Double Row Deep Groove Ball Bearings

Detail Introduction :

The standard double row deep groove ball bearing is 4200A, 4300A type, A type bearing has no ball loading notch, two reinforced nylon cages are inserted from both sides of the bearing. Double row deep groove ball bearings have a higher than single row deep groove ball bearings 1.62 times the radial load carrying capacity, but also can withstand the axial load, the standard deep groove ball bearings for the general group of radial internal clearance.
Double Row Deep Groove Ball Bearings are equipped with two glass fiber reinforced nylon 66 cage, equipped with nylon cage deep groove ball bearings can be operated at temperatures up to 120 ?. The characteristics of the cage are not affected by the lubricant used for general rolling bearings, except for certain synthetic oils or synthetic oil-based greases and lubricants containing a large number of extreme pressure additives in high temperature applications.

Features of double row deep groove ball bearings.

Double row deep groove ball bearings of the inner and outer ring raceways are arc-shaped deep groove, the radius of the groove is slightly larger than the radius of the ball. Double Row Deep Groove Ball Bearing have a small coefficient of friction, high limit speed, simple structure, low manufacturing costs, easy to achieve high manufacturing accuracy.
When the radial clearance of the bearing increases, with the role of angular contact ball bearings, can withstand a relatively large axial load, while more suitable for high-speed rotation. Bearing in the shell hole and shaft relative to the tilt 8? ~ 16?, still can be normal application, but will affect its use of life. In the case of high speed and not recommended to choose thrust ball bearing, you can choose this type of bearing to bear pure axial load.
Double Row Deep Groove Ball Bearings usually choose a two-part composite steel plate stamping cage, but larger size or high speed bearings choose solid cage, such cage with stamping cage is the same by the ball guidance, high speed deep groove ball bearings cage is usually guided by the inner ring or outer ring retaining edge.

Application of Double Row Deep Groove Ball Bearing

Deep groove ball bearings are the most representative rolling bearings, suitable for high speed or even very high speed operation, and very durable. Widely used in automobiles, home appliances, machine tools, motors, pumps, agricultural machinery, textile machinery and many other industrial fields. Its production accounts for more than 70% of the total production of bearings, is the domestic production of high, the most widely used and the price to be cheap a class of bearings.
Double Row Deep Groove Ball Bearings are very suitable for single row deep groove ball bearings in bearing configurations where the load carrying capacity of single row deep groove ball bearings is insufficient.
Compared with other types of bearings of the same size, double row deep groove ball bearings have a lower coefficient of friction, lower vibration and noise, higher limiting speed, and higher precision, making them the preferred bearing type for customer selection. Deep groove ball bearing structure is relatively simple, easy to operate, is the production of large quantities, relatively wide range of applications of a class of bearings.
More details about double row deep groove ball bearings are as follows.
1.Design features and characteristics
Deep groove ball bearings are very widely used. A deep groove is formed on the inner and outer ring of the bearing enabling the bearing to sustain radial and axial loads in either direction as well as the complex loads which result from the combination of these forces. Deep groove ball bearings are suitable for high speed applications.
When two or more deep groove ball bearings are used in combination and mounted adjacent to each other a duplex set (D2) should be used. Duplex bearings (D2) utilize controlled tolerances to more

evenly distribute the loading between the individual bearing rows which improves the overall performance of the assembly.
In addition to unsealed and unlubricated “open” bearings, NTN provides deep groove ball bearings that are pre-lubricated with grease and enclosed by seals or shields. See section “11. Lubrication” for a list of some of the greases which can be used. Table 1 shows the construction and special characteristics of various sealed deep groove ball bearings.

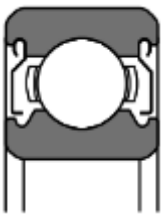
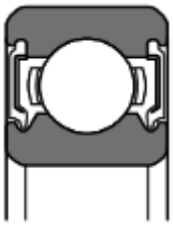
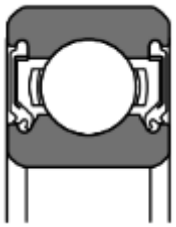
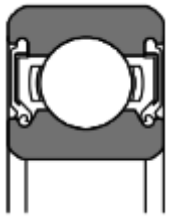
Types and codes		Shielded type Non-contact type ZZ	Sealed type Non-contact type LLB	Contact type LLU	Low torque type LLH
Construction					
		Metal shield plate is affixed to the outside ring; the inner ring incorporates a V-groove and labyrinth clearance.	The outer ring incorporates synthetic rubber molded to a steel plate; seal edge is aligned with V-groove along inner ring surface with labyrinth clearance	The outer ring incorporates synthetic rubber molded to a steel plate; seal edge contacts V-groove along inner ring surface.	Basic construction is the same as LLU type, but a specially designed lip on the edge of the seal prevents foreign matter penetration; low torque construction.
Performance comparison	Torque	Small	Small	Higher	Medium
	Dust proofing	good	Better than ZZ-type	Excellent	Much better than LLB-type
	Water proofng	Poor	Poor	Very good	good
	High speed capacity	Same as open type	Same as open type	Limited by contact seals	Much better than LLU-type
	Allowable temp.range 1	Depends on lubricant	-25 ??120 ?	-25 ??110 ?	-25 ??120 ? -

Table 1

1) Please consult NTN Engineering about applications which exceed the allowable temperature range of products listed on this table.
Note: This chart lists double shielded and double sealed bearings, but single shielded (Z) and single sealed (LB, LU, LH) are also available.
Grease lubrication should be used with single shielded and single sealed bearings.
1.Standard cage type
As shown in Table 2, pressed steel cages are generally used for most deep groove ball bearings. Larger size deep groove ball bearings, and bearings operating at high rotational speeds often utilize a machined metallic cage.

Bearing series	Pressed cages	Machined cages

		
67	6700? 6706	?
68	6800? 6834	6836? 68?600
69	6900? 6934	6936? 69?500
160	16001?16052	16056? 16072
60	6000? 6052	6056? 6084
62	6200? 6244	?
63	6300? 6344	?
64	6403? 6416	?

Table 2

1.Other deep groove ball bearing enhancements

Bearings with snap rings

A snap ring grove or snap ring groove with snap ring combination are optional enhancements for the outer diameter of most deep groove ball bearings. Snap rings allow for simpler axial positioning and installation in the housing. Snap rings can be utilized with both open type and sealed or shielded deep groove ball bearings. Consult NTN Engineering.

Expansion compensating bearings(creep prevention bearings)

NTN offers the innovative Expansion Compensating (EC) feature to help with bearing retention when mounted in light alloy housings which is often a problem at elevated temperatures due to property differences between the bearing steel and the housing. This functionality is achieved by machining circumferential grooves into the outer diameter of an otherwise standard outer ring. These grooves are filled with an optimized polymer which has an expansion rate higher than that of the typical light alloy housing. The net result is a more consistent interference fit across a wide operating temperature range. This more consistent fit condition helps prevent the bearing from rotating within the housing (known as bearing creep) which helps ensure good performance and long life.

(1) Allowable load

As a result of having grooves machined in the outer diameter, the ring strength is lower compared with a standard bearing. Thus, in order to prevent outer ring fracture, it is necessary tolimit the maximum load applied to the bearing to be equal to or less than the allowable load Cp (see dimension table).

(2) Fit with housing

Table 3 shows the recommended fits for bearings with light metal alloy housings. In cases where the bearing is going to be interference fit with the housing, it is very important not to damage the polymer material. Therefore, it is essential that the lip of the housing diameter be given a 10-15° chamfer as shown in Fig. 2. Furthermore, as shown in Fig. 2, it is also advisable to apply the interference fit using a press in order not to force the bearing into the housing in a misaligned position.

Condition		Suitable bearing	Housing bore tolerance class
Load type, etc.	Housing material		

Rotating outer ring load Rotating inner ring load Indeterminate Load Light load Normal load	Light alloys such as Al alloy and Mg alloy	Deep groove ball bearings Cylindrical roller bearings	H6
Rotating outer ring load Indeterminate Load Heavy load Impact load	Light alloys such as Al alloy and Mg alloy	Thick-walled type deep groove ball bearings	N6

Table 3

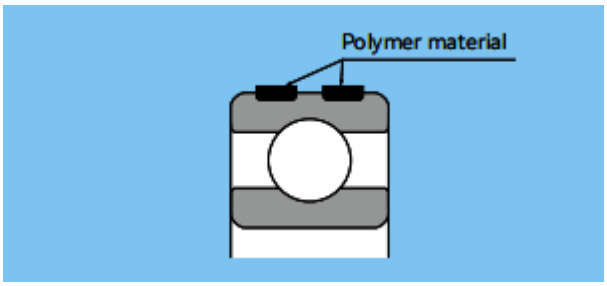


Fig. 1

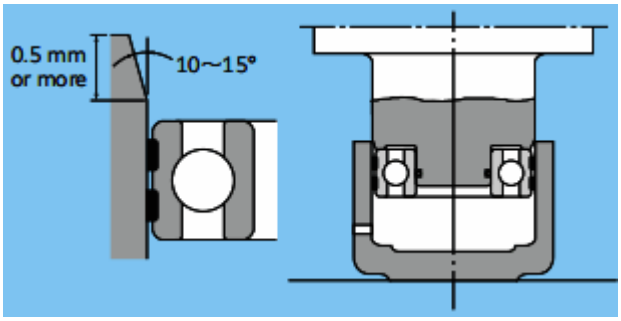


Fig. 2

(3) Radial internal clearance

Radial internal clearance are the same as those for standard deep groove ball bearings. With standard fit and application conditions, a C3 clearance is used. For more detailed information concerning this bearing and the availability of roller bearings contact NTN Engineering

(4) Allowable temperature range

?20 to 120°C

AC bearings (creep prevention bearings)

NTN Offers the AC type bearing which performs a similar function to the EC bearing. AC bearings have the same outer diameter dimensions as standard bearings with the addition of two O-rings located in circumferential grooves on the outside diameter of the outer ring. (Fig. 3) While the EC bearing is more beneficial when using a light alloy housing at elevated temperatures, AC bearings are suitable for applications where a “tight fit” is not possible but outer ring creeping exists under rotating load on the outer ring. AC bearing can also be installed as a floating side bearing to accommodate expansion of shaft by heat as it is more axial. Before installing the bearing into the housing, a high viscosity oil (base oil viscosity, 100 mm2/s or more) or grease must be applied to the space between two O-rings. This lubricant forms a thin oil layer on the bearing outer ring which prevents contact between the outer ring and housing, lowers the friction, and can minimize the occurrence of creeping by utilizing the friction force of the O-rings.

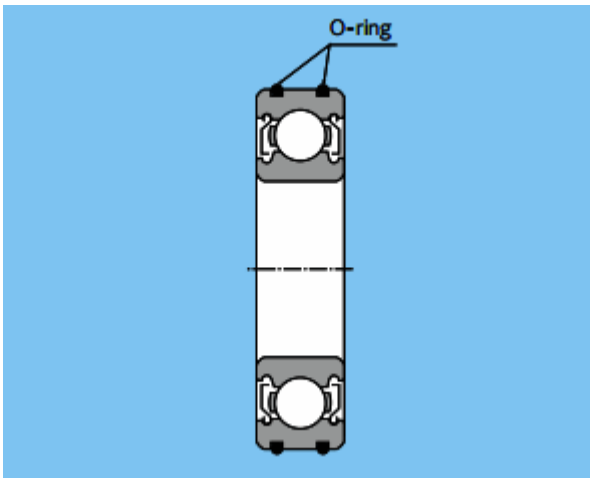


Fig. 3

(1) Allowable load

As is the case with the EC bearing, the load applied to an AC bearing shall be limited to Cp(see dimension table) in order to ensure the strength limit of the modified outer ring is not exceeded.

(2)Housing dimensions and shape Fig. 4 shows the recommended shape of steel housings, and Table 4 shows the dimensions.

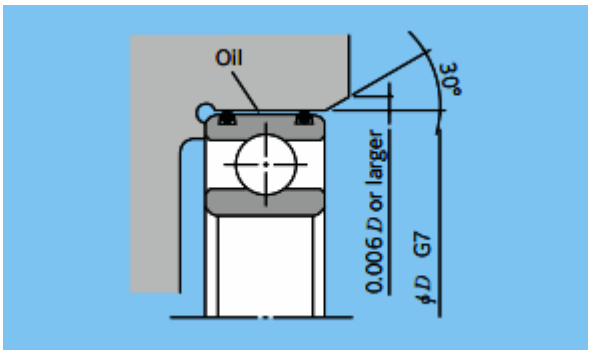


Fig. 4

Housing bore tolerance	G7
Housing bore entrance chamfer	Max. 30°C
Housing bore chamfer undercut	0.006D or larger
Housing bore surface roughness Ra	2.5
Housing bore roundness	1/2 of bearing housing dimension tolerance

(3) Allowable temperature range

?25 to 120°C

Complete guide to double row deep groove ball bearings.

Bearing popularity is very high, in this brand, double row deep groove ball bearings is very widely used, want to know more about this aspect of the content, this guide details the knowledge about double row deep groove ball bearings, then read on.

1?Types of double row deep groove ball bearings in the Market.

(1) with dust cover: single-sided or double-sided iron dust cover.

(2) with non-contact rubber seal: single-sided or double-sided non-contact seal.

(3) with contact rubber seal: single-sided or double-sided contact seal and inner ring contact.

(4) Outer ring with stop groove: N: outer ring with stop groove, NR: outer ring with stop groove and stop ring.

2?Benefits of double row deep groove ball bearings.

Deep groove ball bearings are the most commonly used rolling bearing, its structure is simple, easy to use, mainly used to bear radial load, but when increasing the bearing radial clearance, has a certain angular contact ball bearing performance, can withstand the combined diameter, axial load. In the high speed and should not use thrust ball bearing, also can be used to bear pure axial load. With deep groove ball bearing specifications of the same size of other types of bearings, such bearings friction coefficient is small, high limit speed. But not shock-resistant, not suitable for heavy

load. Deep groove ball bearing installed in the shaft, in the bearing axial clearance range, can limit the shaft or shell two directions of axial displacement, so can be in both directions for axial positioning.
Select a larger radial clearance when the axial load carrying capacity increases, bearing pure radial force when the contact angle is zero. When there is an axial force, the contact angle is greater than zero. Generally use the stamping wave-shaped keep frame, turning solid keep frame, sometimes also use nylon frame. In addition, this type of bearing also has a certain adjusting ability, when relative to the shell hole tilt 2'~10', still can work normally, but the bearing life has a certain impact.

3?Parts of deep groove ball bearings.

Deep groove ball bearing structure is simple, compared with other types of easy to achieve higher manufacturing accuracy, so it is easy to series mass production, manufacturing costs are also lower, the use of extremely common. Deep groove ball bearings in addition to the basic type, there are various variants of structure, such as: deep groove ball bearings with dust cover, deep groove ball bearings with rubber seals, deep groove ball bearings with stop groove, deep groove ball bearings with ball loading gap of large load capacity, double row deep groove ball bearings.

4?How do double row deep groove ball bearings fit?

The fit of the bearing is the fit of the inner ring and the shaft and the fit of the outer ring and the seat hole, and the circumferential fixation of the bearing is ensured by the fit. Because the bearing is a standard part, so with other parts, the bearing bore is the reference hole, the outer ring is the reference shaft, and its fit code does not need to be marked.
In fact, the bearing bore and outer diameter have a small negative deviation in the tolerance zone, and the deviation direction and value are different from the general cylindrical reference hole and reference shaft, so the fit of bearing bore and shaft is much tighter than the general cylindrical similar fit. The selection of bearing fit type should be decided according to the high or low speed, the size of the load, the change of temperature and other factors.
If the fit is too loose, the rotational accuracy will be reduced and the vibration will be increased; if the fit is too tight, it may affect the normal operation of the bearing because of the excessive elastic deformation of the inner and outer ring, and it will also make the bearing installation and disassembly difficult. Generally speaking, high speed, high load, temperature change bearing should choose some tight fit, often disassemble the bearing should choose a looser fit, rotating collar fit should be tighter, the outer ring fit of the swimming pivot point should be loose.

5?How to install double row deep groove ball bearings?

As the NTN bearing fit is usually tight, in order to facilitate assembly and prevent damage to the bearing, a reasonable assembly method should be adopted to ensure the quality of assembly, the combination design should also take corresponding measures. When installing the bearings, small bearings can be used to lightly and evenly hit the copper hammer with the collar to install, large bearings can be pressed into the press, the size of large and tight with the bearing can be heated to expand the hole pieces before assembly.
It should be noted that the force should be applied to the assembled collar, otherwise it will damage the bearing. When disassembling the bearing, special tools can be used. To facilitate disassembly, the height of the bearing's positioning shoulder should be lower than the height of the inner ring, the value of which can be consulted in the bearing samples. Cup bearing assembly and disassembly of the axial movement of the distance is long, usually using tapered roller bearings, the inner and outer ring are assembled separately, the operation is more convenient, and the diameter of the non-cooperative part of the inner hole of the cup should be slightly larger both for the outer ring of the bearing into, but also to reduce the inner hole finishing area.

6, How to identify the double row deep groove ball bearings true or false?

(1) Look at the outer packaging. Bearings due to transportation is more delicate, generally speaking, genuine bearings are very fine outer packaging, but can not exclude the second transport process due to extrusion, water into the bearing packaging deformation occurred.
(2) Look at the inner packaging. In general, counterfeit bearings, the inner packaging bag is not sealed. And good quality bearings inside the bag feel denser, there is a feeling of kraft paper, and

ordinary bags or some differences.
(3) look at the steel seal. ntn bearing steel seal is engraved, there is a clear depression, the font is more rounded, what is the specific font, you can check the information. In short, if you buy the NTN bearing font and the above font is different, then you may buy counterfeit bearings.
(4) Scan the two-dimensional code. Each NTN bearing package, there is a two-dimensional code, you can download the NTN bearing genuine identification APP, and then use the APP scan code identification can be, the specific operation process, you can go to the NTN China website official website to find.
(5) Choose a regular agent. Of course, the safest way is to choose a regular agent, with a certificate of authorization, and can be found on the official website of NTN bearings.

7?How double row deep groove ball bearings Works?

Deep groove ball bearings are mainly used to withstand pure radial load, but also can withstand both radial load and axial load. When it only bears pure radial load, the contact angle is zero. When the deep groove ball bearing has a large radial clearance, has the performance of angular contact bearings, can withstand large axial load. Deep groove ball bearing friction coefficient is very small, the limit speed is also very high, especially in the axial load is very large under high-speed operating conditions, deep groove ball bearing than thrust ball bearings have superiority.
As a variety of machinery has different working conditions, the bearing in the load capacity, structure and use of performance and other aspects have put forward a variety of different requirements. Deep groove ball bearings developed on the basis of sliding bearings, its working principle is to roll friction instead of trickle friction, generally by two rings, a group of rolling body and a cage composed of a very strong generality, standardization, a high degree of serialization of mechanical infrastructure, its most basic structure is composed of the inner ring, outer ring, rolling body and cage.

8, Double Row Deep Groove Ball Bearing wear causes and prevention recommendations.

Structural design, manufacturing process and material quality are the intrinsic factors that determine the quality of double row deep groove ball bearings, double row deep groove ball bearings wear causes are usually closely related to bearing installation, use, maintenance, maintenance, etc.. The following are the causes of double row deep groove ball bearing wear and prevention suggestions.
(1) Improper operation
Cause: Improper installation, operation or disassembly may cause deformation or defect of cage.
Prevention suggestions: use appropriate operation, installation and disassembly tools.
(2) Inadequate lubrication
Cause: Inadequate or improper lubrication may lead to component abrasion or serious double-row deep groove ball bearing deformation.
Prevention suggestions: improve the lubrication system, and properly replenish or replace the lubricant at regular intervals.
(3) Eccentricity
Cause: Eccentricity, tilt or excessive load may lead to geometric stress concentration or surface spalling.
Prevention suggestions: accurate processing of imported bearing seats and shoulders.
(4) External material
Cause: abrasive particle contamination and debris intrusion may lead to import bearing working surface wear, abrasion and denting.
Prevention suggestions: remove intruding particles and debris, replace the lubricant, check the sealing system.
(5) Electric current
Cause: Rotation with electricity may lead to grooves or indentations, double-row deep groove ball bearings at rest, improper grounding of electrical operations can lead to minor burns.
Preventive suggestions: reduce or avoid current through the bearing by proper grounding connection before welding to parts other than the bearing.
(6) Rust and corrosion
Cause: Contact with water may lead to corrosion and rusting of the pump shaft and bearing elements.

Rust damage after the double-row deep groove ball bearings in the work may lead to spalling.
Prevention suggestions: Check the seal regularly to ensure good sealing effect and store the imported bearings correctly.
Video: https://www.youtube.com/watch?v=jVFgnNItm54
PDF.
https://www.ntnglobal.com/en/products/catalog/pdf/2203E_b02.pdf