used in many industries, want to know more about Inch roller bearing units? This guide introduces this knowledge in detail, read on.

1?What are the specifications of inch roller bearing units?

Inch roller bearing units are mostly used in imported machinery or special needs of the industry, the external dimensions and tolerances are expressed in inch units, applicable to the inch size of the device. Corresponding to it is the metric bearing, the structure and assembly size accuracy and rotation accuracy of the inch roller bearing is different from the metric bearing. Its structure type also has a single row, double row, four rows, etc., the work performance and the corresponding metric tapered roller bearings are the same.

2?Temperature monitoring of inch roller bearing units?

If lubrication, installation is not appropriate, the bearing temperature will rise sharply, there will be abnormal high temperature, then must stop running, take the necessary precautions. High temperature often indicates that the bearing has been in abnormal conditions, high temperature is also harmful to the bearing lubricant, sometimes bearing overheating can be attributed to the bearing lubricant. If the British bearing in more than 125 ° temperature for a long time will reduce the bearing life.

The causes of high temperature bearings are insufficient lubrication or excessive lubrication, impurities in the lubricant, excessive load, bearing loss ring, insufficient clearance, and high friction generated by the oil seal and so on. Therefore, continuous monitoring of inch bearing temperature is necessary, whether it is to measure the bearing itself or other important parts. If the operating conditions are the same, any change in temperature can indicate a failure.

The use of heat sensors can monitor the operating temperature of inch bearings at all times and prevent shaft burnout by automatically alerting or stopping when the temperature exceeds a specified value. Bearing temperature can be measured regularly with the help of thermometers, such as bearing digital thermometers, which can accurately measure the bearing temperature and display it in

units of °C or Fahrenheit.

Critical inch bearings, meaning that when they are damaged, it will cause equipment downtime, so these bearings should preferably be equipped with temperature detectors. Under normal circumstances, there will be a natural temperature rise in the bearings just after lubrication or relubrication and last for one or two days.

3?What are the characteristics of inch roller bearing units?

This kind of bearing can limit the axial displacement of the shaft or shell side, not allowing the shaft to have tilt relative to the shell hole. In the radial load, will produce additional axial force, therefore, generally in the bearing two support, bearing outer ring and inner ring with each end face should be installed relative.

The inner and outer rings of roller bearings have tapered raceways, and the raceways are equipped with tapered rollers between them. If the tapered surface extension, eventually will be gathered in the bearing axis on a point.

Roller bearing is mainly used to bear radial load mainly radial, axial combined load. The axial load carrying capacity of the bearing is determined by the contact angle, the larger the contact angle, the greater the axial load carrying capacity. Tapered roller bearings are separated bearings, with rollers and cage of the inner ring constitute the inner component, can be installed separately with the outer ring.

4?What types of roller bearing units are there?

(1) Single row roller bearing

This kind of bearing can only limit the axial displacement of the shaft or shell in one direction and bear the axial load in one direction. In the radial load, the axial force generated in the bearing must also be balanced, two bearings should be used face to face or back to back.

(2) Double row roller bearings

This bearing in bearing radial load at the same time can bear two-way axial load, can be in the bearing axial clearance range to limit the shaft or shell of two-way axial movement.

(3) Four-row roller bearings

The performance of this bearing and double row roller bearings are basically the same, but than double row roller bearings to bear the radial load is greater, the limit speed is slightly lower, mainly for heavy machinery, such as rolling mills.

(4) Multi-seal double row roller bearings

Change the traditional design of fully sealed bearings, using a new type of sealing structure combined with dustproof, improve the sealing effect, improve sealing performance. Personalized new design, long service life, low lubricant consumption.

5?Benefits of Inch roller bearing units

(1) The friction coefficient of roller bearing is smaller than that of sliding bearing, and the transmission efficiency is high, generally the friction coefficient of sliding bearing is 0.08-0.12, while the friction coefficient of rolling bearing is only 0.001-0.005.

(2) Roller bearings have been standardized, serialized, generalized, suitable for mass production and supply, the use and maintenance is very convenient.

(3) roller bearing with bearing steel manufacturing, and after heat treatment, therefore, rolling bearing not only has high mechanical properties and long service life, and can save the manufacture of sliding bearings used in the more expensive non-ferrous metals.

(4) roller bearing internal clearance is very small, the machining accuracy of the parts is high, therefore, the running accuracy is high. At the same time, the rigidity of the bearing can be increased by the method of preloading. This is very important for precision machinery.

(5) Some roller bearings can bear radial load and axial load at the same time, therefore, the structure of the bearing support can be simplified.

(6) Due to the high efficiency of roller bearing transmission, less heat, therefore, can reduce the consumption of lubricating oil, lubrication maintenance is less trouble.

6?What is the difference between roller bearings and sliding bearings?

The ability of roller bearings to bear the load is much smaller than the same volume of sliding bearings, therefore, the radial size of roller bearings is large. Therefore, in the occasion of bearing large loads and requirements of small radial size, compact structure requirements, such as internal combustion engine crankshaft bearings, more than the use of plain bearings.

Roller bearing vibration and noise is large, especially in the late use of particularly significant. Therefore, the precision requirements are very high, but also not allowed to have vibration occasions, rolling bearings are difficult to perform, the general choice of sliding bearing effect is better. Roller bearings are particularly sensitive to metal chips and other foreign objects, once the bearing into the foreign body, will produce intermittent larger vibration and noise, will also cause early damage. In addition, roller bearings due to metal inclusions and other early damage is also likely to occur. Even if early damage does not occur, the life of the roller bearing also has a certain limit. In short, the life of the roller bearing is shorter than the sliding bearing.

Rolling bearings and sliding bearings compared, each has its own advantages and disadvantages, each occupying a certain number of applicable occasions. Therefore, the two can not completely replace each other, and each to a certain direction of development, to expand their own field. However, due to the outstanding advantages of roller bearings, there is a trend of the later taking over. At present, roller bearings have been developed into the main support type of machinery, more and more widely used.

7?What are the uses of roller bearings?

Roller bearings, referred to as bearings, are widely used in the mechanical industry and civil appliances, strict requirements of the supporting infrastructure, is known as the mechanical joints. It can be said that as long as there is rotation where there are bearings, due to the wide range of use, decided the diversity and complexity of bearing varieties. Because of the strict requirements, decided the importance of bearing quality and performance.

In short, industry, agriculture, national defense, science and technology and civil instruments in various fields of the host are useful to the bearing, its precision, performance, life, reliability and economic indicators, have a close relationship with the bearing, and the development of the bearing industry is also related to China's major technical equipment manufacturing level and the export capacity of machinery and equipment, bearing in the national economy and national defense construction is playing an increasingly important Bearing in the national economy and national defense construction is playing an increasingly important role.

8?How to install inch roller bearing units?

Bearing installation shall be carried out in a dry and clean environment. Before installing roller bearings, attention must be paid to inspecting the mating surfaces of the shaft and housing, the end surfaces of the shoulder, the groove and the joint surface. All mating surfaces must be carefully cleaned and deburred. Residual sand must be removed from unfinished surfaces of the casting. Prior to mounting the bearings, the associated cleaning should be done with lubricating oil or kerosene, and the bearings should not be used until they are dry and ensure good lubrication. Bearings usually add grease or some lubricating oil, when using grease, high quality grease should be used, such as impurity-free, anti-oxidation, anti-rust and extreme pressure. The grease filling amount is 30%-60% of the volume of the bearing and bearing housing, and should not be excessive. When mounting the bearing, you must apply equal pressure on the circumference of the end face of the collar to press the collar. Do not use boring head and other tools to directly hit the bearing end face, so as not to damage the bearing. In the case of small interference, the end face of the bearing collar can be pressed with a sleeve at room temperature, with the sleeve tapped with a hammer, and with the collar pressed evenly over the sleeve.

If a large number of installations, a hydraulic press can be used. When pressing in, make sure that the end face of the outer ring and the shoulder end face of the housing, and the end face of the inner ring and the shoulder end face of the shaft are pressed tightly, and that no clearance is allowed. When the interference is large, the oil bath heating or inductor heating bearing method can be used to install, the heating temperature range is 80?-100?, the highest can not exceed 120?.

At the same time, apply nuts or other appropriate methods to fasten the bearing to prevent the bearing from contracting in the width direction after cooling and making the gap between the collar and the shoulder. Single row roller bearing installation finally should be clearance adjustment, clearance value should be according to the different use conditions and with the interference size and specific determination, if necessary, should be tested to determine. Double row roller bearing and pump shaft bearing in the factory has adjusted the clearance, installation without adjustment. After installation, the bearings should be tested by rotation. First, rotate the shaft or bearing box by hand, and if there is no abnormality, then run without load and at low speed with power. Then gradually increase the rotating speed and load depending on the running condition, and detect noise, vibration and temperature rise. If any abnormality is found, stop running and check.