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1 滚动轴承的结构与类型

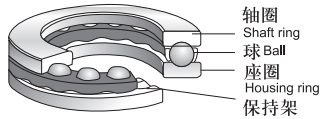
1. Structure and Type of Rolling Bearing

1.1 滚动轴承的结构

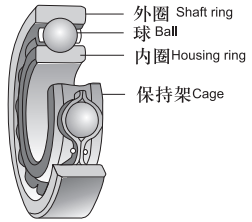
1.1 Structure of rolling bearing

滚动轴承一般由套圈(内圈、外圈)，垫圈(轴圈、座圈)，滚动体和保持架构成。内圈与外圈之间装有若干滚动体，通过保持架使滚动体保持一定间隔，进行圆滑的滚动。图1.1

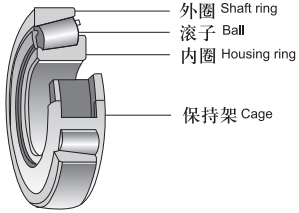
A rolling bearing usually consists of rings (inner and outer), washers (shaft, housing), rolling bodies and cage. A number of rolling bodies are installed between inner and outer rings, which are kept by cage at a certain distance for smooth rolling.
Figure 1.1



(推力球轴承)
(Thrust ball bearing)
图1.1结构示例
Figure 1.1 Structure example



(深沟球轴承)
(Deep groove ball bearing)
图1.1
Figure 1.1



(圆锥滚子轴承)
(Tapered roller bearing)
图1.1
Figure 1.1

1) 套圈(内圈、外圈)、垫圈(轴圈、座圈)

1) Rings(inner, outer), washers(shaft, housing)

套圈上滚动体滚动的部分称做滚道，其表面称做滚道面， 球轴承套圈的滚道又称沟道。

一般来说，套圈中的内圈和外圈分别与轴和外壳配合。

推力轴承的垫圈分别称做轴圈和座圈。

The part on rings on which rolling bodies roll on is called raceway, the surface is called raceway surface, the raceway on a ball bearing ring is also called ball race.
Generally speaking, for rings, the inner and outer rings fit with shaft and housing respectively.
The washers of thrust bearing are called shaft washer and housing washer respectively.

2) 滚动体

2) Rolling body

滚动体分为球和滚子两大类，滚子根据其形状不同又分为圆柱滚子、滚针、圆锥滚子、球面滚子等等。

Rolling body is divided into such two major categories as ball and roller. Roller is divided into cylindrical roller, needle roller, conical roller, spherical roller, etc.

3) 保持架

3) Cage

保持架是将滚动体部分包围，使其在圆周方向保持一定的距离。

保持架有冲压保持架，车制实体保持架，工程塑料成型保持架。

与无保持架的满装型球(滚子)轴承相比，带保持架的轴承摩擦阻力较小，适用于高速旋转。

The cage encircles partially rolling bodies so that a certain distance is kept in circumferential direction between them.
The cage consists of that from pressing, solid cage from turning and that from forming from engineering plastic.
In comparison with full-loaded type ball (roller) bearing without cage, bearings with cages have less frictional resistance and suitable for rotation at a high speed.

1.2 滚动轴承的分类

1.2 Classification of rolling bearing

滚动轴承按接触角的不同，主要分为向心轴承，推力轴承，按滚动体和套圈的结构可分为深沟球轴承，调心球轴承， 角接触球轴承，推力球轴承，圆柱滚子轴承，滚针轴承，调心滚子轴承，圆锥滚子轴承，推力调心滚子轴承等。

滚动轴承按滚动体的列数，可以分为单列，双列和多列(三列、四列)，总之，滚动轴承的分类可按图1.2。

Rolling bearing is mainly divided by contact angle into radial bearing, thrust bearing, by the structure of rolling bodies and rings into deep groove ball bearing, self-aligning ball bearing, angular contact ball bearing, thrust ball bearing, cylindrical roller bearing, needle roller bearing, self-aligning roller bearing, tapered roller bearing, thrust self-aligning roller bearing, etc.
Rolling bearing is divided by rows of rolling body into single-row, double-row and multi-row (three-row, four-row) bearing. In summary, rolling bearing classification is as shown in Figure 1.2.

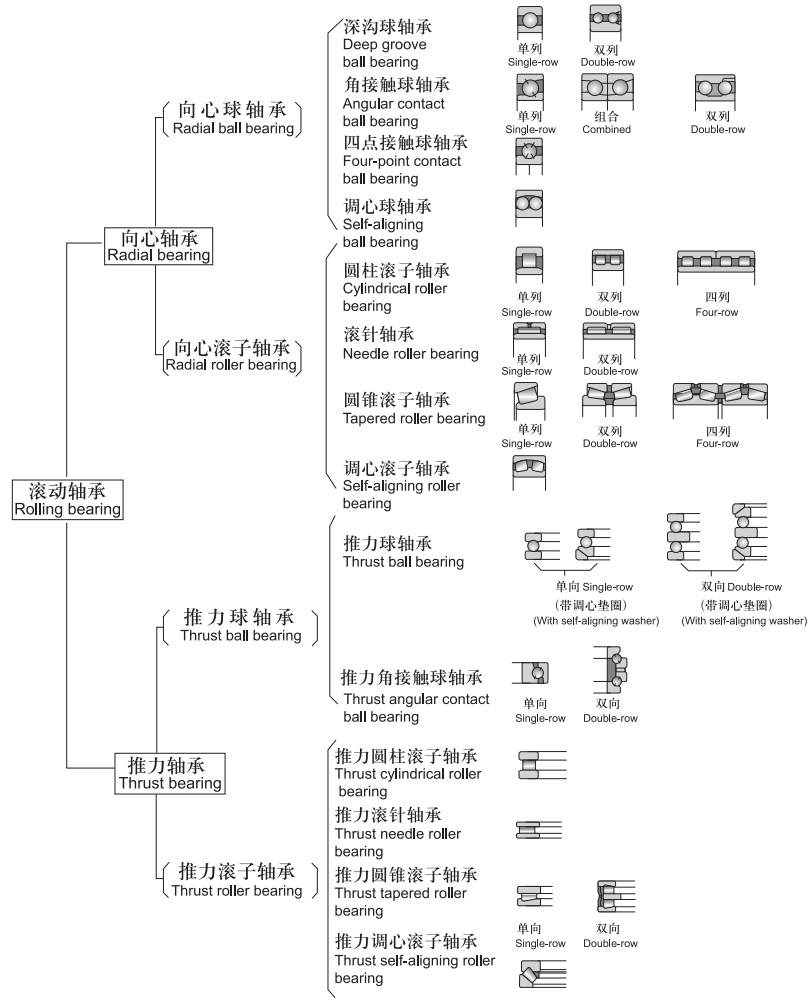


图1.2滚动轴承的分类

1.3 滚动轴承的结构特点

1.3 Structural features of rolling bearing

1.3.1深沟球轴承

1.3.1 Deep groove ball bearing

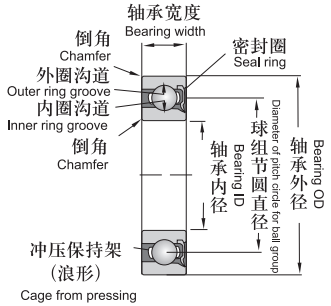
这是最具代表性的滚动轴承，用途广泛。其内外圈滚道都呈弧状沟型，可承受径向载荷与双向轴向载荷，适用于高速旋转及要求低噪声，低振动的场合。

带防尘盖和橡胶密封圈的密封型轴承内预先充填了适量的润滑脂。

带装球口的轴承，钢球数量增加，提高了额定载荷。

此类轴承广泛应用于汽车，电气，仪表，建筑机械，铁路车辆，农业机械及各种专业机械。

This is the most representative kind of rolling bearing with a wide range of applications. The raceways of both its inner and outer rings are in arc groove form capable of bearing radial load and bi-directional axial load. It is suitable for rotation at a high speed and occasions requiring low noise, low vibration.
Seal type bearing with dustproof cover and rubber seal ring is pre-filled with moderate grease.
Bearing with ball loading entrance results in increased balls and rated load.
Such bearings are widely used in automobile, electrical equipment, instrument, building machinery, rolling stock, agricultural machinery and various specialized machineries.



（无密封圈图）

(Figure for ring with no seal)

深沟球轴承

Deep groove ball bearing

●基本型

一般对安装、密封没有特殊要求的场合，均可多用此种轴承。

●外圈有止动槽深沟球轴承(–N)

可利用止动环做轴向定位，简化了在外壳内的安装。

● Basic type

Such bearing can be used in occasions with no special requirement for installation, sealing.

● Deep groove ball bearing with stop groove on outer ring

The stop ring can be used for axial positioning to simplify installation in housing.

●保持架

深沟球轴承一般采用钢板冲压保持架或黄铜实体保持架。 当外径小于等于400毫米时，采用钢板冲压保持架不加后置代号， 当外径大于等于400毫米时，多用黄铜实体保持架不加后置代号。

●允许角度误差

深沟球轴承允许内外圈相对倾斜的角度误差，按径向游隙，列表如下。

●Cage

Deep groove ball bearing usually has cage pressed from steel plate or copper solid cage. When the OD is less than or equal to 400mm, cage pressed from steel plate has no suffix. When the OD is greater than 400mm, copper solid cage is mostly used with no suffix.

●Allowed angle error

Inclination angle error between inner and outer rings is allowed for deep groove ball bearing, which is listed below by radial play:

按径向游隙 By radial play	允许角度误差 Allowed angle error
0组 Group 0	8′
3组 Group 3	12′
4组 Group 4	16′

●当量动载荷：

Equivalent dynamic load

$$P=XF_r+YF_a\ [N]$$

式中 Where

F_r：径向载荷 • N　　Fr: Radial load, N

F_a：轴向载荷 • N　　Fa: Axial load, N

X.Y系数见表 Please see the table below for coefficients X, Y

Fa/Cor	0组游隙 Play for group 0					3组游隙 Play for group 3					4组游隙 Play for group 4				
	Fa/Fr ≤e		Fa/Fr >e		e	Fa/Fr ≤e		Fa/Fr ≤e		e	Fa/Fr ≤e		Fa/Fr ≤e		e
	X	Y	X	Y		X	Y	X	Y		X	Y	X	Y	
0.025	1	0	0.56	2.0	0.22	1	0	0.46	1.74	0.31	1	0	0.44	1.42	0.39
0.04	1	0	0.56	1.8	0.24	1	0	0.46	1.61	0.33	1	0	0.44	1.36	0.41
0.07	1	0	0.56	1.6	0.27	1	0	0.46	1.46	0.36	1	0	0.44	1.27	0.44
0.13	1	0	0.56	1.4	0.31	1	0	0.46	1.30	0.41	1	0	0.44	1.17	0.46
0.25	1	0	0.56	1.2	0.37	1	0	0.46	1.14	0.47	1	0	0.44	1.05	0.53
0.5	1	0	0.56	1.0	0.44	1	0	0.46	1.00	0.54	1	0	0.44	1.00	0.56

●当量静载荷：

Equivalent static load

$Po=F_r$ [N]　　$Fa/Fr \leqslant 0.8$

$Po=0.6Fr+0.5Fa$ [N]　　$Fa/Fr > 0.8$

1.3.2 角接触球轴承

1.3.2 Angular contact ball bearing

单列角接触球轴承，在承受径向载荷时，会产生轴向分力，因此应将两个轴承背对背或面对面配置使用。

套圈与球之间有接触角，标准的接触角为15°，25°和40°接触角越大承受轴向载荷能力也越大，接触角越小则越有利于高速旋转。

单列轴承可承受径向载荷与单向轴向载荷。

双列角接触球轴承分为一个外圈两内圈和一个外圈一个内圈两种结构。

DB组合，DF组合及双列轴承可承受径向载荷与双向轴向载荷。DT组合适用于单向轴向载荷较大，单个轴承的额定载荷不足的场合。

结构上为背面组合的两个单列角接触球轴承共用内圈与外圈，可承受径向载荷与双向轴向载荷。

角接触球轴承适用于高速及高精度旋转。

此类轴承主要应用于机床主轴，高频马达，燃汽轮机，油泵，空气压缩机，印刷机械等。

Single-row angular contact ball bearing will have axial component force when bearing radial load. For this reason, two bearings should be used back to back or face to face.

A contact angle exists between rings and balls. The standard contact angles are 15, 25 and 40. The more the standard angle is, the higher the capability to bear axial load will be. The more the contact angle is, the more advantageous to rotation it will be.

Single-row bearing can bear axial load and unidirectional axial load.

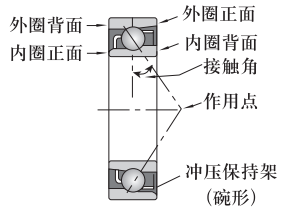
Double-row angular contact ball bearing has such two types of structure as one outer ring and two inner rings and one outer ring and one inner ring.

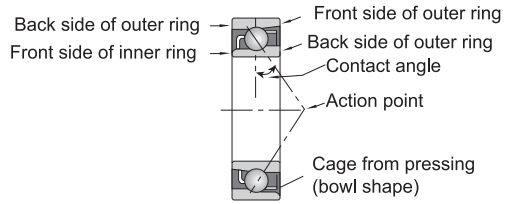
DB combination. DB combination and double-row bearing can bear radial load and bi-directional axial load. DT combination is applicable to occasions where unidirectional axial load is high and the rated load of a single bearing is not sufficient.

Two single-row angular contact bearings combined back to back in structure have common inner and outer rings, capable of bearing axial load and bi-directional axial load.

Angular contact bearing is suitable for rotation at a high speed and accuracy.

Such bearing is mainly applied to machine tool main shaft, high frequency motor, internal combustion turbine, oil pump, air compressor, printing machinery, etc.





1.3.3 四点接触球轴承

1.3.3 Four-point contact ball bearing

此类轴承主要应用于飞机喷气式发动机燃汽轮机。

可承受径向载荷与双向轴向载荷。

单个轴承可代替面对面组合或背对背组合的角接触球轴承。

适用于承受纯轴向载荷或轴向载荷成份较大的联合载荷。

该类轴承承受任何方向的轴向载荷时都能形成其中的一个接触角(α)，因此套圈与球总在任一接触线上的两点接触。

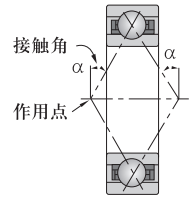
Such bearing is mainly applied to airplane jet engine and internal combustion turbine.

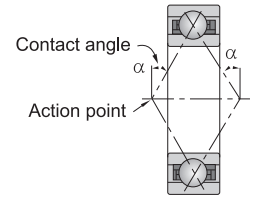
It is capable of bearing radial load and bi-directional axial load.

A single bearing can be used in place of angular contact ball bearing in back to back or face to face combination.

It is applicable to bearing shear axial load or combined load with a high axial component.

Such bearing will have a contact angle () formed when bearing axial load in any direction, therefore, rings and balls always contact with each other at two points on any contact line.





四点接触球轴承QJ000(176000)型为分离型轴承。具有双半内圈，接触角35°。QJF000(116000)型也是可分离性轴承，具有双半外圈，接触角35°。四点接触球轴承主要用于承受双向轴向载荷，在承受轴向载荷的同时亦可承受径向载荷。

成对安装角接触球轴承

成对安装角接触球轴承按其外圈端面的组合分为三类：

1.背对背配置　(DB)

2.面对面配置　(DF)

3.串联配置　　(DT)

此种轴承能承受以径向载荷为主的径、轴向联合载荷，也可以承受纯径向载荷。除串联配置外，其它配置均可承受双向轴向载荷。

一般由生产厂选配组合或成套提交用衣，安装后有预过盈。套圈和钢球处于轴向预加载荷状态，因而提高了整组轴承作为单个支承的载荷能力和刚度。

Model QJ000 (176000) four-point contact ball bearing is a separate type bearing with double half inner rings and contact angle 35, which is mainly applied to bear bi-directional axial load and capable of bearing radial load while bearing that axially.

Angular contact ball bearing installed in pairs

Angular contact ball bearing installed in pairs is divided into three categories by the outer ring end face combination:

1. Back to back configuration (DB)
2. Face to face configuration (DF)
3. Serial configuration (DT)

Such bearing can bear combined load in radial, axial directions with the radial load as the main part. It can also bear shear radial load. Besides serial configuration, other configurations can also bear bi-directional axial load.

Usually the manufacturer takes care of its combination or provides to users in full set. There will be pre-interference and the rings and steel balls in a state of axial preload after installation. As a result, the load bearing capability and rigidity are improved for a whole combination as a single support

当量动载荷 Equivalent dynamic load

接触角为15° 的单列角接触球轴承
For single-row angular contact ball bearing at a contact angle 15

单个轴承或串联配置
In case of single bearing or serial configuration

P=Fr [N]当Fa/Fr≤e

P=0.44Fr+YFa [N]当Fa/Fr>e

背对背、面对面配置
In case of back to back, face to face configuration

P=Fr+Y1Fa [N]当Fa/Fr≤e

P=0.72Fr+Y2Fa [N]当Fa/Fr>e

e、Y、Y1、Y2值见下表
Please see the table below for values of e, Y1, Y2

Fa/Cor	e	Y	Y_1	Y_2
0.015	0.38	1.47	1.65	2.39
0.029	0.40	1.40	1.57	2.28
0.058	0.43	1.30	1.46	2.11
0.087	0.46	1.23	1.38	2.00
0.12	0.47	1.19	1.34	1.93
0.17	0.50	1.12	1.26	1.82
0.29	0.55	1.02	1.14	1.66
0.44	0.56	1.00	1.12	1.63
0.58	0.56	1.00	1.12	1.63

注：Cor为单个轴承的基本额定静载荷。
Note: Cor is the basic rated static load for single bearing.

接触角为25° 的单列角接触球轴承
For single-row angular contact ball bearing at a contact angle 25

单个轴承或串联配置
In case of single bearing or serial configuration

P=Fr [N]当Fa/Fr≤0.68

P=0.41Fr+0.87Fa [N]当Fa/Fr>0.68

背对背、面对面配置
In case of back to back, face to face configuration

P=Fr+0.92Fa [N]当Fa/Fr≤0.68

P=0.67Fr+1.41Fa [N]当Fa/Fr>0.68

接触角为40° 的单列角接触球轴承
For single-row angular contact ball bearing at a contact angle 25

单个轴承或串联配置
In case of single bearing or serial configuration

P=Fr [N]当Fa/Fr≤1.14

P=0.35Fr+0.57Fa [N]当Fa/Fr>1.14

背对背、面对面配置
In case of back to back, face to face configuration

P=Fr+0.55Fa [N]当Fa/Fr≤1.14

P=0.57Fr+0.93Fa [N]当Fa/Fr>1.14

四点接触球轴承
For four-point contact ball bearing

P=Fr+0.66Fa [N]当Fa/Fr≤0.95

P=0.6F+1.07Fa [N]当Fa/Fr>0.95

双列角接触轴承
For double-row angular contact ball bearing

P=Fr+0.78Fa [N]当Fa/Fr≤0.8

P=0.63Fr+1.24Fa [N]当Fa/Fr>0.8

当量静载荷
Equivalent static load

接触角为15° 的单列角接触球轴承
For single-row angular contact ball bearing at a contact angle 15

单个轴承或串联配置
In case of single bearing or serial configuration

Po=0.5Fr+0.46Fa [N]

当Po<Fr 取Po=Fr

背对背、面对面配置
In case of back to back, face to face configuration

Po=Fr+0.92Fa [N]

接触角为25° 的单列角接触球轴承
For single-row angular contact ball bearing at a contact angle 25

单个轴承或串联配置
In case of single bearing or serial configuration

Po=0.5Fr+0.38Fa [N]

当Po<Fr 取Po=Fr

背对背、面对面配置
In case of back to back, face to face configuration

Po=Fr+0.76Fa [N]

接触角为40° 的单列角接触球轴承
For single-row angular contact ball bearing at a contact angle 40

单个轴承或串联配置
In case of single bearing or serial configuration

Po=0.5Fr+0.26Fa [N]

当Po<Fr 取Po=Fr

背对背、面对面配置
In case of back to back, face to face configuration

Po=Fr+0.52Fa [N]

四点接触球轴承
For four-point contact ball bearing

Po=Fr+0.58Fa [N]

双列角接触球轴承
For double-row angular contact ball bearing

Po=Fr+0.66Fa [N]

两套或两套以上单列角接触球轴承安装在一起作为一个支承整体时，其基本额定动载荷为 $i^{0.7}\times Cr$，基本额定静载荷为 $i\times Cor$(其中 i 为支承整体中单个轴承数； C、Cor为单个轴承的基本额定载荷)。极限转速为单列轴承的60%～80%。

When two or more sets of single-row angular contact ball bearing are installed together as an overall support, the basic rated dynamic load is i0.7Cr, the basic rated static load iCr (where i is the number of single bearings in the over support and Cor is the basic rated load of a single bearing). The rotation speed limit is equivalent to 60%~80% of that of a single bearing.

1.3.4 调心球轴承
1.3.4 Self-aligning ball bearing

由于外圈滚道面呈球面，具有调心性能，因此可自动调整因轴或外壳的挠曲或不同心引起的轴心不正。

As the outer ring raceway is of spherical surface with self-aligning feature, it can adjust automatically axial center misalignment as a result of shaft or housing deflection or non-concentricity.

当量动载荷 Equivalent dynamic load

$P=Fr+Y_1Fa$ [N] 当Fa/Fr≤e时

$P=0.65Fr+Y_2Fa$ [N] 当Fa/Fr>e时

Y_1，Y_2和e值列在轴承尺寸表中。
Values of Y1, Y2 and e are shown in the bearing dimension table.

当量静载荷 Equivalent static load

$Po=Fr+Y_oFa$ [N]

Yo值列在轴承尺寸表中。
Values of Y0 are shown in the bearing dimension table.

1.3.5 圆柱滚子轴承
1.3.5 Cylindrical roller bearing

圆柱滚子与滚道呈线接触，承受径向载荷能力大，既适用于承受重载荷与冲击载荷，也适用于高速旋转。

N型及NU型可轴向移动，能适应因热膨胀或安装误差引起的轴与外壳相对位置的变化，最适合用作自由端轴承。

NJ型及NF型可承受一定程度的单向轴向载荷NH型及NUP型可承受一定程度的双向轴向载荷。

内圈或外圈可分离，便于装拆。

NNU型及NN型抗径向载荷的刚性强，大多用于机床主轴。

For cylindrical roller bearing, the cylindrical rollers are in linear contact with the raceway, with a high capability to bear radial load, which is suitable for both heavy load and high-speed rotation.

Type N and NU can move axially and be adaptable to change in the relative position between shaft and housing as a result of thermal expansion or installation error, which is best as bearing at free end.

Type NJ and NF can bear certain degree unidirectional axial load. Type NH and NUP can bear certain degree bi-directional axial load.

Inner ring or outer ring is separable to facilitate assembly and disassembly.

Type NNU and NN has a high rigidity to resist radial load, which are mostly used for machine tool main shaft.

FC.FCD.FCDP.型可承受较大径向载荷，主要用于轧机轧辊上。

此类轴承主要用于中型及大型电动机、发电机、内燃机、燃汽轮机、机床主轴、减速装置、装卸搬运机械，各类产业机械。

单列圆柱滚子轴承

NU型和N型允许轴相对于外壳在一定范围内做轴向移动，因此适合于作自由端轴承。

NJ型和NF型可承受一定程度的单向轴向载荷。

NUP型和NFP型可承受一定程度的两个方向的轴向移动，因此适合于作自由端轴承。

双列圆柱滚子轴承

双列圆柱滚子轴承分圆柱孔和圆锥孔两种。

另外还有外圈带油孔和油槽的轴承。

该类轴承大多用于机床主轴，但也可用于其他场合。

四列圆柱滚子轴承

四列圆柱滚子轴承能承受很大的径向载荷和冲击载荷，加工精度高，适用于高速。大多应用于轧机的轧辊上，但也可用于其它场合。

Type FC, FCD, FCDP can bear high radial load and are mainly used on rollers of rolling machines. Such bearings are mainly for medium and large motors, generators, internal combustion engines, machine tool main shafts, speed reducers, loading, unloading and handling machineries, various industrial machineries.

Type NU and N allow shaft to move axially within certain range in relation to housing and are therefore suitable for bearing at free end.

Type NJ and NF can bear certain degree unidirectional axial load.

Type NUP and NFP can bear certain degree bi-directional axial movement and are therefore suitable for bearing at free end.

Double-row cylindrical roller bearing

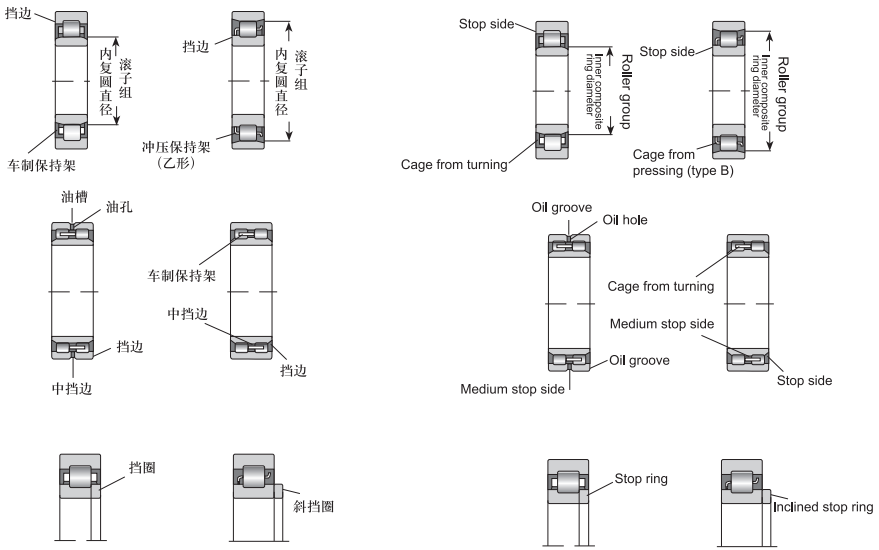
Double-row cylindrical roller bearing is divided into such two types as with cylindrical hole and conical hole.

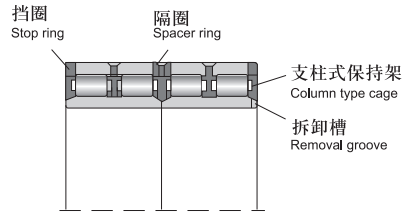
Besides, there are also bearings with outer rings with oil holes and oil grooves.

Such bearings are mostly used on machine tool main shaft and also in other occasions.

Four-row cylindrical roller bearing

Four-row cylindrical bearing can bear high radical load and impact load with a high working accuracy, being suitable for high speed. They are mostly used on rollers of rolling machines and also in other occasions.





当量动载荷： Equivalent dynamic load

P=Fr+YFa [KN]当Fa/Fr≤e时

P=0.67Fr+YFa [KN]当Fa/Fr>e时

Y和e值请咨询光扬轴承

Please consult Guangyang Bearing for values of Y and e.

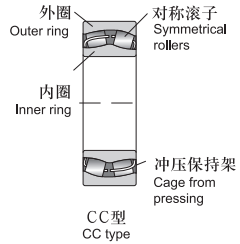
当量静载荷： Equivalent static load

Po=Fr+YoFa [KN]Yo值请咨询光扬轴承

[KN] Please consult Guangyang Bearing for values of Y0

1.3.6 调心滚子轴承

1.3.6 Self-aligning roller bearing



该类轴承在球面滚道外圈与双滚道内圈之间装有球面滚子。

由于外圈滚道的圆弧中心与轴承中心一致，具有调心性能，因此可自动调整因轴或外壳的挠曲或不同心引起的轴心不正。

可承受径向载荷与双向轴向载荷。特别是径向载荷能力大，适用于承受重载荷与冲击载荷。

圆锥孔轴承通过使用紧固件或退卸套可便于轴上的装拆。

圆锥孔有以下两种锥度

1:30(辅助代号：K30)：适用于24000.24100系列。

1:12(辅助代号:K)：适用于其他系列。

带锥孔的轴承主要通过紧定套或退卸套固定于轴上。

调心滚子轴承在正常载荷及工作条件，内圈转动时，容许存在表中给出的角度偏差。能否完全达到此给定值须依轴承配置的设计及密封类型等条件决定。

Such bearing is installed with spherical rollers between the outer ring for spherical raceway and the inner ring for double raceway.

As the arc center of outer ring raceway coincides with bearing center, having aligning feature, it can adjust automatically axial center misalignment as a result of shaft or housing deflection or non-concentricity.

It is capable of bearing axial load and bi-directional axial load. Especially, the radial load bearing capability is so high that it can bear heavy load and impact load.

Mounting onto and removal from shaft are facilitated for bearing with conical hole by using fasteners or withdrawal sleeve.

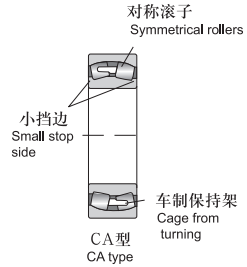
Conical hole has the following two tapers:

1:30 (auxiliary designation: K30): suitable for series 24000, 24100.

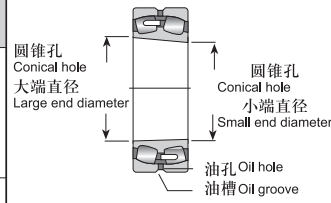
1:12(auxiliary designation: K): suitable for other series.

Bearing with conical hole is secured onto shaft through adapter sleeve or withdrawal sleeve.

Angle deviations as shown in the table below are allowed for self-aligning roller bearing as inner ring rotates under normal load and working conditions. Whether these given values can be attained is determined based on such conditions as bearing configuration design, seal type, etc.



轴承系列 Bearing series		允许角度偏差（不超过）
现代号 Current designation	原代号 Original designation	Allowed angle deviation (not beyond)
23000 23100 22200 23900	3003100 3003700 3500	1.5°
22300 24000	3600	2°
23200 24100	3003200	2.5°



1.3.7 圆锥滚子轴承

1.3.7 Tapered roller bearing

圆锥滚子轴承的内、外圈具有锥形滚道，滚道之间装有锥形滚子。若将锥形面延伸，最终会聚于轴承轴线上一点。圆锥滚子轴承主要用于承受以径向载荷为主的径向、轴向联合载荷。轴承的轴向承载能力由接触角α决定、α越大，轴向承载能力越大。圆锥滚子轴承为分离型轴承、带滚子和保持架的内圈构成内组件，能与外圈分开安装。

The inner ring and outer ring of tapered roller bearing have tapered raceway, and between tapered raceway mounted tapered roller. If stretching the conical surface, they will focus on a point on the bearing axis. Tapered roller bearing is mainly used for carrying radial and axial combined load which is mainly radial load. The axial load carrying capacity of bearing is determined by contact angle α, the bigger α is, the bigger axial load carrying capacity is. Tapered roller bearing is a separable bearing; inner assembly is consisted of inner ring with roller and cage, which can be mounted with outer assembly separably.

ZWA生产公制、英制的单、双、四列圆锥滚子轴承结构型式

单列圆锥滚子轴承

此种轴承只能限制轴或外壳的一个方向的轴向位移，承受一个方向的轴向载荷。在径向载荷的作用下，轴承内产生的轴向力亦须加以平衡。应将两个轴承面对面或背对背配置使用。

双列圆锥滚子轴承

此种圆锥轴承在承受径向载荷的同时可承受双向轴向载荷。可在轴承的轴向游隙范围内限制轴或外壳的双向轴向位移。

四列圆锥滚子轴承

此种轴承的性能与双列圆锥滚子轴承基本相同，但比双列圆锥滚子轴承承受的径向载荷更大，极限转速稍低，主要用于重型机械，如轧钢机等。

保持架

圆锥滚子轴承一般采用钢板冲压，筐形保持架，但尺寸较大时，亦采用车制实体支柱保持架。

ZWA manufacture metric system and British system single row, double row and four row tapered roller bearing units structure.

Single row tapered roller bearing

The bearing can only limit one direction axial displacement of axis or case shell and carry one direction axial load. With the radial load action, the axial force produced inside bearing should be balanced. Two bearing should be face-to-face amounting or back-to-back amounting.

Double row tapered roller bearing

The tapered bearing can carry radial load as well as bidirectional axial load, and can limit bidirectional axial displacement of axis or case shell within the axial clearance of bearing.

Four row tapered roller bearing

The bearing's feature is mostly the same as double tapered roller bearing, but can carry more radial load than double row tapered roller bearing, lower limit rotation rate. Mainly be used in heavy machinery, such as roll mill.

Cage

Tapered roller beating generally use die stamping steel plate basket cage, also can use machined solid cage if its dimension is bigger.

允许角度误差

圆锥滚子轴承一般不允许轴相对外壳孔有倾斜，如有倾斜，最大不得超过 2 ′。

游隙

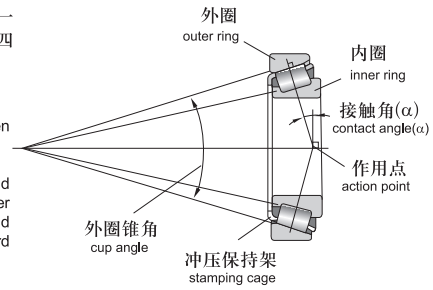
单列圆锥滚子轴承仅在安装后才有游隙，并在用另一个以相反方向定位的轴承进行调节后才能确定。双列和四列圆锥滚子轴承游隙可根据用户要求按相应标准提供。

Allowable angle error

Tapered roller beating generally is inadmissibility inclination between axis and case shell hole. If there is, can't be bigger than 2'.

Clearance

Only after arrangement single row tapered roller beating could appear clearance, and should be determined after adjusted by another right-about localization bearing. The clearance of double row and four row tapered roller bearing can be provided with relevant standard according to the requirement of the customers.



当量动载荷

Equivalent dynamic load

P=Fr [N]Fa/Fr≤e

P=0.4Fr+YFa [N]Fa/Fr>e

单列圆锥滚子轴承成对使用时(基本外形尺寸可不同)，在计算轴承的当量动载荷时，必须计入径向载荷引起的附加轴向力，单列圆锥滚子轴承的附加轴向力S， 可近似按下式计算：

As to paired mounting single row tapered roller bearing (basic boundary dimension could be deference), when calculate the equivalent dynamic load of bearing, must calculate the additive axial force caused by radial load. The additive axial force s of single row tapered roller bearing can be approximately calculated by below formula.

$$S=\frac{Fr}{2Y}$$

双列和四列圆锥滚子轴承

Double row and four row tapered roller bearing

$P=Fr+Y_1Fa$ [N] $Fa/Fr\leqslant e$

$P=0.67Fr+Y_2Fa$ [N] $Fa/Fr>e$

当量静载荷 Equivalent weight static load

单列圆锥滚子轴承 Single row tapered roller beating

$Po=0.5Fr+YoFa$ [N]

若Po＜Fr则取Po=Fr

双列和四列圆锥滚子轴承

Double row and four row tapered roller bearing

$Po=Fr+YoFa$ [N]

Fr和Fa均指作用于单列，双列和四列轴承上的总载荷。

Both Fr and Fa are total load act on single row, double row and four row tapered roller bearing.

计算系数e、Y、Y_1、Y_2、Yo列在轴承尺寸表中。

Calculation factor such as e, Y, Y1, Y2, Yo are list in bearing dimension table.

该类轴承还有英制系列产品。

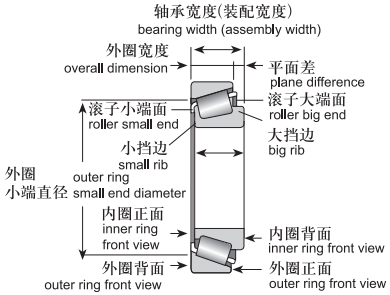
This type of bearing has British system series product.

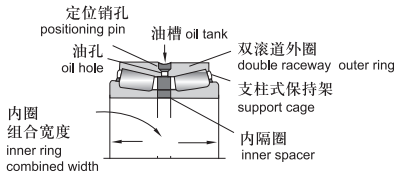
该类轴承主要用途：

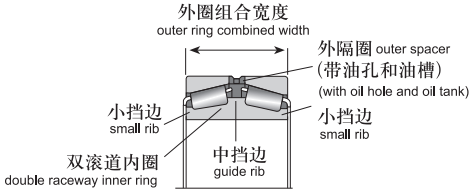
This type of bearing mainly be used in:

汽车前轮、后轮、变速器、差速器、小齿轮轴，机床主轴，建筑机械，大型农业机械，铁路车辆齿轮减速装置，轧钢机辊颈小减速装置。

Auto fore wheel, rear wheel, transmission gear, differential gear, pinion shaft, machine tool chief axis, construction equipment, large scale agricultural machinery, railway vehicle speed reducer gear, roll neck mini speed reducer gear of roll mill, etc.





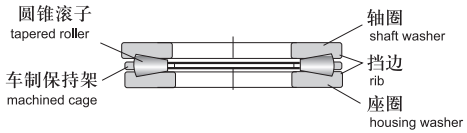


1.3.8 推力圆锥滚子轴承

1.3.8 Thrust tapered roller bearing

该类轴承装有锥形滚子(大端为球面)，滚子由滚道圈(轴圈、座圈)挡边准确引导。
设计上使得轴圈和座圈滚道面以及滚子滚动面的各圆锥面的顶点相交于轴承中心线上的一点。
单向轴承可承受单向轴向载荷。
双向轴承可承受双向轴向载荷。
双向轴承将中圈与轴配合，但由于采用间隙配合， 因此必须用轴套等使中圈轴向定位。
此类轴承主要用途：
单向：起重机吊钩，石油钻机转环。
双向：轧钢机辊颈。

This kind of bearing is equipped with tapered roller(bigger end is spherical)Its roller is led via rib of raceway ring(shaft washer housing washer).
Design is made to the extent that cones of shaft washer, housing washer raceway and roller surface are intersected at one point of bearing central line.
Single row bearing can bear single row axial load.
Double row bearing can bear double row axial load.
Double row bearing is used to fit central washer for shaft. While, clearance remains here, shaft sleeve must be used to axially position central washer.
Main application of bearing
single row:crane shackle, swivel of oil drilling machine
double row:roller neck of rolling mill



1.3.9 推力调心滚子轴承

1.3.9 Thrust self-aligning roller bearing

该类轴承滚子为球面型，由于座圈滚道面呈球面， 具有调心性能。
轴向载荷能力非常大，在承受轴向载荷的同时还可承受若干径向载荷。
推力调心滚子轴承能同时承受轴向和径向载荷，但径向载荷不得超过轴向载荷的55%，这种轴承具有自动调心性能，因此，对同轴度和轴的挠曲不甚敏感。
只要载荷P和Po不超过0.05Co，且轴圈旋转，则轴承允许下表所列的调心角。

Roller of this kind of bearing roller is spherical. Because housing washer raceway is spherical, it functions self-aligning.
Featuring high capability to bear axial load, this bearing can bear axial load as well as several radial loads at any time.
Thrust self-aligning roller bearing can bear axial and radial load, but radial load can not less than 55% of axial load . This bearing functions self-aligning. Thus, it is not sensitive to coaxality and shaft deformation.
If load P and P0 doesn't exceed 0.05Co, and shaft washer rotate normally*bearing can be adjusted with self-aligning angle in the following table:

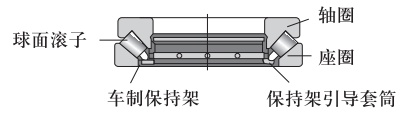
轴承直径系列 Bearing diameter series	调心角 self-aligning angle
200系列 200series	1° ～1.5°
300系列 300series	1.5° ～2°
400系列 400series	2° ～3°

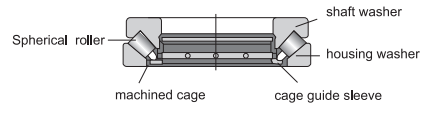
小的数值适用于较大的轴承，而且载荷增大时允许的调心角将会减小。
使用时一般采用油润滑。

Small value is applicable for bigger sized bearing. Allowed self-aligning angle decreases when load increases.
When in operation, lubricant is used generally.

该类轴承主要应用于水力发电机，立式电动机，船舶用螺旋桨轴，塔吊，挤压机等。

This kind of bearing is mainly used for hydro generator, vertical motor, helix marine shaft, tower crane and extrusion machine etc





1.3.10 推力圆柱滚子轴承
1.3.10 Cylindrical roller thrust bearing

由垫圈形滚道圈(轴圈、座圈)与圆柱滚子和保持架组件构成。圆柱滚子采用凸面加工，因此滚子与滚道面之间的压力分布均匀。
可承受单向轴向载荷。
轴向载荷能力大，轴向刚性也强。

Cylindrical roller thrust bearing is consisted of washer raceway (shaft washer, house washer) , cylindrical roller and cage assembly. After crowing workmanship on cylindrical roller, the distribution of pressure between roller and surface of raceway is uniformity.
The bearing can carry one-way axial load.
Big axial load carrying capacity, and strong axial stiffness.

当量动载荷
推力圆柱滚子轴承
P=Fa

Equivalent weight dynamic load
Cylindrical roller thrust bearing
P=Fa

推力调心滚子轴承
P=Fa+1.2Fr

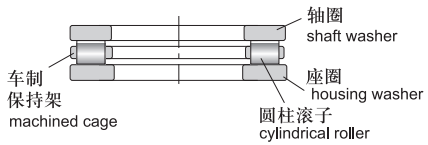
Cylindrical roller self-aligning thrust bearing
P=Fa+1.2Fr

当量径载荷
推力圆柱滚子轴承
Po=Fa

Equivalent weight static load
Cylindrical roller thrust bearing
Po=Fa

推力调心滚子轴承
Cylindrical roller self-aligning thrust bearing
Po=Fa+2.7Fr

该类轴承主要应用于石油钻机，制铁制钢机械。
This type bearing is mainly used in oil well rig, iron and steel manufacture machinery.



2 轴承的主要尺寸与代号
2 Main dimension and scale of bearing

2.1 主要尺寸
2.1main dimension

轴承的主要尺寸，是指表示外形轮廓的轴承内径、外径、宽度或高度和倒角尺寸等，是轴承在轴上及外壳内安装时的必需尺寸。

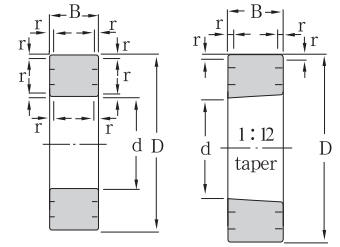
这些主要尺寸已由国际标准(ISO15)标准化了，GB307(滚动轴承的主要尺寸)也是以ISO标准为基准制定的。

国家标准中按向心轴承(圆锥滚子轴承另行规定)和推力轴承的型式分别对主要尺寸做了规定，具体轴承的尺寸都列于后面的产品目录中。

Main dimension of bearing indicate the bearing bored diameter, outer diameter, width, height and chamfer dimension, etc. of boundary profile, which is the required dimension when mounting bearing on shaft or inside case shell.
The main dimension is standardized by international standard (ISO15) , GB307 (roller bearing main dimension) is also established basic on ISO standard.
National standard specified separately the main dimension of radial bearing (tapered roller bearing specified separately) and thrust bearing, dimension of specific bearing list in follow product summary.

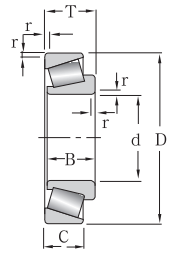
(1)向心轴承
(圆锥滚子轴承除外)
向心轴承
(圆锥滚子轴承除外)
d:轴承公称内径
D:轴承公称外径
B:轴承公称宽度
r:内圈及外圈倒角尺寸

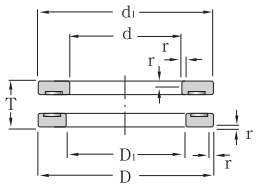
(1)Radial bearing
(exclusive tapered roller bearing)
Radial bearing
(exclusive tapered roller bearing)
d:bearing nominal bore diameter
D:bearing nominal outer diameter
B:bearing nominal width
r:chamfer dimension of inner ring and outer ring

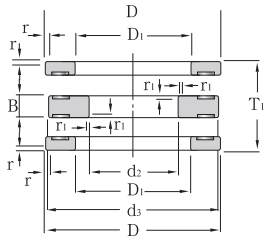


(2)圆锥滚子轴承
圆锥滚子轴承
d:轴承公称内径
D:轴承公称外径
T:轴承公称宽度(装配宽度)
B:内圈公称宽度
C:外圈公称宽度
r:内圈及外圈倒角尺寸

(2)Tapered roller bearing
Tapered roller bearing
d: bearing nominal bore diameter
D: bearing nominal outer diameter
T: bearing nominal width (mounting width)
B: inner ring nominal width
C: outer ring nominal width
r: chamfer dimension of inner ring and outer ring







(3)推力轴承(单向、双向)

(3)Thrust bearing(single row、double row)

推力轴承(平面座圈型)

Thrust bearing (plane housing washer model)

d:轴圈公称内径

d: shaft washer nominal bore diameter

d_1:轴圈公称内外径2)

d1: shaft washer nominal bore/outer diameter2)

d_2:中圈公称内径

d2: central washer nominal inner diameter

d_3:中圈公称外径2)

d3: central washer nominal bore/outer diameter2)

D:座圈公称外径1

D: housing washer nominal outer diameter1

D_1:座圈公称内径1)

D1: housing washer nominal outer diameter1)

T:单向轴承公称高度

T: single row bearing nominal height

T_1:双向轴承公称高度

T1: double row bearing nominal height

B:中圈高度

B: central washer height

r:轴圈及座圈倒角尺寸1)

r: shaft washer and housing washer chamferDimension1)

r1:中圈倒角尺寸1)

r1:central washer chamfer dimension 1)

[注] (Note)

1)轴承尺寸表列出的是最小值

1) Value list in bearing dimension table is minimum value

2)轴承尺寸表列出的是最大值

2) Value list in bearing dimension table is maximum value

[公称型号示例]

[Nominal model sample]

(例1) (Sample 1)

62 10-2Z/C2

- 62: 轴承系列代号(尺寸系列02的单列深沟球轴承) Bearing series code (dimension series 02 of single row deep groove ball bearing)
- 10: 内径型号(轴承公称内径50mm) Inner diameter model (bearing nominal inner diameter 50mm)
- 2Z: 密封种类代号(双侧带防尘盖) Seal species code (double side with shield)
- C2: 轴承游隙代号(C2游隙) Bearing clearance code (C2 clearance)

(例2) (sample 2)

72 10 C/DT P5

- 72: 轴承系列代号(尺寸系列02的单列角接触球轴承) Bearing series code (dimension series 02 of single row deep groove ball bearing)
- 10: 内径型号(轴承公称内径50mm) Inner diameter model (bearing nominal inner diameter 50mm)
- C: 接触角代号(公称接触角15°) Contact angle code (nominal contact angle 15°)
- DT: 组合代号(串联组合) Assembly code(tandem assembly)
- P5: 精度等级代号(5级) Accuracy class (class 5)

2.2 轴承代号

2.2 Bearing code

轴承的代号表示轴承的结构型式、主要尺寸、旋转精度、内部游隙等，它由基本代号、前置代号和后置代号构成。

ZWA还使用GB规定以外的后置代号。

表2.1表示基本代号中的轴承系列代号，图2.1表示轴承代号的构成和前置代号、后置代号的定义。

Code of bearing indicates the construction type of bearing, main dimension, rotary accuracy , internal clearance, etc, it is consisted of basic code, advanced code and postposition code.

ZWA also use postposition code beyond GB specified.

Sheet 2.1 indicates bearing series code of basic code, diagram 2.1 indicates the construction of bearing code and the definition of advanced code, postposition code.

(例3) (sample 3)

NU3 28 E/C3 P6

- NU3: 轴承系列代号(尺寸系列03单列圆柱滚子轴承) Bearing series code (dimension series 03 of single row cylindrical roller bearing)
- 28: 内径型号(轴承公称内径140mm) Inner diameter model (bearing nominal inner diameter 140mm)
- E: 内部结构代号(加强型) Interior structure code (intensify tape)
- C3: 轴承游隙代号(C3游隙) Bearing clearance code (C3 clearance)
- P6: 精度等级代号(6级) Accuracy class(class 6)

(例4) (sample 4)

320 05/HA P6X

- 320: 轴承系列代号(尺寸系列20的单列圆锥滚子轴承) Bearing series code (dimension series 20 of single row tapered roller bearing)
- 05: 内径型号(轴承公称内径25mm) Inner diameter model (bearing nominal inner diameter 25mm)
- HA: 材料代号(真空脱气轴承钢) Material code(vacuum degassing bearing steel)
- P6X: 精度等级代号(6X级) Accuracy class (class 6X)

(例5) (sample 5)

232/500 CA K C4 F3

- 232: 轴承系列代号(尺寸系列32的调心滚子轴承) Bearing series code (dimension series 32 of self-aligning roller bearing)
- 500: 内径型号(轴承公称内径500mm) Inner diameter model (bearing nominal inner diameter 500mm)
- CA: 内部结构代号(对称球面滚子) Interior structure code (symmetry ball roller)
- K: 套圈形状代号(圆锥孔内圈锥度1:12) Ring shape code (taper of conical bore inner ring taper 1:1.2)
- C4: 轴承游隙代号(C4游隙) Bearing clearance code (C4 clearance)
- F3: 保持架材料代号(球墨铸铁) Cage material code(ductile cast iron)

(例6) (sample 6)

512 16

- 512: 轴承系列代号(尺寸系列12的单向推力球轴承) Bearing series code (dimension series 12 of one-way thrust ball bearing)
- 16: 内径型号(轴承公称内径80mm) Inner diameter model(bearing nominal inner diameter 80mm)

表2.1 轴承系列代号
Sheet 2.1 bearing series code

轴承型式 Bearing model	轴承系列代号 Bearing series code	类型代号 Type code	尺寸系列代号 Dimension series code
单列深沟球轴承 Single row deep groove ball bearing	618	6	18
	619	6	19
	160	6	(0)0
	60	6	(1)0
	62	6	(0)2
	63	6	(0)3
	64	6	(0)4
双列 深沟球轴承(有装填槽) Double row deep groove ball bearing (with filing slot)	42	4	(2)2
	43	4	(2)3
单列角接触球轴承 Single row angular contact ball bearing	719	7	19
	70	7	(1)0
	72	7	(0)2
	73	7	(0)3
	74	7	(0)4
双列 角接触球轴承(有装填槽) Double row angular contact ball bearing (with filing slot)	32		32
	33		33
四点接触球轴承 Four point angular contact ball bearing	QJ2	QJ	(0)2
	QJ3		(0)3
调心球轴承 Self- aligning ball bearing	12	1	(0)2
	22	(1)	22
	13	1	(0)
	23	(1)	23
单列圆柱滚子轴承 Single row cylindrical roller bearing	NU10	NU	10
	NU2	NU	(0)2
	NU22	NU	22
	NU32	NU	32
	NU3	NU	(0)3
	NU23	NU	23
	NU4	NU	(0)4
双列圆柱滚子轴承 Double row cylindrical roller bearing	NNU49	NNU	49
	NN30	NN	30

轴承型式 Bearing model	轴承系列代号 Bearing series code	类型代号 Type code	尺寸系列代号 Dimension series code
圆锥滚子轴承 Tapered roller bearing	329	3	29
	320	3	20
	330	3	30
	331	3	31
	302	3	02
	322	3	22
	332	3	32
	303	3	03
	313	3	13
	323	3	23
调心滚子轴承 Self-aligning roller bearing	239	2	39
	230	2	30
	240	2	40
	231	2	31
	241	2	41
	222	2	22
	232	2	32
	213	2	03
	223	2	23
单向 平面座圈型推力球轴承 Single row plane housing washer type thrust ball bearing	511	5	11
	512	5	12
	513	5	13
	514	5	14
单向 调心座圈型推力球轴承 Single row selfaligning housing washer type thrust ball bearing	532	5	32
	533	5	33
	534	5	34
双向 平面座圈型推力球轴承 Bidirection plane housing washer type thrust ball bearing	522	5	22
	523	5	23
	524	5	24
双向 调心座圈型推力球轴承 Double row self aligning housing washer type) thrust ball bearing	542	5	42
	543	5	43
	544	5	44
推力调心 滚子轴承 Thrust self-aligning roller bearing	292	2	92
	293	2	93
	294	2	94

[注] (Note)

1) 表示的宽度系列代号在轴承系列代号中省略。
1) indicates the width series code which omitted in bearing series code

2) 圆柱滚子轴承
除NU型外，还有NJ、NUP、N、NF、NH各型。
2) Besides tape NU, cylindrical roller bearing also includes tape NJ, NUP, N, NH。

图2.1 ZWA轴承代号

3 轴承的精度

3.1 轴承的精度与等级

滚动轴承的精度分(主要)尺寸精度与旋转精度。
精度等级已标准化，分为0级、6X级、P6级、P5级、P4级、P2级六个等级。

精度从0级起依次提高，对于一般用途0级已足够，但在用于表3.1所示条件或场合时，需要5级或更高的精度。

以上的精度等级虽然是以ISO标准为基准制定的， 但其称呼在各国标准中有所不同。

3. Bearing accuracy

3.1 Bearing accuracy and grade

Accuracy of roller bearing is described (mainly) by dimensional accuracy and rotary accuracy .
Accuracy grade has been standardized, described by grade 0, grade 6X, grade P6, grade P5, grade P4 and grade P2 totally 6 grades.
Accuracy increases progressively from grade 0, grade 0 is enough for general use, but in case to condition and situation which list in sheet 3.1, it needs grade 5 or higher grade accuracy 。
Although accuracy grade above are specified basic on ISO standard, its designation may be various in each country's standard.

Diagram 2.1 ZWA bearing code

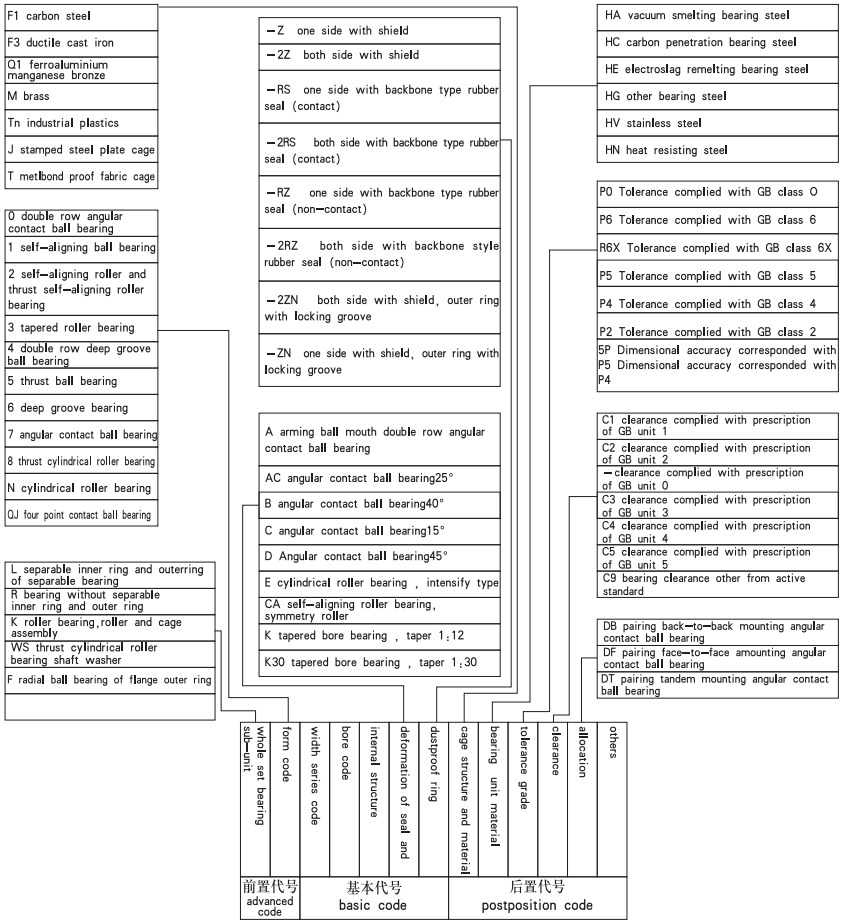


表3.2列出了各种轴承型式所适用的精度等级。
尺寸精度(与轴及外壳安装有关的项目)
内径、外径、宽度及装配宽度的允许偏差
滚子组内复圆直径及外复圆直径的允许偏差
倒角尺寸的允许界限值
宽度的允许变动量
圆锥孔的允许偏差和允许变动量

旋转精度(与旋转体跳动有关的项目)
内圈及外圈的允许径向跳动和轴向跳动
内圈的允许横向跳动
外径面倾斜度的允许变动量
推力轴承滚道厚度的允许变动量
各类轴承的尺寸精度与旋转精度如表4-1～4-19所示。
倒角尺寸界限值如表4-20～4-21所示。

Sheet 3.2 list the accuracy grade applied to different forms of bearing type
Dimensional accuracy (article relevant to shaft and case shell mounting)
Permissible variation of inner diameter, outer diameter, width and assembly width
Permissible variation of roller unit interior barysphere diameter and exterior barysphere diameter
Permissible limit value of chamfer dimension
Permissible variant of width
Permissible variation and permissible variant of tapered bore
Rotary accuracy (article relevant to rotary body runout)
Permissible radial runout and axial runout of inner ring and outer ring
Permissible horizontal runout of inner ring
Permissible variant of outer diameter surface gradient
Permissible thickness variant of thrust bearing raceway
Dimensional accuracy and rotary accuracy to different forms of bearing described from sheet 4-1 to sheet 4-19. Limit value of chamfer dimension described from sheet 4-10 to sheet 4-21.

表3.1精度轴承用例 Sheet 3.1 Sample of accuracy bearing

性能要求 Performance requirement	用例 sample		适用精度等级 Accuracy grade applied
要求旋转体具有高跳动精度 High requirement of rotary body runout accuracy	音响，影像机器主轴(录像机，录音机)	Sounding, chief axis of video machine (video recorder, sound recorder)	P5,P4
	雷达，抛物面天线转轴	Radar, shaft of parabolic antenna	P4
	机床主轴	Chief axis of machine tool	P5,P4,P2,ABEC9
	电子计算机，磁盘主轴	Electronic computer, chief axis of disc	P5,P4,P2,ABEC9
	铝箔辊颈	Aluminum foil journal	P5
	多级轧钢机支承轴承	Multilevel steel rolling block bearing	P4
高速旋转 Highrate rotary	增强器	enhancer	P5,P4
	喷气式发动机主轴，辅机	chief axis of jet engine, assisting locomotive	P5,P4
	离心分离机	centrifugal separator	P5,P4
	液化天然气泵	LNG pump	P5
	涡轮分子泵主轴，保护轴承	Chief axis of turbo molecular pump, safeguard bearing	P5,P4
	机床主轴	Chief axis of machine tool	P5,P4,P2,ABEC9
	张紧轮	Tension pulley	P5,P4
要求摩擦及摩擦变化小 Less attrite and less variation of attrite required	控制机器(同步马达、伺服马达，陀螺万向架)	Controlling machine(synchronous motor, actuating motor, whirligig gimbal mount)	P4,ABMA 7P
	计量仪表	Metering device	P5
	机床主轴	Chief axis of machine tool	P5,P4,P2,ABEC9

表3.2轴承类型与适用精度等级
Sheet 3.2 Forms of bearing type and accuracy grade applied to each other

轴承型式 bearing type		适用标准 applied standard	适用精度等级 applied accuracy grade						参照表 reference sheet
深沟球轴承 deep groove bearing		GB307	0级	–	6级	5级	4级	2级	
角接触球轴承 Angular contact ball bearing			0级	–	6级	5级	4级	2级	
调心球轴承 self-aligning ball bearing			0级	–	–	–	–	–	表3.3
圆柱滚子轴承 cylindrical roller bearing			0级	–	6级	5级	4级	2级	
圆锥滚子轴承 tapered roller bearing	公制系列(单列) meter series(single row)	GB307	0级	6X级	6级	5级	4级	–	表3.4
	公制系列(双列、四列) meter series(double row four row)	SB/T53419-94	0级	–	–	–	–	–	
	英制系列 British series	SB/CO/T10-89	Class4	–	Class2	Class3	Class0	Class00	
调心滚子轴承 self-aligning roller bearing		GB307	0级	–	–	–	–	–	表3.3
推力球轴承 thrust ball bearing			0级	–	6级	5级	4级	–	表3.5
推力调心滚子轴承 thrust self-aligning roller bearing			0级	–	–	–	–	–	表3.6

4 轴承的数据

4.1公差

公差

GB/T307规定了轴承的尺寸公差旋转公差。GB/T4199标准规定了关于尺寸和公差定义。

符合公差等级PN(普通级公差)的轴承能够满足机械典型运用的质量要求。

机床和测量仪器等设备对工作精度、转速和平稳性有很高的要求，这时候可选用P6、P6X。（达不到要求，无需采用）

除了标准中规定的公差等级的轴承之外，ZWA还生产标准中没有的P4S、SP(超高精度)和UP(特超高精度)公差等级的轴承。

公差符号
GB/T4199
内径
d 轴承公称内径（锥形孔时为最小理论径）
dS 在单一平面上测得的内径（单一内径）
dmp 轴承孔平均直径:单一径向平面(横截面)内圆柱形轴承孔最大和最小的算术平均值

锥形孔小端理论平均直径;实测最大和最小直径的算术平均值
d1mp 锥形孔大端理论平均直径;实测最大和最小直径的算术平均值
△dmp=dmp−d
单一内径直径偏差
△ds=ds−d
单一内径直径偏差
△dlmp=dlmp−d1
圆锥孔较大端平均直径与公称直径之差
Vdp内径变动量;圆柱形孔单一径向平面(横截面)上的最大直径与最小直径之差
Vdmp=dmpmax−dmpmin
平均内径变动量;轴承内径最大与最小平均直径之差

外径
D 公称外径
DS 单一位置测得的外径
dmp 平均外径;单一径向平面上最大和最小外径的算术平均值
△Dmp=Dmp−D
单一平面平均外径偏差
△Ds=Ds−D
单一外径与公称外径之差
VDp 外径变动量;单一径向平面上外径的最大与最小值之差
VDmp=Dmpmax−Dmpnin
平均外径变动量;最大与最小平均外径之差

4 Bearing data

4.1 Tolerance

Tolerance
GB/T307 specifies the dimension tolerance of bearing rotation tolerance。GB/T4199 standard specifies the definition of dimension and tolerance.
Bearing complied with grade PN tolerance (normal tolerance) can meet the quality requirement of machine typical operating.
Device such as machine tool, measuring instrument, etc highly require with operating accuracy , rotation rate and stationarity, so as to choose P6、P6X. (Needn't choose when non−requirement)

Tolerance symbol
GB/T4199
Inner diameter
d bearing nominal inner diameter(tapered hole will be minimum theoretical diameter)
dS inner diameter(single inner diameter)measured in single plane
1.mean diameter of bearing hole:arithmetical mean of the maximum and minimum value of cylindrical bearing hole in single radial plane(cross−section)
2.theoretical mean diameter of tapered hole tip end :arithmetical mean of the maximum and minimum measured value of diameter
d1mp theoretical mean diameter of tapered hole big end:arithmetical mean of the maximum and minimum measured value of diameter
Δdmp=dmp−d
Diameter deviation of single inner diameter
Δds=ds−d
Diameter deviation of single inner diameter
Δd1mp=d1mp−d1
Difference between mean diameter and nominal diameter of tapered bore big end
Vdp variant of inner diameter: difference between the maximum diameter and minimum diameter of cylindrical hole in single radial plane (cross−section)
Vdmp=dmpmax−dmpmin
Variant of mean inner diameter: difference between the maximum mean diameter and minimum mean diameter of bearing inner diameter.

Outer diameter
D nominal outer diameter
DS Outer diameter measured on single position
Dmp mean outer diameter: arithmetical mean of the maximum and minimum diameter of outer diameter on single radial plane
ΔDmp=Dmp−D
Deviation of mean outer diameter on single plane
ΔDs=Ds−D
Difference between single outer diameter and nominal outer diameter
VDp variant of outer diameter: difference between the maximum value and minimum value of outer diameter on single radial plane
VDmp=Dmpmax−Dmpmin
Variant of mean outer diameter: difference between the maximum mean diameter and minimum mean diameter of outer diameter.

宽度和高度
Bs、Cs 套圈单一宽度（内圈和外圈）
△Bs=Bs−B,△Cs=Cs−C
单一宽度偏差（内圈和外圈）：套圈单一宽度与公称宽度与公称宽度之差
VBS=Bsmax−Bsmin,VCS=Csmax−Csmin
内圈和外圈宽度变动量；最大与最小套圈单一宽度之差
T1s 圆锥滚了轴承单一总宽度
T18 外圈有挡边的圆锥滚子轴承单一总宽度
T2s 内圈有挡边的圆锥滚子轴承单一总宽度
△ts=Ts−T,△tls−Tls−Tl,△T2s=T2
圆锥滚子轴承单一总宽度偏差；单一α）标准中推力轴承的总高度用T表示。总宽度与公称宽度之差
α）Hs，Hls，H2s，H3s，H4s

推力轴承单一总高度
α）△Hs=Hs−H,△Hls=Hls−H1,△H2s=H2s−Hs,……
推力轴承单一总高度的偏差：单一总高度与公称高度之差
旋转精度
Kia 成套轴承内圈的径向跳动
Kea 成套轴承外圈的径向跳动
Sd 内圈其准端面（背面）对内孔的跳动
SD 外径表面母线对基准端面（背面）的倾斜度变动量（端面跳动）
Sia 成套轴承内圈端面（背面）对滚道的跳动（轴向跳动）
Sea 成套承外圈端面（背面）对滚道的跳动（轴向跳动）
Si 轴圈滚道对底面厚度的变动量（推力轴承的轴向跳动）
Se 座圈滚道对底面厚度的变动量（推力轴承的轴向跳动）

Kia 成套轴承内圈的径向跳动
Kea 成套轴承外圈的径向跳动
Sd 内圈基准端面（背面）对内孔的跳动
SD 外径表面母线对基准端面（背面）的倾斜度变动量
SD1 外径表面母线对凸缘背面的倾斜度变动量
Sia 成套轴承内圈端面（背面）对滚道的跳动
Sea 成套轴承外圈端面（背面）对滚道的跳动
Seal 成套轴承凸缘背面背面对滚道的跳动
Si 轴圈滚道对底面厚度变动量（用于推力轴承）
Se 座圈滚道对底面厚度变动量（用于推力轴承）
T 圆锥滚子轴承公称宽度
△TS 圆锥滚子轴承实际宽度偏差
T1 圆锥滚子轴承内组件与标准外圈组成轴承的公称宽度
△T1s T1的实际偏差
T2 圆锥滚子轴承外圈与标准内组件组成轴承的公称宽度T2的实际测差
△T2 T2实测偏差

width and height
Bs, Cs ring single width (inner ring and outer ring)
ΔBs=Bs−B, ΔCs=Cs−C
single width deviation (inner ring and outer ring): difference between the maximum and minimum single width of ring
T1s single overall width of tapered roller bearing
T18 single overall width of tapered roller bearing which has outer ring with rib
T2 single overall width of tapered roller bearing which has sinner ring with rib
Δts=Ts−T, Δt1s=T1s−T1, ΔT2s=T2
Single overall width deviation of tapered roller bearing: difference between overall and nominal width
single α) total height of thrust bearing in standard is indicated by T
a)Hs,H1s, H2s, H3s, H4s
Single total height of thrust bearing
ΔHs=Hs−H, ΔH1s=H1s−H1, ΔH2s=H2s−Hs…
Single total height deviation of thrust bearing: difference between single total height and nominal height

Rotary accuracy
Kia radial runout of whole set bearing inner ring
Kea radial runout of whole set bearing outer ring
Sd runout among datum end face (back) inner ring and hole
SD lean variant among outer diameter surface main conductor and datum end face (back) (end face runout)
Sia runout among inner ring end face (back) and raceway of whole set bearing (radial runout)
Sea runout among outer ring end face (back) and raceway of whole set bearing (radial runout)
Si variant relative shaft washer raceway to subface thickness (radial runout of thrust bearing)
Se variant relative housing washer raceway to subface thickness (radial runout of thrust bearing)

Kia radial runout of whole set bearing inner ring
Kea radial runout of whole set bearing outer ring
Sd runout among datum end face (back) inner ring and hole
SD lean variant among outer diameter surface main conductor and datum end face (back)
SD1 lean variant among outer diameter surface main conductor and flange back face
Sia runout among inner ring end face (back) and raceway of whole set bearing
Sea runout among outer ring end face (back) and raceway of whole set bearing
Sea1 runout among flange back face and raceway of whole set bearing
Si variant relative shaft washer raceway to subface thickness (of thrust bearing)
Se variant relative housing washer raceway to subface thickness (of thrust bearing)
T tapered roller bearing nominal width
ΔTS tapered roller bearing actual width deviation
T1 tapered roller bearing interior assembly and standard outer ring consist nominal width of bearing
ΔT1S actual deviation of T1
T2 tapered roller bearing outer ring and standard interior assembly consist deviation of bearing nominal width T2
ΔT2 T2 actual measurement deviation

4.2各类轴承公差表 4.2 Bearing Tolerance Table

PO级向心轴承公差(圆锥滚子轴承除外)

Tolerance of Class-PO Radial Bearing (excluding tapered roller bearing)

表4-1 Table 4-1 内圈 Inner Ring 单位 Unit: μm

d mm		△dmp		Sdp 直径系列 Diameter Series 8,9		0,1	2,3,4	Vdmp	△Bs		△Bls		VBS	Kia
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	最大 Max.		最大 Max.	上 Upper	下 Lower	上 Upper	下 Lower	最大 Max.	最大 Max.
80	120	0	-20	25	25	15		15	0	-200	0	-380	25	25
120	180	0	-25	31	31	19		19	0	-250	0	-500	30	30
180	250	0	-30	38	38	23		23	0	-300	0	-500	30	40
250	315	0	-35	44	44	26		26	0	-350	0	-500	35	50
315	400	0	-40	50	50	30		30	0	-400	0	-630	40	60
400	500	0	-45	56	56	34		34	0	-450	0	-	50	65
500	630	0	-50	63	63	38		38	0	-500	-	-	60	70
630	800	0	-75	-	-	-		-	0	-750	-	-	70	80
800	1000	0	-100	-	-	-		-	0	-1000	-	-	80	90
1000	1250	0	-125	-	-	-		-	0	-1250	-	-	100	100
1250	1600	0	-160	-	-	-		-	0	-1600	-	-	120	120

PO级向心轴承公差（圆锥滚子轴承除外）

Tolerance of Class-PO Radial Bearing (excluding tapered roller bearing)

表4-2 Table 4-2 外圈 Outer Ring 单位 Unit: μm

D mm		△Dmp		VDp VDSp VDmp 开型轴承 Open Bearing 闭型轴承 Capped Bearing 直径系列 Diameter Series 8,9		0,1	2,3,4	△cs	△cls	Vcs	Kea
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	最大 Max.		最大 Max.	最大 Max.		最大 Max.
80	120	0	-15	19	19	11		26	11	与同一轴承内圈的△Bs, △Bls, VBS,的数值相同 Identical as the values of △Bs, △Bls and VBs for the inner ring of the same bearing	35
120	150	0	-18	23	23	14		30	14		40
150	180	0	-25	31	31	19		38	19		45
180	250	0	-30	38	38	23		-	23		50
250	315	0	-35	44	44	26		-	26		60
315	400	0	-40	50	50	30		-	30		70
400	500	0	-45	56	56	34		-	34		80
500	630	0	-50	63	63	38		-	38		100
630	800	0	-75	94	94	55		-	55		120
800	1000	0	-100	125	125	75		-	75		140
1000	1250	0	-125	-	-	-		-	-		160
1250	1600	0	-160	-	-	-		-	-		190

P6级向心轴承公差（圆锥滚子轴承除外）

Tolerance of Class-P6 Radial Bearing (excluding tapered roller bearing)

表4-3 Table 4-3 内圈 Inner Ring 单位 Unit: μm

d mm		△dmp		△dsp 直径系列 Diameter Series 8,9		0,1	2,3,4	Vdmp	△Bs		△Bls		VBs	Kia
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	最大 Max.			上 Upper	下 Lower	上 Upper	下 Lower	最大 Max.	最大 Max.
80	120	0	-15	19	19	11		11	0	-200	0	-380	25	13
120	180	0	-18	23	23	14		14	0	-250	0	-500	30	18
180	250	0	-22	28	28	17		17	0	-300	0	-500	30	20
250	315	0	-25	31	31	19		19	0	-350	0	-500	35	25
315	400	0	-30	38	38	23		23	0	-400	0	-630	40	30
400	500	0	-35	44	44	26		26	0	-450	0	-630	45	35
500	630	0	-40	50	50	30		30	0	-500	-	-800	50	40
630	800	0	-50	-	-	-		-	0	-750	-	-	55	45
800	1000	0	-65	-	-	-		-	0	-1000	-	-	60	50
1000	1250	0	-80	-	-	-		-	0	-1250	-	-	70	60
1250	1600	0	-100	-	-	-		-	0	-1600	-	-	70	70

P6级向心轴承公差（圆锥滚子轴承除外）

Tolerance of Class-P6 Radial Bearing (excluding tapered roller bearing)

表4-4 Table 4-4 外圈 Outer Ring 单位 Unit: μm

D mm		△Dmp		VDp VDSp VDmp 开型轴承 Open Bearing 闭型轴承 Capped Bearing 直径系列 Diameter Series 8,9		0,1	2,3,4	△cs	△cls	Vcs	Kea
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	最大 Max.		最大 Max.	最大 Max.		最大 Max.
80	120	0	-13	16	16	10		20	10	与同一轴承内圈的△Bs, △Bls, Vbs,的数值相同 Identical as the values of △Bs, △Bls and VBs for the inner ring of the same bearing	18
120	150	0	-15	19	19	11		25	11		20
150	180	0	-18	23	23	14		30	14		23
180	250	0	-20	25	25	15		-	15		25
250	315	0	-25	31	31	19		-	19		30
315	400	0	-28	35	35	21		-	21		35
400	500	0	-33	41	41	25		-	25		40
500	630	0	-38	48	48	29		-	29		50
630	800	0	-45	56	56	34		-	34		60
800	1000	0	-60	75	75	45		-	45		70
1000	1250	0	-80	-	-	-		-	-		85

P5级向心轴承公差（圆锥滚子轴承除外）

Tolerance of Class-P5 Radial Bearing (excluding tapered roller bearing)

表4—5 Table 4-5 内圈 Inner Ring 单位 Unit: μm

d mm		△dmp		△dsp 直径系列 Diameter Series 8,9,0,1 2,3,4		Vdmp	△Bs		△Bl		VBs	Kia	Sd	Sia
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	最大 Max.	上 Upper	下 Lower	上 Upper	下 Lower	最大 Max.	最大 Max.	最大 Max.	最大 Max.
80	120	0	-10	10	8	5	0	-200	0	-380	7	6	9	9
120	180	0	-13	13	10	7	0	-250	0	-380	8	8	10	10
180	250	0	-15	15	12	8	0	-300	0	-500	10	10	11	13
250	315	0	-18	18	14	9	0	-350	0	-500	13	13	13	15
315	400	0	-23	23	18	12	0	-400	0	-630	15	15	15	20
400	500	0	-27	28	21	14	0	-450	0	-630	18	17	18	23
500	630	0	-33	35	26	18	0	-500	0	-800	20	19	20	25
630	800	0	-40	-	-	-	0	-750	0	-	26	22	26	30

P5级向心轴承公差（圆锥滚子轴承除外）

Tolerance of Class-P6 Radial Bearing (excluding tapered roller bearing)

表4—6 Table 4-6 外圈 Outer Ring 单位 Unit: μm

D mm		△Dmp		△dsp 直径系列 Diameter Series 8,9,0,1 2,3,4		△Dmp	△Cs	VCs	Kea	Sd	Sea 2)
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	最大 Max.	最大 Max.	最大 Max.	最大 Max.	最大 Max.	最大 Max.
80	120	0	-10	10	8	5	与同一轴承内圈圈△Bs △Bls数值相同 Identical asthe values of △Bs and△Bls for the inner ring of the same bearing	8	10	9	11
120	150	0	-11	11	8	6		8	11	10	13
150	180	0	-13	13	10	7		8	13	10	14
180	250	0	-15	15	11	8		10	15	11	15
250	315	0	-18	18	14	9		11	18	13	18
315	400	0	-20	20	15	10		13	20	13	20
400	500	0	-23	23	17	12		15	23	15	23
500	630	0	-28	28	21	14		18	25	18	25
630	800	0	-35	35	26	18		20	30	20	30
800	1000	0	-40	50	29	25		25	35	25	35

1)不适用于具有密封或防尘盖的闭型轴承
2)仅适用于深沟和角接触轴承

1)Not applicable to the capped bearing with sealing or dusk cap
2)Only applicable to deep-groove bearing or angular contact bearing

P0级圆锥滚子轴承公差(公制)

Tolerance of Class-P0 Tapered Roller Bearing (metric system)

表4—7 Table 4-7 内圈和轴承组件宽度 Inner Ring and Bearing Assembly Width 单位 Unit: μm

d		△dmp		△dsp	Vdmp	△Bs		Kia	△Ts		△Tls		△T2s	
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	上 Upper	下 Lower	最大 Max.	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower
80	120	0	-20	20	15	0	-200	30	+200	-200	+100	-100	+100	-100
120	180	0	-25	25	19	0	-250	35	+350	-250	+150	-150	+200	-100
180	250	0	-30	30	23	0	-300	50	+350	-250	+150	-150	+200	-100
250	315	0	-35	35	26	0	-350	60	+350	-250	+150	-150	+200	-100
315	400	0	-40	40	30	0	-400	70	+400	-400	+200	-200	+200	-200
400	500	0	-45	45	34	0	-450	80	+450	-450	-	-	-	-
500	630	0	-60	50	38	0	-500	90	+500	-500	-	-	-	-
630	800	0	-75	75	56	0	-750	100	+600	-600	-	-	-	-
800	1000	0	-100	100	75	0	-1000	115	+750	-750	-	-	-	-
1000	1250	0	-125	-	-	0	-1250	130	+900	-900	-	-	-	-
1250	1600	0	-160	-	-	0	-1600	150	+1050	-1050	-	-	-	-
1600	2000	0	-200	-	-	0	-2000	170	+1200	-1200	-		-	

P0级圆锥滚子轴承公差(公制) Tolerance of Class-P0 Tapered Roller Bearing (metric system)

表4—8 Table 4-8 外圈Outer Ring 单位 Unit: μm

D mm		△Dmp		VDsp	VDmp	△Cs	Kea
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.		最大 Max.
80	120	0	-18	18	14	与同一轴承内圈△Bs的数值相同 Identical as the value of △Bs for the inner ring of the same bearing	35
120	150	0	-20	20	15		40
150	180	0	-25	25	19		45
180	250	0	-30	30	23		50
250	315	0	-35	35	26		60
315	400	0	-40	40	30		70
400	500	0	-45	45	34		80
500	630	0	-50	60	38		100
630	800	0	-75	80	55		120
800	1000	0	-100	100	75		120
1000	1250	0	-125	130	90		120
1250	1600	0	-160	170	100		120
1600	2000	0	-200	-	-		120
2000	2500	0	-250	-	-		120

P5级圆锥滚子轴承公差（公制）
Tolerance of Class-P5 Tapered Roller Bearing (metric system)

表4-9 Table 4-9 内圈和轴承组件宽度 Inner Ring and Bearing Assembly Width 单位 Unit: μm

d mm		△dmp		Vdp	Vdmp	△Bs		Kia	Sd	△Ts	
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	上 Upper	下 Lower	最大 Max.	最大 Max.	上 Upper	下 Lower
80	120	0	-15	11	8	0	-400	8	9	+200	-200
120	180	0	-18	14	9	0	-500	11	10	+350	-250
180	250	0	-22	17	11	0	-600	13	11	+350	-250
250	315	0	-25	19	13	0	-700	13	13	+350	-250
315	400	0	-30	23	15	0	-800	15	15	+400	-400
400	500	0	-35	26	17	0	-900	20	17	+400	-400
500	630	0	-40	30	20	0	-1000	25	20	+500	-500
630	800	0	-50	50	25	0	-1500	30	25	+600	-600
800	1000	0	-60	60	30	0	-2000	37	30	+750	-750

P5级圆锥滚子轴承公差（公制）
Tolerance of Class-P5 Tapered Roller Bearing (metric system)

表4-10 Table 4-10 外圈 Outer Ring 单位 Unit: μm

d mm		△Dmp		VDsp	VDmp	△Cs	Kea	SD
超过 Over	到 To	上 Upper	下 Lower	最大 Max.	最大 Max.	上 Upper 下 Lower	最大 Max.	最大 Max.
80	120	0	-13	10	7		10	9
120	150	0	-15	11	8	与同一轴承内圈△Bs的数值相同	11	10
150	180	0	-18	14	9		13	10
180	250	0	-20	15	10		15	11
250	315	0	-25	19	13		18	13
315	400	0	-28	22	14		20	13
400	500	0	-33	26	17	Identical as the value of △Bs for the inner ring of the same bearing	24	17
500	630	0	-38	30	20		30	20
630	800	0	-45	38	25		36	25
800	1000	0	-60	50	30		43	30
1000	1250	0	-80	65	38		52	38
1250	1600	0	-100	90	50		62	50

英制圆锥滚子轴承公差(4级、2级、3级；0级和00级公差)
Tolerance of Tapered Roller Bearing in Metric System (Tolerances for Class-4, Class-2, Class-3, Class-0 and Class-00)

表4-11 Table 4-11 内 圈 Inner Ring 单位 Unit: μm

适用轴承形式 Applicable Bearing Type	轴承公称内径 Nominal Bearing Inner Diameter d mm		单一内径的偏差 Deviation of Single Inner Diameter △ds									
			4级 Class-4		2级 Class-2		3级 Class-3		0级 Class-0		00级 Class-00	
	超过 Over	到 To	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower
全型式 All types	-	76.2	+13	0	+13	0	+13	0	+13	0	+8	0
	76.2	266.7	+25	0	+25	0	+13	0	+13	0	+8	0
	266.7	304.8	+25	0	+25	0	+13	0	+13	0	+8	0
	304.8	609.6	+51	0	+51	0	+25	0	-	-	-	-
	609.6	914.4	+76	0	-	-	+38	0	-	-	-	-
	914.4	1219.2	+102	0	-	-	+51	0	-	-	-	-
	1219.2	-	+127	0	-	-□	+76	0	-	-	-	-

表4-12 Table 4-12 外 圈 Outer Ring 单位 Unit: μm

适用轴承形式 Applicable Bearing Type	轴承公称外径 Nominal Bearing Outer Diameter d mm		单一外径的偏差 Deviation of Single Outer Diameter △Ds									
			4级 Class-4		2级 Class-2		3级 Class-3		0级 Class-0		00级 Class-00	
	超过 Over	到 To	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower
全型式 All types	-	266.7	+25	0	+25	0	+13	0	+13	0	+8	0
	266.7	304.8	+25	0	+25	0	+13	0	+13	0	+8	0
	304.8	609.6	+51	0	+51	0	+25	0	-	-	-	-
	609.6	914.4	+76	0	+76	0	+38	0	-	-	-	-
	914.4	1219.2	+102	0	-	-	+51	0	-	-	-	-
	1219.2	-	+127	0	-	-□	+76	0	-	-	-	-

表4-13 Table 4-13 径向跳动 Radial Runout 单位 Unit: μm

适用轴承形式 Applicable Bearing Type	轴承公称内径或外径 Nominal Bearing Inner or Outer Diameter d mm		内圈及外圈的径向跳动 Radial Runout of Inner and Outer Rings Kia Kea				
			4级 Class-4	2级 Class-2	3级 Class-3	0级 Class-0	00级 Class-00
	超过 Over	到 To	最大 Max.	最大 Max.	最大 Max.	最大 Max.	最大 Max.
全型式 All types	-	266.7	51	38	8	4	2
	266.7	304.8	51	38	8	4	2
	304.8	609.6	51	38	18	-	-
	609.6	914.4	76	51	51	-	-
	914.4	1219.2	76	-	76	-	-
	1219.2	-	76	-	76	-	-

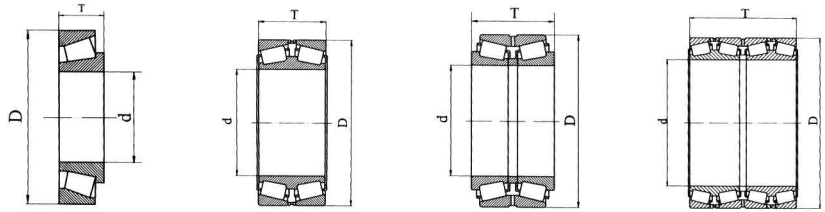
表4-14 (4) 轴承实际宽度与标准内组件组合宽度

Table 4-14 (4) Actual Bearing Width or Deviation from Standard Inner Assembly Width

适用轴承形式 Applicable Bearing Type	轴承公称内径 Nominal Inner Diameter of Bearing d mm		轴承公称外径 Nominal Outer Diameter of Bearing D mm		轴承实际宽度或与标准内组件组合宽度的偏差 Actual Bearing Width or Deviation from Standard Inner Assembly Width							
					4级 Class-4		2级 Class-2		3级 Class-3		0级 Class-0	
	超过 Over	到 To	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower	上 Upper	下 Lower
单列 Single-row	-	110.6	-	-	+203	0	+203	0	+203	-203	+203	-203
	101.6	266.7	-	-	+356	-254	+203	0	+203	-203	+203	-203
	266.7	304.8			+356	-254	+203	0	+203	-203	+203	-203
	304.8	609.6	-	508.0		-	+381	-381	+203	-203		-
	609.6	-	508.0	-		-	+381	-381	+381	-381		-
	609.6	-	-	-	+381	-381	-	-	+381	-381	-	
双列 Double-row	-	101.6		-	+406	0	+406	0	+406	-406	+406	-406
	101.6	266.7			+711	-508	+406	-203	+406	-406	+406	-406
	267.7	304.8		-	+711	-508	+406	-203	+406	-406	+406	-406
	304.8	609.6	-	508.0		-	+762	-762	+406	-406		-
	304.8	609.6	508.0	-		-	+762	-762	+406	-406		-
	609.6	-	-	-	+762	-762	-	-	+762	-762	-	
双列 Double-row	-	127.0		-		-	+254	0	+254	0		-
	127.0	-					+762	0	+762	0		-
				-		-						
四列 Four-row	全尺寸范围 Full-size scope			-	+1524	-1524	+1524	-1524	+1524	-1524	+1524	-1524

(1)适用于0级的轴承

(1) Applicable to bearing of Class-0.



推力轴承公差 Tolerance of Thrust Bearing

表4-15 Table 4-15 轴 圈 Shaft Ring

单位 Unit: μm

d mm 超过 Over	到 To	△dmp 公差等级 Class of Tolerance p0,p6,p5 上 Upper	下 Lower	V_{dp} p0,p6,p5 最大 Max.	S_I 1) p0级 最大 Max.	S_I 1) p6 最大 Max.	S_I 1) p5 最大 Max.
80	120	0	-20	15	15	8	4
120	180	0	-25	19	15	9	5
180	250	0	-30	23	20	10	5
250	315	0	-35	26	25	13	7
315	400	0	-40	30	30	15	7
400	500	0	45	34	30	18	9
500	630	0	-50	38	35	21	11
630	800	0	-75	-	40	25	13
800	1000	0	-100	-	45	30	15
1000	1250	0	-125	-	50	35	18

1)数值不适合球面滚子轴承。对双向轴承采用单列数据。

1) Values are not applicable to spherical roller bearing. Single-row data are adopted for bi-directional bearing.

推力轴承公差 Tolerance of Thrust Bearing

表4-16 Table 4-16 座 圈 Seat Ring

单位 Unit: μm

D mm 超过 Over	到 To	△dmp 公差等级 Class of Tolerance p0,p6,p5 上 Upper	下 Lower	V_{Dp} p0,p6,p5 最大 Max.	S_e
80	120	0	-22	17	与同一轴承轴圈 S_i 的数值相同 Identical as the value of S_i for the shaft ring of the same bearing
120	180	0	-25	19	
180	250	0	-30	23	
250	315	0	-35	26	
315	400	0	-40	30	
400	500	0	-45	34	
500	630	0	-50	38	
630	800	0	-75	55	
800	1000	0	-100	75	
1000	1250	0	-125	-	
1250	1600	0	-160	-	

锥形内孔公差，锥度1：12
Tolerance of Taper Bore, with Conicity at 1:12

表4—17 Table 4-17

d mm 超过 Over	到 To	△dmp 公差等级 Class of Tolerance p0，p6 上 Upper	下 Lower	V_{dp} 1) 最大 Max.	△dlmp — △dmp 高 High	低 Low	△dmp p5 上 Upper	下 Lower	V_{dp} 1) 最大 Max.	△dlmp — △dmp 上 Upper	下 Lower
80	120	+35	0	25	+35	0	+22	0	22	+22	0
120	180	+40	0	31	+40	0	+25	0	25	+25	0
180	250	+46	0	38	+46	0	+29	0	29	+29	0
250	315	+52	0	44	+52	0	+32	0	32	+32	0
315	400	+57	0	50	+57	0	+36	0	36	+36	0
400	500	+63	0	56	+63	0	+40	0	-	+40	0
500	630	+70	0	-	+70	0	+44	0	-	+44	0
630	800	+80	0	-	+80	0	+50	0	-	+50	0
800	1000	+90	0	-	+90	0	+56	0	-	+56	0
1000	1250	+105	0	-	-105	0	+66	0	-	+66	0

1)适用于内孔之任意单一径向平面
1)Applicable to any single radialpiston of bore

锥形内孔公差，锥度1：30
Tolerance of Taper Bore, with Conicity at 1:30

表4—18 Table 4-18

单位 Unit：μm

d mm 超过 Over	到 To	△dmp 公差等级 Class of Tolerance p0 上 Upper	下 Lower	V_{dp} 1) 最大 Max.	△dlmp — △dmp 高 High	低 Low
80	120	+20	0	25	+40	0
120	180	+25	0	31	+50	0
180	250	+30	0	38	+55	0
250	315	+35	0	44	+60	0
315	400	+40	0	50	+65	0
400	500	+45	0	56	+75	0
500	630	+50	0	63	+85	0
630	800	+75	0	-	+100	0
800	1000	+100	0	-	+100	0
1000	1250	+125	0	-	+115	0
1250	1600	+160	0	-	+125	0
1600	2000	+200	0	-	+150	0

1)适用于内孔之任意单一径向平面
1)Applicable to any single radialpiston of bore

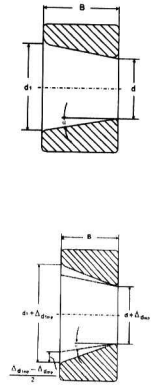


图4.1
Table 4.1

圆锥孔

公称半锥度
α＝2度23′ 9,4″(锥度1:12)
α＝0度57′ 17,4″(锥度1:30)
圆锥孔大端理论基本直径d_1：
$d_1=d+\frac{1}{12}B$(锥度1:12)
$d_1=d+\frac{1}{30}B$(锥度1:30)

Conical bore

Nominal semi-conicity
α=2°23′ 9,4″ (with conicity at 1:12)
α=0°57′ 17,4″ (with conicity at 1:30)
Theoretical basic diameter d_1 at big end of conical bore:

向心轴承倒角
Chamfer of Radial Bearing

表4—19 Table 4-19

R_{min} 或 r_{lmin}	轴承公称内径 Nominal Inner Diameter of Bearing mm 超过 Over	到 To	径向 Radial r_{max}	轴向 Axial r_{lmax}
0.3	40	-	0.8	1
0.6	-	40	1	2
	40	-	1.3	2
1	-	50	1.5	3
	50	-	1.9	3
1.1	-	120	2	3.5
	120	-	2.5	4
1.5	-	120	2.3	4
	120	-	3	5
2	-	80	3	4.5
	80	220	3.5	5
	220	-	3.8	6
2.1	-	280	4	6.5
	280	-	4.5	7
2.5	-	100	3.8	6
	100	280	4.5	6
	280	-	5	7
3	-	280	5	8
	280	-	5.5	8
4	-	-	6.5	9
5	-	-	8	10
6	-	-	10	13
7.5	-	-	12.5	17
9.5	-	-	15	19

公制圆锥滚子轴承倒角
Chamfer of Tapered Roller Bearing in Metric System

表4—20 Table 4-20

r_{min} 或 r_{lmin}	轴承公称内径 Nominal Inner Diameter of Bearing mm 超过 Over	到 To	径向 Radial r_{max}	轴向 Axial r_{lmax}
1.5	-	120	2.3	3
	120	250	2.8	3.5
	250	-	3.5	4
2	-	120	2.8	4
	120	250	3.5	4.5
	250	-	4	5
2.5	-	120	3.5	5
	120	250	4	5.5
	250	-	4.5	6
3	-	120	4	5.5
	120	250	4.5	6.5
	250	400	5	7
	400	-	5.5	7.5
4	-	120	5	7
	120	250	5.5	7.5
	250	400	6	8
	400	-	6.5	8.5
5	-	180	6.5	8
	180	-	7.5	9
6	-	180	7.5	10
	180	-	9	11
7.5	-	-	12.5	17
9.5	-	-	15	19

圆锥滚子轴承倒角(英制尺寸) Chamfer of Tapered Roller Bearing (in British System)

表4—21 Table 4-21

min	内圈公称孔径 Nominal Diameter of Inner Ring		最大值 Max.		外圈公称外径 Nominal Diameter of Outer Ring		最大值 Max.	
r_{smin}	超过 Over d	到 To	r_1 max	r_2 max	超过 Over D	到 To	r_3 max	r_4 max
mm	mm		mm	mm	mm	mm		
见轴承表	-	50.8	rsmin+0.4	rsmin+0.9	-	101.6	rsmin+0.6	rsmin+1.1
	50.8	101.6	rsmin+0.5	rsmin+1.3	101.6	168.3	rsmin+0.6	rsmin+1.2
	101.6	254	rsmin+0.6	rsmin+1.8	168.3	266.7	rsmin+0.8	rsmin+1.4
					266.7	355.6	rsmin+1.7	rsmin+1.7
1.0	254	-	1.9	3	355.6	-	1.9	3
1.5	254	-	3.5	4	355.6	-	3.5	4
2.5	254	-	4.5	6	355.6	-	4.5	6
3.0	254	-	5.5	7.5	355.6	-	5.5	7.5
3.3	254	-	6.5	9	355.6	-	6.5	9
3.5	254	-	6.5	9	355.6	-	6.5	9
6.4	254	-	12.5	17	355.6	-	12.5	17
3.5	254	-	15	19	355.6	-	15	19
9.7	254	-	15	19	355.6	-	15	19
19	254	-	25	38	355.6	-	25	38

5 滚动轴承的内部游隙及预载荷

5.1 内部游隙

5.1.1轴承原始游隙的定义

轴承原始游隙，是指轴承在没有安装之前内圈、外圈、滚动体之间的间隙量。即将内圈或外圈一方固定，将另一方在径向方向的移动量称为径向游隙，在轴向方向的移动量称为轴向游隙。

5.1.2 游隙的选择：

由于轴承在安装时内圈经过盈配合后，轴承的原始游隙会相应减少，轴承承受载荷后轴承的内部游隙又会相应的增加，当轴承运行时轴承内部产生温升，轴承的内、外圈的膨胀不同，轴承的内部游隙相应减少。所以，轴承工作游隙值按下式计算：

$U=U_0-(\delta_f+\delta_t)+\delta_W$ (11)

式中：U—轴承的工作游隙

UO—轴承的内部原始游隙

$\delta_f=\delta_{fo}+\delta_{fi}$

δ_{fo}—轴承外圈与外壳配合的游隙减少量

δ_{fi}—轴与轴承内圈配合的游隙减少量

δ_t—内、外圈温差产生的游隙减少量

δ_W—轴承载荷对游隙的增加量

轴承的工作游隙，理论上略为负数时，疲劳寿命最长，但实际上保持这种理想状态是很困难的。

5 Internal Clearance and Pre-loading of Rolling Bearing

5.1 Internal Clearance

5.1.1 Definition of original bearing internal clearance

The original bearing internal clearance refers to the clearance among the inner ring, the outer ring and rolling elements of bearing before installation. If either the inner ring or the outer ring is fixed, the amount of radial movement of the other is called as radial internal clearance and that of axial movement of it called as axial internal clearance.

5.1.2 Selection of clearance:

At the installation of bearing, after the inner ring has undergone the interference fit, the original bearing internal clearance will decrease correspondingly; after the bearing has carried the load, the internal clearance of bearing will increase correspondingly; and when there is a temperature rise occurred in the bearing interior at running and the difference in expansion of bearing inner and outer rings, the internal clearance of bearing will decrease correspondingly. Therefore, the working internal clearance of bearing shall be calculated according to the following formulas:

$U=U_0-(\delta_f+\delta_t)+\delta_W$ (11)

Where: U – Working internal clearance of bearing

U_0 – Original internal clearance of bearing

$\delta_f=\delta_{fo}+\delta_{fi}$

δ_{fo} – Internal clearance decrease of fit between bearing outer ring and bearing shell

δ_{fi} – Internal clearance decrease of fit between shaft and bearing outer ring

δ_t –Internal clearance decrease due to temperature difference between inner and outer rings

δ_W – Increase of internal clearance caused by bearing load carrying

Theoretically, when the working internal clearance of bearing is negative slightly, the fatigue life is maximum; while, actually, it is very difficult to maintain such an ideal state.

一般来说，选择轴承的工作游隙略大于零好些，这样可以获得较理想的疲劳寿命和运转效果。但对于一些较特殊的场合，则应选择大于或小于0组游隙以适应使用的要求。

Generally speaking, the working internal clearance of bearing selected is better to be more than zero, so that the comparatively ideal fatigue life and running effects would be achieved. However, in some particular occasion, it is required to select the internal clearance more than or less than Group-0 to meet the requirements of use.

表5—1 Table 5-1 游隙选择示例 Example of Internal Clearance Selection

使用条件 Service Condition	用途 Purpose	示例 Example
重载荷或冲击载荷且套圈配合过盈大 Heavy load or impact load, and large bearing race interference fit	轧钢机辊颈（圆柱轴承）铁路车辆、车轴 Rolling mill journal (cylindrical bearing), railway vehicle and axle shaft	C3
振动或冲击载荷且内外圈均为过盈配合 Shocking or impact load, with interference fit at both inner and outer rings	振动筛/铁路车辆主电机 拖拉机末级减速装置 Shaker screen/ master motor of railway vehicle End-class reduction gear of tractor	C3、C4/C4 C4
轴与内圈受到加热 Both the shaft and the inner ring are heated	造纸烘干机/轧钢机辊道辊子 Paper-making drier/ rolling mill table rolls	C3、C4/C3
内外圈均为间隙配合 Both inner and outer rings are clearance fit	轧钢机辊颈 Rolling mill journal	C2

圆柱滚子轴承径向游隙

Radial Internal Clearance of Cylindrical Roller Bearing

表5—2 Table 5-2 单位 Unit: μm

公称内径 Nominal Diameter d mm 超过 Over	到 To	2组 Class-2 最小 Min	最大 Max	0组 Class-0 最小 Min	最大 Max	3组 Class-3 最小 Min	最大 Max	4组 Class-4 最小 Min	最大 Max	5组 Class-5 最小 Min	最大 Max
80	100	15	50	50	85	75	110	105	140	155	190
100	120	15	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	100	145	145	190	200	245
140	160	20	70	70	120	115	165	165	215	225	275
160	180	25	75	75	125	120	170	170	220	250	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	395
250	280	55	125	125	195	190	260	260	330	370	440
280	315	55	130	130	205	200	275	275	350	410	485
315	355	65	145	145	225	225	305	305	385	455	535
355	400	100	190	190	280	280	370	370	460	510	600
400	450	110	210	210	310	310	410	410	510	565	665
450	500	110	220	220	330	330	440	440	550	625	735
500	560	120	240	240	360	360	480	480	600	-	-
560	630	140	260	260	380	380	500	500	620	-	-
630	710	145	285	285	425	425	565	565	705	-	-
710	800	150	310	310	470	470	630	630	790	-	-
800	900	180	350	350	520	520	690	690	860	-	-
900	1000	200	390	390	580	580	770	770	960	-	-
1000	1120	220	430	430	640	640	850	850	1060	-	-
1120	1250	230	470	470	710	710	950	950	1190	-	-
1250	1400	270	530	530	790	790	1050	1050	1310	-	-

四点接触球轴承径向游隙
Radial Internal Clearance of Four-point Contact Ball Bearing

表5-3 Table 5-3

单位 Unit: μ m

公称内径 Nominal Diameter d mm		2组 Class-2		0组 Class-0		3组 Class-3		4组 Class-4	
超过 Over	到 To	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max
80	100	56	116	96	156	136	196	176	236
100	140	66	136	116	176	156	216	196	256
140	180	76	156	136	196	176	236	216	276
180	220	96	176	156	216	196	256	236	296
220	260	115	195	175	235	215	295	275	335
260	300	135	215	195	275	255	335	295	355

双列角接触球轴承径向游隙
Axial Internal Clearance of Double-row Angular Contact Ball Bearing

表5-4 Table 5-4

单位 Unit: μ m

公称内径 d mm		2组 Class-2		0组 Class-0	
超过 Over	到 To	最小 Min	最大 Max	最小 Min	最大 Max
100	140	70	140	120	180
140	180	80	160	140	200
180	220	100	180	160	220
220	260	120	200	180	240
260	300	140	220	200	280
300	355	160	240	220	300
355	400	180	270	250	330
400	450	200	290	270	360
450	500	220	310	290	390
500	560	240	330	310	420
560	630	260	360	340	450
630	710	280	390	370	490
710	800	300	420	400	540
800	900	330	450	440	590
900	1000	360	500	480	630

深沟球轴承径向游隙
Radial Internal Clearance of Deep-groove Ball Bearing

表5-5 Table 5-5

单位 Unit: μ m

公称内径 Nominal Diameter d mm		2组 Class-2		0组 Class-0		3组 Class-3		4组 Class-4		5组 Class-5	
超过 Over	到 To	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140
120	140	2	23	18	48	41	81	71	114	105	160
140	160	2	23	18	53	46	91	81	130	120	180
160	180	2	25	20	61	53	102	91	147	135	200
180	200	2	30	25	71	63	117	107	163	150	230
200	225	2	35	25	85	75	140	125	195	175	265
225	250	2	40	30	95	85	160	145	225	205	300
250	280	2	45	35	105	90	170	155	245	225	340
280	315	2	55	40	115	100	190	175	270	245	370
315	355	3	60	45	125	110	210	195	300	275	410
355	400	3	70	55	145	130	240	225	340	315	460
400	450	3	80	60	170	150	270	250	380	350	510
450	500	3	90	70	190	170	300	280	420	390	570
500	560	10	100	80	210	190	330	310	470	440	630
560	630	10	110	90	230	210	360	340	520	490	690
630	710	20	130	110	260	240	400	380	570	540	760
710	800	20	140	120	290	270	450	430	630	600	840
800	900	20	160	140	320	300	500	480	700	670	940
900	1000	20	170	150	350	330	550	530	770	740	1040
1000	1120	20	180	160	380	360	600	580	850	820	1150
1120	1250	20	190	170	410	390	650	630	920	890	1260

圆柱孔调心滚子轴承游隙

表5-6 Table 5-6 Internal Clearance of Cylindrical-bore Self-aligning Roller Bearing 单位 Unit: μm

公称内径 Nominal Diameter d mm		2组 Class-2		0组 Class-0		3组 Class-3		4组 Class-4		5组 Class-5	
超过 Over	到 To	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max
80	100	35	60	60	100	100	135	135	180	180	225
100	120	40	75	75	120	120	160	160	210	210	260
120	140	50	95	95	145	145	190	190	240	240	300
140	160	60	110	110	170	170	220	220	280	280	350
160	180	65	120	120	180	180	240	240	310	310	390
180	200	70	130	130	200	200	260	260	340	340	430
200	225	80	140	140	220	220	290	290	380	380	470
225	250	90	150	150	240	240	320	320	420	420	520
250	280	100	170	170	260	260	350	350	460	460	570
280	315	110	190	190	280	280	370	370	500	500	630
315	355	120	200	200	310	310	410	410	550	550	690
355	400	130	220	220	340	340	450	450	600	600	750
400	450	140	240	240	370	370	500	500	660	660	820
450	503	140	260	260	410	410	550	550	720	720	900
500	560	150	280	280	440	440	600	600	780	780	1000
560	630	170	310	310	480	480	650	650	850	850	1100
630	710	190	350	350	530	530	700	700	920	920	1190
710	800	210	390	390	580	580	770	770	1010	1010	1300
800	900	230	430	430	650	650	860	860	1120	1120	1440
900	1000	260	480	480	710	710	930	930	1220	1220	1570
1000	1120	290	530	530	780	780	1020	1020	1330	1330	1720
1120	1250	320	580	580	860	860	1120	1120	1460	1460	1820

圆锥孔调心滚子轴承径向游隙

表5-7 Table 5-7 Radial Internal Clearance of Tapered-bore Self-aligning Roller Bearing 单位 Unit: μm

公称内径 Nominal Diameter d mm		2组 Class-2		0组 Class-0		3组 Class-3		4组 Class-4		5组 Class-5	
超过 Over	到 To	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max
80	100	55	80	80	110	110	140	140	180	180	230
100	120	65	100	100	135	135	170	170	220	220	280
120	140	80	120	120	160	160	200	200	260	260	330
140	160	90	130	130	180	180	230	230	300	300	380
160	180	100	140	140	200	200	260	260	340	340	430
180	200	110	160	160	220	220	290	290	370	370	470
200	225	120	180	180	250	250	320	320	410	410	520
225	250	140	200	200	270	270	350	350	450	450	570
250	280	150	220	220	300	300	390	390	490	490	620
280	315	170	240	240	330	330	430	430	540	540	680
315	355	190	270	270	360	360	470	470	590	590	740
355	400	210	300	300	400	400	520	520	650	650	820
400	450	230	330	330	440	440	570	570	720	720	910
450	5003	260	370	370	490	490	630	630	790	790	1000
500	560	290	410	410	540	540	680	680	870	870	1100
560	630	320	460	460	600	600	760	760	980	980	1230
630	710	350	510	510	670	670	850	850	1090	1090	1360
710	800	390	570	570	750	750	960	960	1220	1220	1500
800	900	440	640	640	840	840	1070	1070	1370	1370	1690
900	1000	490	710	710	930	930	1190	1190	1520	1520	1860

双列和四列圆锥滚子轴承径向游隙

表5-8 Table 5-8 Radial Internal Clearance of Double-row and Four-row Tapered Roller Bearing 单位 Unit: μm

公称内径 Nominal Diameter d mm		1组 Class-1		2组 Class-2		0组 Class-0		3组 Class-3		4组 Class-4		5组 Class-5	
超过 Over	到 To	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max
80	100	0	20	20	45	45	70	70	100	100	130	130	170
100	120	0	25	25	50	50	80	80	110	110	150	150	200
120	140	0	30	30	60	60	90	90	120	120	170	170	230
140	160	0	30	30	65	65	100	100	140	140	190	190	260
160	180	0	35	35	70	70	110	110	150	150	210	210	280
180	200	0	40	40	80	80	120	120	170	170	230	230	310
200	225	0	40	40	90	90	140	140	190	190	260	260	340
225	250	0	50	50	100	100	150	150	210	210	290	290	380
250	280	0	50	50	110	110	170	170	230	230	320	320	420
280	315	0	60	60	120	120	180	180	250	250	350	350	460
315	355	0	70	70	140	140	210	210	280	280	390	390	510
355	400	0	70	70	150	150	230	230	310	310	440	440	580
400	450	0	80	80	170	170	260	260	350	350	490	490	650
450	503	0	90	90	190	190	290	290	390	390	540	540	720
500	560	0	100	100	210	210	320	320	430	430	590	590	790
560	630	0	110	110	230	230	350	350	480	480	660	660	880
630	710	0	130	130	260	260	400	400	540	540	740	740	910
710	800	0	140	140	290	290	450	450	610	610	830	830	1100
800	900	0	160	160	330	330	500	500	670	670	920	920	1240
900	1000	0	180	180	360	360	540	540	720	720	980	980	1300
1000	1120	0	200	200	400	400	600	600	820	-	-	-	-
1120	1250	0	220	220	450	450	670	670	900	-	-	-	-

5 .2轴承的预载荷

根据轴承使用的用途，有时需对轴承施加一定的预载荷，使轴承内部处于负游隙状态。 这种方法称预载荷，多用于角接触球轴承及圆锥滚子轴承。

5.2.1预载荷的目的

轴承施加预载荷之后，在滚动体与套圈接触点上总是保持一种预压力，使轴承在载荷下不产生游隙，提高轴抗径向及轴向位移的刚性、旋转精度与定位精度、抑制振动及噪声；同时还制约滚动体的公转滑动、自转滑动，减少擦伤。

除此之外，推力球轴承、推力滚子轴承用于横向轴时，为使滚动体保持正确位置，也要采用预载荷。这点对于轧钢机轧辊轴向固定端的定位轴承非常重要。

对轴承施加预载荷的一般方法，是在相对的两套轴承间施加轴向载荷，使轴承内外圈产生相对的轴向位移。通常可分定位预载荷和定压预载荷两种。

5.2.2轴向预载荷

5.2.2.1定位预载荷

定位预载荷是指轴承的轴向位置在使用过程中保持不变的一种轴向预载荷方式，如图(5.1)所示，可以通过调整两轴承之间的间距套筒的宽度以获得一定的预紧量。

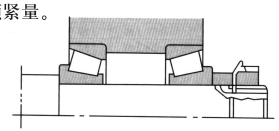


图5.1 定位预载荷示意图
Fig.5.1 Schematic Drawing of Locating Pre-loading

5.2.2.2定压预载荷

定压预载荷是指使轴承的轴向预载荷在使用中保持不变的一种轴向预紧方式。如（图5.2）所示，可以通过调整弹簧的压缩量以获得一定的预紧量

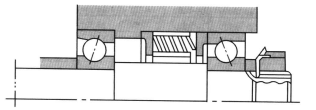


图5.2 定压预载荷示意图
Fig.5.2 Schematic Drawing of Constant-pressure Pre-loading

5.2.3径向预载荷

径向预紧是径向预载荷的一种方式，径向预载荷是提利用过盈配合使轴承内圈膨胀，消除径向游隙，使轴承处于预紧状态的一种预紧方法。

径向预载荷的目的是为了增加载荷区内的滚动体数，提高支承刚度。在高速圆柱滚子轴承中，径向预紧可以减少在离心力作用下，滚动体与滚道打滑的现象。圆锥形内孔的轴承， 用锁紧母调整内圈与紧定套的相对位置，减少轴承的径向游隙，实现径向预紧。圆锥形内孔轴向位移量与内部游隙的变动量的关系列于表4.3.5中。

5.2 Pre-loading of bearing

Certain pre-load may be applied on the bearing as required pursuant to the purpose of bearing sometimes, so as to enable the bearing interior to be in the state of negative internal clearance, which method is called as pre-loading, mostly applied to angular contact ball bearing and tapered roller bearing.

5.2.1 Objective of pre-loading

Upon the application of pre-load on the bearing, a pre-compression will always maintained at the contact point of rolling element and bearing race, so as to ensure no internal clearance of bearing generated under load, improve the rigidity of radial and axial movement, rotation precision and positioning precision, suppress vibration and noise, restrain the revolving and spinning slide of rolling element and reduce the abrasion.

In addition, when the thrust ball bearing and the thrust roller one are used on axial shaft, it is required to adopt the pre-load to keep the rolling element at the correct position, which is very important for the locating bearing at the axial fixed end of rolling mill roll.

The method for applying the pre-load to the bearing is, to apply the axial load between the opposite two sets of bearings so as to enable bearing inner and outer rings to generate the opposite axial displacement.

5.2.2 Axial pre-loading

5.2.2.1 Locating pre-loading

Locating pre-loading refers to the axial pre-loading mode that the axial position of bearing maintains unchanged in the service process, as indicated in Fig. (5.1), with certain pre-tensing amount achieved via regulating the width of space sleeve between two bearings.

5.2.2.2 Constant-pressure pre-loading

Constant-pressure pre-loading refers to the axial pre-tension mode that the axial pre-load of bearing maintains unchanged in the service process, as indicated in Fig. (5.2), with certain pre-tensing amount achieved via regulating the amount of spring compression.

5.2.3 Radial pre-loading

As a radial pre-tensing mode, radial pre-loading is a pre-tensing method of taking advantage of interference fit to make the bearing inner ring expand and eliminate the radial internal clearance.

The objective of radial pre-loading is to increase the quantity of rolling elements in the load area and improve the rigidity of support. In the high-speed cylindrical roller bearing, the radial pre-tensing can reduce the phenomenon of sliding between the rolling element and the bearing race under the effect of centrifugal force. As for the tapered-bore bearing, the radial pre-tensing is achieved by regulating the relative position of inner ring and adapter sleeve with locking for the sake of reducing the radial internal clearance of bearing. The relationship between the axial displacement of tapered bore and the variation of internal clearance is indicated in Table 4.3.5.

圆锥形内孔轴向移动量与轴承内部的游隙变动量的关系

Relationship between Axial Displacement of Tapered Bore and Variation of Internal Clearance

表5—9 Table 5-9 单位 Unit:： μ m

公称内径内径 Nominal Inner Diameter		径向游隙减少量 Decrease in Radial Internal Clearance		轴向方向的压入量 Amount of Radial Press-in				最小残留游隙 Min. Residual Internal Clearance		
				内孔圆锥度 Bore Conicity at 1：12		内孔圆锥度 Bore Conicity at 1：30				
超过 Over	以下 Below	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	Co	C3	C4
30	40	0.020	0.025	0.35	0.40	----	----	0.015	0.025	0.040
40	50	0.025	0.030	0.40	0.45	----	----	0.020	0.030	0.050
50	65	0.030	0.040	0.45	0.60	----	----	0.025	0.035	0.055
65	80	0.040	0.050	0.60	0.75	----	----	0.025	0.040	0.070
80	100	0.045	0.060	0.70	0.90	1.70	2.20	0.035	0.050	0.080
100	120	0.050	0.070	0.75	1.10	1.90	2.70	0.050	0.065	0.100
120	140	0.065	0.090	1.10	1.40	2.70	3.50	0.055	0.080	0.110
140	160	0.075	0.100	1.20	1.60	3.00	4.00	0.055	0.090	0.130
160	180	0.080	0.110	1.30	1.70	3.20	4.20	0.060	0.100	0.150
180	200	0.090	0.130	1.40	2.00	3.50	5.00	0.070	0.100	0.160
200	225	0.100	0.140	1.60	2.20	4.00	5.50	0.080	0.120	0.180
225	250	0.110	0.150	1.70	2.40	4.20	6.00	0.090	0.130	0.200
250	280	0.120	0.170	1.90	2.70	4.70	6.70	0.100	0.140	0.220
280	315	0.130	0.190	2.00	3.00	5.00	7.50	0.110	0.150	0.240
315	355	0.150	0.210	2.40	3.30	6.00	8.20	0.120	0.170	0.260
355	400	0.170	0.230	2.60	3.60	6.50	9.00	0.130	0.190	0.290
400	450	0.200	0.260	3.10	4.00	7.70	10.0	0.130	0.200	0.310
450	500	0.210	0.280	3.30	4.40	8.20	11.0	0.160	0.230	0.350
500	560	0.240	0.320	3.70	5.00	9.20	12.5	0.170	0.250	0.360
560	630	0.260	0.350	4.00	5.40	10.0	13.5	0.200	0.290	0.410
630	710	0.300	0.400	4.60	6.20	11.5	15.5	0.210	0.310	0.450
710	800	0.340	0.450	5.30	7.00	13.3	17.5	0.230	0.350	0.510
800	900	0.370	0.500	5.70	7.80	14.3	19.5	0.270	0.390	0.570
900	1000	0.410	0.550	6.30	8.50	15.8	21.0	0.300	0.430	0.640
1000	1120	0.450	0.600	6.80	9.00	17.0	23.0	0.320	0480	0.700

6.轴承使用材料及要求

6.1轴承套圈和滚动体用材料

根据国家标准及轴承使用要求，目前用于轴承套圈及滚动体的材料有高碳铬轴承钢、渗碳轴承钢、高温轴承钢、不锈钢等，这些材料按各自不同的特点而被用于不同场合。

表5—6为高碳铬轴承钢，应用于普通的场合，其用量最大，约占材料总用量的80%以上。

6 Bearing Materials and Requirements

6.1 Materials for bearing race and rolling element

Pursuant to national standards and bearing service requirements, materials currently used for bearing race and rolling element are high carbon chromium bearing steel, carbonized bearing steel, high-temperature bearing steel and stainless steel etc., which are applied to different occasions according to their respective characteristics.

Table 5-6 is high carbon chromium bearing steel, applied to general occasion, of which the consumption is the most, approximately accounting for over 80% of the total material consumption.

表6—1 Table 6-1

材料代号 Material designation	特点及用途 Features and uses	技术特性 Technical features
GCr15	用于普通场合，用量最大 For use in ordinary occasions with the highest consumption	有效壁厚在18mm以下 淬回火硬度HRC57～62 Effective wall thickness below 18mm Hardening and tempering hardness HRC57-62
GCr18Mo	贝氏体钢、耐冲击场合使用 Bainitic steel for use in impact resistant occasions	有效壁厚在18～30mm之间 淬回火硬度HRC57～62 Effective wall thickness between 18-30mm Hardening and tempering hardness HRC57-62
GCr155SiMn	普通场合使用、用于大型轴承 For large bearings in ordinary occasions	有效壁厚在18mm以上 淬回火硬度HRC57～62 Effective wall thickness over 18mm Hardening and tempering hardness HRC57-62

表6—2
Table 6-2

材料代号 Material designation	特点及用途 Features and uses	技术特性 Technical features
G20CrNi2MoA	用于耐冲击场合、中小轴承浅层渗碳 For use in impact resistant occasions, superficial carburizing for medium and small bearings	有效渗层深1.5～2.3mm 淬回火硬度HRC59～63 Effective carburizing depth 1.5-2.3mm Hardening and tempering hardness HRC59-63
G20Gr2Ni4A	用于耐冲击场合、中大型轴承深层渗碳 For use in impact resistant occasions, deep carburizing for medium and large bearings	有效渗层深＞2.3mm 淬回火硬度HRC59～63 Effective carburizing depth > 2.3mm Hardening and tempering hardness HRC59-63

高温轴承及不锈钢轴承用材料在本样本中没有列出
Materials for high temperature and stainless steel bearings are not shown here.

6.2保持架材料列于表6—3

Materials for cage in 6.2 are shown in Table 6-3.

表6—3 Table 6-3

材料代号 Material designation	特点及用途 Features and uses	技术特性 Technical features
08AL或10	钢板冲压型保持架、用于中小型圆锥轴承 Cage from steel plate pressing for use with medium and small conical bearings	易于冲压成型、重量轻 Easy to form by pressing, light weight
ZCuZn40Pb2	用于大部分轧机轴承及其他中小型轴承 For use with most roller bearings and other medium and small bearings	易于切削、摩擦系数低、强度适中 Easy for turning, with low frictional coefficient, moderate strength
ZCuA110Fe3Mn2	用于高温轴承 For use with high temperature bearings	易于切削、强度高、耐磨性好 Easy for turning, high strength, good wearability
20	用于强冲击、重载荷工况下 For use under strong impact, heavy load conditions	强度高、切削性不好 High strength, low machinability

7. 轴承的配合

选择合适的配合将对轴承的运转可靠性和寿命有很大影响，下面将推荐一些场合的配合选择方法。

7. 1径向轴承的配合

7．1．1 轴与外壳孔的尺寸公差与配合关系

7. Fit of rolling machine bearing

Selection of proper fit will have a substantial influence on bearing service reliability and life. Methods to select fit in some occasions are recommended below.

7.1 Fit of radial bearing

7.1.1 Dimensional tolerances of and fit relation between shaft and housing hole

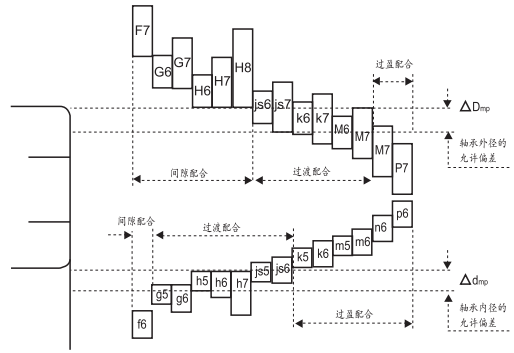


图7.1 轴和外壳孔的尺寸公差与配合的关系（0级公差的轴承）

7.1.2载荷的性质与配合的关系

7.1.2 Relation between load features and fit

表7—1

旋转分区 Rotation zoning	载荷方向 Load direction	载荷性质 Load feature	配合 Fit 内圈与轴 Inner ring and shaft	配合 Fit 外圈与壳 Outer ring and shaft	示 例 Example
内圈旋转，外圈静止 Inner ring rotating, outer ring at rest	固 定 Fixed	内圈旋转载荷外圈静止载荷 Rotating load for inner ring, static load for outer ring	需要过盈配合k.m.n.p.r Interference fit necessary k.m.n.p.r	间隙配合F.G.H.Js Clearance fit F.G.H.js	轧钢机辊颈、正齿轮装置、电动机 Journal of steel rolling machine, spur gear assembly, motor
内圈静止，外圈旋转 Inner ring at rest, outer ring rotating	旋转（与外圈一起旋转） Rotating(with outer ring)				平衡差的车轮 Wheel with balance difference
内圈静止，外圈旋转 Inner ring at rest outer ring rotating	固定 Fixed	内圈静止载荷外圈旋转载荷 Static load for inner ring, rotating load for outer ring	间隙配合f.g.h.js Clearance fit f.g.h.js	需要过盈配合K.M.N.P Interference fit necessary K.M.N.P	带固定轴的行走轮和滑轮 Travel wheel and pulley with fixed shaft
内圈旋转，外圈静止 Inner ring rotating, outer ring at rest	旋转（与内圈一起旋转） Rotating (with inner ring)				振动筛 Vibrating screen
不定 Not certain	旋转或固定 Rotating or fixed	不定向载荷 Load in uncertain direction	过盈配合 Interference fit	过盈配合 Interference fit	曲轴 Crank shaft

表7-2 向心轴承（0级、6级）与轴的推荐配合

Table 7-2 Recommended fit of radial bearing (Class 0 and 6) and shaft

条件 Conditions		球轴承 Ball bearing		圆柱滚子轴承 圆锥滚子轴承 Cylindrical roller bearing taper roller bearing		调心滚子轴承 Self-aligning roller bearing		轴和公差带 Shaft and tolerance zone	备注 Remark	应用参考 References
		轴径 Shaft dia（mm）								
		最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max			
内圈旋转载荷或不定向载荷 Rotary or non-directional load of inner ring	轻载荷或变动载荷 Light or varying load	–	18	–	–			h5 js6	精确性要求时用其所长 js5、k5、m5、js6、k6、m6	电气器具机床泵鼓风机搬运车等 Electric appliance, machine tool pump, air blower etc.
		18	100	–	40			k6		
		100	200	40	140			m6		
		–	–	140	200					
	一般载荷 Normal load	–	18	–	40	–	–	js5	对于单列角接触球轴承及圆锥滚子轴承，因不需考虑配合引起的内部游隙的变化，因此可用m6代替k5、m5 For the single row angular contact ball bearing and the taper roller bearing, you may substitute m6 for k5, m5 because it is not necessary to consider the internal clearance	电动机汽轮机内燃机木工机械等 Motor, steam turbine, combustion engine and woodworking machinery etc.
		18	100	–	40	–	40	k5		
		100	140	40	100	40	65	m5		
		140	200	100	140	65	100	m6		
		200	280	140	200	100	140	n6		
		–	–	280	400	140	250	p6		
		–	–	–	–	280	500	r6		
	重载荷或冲击载荷 Heavy load or shock load			50	140	50	100	n6	需要内部游隙大于标准游隙的轴承 Require the bearing whose internal clearance is bigger than the standard one	铁路车辆车轴铁路车辆主电支机等 Axle shaft and main motor of railway vehicles etc,
				140	200	100	140	p6		
				200	–	140	200	r6		
						200	–	r7		
内圈静止载荷 Static load of inner ring	内圈必须易于在轴上移动 Must be easy for the inner ring to move on the shaft	全部轴劲 All shaft neck						g6	精确性要求高时，采用g5，对于大型轴承，为便于移动，也可采用f6。 For high precision, choose g5; for large bearings, f6 is also applicable.	带固定轴的车轮等 Wheel with fixed shaft etc.
	内圈不需要易于在轴上移动 Unnecessary for the inner ring to move on the shaft easily	全部轴颈 All shaft neck						h6	精确性要求高时采用h5 For high precision, choose h5	张紧轮、滑轮等 Tensioner and pulley etc.
仅中心轴向载荷 Only central axial load		全部轴颈 All shaft neck						js6	–	
圆锥孔轴承（0级精度）（带紧固件或退卸套） Tapered-bore bearing (precision 0) (with the fastener or withdrawal sleeve)										
任意载荷 Arbitrary load		全部轴颈 All shaft neck						H9/IT5[2)]	传动轴等可采用10/IT17[2)] Drive shaft may adopt 10/IT17[2)]	

1）轻载荷、一般载荷以及重载荷是提径向当量动载荷（Pr）分别是对应轴承的径向基本额定动载荷（Cr）的不超过6%，超过6%到12%以及超过12%的载荷

2）IT5及IT17表示轴的圆形公差、圆柱度公差等形位公差等形位公差必须分别在IT5及IT7的公差范围内。IT5及IT7的标准公差数值请参阅附录

1) Light load, normal load and heavy load respectively refer to the loads whose radial equivalent dynamic loads (Pr) are no more than 6%, more than 6% and 12% of the radial primary rated dynamic loads (Cr) of the corresponding bearings.

2) IT5 and IT17 mean that the geometric tolerance such as the circular and cylindricity tolerances must be within the tolerance scope. For the standard tolerance values of IT5 and IT7, refer to the annex.

表7-3 向心轴承（0级、6级）与外壳的推荐配合

Table 7-3 Recommended fit of radial bearing (Class 0 and 6) and casing

条件 Conditions				外壳孔的公差带 Tolerance zone of casing hole	备注 Remark	应用参考 References
外壳 Casing		载荷种类 Load type	外圈能否轴向移动 Whether the outer ring can move axially			
整体型或双半型 The whole or two halves type	外圈静止载荷 Static load of outer ring	任意载荷 Arbitrary load	易于移动 Easy to move	H7	对于大型轴承或外圈与外壳的温度差大时，也可采用G7 For the large bearing or when temp. difference between the outer ring and casing is big, G7 may be adopted.	一般轴承装置，铁路车辆车轴承轴箱、传动装置等 Common bearing device, housing of railway vehicle bearings, driving device.
		轻载荷或一般载荷 Light or normal load		H8	–	
		轴与内圈温度高 Shaft and inner ring at high temp.		G8	对于大型轴承或外圈与外壳的温度差大时，也可采和G8 For the large bearing or when temp. difference between the outer ring and casing is big, G8 may be adopted.	干燥缸体等 Dry cylinder etc.
整体型 The whole type		要求在轻载荷或一般载荷下做高精度旋转 Require the rotation with high precision under light or common load	原则上不能移动 Can not move in principle	K6	主要适用于滚子轴承 Mainly applicable to the ball bearings	
			能移动 Can move	JS6	主要适用于球轴承 Mainly applicable to the roller bearings	
		要求低噪音旋转 Require the rotation with low noise	易于移动 Easy to move	H6	–	
	不定向载荷	轻载荷或一般载荷 Light or normal load	一般能移动 Usually can move	Js7	精确性要求高时，用Js6、K6代替Js7、K7 When high precision is required, substitute JS6 and K6 for JS7 and K7.	电动机、泵、曲轴的主轴承等 Main bearing of the motor, pump and crank shaft etc.
		一般载荷或重载荷 Common or heavy load	原则上不能移动 Can not move in principle	K7		
		强烈冲击载荷 Severe shock load	不能移动 Can not move	M7	–	铁路车辆主电动机等 Main motor etc of railway vehicles
	外圈旋转载荷	轻载荷或变化载荷 Light or normal load	不能移动 Can not move	M7		传动带轮，索道滑轮张紧轮等 Driving pulley, cableway pulley and tensioner etc.
		一般载荷或重载荷 Normal or heavy load		N7	主要适用于球轴承 Mainly applicable to the ball bearings	装有球轴承的轮毂 Hub with ball bearing
		薄壁外壳且为重载荷或强烈冲击载荷 With thin wall and heavy load or severe shock load		P7	主要适用于滚子轴承 Mainly applicable to the roller bearings	装有滚子轴承的轮毂 连杆大端的轴承等 Hub with roller bearing bearing at big end of connecting rod

1）载荷的分类参照表57的注1）

[备注]1、本表适用于铸铁或钢制外壳

2、轴承仅承受中心轴向载荷时，应选择使外圈与外壳之间具有径向间隙的公差带

1) For the load classification, refer to Note 1) of Table 57

[Remark] 1. This table is applicable to the cast iron or steel casing

2. When the bearing only bears the central axial load, choose the tolerance zone where the outer ring and the casing have the radial clearance.

7.2英制圆锥滚子轴承的配合（轴承的公差等级：4级、2级）

7.2 Fit of British system taper roller bearing (tolerance grade: Grade 4 and 2)

表7-4 Table 7-4 与轴的配合公差值表 Tolerance table for fit of shaft 单位 Unit: μm

载荷条件 Loading conditions		轴承公称内径 Bearing nominal inner diameter d (mm) 超过 Over	到 Up to	轴承单一内径偏差 Deviation of bearing single inner diameter △ds 上 Upper	下 Lower	轴径的偏差 Deviation of shaft diameter 上 Upper	下 Lower	备注 Remark
内圈旋转载荷 Rotary load of inner ring	一般载荷 Normal load	–	76.2	+13	0	+38	+25	
		76.2	304.8	+25	0	+64	+38	
		304.8	609.6	+51	0	+127	+76	
		609.6	914.4	+76	0	+190	+114	
	重载荷及冲击载荷、高速旋转 Heavy and shock load, high rotation	–	76.2	+13	0	使平均过盈为0.005Xd(mm)的偏差值 The deviation making the mean interference 0.005Xd (mm)		一般使用在内部游隙大于标准游隙的轴承 Usually the inner clearance is more than the standard clearance
		76.2	304.8	+25	0			
		304.8	609.6	+51	0			
		609.6	914.4	+76	0			
外圈旋转载荷 Rotary load of outer ring	一般载荷(无冲击) Normal load (without shock)	–	76.2	+13	0	+13	0	
		76.2	304.8	+25	0	+25	0	
		304.8	609.6	+51	0	+51	0	
		609.6	914.4	+76	0	+76	0	
	一般载荷（无冲击） Normal load (without shock)	–	76.2	+13	0	0	−13	内圈能轴向移动 Inner ring can move axially
		76.2	304.8	+25	0	0	−25	
		304.8	609.6	+51	0	0	−51	
		609.6	914.4	+76	0	0	−76	
	重载荷及冲击载荷、高速旋转 Heavy and shock load, high rotation	–	76.2	+13	0	使平均过盈为0.0005Xd(mm)的偏差值 The deviation making the mean interference 0.005Xd (mm)		一般使用在内部游隙大于标准游隙的轴承 Usually the inner clearance is more than the standard clearance
		76.2	304.8	+25	0			
		304.8	609.6	+51	0			
		609.6	914.4	+76	0			

表7-5 与外壳孔的配合公差值表

Table 7-5 Tolerance table for fit with the casing hole 单位 Unit: μm

载荷条件 Loading conditions		轴承公称外径 Bearing nominal outer diameter D(mm) 超过 Over	到 Up to	轴承单一外径的偏差 Deviation of bearing single outer diameter △Ds 上 Upper	下 Lower	外壳孔的偏差 Deviation of casing hole 上 Upper	下 Lower	备注 Remark
内圈旋转载荷 Rotary load of inner ring	用于自由端或固定端 For the free or fixed end	–	76.2	+25	0	+76	+51	外圈易于轴向移动 The outer ring is easy to move axially
		76.2	127.0	+25	0	+76	+51	
		127.0	304.8	+25	0	+76	+51	
		304.8	609.6	+51	0	+152	+102	
		609.6	914.4	+76	0	+229	+152	
	外圈的轴向位置能调整 The axial position of outer ring can be adjusted	–	76.2	+25	0	+25	0	外圈能轴向移动 The outer ring can move axially
		76.2	127.0	+25	0	+25	0	
		127.0	304.8	+25	0	+51	0	
		304.8	609.6	+51	0	+76	+25	
		609.6	914.4	+76	0	+127	+51	
	外圈的轴向位置不能调整 The axial position of outer ring cannot be adjusted	–	76.2	+25	0	−13	−38	外圈轴向固定 The outer ring is fixed axially
		76.2	127.0	+25	0	−25	−51	
		127.0	304.8	+25	0	−25	−51	
		304.8	609.6	+51	0	−25	−76	
		609.6	914.4	+76	0	−25	−102	
外圈旋转载荷 Rotary load of outer ring	外圈的轴向位置不能调整 The axial position of outer ring cannot be adjusted	–	76.2	+25	0	−13	−38	外圈轴向固定 The outer ring is fixed axially
		76.2	127.0	+25	0	−25	−51	
		127.0	304.8	+25	0	−25	−51	
		304.8	609.6	+51	0	−25	−76	
		609.6	914.4	+76	0	−25	−102	

7.3轧机轴承的配合 7.3 Fit of rolling mill bearing

轧机用四列圆柱滚子轴承的推荐配合

Recommended fit for four-row cylindrical roller bearing for the rolling mill use

表7-6 Table 7-6 （内圈为过盈配合）(Inner ring is interference fit) 单位 Unit:： μ m

内圈与辊颈(轴) Inner ring and roll neck (shaft)						外圈与箱体（外壳)Outer ring and housing (casing)					
轴承公称内径 Bearing nominal inner diameter d(mm)		单一平面平均内径的偏差 Mean inner diameter deviation in single plane △dmp		辊颈直径的偏差 Deviation of roll neck		轴承公称外径 Nominal bearing outer diameter		单一平面平均内径的偏差 Mean inner diameter deviation in single plane △dmp		箱体内径的偏差 Inner diameter deviation of housing	
超过 Over	到 Up to	上 Upper	下 Lower	上 Upper	下 Lower	超过	到	上	下	上	下
80	120	0	−20	+59	+37	120	150	0	−18	+40	0
120	180	0	−25	+68	+43	150	180	0	−25	+40	0(H7)
180	250	0	−30	+79	+50	180	250	0	−30	+45	0
250	315	0	−35	+88	+56	250	315	0	−35	+52	0
315	400	0	−40	+98	+62	315	400	0	−40	+57	0(H7)
400	500	0	−45	+108	+68	400	500	0	−45	+63	0
500	560	0	−50	+194	+150	500	630	0	−50	+146	+76(H7)
550	630	0	−50	+199	+155					+92	+22(G7)
630	710	0	−75	+225	+175						
710	800	0	−75	+235	+185	630	800	0	−75	+160	+80(F7)
800	900	0	−100	+266	+210					+104	+24(G7)
900	1000	0	−100	+276	+220						
1000	1120	0	−125	+315	+250	800	1000	0	−100	+176	+86(F7)
1120	1250	0	−125	+326	+260					+116	+26(G7)
−	−	0	−	−	−						
						1000	1250	0	−125	+203	+98(F7)
										+133	+28(G7)
						1250	1600	0	−160	+235	+110(F7)
										+155	+30(G7)

[注]上表中的推荐配合为一般的估计值，为防止内圈蠕变，ZWA根据不同的轴承材料及使用条件制定了不同的推荐配合，使用此表时请与ZWA联系。

[Note] The recommended fits in the above table are the normally estimated value. In order to prevent the inner ring creeping, ZWA made different recommendation in accordance with the bearing materials and use conditions. Please contact us if you need this table.

轧机辊颈用公制四列圆锥滚子轴承的推荐配合

Recommended fit of metric system four-row taper roller bearing for the roll neck use

表7-7 Table 7-7 单位 Unit:： μ m

内圈与辊颈(轴) Inner ring and roll neck (shaft)						外圈与箱体（外壳） Outer ring and housing (casing)					
轴承公称内径 Bearing nominal inner diameter d (mm)		单一平面平均内径的偏差 Mean inner diameter deviation in single plane △dmp		辊颈直径的偏差 Deviation of roll neck		轴承公称外径 Bearing nominal outer diameter D(mm)		单一平面平均外径的偏差 Mean outer diameter deviation in single plane △Dmp		箱体内径的偏差 Inner diameter deviation of housing	
超过 Over	到 Up to	上 Upper	下 Lower	上 Upper	下 Lower	超过 Over	到 Up to	上 Upper	下 Lower	上 Upper	下 Lower
80	120	0	−20	−120	−150	120	150	0	−18	+57	+25
120	180	0	−25	−150	−175	150	180	0	−25	+100	+50
180	250	0	−30	−175	−200	180	250	0	−30	+120	+50
250	315	0	−35	−210	−250	250	315	0	−35	+115	+50
315	400	0	−40	−240	−300	315	400	0	−40	+110	+50
400	500	0	−45	−245	−300	400	500	0	−45	+105	+50
500	630	0	−50	−250	−300	500	630	0	−50	+100	+50
630	800	0	−75	−325	−400	630	800	0	−75	+150	+75
800	1000	0	−100	−350	−425	800	1000	0	−100	+150	+75
1000	1250	0	−125	−425	−500	1000	1250	0	−125	+175	+100
1250	1600	0	−160	−510	−600	1250	1600	0	−160	+215	+125
−	−	0	−	−	−	1600	2000	0	−200	+250	+150

轧机辊颈用英制四列圆锥滚子轴承的推荐配合

Recommended fit of British system four-row taper roller bearing for the roll neck use

表7-8 Table 7-8 单位 Unit:： μ m

内圈与辊颈(轴) Inner ring and roll neck (shaft)						外圈与箱体（外壳） Outer ring and housing (casing)					
轴承公称内径 Bearing nominal inner diameter d(mm)		单一平面平均内径的偏差 Mean inner diameter deviation in single plane △dmp		辊颈直径的偏差 Deviation of roll neck		轴承公称外径 Bearing nominal outer diameter D(mm)		单一平面平均外径的偏差 Mean outer diameter deviation in single plane △Dmp		箱体内径的偏差 Inner diameter deviation of housing	
超过 Over	到 Up to	上 Upper	下 Lower	上 Upper	下 Lower	超过 Over	到 Up to	上 Upper	下 Lower	上 Upper	下 Lower
76.2	101.6	+25	0	−75	−100	−	304.8	+25	0	+75	+50
101.2	127	+25	0	−100	−125	304.8	609.6	+51	0	+150	+100
127	152.4	+25	0	−125	−150	609.6	914.4	+76	0	+225	+150
152.4	203.4	+25	0	−150	−175	914.4	1219.2	+102	0	+300	+200
203.4	304.8	+25	0	−175	−200	1219.2	1524.0	+127	0	+375	+250
304.8	609.6	+51	0	−200	−250	1524.0	−	+127	0	+450	+300
609.6	914.4	+75	0	−250	−325						
914.4	1219.2	+102	0	−300	−400						
1219.2	−	+127	0	−375	−475						

7.4推力轴承的配合 7.4 Fit of thrust bearing

表7-9 推力轴承轴圈与轴的配合
Fit of shaft washer and shaft of thrust bearing

条件 Conditions		轴径 Shaft dia mm 超过 Over	到 Up to	轴的公差带 Tolerance zone of shaft	备注 Remark
中心轴向载荷(对普通的推力轴承) Central axial load (for the common thrust bearing)		全部轴径 All shaft diameters		js6	也可采用 h6 h6 is also applicable
合成载荷(对推力调心滚子轴承) Resultant load (for the thrust self-aligning roller bearing)	轴圈静止载荷 Static load of shaft washer	全部轴径 All shaft diameters		js6	–
	轴圈旋转载荷或不定向载荷 Rotary or non-directional load of shaft washer	–	200	k6	也可以分别用js6、k6、m6代替k6、m6、n6 js6, k6 and m6 are also applicable, substituting for k6, m6 and n6 respectively
		200	400	m6	
		400		n6	

表7-10 Table 7-10 推力轴承座圈与外壳的推荐配合
Recommended fit of housing washer and casing of thrust bearing

条件 Conditions		外壳孔的公差带 Tolerance zone of casing hole	备注 Remark
中心轴向载荷(对普通的推力轴承) Central axial load (for common thrust bearing)		–	选择使座圈与外壳之间具有径向间隙的合适公差带 Choose the proper tolerance zone where the housing washer and the casing have radial clearance.
		H8	推力球轴承具精度要求高 The thrust ball bearing requires high precision
合成载荷(对推力调心滚子轴承) Resultant load (for the thrust self-aligning roller bearing)	座圈静止载荷 Static load of housing washer	H7	–
	座圈旋转载荷或不定向载荷 Rotary or non-directional load of housing washer	K7	一般使用条件 Normal use conditions
		M7	径向载荷较大 Big radial load

7.5轴与外壳孔的形位公差

7.5 Geometric tolerance of shaft and casing hole

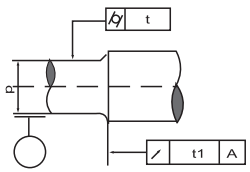


图7.1

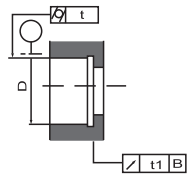


图7.2

7.6轴与外壳孔的公差 7.6 Tolerance of shaft and casing hole

表7-11 Table 7-11 轴与外壳孔的形位公差 Geometric tolerance of shaft and casing hole

公称尺寸 Nominal dim mm		圆柱度 Cylindricity t						端面圆跳动 End face runout t1					
		轴颈 Shaft neck			外壳孔 Casing hole			轴颈 Shaft neck			外壳孔 Casing hole		
		轴承公差等级 Bearing tolerance grade											
		P0	P6	P5	P0	P6	P5	P0	P6	P5	P0	P6	P5
超过 Over	到 Up to	最大 Maximum											
30	50	4	2.5	1.5	7	4	2.5	12	8	5	20	12	5
50	80	5	3	2	8	5	3	15	10	6	25	15	6
80	120	6	4	2.5	10	6	4	15	10	6	25	15	6
120	180	8	5	3.5	12	8	5	20	12	8	30	20	8
180	250	10	7	4.5	14	10	7	20	12	8	30	20	8
250	315	12	8	6	16	12	8	25	15	10	40	25	10
315	400	13	9	7	18	13	9	25	15	10	40	25	10
400	500	15	10	8	20	15	10	25	15	10	40	25	10

8 轧机轴承的润滑

轴承润滑的目的是减少轴承内部摩擦及磨损,防止烧伤,使滚动表面及滑动表面间形成油膜。因此,轧机轴承的润滑应达到如下的效果:

在轴承内部减少滚动体、套圈和保持架间的金属接触,减少轴承摩擦及磨损。

使滚动表面及滑动表面间形成良好的油膜厚度,以便延长轴承的疲劳寿命。

特别是当润滑选择正确,润滑剂足够清洁时金属表面间形成弹性流体动力润滑油膜,轴承使用寿命可以远远超过计算寿命。

稀油循环润滑可以有效地排出摩擦所产生的磨粒,脂润滑还可以起到良好的防尘密封作用。

8.1 润滑剂的选择要点

润滑剂一般分为润滑脂和润滑油两种,润滑剂的选择原则一般为:中低速运转,重载荷的工况用润滑脂;中高转速、中轻载荷的工况用润滑油,高转速的工况有的使用油气润滑。 对于轧辊轴承多选用润滑脂润滑,只有高速时采用油润滑,特别高的速度才采用油气润滑。

在大多数的应用场合,轧机轴承采用脂润滑可以获得较正常的运行效果,与油润滑相比脂润滑具有容易保留润滑脂在轴承的配置中,特别是倾斜及垂直轴安置的轴承,脂润滑可以有效地防止外界异物、水或水气的入侵,同时也具有润滑系统及润滑辅助设备简单的优点, 因此在轴承润滑设计的首先应考虑选用脂润滑。

8.1.1润滑脂的选择要点

转速越高 应用针入度大的脂
环境温度低 应用针入度大的脂
环境温度高 应用滴点较高的脂
要有较强的抗水能力
脂的洁净度、防腐性、含水量、分油量均应在控制指标内

8. Lubrication of rolling mill bearing

The bearing lubrication aims to reduce the internal friction and abrasion, prevent the burning and offer oil film between the rolling and sliding surfaces, thus the following effects can be realized:

Reduce the metal contact among the rolling body, the ring and the cage and reduce the bearing friction and abrasion.

Offer proper oil film between the rolling and sliding surfaces to prolong the fatigue life of the bearing.

Especially if the lubricant is proper and clean enough, the elastic fluid lubricant film is generated between the metal surfaces, which can greatly prolong the service life of the bearing.

The cycled lubrication with thin oil can effectively get rid of the rubbed particles. The grease lubrication also has the function of dustproof and sealing.

8.1 Keys for lubricant choice

The lubricant mainly includes the lubricating grease and oil. The choice generally shall follow these principles: choose the grease for the medium and low rotation and heavy load; choose the oil for the medium and high rotation and medium and light load and sometime choose the oil gas for the high rotation; usually choose the grease for the roll bearing, oil only at high rotation and oil gas at the extra-high rotation. In most cases, the rolling mill bearing can run normally with the grease lubrication. Compared to the oil, the grease lubrication is more likely to remain the grease in the bearing fittings, especially for the bearings with slanted and vertical shafts. The grease lubrication can effectively prevent the foreign matters, water or vapor from entering. Furthermore, its lubrication system and auxiliary devices are easier. Therefore, the grease lubrication shall be first considered in the design of bearing lubrication.

8.1.1 Keys for lubricating grease choice

High rotation: choose the grease with high penetration
Low ambient temperature: choose the grease with high penetration
High ambient temperature: choose the grease with high drop point
Require strong water resistance.
The cleanness, anti-corrosion, moisture and oil separation capacity shall be controlled within the specified indexes.

润滑脂的选择主要根据轴承的结构类型和工作条件，诸如工作温度、载荷的大小、速度参数（dmn值）等。图8.1是按轴承的载荷及速度来划分润滑脂的选用范围：

Ka=1适用于球轴承、角接触球轴承、四点接触球轴承、调心球轴承及圆柱滚子轴承。

Ka=2适用于调心滚子轴承、圆锥滚子轴承及滚针轴承。

Ka=3适用于推力圆柱滚子轴承及无保持架满圆柱滚子轴承。

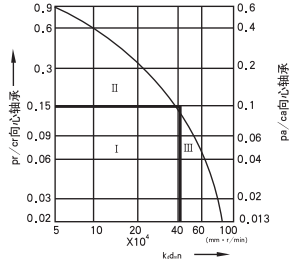


图8.1润滑脂的选择
Figure 8.1 Choice of Lubricating Grease

To choose the lubricating grease, the following shall be considered: the bearing structure and service conditions, e.g. the working temperature, the load, the speed parameters (dmn) etc. Figure 8.1 shows the choice scope divided in accordance with the bearing load and rotation.

Ka=1, applicable to the ball bearing, angular contact ball bearing, four-point contact ball bearing, self-aligning ball bearing and cylindrical roller bearing.

Ka=2, applicable to the self-aligning roller bearing, taper roller bearing and needle bearing.

Ka=3, applicable to the thrust cylindrical roller bearing and full cylindrical roller bearing without cage.

（I）区常用区域，选用一般润滑脂；
（II）区高压区域，选用极压润滑脂；
（III）区高压、高速区域，选用高压、高速润滑脂；

(I) the common zone: choose the common grease;
(II) the high-pressure zone: choose the extreme-pressure grease;
(III) the high-pressure and high-speed zone: choose the high-pressure and high-speed grease;

8.1.2润滑油的选择要点

润滑油的选择主要基于润滑油的粘度，以保证在工作温度下能为轴承提供足够的润滑， 润滑油的粘度与温度有关，为了能在滚动体与滚道接触区形成足够的油膜厚度，润滑油必须在工作温度下不致丧失其最低粘度，因此在选用润滑油时，必须选用在工作温度下粘度高于最小的动力粘度（V1）的润滑油，可以延长轴承使用寿命，但由于增加粘度会引起轴承温度的升高，因此，以这种方法来改善润滑实际上是有限的。

若粘度比V／V1＜1（V为40℃时的动力粘度），则可使用含EP（极压添加剂）的润滑油，若V／V1＜0.4，则必须使用含有EP添加剂的润滑油，在中型或大型滚子轴承中，若V／V1＞1，使用含有EP添加剂的润滑油，可以提高运行可靠性，必须明白不是所有的EP添加剂都能对轴承有益，对于极低或极高的转速，或者复杂的载荷状况，或不正常的润滑条件时润滑选择，请向ZWA咨询。

8.1.2 Keys for lubricating oil choice

Choose the oil mainly based upon the viscosity so that sufficient lubrication can be provided to the bearing at the working temperature. The viscosity has relation with the temperature. In order to ensure the sufficient width of the oil film between the rolling body and the track, the oil shall not lose its minimum viscosity at the working temperature. Therefore choose the oil whose viscosity at the working temperature is higher than the minimum kinetic viscosity (V1), which can prolong the service life of the bearing. However, increasing the viscosity will raise the bearing temperature. Therefore it is not so ideal to improve the lubrication.

If V/V1<1 (V is the kinetic viscosity at 40℃), you may choose the lubricating oil containing EP (extreme-pressure agent); if V/V1<0.4, you must choose the foresaid oil; for the medium or large roller bearing, if V/V1>1, using this oil can enhance the running reliability. Not all the EP agents are beneficial to the bearings. For the lubrication at the extreme low or high rotation, complicated loading or unusual lubrication conditions, please contact with ZWA.

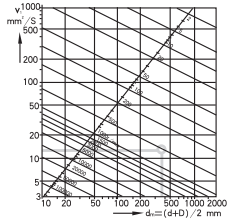


图8.2
Figure 8.2

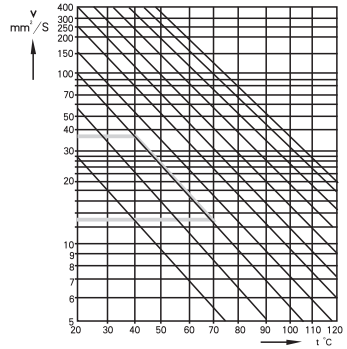


图8.3
Figure 8.3

8.2润滑的方法

8.2.1脂润滑方法

脂润滑的方法一般是润滑剂在轴承安装时注入，注入量应随转速的增高而减少，过多的注入量会引起轴了的温升发热，旋转阻力矩增大和油脂泄漏，污染环境，最终会导致脂的润滑功能下降和老化。一般润滑脂的初次注入量，可以根据轴承脂润滑的许用极限转速ng和轴承的实际转速n的比值来确定。

当：ng/n＜1.25建议润滑脂的注入量占轴承的内部自由空间的1/3

1.25＜ ng/n＜5建议润滑脂的注入量占轴承的内部自由空间的1/3－2/3

ng/n＞5建议润滑脂的注入量占轴承的内部自由空间的2/3以上

一般轧机轴承的润滑脂初次注入量G可按公式（12）计算，

G=0.9(1/3～2/3)[0.7854(D2－d2)BX10－3－M/(7.8X10⁻³)] (12)式中G－注脂量 gm

D轴承外径mm

d轴承内径mm

B－轴承宽度mm

M－轴承重量kg

润滑脂的添加周期可参考图8.4推荐值

8.2 Lubrication method

8.2.1 Grease lubrication method

Usually inject with the bearing installation and the volume shall be reduced with the acceleration of rotation. The over injection may result in the temperature rising of the shaft, the increasing of the rotary resistance moment, leakage, pollution and finally the function reduction and aging of the grease. Usually the initial injection volume may be determined in accordance with the ratio of the allowable limit rotation (ng) to the actual rotation (n).

If ng/n <1.25, recommend the volume takes up 1/3 of the internal free space;

1.25<ng/n<5, recommend the volume takes up 1/3~2/3 of the internal free space;

ng/n>5, recommend the volume takes up over 2/3 of the internal free space.

For the initial injection volume of the common rolling mill bearings G, you may calculate according to the formula (12)

G=0.9(1/3~2/3) [0.7854(D2-d2)]B×10-3-M/(7.8×10-3)]

In which:

G: grease injection volume in unit of gm

D: bearing outer diameter in unit of mm

d: bearing inner diameter in unit of mm

B: bearing width in unit of mm

M: bearing weight in unit of kg

For the injection cycle, refer to the recommended value in Figure 8.4.

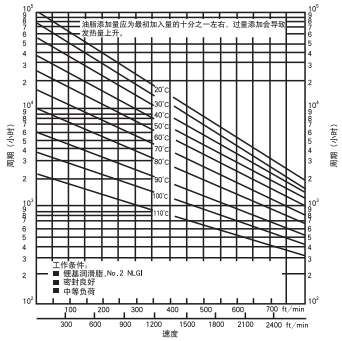


图8.4
Figure 8.4

当选择润滑脂时，锂基脂有较好的抗水性，滴点较高(190～250℃)，可用于潮湿和水淋部位，由高级脂肪酸与无机酸组成的复合锂基脂0#、1#脂用于集中润滑，适用于轧制速度小于30m/s的轴承；2#、3#脂用于非集中润滑系统，如线材轧机、高温电机、输送辊道；2#脂适用于轧制速度小于20m/s，3#适用于12m/s以下。

国内生产的多效锂基脂，在耐温特性、抗挤压、耐水、防蚀、粘附力等方面均比较好。

国内生产的通用锂基脂，极压锂基脂，极压复合锂基脂及耐油密封润滑脂均性能较好，可以选择使用。

国内生产的轧辊轴承润滑脂是由高级脂肪酸和增效剂复合而成的多元复合锂基脂，是轧辊轴承理想的润滑脂。推荐使用。

Lithium based grease has strong water resistance and high drop point (190~250oC), applicable to the damp and water drenching places. The complex lithium based greases 0# and 1# composing of high-class fatty acid and inorganic acid are applicable to the bearing whose rolling speed is under 30m/s; 2# and 3# greases are applicable to the non-centralized lubrication system, e.g. the wire mill, the high-temperature motor and the roll gang; 2# grease is applicable to that with rolling speed under 20m/s and 3# to that under 12m/s.

The multi-functional lithium-based grease made in China works well with regard to the high temperature resistance, the extrusion resistance, corrosion resistance and adhesion etc.

The general lithium based grease, the extreme-pressure lithium based grease, the extreme-pressure complex lithium based grease and the oil-resistant packing grease made in Chinas all works well. The roll bearing grease made in China is the complex lithium based grease composing of the high-class fatty acid and synergist, which is ideal for the roller bearing. Recommend to use it.

表8—1 Table 8-1 极压复合锂基脂 EP complex lithium-based grease

项目 Items	质量指标 Quality index					试验方法 Test method
	00号	0号	1号	2号	3 号	
工作针入度1/10mm, Worked penetration 1/10mm	400－430	355—385	310－340	265－295	220－250	
延长工作针入度(十万次),1/10mm,不大于 Prolongedworked penetration (100,000times), 1/10mm, ≤	460	420	390	360	330	GB/T269
滴点℃，不低于 Drop point ≥	185	220	250	260	260	GB/T2498
分油量%不大于 Oil separation capacity % ≤	/	/	/	15	15	GB/T392
蒸发量(180℃)不大于 Evaporation capacity (180oC),≤	5	5	5	5	5	SH/T0337
腐蚀(45号钢片,100℃,3h) Corrosion (#45 sheet steel, 100oC, 3h)	合格Qualified	合格Qualified	合格Qualified	合格Qualified	合格Qualified	SH/T0331
相似粘度(—20℃, 10s—1, Pa.s不大于 Apparent viscosity(—20oC, 10s—1, Pa.s ≤	/	/	1200	1500	1700	SH/T0048
机械杂质,颗数/cm3,直径24～75/um,不多于 Mechanical impurities particles/cm3,dia. 24~75/um,≤	3000	3000	3000	3000	3000	SH/T0336
直径75～124um,不多于 Dia. 75~124um, ≤	500	500	500	500	500	
直径大于等于125um Dia. ≥ 125um	无 None	无 None	无 None	无 None	无 None	
最大无卡咬负荷Pa,N不小于 Max. nonseizure load Pa, N ≥	785	785	785	785	785	SH/T0202

表8—2 轧辊轴承润滑脂 Table 8.2 Grease for roll bearing

项目 Items		质量指标 Quality index					试验方法 Test method
		00	0	1	2	3	
外观 Appearance		棕黄色到棕黑色 From brown yellow to brown black					目测 Visual
针入度(25℃150g) 1/10mm Penetration (25oC 150g) 1/10mm		400－430	355－385	310—340	265－295	220－250	GB269
滴点℃≥ Drop point ^{o}C		135	140	220	250	250	GB4929
腐蚀(T62,100℃,24h) Corrosion (T62, 100oC, 24h)		合格Qualified	合格Qualified	合格Qualified	合格Qualified	合格Qualified	GB7326 乙法 Method B
灰分% Ash %		5.0	5.0	5.0	5.0	5.0	SY2703
水分% Moisture %		痕迹Residue	痕迹Residue	痕迹Residue	痕迹Residue	痕迹Residue	GB512
蒸发量(98.9℃22h)≤ Evaporation capacity (98.9℃ 22h)≤		3.0	3.0	2.0	2.0	2.0	GB7325
水淋流失量,%(38℃1h)≤ Drenching loss, % (38℃, 1h) ≤		6.0	6.0	5.0	5.0	5.0	SY2718
抗擦能力ok值N≥ Anti-scuffing OK value N≥		156	156	156	156	156	ZBE36020
延长工作针入度(10万次—60万次后差值)≤ penetration (difference after 100,000-600,000 times)≤				±30	±30	±30	GB2369
钢网分油量(100℃24h)% ≤ Oil separation capacity (steel mesh, 100 oC, 24h)% ≤				10	5	5	ZBE36016
显微镜杂质,个/cm Impurities under microscope, pcs/cm	25um以上 Over 25um	3000	3000	3000	3000	3000	SY2721
	75um以上 Over 75um	500	500	500	500	500	
	125um以上 Over 125um	0	0	0	0	0	

8.2.2油润滑方法

油润滑的方法较多，如压力循环供油滑润、滴注式润滑、飞溅式润滑、油浴润滑、循环油润滑、油气润滑等，可根据使用场合的不同而选择。

8.2.2 Oil lubrication method

Forced circulated supply, instillation, splashing, bathing, circulation oil lubrication and oil gas lubrication etc. Depend on the use conditions.

9 轧机轴承的密封

9.1轧机轴承密封的原则：

轧机轴承密封有两种形式：接触式密封和非接触式密封
密封两种形式的使用条件的区分是：
高转速、高温工作条件下，应使用非接触式密封；
中低转速、常温工作条件下，应使用接触式密封；
周围环境有液体、杂质、浸蚀性气体等必须使用接触式密封；
使用稀油作润滑剂必须使用接触式密封。
使用密封装置应考虑摩擦发热问题及拆装与维护方便。

9.2轧机轴承的密封

轧辊轴承欲达到长寿命，有效的轴承密封是十分必要的。油封必须能有效防止轧制铁皮， 水乳液及其它杂质污染物进入轴承内腔，同时也要能防止润滑剂外漏。
轧辊轴承常用的密封形式迷宫、0形环密封、轴向密封环（V型）、径向密封环、金属制的活塞环等。

轧辊轴承密封的选择，应考虑的因素有轧制速度、密封结构、润滑类型和运行温度。

（图9.1、9.2、9.3）为迷宫、V型密封、径向密封环及排水环的综合运用。

（图9.4、9.5）为多重径向密封及迷宫组成的密封部位，可完全阻挡水的进入。立辊机密　　封部位的设计，其迷宫口必须向下（图9.6）。一般情况下，径向密封唇的指向应一个指向轴承内腔，一个指向外部，以防止脂的外泄和水的进入。通常密封环之间应填充润滑脂（见图9.7、9.8）。

热带钢轧机润滑剂的泄漏，不影响被轧制的材料的质量，而冷轧带钢则要避免润滑剂的泄漏，因为任何泄漏都会污染材料的表面。因此，径向密封环的唇部必须指向轴承。

密封唇滑动表面必须光滑 ，轧辊端部外倒角应圆滑过渡，防止轧辊装卸时碰伤密封唇。

自带密封的轧机轴承，其密封圈的主要功能是防水，它不可能替代传统式的密封件，只能是给轧机轴承增加一层辅助的密封，尽管如此，它对改善轧机轴承的工作环境非常有效。

9. Sealing of rolling mill bearing

9.1 Principles for sealing of rolling mill bearing

The sealing has two modes, namely the contact sealing and non-contact sealing.

Their difference in the use conditions are as follows:

Under the work conditions with high rotation and temperature, choose the non-contact one;

Under the working conditions with medium and low rotation and normal temperature, choose the contract one;

If there is liquid, impurities or corrosive air etc, you must choose the contact one;

For the thin oil, choose the contact one.

To choose the sealing device, the friction and heat generation as well as the disassembly and maintenance shall be considered.

9.2 Sealing of rolling mill bearing

Effective sealing is very necessary for the long service life of the roll bearing. The oil seal must prevent the iron scrap, water miscible liquid or other impurities from entering the bearing cavity and prevent the lubricant from leaking in the meantime. The popular sealing modes include labyrinth, O-ring, axial seal ring (V-shape), radial seal ring and metal piston ring etc.

To choose the seal for the roller bearing, take the rolling speed, sealing structure, lubrication type and running temperature etc into account.

(Figure 9.1, 9.2 and 9.3) are the integrated application of labyrinth, V-shape seal, radial seal ring and drainage ring etc.

(Figure 9.4 and 9.5) are the sealing position composing of multiple radial sealing and labyrinth, absolutely prevent the water penetration. For the sealing part of the vertical mill, the labyrinth port must be downward (Figure 9.6). Usually one radial seal lip points toward the bearing cavity and the other toward the outside, in case of grease leakage and water penetration. Where between the seal rings shall be injected the grease (Figure 9.7 and 9.8).

The leakage of grease of hot strip mill will not influence the quality of the materials rolled. However, the cold strip mill shall prevent the leakage of grease, for any leakage will pollute the material surface. Therefore, the lip of radial seal ring shall point toward the bearing.

The sliding surface of seal slip must be smooth. The transition of outer chamfering at the roll end must be smooth, in case that the seal slip is damaged when loading and unloading the roll.

For the mill bearing self equipped with the sealing, the main function of its seal ring is waterproof. It can not substitute for the traditional sealing member and it only add one assistant sealing to the mill bearing. Anyway, it is effective to improve the working environment of the mill bearing.

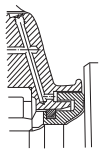


图9.1
Figure 9.1

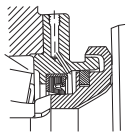


图9.2
Figure 9.2

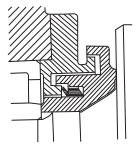


图9.3
Figure 9.3

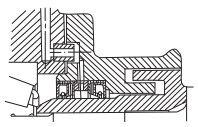


图9.4 Figure 9.4

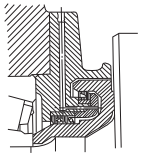


图9.5 Figure 9.5

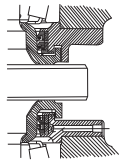


图9.6 Figure 9.6

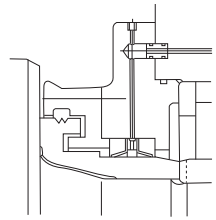


图9.7

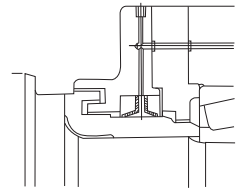


图9.8

10 轧机轴承的保管、存放和安装拆卸

10.1 轴承保管和存放

轧机轴承是一种精密、昂贵的机械配件，对轴承的保管、存放、操作均有较严格的要求：
1）轴承仓库应清洁、凉爽和干燥。最佳温度在10—25℃之间， 最高不得超过30℃，最低不得低于4℃，否则，应采取调温措施。
2）轴承应放在离地面0.2m的铺有防潮纸或塑料布的架子上，特大型的轧机轴承应存放在托盘上，异物、脏物不得进入仓库内；
3）轴承安装与拆卸应由受过培训的钳工操作；
4）操作时应使用清洁的行之有效的装卸工具。

10.2安装前轴承和辊颈的准备工作

1）轴承安装前不得启封；
2）轴颈应当检验，以确信安装部位尺寸在要求公差范围内；
3）轴箱应保持清洁，箱孔应检查，确信在公差范围内；
4）确保其它零件没有不正常现象，无损坏。

10.3轴承安装与拆卸的步骤

10.3.1大尺寸四列圆柱滚子轴承（紧配合）

10.3.1.1安装步骤

1）在油槽中加热（或电感加热）内圈，油槽的油温达到100℃即可。内圈在油槽中应加热20—30分钟为好，加热后的内径增大量按下式计算：
△d=12.5X10—6 （13）　Dd=12.5×10^{-6}△td
式中：△d—内圈内径加热后的增大量（mm）
△t—油温与室温之差（℃）
2）用干净抹布擦去辊颈表面上的油层；
3）迅速吊起已加热的内圈，将有标记“A”的侧面朝上；迅速用干净抹布擦去内圈两侧面　　及内孔表面上的残留油迹，然后快速将内圈装在辊颈上；
4）待冷却后用百分片（即厚薄规）检查此内圈与轴肩定位环之间不得有间隙（见图10.1）；

10. Keeping, storage, installation and disassembly of rolling mill bearing

10. Bearing storage

Rolling mill bearing is a kind of precise and expensive mechanical fitting, thus it must be stored and operated carefully.

1) The warehouse must be clean, cool and dry. The best temperature ranges from 10 to 25 ^{o}C. The temperature shall not be over 30 ^{o}C or under 4 ^{o}C, otherwise adjustment shall be made.

2) The bearings shall be placed on the shelf covered with waterproof paper or plastics, 0.2m above the ground. Super large bearings shall be placed on the tray and the warehouse must be free of foreign matters and dust.

3) The installation and disassembly shall be done by the trained fitter.

4) Use the clean and effective tools.

10.2 Preparation of bearing and roll neck before the installation

1) Do not remove the packing before the bearing installation;

2) Check the roll neck to ensure the installation size is within the tolerance;

3) The shaft housing must be clean and check whether the housing hole is within the tolerance;

4) Ensure that no other parts are damaged.

10.3 Steps of bearing installation and disassembly

10.3.1 Large four-row cylindrical roller bearing (close fit)

10.3.1 Installation steps

1) Heat the inner ring in the oil groove (or inductance heat) to 100 ^{o}C. The inner ring shall be heated in the oil groove for 20 or 30 minutes. The inner diameter increase after heating shall be calculated with the following formula:
△d=12.5×10^{-6} (13)　△d=12.5×10^{-6}△td
in which △d - inner diameter increase after heating (mm)
△t - difference between the oil temperature and room temperature (^{o}C)

2) Use the clean cloth to wipe away the oil on the roll neck surface;

3) Rapidly hoist the heated inner ring and place the side with “A” upward; rapidly use the clean cloth to wipe away the oil residue on the two sides of the inner ring and on the inner hole surface and rapidly mount the inner ring on the roll neck;

4) Check whether there is clearance between this inner ring and the locating ring of shaft shoulder with the thickness gauge after cooling (see Figure 10.1)

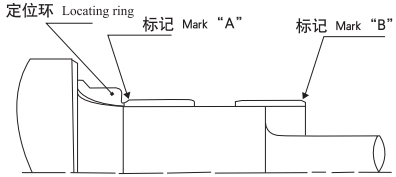


图10.1
Figure 10.1

5）同样方法安装另一内圈，有标记“B”的侧面在外，两内圈必须互相紧密接触；
6）将密封圈压入轴箱后端面，轴箱后端面朝下放平（见图10.2）；

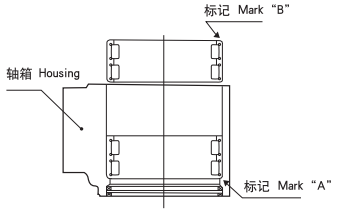


图10.2 Figure 10.2

7）必须确认每一加油孔要畅通无阻，并须去掉轴箱加油孔边缘的毛刺；
8）轴箱内孔表面必须擦干净并涂上薄层润滑油膜；
9）确认好内圈组件端面的系列标记号；
10）用清洁抹布擦去外圈组件上多余的防锈油；
11）在所有滚动体表面上涂上足够的润滑油脂；
12）将吊环螺栓拧入保持架端面起吊丝孔内，并用钢丝绳将有标记“A”的外圈组件垂直向下装入轴箱，装入时注意切勿倾斜；
13）装入时如发生卡住或倾斜可有铜锤或铜棒敲击外组件的外圈端面，但要注意不能敲击滚动体及保持架，防止将铜屑及其脏、杂物掉入轴承内；
14）外组件下端面与轴箱接触面之间不应有间隙；
15）用同样方法安装有标记“B”的另一外圈组件，标记“B”应朝上；
16）两外圈组件之间应无间隙；
17）前端盖应紧贴轴承侧面，不合适时可用垫片调节；
18）最后装上止推卡环；
19）将轧辊水平方向放好，然后用适宜的工具水平吊起内已装有轴承外组件的轴箱；
20）要注意箱体与轧辊二者之间在同心后，然后慢慢地将箱体套在轧辊上，同时必须小心不要碰伤滚道与滚子，如有轻微碰伤可用油石轻轻修磨平滑（见图10.3）；

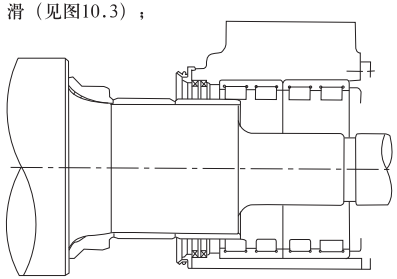


图10.3 Figure 10.3

21）在正确地装入键、止推环和其它零件后，拧紧调节螺母和压盖；
22）最后在确认箱体在轧辊上回转灵活，如不灵活时要拆下检查其原因；

5) Install the other inner ring with the same method and place the side with “B” outward. The two inner rings must contact each other closely;
6) Press the seal ring to the rear end face of the housing and the rear end face shall be placed flat and downward (see Figure 10.2);

7) Make sure that each filling aperture shall be smooth and remove the burrs surrounded.
8) Wipe the shaft housing inner holes clean and spread the thin lubricating film;
9) Confirm the series number on the end face of inner ring assemblies;
10) Wipe away the extra rust proof oil on the outer ring assemblies with clean cloth;
11) Spread sufficient grease on the surfaces of all rolling bodies;
12) Screw the eye bolt into the hole on the cage face and vertically put the outer ring assemblies with “A” to the housing with the wire rope. Do not tilt.
13) If trapped or tilted during the installation, tap the outer ring face of the outer assemblies with copper hammer or bar copper. Do not tap the rolling body and cage in case that copper scale or other impurities fall to the bearing;
14) There shall be no clearance where the lower face of the outer assemblies and the housing contact;
15) Install the other outer assemblies with “B” with the same method and that with “B” shall face up.
16) There shall be no clearance between the two outer ring assemblies;
17) The front end cover shall be close to the bearing side. Adjust with the washer.
18) Finally install the thrust remaining ring;
19) Horizontally place the roll and hoist the housing where the outer assemblies are in with appropriate tools;
20) After the housing boy and the roll are aligned, slowly cover the roll with the housing. Do not damage the track and roller. If slightly damaged, grind gently with the oil stone (see Figure 10.3);

21) After properly installing the key, thrust ring and other parts, screw the nut and gland tightly;
22) Finally make sure that the mill roll move flexible on the housing. Otherwise disassemble to have a check;

10.3.1.2拆卸

1）拆卸的顺序正好与安装相反。先从轧辊上拆下轴箱并朝上放置；
2）用适宜的工具拆下前端盖吊起外环组件（见图10.4）；

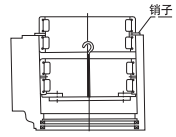


图10.4 Figure 10.4

3）将上外圈组年吊起至外组件加油孔与轴箱端面对齐并能从轴箱侧面看见油孔；
4）用销轴插入三油孔后，固定上外圈组件；
5）将下外圈组件推下；
6）先吊出上外圈组件，后再吊出下外圈组件；
7）请注意不要使卸下的轴承与其它零件混杂，还要注意保持架的侧面螺孔不能作为起吊外组件用（安装时可用）；

10.3.2小尺寸四列圆柱滚子轴承（紧配合）

10.3.2.1安装

1）先将轴肩定位环在油槽中加热；
2）取出轴肩定位环，用洁净抹布迅速抹去内孔表面的油迹；
3）将轴肩定位环一步安装到位；
4）要注意在轴肩定位环冷却后，其侧面与轧辊大直径端面之间不能留有间隙，这一点极为重要（见图10.5）

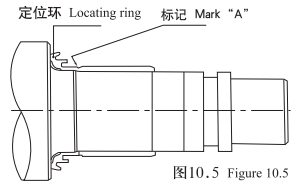


图10.5 Figure 10.5

5）加热内圈，其油温约为100℃——120℃；
6）取出加热的内圈并用洁净抹布擦去内孔表面及两侧面的油迹；
7）将内圈装入轴颈要一次到位，要注意标记“A”必须位于轧辊直径一侧；
8）注意内圈在冷却后，有标记□A□的侧面与轴肩定位环之间不能留有间隙；
9）同时必须确认润滑油应畅通无阻地通过轴箱与轴承组件之间的油孔，要除掉轴箱加油孔边缘的毛刺；
10）密封垫片的两侧面浸油后装入后端盖（见图10.6）；
11）拧紧后端盖螺栓；
12）轴箱垂直放置，轴箱后端朝下放平；
13）擦净轴箱内孔表面并涂上薄薄油的一层油脂；
14）确认好外圈组件上的系列标记号；
15）用洁净抹布擦去外圈组件上多余的防锈油脂；

103.1.2 Disassembly
1) The sequence of disassembly is contrary to that of installation. First dismount the housing from the mill roll and place it facing up;
2) Disassemble the outer ring assemblies at the front end cover with appropriate tools (see Figure 10.4);
3) Hoist the upper outer ring assemblies until the filling aperture is aligned with the housing end face and the aperture can be seen from the housing side;
4) Insert the wrists into three apertures and fix the upper outer ring assemblies;
5) Push off the lower outer ring assemblies;
6) First hoist the upper outer ring assemblies and then the lower ones;
7) Do not mix the bearing with other parts and do not use the side bolt hole of the cage as the external hoisting part (it is allowed during the installation);
10.3.2 Small four-row cylindrical roller bearing (close fit)
10.3.2.1 Installation
1) Heat the locating ring of shaft shoulder in the oil groove;
2) Bring out the ring and rapidly wipe away the oil residue on the surface of inner hole with clean cloth;
3) Completely install the ring;
4) After it is cooled, there shall be no clearance between its side and the big-diameter end face of the mill roll. This point is very importance (see Figure 10.5)

5) Heat the inner ring and the oil temperature shall be 100 oC to 120 oC
6*Bring out the ring and rapidly wipe away the oil residue on the surface of inner hole and two sides with clean cloth;
7) Completely install the ring to the shaft neck and the mark “A” shall be at the same side with the diameter of mill roll;
8) After the ring is cooled, there shall be no clearance between the side with “A” and the locating ring of shaft shoulder;
9) Make sure that the lubricant can smoothly pass through the aperture between the housing and the bearing assemblies and remove the burrs surrounded;
10) After oil impregnate of two sides, the sealing washer shall be installed to the rear end cover (see Figure 10.6)
11) Screw the bolts on the rear end cover tightly;
12) Place the housing vertically and make its rear downward and flat;
13) Wipe the housing inner holes and spread thin lubricating film;
14) Confirm the series number on the outer ring assemblies;
(15) Wipe away the extra rust proof oil on the outer ring assemblies with clean cloth;

16）在所有滚动表面上涂上足够的润滑油脂；
17）用工具或用手将带有标记“A”的外圈组件侧面先装入轴箱内，操作时外组件不允许倾斜，标志“A”侧面向下；
18）操作时如外组件卡住，可用铜锤或铜棒敲击外圈侧面而装入。但要注意不要将铜屑及其它脏杂物掉入轴承内；
19）要检查外组件下端面与轴箱接触面之间不应留有间隙；
20）用同样步骤适用于端面有标记“B”的另一外圈组件。要注意标记“B”侧面必须朝上；
21）应检查两外圈组件之间不应有间隙；
22）在轴箱操作侧安装双列或双联角接触球轴承时要注意成对特性，不可搞错；
23）单列向心球轴承安装在传动侧；
24）拧紧前端3或4枚螺栓，并用厚薄规检测轴承箱和前端盖之间的间隙；
25）插入厚度为测量间隙1.1—1.2倍的垫片，装上前端盖然后均匀的拧紧紧固螺钉；
26）轧辊在水平位置放好后，用适宜的工具吊起轴箱；
27）仔细注意箱体与轧辊二者之间同心后，再慢慢地将箱体导入轧辊上，同时必须小心不要碰伤滚道和滚子，如有可用油石修磨滚道和滚子碰伤处；
28）在正确装好键、止推环和其它零件之后，即可完全拧紧调整螺栓（见图10.7）；
29）最后确认轴箱在轧辊上灵活回转，如不灵活要拆下检查其故障原因；

10.3.2.2拆卸

1）拆卸的顺序与安装顺序相反。先从轧辊上拆下轴箱，并将轴箱前端盖朝上安放；
2）取去前端盖，用适宜工具完全托住滚子端面；

16) Apply sufficient grease on all rolling surfaces;
17) First install the outer ring assembly with marking “A” in the shaft housing with a tool or manually. No outer ring assembly inclination is allowed during operation. The side of marking “A” faces downward;
18) In case of outer ring assembly being stuck, knock in the side of outer ring with a copper hammer or bar. Take care not to let any copper chip and other dirty and foreign matters drop into the bearing;
19) Check that there is no clearance between the contact surface of the lower end face of outer ring assembly and shaft housing;
20) The same steps as mentioned above apply to another outer ring assembly with marking “B”. Take care that side “B” must face upward;
21) Check that there is no clearance between two outer ring assemblies;
22) Take care of the pairing feature when installing any double-row or double angular contact ball bearing on the operating side of the shaft housing. Don’t operate wrongly;

23) A single-row radial ball bearing should be installed on the drive side;
24) Tighten 3 or 4 bolts in front end and measure with a thickness gauge the clearance between the bearing housing and front end cover;
25) Insert a gasket at a thickness 1.1 to 1.2 times the measured clearance, place the front end cover and tighten evenly the securing screws;
26) After the roll is placed properly in horizontal position, lift the shaft housing with a right tool;
27) Take a good care and as soon as concentricity is attained between housing and roll, guide slowly the housing onto the roll and be careful not to damage the raceway and rolls from knocking. If possible, trim any damage from knocking on raceway and rolls with an oil hone;
28) After key, thrust ring and other parts are properly installed, tighten completely the adjusting bolts (as shown in Figure 10.7);
29) Finally confirm that the shaft housing can move freely on the roll. If not, remove to check for the reason.

10.3.2.2 Removal

1) Removal is in the reverse order of installation. Remove the shaft housing from the roll first and place the front end cover of the shaft housing in such a manner that it faces upward;
2) Remove the front end cover and support completely the end face of roller with a proper tool;

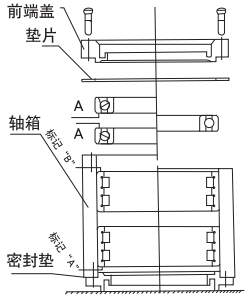


图10.6 Figure 10.6

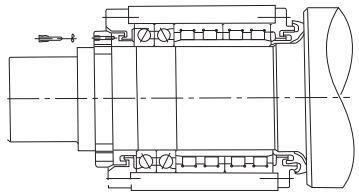


图10.7 Figure 10.7

3）慢慢吊起外圈组件。请注意不要使卸下的轴承与其它零件混杂。当采用油雾润滑时，切不可在轴箱内安装外圈组件时损坏外径表面上的“0”型密封圈，并注意调节好轴箱与外圈组件二者之间的同心（见图10.8）；

10.4检查与维护

由于高载荷运行，为了减少由于轴承疲劳或润滑失效而引起的损坏，检查维护周期一般为3—6个月。从轴箱内拆卸轴承之前，轴箱外部应先清除所有氧化皮铁锈和其它脏物。卸下的轴承要进行清洗。经清洗后的轴承首先应进行目测检查。
1）滚子可通过转动来检查，不必从保持架内拆下；
2）在检查过程中，如滚道上发现有微小剥落或损伤，这往往可以不认为是损坏报废的理由，可用油石修磨剥落损伤的表面后，继续使用。如果在外圈滚道上的剥落是轻微的，则可以通过改变载荷区的办法仍可继续使用；
3）滚道与滚子表面上的锈蚀可用金钢砂布或油石除掉。

10.5 感应加热器

轧辊辊颈轴承安装拆卸可采用电感加热器，四列圆柱滚子轴承内圈与辊颈为过盈配合，使用感应加热器使内圈产生感应电流，生热，尺寸胀大，达到迅速安装与拆卸之目的。
常用手提式感应加热器，此类感应加热器可调节尺寸范围，使用较为方便。
固定式电感应加热器适用于大型轴承，使用时需要使用吊车或运送工具。

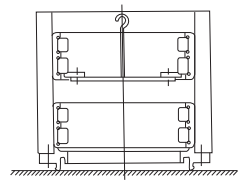


图10.8 Figure 10.8

低压感应加热器，此感应加热器的线圈以水冷却，在技术上是先进的.

is water-cooled and advanced in technology, which is as shown in Figure 10.9, 10.10.

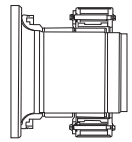


图10.9 Figure 10.9

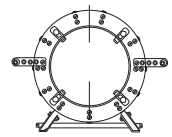


图10.10 Figure 10.10

感应加热器引起轴承和轧辊带磁，在安装后必须退磁，操作方法是将加热器套在轴承上并接通电源， 然后慢慢地移开1—2M长，由于距离增加，磁场强度减小，当磁场的影响十分微弱时，轴承零件达到充分退磁。也有些感应加热器带有自动退磁功能，因此，经感应加热的轴承不会产生剩磁现象。

3) Lift slowly the outer ring assembly. Take care not to mingle any bearing removed with other parts. When using oil mist lubrication, don’t damage the O-ring on OD surface when installing the outer ring assembly in the shaft housing. Take care of concentricity adjustment between the shaft housing and outer ring assembly (as shown in Figure 10.8).

10.4 Inspection and maintenance

Due to operation at high load, the inspection and maintenance period is usually 3 to 6 months with a view to reducing any damage resulting from bearing fatigue or lubrication failure. Before removing any bearing from internal shaft housing, iron scaling and other dirty matters should be cleared from external shaft housing. Any bearing removed should be cleaned. Visual inspection should be performed first for any bearing cleaned.
1) Rollers inspection is achievable by rotating with no removal from internal cage necessary;
2) If any minor peeling or damage is found during inspection, this is often not considered as a reason for scrapping due to damage. Service can be continued after the surface with any such peeling or damage is repaired with an oil hone. If any peeling on outer ring raceway is mild, service can be continued by changing the load zone;
3) Any rust on raceway and roller surface can be removed with an emery cloth or oil hone.

10.5 Induction heater

An induction heater can be used for installing and removing roll neck bearing. Interference fit is provided between the inner ring of four-row cylindrical roller bearing and roller journal. Use an induction heater to produce induced current, generate heat in an inner ring and make it expand in size, achieving the purpose of rapid installation and removal. A hand-held induction heater with an adjustable size range is often used, which is very convenient. Fixed type electric induction heater applies to large size bearings and a crane or carrying tool is necessary when it is used.

Low voltage induction heater. The coil of this kind of heater

图10.11所示加热两个内圈，在3.5分钟内加热到100℃，将内圈置于轴颈端部，待加热达到安装温度后，连同加热器一起推向安装部位。

As shown in Figure 10.11, two inner rings are heated to 100C in 3.5 minutes. Place an inner ring at the end of a journal and push them together with the heater toward the location of installation when being heated to the temperature necessary for installation.

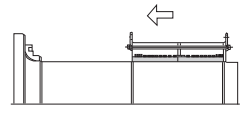


图10.11 Figure 10.11

如图10.12所示，当轴颈为阶梯状时，可使用一安装套做引导。

As shown in Figure 10.12, an installation sleeve can be used as a guide when the journal is in step form.

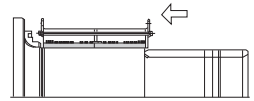
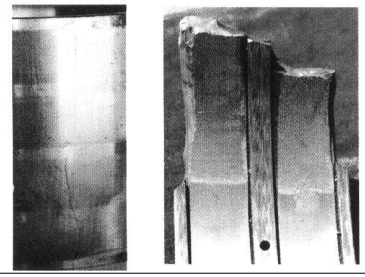
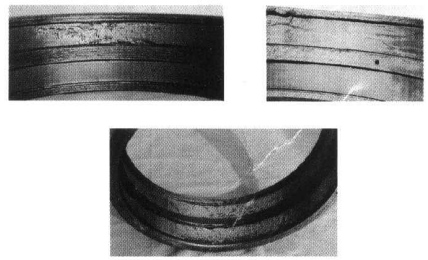
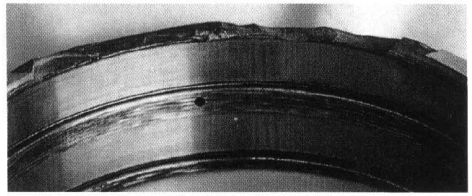
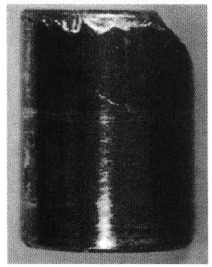


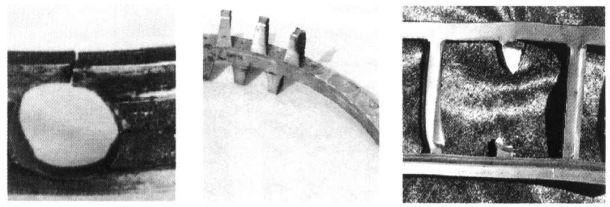
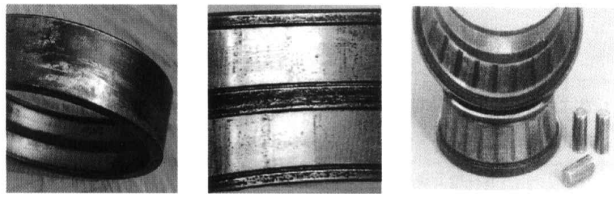
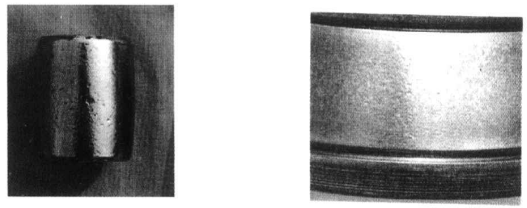
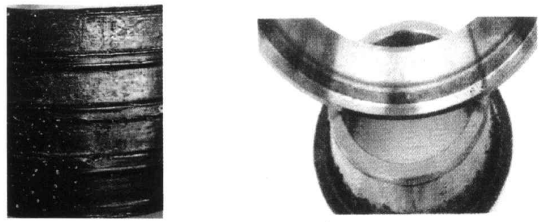
图10.12 Figure 10.12

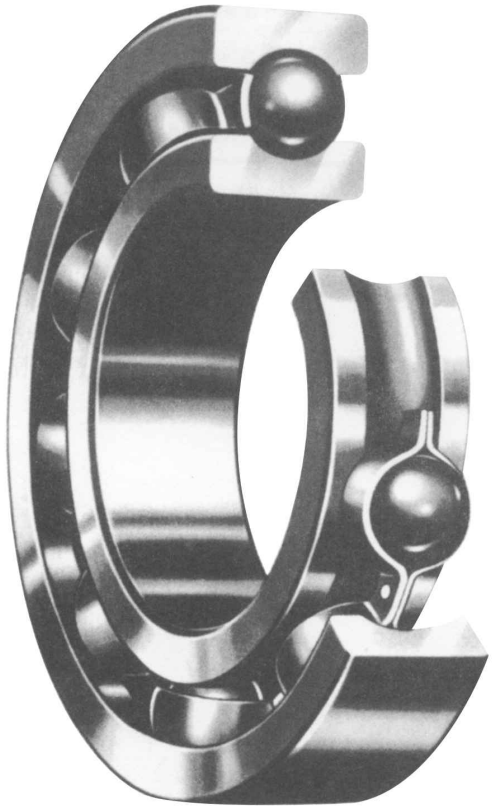
An induction heater may lead to magnetized bearing and roll, which must be demagnetized after installation. The operating procedure is to put such heater on bearing and power on. Then take slowly away for 1-2M long. As the distance increases, the magnetic field becomes less in strength. When the influence of the magnetic field becomes very weak, bearing parts are sufficiently demagnetized. Some induction heaters have automatic demagnetizing function, so there will no remnant magnetism in bearings heated with such heaters.

11 轧机轴承的主要损坏形式及分析

11 Main Damage Forms of Rolling Mill Bearing and Corresponding Analysis

类型 Type	损伤示例图片 Photo of Damage Example	损坏现象 Damage Phenomenon	原因 Reasons	措施 Measures
断裂 Rupture		外圈或内圈断裂 The outer or inner ring is ruptured.	装机过盈太大 轴或外壳的圆角过大 冲击载荷过大 剥落或烧伤的发展 Excessive interference of machine installation. Excessive round angle of shaft or shell. Excessive impact load. Evolution from flaking or burn.	选择合适的配合 使轴或外壳的圆角半径小于轴承倒角尺寸 改善荷载条件 Select the appropriate fit. Make the round angle of shaft or shell at the radius less than the size of bearing chamfer. Improve the loading condition.
剥落 Flaking		一侧出现偏剥落 滚道圆周方向的对称位置出现剥落 One side is flaking off. The symmetrical position at the perimeter of bearing race is flaking off.	有异常的轴向载荷 外壳的圆度差过大 With abnormal axial load. Excessive shell roundness difference.	自由端轴承的外圈与外壳之间选择间隙配合 提高外壳孔的加工质量 Select clearance fit between the inner ring and the shell of bearing at free end Improve the processing quality of shell hole
挡边碎裂 Capped edge broken		挡边出现缺陷 The capped edge is broken.	安装时敲击挡边 轴向冲击载荷过大 Edge knocked at installation Excessive axial impact load	改进安装作业方法 改善载荷条件 Improve the installation and operation methods. Improve the loading condition.
滚动体碎裂 Rolling element broken		滚动体碎裂 The rolling element is broken.	冲击载荷过大 剥落的发展 润滑剂不合适或不足 轴向载荷过大 安装后轴与外壳不同心，轴歪斜 Excessive impact load. Evolution from flaking Improper or insufficient lubricant Excessive axial load Disalignment of shaft and shell after installation, with deflective shaft	提高安装部件的精度，改进安装作业方法，避免轴的歪斜 改善载荷条件 改进润滑脂，保证足够的润滑脂 Promote the precision of installed components Improve the installation and operation methods. Avoid the shaft from deflection. Improve the loading condition. Improve the lubricating grease. Ensure the lubricating grease to be sufficient.

类型 Type	损伤示例图片 Photo of Damage Example	损坏现象 Damage Phenomenon	原因 Reasons	措施 Measures
保持架断裂 Holder rupture		保持架出现伤痕、变形、缺陷、断裂和异常磨损等 Scar, distortion, deflect, rupture and abnormal abrasion on holder	振动冲击力过大 润滑剂不足 安装不良（轴呈倾斜状态） 安装时撞伤 Excessive impact force of vibration. Insufficient lubricant. Poor installation (with shaft at deflective position) Bruise at installation	改善载荷条件 重新选择润滑方式和润滑剂 减小安装误差 改变保持架型式 改进安装作业方法 Improve the loading condition. Reselect the lubricating mode and lubricants Reduce the installation error. Change the type of holder Improve the installation and operation methods.
锈蚀 Corrosion		轴承出现锈蚀 Bearing corrosion	保管不当 空气中水分的凝结 使用时有水份或腐蚀性物质侵入 Improper storage. Condensation of moisture in air. Invasion of moisture or corrodent in service	改善轴承保管 改进密封装置 长期停止运转时进行防锈处理 Improve the bearing storage. Improve the sealing device Conduct the rust-proofing treatment at long-term operation suspension
压痕 Dent		滚道或滚动体出现压痕 Dent on bearing race or rolling element	有异物侵入 安装时有冲击 内外孔配合不当 游隙选择不当 Invasion of foreign matters With impact at installation. Improper fit of inner and outer holes. Improper selection of internal clearance.	安装前彻底清洗轴承，确保没有杂质侵入 改进密封装置 改进安装作业方法 选择合适游隙组别 Thoroughly clean the bearing before installation, ensuring no invasion of foreign matters. Improve the sealing device Improve the installation and operation methods. Select the appropriate group of internal clearance.
烧伤变形 Distortion due to burn		出现因轴承发热引起的变色、变形和溶敷 Off-color, distortion and deposition due to bearing heating	轴承内部游隙过小 润滑剂不合适或不足 载荷过大 其它轴承损伤的发展 Over-thin internal clearance Evolution from flaking Improper or insufficient lubricant Overload Evolution from other bearing damages	选择合适的轴承内部游隙 重新选择润滑方式和润滑剂 重新选择轴承型式 早期发现轴承损伤 Select the appropriate internal clearance of bearing. Reselect the lubricating mode and lubricants Reselect the type of bearing Early discovery of bearing damages



深沟球轴承

深沟球轴承尺寸范围广，是滚动轴承中用的最多的一种形式，可同时承受径向负荷与一定程度的双向轴向负荷。

■密封型(带防尘盖或密封圈)

可以简化轴承周边的密封装置。

已充填润滑脂，不需再充填。

主要的带防尘盖或密封圈轴承的形式及其性能请与ZWA联系。

■带止动环

可利用止动环做轴向定位，简化了外壳内的安装。

■最大负荷型

结构上的内、外圈有一处装填槽的标准单列深沟球轴承，加大了球径并增加了装球数，从而提高了径向额定负荷，但不适用于承受轴向负荷或高速旋转。

安装时应尽量将非旋转套圈的装填槽位置，放在非承受负荷一侧。

Deep groove ball bearing

Deep groove bearing has wide dimension range, which is the mostly type among roller bearing, can carry radial load and certain extent double row axial load.

■Capped type (with shield or seal)

Could simplify peripheral sealing device of bearing

Prelubricated with an adequate quantity of grease, needn't refilling.

For mainly type and capacity of bearing with shield or sea, please contact with ZWA

■With snap ring

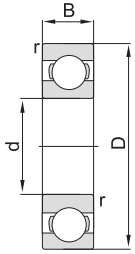
Could localize axial by snap ring, simplified the mounting inside case shell.

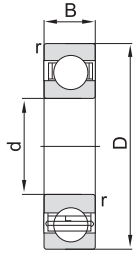
■Maximum load type

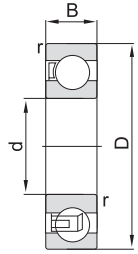
In structure, standard single row deep groove ball bearing has a filing slot among inner ring and outer ring, increased ball diameter and the number of ball filled, consequently increase the nominal radial load, but not applicable to carrying axial load or highrate rotary.

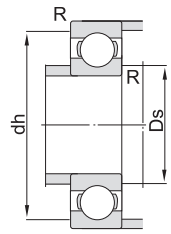
Trying fixing the filing slot position of non-rotary ring in the non-carrying load side when mounted

基本尺寸 Basic Sized d	D	B	rsmin	基本额定负荷 Basic Rated Load 动 dyc Cr	静stc Cor	原代号 Original Code	现代号 Current Code	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	重量 Weight
mm				KN				r/min		kg
190	240	24	1.5	68	88	1000838	61838	2200	2800	2.8
	260	33	2	108	120	1000938	61938	2200	2800	5.4
	290	31	2	133	154	7000138	16038	2000	2600	8
	290	46	2.1	181	194	138	6038	2000	2600	11.5
	340	55	4	269	300	238	6238	1600	2000	25.6
	400	78	5	350	400	338	6338	1500	1900	50
200	250	24	1.5	70	95	1000840	61840	2200	2800	3
	280	38	2.1	135	150	1000940	61940	2000	2600	7.5
	310	34	2	153	178	7000140	16040	1900	2400	10.4
	310	51	2.1	206	225	140	6040	1900	2400	14.4
	360	58	4	268	305	240	6240	1600	2000	27.4
	420	80	5	350	430	340	6340	1400	1800	56
220	270	24	1.5	70	100	1000844	61844	1900	2400	3.2
	300	38	2.1	136	162	1000944	61944	1900	2400	9.3
	340	37	2.1	170	202	7000144	16044	1800	2200	12.7
	340	56	3	224	265	144	6044	1800	2200	18.4
	400	65	4	311	376	244	6244	1400	1800	38.6
	460	88	5	400	500	344	6344	1300	1600	73
240	300	28	2	100	140	1000848	61848	1800	2200	4.7
	320	38	2.1	143	177	1000948	61948	1800	2200	8.36
	360	37	2.1	170	200	700148	16048	1600	2000	15
	360	56	3	232	275	148	6048	1600	2000	26.7
	440	72	4	330	440	248	6248	1300	1600	51.5
	500	95	5	410	540	348	6348	1100	1400	93
260	320	28	2	100	135	1000852	61852	1600	2000	4.9
	360	46	2.1	210	269	1000952	61952	1500	1900	15.1
	370	46	2.1	210	270	752	752	1200	1500	17
	400	44	3	236	310	7000152	16052	1400	1800	21.5
	400	65	4	294	372	152	6052	1400	1800	28.3
260	480	80	5	370	500	252	6252	1100	1400	66
	540	102	6	480	670	352	6352	1000	1300	116
280	350	33	2	125	180	1000856	61856	1500	1900	7.5
	380	46	2.1	216	285	1000956	61956	1400	1800	15.2
	420	44	3	230	320	7000156	16056	1400	1700	23
	420	65	4	306	405	156	6056	1400	1700	31
	500	80	5	400	550	256	6256	110	1400	71
	580	108	6	550	800	356	6356	950	1200	140
300	380	38	2.1	170	228	1000860	61860	1100	1700	10.6
	420	56	3	268	371	1000960	61960	1300	1600	22.1
	460	50	4	260	380	7000160	16060	1200	1500	33
	460	74	4	356	500	160	6060	1200	1500	44.7
	540	85	5	492	735	260	6260	1000	1300	85.5
320	400	38	2.1	172	236	1000864	61864	1300	1600	11.3
	412	38	2.1	180	280	864	864	1300	1600	13.5
	440	37	2.1	190	360	7000964	16964	1200	1500	17
	440	56	3	275	394	1000964	61964	1200	1500	24.9
	480	50	4	260	365	7000164	16064	1100	1400	34
	480	74	4	370	540	164	6064	1100	1400	46.7
	580	92	5	500	750	264	6264	950	1200	110
340	420	38	2.1	160	260	1000868	61868	1200	1500	12
	460	56	3	260	400	1000968	61968	1100	1400	27
	520	57	4	330	500	7000168	16068	1000	1300	45
	520	82	5	385	574	168	6068	1000	1300	65.8
	620	92	6	520	850	268	6268	900	1100	115
360	440	25	1.5	110	190	-	60872	1100	1400	7
	440	38	2.1	170	260	1000872	61872	1100	1400	13
	480	56	3	265	400	1000972	61972	1100	1400	28.5





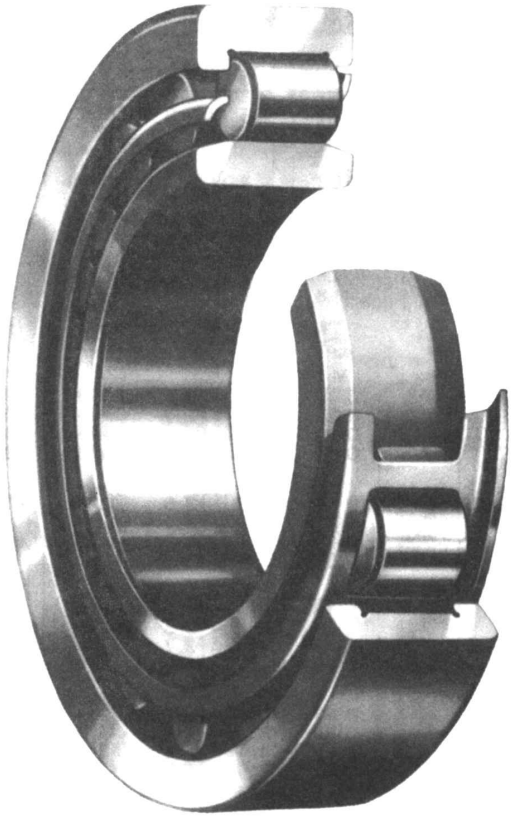




基本尺寸 Basic Sized d	D	B	rsmin	基本额定负荷 Basic Rated Load 动 dyc Cr	静stc Cor	原代号 Original Code	现代号 Current Code	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	重量 Weight
mm				KN				r/min		kg
360	540	57	4	315	500	7000172	16072	1000	1300	50
	540	82	5	415	660	172	6072	1000	1300	65
380	480	46	2.1	198	287	1000876	61876	1000	1300	21.5
	520	65	4	353	550	1000976	61976	1000	1300	38.5
	560	57	4	340	560	7000176	16076	950	1200	52
	560	82	5	420	680	176	6076	950	1200	69
400	500	31	2	150	255	-	60880	1000	1300	17
	500	46	2.1	225	365	1000880	61880	1000	1300	22
	540	44	3	240	400	-	60980	950	1200	29
	540	65	4	354	576	1000980	61980	950	1200	43.6
	600	90	5	492	810	180	6080	900	1100	81
420	520	46	2.1	230	385	1000884	61884	950	1200	23
	560	65	4	320	540	1000984	61984	900	1100	45
	620	90	5	460	800	184	6084	900	1100	94
440	540	31	2	145	265	-	60888	900	1100	18
	540	46	2.1	230	400	1000888	61888	900	1100	24
	600	74	4	370	650	1000988	61988	900	1100	63
	650	94	6	500	870	188	6088	800	1000	110
460	580	56	3	304	508	1000892	61892	900	1100	35.6
	620	74	4	400	710	1000992	61992	800	1000	63
	680	100	6	550	1000	192	6092	750	950	125
480	600	56	3	300	550	1000896	61896	800	1000	37
	650	78	5	420	770	1000996	61996	750	950	75
	700	100	6	580	1050	196	6096	700	900	128
500	620	37	2.1	210	410	-	608/500	750	950	21
	620	56	3	312	533	10008/500	618/500	750	950	37.8
500	670	78	5	445	806	10009/500	619/500	700	900	82
	720	100	6	558	1058	1/500	60/500	700	900	138
530	650	56	3	300	620	10008/530	618/530	700	900	40
	710	57	4	400	770	-	609/530	670	850	62
	710	82	5	460	880	10009/530	619/530	670	850	92
	780	112	6	610	1200	1/530	60/530	700	800	190
560	680	37	2.1	210	440	-	608/560	670	850	31
	680	56	3	325	650	10008/560	618/560	670	850	43
	750	85	5	465	925	10009/560	619/560	630	800	108
	820	115	6	625	1390	1/560	60/560	600	750	212
600	730	42	3	250	520	-	608/600	630	800	41
	730	60	3	340	720	10008/600	618/600	630	800	53
	800	90	5	550	1150	10009/600	619/600	600	750	126
	870	118	6	690	1420	1/600	60/600	560	700	232
630	780	48	3	340	720	-	608/630	600	750	42
	780	49	4	415	915	10008/630	618/630	600	750	74
	850	71	5	460	1000	-	609/630	560	700	112
	850	100	6	590	1260	10009/630	619/630	560	700	162
	920	128	7.5	770	1660	1/630	60/630	530	670	287
670	820	69	4	445	911	10008/670	618/670	530	670	81.6
	900	73	5	520	1150	-	609/670	500	630	148
	900	103	6	640	1420	10009/670	619/670	500	630	188
	980	136	7.5	850	1900	1/670	60/670	480	600	348
710	870	74	4	440	1000	10008/710	618/710	500	630	95
	950	78	5	510	1200	-	609/710	480	600	152
	950	106	6	620	1400	10009/710	610/710	480	600	223
	1030	140	7.5	880	2000	1/710	60/710	450	560	380

基本尺寸 Basic Sized d	D	B	rsmin	基本额定负荷 Basic Rated Load 动 dyc Cr	静stc Cor	原代号 Original Code	现代号 Current Code	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	重量 Weight
mm				KN				r/min		kg
750	920	78	5	500	1067	10008/750	618/750	480	600	113
	1000	112	6	700	1670	10009/750	619/750	450	560	260
	1090	1150	7.5	920	2150	1/750	60/750	430	530	490
800	980	57	4	370	920	-	608/800	430	530	103
	980	82	5	510	1250	10008/800	618/800	430	530	135
	1060	115	6	765	1870	10009/800	619/800	400	500	280
	1150	155	7.5	920	2300	1/800	60/800	380	480	540
850	1030	57	4	365	930	-	608/850	400	500	78
	1030	82	5	510	1300	10008/850	618/850	400	500	145
	1120	118	6	765	1940	10009/850	619/850	380	480	315
	1220	165	7.5	1030	2650	1/850	60/850	340	430	635
900	1090	85	5	565	1450	10008/900	618/900	340	430	163
	1180	122	6	780	2050	10009/900	619/900	320	400	355
	1280	170	7.5	1040	2800	1/900	60/900	300	380	725
950	1150	90	5	585	1560	10008/950	618/950	-	-	195
	1250	132	7.5	925	2520	10009/950	619/950	-	-	395
	1360	180	7.5	1070	2930	1/950	60/950	-	-	870
1000	1220	71	5	505	1410	-	608/1000	-	-	180
	1220	1000	6	585	1620	10008/1000	618/1000	-	-	250
	1320	103	6	750	2125	-	609/1000	-	-	415
	1320	140	7.5	925	2520	10009/1000	619/1000	-	-	520
	1420	185	7.5	1240	3510	1/1000	60/1000	-	-	940
1060	1280	100	6	730	1910	10008/1060	618/1060	-	-	265
	1400	150	7.5	930	2700	10009/1060	619/1060	-	-	630
	1500	195	9.5	1250	3510	1/1060	60/1060	-	-	1100
1120	1360	106	6	685	1980	10008/1120	618/1120	-	-	320

基本尺寸 Basic Sized d	D	B	rsmin	基本额定负荷 Basic Rated Load 动 dyc Cr	静stc Cor	原代号 Original Code	现代号 Current Code	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	重量 Weight
mm				KN				r/min		kg
1120	1460	150	7.5	960	2790	10009/1120	619/1120	-	-	660
	1580	200	9.5	1350	3960	1/1120	60/1120	-	-	1270
1180	1420	106	6	700	2120	10008/1180	618/1180	-	-	332
	1540	160	7.5	1050	3240	10009/1180	619/1180	-	-	780
	1660	212	9.5	1710	4680	1/1180	60/1180	-	-	1420
1250	1500	112	6	785	2475	10008/1250	618/1250	-	-	390
	1630	170	7.5	1290	3510	10009/1250	619/1250	-	-	925
	1750	218	9.5	1840	5040	1/1250	60/1250	-	-	1620
1320	1600	122	6	880	2835	10008/1320	618/1320	-	-	510
	1720	128	7.5	1110	3650	-	609/1320	-	-	840
	1720	175	7.5	1410	4050	10009/1320	619/1320	-	-	1060
	1850	230	12	1950	5580	1/1320	60/1320	-	-	1900
1400	1700	132	7.5	1030	3600	10008/1400	618/1400	-	-	620
	1820	185	9.5	1465	4950	10009/1400	619/1400	-	-	1260
	1950	243	12	2135	6260	1/1400	60/1400	-	-	2190
1500	1820	140	7.5	1120	3960	10008/1500	618/1500	-	-	750
	1950	195	9.5	1580	5490	10009/1500	619/1500	-	-	1520
	2120	272	12	2400	7340	1/1500	60/1500	-	-	3000
1600	1950	155	7.5	1170	4320	10008/1600	618/1600	-	-	970
	2060	200	9.5	1715	6260	10009/1600	619/1600	-	-	1660
	2240	280	12	2580	8240	1/1600	60/1600	-	-	3390
1700	2060	160	7.5	1170	4410	10008/1700	618/1700	-	-	1120
	2180	212	9.5	1830	6885	10009/1700	619/1700	-	-	1980
	2360	290	15	2670	8850	1/1700	60/1700	-	-	3800
1800	2300	218	12	2025	6750	10009/1800	619/1800	-	-	2200
	2500	308	15	3080	10600	1/1800	60/1800	-	-	4550
1900	2430	230	12	2210	7785	10009/1900	619/1900	-	-	2600



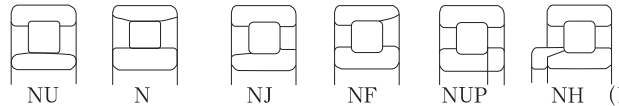
圆柱滚子轴承

圆柱滚子轴承的滚子与滚道面是线接触，向负荷能力大，适用于承受重负荷与冲击负荷。

另外结构上容易做到高精度加工，因此适用于高速旋转。

内圈与外圈可分离，便于装拆。

■ 单列圆柱滚子轴承



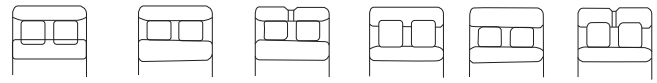
NU　N　NJ　NF　NUP　NH　(NJ+HJ)

.NU型与N型允许轴相对于外壳在一定范围内做轴向移动,因此最适合用作　自由端轴承。

.NJ型与NF型可承受一定程度的单向轴向负荷,NUP型与NH型可承受一定　程度的双向轴承向负荷。

.E型圆柱滚子轴承的主要尺寸与标准相同，通过改变内部规格，提高了额　定负荷。

■ 双列圆柱滚子轴承



NN　NN…K　NN…W　NNU　NNU…K　NNU…W

.双列圆柱滚子轴承有圆柱形内孔和圆锥形内孔两种,圆锥孔轴承通过调整　推入量可得到所需的内部游隙。

另外还有外圈带油孔和油槽的轴承，其公称型号中后置辅助代号“W”.

.该类轴承抗倒向负荷的刚性强,大多用于机床主轴等。

Cylindrical roller bearing

The roller and raceway surface of cylindrical roller bearing is line contact, so the bearing has high carrying radial load capacity, applicable to carrying heavy load and shock load. Besides, owing to its structure, it’s easy to high accuracy processing, applicable to highrate rotary.

Inner ring and outer ring are separable, convenient for mounting and dismounting.

Single row cylindrical roller bearing

Tape NU and type N allow shaft moving in axial direction within limits, applicable to use as free end.

Type NJ and type NF can carry certain extent one-way axial load. Type NUP and type NH can carry certain extent both-way axial load.

Main dimension of type E cylindrical roller bearing coordinate with standard, and through modifying interior specification to increase nominal load.

Double row cylindrical roller bearing

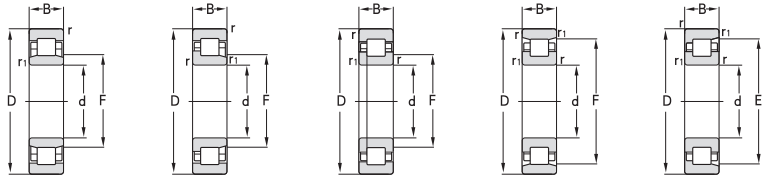
Double row cylindrical roller bearing have cylindrical hole type and tapered hole type, tapered bore bearing can get needed internal clearance by self-aligning the depth of thrusting in.

Besides, there are bearing whose outer ring with oil hole and oil tank, it’s nominal type code has a postposition assistant code “W”

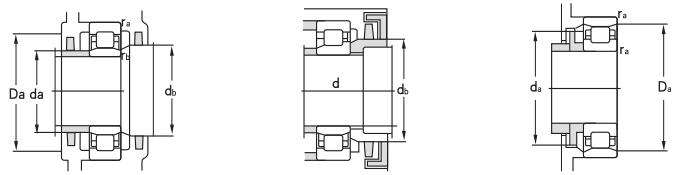
The type bearing has strong fixity resisting reversal load, mainly applicable to chief shaft of machine tool, etc.

单列圆柱滚子轴承

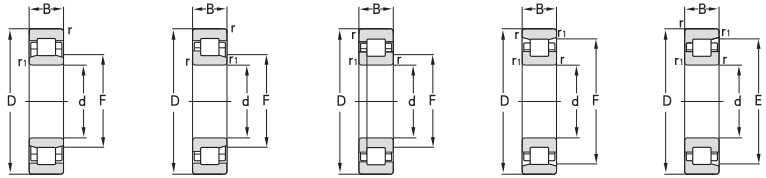
Single-row Cylindrical Roller Bearing



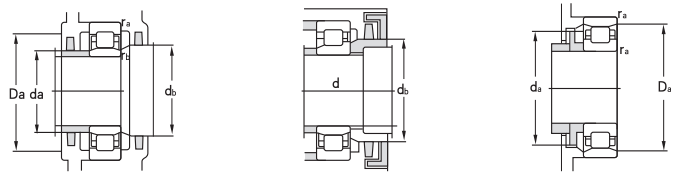
NU型　NJ型　NUP型　N型　NF型



基本尺寸 Basic Size							基本额定负荷 Basic Rated Load		原代号	现代号	安装相关尺寸 Related Installation Size							极限转速 Limit Speed		重量
d	D	B	rmin	rlmin	F	E	动 dyc Cr	静stc Cor	Original Code	Current Code	damin	damax	dbmin	Damax	Damin	ramax	Fbmax	脂润滑 Grease	油润滑 Oil	Weight
mm							KN				mm							r/min		kg
150	270	45	3	3	182		415	610	**32230E**	NU230E	163	178	185	247		2.5	2.5	1900	2400	11.2
	270	45	3	3	182		415	610	**32230EQ**	NU230EQ1	163	178	185	257		2.5	2.5	1900	2400	11.8
	270	45	3	3	182		380	565	**42230**	NJ230M	163	178	197	257		2.5	2.5	1900	2400	12.0
	270	45	3	3	182		415	610	**42230E**	NJ230E	163	178	197	257		2.5	2.5	1900	2400	11.6
	270	45	3	3	182		380	565	**92230**	NUP230M	163		197	257		2.5	2.5	1900	2400	
	320	65	4	4		277	650	890	**2330**	N330M	166	272		304	282	3	3	1700	2000	26.5
	320	65	4	4	193		650	890	**32330**		166	189	196	304		3	3	1700	2000	26.6
	320	65	4	4	193		740	1010	**32330EQ**	NU330M	166	189	196	304		3	3	1700	2000	26.2
	320	65	4	4	193		740	1010	**32330EQTU**	NU330EQ1	166	189	196	304		3	3	1700	2000	26.2
	320	65	4	4	193		740	1010	**32330EQU**	NU330EQ1/C9	166	189	196	304		3	3	1700	2000	26.2
	320	65	4	4	193		650	890	**42330**	NJ330M	166	189	213	304		3	3	1700	2000	26.9
	320	65	4	4	193		740	1010	**42330E**	NJ330EM	166	189	213	304		3	3	1700	2000	26.2
	320	65	4	4	193		650	890	**92330**	NUP330M	166		213	304		3	3	1700	2000	27.4
	320	128	4	4	193		1200	1880	**3042330**	NJ3330M	166	189	213	304		3	3	1400	1800	49.9
	270	73	3	3	182		600	980	**45530E**	NJ2230E	163	177	197	257		2.5	2.5	1900	2400	18.1
	270	88.9	6.4	2.6	181.53		925	1610		NU5230XPC3	167	180	185	260.5		2	2	1800	2200	23.6
	320	108	4	4		277	970	1480	**12630**	NF2330M	166			304	284	3	3	1700	2000	43.6
	320	108	4	4	193		970	1480	**32630**	NU2330M	166	186	196	304		3	3	1700	2000	41.5
	320	108	4	4	193		970	1480	**42630**	NJ2330M	166	186	213	304		3	3	1700	2000	42.4
160	220	36	2	2	173		232	435		NJ2932M	169	177	181	211		1.5	1.5	2500	3200	4.17
	240	25	1.5	1.5		216	175	300	**7002132**	N032M	168	213		229	220	1.5	1.5	2800	3400	4.47
	240	38	2.1	1.5	180		235	380	**42132M**	NJ1032M	168	177	191	229		2	1.5	2400	3000	6.13
	240	38	2.1	2.1	180		235	380	**32132M**	NU1032M	168	177	183	229		2	2	2400	3000	5.96
	240	38	2.1	2.1	180		235	380	**32132Q**	NU1032Q1	168	177	183	229		2	2	2400	3000	5.86
	290	48	3	3		257	450	655	**2232**	N232M	173	255		277	263	2.5	2.5	1800	2200	14.3
	290	48	3	3		259	470	695	**2232E**	N232E	173	255		277	263	2.5	2.5	1800	2200	13.9
	290	48	3	3	193		450	655	**32232**	NU232M	173	191	198	277		2.5	2.5	1800	2200	14.4
	290	48	3	3	195		470	695	**32232E**	NU232E	173	191	198	277		2.5	2.5	1800	2200	14.0
	290	48	3	3	195		470	695	**32232EQ**	NU232EQ1	173	191	198	277		2.5	2.5	1800	2200	13.2
	290	48	3	3	193		450	655	**42232**	NJ232M	173	191	210	277		2.5	2.5	1800	2200	14.2
	290	48	3	3	195		470	695	**42232E**	NJ232E	173	191	210	277		2.5	2.5	1800	2200	14.3
	290	48	3	3	193		450	655	**92232**	NUP232M	173		210	277		2.5	2.5	1800	2200	14.6
	340	68	4	4		292	685	970	**2332**	N332M	176	288		324	296	3	3	1500	1800	30.8
	340	68	4	4	208		685	970	**32332**	NU332M	176	204	211	324		3	3	1500	1800	30.9
	340	68	4	4	204		835	1150	**32332EQ**	NU332EQ1	176	200	207	324		3	3	1500	1800	27.8



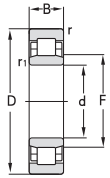
NU型　NJ型　NUP型　N型　NF型



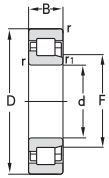
基本尺寸 Basic Size							基本额定负荷 Basic Rated Load		原代号	现代号	安装相关尺寸 Related Installation Size							极限转速 Limit Speed		重量
d	D	B	rmin	rlmin	F	E	动 dyc Cr	静stc Cor	Original Code	Current Code	damin	damax	dbmin	Damax	Damin	ramax	Fbmax	脂润滑 Grease	油润滑 Oil	Weight
mm							KN				mm							r/min		kg
160	340	68	4	4	208		685	970	32332K		176	204	211	324		3	3	1500	1800	30.9
	340	68	4	4	208		685	970	42332	NJ332M	176	204	225	324		3	3	1500	1800	31.5
	290	80	3	3	193		735	1190	32532E	NU2232EM	173	189	196	277		2.5	2.5	1800	2200	24.2
	290	80	3	3	193		625	1000	32532W	NU2232	173	189	196	277		2.5	2.5	1800	2200	23.3
	290	80	3	3	193		735	1190	42532E	NJ2232E	173	188	208	277		2.5	2.5	1800	2200	243.7
170	340	114	4	4		292	1020	1610	2632	N2332M	176	288		324	295	3	3	1500	1800	51.6
	340	114	4	4	208		1020	1610	32632E	NU2332M	176	200	211	324		3	3	1500	1800	54.4
	310	108	4	4	198		970	1490	32732		176	195	201	304		3	3	1500	1800	40.9
	260	42	2.1	2.1	193		272	440	32134H	NU1034M	181	190	196	249		2	2	2200	2800	8.23
	260	42	2.1	2.1	193		272	440	42134	NJ1034M	181	190	205	249		2	2	2200	2800	8.47
	310	52	4	4		272	500	780	2234	N234M	186	266		294	278	3	3	1800	2200	18.2
	310	52	4	4	208		500	780	32234	NU234M	186	203	210	294		3	3	1800	2200	17.9
	310	52	4	4	208		500	780	32234H		186	203	210	294		3	3	1800	2200	17.4
	310	52	4	4	208		500	780	32234Q	NU234Q1	186	203	210	294		3	3	1800	2200	18.1
	310	52	4	4	208		500	780	42234	NJ234M	186	203	224	294		3	3	1800	2200	19.2
	360	72	4	4		310	780	1110	2334	N334M	186	307		344	315	3	3	1400	1700	37.3
	360	72	4	4	220		780	1110	32334	NU334M	186	214	223	344		3	3	1400	1700	37.7
	360	72	4	4	220		780	1110	42334	NJ334M	186	214	243	344		3	3	1400	1700	38.4
	310	86	4	4	205		910	1480	32534E	NU2234EM	186	201	208	294		3	3	1800	2200	29.0
	360	120	4	4	220		1160	1850	42634	NJ2334M	186	212	240	344		3	3	1400	1700	62.5
	360	120	4	4	220		1160	1850	32634	NU2334M	186	212	223	344		3	3	1400	1700	61.1
	265	42	2.1	2.1		237	300	500	2834		186	234		254	241	2	2	580	1100	7.97
	230	28	2	2		216	175	310	1002934		180		213	222	219	1.5	1	2400	2900	3.64
180	280	31	2	2		250	245	420	7002136	N036M	191	246		269	254	2	2	2000	2400	8.59
	280	31	2	2		250	245	420	7002136	N036L	191	246		269	254	2	2	2000	2400	7.08
	280	33	2	2		260	310	540		N036X2	191	256		269	264	2	2	1900	2200	8.44
	320	52	4	4		282	505	785	2236	N236M	196	278		304	286	3	3	1700	2000	19.7
	320	52	4	4	218		505	785	32236	NU236M	196	213	220	304		3	3	1700	2000	19.2
	320	52	4	4	218		505	785	32236H		196	213	220	304		3	3	1700	2000	19.4
	320	52	4	4	218		505	785	42236	NJ236M	196	213	234	304		3	3	1700	2000	19.3
	320	52	4	4	218		505	785	92236	NUP236M	196		234	304		3	3	1700	2000	20.5
	380	75	4	4	231		1060	1360	42336	NJ336EM	196	226	254	364		3	3	1500	2000	42.7
	380	75	4	4	231		1060	1360	32336E	NU336EM	196	226	236	364		3	3	1500	1800	42.1

单列圆柱滚子轴承

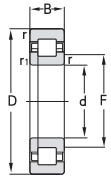
Single-row Cylindrical Roller Bearing



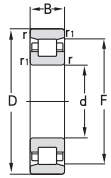
NU型



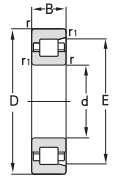
NJ型



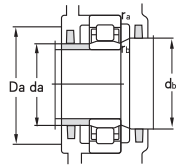
NUP型

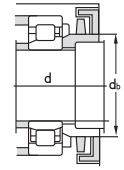


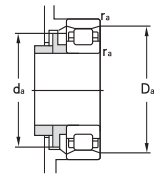
N型



NF型



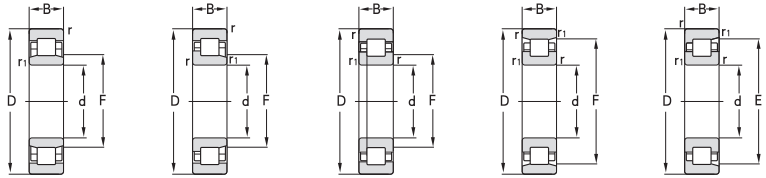




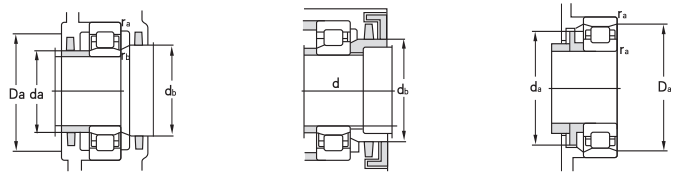
基本尺寸 Basic Size							基本额定负荷 Basic Rated Load		原代号	现代号	安装相关尺寸 Related Installation Size							极限转速 Limit Speed		重量
d	D	B	rmin	rlmin	F	E	动 dyc Cr	静stc Cor	Original Code	Current Code	damin	damax	dbmin	Damax	Damin	ramax	Fbmax	脂润滑 Grease	油润滑 Oil	Weight
mm							KN				mm							r/min		kg
180	380	75	4	4		330	900	1260	2336	N336M	196	325		364	335	3	3	1500	1800	39.6
	380	75	4	4	230		900	1260	32336	NU336M	196	226	236	364		3	3	1500	1800	42.8
	320	86	4	4	215		950	1580	32536	NU2236M	196	211	218	304		3	3	1700	2000	31.4
	320	86	4	4	215		950	1580	32536E	NU2236EM	196	211	218	304		3	3	1700	2000	30.3
	320	86	4	4	215		950	1580	42536	NJ2236M	196	211	232	304		3	3	1700	2000	31.9
	320	86	4	4	215		950	1580	42536E	NJ2236EM	196	211	232	304		3	3	1700	2000	31.0
	320	86	4	4	215		950	1580	92536	NUP2236M	196		232	304		3	3	1700	2000	31.2
	380	126	4	4	232		1240	1850	42636	NJ2336M	196	227	255	364		3	3	1300	1600	72.0
	380	126	4	4	232		1240	1850	32636	NU2336M	196	227	236	364		3	3	1300	1600	69.5
	250	33	2	1.1		233	215	380	1012936		190			240	236	1.5	1.5	2200	2800	4.96
190	260	42	2	1.1	208		315	685		NU2938Q1	196	206	210	252		1.5	1	2200	2800	6.98
	290	46	2.1	2.1	215		375	640	32138	NU1038M	201	212	218	279		2	2	2000	2600	10.9
	340	55	4	4	231		565	885	32238	NU238M	206	226	234	324		3	3	1600	1900	21.6
	340	55	4	4	231		565	885	42238	NJ238M	206	226	248	324		3	3	1600	1900	22.0
	340	55	4	4	231		565	885	92238	NUP238M	206		248	324		3	3	1600	1900	22.3
	400	78	5	5	245		945	1370	42238	NJ338M	206	240	266	380		4	4	1200	1500	49.4
	400	78	5	5	245		945	1370	32338	NU338M	210	240	249	380		4	4	1200	1500	48.5
	400	78	5	5		345	945	1730	2338	N338M	210	340	380	350		4	4	1200	1500	50.2
	340	92	4	4	228		1040	1750	32538	NU2238M	206	223	232	324		3	3	1600	1900	38.6
200	310	34	2	2		277	305	545	7002140		211	274		299	280	2	2	2200	2800	10.1
	310	51	2.1	2.1	227		425	705	32140	NU1040M	211	225	233	299		2	2	1900	2400	14.3
	310	51	2.1	2.1	227		425	705	42140	NJ1040M	211	225	242	299		2	2	1900	2400	14.7
	320	88.9	3	3	232.689		705	1350		NU3040X3M/C3	211	225	235	309		3	3	1700	2000	28.7
	360	58	4	4		316	625	995	2240	N240M	216	310		344	322	3	3	1500	1800	26.8
	360	58	4	4	244		625	995	32240	NU240M	216	239	247	344		3	3	1500	1800	26.5
	360	58	4	4	244		625	995	42240	NJ240M	216	239	262	344	330	3	3	1500	1800	27.1
	420	165	5	5	260		1950	3540	3032340	NU3340M	220	253	264	400		4	4	1200	1500	118
	420	165	5	5	260		1950	3540	3092340K	NUP3340	220		282	400		4	4	1200	1500	121
	360	98	4	4		325	1160	1980		N2240EM	216	320		344		3	3	1500	1800	44.9
	360	98	4	4	244		905	1600	42540	NJ2240M	216	236	260	344		3	3	1500	1800	45.5
	360	98	4	4	241		1160	1980		NU2240EM	216	236	245	344		3	3	1500	1800	42.2
	360	98	4	4	244		905	1600	92540	NUP2240M	216		260	344		3	3	1500	1800	46.3
	420	138	5	5		364	1620	2640	2640	N2340M	220	360		400	368	4	4	1200	1500	94.5
	320	48	2.1	2.1		283	430	705	2740		211	280		299	286	2	2	1900	2400	14.7

单列圆柱滚子轴承

Single-row Cylindrical Roller Bearing



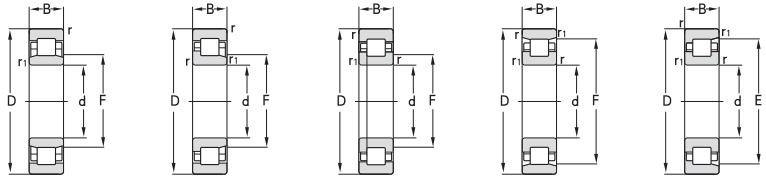
NU型　NJ型　NUP型　N型　NF型



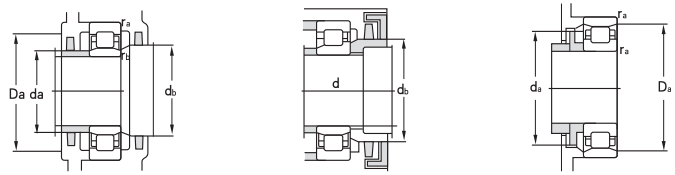
基本尺寸 Basic Size							基本额定负荷 Basic Rated Load		原代号	现代号	安装相关尺寸 Related Installation Size							极限转速 Limit Speed		重量
d	D	B	rmin	rlmin	F	E	动 dyc Cr	静stc Cor	Original Code	Current Code	damin	damax	dbmin	Damax	Damin	ramax	Fbmax	脂润滑 Grease	油润滑 Oil	Weight
mm							KN				mm							r/min		kg
220	300	48	2.1	1.5	240		370	755	2032944Q	NU2944Q1	229	237	243	289		2	1	1900	2400	10.5
	340	56	3	3	250		470	775	32144Q	NU1044Q1	233	246	254	327		2.5	2.5	1800	2200	19.4
	340	56	3	3	250		485	810	42144	NJ1044M	233	246	265	327		2.5	2.5	1800	2200	19.6
	400	65	4	4		350	760	1220	2244	N244M	236	342		384	358	3	3	1500	1800	36.7
	400	65	4	4	270		760	1220	42244	NJ244M	236	263	290	384		3	3	1500	1800	35.4
	400	65	4	4	270		760	1220	32244	NU244M	236	263	276	384		3	3	1500	1800	35.0
	460	88	5	5	284		1160	1730	32344	NU344M	240	277	288	440	411	4	4	1000	1300	73.4
	400	108	4	4	270		1110	1990	32544	NU2244M	236	262	274	384		3	3	1300	1600	62.2
	400	108	4	4	270		1110	1900	42544	NJ2244M	236	262	290	384		3	3	1300	1600	63.3
	460	145	5	5		407	2090	3360		N2344EM	240	403		440		4	4	1000	1300	114
	460	145	5	5	284		1970	3270	32644E	NU2344EM	240	276	288	440		4	4	1000	1300	114
	460	145	5	5	284		1970	3270	32644U	NU2344M/C9	240	276	288	440		4	4	1000	1300	114
240	360	56	3	3	270		495	855	32148Q	NU1048Q1	253	266	274	347		2.5	2.5	1700	2000	21.2
	440	72	4	4	295		950	1540	32248	NU248M	256	288	299	424		3	3	1300	1600	46.9
	440	72	4	4	295		950	1540	42248		256	288	317	424		3	3	1300	1600	49.6
	500	95	5	5		430	1390	2120	2348	NJ248M	260	426		480	434	4	4	1000	1300	96.3
	500	95	5	5	310		1390	2120	32348	N348M NU348M	260	302	314	480		4	4	1000	1300	96.3
	440	146	4	4	290		2040	3820			256	287	293	424		3	3	1100	1400	104
	320	38	2.5	1.8	260		280	540	1032948	NU5248/P5	249	257	263	308		2	1.5	1900	2400	8.50
250	308	50	6	2.3		347	595	1050		N650EM/HAC9	268	343		368	351	5	2	1800	2300	21.4
260	400	65	4	4			625	1090	32152	NU1052M	276	291	300	384		3	3	1500	1800	30.2
	400	65	4	4	296		625	1090	92152	NUP1052M	276		313	384		3	3	1500	1800	37.2
	400	82	4	4	294		985	1880	2032152	NU2052EM	276	291	300	384		3	3	1300	1700	40.1
	480	80	5	5	320		1110	1800	32252	NU252M	280	313	324	460		4	4	1100	1400	67.1
280	340	30	2	2		327	280	690		N1856X3M/HG2	289		324	330	330	2	2	1800	2200	5.76
	420	65	4	4	316		640	1140	42156	NJ1056M	296	311	332	404		3	3	1400	1700	32.2
	380	46	2.1	2.1	306		430	865	1032956		291	303	309	369		2	2	1700	1900	15.5
300	460	74	4	4	340		850	1510	42160	NJ1060M	316	335	358	444		3	3	1200	1500	45.1
	460	74	4	4	340		850	1510	32160	NU1060M	316	335	344	444		3	3	1200	1500	44.1
	460	74	4	4	340		850	1510		NU1060M/HA	316	335	344	444		3	3	1200	1500	44.1
	460	57	4	4	344		730	1340		NJ1060X2M	316	335	358	444		3	3	1400	1700	36.5
	540	85	5	5	364		1370	2270	32260	NU260M	320	358	368	520		4	4	1000	1300	86.9
	620	109	7.5	7.5	385		2100	3300	32360	NU360M	330	379	390	590		7	7	900	1100	166
320	480	74	4	4	360		870	1580	42164	NJ1064M	336	355	380	464		3	3	1100	1400	47.8
	480	74	4	4	360		870	1580	32164	NU1064M	336	355	364	464		3	3	1100	1400	48.2
	480	74	4	4	360		870	1580		NU1064KM/C9	336	355	364	464		3	3	1100	1400	46.3
	480	74	4	4	360		870	1580	92164	NUP1064M	336		380	464		3	3	1100	1400	49.1
	440	56	3	3	530		580	1130	1032964H		335	346	354	425		2.5	2.5	1100	1400	24.7
340	520	82	5	5	385		1050	1910	32168	NU1068M	360	380	389	500		4	4	1000	1300	65.0
360	750	224	7.5	7.5	455		4900	8650	32672		390	445	460	720		7	7	700	850	480
	600	192	5	5	420		3200	6500		NU3172	373	417		587	423	4	4	900	1000	219

单列圆柱滚子轴承

Single-row Cylindrical Roller Bearing



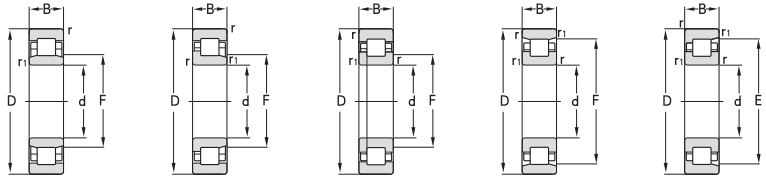
NU型　NJ型　NUP型　N型　NF型



基本尺寸 Basic Size							基本额定负荷 Basic Rated Load		极限转速 rLimit Speed		原代号	现代号	重量	斜挡圈代号
d	D	B	B1	rsmin	r1smin	Fw(EW)	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	Original Code	Current Code	Weight	Code of Separate Thrust Collar
mm							KN		r/min				kg	
400	540	65	-	4	4	434	780	980	950	1200	1032980	NU1980	44	-
	600	90	23	5	5	450	1310	2460	900	1100	32180	NU1080	90	HJ1080
	600	90	-	5	5	450	1310	2460	900	1100	42180	NJ1080	91	-
	600	148	-	5	5	448	2150	3300	800	950	3032180	NU3080	150	-
	650	145	-	6	6	585	2800	3000	750	900	2002780	N2180	195	-
420	620	90	23	4	4	470	1300	2200	900	1100	32184	NU1084	96	HJ1084
440	546	46	-	2.5	1.5	468	410	476	900	1100	32788	NU688	27	-
	650	94	24	6	6	493	1360	2400	850	1000	32188	NU1088	110	HJ1088
	720	122	-	6	6	648	2300	2300	700	900	1002788	N1188	195	-
	720	226	-	6	6	508	4850	9800	600	700	3032788	NU3188	374	-
460	620	95	-	4	4	502	1520	1600	800	950	-	NUP2992	85	-
	680	100	25	6	6	516	1500	2600	800	950	32192	NU1092	125	HJ1092
	760	240	-	7.5	7.5	531	4950	1000	560	670	3032792	NU3192	465	-
480	700	100	25	6	6	536	1600	2700	750	900	32196	NU1096	130	NJ1096
500	620	56	-	3	3	530	800	1700	800	950	-	NU18/500E	39	-
	670	78	-	5	5	544	1100	2100	750	900	10329/500	NU19/500	79	-
	670	100	-	5	5	543	1760	4300	750	900	20329/500	NU29/500	101	-
	670	128	-	5	5	543	2100	4700	750	900	-	NJ39/500E	130	HJ10/500
	720	100	-	6	6	556	1800	4350	750	900	321/500	NU10/500	135	
	720	128	25	6	6	553	2700	5300	630	750	-	NU20/500E	180	-
	720	167	-	6	6	540.8	3650	7200	630	750	-	NU30/500E	230	-
	830	264	-	7.5	7.5	576	5800	10800	500	600	-	NU31/500E	595	-
	920	185	-	7.5	7.5	604	4700	7650	560	670	-	NU12/500	585	-
530	650	72	-	3	3	622	1050	2890	750	900	-	NF28/530	53	-
	650	72		3	3	560.5	1050	2890	750	900	-	NJ28/530E	52	-
	710	106	-	5	5	580	1800	4550	700	850	10329/530	NU19/530	123	-
	710	106	-	5	5	580	1800	4550	700	850	20329/530	NUP29/530	126	-
	780	112	-	6	6	593	2100	3700	670	800	321/530	NU10/530	190	-
	780	145	-	6	6	591	3400	6600	560	670	-	NU20/530E	255	-
560	750	85	-	5	5	608	1500	2900	670	800	10329/560E	NU19/560E	110	-
	750	112	-	5	5	703	2250	5600	670	800	-	N29/560	140	-
	820	115		6	6	625	2100	3850	630	750	321/560	NU10/560	215	-
	820	115	-	6	6	625	2100	3850	630	750	421/560	NJ10/560	220	-
	820	150	-	6	6	626	3500	6900	530	630	-	NU20/560E	290	-
	1030	206	-	6	6	668	6500	10100	480	560	-	NU12/560	805	-

单列圆柱滚子轴承

Single-row Cylindrical Roller Bearing



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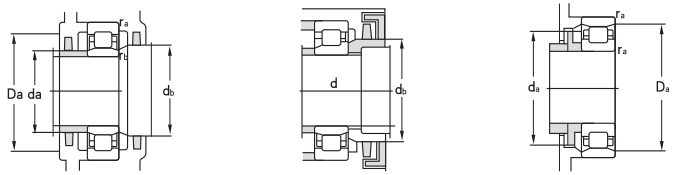
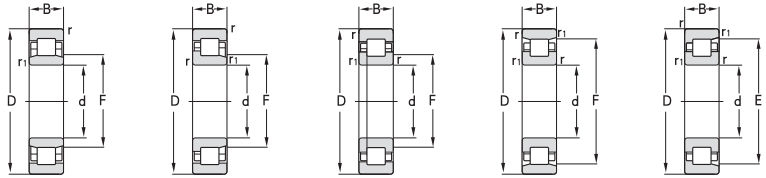
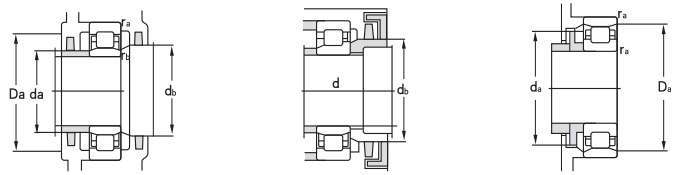


基本尺寸 Basic Size							基本额定负荷 Basic Rated Load		极限转速 rLimit Speed		原代号	现代号	重量	斜挡圈代号
d	D	B	B1	rsmin	r1smin	Fw(EW)	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	Original Code	Current Code	Weight	Code of Separate Thrust Collar
mm							KN		r/min					
600	730	60	-	3	3	632	810	1850	670	800	-	NU18/600E	51	-
	800	90	-	5	5	649	1750	3500	630	750	10329/600E	NU19/600E	130	-
	800	90	-	5	5	649	1750	3500	630	750	-	NUP19/600E	140	-
	800	90		5	5	757	1750	3500	630	750	-	NF19/600E	135	-
	800	118	-	5	5	649	2650	5900	630	750	20329/600E	NUP29/600E	165	-
	830	150	-	5	5	655	3100	7400	630	750	327/600	-	240	-
	870	118	-	6	6	667	2500	4600	600	700	321/600	NU10/600	250	-
600	870	155	-	6		661	3800	7200	500	600	-	NU20/600E	325	-
	870	200	-	6	6	661	4850	9900	500	600	-	NU30/600E	415	-
630	780	88	-	4	4	668	1450	3550	630	750	-	NU28/630	98	-
	780	88	-	4	4	743	1450	3550	630	750	-	N28/630	100	-
	780	112	-	4	4	745	2000	5150	560	670	-	N38/630	120	-
	780	112	-	4	4	745	2000	5150	560	670	-	NF38/630	125	-
	850	100	-	6	6	795	1850	2530	600	700	10029/630	N19/630	165	-
	850	100	-	6	6	688	1850	2530	600	700	10329/630	NU19/630	160	-
	850	100	-	6	6	683	2050	4000	600	700	10329/630E	NU19/630E	165	-
	850	128	-	6	6	685	3000	4200	600	700	20329/630	NU29/630	210	-
	850	128	-	6	6	683	3200	6400	600	700	20329/630E	NU29/630E	220	-
	850	128	-	6	6	683	3200	6400	600	700	-	NUP29/30E	230	-
	920	128	-	7.5	7.5	702	3100	5600	450	530	-	NU10/630E	285	-
	920	128	-	7.5	7.5	702	3100	5600	450	530	-	NUP10/630E	290	-
	920	170	-	7.5	7.5	699	4300	8600	450	530	-	NU20/630E	400	-
670	900	103	-	6	6	728	2100	4300	530	630	10329/670E	NU19/670E	195	-
	900	103	-	6	6	728	2100	4300	530	630	-	NUP19/670E	200	-
	980	136	-	7.5	7.5	747	3400	6150	430	500	321/670E	NU10/670E	350	-
	980	180	-	7.5	7.5	746	4900	9900	430	500	-	NU20/670E	480	-
	980	230	-	7.5	7.5	744	6000	12600	430	500	-	NU30/670	600	-
700	930	160	-	6	6	760	3200	4500	430	500	327/700	NU6/700	300	-
710	870	74	-	4	4	750	1350	3050	530	630	-	NU18/710	98	-
	870	95	-	4	4	831	1750	4500	530	630	-	N28/710E	130	-
	950	106	-	6	6	770	2300	3250	500	600	10329/710	NU19/710	210	-
	950	140	-	6	6	766	3400	7500	500	600	-	NU29/710E	295	-
	950	140	-	6	6	766	3400	7500	500	600	-	NUP29/710E	300	-
	1030	140	-	7.5	7.5	778	4200	7650	430	500	321/710	NU10/710	480	-
	1030	185	-	7.5	7.5	787	5350	10800	400	480	-	NU20/710E	540	-



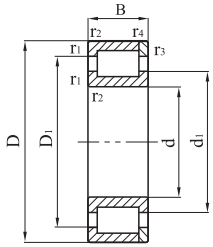
NU型　NJ型　NUP型　N型　NF型



基本尺寸 Basic Size							基本额定负荷 Basic Rated Load		极限转速 rLimit Speed		原代号	现代号	重量	斜挡圈代号
d	D	B	B1	rsmin	r1smin	Fw(EW)	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	Original Code	Current Code	Weight	Code of Separate Thrust Collar
mm							KN		r/min					
750	920	78	-	5	65	794	1350	3150	500	600	-	NU18/750	110	-
	1000	112	-	6	6	943	2550	5300	480	560	-	NF19/750E	265	-
	1090	150	-	7.5	7.5	832	4300	7950	360	430	321/750E	NU10/750E	490	-
	1090	195	-	7.5	7.5	832	6350	13200	360	430	-	NU20/750E	635	-
800	980	82	-	5	5	848	1550	3750	450	530	-	NJ18/800E	145	-
	1150	155	-	7.5	7.5	883	4950	9550	340	400	321/800E	NU10/800E	560	-
	1150	200	-	7.5	7.5	882	6350	13150	340	400	-	NU20/800E	715	-
840	1040	125	-	3	3	985	2500	5280	-	-	27/840	N6/840	240	-
850	1030	106	-	5	5	895	1910	5400	-	-	-	NU28/850	190	-
	1030	106	-	5	5	982	1910	5400	-	-	-	N28/850	195	-
	1120	118	-	6	6	919	2900	6300	-	-	-	NU19/850E	330	-
950	1250	175	-	7.5	7.5	1024	5100	13400	-	-	-	NUP29/950	616	-
	1250	224	-	7.5	7.5	1170	6780	15500	-	-	30029/950	N39/950	750	-
1060	1400	150	-	7.5	7.5	1162	4500	10000	-	-	10329/1060	NU19/1060	690	-
1200	1520	185	-	7.5	7.5	1289	5650	17000	-	-	-	NU6/1200	830	-
1250	1500	112	-	6	6	1316	3300	9550	-	-	-	NU18/1250	390	-
	1750	290	-	9.5	9.5	1635	12000	27500	-	-	-	N20/1250	2320	-

单列满装圆柱滚子轴承

Single-row Full-complement Cylindrical Roller Bearing



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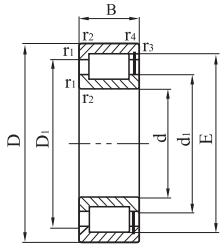

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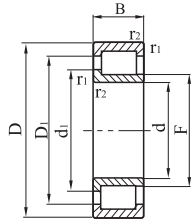

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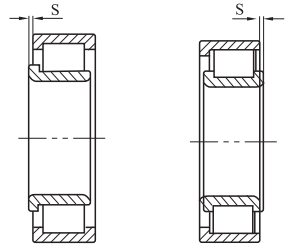
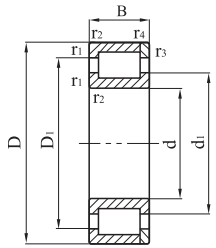


基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量 Weight	轴承型号 Basic Rated Load	内径 Weight	其它尺寸 Other Sizes					极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor				E	F	d1	D1	S	脂润滑 Grease	油润滑 Oil
mm					KN		kg		mm	mm					r/min	
									d							
150	190	20	1.1	1	108	185	1.54	NC1830V	150	-	-	163	176	1.5	700	1500
	190	20	1.1	1	108	185	1.30	NCF1830V		179.5	-	163	176	1.5	700	1500
	210	36	2	1.1	286	497	4	NC2930V		-	-	171	188	-	670	1400
	210	36	2	1.1	286	497	3.85	NCF2930V		195.5	-	171	188	0.8	670	1400
	225	56	2.1	1.1	530	880	7.72	NC3030V		-	-	174	203	-	630	1300
	225	56	2.1	1.1	530	880	7.50	NCF3030V		211.7	-	174	203	3.5	630	1300
	320	108	4	1.1	1450	2240	42.5	NJ2330VH		-	182.5	203	261	6.5	430	800
160	200	20	1.1	1.1	112	199	1.60	NC1832V	160	-	-	173	185	1.5	670	1400
	200	20	1.1	1.1	112	199	1.45	NCF1832V		189	-	173	185	1.5	670	1400
	220	36	2	1.1	297	524	4	NC2932V		-	-	181	198	-	630	1300
	220	36	2	1.1	297	524	4.05	NCF2932V	160	205.7	-	181	198	0.8	630	1300
	240	60	2.1	1.1	580	970	9.26	NC3032V		-	-	184.8	214.8	-	600	1100
	240	60	2.1	1.1	580	970	9.10	NCF3032V		225.1	-	184.8	214.8	4	600	1100
	340	114	4	-	1630	2550	48.8	NJ2332VH		-	196.55	216.7	286	7	400	750
170	215	22	1.1	1.1	142	245	2	NC1834V	170	-	-	185	200	1.5	630	1300
	215	22	1.1	1.1	142	245	1.85	NCF1834V		204.5	-	185	200	1.5	630	1300
	230	36	2	1.1	308	552	4.50	NC2934V		-	-	192	208	-	600	1200
	230	36	2	1.1	308	552	4.25	NCF2934V		216	-	192	208	0.8	600	1200
	260	67	2.1	1.1	728	1230	13.7	NC3034V		-	-	198	232	-	560	1000
	260	67	2.1	1.1	728	1230	12.5	NCF3034V		243.2	-	198	232	4	560	1000
	360	120	3	-	1760	2400	59.2	NJ2334VH		-	-	224.5	296.4	7	450	800
180	225	22	1.1	1.1	147	275	2.20	NC1836V	180	-	-	196	211	1.5	600	1200
	225	22	1.1	1.1	147	275	1.95	NCF1836V		215.2	-	196	211	1.5	600	1200
	250	42	2	1.1	391	690	6.40	NC2936V		-	-	203	223	-	560	1100
	250	42	2	1.1	391	690	6.25	NCF2936V		232	-	203	223	1	560	1100
	280	74	2.1	2.1	820	1400	17.10	NC3036V		-	-	212	249	-	560	1100
	280	74	2.1	2.1	820	1400	16.50	NCF3036V		260.5	-	212	249	5	560	1100
	380	126	3	-	1900	2700	69.60	NJ2336VH		-	221.74	242.6	314.6	9	400	700

单列满装圆柱滚子轴承

Single-row Full-complement Cylindrical Roller Bearing



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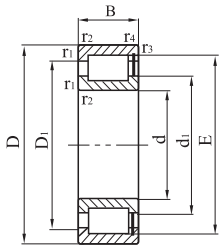

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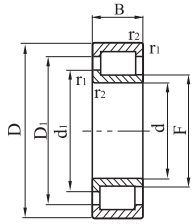

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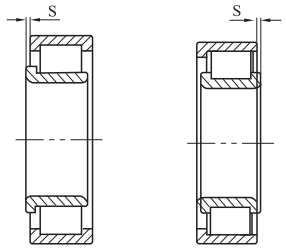
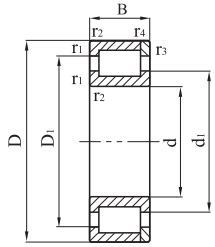


基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量 Weight	轴承型号 Basic Rated Load	内径 Weight	其它尺寸 Other Sizes					极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor			mm	E	F	d1	D1	S	脂润滑 Grease	油润滑 Oil
mm					KN		kg		d	mm					r/min	
190	240	24	1.5	1.5	172	320	2.70	NC1838V	190	-	-	208	224	1.8	560	1100
	240	24	1.5	1.5	172	320	2.45	NCF1838V		229	-	208	224	1.8	560	1100
	260	42	2	1.1	440	782	6.80	NC2938V		-	-	212	236	-	560	1100
	260	42	2	1.1	440	782	6.55	NCF2938V		244	-	212	236	1	560	1000
	290	75	2.1	2.1	850	1450	17.9	NC3038V		-	-	222	258	-	530	1000
	290	75	2.1	2.1	850	1450	17.0	NCF3038V		270	-	222	258	6	530	1000
	400	132	4	-	2080	2900	80.0	NJ2338VH		-	224.6	247.6	327	7	400	700
200	250	24	1.5	1.5	176	335	3	NC1840V	200	-	-	216	233	1.8	560	1100
	250	24	1.5	1.5	176	335	2.60	NCF1840V		237.5	-	216	233	1.8	560	1100
	280	48	2.1	1.5	528	938	9.50	NC2940V	200	-	-	227	253	-	530	1000
	280	48	2.1	1.5	528	938	9.15	NCF2940V		262	-	227	253	3	530	1000
	310	82	2.1	2.1	990	1750	23.0	NC3040V		-	-	237	276	-	450	800
	310	82	2.1	2.1	990	1750	22.5	NCF3040V		287.75	238.65	237	276	6.5	450	800
	420	138	5	-	2290	3680	91.6	NJ2340VH		-	-	263.2	347.5	9	320	600
220	270	24	1.5	1.5	183	350	3.35	NC1844V	220	-	-	237	253	1.8	530	1000
	270	24	1.5	1.5	183	350	2.85	NCF1844V		258	-	237	253	1.8	530	1000
	300	48	2.1	1.5	550	1030	10.9	NC2944V		-	-	248	274	-	480	900
	300	48	2.1	1.5	550	1030	9.9	NCF2944V		283	-	248	274	2.5	480	900
	340	90	3	3	1190	2100	30.5	NC3044V		-	-	254.7	297.9	-	430	850
	340	90	3	3	1190	2100	29.5	NCF3044V		312.7	-	254.7	297.9	7	430	850
240	300	28	2	2	260	510	5.30	NC1848V	240	-	-	261	281	1.8	480	900
	300	28	2	2	260	510	4.4	NCF1848V		287	-	261	281	1.8	480	900
	320	48	2.1	1.5	583	1120	12.0	NC2948V		-	-	261	296	-	450	850
	320	48	2.1	1.5	583	1120	11.0	NCF2948V		303	-	261	296	2.5	450	850
	360	92	3	3	1250	2240	33.0	NC3048V		-	-	278	322	-	430	800
	360	92	3	3	1250	2240	32.0	NCF3048V		335.6	-	278	322	7	430	800



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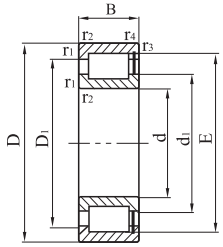

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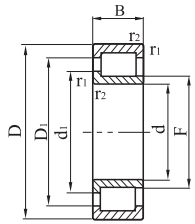

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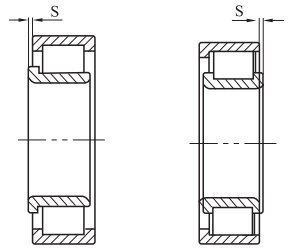
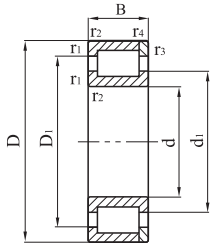


基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量 Weight	轴承型号 Basic Rated Load	内径 Weight	其它尺寸 Other Sizes					极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor			mm	E	F	d1	D1	S	脂润滑 Grease	油润滑 Oil
mm					KN		kg		d	mm					r/min	
260	320	28	2	2	270	550	5.55	NC1852V	260	-	-	281	301	1.8	430	800
	320	28	2	2	270	550	4.75	NCF1852V		307.2	-	281	301	1.8	430	800
	360	60	2.1	1.5	737	1410	19.3	NC2952V		-	-	294	321	-	400	750
	360	60	2.1	1.5	737	1410	18.5	NCF2952V		333.7	-	294	321	5	400	750
	400	104	4	4	1600	2920	47.5	NC3052V		-	-	304.1	358.1	-	380	700
	400	104	4	4	1600	2920	46.5	NCF3052V		373.5	-	304.1	358.1	8	380	700
280	350	33	2	2	330	650	8.0	NC1856V	280	-	-	305	327	2.5	400	750
	350	33	2	2	330	650	7.1	NCF1856V		334	-	305	327	2.5	400	750
	380	60	2.1	1.5	897	1710	21.1	NC2956V		-	-	319	346	-	380	700
	380	60	2.1	1.5	897	1710	20.0	NCF2956V		362.7	-	319	346	4	380	700
	420	106	4	4	1650	3100	52.5	NC3056V		-	-	324	375	-	320	560
	420	106	4	4	1650	3100	50.0	NCF3056V		391	-	324	375	9	320	560
300	380	38	2.1	2.1	418	850	11.5	NC1860V	300	-	-	329	355	3	360	670
	380	38	2.1	2.1	418	850	10.0	NCF4860V		363	-	329	355	3	360	670
	420	72	3	3	1120	2170	32.3	NC2960V		-	-	342	375	-	340	630
	420	72	3	3	1120	2170	31.5	NCF2960V		390.5	-	342	375	5	340	630
320	400	38	2.1	2.1	440	852	11.3	NC1864V	320	-	-	349	375	3	340	630
	400	38	2.1	2.1	440	852	10.5	NCF1864V		383	-	349	375	3	340	630
	440	72	3	3	1140	2300	34.0	NC2964V		-	-	363	395	-	320	600
	440	72	3	3	1140	2300	33.0	NCF2964V		411	-	363	395	5	320	600
340	420	38	2.1	2.1	446	900	12.8	NC1868V	340	-	-	369	395	3	320	600
	420	38	2.1	2.1	446	900	11.0	NCF1868V		403	-	369	395	3	320	600
	460	72	3	3	1190	2460	36.0	NC2968V		-	-	383	415	-	300	560
	460	72	3	3	1190	2460	35.0	NCF2968V		431	-	383	415	5	300	560
360	440	38	2.1	2.1	452	950	12.4	NC1872V	360	-	-	389	415	3	300	560
	440	38	2.1	2.1	452	950	12.0	NCF1872V		423.2	-	389	415	3	300	560
	480	72	3	3	1230	2580	36.8	NC2972V		-	-	403	436	-	280	530
	480	72	3	3	1230	2580	36.5	NCF2972V		451.5	-	403	436	5	280	530
380	480	46	2.1	2.1	627	1230	19.9	NC1876V	380	-	-	416	448	3.5	280	530
	480	46	2.1	2.1	627	1230	19.5	NCF1876V		458	-	416	448	3.5	280	530
	520	82	4	4	1570	3000	53.5	NC2976V		-	-	427	473	-	260	500
	520	82	4	4	1570	3000	52.5	NCF2976V		488	-	427	473	5	260	500
400	500	46	2.1	2.1	627	1280	21.2	NC1880V	400	-	-	433	465	3.5	260	500
	500	46	2.1	2.1	627	1280	20.5	NCF1880V		475	-	433	465	3.5	260	500
	540	82	4	4	1650	3420	55.0	NC2980V		-	-	450	496	-	240	480
	540	82	4	4	1650	3420	54.5	NCF2980V		511	-	450	496	5	240	480

单列满装圆柱滚子轴承

Single-row Full-complement Cylindrical Roller Bearing



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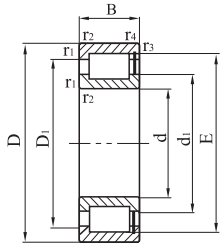

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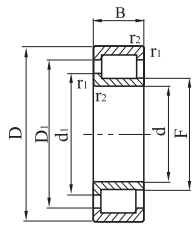

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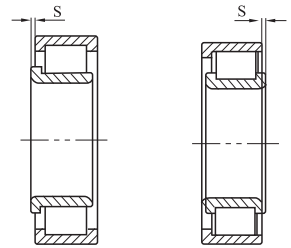
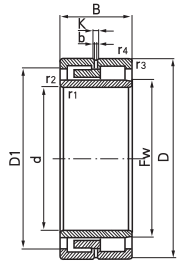
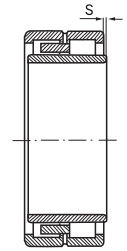


基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量 Weight	轴承型号 Basic Rated Load	内径 Weight	其它尺寸 Other Sizes					极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor			mm	E	F	d1	D1	S	脂润滑 Grease	油润滑 Oil
mm					KN		kg		d	mm					r/min	
420	520	46	2.1	2.1	660	1340	21.6	NC1884V	420	-	-	457	489	3.5	240	480
	520	46	2.1	2.1	660	1340	21.0	NCF1884V		499	-	457	4889	3.5	240	480
	560	82	4	4	1650	3500	57.7	NC2984V		-	-	463	509	-	220	450
	560	82	4	4	1650	3500	57.0	NCF2984V		524	-	463	509	5	220	450
440	540	46	2.1	2.1	670	1405	22.6	NC1888V	440	-	-	474	506	3.5	220	450
	540	46	2.1	2.1	670	1405	22.0	NCF1888V		516	-	474	506	3.5	220	450
	600	95	4	4	2010	4270	81.1	NC2988V		-	-	502	545	-	200	430
	600	95	4	4	2010	7270	80.5	NCF2988V		565.5	-	502	545	6	200	430
460	580	56	3	3	913	1850	34.8	NC1892V	460	-	-	501	541	5	200	430
	580	56	3	3	913	1850	34.0	NCF1892V		553	-	501	541	5	200	430
	620	95	4	4	2050	4420	83.9	NC2992V		-	-	516	558	-	190	400
	620	95	4	4	2050	4420	83.5	NCF2992V		579	-	516	558	6	190	400
480	600	56	3	3	935	1920	35.5	NCF1896V	480	573.5	-	522	561	5	190	400
	650	100	5	5	2290	4950	98.0	NCF2996V		606	-	538	584	-	180	380
500	620	56	3	3	952	2120	36.5	NCF18/530V	500	594	-	542	582	5	180	380
	670	100	5	5	2380	5240	100.0	NCF29/500V		634.5	-	567	612	7	170	360
530	650	56	3	3	990	2110	38.5	NCF18/530V	530	624.5	-	573	612	5	170	360
560	680	56	3	3	1020	2230	40.5	NCF18/560V	560	655	-	603	643	5	160	340
600	730	60	3	3	1050	2350	51.5	NCF18/600V	600	696	-	644	684	7	150	320
630	780	69	4	4	1250	2800	72.5	NCF18/630V	630	739	-	681	725	8	140	300

双列圆柱滚子轴承

Double-row Cylindrical Roller Bearing



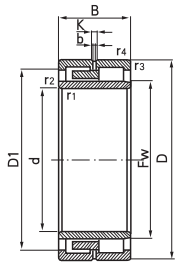


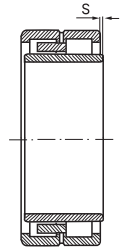
径向当量动载荷
Radial equivalent dynamic load
Pr=Fr
径向当量静载荷
Radial equivalent static load
For=Fr

基本尺寸 Basic Size					轴承型号 Bearing Model		内径 Inner Diameter	基本额定负荷 Basic Rated Load		其它尺寸 Other Sizes					重量 Weight	极限转速 Limit Speed
d	D	B	r1.2min	r3.4min				动Cr	静Cor	D1	F	b	K	s		油 Oil
mm					圆柱孔 Cylindrical bore	圆锥孔 Tapered bore	d	KN		mm					kg	r/min
150	210	60	2	2	NNU4930/W33	NNU4930K/W33	150	330	655	191	168.5	5.5	3	2	6.25	4300
	250	100	2.1	2.1	NNU4130/W33	NNU4130K30/W33		748	1290	219	177	8.3	4.5	4.3	18.0	2400
160	220	60	2	2	NNU4932/W33	NNU4932K/W33	160	330	680	201	178.5	5.5	3	2	6.6	4000
	270	109	2.1	2.1	NNU4132/W33	NNU4132K30/W33		935	1530	238	188	8.3	4.5	4.1	25.0	2200
170	230	60	2	2	NNU4934/W33	NNU4934K/W33	170	336	695	211	188.5	5.5	3	2	6.95	3800
	280	109	2.1	2.1	NNU4134/W33	NNU4134K30/W33		968	1630	248	198	8.3	4.5	4	26.0	2000
180	250	69	2	2	NNU4936/W33	NNU4936K/W33	180	402	850	226	202	8.3	4.5	2.3	10.5	3400
	300	118	3	3	NNU4136/W33	NNU4136K30/W33		1080	1830	265	211	11.1	6	3.9	32.5	1900
190	260	69	2	2	NNU4938/W33	NNU4938K/W33	190	402	880	236	212	8.3	4.5	2.3	11.0	3200
	320	128	3	3	NNU4138/W33	NNU4138K30/W33		1320	2200	282	222	11.1	6	4.0	41.0	1800
200	280	80	2.1	2.1	NNU4940/W33	NNU4940K/W33	200	484	1040	253	225	11.1	6	3.7	15.0	3000
	340	140	3	3	NNU4140/W33	NNU4140K30/W33		1470	2550	299	235	11.1	6	5.3	51.0	1700
220	300	80	2.1	2.1	NNU4944/W33	NNU4944K/W33	220	512	1140	273	245	11.1	6	3.7	16.5	2800
	370	150	4	4	NNU4144/W33	NNU4144K30/W33		1650	2900	325	258	13.9	7.5	5.5	65.0	1500
240	320	80	2.1	2.1	NNU4948/W33	NNU4948K/W33	240	528	1220	293	265	11.1	6	3.7	17.5	2600
	400	160	4	4	NNU4148/W33	NNU4148K30/W33		1980	3650	353	282	13.9	7.5	4.6	85.0	1400
260	360	100	2.1	2.1	NNU4952/W33	NNU4952K/W33	260	748	1700	326	292	13.9	7.5	4.5	30.5	2400
	440	180	4	4	NNU4152/W33	NNU4152K30/W30		2200	3900	387	306	13.9	7.5	5.1	110	1300
280	380	100	2.1	2.1	NNU4956/W33	NNU4956K/W33	280	765	1800	346	312	13.9	7.5	4.5	32.5	2200
	460	180	5	5	NNU4156/W33	NNU4156K30/W33		2550	4750	407	326	13.9	7.5	6.3	120	1200
300	420	118	3	3	NNU4960/W33	NNU4960K/W33	300	1020	2360	379	339	16.7	9	5.5	50.0	2000
	500	200	5	5	NNU4160/W33	NNU4160K30/W33		2860	5300	442	351	16.7	9	7.3	155	1100
320	440	118	3	3	NNU4964/W33	NNU4964K/W33	320	1060	2500	399	359	16.7	9	5.5	53.0	1900
	540	218	5	5	NNU4164/W33	NNU4164K30/W33		3410	6200	476	375	16.7	9	8.9	200	1000
340	460	118	3	3	NNU4968/W33	NNU4968K/W33	340	1100	2650	419	379	16.7	9	5.5	56.5	1700
	580	243	5	5	NNU4168/W33	NNU4168K30/W33		4020	7500	510	402	16.7	9	10	260	950
360	480	118	3	3	NNU4972/W33	NNU4972K/W33	360	1120	2800	439	399	16.7	9	5.5	58.5	1700
	600	243	5	5	NNU4172/W33	NNU4172K30/W33		4290	8500	530	422	16.7	9	5.9	275	900
380	520	140	4	4	NNU4976/W33	NNU4976K/W33	380	1450	3600	471	426	16.7	9	5.5	87.5	1500
	620	243	5	5	NNU4176/W33	NNU4176K30/W33		4290	8500	550	442	16.7	9	7.4	285	850
400	540	140	4	4	NNU4980/W33	NNU4980K/W33	400	1470	3800	491	446	16.7	9	5.5	91.5	1500
	650	250	6	6	NNU4180/W33	NNU4180K30/W33		4730	9500	577	463	16.7	9	7.5	325	800

双列圆柱滚子轴承

Double-row Cylindrical Roller Bearing



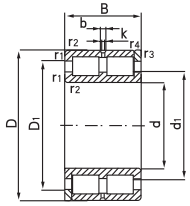


径向当量动载荷
Radial equivalent dynamic load
Pr=Fr
径向当量静载荷
Radial equivalent static load
For=Fr

基本尺寸 Basic Size d	D	B	r1.2min	r3.4min	轴承型号 Bearing Model 圆柱孔 Cylindrical bore	圆锥孔 Tapered bore	内径 Inner Diameter d	基本额定负荷 Basic Rated Load 动Cr	静Cor	其它尺寸 Other Sizes D1	F	b	K	s	重量 Weight	极限转速 Limit Speed 油 Oil
mm								KN		mm					kg	r/min
420	560	140	4	4	NNU4984/W33	NNU4984K/W33	420	1510	4000	511	466	16.7	9	5.5	95.5	1400
	700	280	6	6	NNU4184/W33	NNU4184K30/W33		5500	11400	609	497	16.7	9	12.2	440	750
440	600	160	4	4	NNU4988/W33	NNU4988K/W33	440	2050	5200	545	490	16.7	9	3.2	130	1300
	720	280	6	6	NNU4188/W33	NNU4188K30/W33		5720	11800	638	511	22.3	12	10.8	450	700
460	620	160	4	4	NNU4992/W33	NNU4992K/W33	460	2090	5500	565	510	16.7	9	3.2	135	1200
	760	300	7.5	7.5	NNU4192/W33	NNU4192K30/W33		6440	13200	672	537	22.3	12	12.8	535	670
480	650	170	5	5	NNU4996/W33	NNU4996K/W33	480	2330	6100	592	534	22.3	12	3.5	160	1200
	790	308	7.5	7.5	NNU4196/W33	NNU4196K30/W33		7040	14300	701	557	22.3	12	12	590	630
500	670	170	5	5	NNU49/500/W33	NNU49/500K/W33	500	2330	6100	612	554	22.3	12	3.5	165	1100
	830	325	7.5	7.5	NNU41/500/W33	NNU41/500K30/W33		7480	15000	734	582	22.3	12	14.1	710	600
530	710	180	5	5	NNU49/530/W33	NNU49/530K/W33	530	2860	7800	649	588	22.3	12	5.5	200	1000
	870	335	7.5	7.5	NNU41/530/W33	NNU41/530K30/W33		7810	16000	770	618	22.3	12	17	790	560
560	750	190	5	5	NNU49/560/W33	NNU49/560K/W33	560	3190	8650	687	623	22.3	12	5.5	235	950
	920	355	7.5	7.5	NNU41/560/W33	NNU41/560K30/W33		8800	18300	814	653	22.3	12	7.5	930	530
600	800	200	5	5	NNU49/600/W33	NNU49/600K/W33	600	3580	10200	734	666	22.3	12	5.5	280	900
	980	375	7.5	7.5	NNU41/600/W33	NNU41/600K30/W33		9900	21100	868	699	22.3	12	18.5	1100	480
630	850	218	6	6	NNU49/630/W33	NNU49/630K/W33	630	4020	11400	776	704	22.3	12	7	355	850
	1030	400	7.5	7.5	NNU41/630/W33	NNU41/630K30/W33		11000	24000	912	734	22.3	12	19.7	1330	450
670	900	230	6	6	NNU49/670/W33	NNU49/670K/W33	670	4950	13700	822	738	22.3	12	6	410	800
	1090	412	7.5	7.5	NNU41/670/W33	NNU41/670K30/W33		12100	25500	969	774	22.3	12	19.5	1500	430
710	950	243	6	6	NNU49/710/W33	NNU49/710K/W33	710	5390	15300	879	782	22.3	12	7.5	480	700
	1150	438	9.5	9.5	NNU41/710/W33	NNU41/710K30/W33		13400	28500	1024	820	22.3	12	20.5	1790	380
750	1000	250	6	6	NNU49/750/W33	NNU49/750K/W33	750	5500	16000	918	831	22.3	12	7.5	540	670
	1220	475	9.5	9.5	NNU41/750/W33	NNU41/750K30/W33		16100	35500	1083	871	22.3	12	19	2230	360
800	1060	258	6	6	NNU49/800/W33	NNU49/800K/W33	800	5830	17000	974	884	22.3	12	8	615	-
	1280	475	9.5	9.5	NNU41/800/W33	NNU41/800K30/W33		16500	36500	1141	921	22.3	12	18.6	2390	-

双列满装圆柱滚子轴承

Double-row full-complement cylindrical roller bearing



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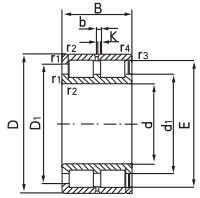

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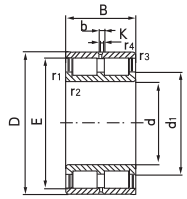

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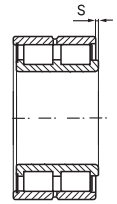
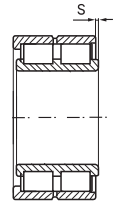
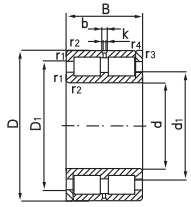




基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量	轴承型号	内径	其它尺寸 Other Sizes					极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor	Weight	Basic Rated Load	Weight	E	d1	D1	b	k	s	脂润滑 Grease	油润滑 Oil
mm					KN		kg		mm	mm						r/min	
									d								
150	190	40	1.1	1.1	230	560	3	NNC4830V	150	-	165	174	7	4	-	720	1500
	190	40	1.1	1.1	230	560	2.8	NNCF4830V		178.7	165	174	7	4	2	720	1500
	190	40	1.1	1.1	230	560	2.8	NNCL4830V		178.7	165	-	7	4	2	720	1500
	210	60	2	2	383	843	7	NNC4930V		-	172.5	185.5	7	4	-	680	1400
	210	60	2	2	383	843	6.8	NNCF4930V		192	172.5	185.5	7	4	4	680	1400
	210	60	2	2	383	843	6.8	NNCL4930V		192	172.5	185.5	7	4	4	680	1400
	225	100	2.1	2.1	842	1680	14	NNCF5030V		209	175	201	7	4	3	630	1300
160	200	40	1.1	1.1	238	600	3.2	NNC4832V	160	-	176.5	185.5	7	4	-	680	1400
	200	40	1.1	1.1	238	600	3.0	NNCF4832V		190.1	176.5	185.5	7	4	2	680	1400
	200	40	1.1	1.1	238	600	3.0	NNCL4832V		190.1	176.5	-	7	4	2	680	1400
	220	60	2	2	399	906	7.2	NNC4932V		-	184.5	197.5	7	4	-	650	1300
	220	60	2	2	399	906	7.1	NNCF4932V		203.9	184.5	197.5	7	4	4	650	1300
	220	60	2	2	399	906	7.1	NNCL4932V		203.9	184.5	197.5	7	4	4	650	1300
	240	109	2.1	2.1	1010	1950	17	NNCF5032V		225	185	215	7	4	3	600	1200
170	215	45	1.1	1.1	258	631	4.2	NNC4834V	170	-	187.5	196.5	7	4	-	640	1300
	215	45	1.1	1.1	258	631	4.0	NNCF4834V		201.7	187.5	196.5	7	4	3	640	1300
	215	45	1.1	1.1	258	631	4.0	NNCL4834V		201.7	187.5	-	7	4	3	640	1300
	230	60	2	2	408	950	7.6	NNC4934V		-	192.5	205.5	7	4	-	600	1200
	230	60	2	2	408	950	7.5	NNCF4934V		212.2	192.5	205.5	7	4	4	600	1200
	230	60	2	2	408	950	7.5	NNCL4934V		212.2	192.5	205.5	7	4	4	600	1200
	260	122	2.1	2.1	1140	2170	23.0	NNCF5034V		243	198	232	7	4	5	560	1100
180	225	45	1.1	1.1	266	664	4.5	NNC4836V	180	-	196	207	7	4	-	610	1200
	225	45	1.1	1.1	266	664	4.2	NNCF4836V		211.3	196	207	7	4	3	610	1200
	225	45	1.1	1.1	266	664	4.2	NNCL4836V		211.3	196	-	7	4	3	610	1200
	250	69	2	2	547	1220	11	NNC4936V		-	207	223	7	4	-	570	1100
	250	69	2	2	547	1220	10.8	NNCF4936V		231.1	207	223	7	4	4	570	1100



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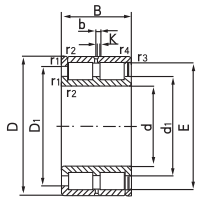

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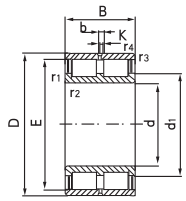

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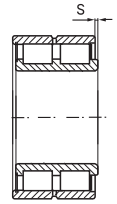
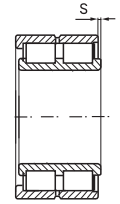
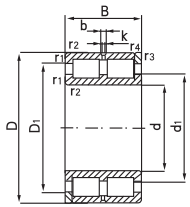




基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量 Weight	轴承型号 Basic Rated Load	内径 Weight	其它尺寸 Other Sizes						极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor			mm	E	d1	D1	b	k	s	脂润滑 Grease	油润滑 Oil
mm					KN		kg		d	mm						r/min	
180	250	69	2	2	547	1220	10.8	NNCL4936V	180	231.5	207	223	7	4	4	570	1100
	280	136	2.1	2.1	1320	2580	30.5	NNCF5036V		260.5	212	249	8	4	6	560	1100
190	240	50	1.5	1.5	305	760	5.8	NNC4838V	190	-	209	220	7	4	-	560	1150
	240	50	1.5	1.5	305	760	5.5	NNCF4838V		225.4	209	220	7	4	4	560	1150
	240	50	1.5	1.5	305	760	5.5	NNCL4838V		225.4	209	-	7	4	4	560	1150
	260	69	2	2	562	1290	11.5	NNC4938V		-	217.5	233	7	4	-	550	1100
	260	69	2	2	562	1290	11.3	NNCF4938V		241.3	217.5	233	7	4	4	550	1100
	260	69	2	2	562	1290	11.3	NNCL4938V		241.3	217.5	233	7	4	4	550	1100
	290	136	2.1	2.1	1380	2690	31.5	NNCF5038V		270	222	258	8	4	6	530	1000
200	250	50	1.5	1.5	315	799	6	NNC4840V	200	-	219.5	230	7	4	-	550	1100
	250	50	1.5	1.5	315	799	5.8	NNCF4840V		235.9	219.5	230	7	4	4	550	1100
	250	50	1.5	1.5	315	799	5.8	NNCL4840V		235.9	219.5	-	7	4	4	550	1100
	280	80	2.1	2.1	661	1495	16	NNC4940V		-	233	251	8	4	-	530	1000
	280	80	2.1	2.1	661	1495	15.9	NNCF4940V		260	233	251	8	4	5	530	1000
	280	80	2.1	2.1	661	1495	15.9	NNCL4940V		260	233	251	8	4	5	530	1000
	310	150	2.1	2.1	1570	3130	41.0	NNCF5040V		288	236	276	8	4	7	500	950
220	270	50	1.5	1.5	330	878	6.5	NNC4844V	220	-	240.5	251.5	7	4	-	500	1000
	270	50	1.5	1.5	330	878	6.3	NNCF4844V		256.9	240.5	251.5	7	4	4	500	1000
	270	50	1.5	1.5	330	878	6.3	NNCL4844V		256.9	240.5	-	7	4	4	500	1000
	300	80	2.1	2.1	690	1610	17.5	NNC4944V		-	250	268	8	4	-	500	950
	300	80	2.1	2.1	690	1610	17.2	NNCF4944V		277.2	250	268	8	4	5	500	950
	300	80	2.1	2.1	690	1610	17.2	NNCL4944V		277.2	250	268	8	4	5	500	950
	340	160	3	3	1870	3680	52.5	NNCF5044V		313.5	255	300	8	4	7	450	850
240	300	60	2	2	497	1292	10.3	NNC4848V	240	-	261.5	275.5	8	4	-	480	900
	300	60	2	2	497	1292	10.0	NNCF4848V		282.4	261.5	275.5	8	4	4	480	900
	300	60	2	2	497	1292	10.0	NNCL4848V		282.4	261.5	-	8	4	4	480	900
	320	80	2.1	2.1	725	1762	18.7	NNC4948V		-	273	291	8	4	-	450	850
	320	80	2.1	2.1	725	1762	18.5	NNCF4948V		300.1	273	291	8	4	5	450	850

双列满装圆柱滚子轴承

Double-row full-complement cylindrical roller bearing



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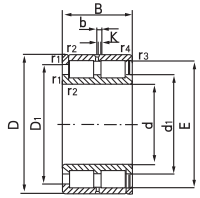

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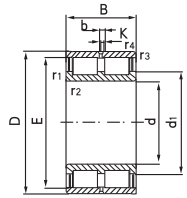

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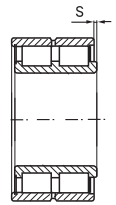
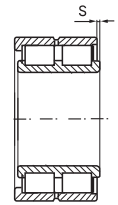
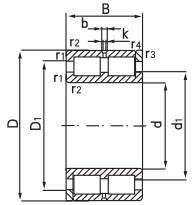




基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量	轴承型号	内径	其它尺寸 Other Sizes						极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor	Weight	Basic Rated Load	内径 Weight	E	d1	D1	b	k	s	脂润滑 Grease	油润滑 Oil
mm					KN		kg		mm	mm						r/min	
									d								
240	320	80	2.1	2.1	725	1762	18.5	NNCL4948V	240	300.1	273	291	8	4	5	450	850
	360	160	3	3	1980	4050	56.0	NNCF5048V		335.6	278	322	9.4	5	7	430	800
260	320	60	2	2	521	1406	11.1	NNC4852V	260	-	283.5	297.5	8	4	-	430	820
	320	60	2	2	521	1406	10.8	NNCF4852V		304.7	283.5	297.5	8	4	4	430	820
	320	60	2	2	521	1406	10.8	NNCL4852V		304.7	283.5	-	8	4	4	430	820
	360	100	2.1	2.1	1070	2520	33.1	NNC4952V		-	297	320	9.4	5	-	400	750
	360	100	2..1	2..1	1070	2520	32.1	NNCF4952V		331..5	297	320	9.4	5	6	400	750
	360	100	2.1	2.1	1070	2520	32.2	NNCL4952V		331.5	297	320	9.4	5	6	400	750
	400	190	4	4	2640	5340	85.5	NNCF5052V		373.5	304	357	9.4	5	7	380	700
280	350	69	2	2	680	1853	16.1	NNC4856V	280	-	309	325	8	4	-	400	750
	350	69	2	2	680	1853	15.8	NNCF4856V		332.9	309	325	8	4	4	400	750
	350	69	2	2	680	1853	15.8	NNCL4856V		332.9	309	-	8	4	4	400	750
	380	100	2.1	2.1	1120	2710	34.5	NNC4956V		-	319	342	9.4	5	-	380	700
	380	100	2.1	2.1	1120	2710	34.2	NNCF4956V		353.5	319	342	9.4	5	6	380	700
	380	100	2.1	2.1	1120	2710	34.2	NNCL4956V		353.5	319	342	9.4	5	6	380	700
	420	190	4	4	2700	5610	90.5	NNCF5056V		389	320	372	9.4	5	7	360	670
300	380	80	2.1	2.1	801	2146	22.9	NNC4860V	300	-	330.5	348.5	9.4	5	-	380	700
	380	80	2.1	2.1	801	2146	22.5	NNCF4860V		357.4	330.5	348.5	9.4	5	6	380	700
	380	80	2.1	2.1	801	2146	22.5	NNCL4860V		357.4	330.5	-	9.4	5	6	380	700
	420	118	2.1	2.1	1560	3630	53	NNC4960V		-	346.5	375.5	9.4	5	-	340	650
	420	118	3	3	1560	3630	52.8	NNCF4960V		390.2	346.5	375.5	9.4	5	6	340	650
	420	118	3	3	1560	3630	52.8	NNCL4960V		390.2	346.5	375.5	9.4	5	6	340	650
	460	218	3	3	3410	7180	130	NNCF5060V		432	355	413	9.4	5	9	320	600
320	400	80	2.1	2.1	832	2300	24	NNC4864V	320	-	353.5	371.5	9.4	5	-	340	640
	400	80	2.1	2.1	832	2300	23.8	NNCF4864V		380.3	353.5	371.5	9.4	5	6	340	640
	400	80	2.1	2.1	832	2300	23.8	NNCL4864V		380.3	353.5	-	9.4	5	6	340	640
	440	118	3	3	1600	3835	56	NNC4964V		-	365.5	399	9.4	5	-	320	600



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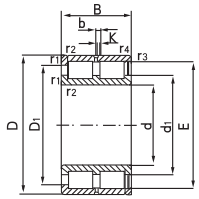

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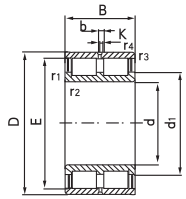

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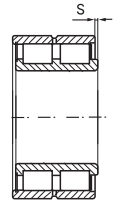
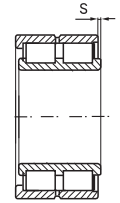
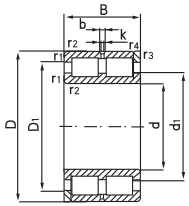




基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量 Weight	轴承型号 Basic Rated Load	内径 Weight	其它尺寸 Other Sizes						极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor			mm	E	d1	D1	b	k	s	脂润滑 Grease	油润滑 Oil
mm					KN		kg		d	mm						r/min	
320	440	118	3	3	1600	3835	55.2	NNCF4964V	320	409	365.5	399	9.4	5	6	320	600
	440	118	3	3	1600	3835	55.2	NNCL4964V		409	365.5	399	9.4	5	6	320	600
	480	218	4	4	3470	7450	135	NNCF5064V		447.5	370	429	9.4	5	9	300	650
340	420	80	2.1	2.1	850	2415	25.5	NNC4868V	340	-	370.5	388.5	9.4	-	-	320	600
	420	80	2.1	2.1	850	2415	25.2	NNCF4868V		397.4	370.5	388.5	9.4	6	6	320	600
	420	80	2.1	2.1	850	2415	25.2	NNCL4868V		397.4	370.5	-	9.4	6	6	320	600
	460	118	3	3	1640	4035	60.5	NNC4968V		-	383.5	412.5	9.4	-	-	300	560
	460	118	3	3	1640	4035	58.8	NNCF4968V		427.1	383.5	412.5	9.4	6	6	300	560
	460	118	3	3	1640	4035	58.8	NNCL4968V		427.1	383.5	412.5	9.4	6	6	300	560
	520	243	5	5	4180	9200	185	NNCF5068V		486	399	465	9.4	11	11	280	530
360	440	80	2.1	2.1	880	2570	27	NNC4872V	360	-	393	411	9.4	-	-	300	560
	440	80	2.1	2.1	880	2570	26.5	NNCF4872V		420.2	393	411	9.4	6	6	300	560
	440	80	2.1	2.1	880	2570	26.5	NNCL4872V		420.2	393	-	9.4	6	6	300	560
	480	118	2.5	2.5	1690	4240	61	NNC4972V		-	399	436.5	9.4	-	-	300	550
	480	118	2.5	2.5	1690	4240	60.5	NNCF4972V		446	399	436.5	9.4	6	6	300	550
	480	118	2.5	2.5	1690	4240	60.5	NNCL4972V		446	399	436.5	9.4	6	6	300	550
	540	243	5	5	4290	9570	195	NNCF5072V		504	417	483	9.4	11	11	260	500
380	480	100	2.1	2.1	1293	3618	45	NNC4876V	380	-	421.5	444.5	9.4	-	-	280	530
	480	100	2.1	2.1	1293	3618	44.6	NNCF4876V		456.0	421.5	444.5	9.4	6	6	280	530
	480	100	2.1	2.1	1293	3618	44.6	NNCL4876V		456.0	421.5	-	9.4	6	6	280	530
	520	140	4	4	2124	5460	93	NNC4976V		-	433.5	465.5	9.4	-	-	260	500
	520	140	4	4	2124	5460	92.4	NNCF4976V		481.5	433.5	465.5	9.4	7	7	260	500
	520	140	4	4	2124	5460	92.4	NNCL4976V		481.5	433.5	465.5	9.4	7	7	260	500
	560	243	5	5	4400	9940	200	NNCF5076V		532	435	511	9.4	11	11	240	480
400	500	100	2.1	2.1	1311	3748	47	NNC4880V	400	-	436	459	9.4	-	-	270	500
	500	100	2.1	2.1	1311	3748	46.8	NNCF4880V		470.3	436	459	9.4	6	6	270	500
	500	100	2.1	2.1	1311	3748	46.8	NNCL4880V		470.3	436	-	9.4	6	6	270	500

双列满装圆柱滚子轴承

Double-row full-complement cylindrical roller bearing



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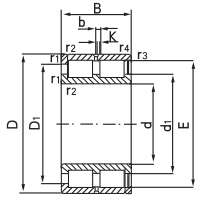

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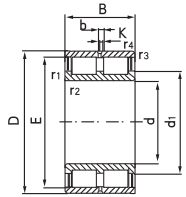

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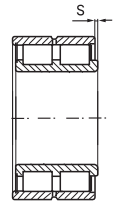
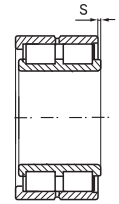
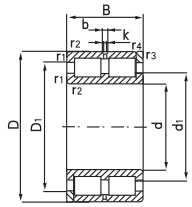




基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量 Weight	轴承型号 Basic Rated Load	内径 Weight	其它尺寸 Other Sizes						极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor				E	d1	D1	b	k	s	脂润滑 Grease	油润滑 Oil
mm					KN		kg		mm	mm						r/min	
400	540	140	4	4	2185	5730	97.5	NNC4980V	400	470.0	436	-	9.4	5	6	270	500
	540	140	4	4	2185	5730	96.5	NNCF4980V		-	454	486	9.4	5	-	240	480
	540	140	4	4	2185	5730	96.5	NNCL4980V		502	454	486	9.4	5	7	240	480
	600	272	5	5	5500	12300	270	NNCF5080V		502	454	486	9.4	5	7	240	480
										560	464	536	9.4	5	11	220	450
420	520	100	2.1	2.1	1353	3942	49.2	NNC4884V									
	520	100	2.1	2.1	1353	3942	48.8	NNCF4884V	420	-	458	481	9.4	5	-	250	470
	520	100	2.1	2.1	1353	3942	48.8	NNCL4884V		492.6	458	481	9.4	5	6	250	470
	560	140	4	4	2235	6000	100	NNC4984V		492.6	458	-	9.4	5	6	250	470
	560	140	4	4	2235	6000	99.0	NNCF4984V		-	470.5	512	9.4	5	-	220	450
	560	140	4	4	2235	6000	99.0	NNCL4984V		522.5	470.5	512	9.4	5	7	220	450
	620	272	5	5	5610	12800	280	NNCF5084V		522.5	470.5	512	9.4	5	7	220	450
										579	483	555	9.4	5	11	200	430
440	540	100	2.1	2.1	1387	4136	51.5	NNC4888V									
	540	100	2.1	2.1	1387	4136	50.9	NNCF4888V	440	-	480	503	9.4	5	-	240	450
	540	100	2.1	2.1	1387	4136	50.9	NNCL4888V		514.6	480	503	9.4	5	6	240	450
	600	160	4	4	2990	7570	140	NNC4988V		514.6	480	-	9.4	5	6	240	450
	600	160	4	4	2990	7570	138	NNCF4988V		-	503.5	543.5	9.4	5	-	200	430
	600	160	4	4	2990	7570	138	NNCL4988V		563.5	503.5	543.5	9.4	5	7	200	430
	650	280	6	6	6160	14100	320	NNCF5088V		563.5	503.5	543.5	9.4	5	7	200	430
										608	507	583	9.4	5	11	190	400
460	580	118	3	3	1560	4614	77.5	NNC4892V									
	580	118	3	3	1560	4614	76.9	NNCF4892V	460	-	506	531	9.4	5	-	230	420
	580	118	3	3	1560	4614	76.9	NNCL4982V		543.3	506	531	9.4	5	7	230	420
	620	160	4	4	3020	7770	145	NNC4992V		543.3	506	-	9.4	5	7	230	420
	620	160	4	4	3020	7770	141	NNCF4992V		-	512	564	9.4	5	-	190	400
	620	160	4	4	3020	7770	141	NNCL4992V		577	512	564	9.4	5	7	190	400
	680	300	6	6	6440	14700	365	NNCF5092V		577	512	564	9.4	5	7	190	400
										638	527	609	9.4	5	14	180	380
480	600	118	3	3	1597	4838	80	NNC4896V									
	600	118	3	3	1597	4838	89.8	NNCF4896V	480	-	530	555	9.4	5	-	210	400
										567.3	530	555	9.4	5	7	210	400

双列满装圆柱滚子轴承

Double-row full-complement cylindrical roller bearing



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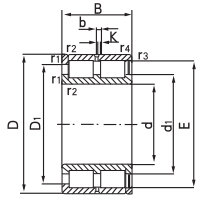

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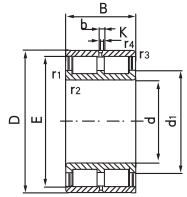

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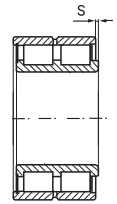
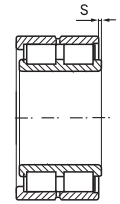
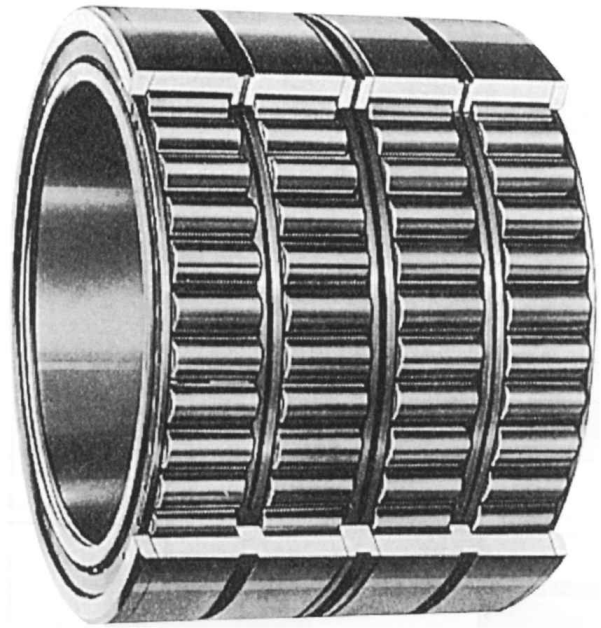




基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		重量 Weight	轴承型号 Basic Rated Load	内径 Weight	其它尺寸 Other Sizes						极限转速 Limit Speed	
d	D	B	r1.2min	r3.4min	动Cr	静Cor				E	d1	D1	b	k	s	脂润滑 Grease	油润滑 Oil
mm					KN		kg		mm	mm						r/min	
480	600	118	3	3	1597	4838	89.8	NNCL4896V	480	567.3	530	-	9.4	5	7	210	400
	650	170	5	5	3270	8420	170	NNC4996V		-	537	592	9.4	5	-	180	360
	650	170	5	5	3270	8420	166	NNCF4996V		605.5	537	592	9.4	5	8	180	360
	650	170	5	5	3270	8420	166	NNCL4996V		605.5	537	592	9.4	5	8	180	360
	700	300	6	6	6710	15300	380	NNCF5096V		657	548	630	9.4	5	14	170	360
500	620	118	3	3	1625	4987	82.5	NNC48/500V	500	-	547	571	9.4	5	-	200	380
	620	118	3	3	1625	4987	83.0	NNCF48/500V		583.5	547	571	9.4	5	7	200	380
	620	118	3	3	1625	4987	83.0	NNCL48/500V		583.5	547	-	9.4	5	7	200	380
	670	170	5	5	3350	8850	179	NNC49/500V		-	568.8	610.5	9.4	5	-	170	360
	670	170	5	5	3350	8850	175	NNCF49/500V		631.5	568.5	610.5	9.4	5	8	170	360
	670	170	5	5	3350	8850	175	NNCL49/500V		631.5	568.5	610.5	9.4	5	8	170	360
	720	300	6	6	6820	15900	390	NNCF50/500V		678	569	651	9.4	5	14	170	360
530	650	118	3	3	1700	5285	87.5	NNC48/530V	530	-	577.5	602.5	9.4	5	-	180	340
	650	118	3	3	1700	5285	87.2	NNCF48/530V		615	577.5	602.5	9.4	5	6	180	340
	650	118	3	3	1700	5285	87.2	NNCL48/530V		615	577.5	-	9.4	5	6	180	340
	710	180	4	4	3870	10100	208	NNC49/530V		-	588	648	9.4	5	-	160	340
	710	180	4	4	3870	10100	205	NNCF49/530V		663	588	648	9.4	5	8	160	340
	710	180	4	4	3870	10100	205	NNCL49/530V		663	588	648	9.4	5	8	160	340

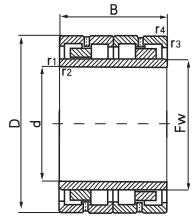


四列圆柱滚子轴承

该类型轴承是冶金行业各类轧机轴承中应用最广泛的一种轴承。
1、主要特点
a、轴承在有限的安装空间内具有最大的额定动载荷值；
b、轴承可用于高转速；
c、轴轴允许有较精密的极限公差；
d、内圈允许和外组件(外圈、成套滚子)互换装配，有利于快速换辊；
e、轴承仅能承受径向载荷。
2、轴承结构形式
在三种基本结构基础上，有以下几种变形结构：
FC……A型：外径无油槽油孔，外圈端有油槽；
FC……B型：外径有油槽油孔，外圈端面有油槽；
FC……E型：外径无油槽油孔，外圈端面有油槽，外圈无中挡边，整体窗式保持架；
FCD……A型：外径无油槽油孔，外圈端面有油槽；
FCD……B型：外径有油槽油孔，外圈端面有油槽；
FCD……Y型：外径无油槽油孔，外圈端面有油槽，两外圈中间有隔圈，此种结构是我公司专利产品。
FCD……2LS型：外径无油槽油孔，密封型。
FCDP……E型：外径有油槽油孔，内端面有油槽，柱销式保持架(空心滚子)或实体窗式保持架。
3、径向当量动载荷 Pr=Fr
4、径向当量静载荷 Por=F r

Four row cylindrical roller bearing

This bearing is widely used for roller in metallurgy industry.
1. Main feature
a.Bearing features maximum rated dynamic load in restricted space.
b.Bearing can be used for high rotating speed equipment.
c.Shaft is allowed to have high precision tolerance.
d.Inner ring is allowed to be changeable with outer assembly (consisting of outer ring and roller set) to speed up roller change.
e.Bearing can bear radial load only.
2. Bearing structure machining
Based on three basic type of structure, the following can be done:
FC...A type: Outer diameter without oil tank oil hole, outer ring with oil tank
FC...B type: Outer diameter with oil tank oil hole, outer ring with Oil tank
FC...E type: Outer diameter without oil tank oil hole, outer ring with Oil tank, outer ring without guide rib, integral window cage。
FCD...A type: Outer diameter without oil tank oil hole, outer ring with oil tank
FCD...B type: Outer diameter with oil tank oil hole, outer ring with Oil tank
FCD...Y type: Outer diameter without oil tank oil hole, outer ring with oil tank, pin cage (hollow roller) or window cage。
3. Radial equivalent dynamic load Pr=Fr
4. Radial equivalent static load Por=Fr



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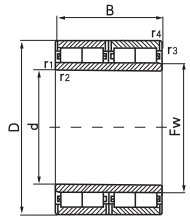
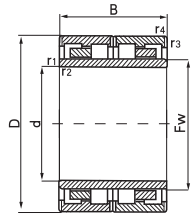
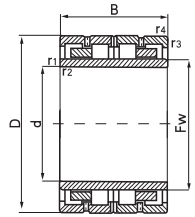


FC……E



FC……A



FC……B

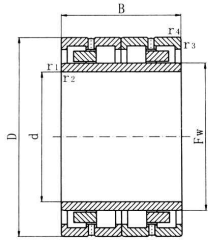
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
150	210	120	166	2	2	FC3042120		587	1380	150	12.5					
	220	120	167	2	2	FC3044120	672930K	702	1193		15.5					
	220	150	168	2	2	FC3044150		701	1700		19.3			4R3031	150RV2201	30FCC22150A
	225	120	169	2	2	FC3045120	672730K	702	1408		16.2					
	225	150	169	2	2	FC3045150		801	1670		20.9					
	230	130	174	2	2	FC3046130		670	955		19.7			4R3029		
	230	150	177	2	2	FC3046150		950	1790		22.8					
	230	156	174	2	2	FC3046156	672730	825	1810		24	313891A	508955	4R3040	150RV202	313891-1
160	220	180	177	2.1	2.1	FC3244180		940	2560	160	20.2			4R3224		
	225	120	177	2.1	2.1	FC3245120		639	1340		14.9					
	230	130	178	2.1	2.1	FC3246130		781	1320		17.7				160VR2301	
	230	130	180	2.1	2.1	FC3246130E		781	1340		17	314190	541515	4R3226		
	230	168	177	2.1	2.1	FC3246168		895	2200		22.8					
	230	168	179	2.1	2.1	FC3246168E		1050	2170		23.5	315189A	510150	4R3232		
	230	168	180	2.1	2.1	FC3246168E1		895	2200		23.5				160RV2302	32FC23170A
	230	180	178	2.1	2.1	FC3246180		838	2270		24.6					32FC23180
	240	120	183	2.1	2.1	FC3248120		635	1301		18.6					
	240	124	183	2.1	2.1	FC3248124	672732K	635	1301		19.6					
	240	168	183	2.1	2.1	FC3248168	672732	1042	2310		26.7					
	240	170	183	2.1	2.1	FC3248170		980	2290		27.8			4R3225		
170	230	120	187	2	2	FC3446120		819	1580	170	14.3			4R3426		
	230	130	188.5	2	2	FC3446130		670	1400		15.6	313673				
	230	180	186	2.1	2.1	FC3446180		1034	2035		24.5					
	240	130	190	2.1	2.1	FC3448130		913	1830		18.7	BC4B635122				
	240	156	189	2.1	2.1	FC3448156		905	2170		22.2			4R3429		
	250	150	192	2.1	2.1	FC3450150		720	1716		25					
	250	168	192	2.1	2.1	FC3450168		1040	2320		28				170RV2502	34FC25168
	250	170	192	2.1	2.1	FC3450170	672734	1170	2428		28.6					34FC25170
	255	180	193	2.1	2.1	FC3451180		1380	2500		30.5			4R3425	170V2503	

基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
170	260	120	195	2.1	2.1	FC3452120	672734K	860	1752	170	23					
	260	150	195	2.1	2.1	FC3452150		883	1803		28.8					
	260	170	195	2.1	2.1	FC3452170		1034	2096		32.7					
	260	192	195	2.1	2.1	FC3452192	672734KU	1087	2240		36.9					
	260	225	196	2.1	2.1	FC3452225		1650	3310		43.3	313587B	505470	4R3431		
180	250	120	200	2.1	2.1	FC3650120		610	1578	180	18					
	250	130	200	2.1	2.1	FC3650130		716	1922		19.5					
	250	156	198	2.1	2.1	FC3650156	672736K	880	2230		23.4					
	250	156	200	2.1	2.1	FC3650156E		880	2230		22.8			4R3625	180RV2501	36FC25156A
	260	120	202	2.1	2.1	FC3652120	672836	735	1577		21					
	260	124	202	2.1	2.1	FC3652124		735	1577		21.7					
	260	156	198	2.1	2.1	FC3652156		835	2200		27.3					
	260	160	202	2.1	2.1	FC3652160	672736U	880	2230		28.4					
	260	168	202	2.1	2.1	FC3652168	672736	990	2300		29.5	313812	507536	4R3628	180RV2601	313812W
	265	180	204	2.1	2.1	FC3653180		1040	2649		33.8					
	280	180	206	2.1	2.1	FC3656180E		1287	2995		41		524372			
	280	180	207	2.1	2.1	FC3656180	672736K1	1287	2995		41.4					
190	260	168	208	2.1	2.1	FC3852168	672838	1140	2520	190	24.9					
	260	168	212	2.1	2.1	FC3852168E		1140	2600		27	313651	507735	4R3820	190RV2601	38FC26168-1
	265	124	213	2.1	2.1	FC3853124		819	1921		21					
	270	166	212	2.1	2.1	FC3854166		1034	2460		30.4					
	270	168	212	2.1	2.1	FC3854168	672738K	1034	2460		30.8					
	270	170	213	2.1	2.1	FC3854170		1240	2910		31.7			4R3818		
	270	200	212	2.1	2.1	FC3854200	672738	1510	3310		37.5	314199B	508657	4R3821	190RV2701	314199
	280	200	214	2.1	2.1	FC3856200		1720	3370		42	314049B	510199	4R3823		
200	270	120	222	2.1	2.1	FC4054120		617	1630	200	19.6					
	270	170	222	2.1	2.1	FC4054170		1170	2580		28.5	314553		4R4039		
	280	170	222	2.1	2.1	FC4056170		1380	2870		32.5					

基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
200	280	188	222	2.1	2.1	FC4056188	672740K	1210	2720	200	36					
	280	200	222	2.1	2.1	FC4056200E		1510	3310		39	313893	508726	4R4037		313893-1
	280	200	224	2.1	2.1	FC4056200	672940	1210	3200		39.4				200RV2801	
	290	130	226	2.1	2.1	FC4058130		941	1916		38.5					
	290	192	226	2.1	2.1	FC4058192	672740	1540	3310		42.8	313811	512580	4R4041	200RV2901	313811
	290	202	226	2.1	2.1	FC4058202		1540	3310		43.4					
	310	130	229	2.1	2.1	FC4062130		1113	2254		36.3					
	310	200	229	2.1	2.1	FC4062200		1573	3625		55.8		524373			
	310	230	229	2.1	2.1	FC4062230		2010	3750		64	313639/VJ202		4R4028		
	320	216	231	2.1	2.1	FC4064216		1794	3404		67					
210	290	192	234	2.1	2.1	FC4258192		1185	3245	210	38.2					
	290	192	236	2.1	2.1	FC4258192E		1450	3400		41	313646	507628	4R4206	210RV2901	
	300	170	234	2.1	2.1	FC4260170		1215	2845		38.8					
	300	210	234	2.1	2.1	FC4260210	672742	1300	3209		47.9					
220	290	192	239	2.1	2.1	FC4458192		1190	3350	220	33.8			4R4413		
	300	160	245	2.1	2.1	FC4460160		1000	2590		32.8			4R4419		
	300	190	240	2.1	2.1	FC4460190		1219	3323		39.3					
	300	192	242	2.1	2.1	FC4460192	672944	1219	3323		39.7					
	300	200	240	2.1	2.1	FCD4460200		1790	3900		41.0	BC2B322341/HB1VJ202				
	310	190	246	2.1	2.1	FC4462190		1320	3450		45					
	310	192	246	2.1	2.1	FC4462192	672744	1680	3650		46	313839	507333	4R4426	220RV3101	
	310	192	247	2.1	2.1	FC4462192E		1320	3450		46					
	310	204	247	2.1	2.1	FCD4462204		1420	3750		49.8			4R4425		
	310	215	242	2.1	2.1	FCD4462215		1590	3950		51.5			4R4420		
	310	225	244	2.1	2.1	FCD4462225E		1940	4300		54.5	313894B	514461			
	310	225	245	2.1	2.1	FCD4462225		1480	3950		54.9			4R4416	220RV3102	44FC31225
	310	265	245	2.1	2.1	FCD4462265		1690	4700		63.5			4R4430		
	320	160	245	2.1	2.1	FC4464160		1190	2550		46.5			4R4428		
	320	192	246	2.1	2.1	FC4464192	672844	1600	3440		51.5					

四列圆柱滚子轴承

Four row cylindrical roller bearing



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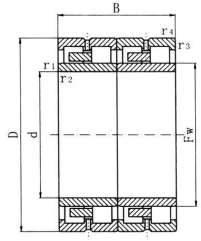

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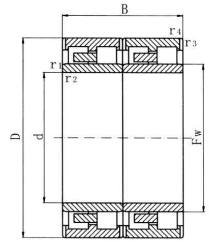
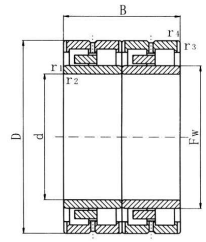
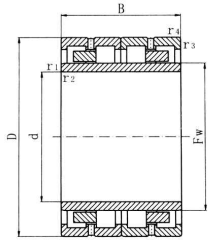


FCD……A



FCD……B

基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
220	320	210	246	2.1	2.1	FCD4464210		1820	3600	220	61		509216			
	320	210	248	2.1	2.1	FCD4464210E		1550	3650		56			4R4429	220RV3201	44FC32210-1
	330	230	249	2.1	2.1	FCD4466230		2050	4000		68.5	314889/VJ202	541452			
	340	192	246	2.1	2.1	FC4468192	672744K	1820	3600		64.2					
	340	210	250	2.1	2.1	FCD4468210	672844Y	1909	3846		70.2					
	340	290	250	2.1	2.1	FCD4468290		2980	5010		96.3		525147			
	345	210	250	2.1	2.1	FCD4469210		1909	3846		73.8					
230	330	170	260	2.1	2.1	FC4666170		1140	2970	230	47.4					
	330	206	258	2.1	2.1	FC4666206E		1520	3800		58.6			4R4614		
	330	206	260	2.1	2.1	FC4666206	672746	1870	4000		58	313824	508727		230RV3301	313824
	340	260	261	2.1	2.1	FCD4668260		2050	5100		81			4R4611	230RV3401	46FC34260
	365	250	266	2.1	2.1	FCD4673250		2640	4900		100	313581A	529113			
240	330	180	265	2.1	2.1	FC4866180		1720	3800	240	49.5	635194	504547			
	330	220	264	2.1	2.1	FCD4866220	672748	1639	4340		56.4					
	330	220	270	2.1	2.1	FCD4866220E		1720	4300		58	313921	508368	4R4811	240RV3301	312943/1YD
	340	192	268	2.1	2.1	FC4868192	672748K	1474	3582		55.4					
	340	220	268	2.1	2.1	FCD4868220		1670	4200		71					
	350	220	270	2.1	2.1	FCD4870220		1576	4073		71					
	360	220	272	2.1	2.1	FCD4872220E		1912	4374		78.8					
	360	220	274	2.1	2.1	FCD4872220		1760	4050		79.6			4R4807		
250	340	170	274	3	3	FC5068170		1392	3488	250	45					
	340	220	274	3	3	FC5068220		1329	3123		52.8					
	340	230	270	3	3	FCD5068230		1700	4350		65.0					
	350	220	274	3	3	FCD5070220E		1700	4350		58					
	350	220	278	3	3	FC5070220	672750	1700	4350		65			4R5008	250RV3501	50FC35220
	350	230	278	3	3	FCD5070230	672750K1	1700	4350		68.7					
	360	220	282	3	3	FC5072220	672750K	1700	4240		73					



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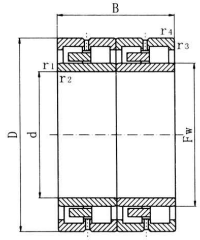

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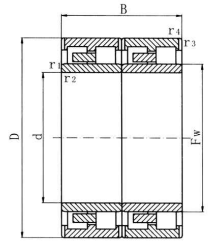
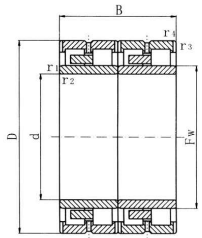
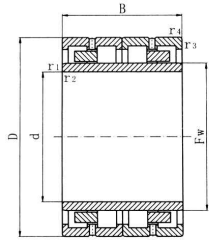


FCD……A



FCD……B

基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load 动 Cr	静 Cor	内径 Inner Diameter d	重量 Weight	国外型号 Foreign Model SKF	FAG	NTN	NSK	KOYO
d	D	B	Fw	r1.2min	r3.4min	新 Old	旧 New	KN		mm	kg	mm				
260	360	192	288	3	3	FC5272192		1609	3874	260	60					
	360	204	287	3	3	FC5272204		1980	4400		64.5	314997/ VJ202				
	360	230	292	3	3	FC5272230		1980	4650		73.5	BC4B320956				
	360	260	287	3	3	FCD5272260		2300	5320		80.0					52FC36260
	370	192	291	3	3	FC5274192		1670	4012		66					
	370	200	292	3	3	FC5274200	672752K	1771	4120		68.9					
	370	220	292	3	3	FC5274220	672752	2160	4650		76.5	313823	507336	4R5217	260RV3701	313823
	370	230	292	3	3	FC5274230		1760	4450		79.3					
	380	220	292	3	3	FC5276220		2104	4900		85					
	380	280	294	3	3	FCD5276280E		2420	6250		108					
	380	280	295	3	3	FCD5276280	672852	2720	6250		108					
	400	290	296	3	3	FCD5280290		3520	7100		135	313427B	518214	4R5213	260RV38301	
	400	335	294	3	3	FCD5280335		3750	7340		149					52FC40335W
265	370	234	300	3	3	FCD5374234		2240	5400	265	80	313922	517423			
270	380	230	298	3	3	FC5476230	672754	2000	5050	270	81.8				270RV3801	
	380	275	298	3	3	FCD5476275E		3080	6990		97.8					
	380	275	300	3	3	FCD5476275	672754K1	3080	6990		101.3					
	390	220	306	3	3	FC5478220		1800	4803		86.7					
	390	240	298	3	3	FCD5478240		2236	5330		94					
	400	220	305	3	3	FC5480220	672854	1822	4600		95.3					
280	375	200	307	3	3	FC5675200	672956	1500	4310	280	63.5					
	380	170	306	3	3	FC5676170		1710	3590		55.0					56FC38170W
	380	192	310	3	3	FC5676192		1560	4580		64.6					
	380	290	308.5	3	3	FCD5678290		2750	6950		75	BC4-0001				
	390	220	312	3	3	FC5678220	672756	2240	5000		81.5	313822	507339	4R5611	280RV3901	313822
	390	240	312	3	3	FC5678240		2008	5331		90					
	390	275	308	3	3	FCD5678275		2424	6350		105	314719C	527104	4R5612		
	390	275	312	3	3	FCD5678275Y		2010	5330		105		513729A			



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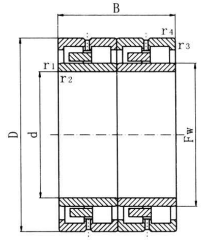

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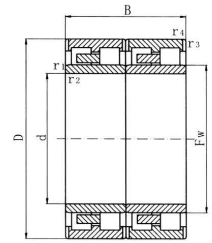

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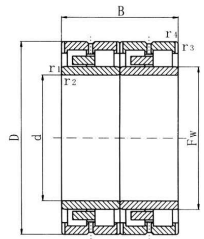

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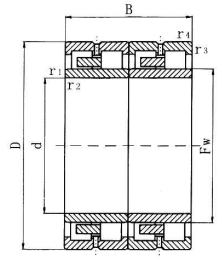
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
		mm				新 Old	旧 New	KN		mm	kg	mm				
280	400	285	316	3	3	FCD5680285		3140	7350	280	120	314070/VJ202				
	410	300	313	3	3	FCD5682300	672856	3520	7450		133.9	314897/VJ202				
	420	280	318	3	3	FCD5684280		2945	7212		136.5					
	420	300	319	3	3	FCD5684300		3410	7180		150	313487			280RV4201	
290	390	190	316	4	4	FC5878190		2050	4550	290	67	635195				
	390	234	320	4	4	FC5878234		1990	5400		79.6					
	400	180	320	4	4	FC5880180		2189	5385		68					
	410	240	320	4	4	FC5882240	672758	2340	5600		102.3			4R5806		
	420	300	327	4	4	FCD5884300		2790	7369		141			4R5805	290RV4201	
	440	310	328	4	4	FCD5888310		4300	9700		170		517796			
300	400	300	328	4	4	FCD6080300		2330	6900	300	104			E-4R6014	300RV4021	
	420	180	332	4	4	FCD6084180		2200	6780		92.4					
	420	218	332	4	4	FC6084218	672760K	2014	4956		93.7					
	420	240	332	4	4	FC6084240	672760	2264	5644		103				300RV4201	
	420	240	334	4	4	FC6084240E		2020	5450		106			E-4R6017		
	420	300	332	4	4	FCD6084300		3250	7270		130	314484D	560840	E-4R6020		60FC42300W
	460	270	344	4	4	FCD6092270		2670	5800		162			E-4R6019		
	460	350	341	4	4	FCD6092350		5500	9700		250		517795			
310	430	240	344.5	4	4	FC6286240		2244	5950	310	107			E-4R6203	310RV4301	
320	440	240	351	4	4	FC6488240		2169	5051	320	112.9					
	440	286	350	4	4	FCD6488286		6900	8564		142		537046			
	440	300	351	4	4	FCD6488300		2193	5364		142					
	450	180	355	4	4	FC6490180		2193	5364		90.1					
	450	240	354	4	4	FC6490240		2320	5750		125					
	450	240	355	4	4	FC6490240E		2320	5750		116				320RV4502	
	460	300	357	4	4	FCD6492300		2567	6087		163					
	460	240	364	4	4	FCD6492240		2920	7200		140	BC4B322216/VJ202				



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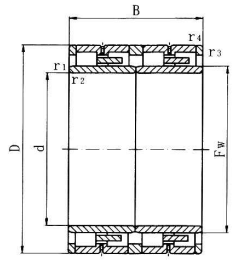

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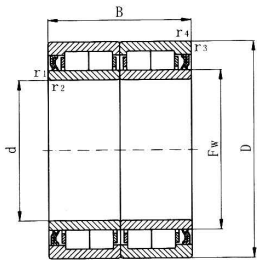

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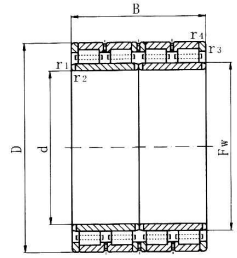

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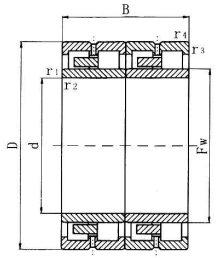
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
320	460	340	360	4	4	FCD6492340		3400	9450	320	178			E-4R6412		
	470	350	357	4	4	FCD6494350		5200	9780		225		532592			
	480	350	364	4	4	FCD6496350		4950	10800		235	314274B	541851			
330	430	230	358	4	4	FC6686230		1986	5644	330	87.4					
	440	200	360	4	4	FC6688200		1820	4850		83.6			E-4R6603		
	460	340	365	4	4	FCD6692340		3650	8950		175	313445C	543447	E-4R6605	330RV4601	
	460	340	364	4	4	FCD6692340E		3860	9150		174					66FC46340
340	450	250	364	4	4	FC6890250E		2400	6530	340	108.1					
	450	250	371	4	4	FC6890250	672768K	2307	6585		124.4					68FC45250BW
	450	250	368	4	4	FC6890250E1		2750	6480		106					
	460	260	370	4	4	FC6892260	672768	3120	8120		124.8					
	480	280	374	4	4	FC6896280		3120	8120		159.9					
	480	350	378	4	4	FCD6896350		3575	10510		200.9	314485A	527634			
	490	300	377	4	4	FCD6898300		3350	8300		187			E-4R6804		
	500	370	385	4	4	FCD68100370		5230	11800		260	BC4B322261/HB1	517749			
	560	380	396	4	4	FCD68120380		6820	12900		350	313404A	545171			
350	500	380	389	4	4	FCDP70100380		3880	10800	350	242.3	314563/VJ202				
	500	410	388	4	4	FCDP70100410		5830	13700		285	BC4B322777/HB1	532001			
	520	300	401	4	4	FCDP70104300		4290	9000		220	BC2B319878/VJ202				
360	480	290	392	4	4	FC7296290E		3470	8510	360	145					72FC48290
	480	290	394	4	4	FC7296290		2773	8075		146.2					
	500	250	394	4	4	FC72100250		3580	7350		145	BC2B320075/VJ202				
	510	400	397	4	4	FCDP72102400		4250	11500		262			E-4R7203		
	520	380	405	4	4	FCDP72104380		3350	8300		266.2		562913			
370	480	230	400	4	4	FC7496230		2100	6250	370	106			E-4R7405		
	480	250	401	4	4	FC7496250		2650	7422		116.3					



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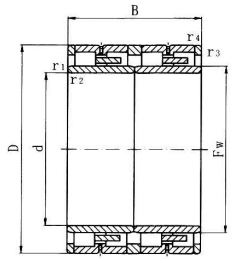

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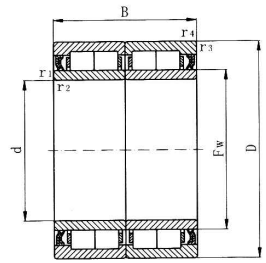

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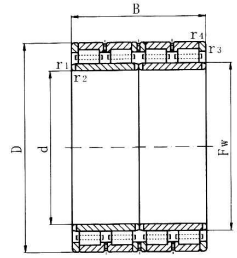

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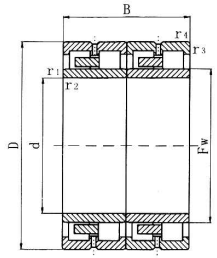
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
			mm			新 Old	旧 New	KN		mm	kg			mm		
370	520	380	409	4	4	FCDP74104380		3100	7850	370	255	314486A	543975		370RV4801	
	520	400	413	4	4	FCDP74104400		4740	11900		268					74FC52400W
	540	400	415	4	4	FCDP74108400		4400	12400		311				370RV5401	
380	500	290	414	4	4	FCD76100290		2862	8545	380	152.4					
	520	280	417	4	4	FCD76104280		3400	9150		174			E-4R7605		
	520	280	426	4	4	FCD76104280E		2860	7200		185	NNU4976B/DRW33				
	520	290	418	4	4	FCD76104290		3069	8286		181.8					
	520	300	416	4	4	FCD76104300		3550	9600		210			E-4R7607		
	540	300	421	4	4	FCD76108300		5010	11000		220	313030A	541982			
	540	340	424	4	4	FCD76108340		3952	10660		249					
	540	400	422	4	4	FCDP76108400E		830	14000		295	BC4B313511B	544794	E-4R7604		
	540	400	424	4	4	FCDP76108400		4300	12000		280				380RV5401	76FC54400CW
	560	300	424	4	4	FCDP76112300		4950	9650		260	BC4B322189				
	560	325	428	4	4	FCDP76112325		5230	10600		265	BC4B322264/HB1				
390	510	290	424	4	4	FCD78102290		2905	7448	390	155.8					
	540	320	431	4	4	FCD78108320		5280	12200		230	BC4B322498				
	550	310	430	4	4	FCD78110310		5120	11200		240	313190A				
	550	400	434	4	4	FCDP78110400		5130	12400		303				390RV5521	78FC55400AW
400	520	250	432	5	5	FCD80104250		2552	4748	400	137.3					
	540	380	436	5	5	FCDP80108380		4550	9780		273		533426			
	550	300	438	5	5	FCDP80110300E		4460	10400		214					80FC55300
	550	300	441	5	5	FCDP80110300		3525	9486		212.7					
	560	400	446	5	5	FCDP80112400		4250	11800		303			E-4R8007		
	560	410	445	5	5	FCDP80112410		5600	16500		313.3	313015DC	545614	E-4R8010	400RV5611	80FC56410
	590	440	450	5	5	FCDP80108440		7370	16600		415	315802/VJ202				
410	560	400	450	5	5	FCDP82112400		6700	16600	410	300	316689	543736			
	600	440	450	5	5	FCDP82120440		7650	17300		425	313877B	545588			

四列圆柱滚子轴承

Four row cylindrical roller bearing



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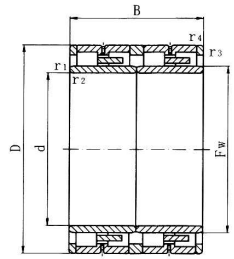

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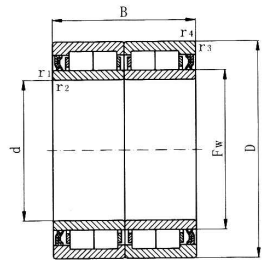

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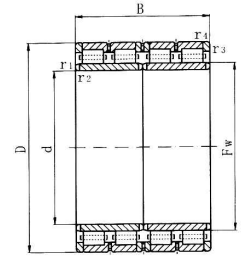

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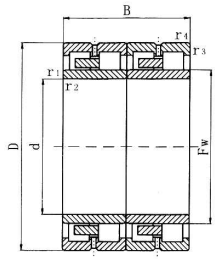
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
420	560	260	468	5	5	FCD84112260		3740	9650	420	210	BC2B320074/VAJ202				
	560	280	457	5	5	FCD84112280		3930	9140		191.1					84FC56280
	580	320	463	5	5	FCD84116320		4680	10800		250	313555C/VJ202				
	600	440	470	5	5	FCDP84120440		5768	17100		400	313513	545467			
	620	300	473	5	5	FCD84124300		5200	15800		416					
	620	400	473	5	5	FCDP84124400E		6930	15600		430	314391/VJ202				
	620	400	478	5	5	FCDP84124400		5000	13400		410			E-4R8401		
430	570	340	465	5	5	FCD86114340		6000	16800	430	260		562415			
	591	420	476	5	5	FCDP86118420		4450	13400		347				430RV5921	
440	620	450	487	5	5	FCDP8812450E		7810	19600	440	427.2	314554B	545628	E-4R8801		88FC62450AW
	620	450	490	5	5	FCDP88124450		6350	19000		430				440RV6221	
	650	355	494	5	5	FCD88130355		6700	14000		420	316899A				
	660	340	492	5	5	FCDP88132340		6710	13700		430	635043				
450	590	300	490	5	5	FCD90108300		3910	12000	450	245	315811E				
	590	435	486	5	5	FCDP90108435		5150	14800		345		542648			
	630	450	500	5	5	FCDP90126450		6820	16600		433					90FC63450A
460	610	322	499	5	5	FCD92122322		4100	14600	460	290		526420			
	620	320	500	5	5	FCD92124320		4800	16200		290		526026			
	620	400	502	5	5	FCD92124400		6500	17000		343.9			E-4R9209		
	650	355	509.5	5	5	FCD92130355		6270	14600		380	313031A				
	650	424	510	5	5	FCDP92130424		7810	18300		450	315196A	513584A			
	650	470	509	5	5	FCDP92130470		8800	22400		510	314560	518846	E-4R9216		92FC65470W
	660	475	508	5	5	FCDP92132475		11000	35000		585		517693			
	670	500	522	5	5	FCDP92134500		7650	22700		596				460RV6721	
	700	540	519	5	5	FCDP92140540		12000	37500		785		529368			
480	650	340	522	5	5	FCD96130340		6550	18400	480	320		525884			
	650	420	522	5	5	FCD96130420		8120	23700		440		525912			



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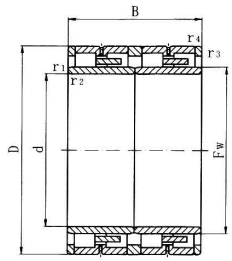

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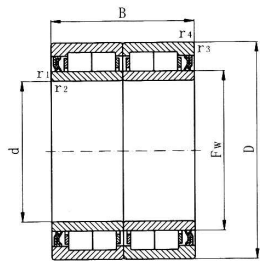

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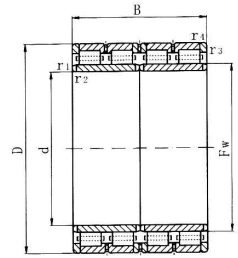

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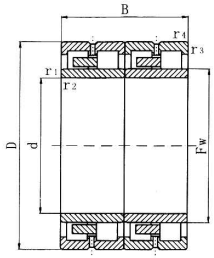
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load 动 Cr	静 Cor	内径 Inner Diameter d	重量 Weight	国外型号 Foreign Model SKF	FAG	NTN	NSK	KOYO
d	D	B	Fw	r1.2min	r3.4min	新 Old	旧 New	KN		mm	kg	mm				
480	650	450	525	5	5	FCDP96130450		6560	21000	480	401.4	316690B	547660	E-4R9609		
	680	420	528	5	5	FCD96136420		6720	19100		515	319320	533522			
	680	500	528	5	5	FCDP96136500		7480	23000		605	316624				
	680	500	532	5	5	FCDP96136500E		7616	23700		585	313516D	514445B	E-4R9604		
	680	500	534	5	5	FCDP96136500E1		7700	23100		630				480RV6811	96FC68500
	700	500	534	5	5	FCDP96140500		9200	34200		675		546125			
	700	530	536	5	5	FCDP96140530		8300	31500		720		523399			
500	650	260	542	6	6	FC100130260		4020	10200	500	225	319254/VJ202				
	670	450	540	6	6	FCDP100134450E		5775	21300		463	316083A				
	670	450	556	6	6	FCDP100134450		4500	11400		458		533023			
	680	450	550	6	6	FCDP100136450		5775	21300		500	BC4B316515	546335			
	690	470	547	6	6	FCDP100138470		7650	22500		590			E-4R10016		
	690	510	552	6	6	FCDP100138510		9010	24600		590			E-4R10006		100FC69510
	700	500	554	6	6	FCDP100140500		11600	38000		615		517692			
	700	515	554	6	6	FCDP100140515		8150	25200		680			E-4R10011	500RV7021	
	710	480	558	6	6	FCDP100142480		8800	21600		610	316968A	530488			
	720	400	558	6	6	FCDP100144400		7920	17600		530	BC4B322066				
	720	530	560	6	6	FCDP100144530		8550	25300		782				500RV7211	
	720	530	568	6	6	FCDP100144530E		10800	28500		780	314441B	513378A	E-4R10015		
510	670	320	554	6	6	FCD102134320		4550	13500	510	335			E-4R10201		
	680	500	560	6	6	FCDP102136500		8970	26000		522	BC4B319411				
	700	540	558	6	6	FCDP102140540		8300	25000		689			E-4R10202		
	730	520	565	6	6	FCDP102146520E		13400	42000		745		514646			
	730	520	569	6	6	FCDP102146520		9520	22000		750	BC4-8009/HB1				
	760	550	570	6	6	FCDP102152550		12100	26500		950	BC4-8007/HB1	517690			
520	700	540	564	6	6	FCDP104140540		8200	25500	520	658			E-4R10403		
	735	535	574.5	6	6	FCDP104147353		9000	26600		740			E-4R10402	520RV7331	104FC74535
	750	530	576	6	6	FCDP104150530		13700	45000		810		541647			



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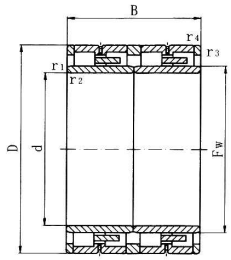

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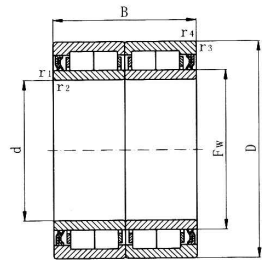

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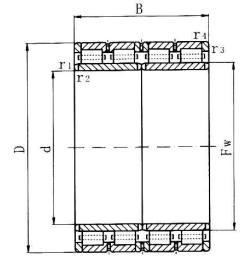

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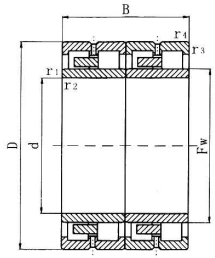
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
530	700	540	574	6	6	FCDP106140540		8150	26500	530	626			E-4R10603		
	760	520	587	6	6	FCDP106152520E		11700	28500		775	314886A	537383			
	760	520	590	6	6	FCDP106152520		9150	26700		800			E-4R10601		
	780	500	591	6	6	FCDP106156500		9350	20400		805	315040/VJ202				
	780	570	595	6	6	FCDP106156570		12500	30600		952					106FC78570
	780	570	601	6	6	FCDP106156570E		12800	32500		960	314517A	517689A	E-4R10602		
	870	670	615	6	6	FCDP106174670		21200	67000		1680		543481			
550	740	540	600	6	6	FCDP110148510		10100	27000	550	621.8	316691B	532843			
	800	520	612	6	6	FCDP110160520		11700	26500		895	316115/VJ202				
	800	520	622	6	6	FCDP110160520		9450	27000		965			E-4R11001		
	800	560	610	6	6	FCDP110160560		12100	28000		930	BC4B322719/HB1		517688		
560	680	360	590	6	6	FCDP112136360		4650	16500	560	265			E-4R11202		
	800	600	620	6	6	FCDP112160600		13000	33400		1010					112FC80600
	820	600	625	6	6	FCDP112164600		14200	34000		1080	BC4B322930/HA1		517687A		
	820	630	625	6	6	FCDP112164630		14000	45200		1240		526708			
570	815	594	628	6	6	FCDP114163594		11800	34500	570	1010			E-4R11402	570RV8111	114FC81594
	830	600	635	6	6	FCDP114166600		17600	67800		1200		517686			
580	850	640	648	6	6	FCDP116170640		18000	63400	580	1275		517685			
600	820	550	660	6	6	FCD120164550		9400	30400	600	900		518780			
	820	575	660	6	6	FCDP120164575		13000	36000		910	315175A				
	870	540	672	6	6	FCDP120174540		12080	38300		1150	315068A	533259	E-4R12002		
	870	640	672	6	6	FCDP120174640E		15700	40000		1340	315513	517684A	E-4R12001		
	870	640	682	6	6	FCDP120174640		15100	40000		1300	314317A				
	920	680	674	6	6	FCDP120184680		22800	67100		1800		526235			
610	820	430	665	6	6	FCD122164430		9350	23600	610	652.4	315257A				
	870	660	680	6	6	FCDP122174660		15200	40300		1400			E-4R12202	610RV8711	122FC87660



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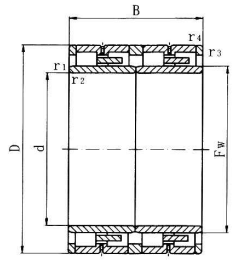

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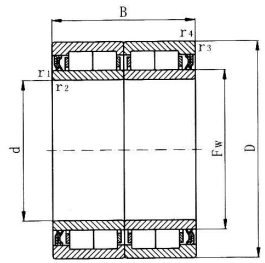

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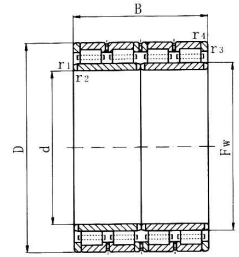

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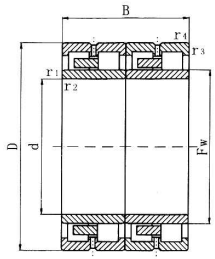
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
630	850	436	690	6	6	FCD126170436		7480	23600	630	720	BC2-8012/HB1VJ202				
	900	670	698	6	6	FCDP126180670		20800	63500		1525		517683			
650	900	650	704	7.5	7.5	FCDP130180650		17200	41500	650	1260	BC4-8002/HA6				
	920	670	723	7.5	7.5	FCDP130184670		13700	46500		1460	313007C	515194A	E-4R13005	650RV9211	
	920	690	723	7.5	7.5	FCDP130184690		14300	46500		1550			E-4R13003		
	920	690	724	7.5	7.5	FCDP130184690E		16700	45500		1490					130FC92690
660	820	440	702	7.5	7.5	FCD132164440		7480	22800	660	530	239509FA		E-4R13201		
	880	450	727	7.5	7.5	FCD132176450		7210	23600		785	313477/VJ202				
680	940	600	743	7.5	7.5	FCD136188600		13800	53400	680	1260		533683			
	980	640	760	7.5	7.5	FCDP136196640		17200	44000		1590	313154C	524229			
690	980	715	767.5	7.5	7.5	FCDP138196715		15840	51300	690	1780	313008A	517681	E-4R13802	690RV9831	
	980	750	766	7.5	7.5	FCDP138196750		18900	50800		1850					138FCC98750
700	930	620	763	7.5	7.5	FCD140186620		12900	43000	700	1197	316967	530487	E-4R14003	700RV9311	
	980	700	774	7.5	7.5	FCD140196600		17800	48200		1680					140FC98700
710	1000	715	787.5	7.5	7.5	FCDP142200715		16800	54500	710	1860	313403C	517680A	E-4R14205		
730	940	500	780	7.5	7.5	FCD146188500		12300	42500	730	872		526447			
	960	620	790	7.5	7.5	FCD146192620		15400	45000		1220	315982	525438			
	1030	750	809	7.5	7.5	FCDP146206750		20900	58500		2040	314518B	517679			
750	1000	500	816	7.5	7.5	FCD150200500		12300	33500	750	1150	314420/VJ202	524881A			
	1000	670	813	7.5	7.5	FCDP150200670		17600	50000		1480	315973	524881A			
780	1070	780	853	7.5	7.5	FCDP156214780		22400	61000	780	2300	BC4-8015/HB1	540088			

四列圆柱滚子轴承

Four row cylindrical roller bearing



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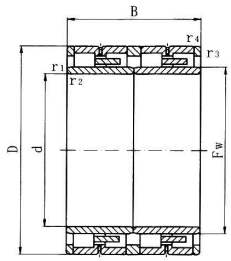

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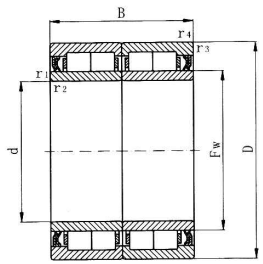

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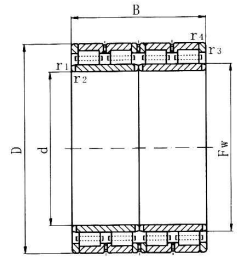

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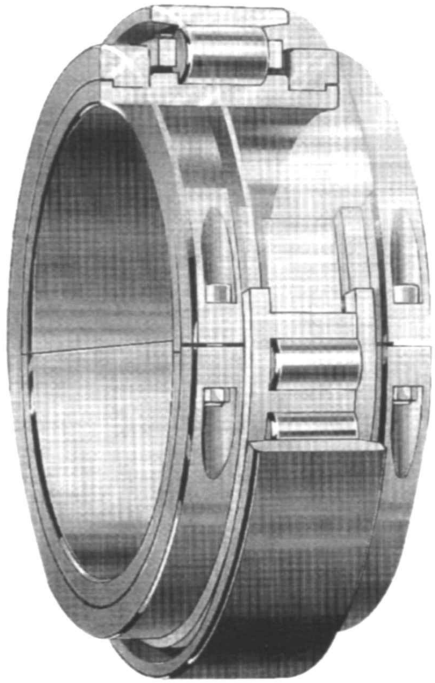
基本尺寸 Basic Size						轴承型号 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	重量	国外型号 Foreign Model				
d	D	B	Fw	r1.2min	r3.4min			动 Cr	静 Cor	d	Weight	SKF	FAG	NTN	NSK	KOYO
mm						新 Old	旧 New	KN		mm	kg	mm				
800	1080	700	870	7.5	7.5	FCD160216700		16500	55000	800	1950			E-4R16004		
	1080	700	878	7.5	7.5	FCD160216700E		19800	58500		1950	315599A	526169			
	1080	750	880	7.5	7.5	FCDP160216750		18400	55000		2050			E-4R16005	800RV1032	160FC108750
820	1130	800	903	7.5	7.5	FCDP164226800		24200	68000	820	2540	BC4B320455		E-4R16406		
	1160	840	910	7.5	7.5	FCDP164232840		21600	71000		2930			E-4R16403		
	1160	840	911	7.5	7.5	FCDP164232840E		21900	71500		2900				800RV1121	
850	1150	650	941	7.5	7.5	FCD170230650		15700	51000	850	1980			E-4R17001		
	1150	800	930	7.5	7.5	FCDP170230800		19700	71000		2430			E-4R17003		
	1150	840	928	7.5	7.5	FCDP170230840		25500	75000		2570	315826A	545636			
	1180	650	945	7.5	7.5	FCD170236650		17100	54500		2270			E-4R17004		
	1180	850	928	7.5	7.5	FCDP170236850E		24100	78500		2970			E-4R17002		
	1180	850	940	7.5	7.5	FCDP170236850		21100	72000		2850				850RV1111	
	1220	900	940	7.5	7.5	FCDP170244900		28000	82400		3720		523397			
900	1220	840	989	7.5	7.5	FCDP180244840		26400	80000	900	3060	316043	527048			
	1280	930	1000	7.5	7.5	FCDP180256930		33000	93000		4080	313528C	541812			



剖分式单列圆柱滚子轴承

剖分式圆柱滚子轴承主要用于曲轴上和轴承难以达到的地区。凡是整体式圆柱轴承在维护与更换非常困难时以及设备不能停机时，剖分式圆柱滚子轴承就显示出其特别的优越性，皮格钢管冷轧机曲轴、棘轴、挖掘机、轧机传动主轴以及大型通风设备是主要应用领域。
ZWA已成功开发了随时随地安装的剖分式圆柱滚子轴承满足连铸冷却区的传动输送辊道轴承的需要。

双列剖分式圆柱滚子轴承

双列剖分式圆柱滚子轴承开始是为轧机的传动轴承而研制开发的。两半外圈安装在轴承座 内后即相联接在一起，也可用几个键以防止其转动。其剖分式内圈截面与轴承中心线之间形成 一夹角，使轴承转动时平稳，用卡箍联结在一起。剖分式黄铜保持架由滚子定位。其轴向游隙要适合万向节轴长度的热膨胀变化的要求。
尺寸
剖分式圆柱滚子轴承的外形尺寸尚未标准化。
轴线角度对准误差
单列和双列剖分式圆柱子滚子轴承，在滚子与滚道之间有一“对数”曲线接触面，它能有效的 改善轴承内部的应力分布，并允许有2〞的微小角度对准误差。
公差
剖分式圆柱滚子轴承按标准公差级生产，但其内圈、外圈宽度公差则除外。其标准公差值符合IS0492—1986
内部游隙
剖分式圆柱滚子轴承按标准级加工，其数值符合IS05753—1991
载荷能力
由于滚子数的减少，其载荷能力要比整体轴承的小些。
在计算当量动载荷时，要考虑滚子不要超越滚道联接处。此数值取决于工作条件，请见“当量动载荷”一节。
速度
由于剖分原因，在工作时会产生一些振动，限制了其速度能力，约为整体式轴承的50%，如此数值难以满足用户需要，适当提高时请咨询ZWA技术服务部门。

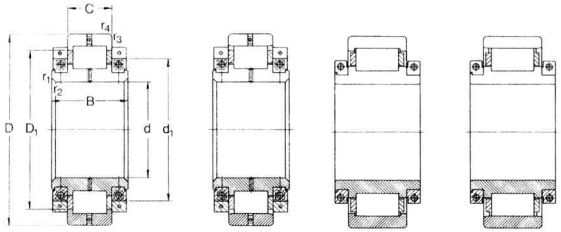
相关部件设计
剖分式轴承适用于正反方向中的载荷与旋转。较高载荷要取P〉0.12Cr，安装轴的加工公差为h6。轴承在承受方向不变与较轻载荷时(P〈0.12Cr)，安装轴的加工公差可为h7，在轻载荷及低速时，允许安装带有紧定套轴承的轴公差为h9/IT7，安装此轴承的轴承座公差为H7。
剖分式圆柱滚子轴承常用以代替设备最初安装的整体轴承，在此条件下，轴公差应按n6—r7加工。
当量动载荷
轴承在承受纯径向载荷时，其当量动载荷按下工求得：
P=bFr　选择b值时，要考虑设备的工作条件以及工作平稳的需要，可按下面所述选取。
设备以恒速动转并要求平稳可靠：取1.1—1.3
设备承受围的冲击并有不平稳力：取1.3—2.0
设备承受大冲击载荷，或有摆动：取2.0—4.0
当量静载荷：Por=Fr。

Split single row cylindrical roller bearing

Split single row cylindrical roller bearing is mainly used for crankshaft and where it is difficult to reach. When it is difficult to maintain and replace integral cylindrical bearing or stop equipment, split cylindrical roller bearing shows its superior. Its main application is crank shaft/ ratchet shaft of Pige steel pipe, excavator, drive shaft of rolling mill as well as large sized ventilation equipment. ZWA have successfully developed split cylindrical roller bearing, which can be installed at any time, to meet requirements of transmission bearing in cool unit of continuous casting equipment.
Double row split cylindrical roller bearing
double row split cylindrical roller bearing is developed initially for transmission bearing. Two halve outer rings are installed inside bearing seat ie connected each other or by using several keys to prevent it rotation. Its split inner ring section forms a included angle to central line of bearing to makes bearing rotated stably and connected via clip. Split brass cage is positioned through roller. Its axial clearance shall meet heat expansion requirement of cardan axis in length.
Dimension
Overall dimension of split cylindrical roller bearing is not standardized yet.
Angular alignment tolerance in axial direction
For single row and double row split cylindrical roller bearing, there are one “logarithm” curving contact surface between roller and raceway, which can effectively improve stress distribution inside bearing and allow minor angular alignment tolerance:”2”
Tolerance
Split cylindrical roller bearing is manufactured according to standard tolerance level. But its inner ring、outer ring width tolerance are exceptional. Its standard tolerance shall accord to ISO0492—1986.
Internal clearance
Split cylindrical roller bearing is machined according to standard level and value shall accord to ISO5753—1991.
Load bearing capacity
Because roller is less in quantity, its bearing capacity is lower than integral bearing.
In calculating equivalent dynamic load, consideration shall be taken not to let roller exceeding raceway connection. This value is subject to working condition. Please refer to section “equivalent dynamic load ”.
Speed
Due to split reason, vibrating occurs during operation, which limit its speed performance accounting 50% of integral bearing. Such a value can not meet demand of client. Please consult with ZWA technical service department for proper improvement.
Design of relevant components
Split bearing is applicable for bearing and rotation in obverse and reverse directions. For comparatively high load, P>0.12Cr is adopted and machined tolerance of installation shaft is h6。When load direction of bearing remains unchanged and it bears light load (P<0.12Cr) , machined tolerance of installation shaft is h7. Under light load and in low speed, it is permitted to install fixing sleeve and sleeve shaft tolerance is h9/IT7. Tolerance of bearing seat is H7.
Split cylindrical roller bearing is often used to replace integral bearing which is installed in the beginning. In this condition, shaft tolerance is n6—r7.
Equivalent dynamic load
Carrying pure radial load, equivalent dynamic load can be obtained from formula here below:
P=bFr; When selecting value b, you have to consider working condition and stability requirement according to the following:
Equipment rotates in constant speed with stable requirement: 1.1—1.3 is adopted
Equipment bear tripping and stable force: 1.3—2.0 is adopted.
Equipment bear high tripping load or vibrate:2.0—4.0 is adopted.
Equivalent static load: Por=Fr

剖分式单列圆柱滚子轴承

Split single row cylindrical roller bearing



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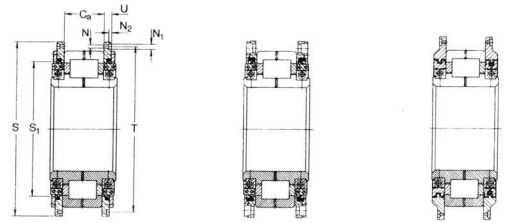

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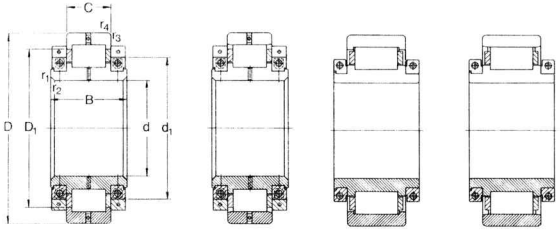
基本尺寸 Basic Size				基本额定负荷 Basic Rated Load		径向游隙 Radial Internal Clearance		重量	设计形式	尺寸 Size														国外轴型号 Foreign Shaft Model
d	D	B	C	动 Cr	静 Cor	最小 Min	最大 Max	Weight	Design Form	d	d1	D1	r1.2	r3.4	S	S1	T	U	N	N1	N2	Ca		SKF
mm				KN		mm		kg		mm														
220	393.7	156	90.5	1210	1800	0.105	0.165	90	5	220	312	339	8X45*	2	460	380	430	32	14	20	15	90.5		316350DA
240	440	156	90.5	1320	2040	0.105	0.165	105	1	240	340	373	8X45*	3										319307A
	440	156	90.5	1320	2040	0.105	0.165	125	6		340	373	8X45*	3	510	405	475	15.85	18	26	17.5	100.1		319307B
	440	156	90.5	1320	2040	0.105	0.165	125	6		340	373	8X45*	3	510	405	475	15.85	18	26	17.5	100.1		316733DC
300	558.8	220	139.7	2330	3250	0.130	0.205	210	1	300	434	478	12X45*	5										316733DD
	558.8	220	139.7	2330	3250	0.130	0.205	210	1		434	478	12X45*	5										316766DA
	558.8	220	139.7	2330	3250	0.130	0.205	305	6		434	478	12X45*	5	640	500	600	33.75	18	26	17.5	150.4		316733DB
	558.8	220	139.7	2330	3250	0.130	0.205	305	6		434	478	12X45*	5	640	500	600	33.75	18	26	17.5	150.4		316733
	558.8	220	139.7	2330	3250	0.130	0.205	305	7		434	478	12X45*	5	640	478	600	33.75	18	26	17.5	150.4		BCSB322810
318	622.37	272	160.4	2920	4400	0.145	0.225	365	1	318	475	521	12X45*	7.5										BCSB322213CC
	622.37	272	160.4	2920	4400	01.45	0.225	365	1		475	521	12X45*	7.5										BCSB322213CD
	622.37	272	160.4	2920	4400	0.145	0.225	515	5		475	521	12X45*	7.5	700	540	660	30.5	18	26	17.5	160.4		BCSB322213CA
320	622.37	272	160.4	2920	4400	0.145	0.225	345	1	320	475	521	12X45*	7.5										
	622.37	272	160.4	2920	4400	0.145	0.225	330	1		475	521	12X45*	7.5										316351CC
	622.37	272	160.4	2920	4400	0.145	0.225	470	5		475	521	12X45*	7.5										316351CD
	622.37	272	160.4	2920	4400	0.145	0.225	470	5		475	521	12X45*	7.5	700	540	660	30.5	18	26	17.5	160.4		316351CA
355.6	488.95	146	74.6	720	1220	0.280	0.370	72.5	2		475	521	12X45*	7.5	700	540	660	30.5	18	26	17.5	160.4		316351CB
400	600	220	148	2250	4900	0.190	0.280	200	2	355.6	450		3	3										BC1B319605
414	740	320	190	4020	6700	0.210	0.310	550	2	400	520	540	5	5										BCS-8000
	740	320	190	4020	6700	0.210	0.310	700	2	414	584	635	12X45*	7.5										316352CC
	740	320	190	4020	6700	0.210	0.310	700	2		584	635	12X45*	7.5	820	650	780	34.5	18	26	17.5	190		316352CA
500	850.9	360	210	5010	9000	0.220	0.330	880	1		584	635	12X45*	7.5	820	650	780	34.5	18	26	17.5	190		316352CB
	850.9	360	210	5010	9000	0.220	0.330	850	1	420	584	635	12X45*	7.5	820	650	780	34.5	18	26	17.5	190		BC1B319576DA
	850.9	360	210	5010	9000	0.220	0.330	985	5	500	718	734	12X45*	7.5										316353DC
											718	734	12X45*	7.5										316353DD
											718	734	12X45*	7.5	930	790	890	29.5	18	26	17.5	210		316353DA

剖分式单列圆柱滚子轴承

Split single row cylindrical roller bearing



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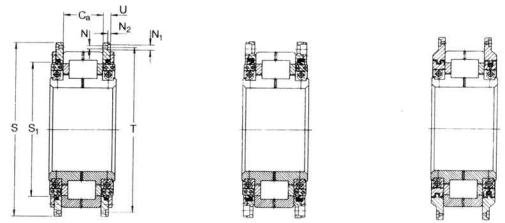

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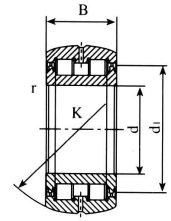
基本尺寸 Basic Size d	D	B	C	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	径向游隙 Radial Internal Clearance 最小 Min	最大 Max	重量 Weight	设计形式 Design Form	尺寸 Size d	d1	D1	r1.2	r3.4	S	S1	T	U	N	N1	N2	Ca	国外轴型号 Foreign Shaft Model SKF
mm				KN		mm		kg		mm													
500	850.9	360	210	5010	9000	0.220	0.330	985	5	500	718	734	12X45	7.5	930	790	890	29.5	18	26	17.5	210	316353DB
580	750	160	90	1190	2280	0.380	0.500	135	2	580	682		4	5									BC1M58-319470
630	794	190	88	1760	4300	0.380	0.500	160	4	630	782		5	2									BCSB316283A
749.92	920	165	78	168	4050	0.270	0.365	190	7	749.92	831		2X30	4									BCSB320861
900	1090	150	85	1720	4250	0.400	0.520	240	7	900	101	510	226	6									BCSB316586
1000	1220	170	100	2700	6400	0.430	0.550	345	7	100	112	411	426	6									BCS320099

外球面圆柱滚子轴承

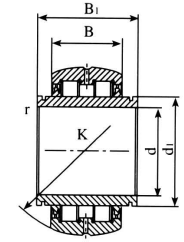
外球面圆柱滚子轴承是满滚子、密封、双列圆柱滚子轴承。圆柱滚子通过挡边引导。其性能与普通满装圆柱滚子轴承相同。其结构分为SL05..E型和SL06..型两种。SL05..E型用于定位端，SL06..E主要用于非定位端。SL06..E型可有一定的轴向位移“S”，其值列于轴承尺寸表。

Outer spherical cylindrical roller bearing

Outer spherical cylindrical roller bearing is full－ roller and sealed double row cylindrical roller bearing。Cylindrical roller is guided through rib. Its performance remains same as commonly configured cylindrical roller bearing. Its structure is classified into SL05…E and SL06…E。SL05。。E is placed on positioning end and SL06。。。E is placed on non－positioning end.SL06。。E can have axial displacement “S” with values listed in bearing dimension table.



SL05..E



SL06..E

基本尺寸 Basic Siz							基本额定负荷 Basic Rated Load		现代号	极限转速 Limit Speed	重量
d	K	B	B1	rsmin	S	d1	动 Cr	静 Cor	Current Code	脂润滑 Grease	Weight
mm							KN			r/min	kg
100	150	55	-	1.5	-	116	280	490	SL05020E	1100	3.3
	150	55	65	1.5	2.5	110	280	490	SL06020E	1100	3.5
110	170	60	-	2	-	130	340	620	SL05022E	950	4.9
	170	60	75	2	5	124	340	620	SL06022E	950	5.2
120	180	60	-	2	-	138	350	660	SL05024E	850	5.2
	180	60	75	2	5	132	350	660	SL06024E	850	5.5
130	200	65	-	2	-	154	435	810	SL05026E	800	7.4
	200	65	80	2	5	146	435	810	SL06026E	800	7.8
140	210	70	-	2	-	160	495	930	SL05028E	750	8.2
	210	70	85	2	5	152	495	930	SL06028E	750	8.6
150	225	75	-	2.1	-	175	540	1020	SL05030E	700	10
	225	75	90	2.1	5	166	540	1020	SL06030E	700	10.5
160	240	90	-	2.1	-	184	660	1260	SL05032E	650	13.7
	240	90	110	2.1	7.5	175	660	1260	SL06032E	650	14.3
170	260	95	-	2.1	-	196	760	1420	SL05034E	600	17.4
	260	95	115	2.1	7.5	186	760	1420	SL06034E	600	18.1
180	280	100	-	2.1	-	210	790	1520	SL05036E	550	22.1
	280	100	120	2.1	7.5	200	790	1520	SL06036E	550	23
190	290	110	-	2.1	-	222	950	1850	SL05038E	550	25
	290	110	135	2.1	7.5	212	950	1850	SL06038E	550	26.5
200	310	115	-	2.1	-	234	1070	2060	SL05040E	500	30.5
	310	115	140	2.1	10	222	1070	2060	SL06040E	500	32
220	340	125	-	3	-	262	1260	2440	SL05044E	460	40
	340	125	150	3	10	248	1260	2440	SL06044E	460	42
240	360	130	-	3	-	278	1310	2600	SL05048E	430	44
	360	130	155	3	10	266	1310	2600	SL06048E	430	46

调心滚子轴承

尺寸

表中所列轴承之外形尺寸与ISO015-1981相符。

角度对准误差

调心滚子轴承之设计，令其具有自动调心功能，即轴承本身可调节、内外圈间的角度对准误差。在正常负荷及工作条件下，内圈转动时，允许存在下表中给出的不对心值。能否完全达到此给定值，须依轴承配置的设计及密封类型等条件决定。

公差

ZWA带圆柱内孔或圆锥内孔调心滚子轴承具普通级公差。

内部游隙

ZWA标准调心滚子轴承具普通级径向内部游隙。几乎所有的轴承都能以C3游隙供货，有些甚至可供更大的游隙C4。有些尺寸可以小于普通级的C2游隙供货。凡订购具非标准径向游隙(包括C5)的轴承时，应先查询是否可供货。这些游隙数值用于零测量负荷及未安装时的轴。

ZWA提供CA型外，另可供CC型，MB型结构用于特殊用户。请与ZWA联系。

Self-aligning roller bearing

Dimension

Overall dimension of bearing listed in bearing table accords to ISO015-1981.

Angular alignment tolerance

Self-aligning roller bearing is designed in such a way that it is self-aligning. That means that bearing can adjust itself and angular alignment tolerance between outer rings. Under normal load and working condition and inner ring rotates, the unsymmetrical value listed in below table is allowed. Achieving completely specified value is subject to design and seal type of configured bearing.

Tolerance

ZWA self-aligning roller bearing with cylindrical bore or tapered core is of common tolerance level.

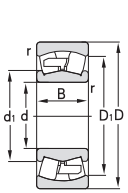
Internal clearance

According to ZWA standard, self-aligning roller bearing is of common tolerance level in internal clearance in its radial direction. Almost all bearings can be supplied at C3 clearance, or even higher level C4 clearance。Bearings with dimension less than common level;C2 clearance can also be supplied. Please consult first to check supply status for bearing with non-standard radial clearance (including C5) .These clearance values are used for zero load testing and shaft, which remains uninstalled.

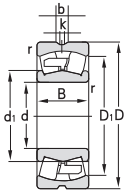
Structure

Besides CA type, ZWA can provide CC and MB structure for special clients. Please contact with ZWA for details.

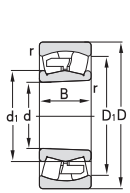
轴承 Bearing	允许不对心值 Unsymmetrical value is allowed
—	角度 Angle
系列 Series 213	1
系列 Series 222	1.5
系列 Series 223	2
系列 Series 230	1.5
系列 Series 231	1.5
系列 Series 232	2.5
系列 Series 239	1.5
系列 Series 240	2
系列 Series 241	2.5



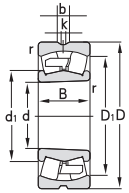
CA



CA/W33



CAK



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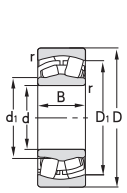
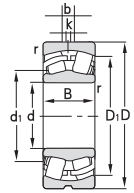


CC



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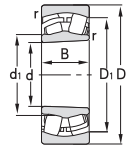

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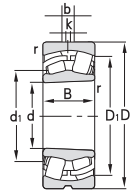

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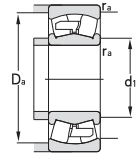
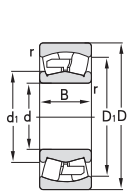


基本尺寸 Basic Size d	D	B	rmin	其它尺寸 Other Sizes d1	D1	b	k	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	原代号 Original Code		现代号 Current Code		接触面与倒角装配尺寸 Size of Contract Surface & Chamfer Fixing damin	Damin	ramax	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	重量 Weight
mm				mm				r/min						mm			KN		kg
150	225	75	2.1	175	196	5.5	3	1300	1700	4053130K	4453130K	24030CA/W33	24030CAK30/W33	162	213	2	500	1050	9.39
	250	80	2.1	173	212	11.1	5	1400	1800	3003730K		23130W/W33		162	238	2	745	685	16.9
	250	80	2.1	182	216	11.1	5	1400	1800	3053730	3053730K	23130CA	23130CA/W33	162	238	2	745	685	16.5
	250	80	2.1	182	216	11.1	5	1400	1800	3053730W2	3053730KW2	23130CAF3	23130CAF3/W33	162	238	2	745	685	16.4
	250	80	2.1	182	216	11.1	5	1400	1800	3153730	3153730K	23130CAK	23130CAKF3/W33	162	238	2	745	685	16.4
	270	73	3	179	234	12	6	1600	2000	3530K		22230/W33		164	256	2.5	610	1000	18.6
	270	73	3	189	234	12	6	1600	2000	53530	53530K	22230CA	22230CA/W33	164	256	2.5	630	1050	18.7
	270	73	3	189	234			1600	2000	53530W2	153530	22230CAF3	22230CAK	164	256	2.5	630	1050	18.5
	270	96	3	177	228			1100	1500	3003230		23230		164	256	2.5	950	1550	25.7
	270	96	3	188	228	11.1	6	1100	1500	3053230	3053230HK	23230CA	23230CA/W33	164	256	2.5	950	1550	26.6
	320	108	4	203	265	16.7	9	1000	1400	53630	53630HK	22330CA	22330CA/W33	168	302	3	1120	1810	41.5
	320	108	4	203	265			1000	1400	153630	153630W2	22330CAK	22330CAKF3	168	302	3	1120	1810	41.1
160	240	60	2.1	180	216			1700	2200	3003132	3113132	23032	23032K	172	228	2	445	875	8.86
	240	60	2.1	186	216	8.3	5	1700	2200	3053132	3053132K	23032CA	23032CA/W33	172	228	2	445	875	10
	240	60	2.1	186	216			1700	2200	3053132W2		23032CAF3		172	228	2	445	875	9.97
	240	80	2.1	183	209	8.3	5	1100	1500	4053132K	4053132KW2	24032CA/W33	24032CAF3/W33	172	228	2	570	1210	13.2
	240	80	2.1	183	209	8.3	5	1100	1500	4453132W2	4453132	24032CAK30F3	24032CAK30/W33	172	228	2	570	1210	13.2
	270	86	2.1	195	234	13.9	6	1300	1700	3053732	3053732K	23132CA	23132CA/W33	172	258	2	765	1430	21.9
	270	86	2.1	195	234			1300	1700	3053732	3153732	23132CAF3	23132CAK	172	258	2	765	1430	21.9
	270	109	2.1	193	225	8.3	4	700	900	4053732Y		24132CA/HAC9SOW20X		172	258	2	1020	1690	23.4
	270	109	2.1	193	225	8.3	4	700	900	4053732K		24132CA/W33	24132CA/W33X	172	258	2	865	1690	24.6
	290	80	3	201	249			1500	1900	53532	53532W2	22232CA	22232CAF3	174	276	2.5	750	1300	24.6
	290	80	3	201	249			1500	1900	153532		22232CAK		174	276	2.5	750	1300	24.1
	290	104	3	189	244	13.9	7	1000	1400	3003232	3003232K	23232	23232/W33		276	2.5	1100	1760	30.0
	290	104	3	200	244	13.9	7	1000	1400	3053232	3053232K	23232CA	23232CA/W33	174	276	2.5	955	1770	30.2
	290	104	3	200	244	13.9	7	1000	1400	3153232	3153232K	23232CAK	23232CAK/W33	174	276	2.5	955	1770	29.2
	290	104	3	189	244	13.9	7	1000	1400	3113232K		23232CK/W33		174	276	2.5	1100	1760	29.0
	340	114	4	201	284			950	1300	3632		22332		178	322	3	1270	2050	51.8
	340	114	4	216	284			950	1300	53632	153632	22332CA	22332CAK	178	322	3	1270	2050	52.8
	340	114	4	216	284	16.7	7	950	1300	53632W2	53632KW2	22332CAF3	22332CAF3/W33	178	322	3	1270	2050	52.5
	340	114	4	216	284	16.7	7	950	1300	153632KW2		22332CAKF3/W33		178	322	3	1270	2050	52.5
170	260	67	2.1	192	231			1600	2000	3003134	3113134	23034	23034K	182	248	2	555	1090	14.2
	260	67	2.1	198	231	11.1	5	1600	2000	3053134	3053134K	23034CA	23034CA/W33	182	248	2	555	1090	14.1
	260	67	2.1	198	231			1600	2000	3053134W2	3153134	23034CAF3	23034CAK	182	248	2	555	1090	14.0
	260	90	2.1	198	227	8.3	4	1000	1400	4053134K		24034CA/W33		182	248	2	705	1500	17.8
	280	88	2.1	204	243			1200	1600	3053734		23134CA		182	248	2	730	1390	26.1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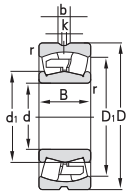
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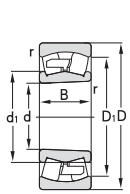
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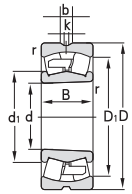
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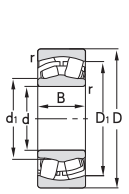
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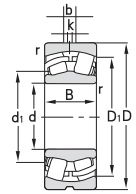
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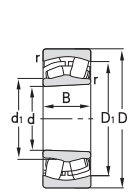
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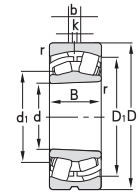
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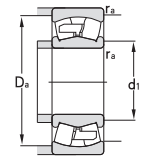
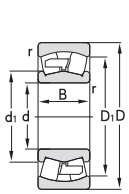


基本尺寸 Basic Size d	D	B	rmin	其它尺寸 Other Sizes d1	D1	b	k	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	原代号 Original Code		现代号 Current Code		接触面与倒角装配尺寸 Size of Contract Surface & Chamfer Fixing damin	Damin	ramax	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	重量 Weight
mm				mm				r/min						mm			KN		kg
170	280	88	2.1	204	243			1200	1600	3153734	3153734W2	23134CAK	23134CAKF3	182	268	2	730	1390	24.6
	280	109	2.1	203	237	8.3	5	670	850	4053734Y		24134CA/HCW33YA2		182	268	2	915	1830	24.7
	280	109	2.1	203	237	8.3	5	670	850	4053734K		24134CA/W33		182	268	2	915	1830	24.8
	310	86	4	215	268	16.7	6	1300	1700	53534	53534K	22234CA	22234CA/W33	188	292	3	845	1450	26.8
	310	86	4	215	268	16.7	6	1300	1700	153534	153534K	22234CAK	22234CAK/W33	188	292	3	845	1450	26.2
	310	110	4	214	261	13.9	7	950	1300	3053234	3053234KW2	23234CA	23234CAF3/W33	188	292	3	1070	1930	38.0
	360	120	4	211	299			950	1300			22334C/YA7		188	342	3	1320	2120	59.7
	360	120	4	231	299	16.7	7	950	1300	53634	53634K	22334CA	22334CA/W33	188	342	3	1320	2120	62.6
180	250	52	2	204	230	9.5	4	1700	2200	3053936K		23936CAF3/W33		190	240	2	430	830	7.34
	280	74	2.1	214	247	13.9	7.5	1400	1800	3053136	3053136K	23036CA	23036CA/W33	192	268	2	630	1280	17.7
	280	74	2.1	214	247			1400	1800	3053136		230036CAF3		192	268	2	630	1280	17.6
	280	100	2.1	210	242	8.3	4	950	1300	4053136	4053136K	24036CA	24036CA/W33	192	268	2	835	1750	26.6
	280	100	2.1	210	242	8.3	4	950	1300	4053136KW2	4453136KW2	24036CAF3/W33	24036CAK30F3/W33	192	268	2	835	1750	26.6
	300	96	3	216	259	13.9	6	1100	1500	3053736	3053736K	23136CA	23136CA/W33	194	268	2.5	900	1720	27.1
	300	96	3	216	259			1100	1500	3053736W2	3153736	23136CAF3	23136CAK	194	286	2.5	900	1720	27.0
	300	118	3	212	252	11.1	6	630	800	4053736	4053736K	24136CA	24136CA/W33	194	286	2.5	1020	2030	33.0
	300	118	3	212	252			630	800	4053736Q		24136CAQ1		194	286	2.5	1020	2030	33.0
	320	86	4	224	278	16.7	6	1300	1700	53536	53536K	22236CA	22236CA/W33	198	302	3	895	1550	29.4
	320	86	4	224	278			1300	1700	53536W2	53536Q	22236CAF3	22236CAQ1	198	302	3	895	1550	29.2
	320	86	4	224	278			1300	1700	153536	153536W2	22236CAK	22236CAKF3	198	302	3	895	1550	29.3
	320	112	4	222	271			900	1200	3053236		23236CA		198	302	3	1160	2130	38.7
	320	112	4	222	271	13.9	7	900	1200	3053236K	3053236Y	23236CA/HCW33	23236CA/HCW33YA2	198	302	3	1160	2130	38.6
	320	112	4	222	271	13.9	7	900	1200	3053236W2	3053236KW2	23236CAF3	23236CAF3/W33	198	302	3	1160	2130	38.5
	320	112	4	222	271	13.9	7	900	1200	3153236K	3153236KW2	23236CAK/W33	23236CAKF3/W33	198	302	3	1160	2130	38.4
	380	126	4	242	316	22.3	8	900	1200	53636	53636K	22336CA	22336CA/W33	198	362	3	1470	2400	72.2
	380	126	4	242	316	22.3	8	900	1200	53636KW2	153636	22336CAF3/W33	22336CAK	198	362	3	1470	2400	71.3
190	290	75	2.1	215	259			1300	1700	3003138		23038		202	278	2	700	1450	16.9
	290	75	2.1	224	259	13.9	5	1300	1700	3053138		23038CA	23038CA/W33	202	278	2	700	1450	17.3
	290	75	2.1	224	259			1300	1700	3053138W2	3053138K	23038CAF3		202	278	2	700	1450	17.2
	290	75	2.1	224	259	13.9	5	1300	1700	3153138	3153138KW2	23038CAK	23038CAKF3/W33	202	278	2	700	1450	16.8
	290	100	2.1	219	252			950	1300	4053138	4053138W2	24038CA	24038CAF3	202	278	2	855	1840	22.9
	320	104	3	232	276	13.9	7	1000	1400	3053738	3053738K	23138CA	23138CA/W33	204	306	2.5	975	1840	34.3
	320	128	3	226	267	11.1	6	600	750	4053738	4053738K	24138CA	24138CA/W33	204	306	2.5	1200	2400	41.9
	320	128	3	226	267	11.1	6	600	750	4053738W2	4453738K	24138CAF3	24138CAK30/W33	204	306	2.5	1200	2400	41.8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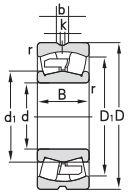
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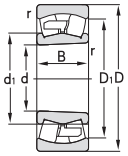
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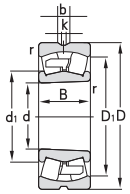
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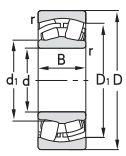
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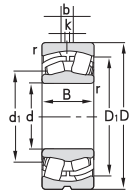
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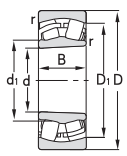
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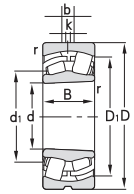
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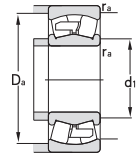
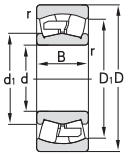


基本尺寸 Basic Size				其它尺寸 Other Sizes				极限转速 Limit Speed		原代号 Original Code		现代号 Current Code		接触面与倒角装配尺寸 Size of Contract Surface & Chamfer Fixing			基本额定负荷 Basic Rated Load		重量 Weight
d	D	B	rmin	d1	D1	b	k	脂润滑 Grease	油润滑 Oil					damin	Damin	ramax	动 Cr	静 Cor	
mm				mm				r/min						mm			KN		kg
190	340	92	4	235	293			1200	1600	3538	3538K	22238	22238/W33	208	322	3	865	1620	37.4
	340	92	4	235	293	16.7	6	1200	1600	53538K		22238CA/W33		208	322	3	865	1620	37.4
	340	92	4	235	293			1200	1600	53538W2	153538W2	22238CAF3	22238CAKF3	208	322	3	865	1620	37.2
	340	92	4	235	293	16.7	6	1200	1600	153538	153538K	22238CAK	22238CAK/W33	208	322	3	865	1620	37.3
	340	120	4	237	288	16.7	7	850	1100	3053238	3053238K	23238CA	23238CA/W33	208	322	3	1290	2400	44.8
	340	120	4	237	288	16.7	7	850	1100	3153238K		23238CAK/W33		208	322	3	1290	2400	43.1
	400	132	5	238	334			850	1100	3638		22338		212	378	4	1640	2630	80.8
	400	132	5	257	334	22.3	8	850	1100	53638	53638K	22338CA	22338CA/W33	212	378	4	1640	2630	82.2
	400	132	5	257	334			850	1100	53638W2		22338CAF3		212	378	4	1640	2630	81.7
200	280	60	2.1	226	254	9.5	4	1600	2000	3053940KW2		23940CAF3/W33		212	268	2	495	1150	12.1
	310	82	2.1	237	276	13.9	7.5	1200	1600	3053140	3053140K	23040CA	23040CA/W33	212	298	2	770	1560	22.6
	310	82	2.1	237	276			1200	1600	3153140		23040CAK		212	298	2	770	1560	22.4
	310	109	2.1	233	268	11.1	5	900	1200	4053140K	4453140K	24040CA/W33	24040CAK30/W33	212	298	2	985	2130	31.3
	340	112	3	243	292	16.7	7	950	1300	3053740	3053740K	23140CA	23140CA/W33	214	326	2.5	1170	2240	43.8
	340	112	3	243	292	16.7	7	950	1300	3153740	3153740K	23140CAK	23140CAK/W33	214	326	2.5	1170	2240	42.6
	340	140	3	242	283	11.1	6	5601	700	4053740K		24140CA/W33		214	326	2.5	1380	2800	52.1
	360	98	4	237	309			1100	1500	3540		22240		218	342	3	1100	1950	43.7
	360	98	4	250	309	16.7	6	1100	1500	53540	53540K	22240CA	22240CA/W33	218	342	3	1100	1950	44.7
	360	98	4	250	309	16.7	6	1100	1500	53540W2	153540W2	22240CAF3	22240CAKF3	218	342	3	1100	1950	44.3
	360	98	4	250	309	16.7	6	1100	1500	153540	153540K	22240CAK	22240CAK/W33	218	342	3	1100	1950	44.0
	360	128	4	249	304	16.7	8	850	1100	3053240K		23240CA/W33		218	342	3	1360	2530	53.4
	360	128	4	249	304	16.7	8	850	1100	3153240	3153240K	23240CAK	23240CAK/W33	218	342	3	1360	2530	52.0
	420	138	5	269	350			850	1100	53640	53640W2	23340CAF3	22340CAF3	222	398	4	1740	2860	97.0
	420	138	5	269	350	22.3	8	850	1100	153640	153640K	22340CAK	22340CAK/W33	222	398	4	1740	2860	95.3
	420	165	5	266	340			750	950	53340W2		23340CAF3		222	398	4	2020	3500	122
219.5	340	90	3	260	303			1100	1500	3053144Y		23044CA/YA2		234	326	2.5	935	1900	31.5
220	340	90	3	260	303	13.9	6	1100	1500	3053144	3053144K	23044CA	23044CA/W33	234	326	2.5	935	1900	32.0
	340	90	3	260	303	13.9	6	1100	1500	3153144	3153144K	23044CAK	23044CAK/W33	234	326	2.5	935	1900	31.6
	340	90	3	260	303			1100	1500	3053144W2		23044CAKF3		234	326	2.5	935	1900	31.0
	340	118	3	257	295	11.1	5	850	1100	4053144K		24044CA/W33	24044CA/W33X	234	326	2.5	1150	2500	39.1
	340	118	3	257	295	11.1	5	850	1100	4053144W2	4053144KW2	24044CAF3	24044CAF3/W33	234	326	2.5	1150	2500	39.0
	370	120	4	268	320	16.7	7	900	1200	3053744	3053744K	23144CA	23144CA/W33	238	352	3	1370	2710	54.7
	370	120	4	268	320	16.7	7	900	1200	3053744Y		23144CA/HG2W33		238	352	3	1370	2750	54.6
	370	120	4	268	320	16.7	7	900	1200	3153744	3153744K	23144CAK	23144CAK/33	238	352	3	1370	2710	53.1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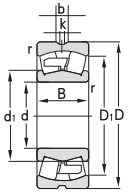
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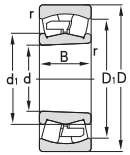
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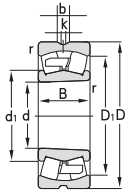
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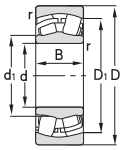
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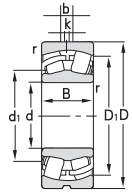
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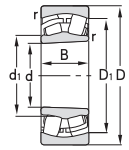
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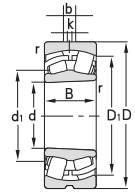
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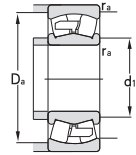
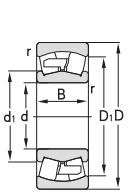


基本尺寸 Basic Size d	D	B	rmin	其它尺寸 Other Sizes d1	D1	b	k	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	原代号 Original Code		现代号 Current Code		接触面与倒角装配尺寸 Size of Contract Surface & Chamfer Fixing damin	Damin	ramax	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	重量 Weight
mm				mm				r/min						mm			KN		kg
220	370	120	4	268	320	16.7	7	900	1200	3153744KW2		23144CAKF3/W33		238	352	3	1570	2750	52.7
	400	108	4.0	275	344	16.7	8	950	1300	53544	53544	22244CA	22244CA/W33	238	382	3	1350	2400	63.5
	400	108	4	275	344	16.7	8	950	1300	53544Y	53544W2	22244CA/W33X	22244CAF3	238	382	3	1350	2400	62.0
	400	108	4	275	344			950	1300	153544		22244CAK		238	382	3	1350	2400	63.2
	400	144	4	273	334	16.7	8	750	950	3053244K	3153244K	23244CA/W33	23244CAKW33	238	382	3	1720	3200	77.3
240	320	60	2.1	266	295	9.5	4	1300	1700	3053948HK		23948CA/W33		252	308	2	530	1310	15.0
	320	60	2.1	266	295	9.5	4	1300	1700	3053948W2	3053948KW2	23948CAF3	23948CAF3W33	252	308	2	530	1310	14.9
	360	92	3	278	322	13.9	6	1000	1400	3053148	3053148K	23048CA	23048CA/W33	254	346	2.5	985	2080	34.2
	360	92	3	278	322	13.9	6	1000	1400	3153148	3153148K	23048CAK	23048CAF3/W33	254	346	2.5	985	2080	32.2
	360	92	3	278	322			1000	1400	3153148Q		23048CAQ1		254	346	2.5	985	2080	34.2
	360	118	3	278	318	11.1	5	800	1000	4053148	4053148K	24048CA	24048CA/W33X	254	346	2.5	1240	2800	46.5
	360	118	3	278	318			800	1000	4453148		24048CAK30		254	346	2.5	1240	2800	46.5
	400	128	4	289	345	16.7	8	850	1100	3053748	3053748K	23148CA	23148CA/W33	258	382	3	1500	3000	68.2
	400	160	4	285	336	11.1	6	480	600	4053748	4053748K	24148CA	24148CA/W33	258	382	3	1660	3400	79.0
	400	160	4	285	336	11.1	6	480	600	4453748KW2		24148CAK30F3/W33		258	382	3	1660	3400	77.8
	440	120	4	303	379	18	7	900	1200		53548KW2	22248CAF3/C9W33	22248CAF3/W33	258	422	3	1820	1640	85.0
	440	160	4	292	369	22.3	8	670	850	3053248K	3053248W2	23248CA/W33	23248CAF3	258	422	3	2080	3950	102
	440	160	4	292	369	22.3	8	670	850	3153248K		23248CAK/W33		258	422	3	2080	3950	102
241	360	92	3	278	322			1000	1400	3053148Q		23248CAQ1/Y2		254	346	2.5	985	2080	34.0
260	360	75	2.1	294	328			1100	1500	3053952		23952CA		272	348	2	820	1750	21.6
	400	104	4	306	357	16.7	7	900	1200	3053152	3053152K	23052CA	23052CA/W33	278	382	3	1230	2550	49.8
	400	104	4	306	357			900	1200	3053152W2		23052CAF3		278	382	3	1230	2550	49.5
	400	104	4	306	357	16.7	7	900	1200	3153152	3153152K	23052CAK	23052CAK/W33	278	382	3	1230	2550	46.9
	400	140	4	300	347	11.1	6	700	900	4053152K		24052CA/W33		278	382	3	1780	1910	66.7
	400	140	4	300	347	11.1	6	700	900	4053152W2	4053152KW2	24052CAF3	24052CAF3/W33	278	382	3	1550	3500	64.9
	400	140	4	300	347	11.1	6	700	900	4453152K		24052CAK30/W33		278	382	3	1550	3500	65.2
	440	144	4	310	379	16.7	9	800	1000	3053752	3053752K	23152CA	23152CA/W33	278	422	3	1560	3750	88.9
	440	144	4	310	379	16.7	9	800	1000	3153752		23152CAK	23152CAK/HG2C9YA6W33	278	422	3	1990	4050	88.7
	440	180	4	312	366	13.9	8	430	530	4053752	4053752K	24152CA	24152CA/W33	278	422	3	2100	4350	115
	440	180	4	312	366	13.9	8	430	530	4053752KW2	4453752K	24152CAF3/W33	24152CAK30/W33	278	422	3	2100	4350	113
	480	130	5	330	414			850	1100	53552	53552K	22252CA	22252CAK30/W33	282	458	4	1900	3600	106
	480	130	5	330	414			850	1100	153552		22252CAK		282	458	4	2280	3600	105
	480	174	5	320	404	22.3	8	630	800	3053252K	3053252KW2	23252CA/W33	23252CAF3/W33	282	458	4	2800	4750	141
	480	174	5	320	404	22.3	8	630	800	31532525K	3153252K	23252CAK/W33	23252CAKL/W33	282	458	4	2800	4750	145
	540	165	6	349	455	22.3	8	630	800	53652KW2	153652KW2	22352CAF3/W33	22352CAKF3/W33	288	512	5	3000	4700	184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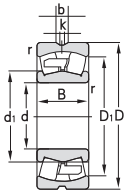
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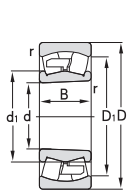
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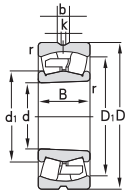
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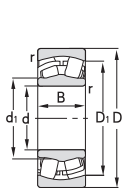
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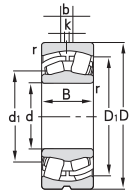
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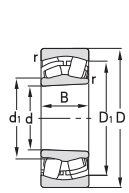
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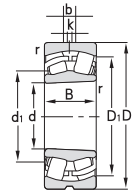
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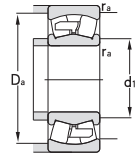

基本尺寸 Basic Size d	D	B	rmin	其它尺寸 Other Sizes d1	D1	b	k	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	原代号 Original Code		现代号 Current Code		接触面与倒角装配尺寸 Size of Contract Surface & Chamfer Fixing damin	Damin	ramax	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	重量 Weight
mm				mm				r/min						mm			KN		kg
280	380	75	2.1	316	346	12	6	1000	1400	3053956QK		23956CAQ1/W33		292	368	2	700	1850	25.7
	420	106	4	323	377			850	1100	3053156	3153156	23056CA	23056CAK	298	402	3	1320	2850	56.8
	420	140	4	317	366	11.1	6	670	850	4053156K		24056CA/W33		298	402	3	1620	3700	69.2
	420	140	4	317	366	11.1	6	670	850	4053156W2	4053156KW2	24056CAF3	24056CAF3/W33	298	402	3	1620	3700	68.2
	420	140	4	317	366	11.1	6	670	850	4453156KW2		24056CAK30F3/W33		298	402	3	1620	3700	67.2
	460	146	5	333	400	16.7	8	750	950	3053756	3053756K	23156CA	23156CA/W33	302	438	4	1990	4150	104
	460	146	5	333	400			750	950	3053756W2	3153756W2	23156CAF3	23156CAKF3	302	438	4	1990	4150	103
	460	146	5	333	400	16.7	8	750	950	3153756	3153756K	23156CAK	23156CAK/W33	302	438	4	1900	4150	101
	460	130	5	332	404			750	950	3153756Y		23156X2CA		302	438	4	1700	3400	87.0
	460	180	5	327	393			400	500	4053756		24156CA		302	438	4	2220	4750	119
	460	180	5	327	388	13.9	8	400	500			24156CA/HCW33	24156CA/W33	302	438	4	2220	4750	119
	500	130	5	347	435			800	1000	53556	53556W2	22256CA	22256CAF3	302	478	4	1990	3600	118
	500	130	5	347	435	22.3	8	800	1000	153556K		22256CAK/W33		302	478	4	1990	3600	117
	500	176	5	340	424			600	750	3053256		23256CA		302	478	4	2580	5100	147
	500	176	5	340	424	22.3	8	600	750	3053256W2	3053256KW2	23256CAF3	23256CAF3/W33	302	478	4	2580	5100	146
	580	176	6	364	485	22.3	8	600	750	53656K		22356CA/W33		308	552	5	3200	5700	221
300	420	90	3	339	382	15	6	950	1300	3053960K		23960CA/W33		314	406	2.5	1050	2500	40.1
	460	118	4	351	409	16.7	7	800	1000	3053160KW2		23060CAF3/W33		318	442	3	1610	3450	74.9
	460	118	4	351	409	16.7	7	800	1000	3153160	3153160K	23060CAK	23060CAK/W33	318	442	3	1610	3450	73.6
	460	160	4	342	399	13.9	7	600	750	4053160	4053160K	24060CA	24060CA/W33	318	442	3	2020	2700	99.0
	500	160	5	356	433	16.7	9	670	850	3053760	3053760K	23160CA	23160CA/W33	322	478	4	2310	4750	126
	500	160	5	356	433	16.7	9	670	850	3053760W2	3053760KW2	23160CAF3	23160CAF3/C9W33	322	478	4	2310	4750	125
	500	160	5	356	433	16.7	9	670	850	3153760K	3153760W2	23160CAK/W33	23160CAKF3	322	478	4	2310	4750	125
	540	140	5	374	467			750	950	53560	53560W2	22260CA	22260CAF3	322	518	4	2310	4300	138
	540	140	5	374	467			750	950	153560W2		22260CAKF3		322	518	4	2310	4300	136
	540	192	5	373	455	22	10	530	670	3053260W1	3153260KW1	23260CAF1	23260CAKF1/W33	322	518	4	3300	5600	192
320	480	121	4	368	431	16.7	8	800	1000	3053164KW2	3153164K	23064CAF3/W33	23064CAK/W33	338	462	3	1930	2200	84.7
	480	160	4	368	421	22	8	560	700	4053164W2	4053164KW2	24064CAF3	24064CAF3/W33	338	462	3	2480	5100	106
	540	176	5	389	465	22.3	8	630	800	3053164	3053164K	23164CA	23064CA/W33	342	518	4	3150	3200	200
	540	176	5	389	465	22.3	8	630	800	3153764	3153764K	23164CAK	23164CAK/W33	342	518	4	3150	3200	195
	580	150	5	400	502			670	850	53564	153564	22264CA	22264CAK	342	558	4	2490	4550	175
	580	208	5	400	490	24	10	500	630	3053264K	3053264KW2	23264CA/W33	23264CAF3/W33	342	558	4	3900	6800	253
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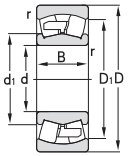
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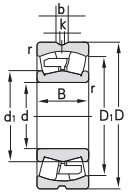
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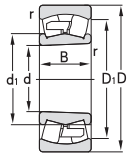
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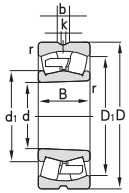
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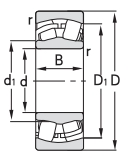
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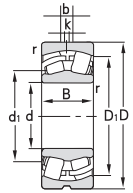
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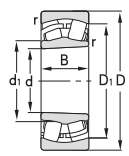
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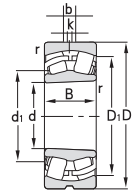
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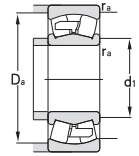

基本尺寸 Basic Size d	D	B	rmin	其它尺寸 Other Sizes d1	D1	b	k	极限转速 Limit Speed 脂润滑 Grease	油润滑 Oil	原代号 Original Code		现代号 Current Code		接触面与倒角装配尺寸 Size of Contract Surface & Chamfer Fixing damin	Damin	ramax	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	重量 Weight
mm				mm				r/min						mm			KN		kg
340	460	90	3	378	423	15	6	900	1200	3053968KW2		23968CAF3/W33		354	446	2.5	1200	2700	45.6
	520	133	5	400	464	22.3	8	700	900	3053168	3053168K	23068CA	23068CA/W33	362	498	4	1980	4400	115
	520	133	5	400	464	22.3	8	700	900	3053168W2	3053168KW2	23068CAF3	23068CAF3W33	362	498	4	1980	4400	114
	520	133	5	400	464	22.3	8	700	900	3153168W2	3153168KW2	23068CAKF3	23068CAKF3/W33	362	498	4	1980	4400	111
	520	180	5	394	451	16.7	8	530	670	4053168K	4053168KW	24068CA/W33	24068CAF1/W33	362	498	4	2460	5700	137
	520	180	5	394	451			530	670	4453168W		24068CAK30F1		362	498	4	2460	5700	134
	580	190	5	412	497	22.3	8	600	750	3053768K	3053768KW2	23168CA/W33	23168CAF3/W33	362	558	4	3050	6300	211
	580	190	5	412	497	22.3	8	600	750	3153768KW2		23168CAKF33/W33		362	558	4	3050	6300	206
	580	243	5	408	486	22.3	10	320	400	4453768K		24168CAK30/W33		362	558	4	3700	7950	256
360	480	90	3	403	441			850	1100	3053972		23972CA		374	466	2.5	1290	2820	46.6
	540	134	5	419	486	22.3	8	670	850	3053172	3053172K	23072CA	23072CA/W33	382	518	4	2280	4800	126
	540	134	5	419	486	22.3	8	670	850	3053172W2	3053172KW2	23072CAF3	23072CA/W33	382	518	4	1950	2850	125
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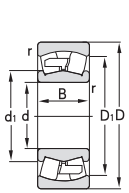
	600	243	5	430	511	20	12	300	380	4053772	4053772K	24172CA	24172CA/W33	382	578	4	5600	8400	270
	600	243	5	430	511	20	12	300	380	4053772W2	4053772KW1	24172CAF1	24172CAF1/W33	382	578	4	5600	8400	269
	600	243	5	430	511	20	12	300	380	4453772K	4453772KW1	24172CAK30/W33	24172CAK30F1/W33	382	578	4	5600	8400	270
	650	243	6	443	547	22.3	10	400	500	3053272KW2		23272CAKF3/W33		388	622	5	4650	8300	330
	750	224	7.5	471	631			400	500	53672W2		22372CAF3		392	720	6	4900	8600	466
	750	224	7.5	471	631			400	500	153672	153672W2	22372CAK	22372CAKF3	392	720	6	4900	8600	460
380	520	106	4	426	476	15	10	800	1000	3053976KW1		23976CAF1/W33		398	502	3	1730	3800	69.5
	560	135	5	441	505			630	800	3053176	3153176KW2	23076CA	23076CAKF3	402	538	4	2480	5000	130
	560	180	5	435	494	22	10	480	600	4453176KW3		24076CAK30F3/W33		402	538	4	3150	6900	153
	620	194	5	457	540	22	8	400	500	3053776KW2		23176CAF3/HAW33	23176CAF3/W33	402	598	4	3400	7350	244
	620	194	5	457	540	22	8	400	500	3153776	3153776KW2	23176CAK	23176CAKF3/W33	402	598	4	3400	7350	244
400	540	106	4	445	497	15	10	750	950	3053980K		23980CAF1/W33		418	522	3	2540	3900	72.4
	600	148	5	460	538			600	750	3053180	3153180W2	23080CA	23080CAKF3	422	578	4	2540	5900	161
	600	148	5	460	538	22	12	600	750	3053180W2	3153180KW2	23080CAF3	23080CAF3/W33	422	578	4	1730	5900	158
	600	200	5	458	524	22	12	450	560	4053180W2	4053180KW2	24080CAF3	24080CAF3/W33	422	578	4	3600	7800	202
	650	200	6	480	568	22.3	8	380	480	3053780	3053780K	23180CA	23180CA/W33	428	622	5	4100	7650	275
	650	200	6	480	568	22.3	8	380	480	3053780W2	3053780KW2	23180CAF3	23180CAF3/W33	428	622	5	4100	7650	273
	650	200	6	480	568	22.3	8	380	480	3153780KW2		23180CAKF3/W33		428	622	5	4100	7650	264
	670	216	6	480	579	22.3	8	380	480	3053780Y		23180X3CA/W33		428	622	5	4000	8550	293
	720	256	6	499	606	22	10	340	430	3053280K	3053280KW2	23280CA/W33	23280CAF3/W33	428	692	5	6150	11300	353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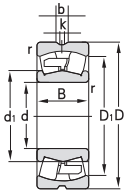
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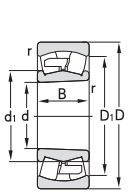
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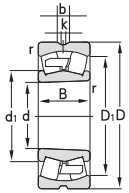
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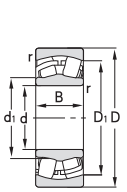
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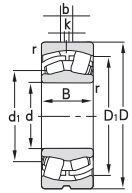
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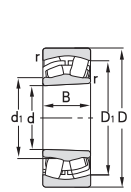
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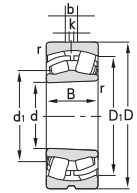
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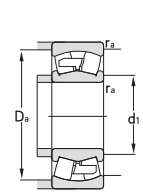
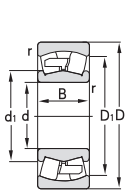


基本尺寸 Basic Size				其它尺寸 Other Sizes				极限转速 Limit Speed		原代号 Original Code		现代号 Current Code		接触面与倒角装配尺寸 Size of Contract Surface & Chamfer Fixing			基本额定负荷 Basic Rated Load		重量 Weight
d	D	B	rmin	d1	D1	b	k	脂润滑 Grease	油润滑 Oil					damin	Damin	ramax	动 Cr	静 Cor	
mm				mm				r/min						mm			KN		kg
420	620	150	5	484	558			450	560	3053184	3053184W2	23084CA	23084CAF3	442	598	4	2700	6400	149
	620	150	5	484	558	22	8	450	560	3153184W2	3053184KW2	23084CAKF3	23084CAF3W33	442	598	4	2700	6400	149
	620	200	5	479	548	22.3	12	380	480	4053184K	4053184KW2	24084CA/W33	24084CAF3/W33	442	598	4	3350	8450	202
	620	200	5	479	548	22.3	12	380	480	4453184KW2		24084CAK30F3/W33X		442	598	4	3350	8450	197
	700	224	6	505	605			360	450	3053784W2	3153784	23184CAF3	23184CAK	448	672	5	4250	9200	353
	760	272	7.5	525	643	22	12	320	400	3053284K		23284CA/W33	23284CAF3/C9W33	456	724	6	5610	11900	550
	760	272	7.5	525	643	22	12	320	400	3153284K		23284CAK/W33		456	724	6	5610	11900	549
440	650	157	6	507	585	22.3	8	430	530	3053188W2	3053188KW2	23088CAF3	23088CAF3/W33	468	622	5	2780	6500	185
	650	157	6	507	585			430	530	3153188W2		23088CAKF3		468	622	5	2780	6500	179
	720	226	6	522	626			340	430	3053788		23188CA		468	692	5	4500	10000	378
460	680	163	6	531	613	23.5	12	400	500	3053192KW2	3153192KW2	23092CAF3/W33	23092CAKF3	488	652	5	3450	6950	226
	680	218	6	528	600	24	12	340	430	4053192KW2		24092CAF3/W33		488	652	5	4200	9100	304
	760	240	7.5	557	660	22	8	320	400	3053792W2	3153792KW2	23192CAF3	23192CAKF3/W33	496	724	6	5500	10000	457
	760	300	7.5	540	639	22.3	8	160	200	4053792K		24192CA/W33		496	724	6	6100	14400	459
	830	296	7.5	566	698	22.3	10	300	380	3153292KW2		23292CAKF3/W33		496	794	6	7350	13500	698
480	600	90	3	523	563			450	600			23896CA		500	580	3	1290	4000	60.4
	650	128	5	532	596	16.7	10	400	500	3053996KW1		23996CAF1/W33		502	628	4	2150	5750	125
	790	248	7.5	578	687	22	12	300	380	3053796KW1	3153796KW	23196CAF1/W33	23196CAKF1/W33X	516	754	6	6100	12000	516
	870	310	7.5	581	732			260	340	3153296W2		23296CAKF3		516	834	6	6750	15200	853
500	670	128	5	555	619			400	500	30539/500W1		239/500CAF1		522	648	4	2530	6000	120
	720	167	6	568	653	22.3	8	380	480	30531/500K		230/500CAF3/HAW33X		528	692	5	3150	7650	228
	920	336	7.5	620	774	22.3	12	280	360	30532/500K		232/500CAF3/W33		536	884	6	8600	18600	985
530	780	185	6	614	703	24	12	340	430	30531/530	30531/530K	230/530CA	230/530CA/W33X	558	752	5	3900	9650	339
	780	185	6	614	703	24	12	340	430	30531/530W2	30531/530KW2	230/530CAF3	230/530CAF3/W33X	558	752	5	3900	9650	335
560	750	140	5	621	693			340	430	30539/560W1		239/560CAF1		582	728	4	3050	7200	177
	820	195	6	644	741			320	410	30531/560	30531/560W2	230/560CA	230/560CAF3	588	792	5	4300	10500	363
	820	195	6	644	741	22.3	9	320	410	30531/560KW2		230/500CAF3/W33		588	792	5	4300	10500	360
	920	280	7.5	677	803	22.3	12	240	320	30537/560K	30537/560KW2	231/560CA/W33	231/560CAF3/W33	596	884	6	6900	15700	756
	920	280	7.5	677	803	22.3	12	240	320	31537/560K	31537/560KW2	231/560CAK/W33	231/560CAKF3/W33	596	884	6	6900	15700	745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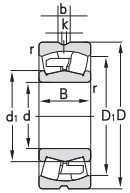
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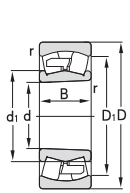
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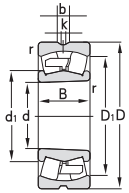
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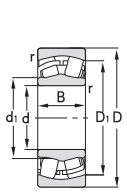
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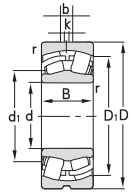
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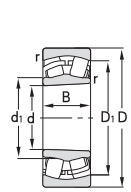
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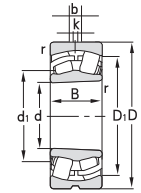
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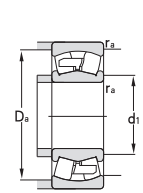
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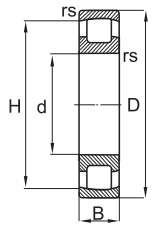
基本尺寸 Basic Size				其它尺寸 Other Sizes				极限转速 Limit Speed		原代号 Original Code		现代号 Current Code		接触面与倒角装配尺寸 Size of Contract Surface & Chamfer Fixing			基本额定负荷 Basic Rated Load		重量 Weight
d	D	B	rmin	d1	D1	b	k	脂润滑 Grease	油润滑 Oil					damin	Damin	ramax	动 Cr	静 Cor	
mm				mm				r/min						mm			KN		kg
600	870	200	6	685	787	22.3	9	300	380	30531/600W2	30531/600KW2	230/600CAF3	230/600CAF3/W33	628	842	5	4700	11600	442
	870	200	6	685	787			300	380	31531/600W2		230/600CAKF3		628	842	5	4700	11600	430
	980	375	7.5	709	827			110	150	40537/600		241/600CA		636	944	6	8800	21600	1140
630	920	212	7.5	721	831			260	340	30531/630W2		230/630CAF3		666	884	6	5150	12800	471
670	980	230	7.5	760	885			240	320	30531/670W2		230/670CAF3		706	944	6	5730	14200	601
750	1090	250	7.5	847	987			200	280	30531/750	30531/750W2	230/750CA	230/750CAF3	786	1054	6	7000	17900	789
800	1150	345	7.5	900	1029			170	220	40531/800W1		240/800CAF1		836	1114	6	10300	24600	1092
850	1220	272	7.5	954	1108	22.3	12	180	240	30531/850W1	30531/850W1	230/850CAF1	230/850CAKF1	886	1184	6	8450	22500	1074
	1220	365	7.5	956	1086			160	200	40531/850K		240/850CAF1/W33X	240/850CAF1/YA1	886	1184	6	10400	29700	1410
1180	1540	272	7.5	1296	1432	24	12	110	150	31539/1180	31539/1180KW1	239/1180CAK	239/1180CAKF1/W33X	1216	1536	8	9350	29600	1350
	1660	355	9.5	1328	1509	24	12	110	150	30531/1180KW1		230/1180CAF1/W33X		1240	1600	6	9350	29600	2460



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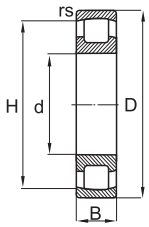

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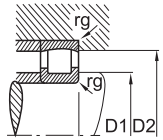

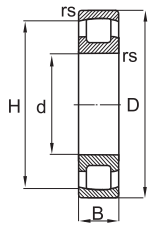

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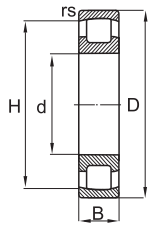

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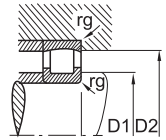


基本尺寸 Basic Size					重量 Weight	基本额定负荷 Basic Rated Load		极限转速 Limit Speed	轴承型号 Bearing Model	安装尺寸 Installation Size		
d	D	B	rs min	H		动 Cr	静 Cor			D1	D2	rg
mm					kg	KN		min⁻¹		mm		
150	270	45	3	238.6	11.7	430		1300	20230MB	164	256	2.5
	270	45	3	238.6	11.6	430		1300	20230K.MB.C3	164	256	2.5
	320	65	4	275.9	26.9	720		1200	20230MB	167	303	3
160	290	48	3	256.6	14.5	500		1200	20232MB	174	276	2.5
	290	48	3	256.6	14.5	500		1200	20232K.MB.C3	174	276	2.5
								1100	23234MB	187	293	3
170	310	52	4	273.1	17.9	570						
								1000	23236MB	197	303	3
180	320	52	4	284.3	18.4	585						
								950	20238MB	207	323	3
190	340	55	4	301.2	22.5	640						
								950	20240MB	217	343	3
200	360	58	4	319	26.7	735						
								850	20244MB	237	383	3
220	400	65	4	353.5	37.4	880						
								750	20248MB	257	423	3
240	440	72	4	388	50.5	1060						
								700	20252MB	280	460	4
260	480	80	5	421.3	68.2	1270						

剖分式调心滚子轴承

剖分式调心滚子轴承主要用于轴承难以安装的地方，例如有多个支承点的长传动轴或曲轴上，也用于维护保养十分困难的整体轴承的场合，特别是更换轴承所需费用十分昂贵的场合或者机械设备不允许停机维修的情况下，剖分式轴承就提供了最好的解决办法。

ZWA已经成功开发了可以随时随地的剖分式轴承，特别是用于连铸设备冷却区域的传动辊道上，铸钢轴承座是用水冷却的，在轴承座顶部有一个小截面的冷却内腔，因为标准设计只允许轴承的一半外圈放置在轴承的底坐上。

设计

剖分式调心滚子轴承主要是根据整体式标准型调心滚子轴承发展起来的，它代表着目前轴承技术发展水平。所有剖分式轴承均为圆柱形孔径，在外圈外径上均有油槽油孔，使润滑更容易进入轴承的空腔内。

两剖分轴承内圈的联结断面与轴承中心线成一夹角，以改善联结后的滚动条件，转动平稳，整套轴承的内、外圈以及保持架均在中心剖分。剖分内圈用螺栓或卡箍联结：

BSR.1—内圈用螺栓联结，两个剖分式保持架组合件，黄铜实体保持架由内圈定位。

BSR.2—内圈两端法兰由两个尚未紧固的剖分式卡箍卡紧，实体保持架由内圈定位。

剖分式轴承外形尺寸尚未标准化。

部分式轴承为自动调心，轴与轴承座允许许角度对准误紧1—1.5°。

Split aligning roller bearing

Split aligning roller bearing is used where difficult to install eg long drive shaft or crank shaft with several bearing points. It is also used where difficult to perform maintenance, and particularly where required cost of replacement is quite expensive or equipment can't be halted for maintenance. In these cases, split bearing can provide best solution.

ZWA have successfully developed split bearing, which can be split at any time. It is specially used for live roller in cooling unit of continuous casting equipment. Cast steel bearing seat is cooled via water and a small bore cooling cavity seats on the top of bearing seat because standard design allows half of outer ring seating on bearing seat.

Design

Split self—aligning roller bearing is developed on the basis of integral standard self—aligning roller bearing, which represents current technical development level. All split bearing has cylindrical bore. Oil tank and oil hole are equipped for outer ring and outer diameter, which makes lubricant easy to flow inside cavity.

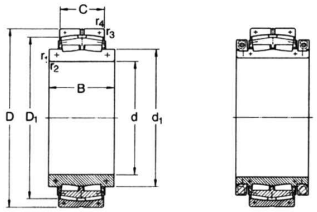
Coupling section of two split bearing inner ring forms included angle to central line of bearing in order to improve rolling condition after being coupled and rotate stably. Inner/outer ring and cage of complete set of bearing is split centrally. Split inner ring is coupled by using bolt or clip.

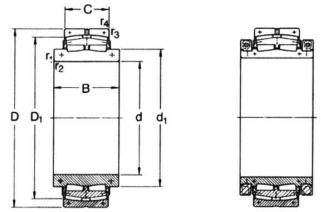
BSR。1—inner ring is coupled via bolt, two split cage assembly and brass cage is positioned via inner ring.

BSR。2—flanges at two ends of inner ring are clipped via two split clips, which have not been fastened yet. Cage is positioned via inner ring.

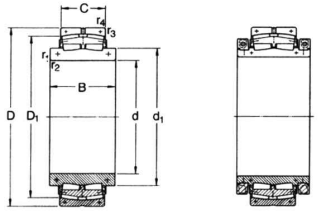
External shape of split bearing is not yet standardized.

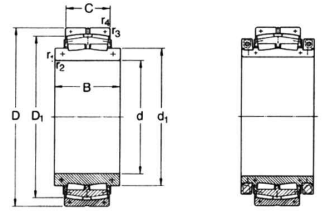
Split bearing is self—aligning. Angular alignment tolerance1 of shaft to bearing seat is 1 through 1.5°.



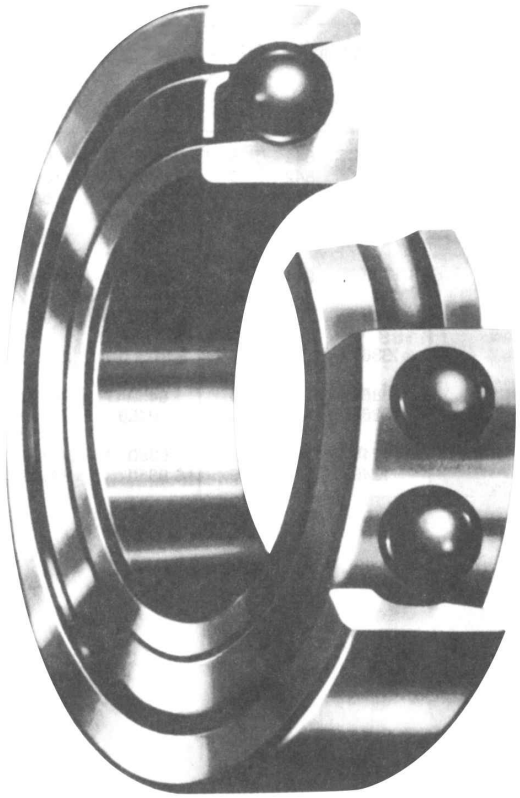


基本尺寸 Basic Size				基本额定负荷 Basic Rated Load		重量 Weight	设计形式 Design Form	尺寸 Size					计算系数 Calculation Coefficient				国外轴型号 Foreign Shaft Model
d	D	B	C	动 Cr	静 Cor			d	d1	D1	r12min	r34min	e	Y1	Y2	Y3	SKF
mm				KN		kg		mm									
120	200	142	80	552	900	17.0	1	120	166	169	11X45°	2	0.37	1.8	2.7	1.8	BS2B321598
140	230	102	53	368	600	14.0	1	140	180	190	2	2	0.22	3	4.6	2.8	BS2B321606
148	225	142	75	535	950	14.0	1	148	180	197	2.1	2.1	0.30	2.3	3.4	2.2	BS2B321578
180	300	125	74	713	1200	30.0	1	180	220	248	2.1	2.1	0.24	2.8	4.2	2.8	BS2B321610
280	500	260	176	2710	4650	175	2	280	419	439	5	5	0.35	1.9	2.9	1.9	BS2B247534
300	500	260	176	2710	4650	175	2	300	418	434	5	5	0.30	2.3	3.4	2.2	BS2B247597
360	540	220	134	2250	4500	155	2	360	476	482	5	5	0.23	2.9	4.4	2.8	BS2B247307
400	600	240	148	2880	5850	205	2	400	522	541	5	5	0.23	2.9	4.4	2.8	BS2B243256
420	620	238	150	2880	5850	215	2	420	542	562	6	6	0.22	3	4.6	2.8	BS2B243485
460	700	245	165	3280	6550	340	2	460	604	635	6	6	0.21	3.2	4.8	3.2	BS2B243120
470	720	270	167	3570	7500	375	2	470	646	656	6	6	0.21	3.2	4.8	3.2	BS2B242975D
560	800	230	150	3340	8150	320	1	560	669	742	5	5	0.17	4	5.9	4	BS2B247590
	870	330	200	5060	11000	580	2		733	786	6	6	0.22	3	4.6	2.8	BS2B247087
600	920	310	212	5640	12000	690	2	600	798	837	9.5	7.5	0.21	3.2	4.8	3.2	BS2B243123
	980	515	375	10400	21600	1350	2		811	833	7.5	7.5	0.35	1.9	2.9	1.8	BS2B243266
630	920	310	212	5640	12000	630	2	630	798	837	7.5	7.5	0.21	3.2	4.8	3.2	BS2B242989
670	980	350	230	6440	14000	800	2	670	860	890	7.5	7.5	0.21	3.2	4.8	3.2	BS2B242994
710	950	375	243	5750	15300	700	2	710	860	868	6	6	0.22	3	4.6	2.8	BS2B243122

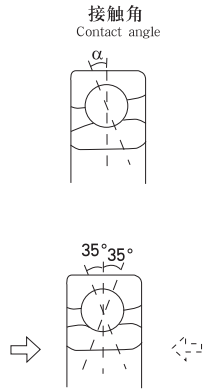




基本尺寸 Basic Size				基本额定负荷 Basic Rated Load		重量 Weight	设计形式 Design Form	尺寸 Size					计算系数 Calculation Coefficient				国外轴型号 Foreign Shaft Model
d	D	B	C	动 Cr	静 Cor			d	d1	D1	r12min	r34min	e	Y1	Y2	Y3	SKF
mm				KN		kg		mm									
710	1030	360	236	7020	15600	880	2	710	901	939	7.5	7.5	0.21	3.2	4.8	3.2	BS2B247181
750	1000	360	250	6330	17000	710	2	750	900	916	6	6	0.22	3	4.6	2.8	BS2B247181
	1090	475	335	9950	24000	1300	2		935	969	6	6	0.22	3	4.6	2.8	BS2B243127
800	1060	370	258	6900	18600	810	2	800	955	968	6	6	0.21	3.2	4.8	3.2	BS2B243262
850	1120	390	272	7360	20800	830	2	850	1008	1028	6	6	0.22	3	4.6	2.8	BS2B243124
	1180	331	206	6440	17000	880	2		1070	1100	6	6	0.15	4.5	6.7	4.5	BSR-8001
	1280	430	280	10100	23200	1550	2		1120	1177	7.5	7.5	0.20	3.4	5	3.2	BSR-8000
	1280	540	375	12400	31000	2350	2		1123	1147	7.5	7.5	0.26	2.6	3.9	2.5	BS2B243268
900	1180	400	280	8170	22800	1100	2	900	1058	1086	6	6	0.21	3.2	4.8	3.2	BS2B243268
950	1250	420	300	8970	25500	1300	2	950	1130	1150	7.5	7.5	0.21	3.2	4.8	3.2	BS2B243114
1020	1280	352	218	5980	19600	950	2	1020	1192	1210	6	6	0.14	4.8	7.2	4.5	BS2-8001



角接触球轴承



具有接触角的角接触球轴承适用于高速及高精度旋转，并可承受合成负荷。

■单列及组合角接触球轴承

标准的接触角为15°、25°、和40°，分别后置辅助代号“c”、“AC”和“B”。

接触角越大轴向负荷能力也越大，接触面越小，越有利于高速旋转。

使用角接触球轴承时大多施加预紧，以提高轴承的刚性和旋转精度。

该类轴承在承受径向负荷时会产生轴向分力，因此应将两个轴承正面或背面配置（或组合） 使用。

■双列角接触球轴承

结构上的背面组合的两个单列角接触球轴承只用内圈与外圈。

■四点接触球轴承

标准结构为内圈轴向等分并具有35°接触角，适用于承受纯轴向负荷或轴向负荷成份较大的合成负荷。

单个轴承可承受双向轴向负荷与一定程度的径向负荷，根据轴向负荷的方向不同，套圈与球总在左右任一接触线上的两点接触。

使用四点接触球轴承时，充分分析轴承负荷等使用条件，请与ZWA联系。

Angular contact ball bearing

Angular contact ball bearing with contact angle is applicable to high speed and high precision rotary, which can bear combined load.

■ Single row and combined angular contact ball bearing

Standard contact angle is 150,250 and 400 respectively configuring in post position with code “C”, “AC” and “B ”.

The more contact angle is, the larger axial load bearing capacity is, the smaller contact surface is, the much more convenient high speed rotary is.

Pretension is made on angular contact ball bearing to increase rigidity and accuracy of bearing.

This bearing creates axial thrust load when being forced by radial load, thus it is configured (or combined) face to face or back to back.

■ Double row angular contact ball bearing

When configured back to back, bearings are composed of inner ring and outer ring only.

■ Four point contact ball bearing

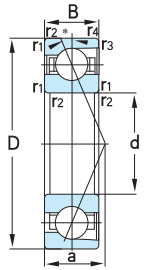
Standard structure is that its inner ring is equally divided in axial direction ,which is applicable to axial load or combined load , among which axial load is major composition.

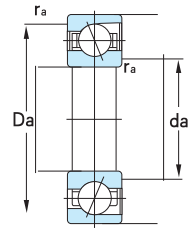
Single bearing can bear double row axial load and certain extent radial load。According to different direction of axial load, ring and sphere always contact at two points of linear line.

When four point contact bearing is used, please contact with ZWA for analysis of operating conditions including bearing load.

注：7000C型 （α=15° ）
70000AC型（α=25° ）
70000B型（α=40° ）

Note:7000C Type （a=15° ）
70000AC Type (a=25°)
70000B Type （a=40° ）

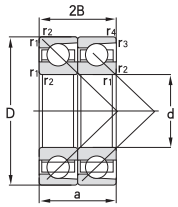




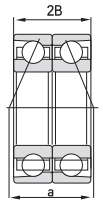
基本尺寸 Basic Size						轴承型号 Bearing Model		重量	内径	基本额定负荷 Basic Rated Load		极限转速 Limit Speed		计算系数 Calculation Coefficient			
d	D	B	r1,2min	r3,4min	a			Weight	Inner Diameter d	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	e	X	Y	Ya
mm						新 New	旧 Old	kg	mm	KN		r/min					
150	225	35	2.1	1.1	96	7030AC	46130	4.7	150	137	154	1900	2800	1.14	0.38	0.57	0.26
160	240	38	2.1	1.1	103	7032AC	46132	5.8	160	155	176	1800	2600	1.14	0.38	0.57	0.26
170	260	42	2.1	1.1	111	7034AC	46134	7.7	170	177	238	1700	2400	1.14	0.38	0.57	0.26
180	280	46	2.1	1.1	119	7036AC	46136	10	180	207	252	1600	2200	1.14	0.38	0.57	0.26
190	290	46	2.1	1.1	124	7038A C	46138	10.5	190	221	274	1600	2200	1.14	0.38	0.57	0.26
200	310	51	2.1	1.1	134	7040AC	46140	14.3	200	240	310	1600	2200	1.14	0.38	0.57	0.26
380	520	65	4	1	222	466953		43.5	380	345	610	800	1100	1.14	0.35	0.57	0.26

成对双联角接触球轴承

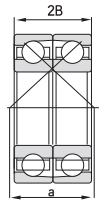
Back-to-back Duplex Angular Contact Ball Bearing



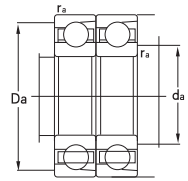
DT结构
DT Structure



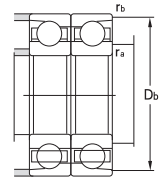
DB结构
DB Structure



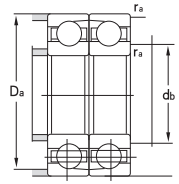
DF结构
DF Structure



DT结构
DT Structure



DB结构
DB Structure



DF结构
DF Structure

基本尺寸 Basic Size					基本额定负荷 Basic Rated Load		极限转速 Limit Speed		原型号 Original Model	现型号 Current Model	作用点 Application Point			安装相关尺寸 Related Installation Size						重量 Weight
d	D	2B	r12min	r34min	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil			背面组合 Back combination	正面组合 Front combination	串联组合 Combination in series	damin		Damax	dbmin	Dbmax	ramax	rbmax	
mm					KN		r/min				a			mm							kg
150	320	130	4	4	448	857	2600	3600	346330	7330AC/DF		45.3		168		302	-	311	3	1.5	51.6
	320	130	4	4	448	856	2600	3600	366330	7330B/DF		44.6		168		302	-	311	3	1.5	52.3
160	240	76	2.1	1.1	173	315	3100	4100	K266132	7032BM/DB				172		228	-	233	2	1	12.6
	340	136	4	4	421	819	2000	3000	366332K	7332B/DF	205.8	141.8		178		322	-	331	3	1.5	61.6
170	310	104	4	1.5	355	685	2900	3900	746234	B7234AC/DT			82	188		292	-	301	3	1.5	34.8
190	290	92	2.1	1.1	267	526	2600	3400	446138J	7038AC/DT			79	202		278	-	283	2	1	21.4
200	360	116	4	4	430	924	2200	3000	346240J	7240AC/DF		72.6		218		342	-	351	3	1.5	50.3
	360	116	4	1.5	387	834	2200	3000	266240	7240B/DB				218		342	-	351	3	1.5	51.6
	360	116	4	4	453	974	2200	3000	336240J	7240C/DF	292.9	17		218		342	-	351	3	1.5	50.3
	360	116	4	4	560	920	2200	3000	346240J	7240AC/DF		-105		218		342	-	351	3	1.5	50.3
240	370	112	3	3					366748K	366748K		-49.4		254		356	-	363	2.5	2.5	48.70
380	480	92	2.1	1.1	276	730				71876B/DB	601			392		468	-	473	2	1	37.2

双内圈双列角接触球轴承

在恶劣条件下，如转速极高或运行温度高时，内圈可能会可能会漏出润滑脂。若轴承配置不允许漏脂，应采取特殊设计措施。

尺寸

表中所列双内圈双列角接接触球轴承的基本尺寸与ISO15—1981相符，但轴承3200型的宽度数值例外。

角度对准误差

双内圈双列角接触球轴承外圈相对于内圈的角度对准误差会导致球和滚道的额外应力，由此增加的负荷会缩短轴承寿命。

公差

ZWA标准双内圈双列角接触球轴承具普通级公差。32系列的小尺寸轴承也有较高精度的产品（公差等级P6和P5），但订货前应先核实。

内部游隙

ZWA标准双内圈双列角接触球轴承具普通级轴向游隙。但对大多数尺寸的轴承，ZWA可以提供比普通级大或小的内部游隙。其数值适用于安装前零负荷的轴承。

保持架

ZWA标准双列角接触球轴承配备的保持架形式多为黄铜保持架。

玻璃纤维增强尼龙66保持架可用于大多数应用场合，运行温度可高达120℃。对需在极高温或恶劣条件下连续运行的轴承配置，可用冲压钢制保持架。若需非标准保持架轴承，订货前应核实，有关保持架耐高温及其性能等请参阅“轴承用材料及要求”一节。

Double inner ring double row angular contact ball bearing

In severe condition such as high speed or high working temperature, its inner ring could leak lubricant. If bearing configuration doesn’ t allow to leak lubricant, special design measures shall be taken.

Dimension

Main dimension of double—inner—ring double—row angular contact ball bearing listed in bearing table shall accord to ISO15—1981 except for width of bearing 3200.

Angular alignment tolerance

In relation to angular alignment tolerance of inner ring, outer ring of this bearing leads to additional stress onto spherical and raceway, which brings additional load and thus shorten service life of bearing.

Tolerance

ZWA standard double inner ring double row angular contact ball bearing is of common tolerance。32 series small—sized bearing is of high precise product (Tolerance level ;P6 and P5) .Please specify and confirm this before ordering.

Internal clearance

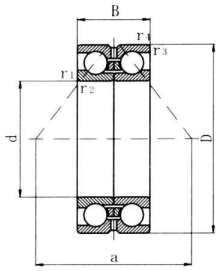
ZWA standard double inner ring double row angular contact ball bearing has common axial clearance. For major bearings, ZWA can provide bearings, internal clearance of which is greater or smaller than common level. This value is applicable to load—free bearing prior to installation.

Cage

Cage equipped for ZWA standard double row angular contact ball bearing is of brass normally. Glass fibre reinforced nylon—66 cage can be used for major application. Its working temperature is 1200C. Bearing configuration requiring bearing to work in extremely high temperature or severe condition, punching press cage can be used. If non—standard cage is needed to hold bearing, please specify and confirm it before ordering. Please refer to Bearing Material and Requirement for high temperature resistant and performance of cage.

双列角接触球轴承

Double inner ring double row angular contact ball bearing



当量动载荷
当Fa/Fr≤e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=XFr+Y2Fa

Equivalent dynamic load
Where Fa/Fr≤e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=XFr+Y2Fa

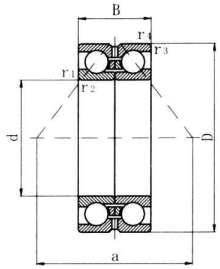
当量静载荷
Por=Fr+YoFa

Equivalent static load
Por=Fr+YoFa

基本尺寸 Basic Size						轴承型 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	极限转速 Limit Speed		重量	计算系数 Calculation Coefficient					参考型号 Reference Model
d	D	B	a	r1,2min	r3,4min	新 New	旧 Old	动 Cr	静 Cor	d	脂润滑 Grease	油润滑 Oil	Weight	e	X	Y1	Y2	Y3	SKF
mm								KN		mm	r/min		kg						
150	225	70	161	2.1	2.1		86830	222	305	150	1600	2200	10.0	1.14	0.57	0.55	0.93	0.52	-
	225	73	162	2.1	2.1	4030X2	86730	199	275		1600	2200	9.5	1.14	0.57	0.55	0.93	0.52	305286D
	225	75	163	2.1	2.1	4030	4086130	199	204		1600	2200	9.4	1.14	0.57	0.55	0.93	0.52	-
160	240	58	163	2	2		4086132K	234	245	160	1500	2000	9.6	1.14	0.57	0.55	0.93	0.52	-
	240	76	172	2.1	2.1	4032X2		234	335		1500	2000	11	1.14	0.57	0.55	0.93	0.52	305183
	240	80	174	2.1	2.1	4032	4086132	367	327		1500	2000	11.9	1.14	0.57	0.55	0.93	0.52	-
170	260	84	185	2	2	4034X2		281	405	170	1400	1900	15	1.14	0.57	0.55	0.93	0.52	305180
	260	90	188	2.1	2.1	4034	4086134	281	405		1400	1900	17.5	1.14	0.57	0.55	0.93	0.52	-
180	259.5	66	109	2.1	2.1	4936X3	86736	265	400	180	1400	1900	11	0.86	0.62	0.73	1.17	0.63	305262D
	280	92	122	2.1	2.1	4036X2	4086136K	320	480		1300	1800	21.9	1.14	0.57	0.55	0.93	0.53	3057172B
	280	100	126	2.1	2.1	4036	4086136	320	480		1300	1800	25.3	1.14	0.57	0.55	0.93	0.52	-
190	269.5	66	113	2.1	2.1	4938	86738	270	415	190	1300	1800	11	0.86	0.62	0.73	1.17	0.63	305338DA
	290	92	126	2.1	2.1	4038X2		325	510		1200	1700	20.5	1.14	0.57	0.55	0.93	0.52	305178
	290	100	130	2.1	2.1	4038	4086138	325	510		1200	1700	24	1.14	0.57	0.55	0.93	0.52	-
200	279.5	76	206	2.1	2.1	4940X3	86740	242	380	200	1200	1700	13	1.14	0.57	0.55	0.93	0.52	305428D
	289.5	76	206	2.1	2.1		86840	302	475		1200	1700	15.5	0.86	0.62	0.73	1.17	0.63	305263DA
	310	96	216	2.1	2.1	4040X2		358	560		1100	1600	25.5	1.14	0.57	0.55	0.93	0.52	305352
	310	109	222	2.1	2.1	4040	4086140	358	560		1100	1600	29.2	1.14	0.57	0.55	0.93	0.52	-
220	309.5	76	223	3	3	4944X3	86744	312	520	220	1000	1500	17	0.86	0.62	0.73	0.63	0.63	305272DA
	340	118	244	3	3	4044	4086144	330	560		1000	1500	36.7	0.86	0.62	0.73	0.63	0.63	-

双列角接触球轴承

Double inner ring double row angular contact ball bearing



Equivalent dynamic load
Where Fa/Fr≤e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=XFr+Y2Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						轴承型 Bearing Model		基本额定负荷 Basic Rated Load		内径 Inner Diameter	极限转速 Limit Speed		重量	计算系数 Calculation Coefficient					参考型号 Reference Model
d	D	B	a	r1,2min	r3,4min			动 Cr	静 Cor		脂润滑 Grease	油润滑 Oil	Weight	e	X	Y1	Y2	Y3	SKF
mm						新 New	旧 Old	KN		mm	r/min		kg						
230	329.5	80	273	3	3	4946X1	86746	351	600	230	950	1400	21	0.86	0.62	0.73	1.17	0.63	305264DA
240	359.5	118	260	3	3		4086148K	425	650	240	900	1300	39.4	1.14	0.57	0.55	0.93	0.52	-
	360	118	260	3	3	4048	4086148	425	650		900	1300	40	1.14	0.57	0.55	0.55	0.52	-
	370	112	257	3	3	4048X3	86748K	460	680		900	1300	41	0.86	0.62	0.73	1.17	0.63	-
	440	114	258	3	3	3248X2	86748	530	750		900	1300	48.5	0.83	0.62	0.73	1.17	0.63	-
260	369.5	92	264	3	3	4952X3	86752	397	710	260	850	1200	30	0.86	0.62	0.73	1.17	0.63	305270D
	400	130	283	4	4	4052X2		436	735		850	1200	31	0.86	0.62	0.73	1.17	0.63	-
	400	140	288	4	4	4052	4086152	436	735		850	1200	55.8	1.14	0.57	0.55	0.93	0.52	-
280	389.5	92	281	4	4	4956X3	86756K	403	750	280	850	1200	31.5	0.86	0.62	0.73	1.17	0.63	305269D
	390	92	281	4	4		86756	403	750		850	1200	33	0.86	0.62	0.73	1.17	0.63	-
	420	140	305	4	4	4056	4086156	475	830		850	1200	59.2	1.14	0.57	0.73	1.17	0.63	-
300	460	160	332	4	4	4060	4086160	485	860	300	800	1100	66	1.14	0.57	0.55	0.93	0.52	-
320	459.5	140	339	4	4	4964X3	86764	510	910	320	800	1100	33.5	0.86	0.62	0.73	1.17	0.63	-
	480	160	349	4	4	4064	4086164	520	925		800	1100	75	1.14	0.57	0.55	0.93	0.52	-
340	520	180	375	5	5	4068	4086168	610	1040	340	750	1000	103.8	1.14	0.57	0.55	0.93	0.52	-

四点接触球轴承

定位槽

四点接触球轴承主要用于承受轴向负荷，在许多应用场合都用作具一定径向间隙的推力轴承装在轧辊轴承箱内及轴向定位。为了方便定位并防止外圈旋转，外径大于或等于160mm的四点接触球轴承根据用户要求外圈上应有二个定位槽(N2设计)。定位槽尺寸可查图。

其它四点接触球轴承

除轴承表中所列轴承外，ZWA也生产其它四点接触球轴承。用户需要这些轴承时请咨询ZWA技术服务部门。

尺寸

表中所列四点接触球轴承的主要尺寸与ISO015—1981相符。

角度准误差

四点接触球轴承只能承受有限的内外圈角度准误差。决定允许角度误差值各系数之间的关系与单列深沟球轴承的情形一样复杂。必须记住任何角度误差都会使轴承噪音明显增加。

若四点接触球轴承作为推力轴承与其它径向轴承组合，在轴承箱中安装时需留有径向游 隙 ，且外圈与内圈之间不允许有角度对准误差。

Four point contact ball bearing

Positioning groove

Four point contact ball bearing is mainly used to bear axial load. In many applications, it is used for thrust bearing with certain radial clearance and equipped in roll box for axial positioning. In order to position conveniently and prevent outer ring from rotating, four point contact ball bearing, whose outer diameter is equal to or greater than 160mm, shall equip two positioning grooves (N2 design) on its outer ring. Please refer to drawing for positioning groove dimension.

Other kind of four point contact ball bearing

Besides bearing listed in bearing table, ZWA also manufacture other types of four point contact ball bearing。Please consult with ZWA technical service department when you need those types of bearing.

Dimension

Main dimension of four point contact ball bearing listed in the bearing table shall be consistent with ISO015—1981.

Angular alignment tolerance

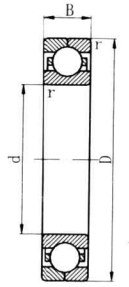
Four point contact ball bearing can only bar limited angular alignment tolerance in its outer ring. Relations between different factors determining angular alignment tolerance is quite complicated, which is just same as single row deep groove ball bearing. Remind: any angular alignment tolerance could lead to increase of noisy level.

If four point contact ball bearing works as thrust bearing combined with other radial bearing, radial clearance shall be considered during installation and no angular alignment tolerance is permitted between its outer ring and inner ring.

外径 Outer diameter D 超过 Over	到 Up to	QJ2系列尺寸 QJ2seriesDimension b	h	r_o	QJ3系列尺寸 QJ3seriesDimension b	h	r_o
mm		mm					
–	170	6.5	8.1	1	8.5	10.1	2
170	210	8.5	10.1	2	10.5	11.7	2
210	270	10.5	11.7	2	10.5	11.7	2
270	400	10.5	12.7	2	10.5	12.7	2

四点接触球轴承

Four point contact ball bearing



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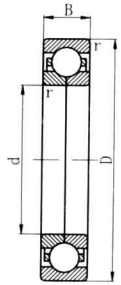


QJ

当量动载荷(接触角为35°)
当Fa/Fr≤0.95 Pr=Fr+Y1Fa
当Fa/Fr>0.95 Pr=XFr+Y2Fa

当量静载荷(接触角为35°)
Por=Fr+Y0Fa
当四点接触球轴承与其它径向轴承联合安装作为推力轴承受轴向载荷时，轴承必须与轴承壳体间有一定的间隙，其当量动载荷为Pr=1.07Fa

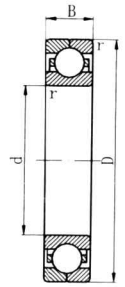
Equivalent dynamic load (with the contact angle at 35°)
Where Fa/Fr≤0.95 Pr=Fr+Y1Fa
Where Fa/Fr>0.95 Pr=XFr+Y2Fa
Equivalent static load(with the contact angle at 35°)
Por=Fr+Y0Fa

When the four-point ball bearing is installed jointly with other radial bearings as thrust bearing that carries the radial load, there must be certain space between the bearing and the bearing shell, of which the equivalent dynamic load is Pr=1.07Fa.

基本尺寸 Basic Size				轴承型号 Bearing Model				重量 Weight	内径 Inner Diameter	基本额定负荷 Basic Rated Load		极限转速 Limit Speed		计算系数 Calculation Coefficient				
d	D	B	rmin						d	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	e	X	Y1	Y2	Y0
mm				新 New		旧 Old		kg	mm	KN		r/min						
200	309.5	51	2.1	QJ1040X1	QJF1040X1	176740	116740	14.5	200	351	558	1500	2000	0.95	0.60	0.66	1.07	0.58
	310	51	2.1	QJ1040	QJF1040	176140	116140	15		351	558	1500	2000	0.95	0.60	0.66	1.07	0.58
	360	58	4	QJ240	QJF240	176240	116240	28.5		456	765	1300	1800	0.95	0.60	0.66	1.07	0.58
220	339.5	56	3	QJ1044X1	QJF1044X1	176744	116744	19	200	398	675	1300	1800	0.95	0.60	0.66	1.07	0.58
	340	56	3	QJ1044	QJF1044	176144	116144	19.5		398	675	1300	1800	0.95	0.60	0.66	1.07	0.58
	400	65	4	QJ244	QJF244	176244	116244	39.5		498	882	1100	1600	0.95	0.60	0.66	1.07	0.58
240	359.5	56	3	QJ1048X1	QJF1048X1	176748	116748	20.5	240	404	702	1200	1700	0.95	0.60	0.66	1.07	0.58
	360	56	3	QJ1048	QJF1048	176148	116148	21		404	702	1200	1700	0.95	0.60	0.66	1.07	0.58
	440	72	4	QJ248	QJF248	176248	116248	53		585	1080	1000	1500	0.95	0.60	0.66	1.07	0.58
260	399.5	65	4	QJ1052X1	QJF1052X1	176752	116752	31	260	486	900	1000	1500	0.95	0.60	0.66	1.07	0.58
	400	65	4	QJ1052	QJF1052	176152	116152	31.5		486	900	1000	1500	0.95	0.60	0.66	1.07	0.58
	480	80	5	QJ252	QJF252	176252	116252	68		655	1287	900	1300	0.95	0.60	0.66	1.07	0.58
280	419.5	65	4	QJ1056X1	QJF1056X1	176752	116752	33	280	498	954	950	1400	0.95	0.60	0.66	1.07	0.58
	420	65	4	QJ1056	QJF1056	176156	116156	33.5		498	954	950	1400	0.95	0.60	0.66	1.07	0.58
300	459.5	74	4	QJ1060X1	QJF1060X1	176760	116760	47	300	585	1206	900	1300	0.95	0.60	0.66	1.07	0.58
	460	74	4	QJ1060	QJF1060	176164	116160	47.5		585	1206	900	1300	0.95	0.60	0.66	1.07	0.58
320	479.5	74	4	QJ1064X1	QJF1064X1	176764	116764	49	320	597	1260	850	1200	0.95	0.60	0.66	1.07	0.58
	480	74	4	QJH1064	QJF1064	176164	116164	50		597	1260	850	1200	0.95	0.60	0.66	1.07	0.58
340	519.5	82	5	QJ1068X1	QJF1068X1	176768	116768	66.5	340	702	1530	800	1100	0.95	0.60	0.66	1.07	0.58
	520	82	5	QJ1068	QJF1068	176168	116168	67.5		702	1530	800	1100	0.95	0.60	0.66	1.07	0.58
360	539.5	82	5	QJ1072X1	QJF1072X1	176722	116772	69	360	714	1620	800	1100	0.95	0.60	0.66	1.07	0.58
	540	82	5	QJ1072	QJF1072	176172	116172	70.5		714	1620	800	1100	0.95	0.60	0.66	1.07	0.58
380	559.5	82	5	QJ1076X1	QJF1076X1	176776	116776	72	380	737	1710	750	1000	0.95	0.60	0.66	1.07	0.58
	560	82	5	QJ1076	QJF1076	176176	116176	73.5		737	1710	750	1000	0.95	0.60	0.66	1.07	0.58

四点接触球轴承

Four point contact ball bearing



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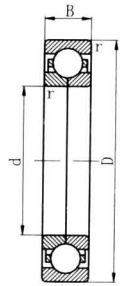

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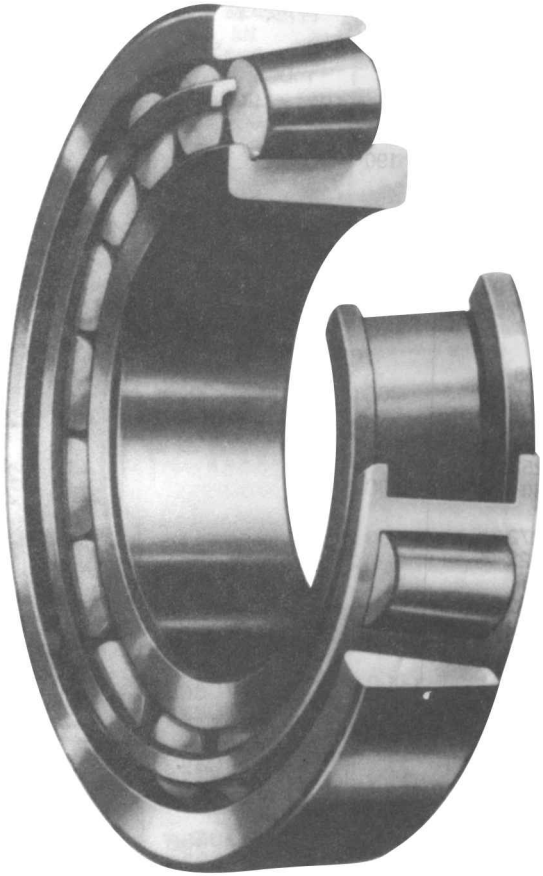
当量动载荷(接触角为35°)
当Fa/Fr≤0.95　Pr=Fr+Y1Fa
当Fa/Fr>0.95　Pr=XFr+Y2Fa

当量静载荷(接触角为35°)
Por=Fr+Y0Fa
当四点接触球轴承与其它径向轴承联合安装作为推力轴承受轴向载荷时，轴承必须与轴承壳体间有一定的间隙，其当量动载荷为Pr=1.07Fa

基本尺寸 Basic Size				轴承型号 Bearing Model				重量 Weight	内径 Inner Diameter	基本额定负荷 Basic Rated Load		极限转速 Limit Speed		计算系数 Calculation Coefficient				
d	D	B	rmin						d	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	e	X	Y1	Y2	Y0
mm				新 New		旧 Old		kg	mm	KN		r/min						
400	599.5	90	5	QJ1080X1	QJF1080X1	176780	116780	94	400	814	1944	700	950	0.95	0.60	0.66	1.07	0.58
	600	90	5	QJ1080	QJF1080	176180	116180	95.5		814	1944	700	950	0.95	0.60	0.66	1.07	0.58
420	619.5	90	5	QJ1084X1	QJF1084X1	176784	116784	98	420	831	2052	670	900	0.95	0.60	0.66	1.07	0.58
	620	90	5	QJ1084	QJF1084	176184	116184	99.5		831	2052	670	900	0.95	0.60	0.66	1.07	0.58
440	649.5	94	5	QJ1088X1	QJF1088X1	176788	116788	113	440	896	2250	630	850	0.95	0.60	0.66	1.07	0.58
	650	94	5	QJ1088	QJF1088	176188	116188	115		89	2250	630	850	0.95	0.60	0.66	1.07	0.58
460	680	100	6	QJ1092	QJF1092	176192	116192	130	460	936	2385	600	800	0.95	0.60	0.66	1.07	0.58
480	700	100	6	QJ1096	QJF1096	176196	116196	135	480	954	2520	560	750	0.95	0.60	0.66	1.07	0.58



圆锥滚子轴承

圆锥滚子轴承在设计上使得内圈滚道面、外圈滚道面以及滚子滚动面的各圆锥面的顶点相交于轴承中心线上一点.

除公制系产品外,还有多种英制系列产品，请与“ZWA”联系。

适用于承受重负荷与冲击负荷。

■单列圆锥滚子轴承

可同时承受径向负荷与单向轴向负荷。

该类轴承在承受径向负荷时会产生轴向分力，因此应将两个轴承正面或背面配置（或组合）使用。

按接解角的不同，分为小锥角、中锥角和大锥角三种形式。

■双列圆锥滚子轴承

分外向型和内向型两种。

前者带一个双滚道外圈和两个单滚道内圈，后者带两个单滚道外圈和一个双滚道内圈， 二者均可承受径向负荷与双向轴向负荷。

为使轴承安装后具有所需的内部游隙，内隔圈及外隔圈的尺寸均预先经过修磨。

■四列圆锥滚子轴承

适用于低速及中速轧钢机。

轴承内部游隙预先经过调整，使用方便。

Tapered roller bearing

Tapered roller bearing is designed in such a way that cone apexes of inner ring raceway, outer ring raceway and roller raceway intersects at one point of its central line. Beside metric series products, there are inch series products, which are applicable for heavy load and impact load. For more details, please contact with ZWA.

■Single row tapered roller bearing

It can bear simultaneously radial load and single row axial load.

When carrying radial load, it creates axial thrust load. Thus two bearings are configured (or combined) face to face or back to back.

According to contact angle difference, it is classified into three types: small cone angle, medium cone angle and big cone angle.

■Double row tapered roller bearing

It is classified into two types: capped and open.

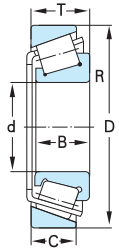
The former equips two raceway outer rings and two single raceway inner rings. The latter equips two raceway outer rings and one double raceway inner ring. Both of them can bear radial load and double row axial load.

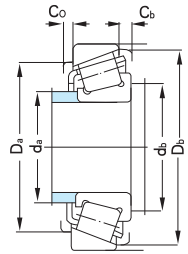
In order to make bearing having required internal clearance after being installed, its inner/outer spacer are thinned previously.

■Four row tapered roller bearing

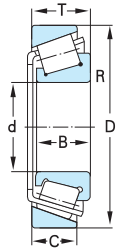
It is applied to low speed and medium speed rolling mill.

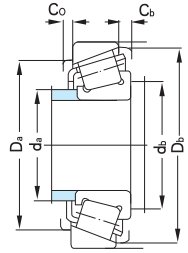
Bearing internal clearance is adjusted , which makes it easier to use.





基本尺寸 Basic Size					R径向(最小) R轴向(最小) r径向(最小) r轴向(最小)				基本额定负荷 Basic Rated Load		极限转速 Limit Speed		原代号 Original Code	现代号 Current Code	安装相关尺寸 Related Installation Size							计算系数 Calculation Coefficient				重量 Weight
d	D	T	B	C	R/radial (min)	R/axial (min)	r/radial (min)	r/axial (min)	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil			damax	dbmin	Damin	Damax	Dbmin	Camin	Cbmin	e	Y	Yo	a	
mm									KN		r/min				mm											kg
150	210	38.5	36	31	2.5	2.5	2	2	199	384	1500	2000	2007930*	2007930*	165	160	191	202	201	9	7.5	0.27	2.2	1.21	33	4.56
	225	48.5	45	38	3	3	2.5	2.5	254	454	950	1400	2007130*	2007130*	164	162	200	213	216	8	13	0.39	1.5	0.85	46	6.84
	270	49	45	38	4	4	3	3	409	606	1300	1800	7230E*	30230*	174	164	234	256	252	9	11	0.44	1.4	0.76	53	11.2
	270	77	73	60	4	4	3	3	669	1142	1200	1700	7530E*	32230*	168	164	223	256	256	4.5	17	0.44	1.4	0.76	64	18.4
	320	72	65	55	5	5	4	4	744	1050	1100	1600	7330E*	30330*	190	165	273	302	294	4.5	17	0.35	1.7	0.96	60	25.5
	320	114	108	90	5	5	4	4	1168	1876	950	1400	7630E*	32330*	190	166	261	307	299	4.5	24	0.35	1.7	0.96	77	42.2
160	220	38.5	36	31	2.5	2.5	2	2	211	400	1500	2000	2007932*	2007932*	175	170	203	212	213	9	7.5	0.27	2.2	1.23	34	3.79
	240	51.5	48	41	3	3	2.5	2.5	343	629	1100	1600	2007132*	2007132*	175	172	213	228	231	8	13	0.37	1.6	0.89	47	7.67
	290	52	48	40	4	4	3	3	466	696	1100	1600	7232E*	30232*	189	174	252	276	271	9	12	0.44	1.4	0.76	57	13.4
	290	84	80	67	4	4	3	3	797	1392	1100	1600	7532E*	32232*	180	174	242	276	276	10	17	0.44	1.4	0.76	70	23.3
	340	88	79	54	3.7	3.7	3.7	3.7	750	1081	1000	1500	27332*	27332*	199	161	265	340	315	4.5	34	0.76	0.8	0.43	100	29.9
	340	121	114	95	5	5	4	4	1400	2230	1000	1500	7632E*	32332*	199	176	274	327	314	4.5	29	0.35	1.7	0.96	81	51.7
	375	87.3	79.4	50.3	4.7	4.7	4.7	4.7	790	1057	1000	1500	7832*	7832*	214	176	295	375	337	4.5	37	0.7	0.9	0.47	98	40.7
170	230	38.5	36	31	2.5	2.5	2	2	214	415	1400	1900	2007934*	2007934*	185	180	213	222	224	9	7.5	0.28	2.1	1.17	36	3.864
	260	57.5	54	46	3	3	2.5	2.5	391	752	1400	1900	2007134*	2007134*	187	182	230	248	249	10	14	0.31	1.9	1.07	47	10.1
	360	128	120	100	3.7	3.7	3.7	3.7	1296	2116	950	1400	7634*	7634*	213	184	288	360	332	4.5	28	0.36	1.7	0.92	87	63.5
180	280	64.5	60	52	3	3	2.5	2.5	473	860	950	1400	2007136*	2007136*	199	192	247	268	267	9	16	0.28	2.2	1.19	53	13
	290	65	63.5	48	2.3	2.3	2.3	2.3	489	920	950	1400	7736*	7736*	207	196	247	290	274	4.5	17	0.44	1.4	0.75	62	15.6
	320	57	52	43	5	5	4	4	537	823	1000	1500	7236E*	30236*	209	198	278	302	300	4.5	14	0.45	1.3	0.73	64	17.8
	320	91	86	71	5	5	4	4	931	1675	950	1400		32236	208	196	264	307	304	10	20	0.45	1.3	0.73	78	32.3
190	260	45.5	42	36	2.5	2.5	2	2	675	1040	1100	1600		32938X2A	205	202	235	252	251	10	9.5	0.38	1.6	0.86	49	6.52
	290	51	46	40	3	3	2.5	2.5	349	610	950	1400	7138*	7138*	215	202	256	281	272	4.5	11	0.38	1.6	0.87	53	10.5
	290	64.5	60	52	3	3	2.5	2.5	473	882	1000	1500	2007138*	2007138*	209	202	257	278	279	10	13	0.37	1.6	0.89	58	15.28
	340	60	55	46	5	5	4	4	675	1040	950	1400		30238	229	206	294	327	317	4.5	14	0.44	1.4	0.76	67	20.6
	340	97	92	75	5	5	4	4	1000	1080	950	1300		32238	214	208	286	322	326	10	22	0.44	1.4	0.76	81	36.1

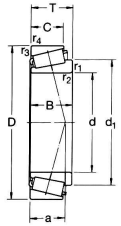


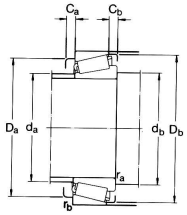


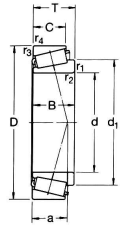
基本尺寸 Basic Size					R径向(最小) R轴向(最小) r径向(最小) r轴向(最小)				基本额定负荷 Basic Rated Load		极限转速 Limit Speed		原代号 Original Code	现代号 Current Code	安装相关尺寸 Related Installation Size							计算系数 Calculation Coefficient				重量 Weight
d	D	T	B	C	R/radial (min)	R/axial (min)	r/radial (min)	r/axial (min)	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil			damax	dbmin	Damin	Damax	Dbmin	Camin	Cbmin	e	Y	Yo	a	
mm									KN		r/min				mm											kg
200	280	51.5	48	41	3	3	2.5	2.5	348	742	1000	1500	2007940K*	32940*	220	212	251	271	270	10	11	0.39	1.5	0.84	54	8.7
	280	51.5	48	41	3	3	2.5	2.5	348	742	1000	1500	2007940*	2007940*	220	212	251	271	270	4.5	11	0.39	1.5	0.84	54	8.86
	310	70.5	66	56	3	3	2.5	2.5	525	1040	950	1400	2007140*	32040*	221	212	273	298	297	11	17	0.39	1.5	0.84	65	18.2
	360	64	58	48	5	5	4	4	710	1098	900	1300	7240E*	30240*	236	218	315	342	338	9	16	0.44	1.4	0.76	70	25.4
	360	104	98	82	5	5	4	4	1235	2144	900	1300	7540E*	32240*	222	218	302	342	342	11	22	0.41	1.5	0.81	84	42.6
220	300	51.5	48	41	3	3	2.5	2.5	354	835	900	1400	2007944*	32944*	310	232	342	291	361	10	11	0.39	1.5	0.84	66	10.1
	340	76.5	72	62	4	4	3	3	709	1336	950	1400	2007144*	32044*	243	234	300	326	326	12	19	0.35	1.7	0.95	67	23.3
	400	72	65	54	5	5	4	4	887	1373	900	1300	7244E*	30244*	256	220	334	382	382	10	18	0.42	1.4	0.79	77	36.8
	400	73	65	54	3.7	3.7	3.7	3.7	780	1181	900	1300	7244*	7244*	256	220	334	382	382	10	19	0.37	1.6	0.88	71	37.6
	400	114	108	90	5	5	4	4	1445	2641	900	1300	7544E*	32244*	256	220	334	382	382	10	24	0.44	1.4	0.76	96	62.7
240	320	51.5	48	41	3	3	2.5	2.5	354	767	900	1300	2007948*	32948*	259	252	331	387	309	10	11	0.32	1.9	1.04	52	10.8
	360	76.5	72	62	4	4	3	3	698	1414	850	1200	2007148*	32048*	261	254	318	346	346	12	19	0.31	1.9	1.05	65	23.8
	360	76	76	57	4	4	3	3	768	1414	850	1200	2007148S*	2007148S*	261	254	318	346	346	12	19	0.31	1.9	1.05	63	24.9
	360	76	76	57	4	4	3	3	768	144	850	1200	2007148SY*	2007148SY*	261	254	318	346	346	12	19	0.31	1.9	1.05	63	24.7
254	422.27	86.1	79.8	66.7	4.7	4.7	2.5	2.5	1011	1762	850	1200	7951*	7951*	297	270	370	413	399	13	19	0.36	1.7	0.90	80	45.4
260	360	64.5	60	52	3	3	2.5	2.5	528	1187	800	1100	2007952*	32952*	286	272	325	351	344	13	13	0.3	2.0	1.09	60	19.2
	400	87.7	82	71	5	5	4	4	912	1835	800	1100	2007152*	32052*	287	278	352	382	383	14	22	0.3	2.0	1.11	71	37.8
	540	114	102	85	6	6	6	6	1760	2727	670	900	7352*	7352*	332	279	449	522	481	10	29	0.32	1.9	1.04	92	113
280	380	64.5	60	52	3	3	2.5	2.5	543	1257	800	1100	2007956*	32956*	305	292	344	371	364	13	13	0.32	1.9	1.03	64	21.3
	420	87.7	82	71	5	5	4	4	987	1975	750	1000	2007156*	32056*	305	298	370	402	402	14	22	0.37	1.6	0.89	83	39.6
300	420	74.5	72	62	4	4	3	3	646	1807	700	950	2007960*	32960*	330	314	379	409	400	13	15	0.28	2.1	1.17	67	30.2
	460	100.7	95	77	5	5	4	4	3850	10200	700	950	2007160*	32060*	329	318	404	442	439	15	26	0.36	1.7	0.90	89	57
320	480	100	100	74	5	5	4	4	1400	2940	630	850		32064	354	336	419	467	463	13	26	0.46	1.3	0.72	104	62.7
360	480	76	76	57	4	4	4	4	879	2222	500	630	2007972E*	32972*	388	374	433	467	468	13	19	0.46	1.3	0.72	97	38.5
400	500	60	57	47	4	4	3	3	421	954	400	500	7880*	7880*	368	414	406	489	430	13	13	0.38	1.6	0.86	77	25.1
420	620	95	90	67	5	5	5	5	1050	2130	380	480	7184*	31084X2	470	436	552	605	586	13	28	0.41	1.5	0.80	111	88.3
760	890	78	75	59	4.7	4.7	4.7	4.7	1241	3519	130	170	78/760*	78/760*	785	776	393	870	870	13	22	0.32	1.9	1.04	71	78.3
900	1280	190	170	135	7.5	7.5	7.5	7.5	5860	14607	95	130	71/900*	71/900*	990	920	1142	1230	1265	13	55	0.44	1.4	0.74	242	71.8

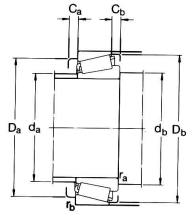
英制单列圆锥滚子轴承

British-system Single-row Tapered Roller Bearing





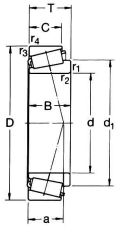
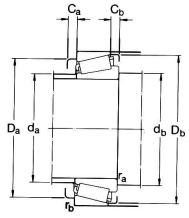
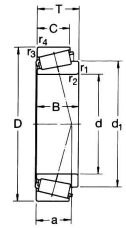
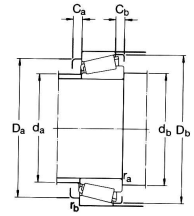




基本尺寸 Basic Size d	D	T	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	疲劳负荷极限 Fatigue Load Limit	额定转速 Rated Speed 参考转速 Reference Speed	极限转速 Limit Speed	质量 Quality	原代号 Original Code	系列 Series	尺寸 Size d	d1 ~	B	C	r1.2 最小 Min	r3.4 最小 Min	a	挡肩及倒角尺寸 Size of Capped Edge and Chamfer da 最大 Max	db 最小 Min	Da 最小 Min	Da 最大 Max	Db 最小 Min	Ca 最小 Min	Cb 最小 Min	ra 最大 Max	rb 最大 Max	计算系数 Calculation Coefficient e	Y	Yo
mm/in			KN		KN	r/min		kg	–	–	mm/in							mm									–		
152,400	222,250	46,830	375	630	62	2200	3000	5.90	*M231649/610/VQ051	M231600	152,400	186	46,830	34,925	3.5	1.5	40	169	165	200	214	210	7	11.5	3	1.5	0.33	1.8	1
6,0000	8,7500	1,8437									6,0000		1,8437	1,3750	0.14	0.06													
158,750	205,583	23,812	138	280	27	2000	3000	1.95	L432348/310	L432300	158,750	182	23,812	18,258	4.8	1.5	33	172	175	194	197	197	5	5.5	4	1.5	0.35	1.7	0.9
6,2500	8,0938	0,9375									6,2500		0,9375	0,7188	0.19	0.06													
	205,583	23,812	138	280	27	2000	3000	1.95	L432349/310	L432300		182	23,812	18,258	1.5	1.5	33	172	167	194	197	197	5	5.5	1.5	1.5	0.35	1.7	0.9
	8,0938	0,9375											0,9375	0,7188	0.06	0.06													
177,800	227,012	30,162	187	425	40	1800	2800	3.00	36990/36920	36900	177,800	203	30,162	23,020	1.5	1.5	43	190	186	212	219	220	5	7	1.5	1.5	0.44	1.35	0.8
7,0000	8,9375	1,1875									7,0000		1,1875	0,9063	0.06	0.06													
178,595	265,112	51,595	495	880	86.5	1700	2400	9.60	M336948/912	M336900	178,595	217	57,150	38,895	3.3	3.3	47	196	191	240	253	251	9	12.5	3	3	0.33	1.8	1
7,0313	10,4375	2,0.13									7,0313		2,2500	1,5313	0.13	0.13													
179,934	265,112	51,595	495	880	86.5	1700	2400	9.40	M336949/912	M336900	179,934	217	57,150	38,895	3.3	3.3	47	196	193	240	253	251	9	12.5	3	3	0.33	1.8	1
7,0840	10,4375	2,0313									7,0840		2,2500	1,5313	0.13	0.13													
187,325	282,575	50,800	402	695	67	1600	2200	9.80	87737/87111	8700	187,325	233	47,625	36,512	3.5	3.3	55	213	201	253	271	267	6	14	3	3	0.43	1.4	0.8
7,3750	11,1250	2,0000									7,3750		1,8750	1,4375	0.14	0.13													
190,475	279,400	52,388	523	980	95	1600	2200	9.50	M239449/410	M239400	190,475	232	57,150	41,275	3.3	3.3	49	211	203	254	265	266	9	11	3	3	0.35	1.7	0.9
7,4990	11,0000	2,0625									7,4990		2,2500	1,6250	0.13	0.13													
190,500	282,575	50,800	402	695	67	1600	2200	9.60	87750/87111	8700	190,500	233	47,625	36,512	3.5	3.3	55	213	205	253	268	267	6	14	3	3	0.43	1.4	0.8
7,5000	11,1250	2,0000									7,5000		1,8750	1,4375	0.14	0.13													
191,237	279,400	52,388	523	980	95	1600	2200	9.20	M239448A/410	M239400	191,237	232	58,738	41,275	3.3	3.3	49	211	204	254	265	266	9	11	3	3	0.35	1.7	0.9
7,5290	11,0000	2,0625									7,5290		2,3125	1,6250	0.13	0.13													
196,850	241,300	23,812	154	315	29	1700	2600	2.00	LL639249/210	LL639200	196,850	217	23,017	17,462	1.5	1.5	41	207	204	232	233	235	5	6	1.5	1.5	0.43	1.4	0.8
7,7500	9,5000	0,9375									7,7500		0,09062	0,6875	0.06	0.06													
	241,300	23,812	154	315	29	1700	2600	2.00	LL639249/2/210/4	LL639200		217	23,017	17,462	1.5	1.5	41	207	204	232	233	235	5	6	1.5	1.5	0.43	1.4	0.8
	9,5000	0,9375											0,9062	0,6875	0.06	0.06													
	257,175	39,688	275	315	58.5	1600	2400	5.30	LM739749/710/VE174	LM739700		229	39,688	30,162	3.5	3.3	50	236	210	236	245	247	8	9.5	3	3	0.44	1.35	0.8
	10,1250	1,5625											1,5625	1,1875	0.14	0.13													
200,025	276,225	42,862	450	780	72	1700	2200	7.70	*LM241147/110/QVQ051	LM241100	200,025	237	46,038	34,133	3.5	3.3	45	220	213	257	261	265	6	8.5	3	3	0.31	1.9	1.1
7,8750	10,8750	1,6875									7,8750		1,8125	1,3438	0.14	0.13													
203,987	276,225	42,862	450	780	72	1700	2200	7.25	*LM241148/110/QVQ051	LM241100	203,987	237	46,038	34,133	3.5	3.3	45	220	217	257	261	265	6	8.5	3		0.31	1.9	1.1
8,0310	10,8750	1,6875									8,0310		1,8125	1,3438	0.14	0.13													

英制单列圆锥滚子轴承

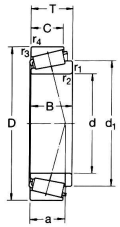
British-system Single-row Tapered Roller Bearing

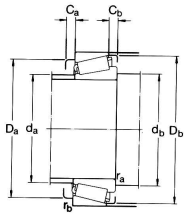





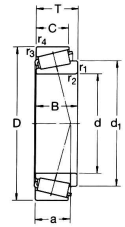
基本尺寸 Basic Size d	D	T	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	疲劳负荷极限 Fatigue Load Limit	额定转速 Rated Speed 参考转速 Reference Speed	极限转速 Limit Speed	质量 Quality	原代号 Original Code	系列 Series	尺寸 Size d	d1 ~	B	C	r1.2 最小 Min	r3.4 最小 Min	a	挡肩及倒角尺寸 Size of Capped Edge and Chamfer da 最大 Max	db 最小 Min	Da 最小 Min	Da 最大 Max	Db 最小 Min	Ca 最小 Min	Cb 最小 Min	ra 最大 Max	rb 最大 Max	计算系数 Calculation Coefficient e	Y	Yo
mm/in			KN		KN	r/min		kg	–	–	mm/in																–		
206,375	282,575	46,038	380	830	76.5	1500	2200	8.60	67985/67920/HA3VQ117	67900	206,375	247	46,038	36,512	3.5	3.3	62	222	220	254	268	272	8	9.5	3	3	0.5	1.2	0.7
8,1250	11,1250	1,8125									8,1250		1,8125	1,4375	0.14	0.13													
215,900	285,750	46,038	380	850	76.5	1500	2200	7.90	LM742794/710/VE174	LM742700	215,900	253	46,038	34,924	3.5	3.3	60	230	229	261	271	277	7	11	3	3	0.48	1.25	0.7
8,5000	11,1250	1,8125									8,5000		1,8125	1,3750	0.14	0.13													
216,408	285,750	46,038	380	850	76.5	1500	2200	7.85	LM742747/710	LM742700	216,713	253	49,212	34,924	3.5	3.3	60	230	230	261	271	277	7	11	3	3	0.48	1.25	0.7
8,5200	11,2500	1,8125									8,5200		1,9375	1,3750	0.14	0.13													
216,713	285,750	46,038	380	850	76.5	1500	2200	7.85	LM742747A/710	LM742700	216,713	253	49,212	34,924	3.5	3.3	60	230	230	261	271	277	7	11	3	3	0.48	1.25	0.7
8,5320	11,2500	1,8125									8,5320		1,9375	1,3750	0.14	0.13													
230,188	317,500	47,625	523	980	90	1300	2000	10.5	LM245846/810	LM245800	230,188	268	52,388	36,512	3.3	3.3	49	249	243	296	303	304	8	11	3	3	0.31	1.9	1.1
9,0625	12,5000	1,8750									9,0625		2,0625	1,4375	0.13	0.13													
231,775	300,038	33,338	216	425	39	1400	2000	5.30	544091/2B/544118A/2B	544000	231,775	260	31,750	23,812	3.3	3.3	49	248	245	278	285	384	5	9.5	3	3	0.4	1.5	0.8
9,1250	11,8125	1,3125									9,1250		1,2500	0,9375	0.13	0.13													
	317,500	47,625	523	980	90	1300	2000	10.5	LM245848/810	LM245800		268	52,388	36,512	3.3	3.3	49	249	245	296	303	304	8	11	3	3	0.31	1.9	1.1
	12,5000	1,8750											2,0625	1,4375	0.13	0.13													
255,600	342,900	57,150	594	1220	110	1200	1800	14.0	M349547/510	M349500	255,600	297	63,500	44,450	1.5	3.3	60	274	267	318	328	331	9	12.5	1.5	3	0.35	1.7	0.9
10,0630	13,5000	2,2500									10,0630		2,5000	1,7500	0.06	0.13													
257,175	342,900	57,150	594	1220	110	1200	1800	14.0	M349549/510/VE174	M349500	257,175	297	57,150	44,450	6.4	3.3	60	274	289	318	328	331	9	12.5	6	3	0.35	1.7	0.9
10,1259	13,5000	2,2500									10,1259		2,2500	1,7500	0.25	0.13													
	358,775	71,438	842	1760	156	1200	1700	20.5	M249747/710	M249700		297	57,150	44,450	6.4	3.3	60	273	289	318	343	331	9	12.5	6	3	0.35	1.7	0.9
	14,1250	2,8125											2,2500	1,7500	0.25	0.13													
263,525	325,438	28,575	220	550	48	1300	1800	53.0	38880/38820	38800	263,525	294	28,575	25,400	1.5	1.5	49	282	275	307	315	313	4	3	1.5	1.5	0.37	1.6	0.9
10,3750	12,8125	1,1250									10,3750		1,1250	1,0000	0.06	0.06													
292,100	374,650	47,625	501	1140	98	1100	1600	12.0	L555249/210	L555200	292,100	331	47,625	34,925	3.5	3.3	65	311	308	350	359	361	8	12.5	3	3	0.4	1.5	0.8
11,5000	14,7500	1,8750									11,5000		1,8750	1,3750	0.14	0.13													
	374,650	47,625	501	1140	98	1100	1600	12.0	L555249/210VE/VE174	L555200		331	47,625	34,925	3.5	3.3	65	311	308	350	359	361	8	12.5	3	3	0.4	1.5	0.8
	14,7500	1,8750											1,8750	1,3750	0.14	0.13													
304,800	393,700	50,800	528	1220	104	1000	1500	14.5	L357049/010/VE174	L357000	304,800	348	50,800	38,100	6.4	3.3	64	328	337	368	378	379	7	12.5	6	3	0.35	1.7	0.9
12,0000	15,5000	2,0000									12,0000		2,0000	1,5000	0.25	0.13													
343,154	450,850	66,675	935	2200	180	900	1300	28.0	LM361649A/610	LM361600	343,154	394	66,675	52.388	8.5	3.5	75	365	385	417	433	434	12	14	8	3	0.35	1.7	0.9
13,5100	17,7500	2,6250									13,5100		2,6250	2,0625	0.33	0.14													

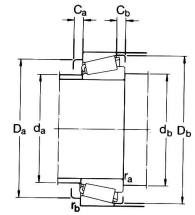
英制单列圆锥滚子轴承

British-system Single-row Tapered Roller Bearing





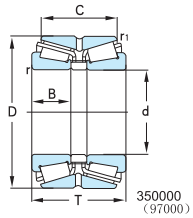




基本尺寸 Basic Size d	D	T	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	疲劳负荷极限 Fatigue Load Limit	额定转速 Rated Speed 参考转速 Reference Speed	极限转速 Limit Speed	质量 Quality	原代号 Original Code	系列 Series	尺寸 Size d	d1	B	C	r1.2 最小 Min	r3.4 最小 Min	a	挡肩及倒角尺寸 Size of Capped Edge and Chamfer da 最大 Max	db 最小 Min	Da 最小 Min	Da 最大 Max	Db 最小 Min	Ca 最小 Min	Cb 最小 Min	ra 最大 Max	rb 最大 Max	计算系数 Calculation Coefficient e	Y	Yo
mm/in			KN		KN	r/min		kg	–	–	mm/in																–		
346.075	488,950	95.250	1420	3150	255	850	1200	55.0	HM262749/710	HM262700	346.075	413	95.250	74.612	6.4	3.3	88	379	378	442	472	467	12	21	6	3	0.331.6		1
13.6250	19,2500	3.7500									13.6250		3.7500	2.9375	0.25	0.13													
381.000	479.425	49.250	594	1500	120	800	1200	20.0	L865547/512	L865500	381.000	431	47.625	34.925	6.4	3.3	92	406	413	448	462	463	9	14	6	3	0.5	1.2	0.7
15.0000	18.8750	1.9375									15.0000		1.8750	1.3750	0.25	0.13													
384.175	546.100	104.775	1870	4150	320	750	1100	77.0	HM266449/410	HM266400	384.175	458	104.775	82.550	6.4	6.4	96	418	416	492	514	520	15	22	6	3	0.331.8		1
15.1250	21.5000	4.1250									15.1250		4.1250	3.2500	0.25	0.25													
403.225	460.375	28.575	246	765	58.5	800	1200	6.70	LL566848/810/HA1	LL566800	403.225	430	28.575	20.638	3.5	3.3	70	417	420	445	443	448	6	7.5	6	3	0.4	1.5	0.8
15.8750	18.1250	1.1250									15.8750		1.1250	0.8125	0.14	0.13													
406.400	549.275	85.725	1380	3050	236	700	1000	53.5	LM567949/910/HA1	LM567900	406.400	471	84.138	61.962	6.4	3.3	100	434	438	502	532	526	13	23.5	6	3	0.4	1.5	0.8
16.0000	21.6250	3.3750									16.0000		3.3125	2.4375	0.25	0.13													
457.200	603.250	85.725	1450	3400	265	630	950	61.5	LM770949/910	LM770900	457.200	525	84.138	60.325	6.4	3.3	115	486	489	553	586	580	13	25	6	3	0.461.3		0.7
18.0000	23.7500	3.3750									18.0000		3.3125	2.3750	0.25	0.13													
488.950	634.873	84.183	1450	3650	265	600	850	63.5	LM772748/710/HA1	LM772700	488.950	560	84.138	61.912	6.4	3.3	124	519	520	584	618	613	13	22	6	3	0.481.25		0.7
19.2500	24.9950	3.3143									19.2500		3.3125	2.4375	0.25	0.13													
498.475	634.873	80.962	1470	3650	270	600	850	59.5	EE243196/250/HA2	243000	498.475	556	80.962	63.500	6.4	3.3	98	522	530	590	618	610	14	17	6	3	0.351.7		0.9
19.6250	24.9950	3.1875									19.6250		3.1875	2.5000	0.25	0.13													
558.800	736.600	88.108	1830	4150	305	500	750	92.5	EE8432220/290	843000	558.800	637	88.108	63.500	6.4	6.4	111	600	590	689	704	707	13	24.5	6	6	0.351.7		0.9
22.0000	29.0000	3.4688									22.0000		3.4686	2.5000	0.25	0.25													
	736.600	104.775	2330	5700	405	500	750	115	LM377449/410	LM377400		640	104.775	80.962	6.4	6.4	130	595	590	680	704	707	17	23.5	6	6	0.351.7		0.9
	29.0000	4.1250											4.1250	3.1875	0.25	0.25													
609.600	787.400	93.662	2160	5300	380	450	670	110	EE649240/310	649000	609.600	687	93.662	69.850	6.4	6.4	125	643	642	732	755	755	17	23.5	6	6	0.371.6		0.9
24.0000	31.0000	3.6875									24.0000		3.6875	2.7500	0.25	0.25													
	787.400	93.662	2160	5300	380	450	670	110	EE649240AX/310	649000		687	93.662	69.850	6.4	6.4	125	643	642	732	755	755	17	23.5	6	6	0.371.6		0.9
	31.0000	3.6875											3.6875	2.7500	0.25	0.25													
749.300	990.600	159.500	4570	12000	750	340	500	330	LM283649/610/HA1	LM283600	749.300	858	160.338	123	6.4	6.4	165	793	781	910	958	953	22	36.6	6	6	0.331.8		1
29.5000	39.0000	6.2795									29.5000		6.3125	4.8425	0.25	0.25													
760.000	889.000	69.850	1230	3800	255	380	560	67.5	LL483448/418	LL4843400	760.000	819	69.850	50.800	3.3	3.3	132	785	777	844	872	858	13	19	6	3	0.371.6		0.9
29.9183	35.0000	2.7500									29.9183		2.7500	2.0000	0.13	0.13													
	889.000	88.900	1870	5850	380	360	530	94.0	L1834481410	L183400		822	88.900	72.000	3.3	3.3	123	785	777	854	872	872	16	16.5	6	3	0.3	2	1.1
	35.0000	3.5000											3.5000	2.8346	0.13	0.13													
762.000	889.000	69.850	1230	3800	255	380	560	66.5	LL483449/418	LL483400	762.000	819	69.850	50.800	3.3	3.3	132	785	779	844	872	858	13	19	6	3	0.371.6		0.9
30.0000	35.0000	2.7500									30.0000		2.7500	2.0000	0.13	0.13													
	889.000	88.900	1870	5850	380	360	530	94.0	L183449/410	L183400		822	88.900	72.000	3.3	3.3	123	785	779	854	872	872	16	16.5	6	3	0.3	2	1.1
	35.0000	3.5000											3.5000	2.8346	0.13	0.13													
838.200	1041.400	93.662	1900	4800	320	320	460	160	EE763330/410	763000	838.200	925	93.662	66.675	6.4	6.4	177	894	870	975	10101001		10	26.5	6	6	0.441.35		0.8
33.0000	41.0000	3.6875									33.0000		3.6875	2.6250	0.25	0.25													

双列圆锥滚子轴承

Double-row Tapered Roller Bearing



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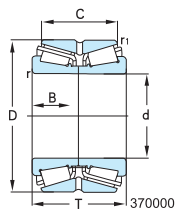

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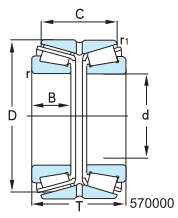

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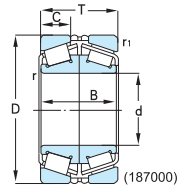

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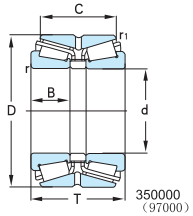
基本尺寸 Basic Size							轴承型号 Bearing Model		内径 Inner Diameter	基本额定负荷 Basic Rated Load		极限转速 Limit Speed		计算系数 Calculation Coefficient				重量 Weight
d	D	T	B	C	r1,2min	r3,4min				动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	e	Y1	Y2	Y0	
mm							新 New	旧 Old	mm	KN		r/min						kg
150	210	80	38	62	2.5	0.6	352930	2097930	150	280	408	950	1300	0.27	2.5	3.7	2.4	9.32
	250	138	60	112	2.5	1	352130	2097730		668	892	850	1100	0.3	2.2	3.3	2.2	25.8
	270	174	73	138	4	1	352230X2	97530E		878	1210	800	1100	0.39	1.7	2.6	1.7	38.9
160	240	115	51	90	3	1	352032	2097132	160	498	705	850	1100	0.37	1.8	2.7	1.8	16.5
	270	150	66	120	2.5	1	352132	2097732		712	948	800	1000	0.36	1.9	2.8	1.8	28.2
	290	178	80	144	4	1	352232	97532E		1390	1620	700	1000	0.44	1.6	2.3	1.5	46.2
165	290	150	70	125	3	1	350633	97833	165	1100	2300	850	1100	0.37	1.8	2.7	1.8	41.1
170	230	82	38	65	2.5	0.6	352934	2097934	170	325	488	850	1100	0.28	2.4	3.6	2.3	8.11
	260	120	57	95	3	1	352034	2097134		552	812	800	1000	0.31	2.2	3.2	2.1	20.4
	280	150	66	120	2.5	1	352134	2097734		775	1070	750	950	0.38	1.8	2.6	1.7	35.6
	310	192	86	152	5	1.1	352234	97534E		758	1840	750	950	0.44	1.6	2.3	1.5	58.2
180	250	95	45	74	2.5	0.6	352936	2097936	180	385	575	800	1000	0.37	1.8	2.7	1.8	13
	280	134	64	108	3	1	352036	2097136		610	585	750	950	0.28	2.4	3.6	2.4	28.5
	300	164	72	134	3	1	352136	2097736		778	1140	700	900	0.26	2.6	3.8	2.6	39.9
	320	192	86	145	5	1.1	352236	97536		1140	1540	670	850	0.36	1.9	2.8	1.8	51.5
190	260	95	95	75	2.5	0.6	352938	2097938	190	418	648	750	950	0.38	1.8	2.6	1.7	13.3
	290	134	64	104	3	1	352038	2097138		610	858	700	900	0.45	1.5	2.2	1.5	28.8
	320	170	78	130	3	1	352138	2097738		958	1360	670	850	0.31	2.2	3.2	2.1	52
	340	204	92	160	5	1.1	352238	97538E		1740	2020	600	800	0.44	1.6	2.3	1.5	69.8
200	280	105	51	80	3	1	352940	2097940	200	498	792	700	900	0.39	1.8	2.6	1.7	18.1
	310	152	70	120	3	1	352040X2	2097140E		748	1190	670	850	0.39	1.7	2.6	1.7	39
	340	184	82	150	3	1	352140	2097740		1190	1670	630	800	0.25	2.7	4	2.7	63.8
	360	218	98	174	5	1.1	352240	97540E		2140	2500	560	700	0.41	1.7	2.5	1.6	93.3
220	300	110	51	88	3	1	352944	2097944	220	505	815	670	850	0.31	2.2	3.2	2.1	21.7



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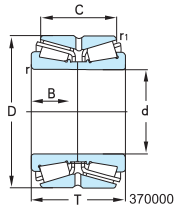

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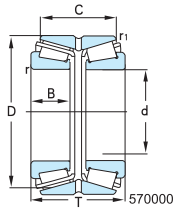

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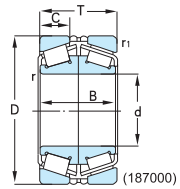

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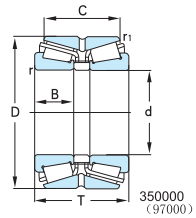
基本尺寸 Basic Size							轴承型号 Bearing Model		内径 Inner Diameter	基本额定负荷 Basic Rated Load		极限转速 Limit Speed		计算系数 Calculation Coefficient				重量 Weight
d	D	T	B	C	r1,2min	r3,4min				动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	e	Y1	Y2	Y0	
mm							新 New	旧 Old	mm	KN		r/min						kg
220	340	165	76	130	4	1	352044	2097144	220	1020	1490	600	750	0.35	1.9	2.9	1.9	49
	370	195	88	150	4	1.1	352144	2097744		1260	1780	600	750	0.37	1.8	2.7	1.8	76.3
240	320	110	51	90	3	1	352948	2097948	240	505	815	600	750	0.32	2.1	3.1	2.1	22.2
	360	165	76	130	4	1	352048	2097148		1020	1570	530	670	0.33	2	3	2	52.8
	400	210	95	163	4	1.1	352148	2097748		1550	2230	500	630	0.31	2.2	3.2	2.1	98.1
260	360	134	63.5	108	3	1	352952x2	2097952	260	832	1350	530	670	0.37	1.8	2.7	1.8	37
	400	186	87	146	5	1.1	352052x2	2097152		1290	2000	500	630	0.3	2.3	3.3	2.2	79.3
	440	225	106	180	4	1.1	352152	2097752		1810	2620	450	560	0.24	2.8	4.2	2.8	124
280	380	134	63.5	108	3	1	352956x2	2097956	280	875	1450	480	600	0.29	2.3	3.4	2.3	41.3
	420	186	87	146	5	1.1	352056x2	2097156		1400	2160	450	560	0.37	1.8	2.7	1.8	81.5
300	420	160	76	128	4	1	352960x2	2097960	300	1120	1900	450	560	0.28	2.4	3.6	2.3	60.8
	460	210	100	125	5	1.1	352060x2	2097160		1500	2440	430	530	0.31	2.2	3.2	2.1	117
	500	205	90	165	5	1.5	351160	1097760		1720	2450	400	500	0.32	2.1	3.2	2.1	143
320	440	160	76	128	4	1	352964	2097964	320	1150	2000	430	530	0.3	2.3	3.3	2.2	67
	480	210	100	160	5	1.1	352064x2	2097164		1500	2440	400	500	0.42	1.6	2.4	1.6	122
340	460	160	76	128	4	1	352968x2	2097968	340	1170	2080	400	500	0.31	2.2	3.2	2.1	71
	520	180	82	135	4	1.5	351068	97168		1530	2200	380	480	0.29	2.3	3.4	2.3	128
	580	242	106	170	5	1.5	351168	1097768		2340	3290	340	430	0.42	1.6	2.4	1.6	235
360	480	160	76	128	4	1	352972	2097972	360	1210	2190	380	480	0.33	2.1	3.1	2	74.3
	540	185	82	128	5	1.5	351072	97172		1600	2360	360	450	0.30	2.3	3.3	2.2	132
	600	242	106	170	5	1.5	351172	1097772		2370	3390	320	400	0.44	1.5	2.3	1.5	235
380	520	145	65	105	4	1.1	351976	1097976	380	992	1640	360	450	0.43	1.6	2.3	1.6	80.3
	560	190	82	140	5	1.5	351076	97176		1740	2670	340	430	0.31	2.2	3.2	2.1	146
	620	242	106	170	5	1.5	351176	1097776		2690	4050	300	380	0.46	1.5	3.2	1.4	264
400	540	150	65	105	4	1.1	351980	1097980	400	992	1640	320	400	0.45	1.5	2.2	1.5	86.9
	600	206	90	150	5	1.5	351080	97180		2010	3180	300	380	0.4	1.7	2.5	1.7	180

双列圆锥滚子轴承

Double-row Tapered Roller Bearing



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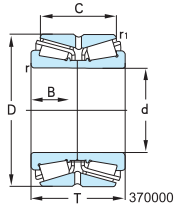

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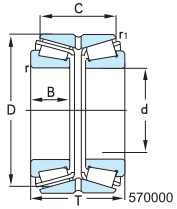

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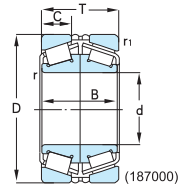

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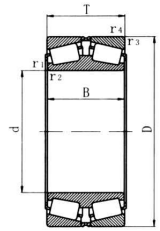
基本尺寸 Basic Size							轴承型号 Bearing Model		内径 Inner Diameter	基本额定负荷 Basic Rated Load		极限转速 Limit Speed		计算系数 Calculation Coefficient				重量 Weight
d	D	T	B	C	r1,2min	r3,4min				动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	e	Y1	Y2	Y0	
mm							新 New	旧 Old	mm	KN		r/min						kg
420	560	145	65	105	4	1.1	351984	351984	1097984	420	1190	1970	300	380	0.31	2.2	3.2	2.1	88.8
	620	206	90	150	5	1.5	351084	351084	97184		2010	3180	280	360	0.41	1.6	2.5	1.6	196
	700	275	122	200	6	2.5	351184	351184	1097784		3370	5130	240	320	0.32	2.1	2.2	2.1	392
440	600	170	74	125	4	1.1	351988	351988	1097988	440	1550	2560	280	360	0.39	1.8	2.6	1.7	114
	650	212	94	152	6	2.5	351088	351088	97188		2240	3710	260	340	0.43	1.6	2.3	1.5	213
460	620	174	74	130	4	1.1	351992	351992	1097992	460	1570	2630	260	340	0.4	1.7	2.5	1.7	128
	680	230	100	175	6	2.5	351092	351092	97192		2420	3740	220	300	0.31	2.2	3.2	2.1	253
480	650	180	78	130	5	1.5	351996	351996	1097966	480	1600	2730	240	320	0.42	1.6	2.4	1.6	133
	700	240	100	180	6	2.5	351096	351096	97196		2730	4430	200	280	0.32	2.1	3.1	2.1	281
	790	310	136	224	7.5	3	351196	351196	1097796		4110	6510	180	240	0.41	1.6	2.5	1.6	250
500	670	180	78	130	5	1.5	3519/500	3519/500	10979/500	500	1760	3120	220	300	0.44	1.5	2.3	1.5	129
	720	236	100	180	9	2.5	3510/500	3510/500	971/500		2780	4570	190	260	0.33	2	3	2	289
530	710	190	82	136	5	1.5	3519/530	3519/530	10979/530	530	1960	3390	190	260	0.41	1.6	2.5	1.6	192
560	750	213	85	156	5	1.5	3519/560	3519/560	10979/560	560	2090	3720	170	220	0.44	1.5	2.3	1.5	235
	820	260	115	185	6	2.5	3510/560	3510/560	971/560		3570	5760	160	200	0.4	1.7	2.5	1.7	410
600	800	205	90	156	5	1.5	3519/600	3519/600	10979/600	600	2580	4860	150	190	0.33	2.1	3.1	2	265
	870	270	118	198	6	2.5	3519/600	3510/600	971/600		3980	6670	130	170	0.41	1.6	2.5	1.6	500
630	850	242	100	182	6	2.5	3519/630	3519/630	10979/630	630	3060	5470	130	170	0.4	1.7	2.5	1.7	368
670	1090	410	185	182	7.5	3	3511/670	3511/670	10977/670	670	7940	1290	90	120	0.32	0.32	3.2	2.1	370
710	950	240	106	175	6	2.5	3519/710	3519/710	10979/710	710	3310	6400	100	140	0.49	1.5	2.2	1.4	444
	1030	315	140	220	7.5	3	3510/710	3511/710	971/710		5360	9390	90	120	0.43	1.6	2.3	1.5	810
750	1000	264	112	194	6	2.5	3519/750	3519/750	10979/750	750	4010	7450	90	120	0.4	1.7	2.5	1.6	499
800	1060	270	115	204	6	2.5	3519/800	3519/800	10979/800	800	4010	7920	80	100	0.35	1.9	2.9	1.9	604
850	1120	268	118	188	6	2.5	3519/850	3519/850	10979/850	850	4070	8260	75	95	0.46	1.5	2.2	1.5	636
900	1180	275	122	205	6	2.5	3519/900	3519/900	10979/900	900	3640	8260	70	90	0.39	1.7	2.6	1.7	730
950	1250	300	132	220	7.5	3	3519/950	3519/950	10979/950	950	4920	10800	-	-	0.33	2	3	2	910

英制双列圆锥滚子轴承

British—system Double—row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

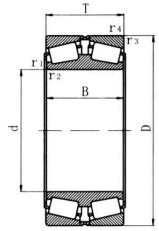
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model		
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	FAG	TIMKEN
mm						KN		kg	mm							
152.400	225.250	84.138	84.138	1.5	1.5	605	1250	11.5	152.400	0.33	2	3	2	331387		M231649D-M231610
177.800	247.650	90.488	90.488	1.5	3.3	660	1500	13.0	177.800	0.44	1.5	2.3	1.4	331814	540696	67790D-67720
	288.925	123.825	123.825	1.5	3.3	1300	2280	31.5		0.31	2.2	3.3	2.2	BT2B332534/HA1		94706D-94113
203.200	317.500	133.350	133.350	6.4	3.3	1170	2400	40.0	203.200	0.52	1.3	1.9	1.3	BT2B332799		
	368.300	158.750	152.400	3.3	3.3	1870	3350	75.0		0.40	1.7	2.5	1.6	BT2B332683/HA1	541397	
206.375	282.575	87.312	87.132	0.8	3.3	704	1660	17.0	206.375	0.5	1.35	2	1.3	331388		
	336.550	180.975	184.150	1.5	3.3	2120	4300	66.5		0.33	2	3	2	BT2B328834		H2426490D-H242610
220	340	140	200	1.5	3	1650	3350	50.5	220	0.43	1.6	2.3	1.6	BT2B332873/HA4		
234.950	327.025	93.662	93.662	1.5	3.3	842	2120	25.5	234.950	0.40	1.7	2.5	1.6	BT2B332492		
240	480	220	200	2.5	5	3360	5500	183	240	0.72	0.94	1.4	0.9	BT2B332931		
254	358.775	130.175	130.175	1.5	3.3	1540	3550	43.5	254	0.33	2	3	2	332296/HA1	511577	M249748D-M249710
	438.150	165.100	165.100	3.3	6.4	2510	4250	100		0.35	1.9	2.9	1.8	BT2B332536/HA1	547757	
269.875	381.000	136.525	136.525	3.3	3.3	1650	3750	51.0	269.875	0.33	2	3	2	331223A	517563A	M252349D-M252310
279.587	380.898	117.475	117.475	1.5	3.3	1230	3200	14.5	279.587	0.43	1.6	2.3	1.6	BT2B332899/HA1		
288.925	406.400	165.100	234.950	1.6	3.2	2240	4900	73.0	288.925	0.33	2	3	2	BT25B332870/HA4		
300.038	422.275	150.812	150.812	3.3	3.3	2050	4750	70.0	300.038	0.33	2	3	2	331951	542664	HM256849D-HM256810
303.212	495.300	263.525	263.525	3.3	6.4	4570	9800	212	303.212	0.33	2	3	2	BT2B332685/HA1		
317.500	422.275	128.588	128.588	1.5	3.3	1680	4150	51.5	317.500	0.31	2.2	3.3	2.2	BT2B328699G/HA1		LM258648DW-LM258610

英制双列圆锥滚子轴承

British—system Double—row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

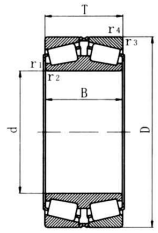
径向当量静载荷
Por=Fr+YoFa

Equivalent static load
Por=Fr+YoFa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量	内径	计算系数 Calculation Coefficient				轴承型号 Bearing Model		
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor	Weight	Inner Diameter d	e	Y1	Y2	Y0	SKF	FAG	TIMKEN
mm						KN		kg	mm							
333.375	169.900	166.688	166.688	3.3	3.3	2460	5700	92.5	333.375	0.33	2	3	2	BT2B328695A/HA1	510687A	HM259049D-HM259010
	469.900	166.688	231.775	1.6	3.3	2460	5700	98.0		0.33	2	3	2	BT2B332871/HA4		
342.900	533.400	139.700	146.050	3.3	3.3	2380	4400	115	342.900	0.33	2	3	2	331713A	515956	
343.052	457.098	122.238	122.238	1.5	3.3	1510	3400	54.0	343.052	0.48	1.4	2.1	1.4	332240A		LM761649DW-LM7616010
346.075	188.950	104.775	95.250	1.5	6.4	1170	2750	62.0	346.075	0.50	1.35	2	1.3	BT2B332913/HB1		
	488.950	174.625	174.625	3.3	3.3	2640	6300	113		0.33	2	3	2	331527C	575296	HM262749D-HM262710
360	680	330	300	4	7.5	7210	13400	540	360	0.60	1.1	1.7	1.1	331729		
368.300	523.875	185.738	185.738	3.3	6.4	3140	7500	133	368.300	0.33	2	3	2	BT2B331836		
	596.900	165.10	158.750	6.4	6.4	2080	5850	160		0.40	1.7	2.5	1.6	331905		
384.175	546.100	193.675	193.675	3.3	6.4	2470	8300	152	384.175	0.33	2	3	2	331158A	518240	HM266449DW-HM266410
390	546.100	141.288	141.288	3.3	6.4	2200	5100	102	390	0.48	1.4	2.1	1.4	BT2B328705/HA1		
406.400	546.100	138.113	138.113	1.5	6.4	2200	5100	89	406.400	0.48	1.4	2.1	1.4	BT2B331840C/HA1		LM767749DW-LM767710
408.400	546.100	120	98	1	3	1510	3450	76.5	408.400	0.88	0.8	1.2	0.8	BT2B328874/HA1		
	546.100	150	125	1.5	3.3	1830	4750	99		0.83	0.8	1.2	0.8	BT2B328466/HA1		
409.575	546.100	161.925	161.925	1.5	6.4	2510	6550	110	409.575	0.43	1.6	2.3	1.6	331714B		M667947DW-M667910
415.925	590.550	209.550	209.550	3.3	6.4	3910	9650	192	415.925	0.33	2	3	2	BT2B328283/HA1	524903	M268749DW-M268710
430	535	84	84	1	3	1080	3000	44.5	430	0.54	1.3	1.8	1.3	BT2B334013/HA1		
447.625	635.000	223.838	223.838	3.3	6.4	4400	11000	236	447.625	0.33	2	3	2	331562	518667	M270749DW-M270710

英制双列圆锥滚子轴承

British—system Double—row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

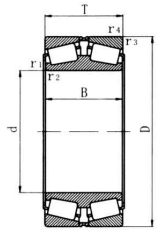
径向当量静载荷
Por=Fr+YoFa

Equivalent static load
Por=Fr+YoFa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model		
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	FAG	TIMKEN
mm						KN		kg	mm							
450	595	178	178	3	6	2970	8150	140	450	0.33	2	3	2	BT2B328523/HA1		
464	615.950	150	136	1.5	4	2160	5850	125	464	0.83	0.8	1.2	0.8	BT2B328361/HA1		
489.026	634.87	152.400	152.400	3.3	3.3	2750	7350	130	489.026	0.35	1.9	2.9	1.8	BT2B331848		
491	635	148	128	1.5	3.3	1900	5300	120	491	1.00	0.68	1	0.7	BT2B328381/HA1		
500	730	280	280	3	6	6600	15600	420	500	0.31	2.2	3.3	2.2	331676A		
501.650	711.200	250.825	250.825	3.2	6.4	500	13700	330	501.650	0.33	2	3	2	331182	503772	M274149DW-M274110
519.112	736.600	258.762	258.762	3.6	6.4	6050	15600	370	519.112	0.33	2	3	2	BT2B332662/HB1		M275349D-M275310
522	690	180	160	1.5	4	2860	8300	190	522	0.79	0.9	1.3	0.8	BT2B328659/HA1		
536.575	761.873	269.875	269.875	3.3	6.4	6270	16000	410	536.575	0.33	2	3	2	331682	526165	M276449DW-M276410
558.800	736.600	196.850	196.850	3.3	6.4	4290	11600	235	558.800	0.35	1.9	2.9	1.8	331607A	544145	LM37749DW-LM377410
560.000	820.000	242.000	242.000	2.5	8	5010	11400	425	560.000	0.88	0.8	1.2	0.8	BT2B332626/HA7		
571.500	812.800	285.750	285.750	3.3	6.4	7210	18000	500	571.500	0.33	2	3	2	BT2B331854/HA1	543718	M278749DW-M278710
580	830	280	280	3	6	6820	16600	515	580	0.31	2.2	3.3	2.2	331677		
609.600	787.400	171.450	171.450	3.3	6.4	4020	10600	218	609.600	0.37	1.8	2.7	1.8	BT2B331858/HA1		EE649241DW-649310
	820	171.450	171.450	3.3	6.4	4020	10600	265		0.37	1.8	2.7	1.8	BT2B332424/HA3	538086	
650	1030	270	270	15	10	8800	18300	900	650	0.31	2.2	3.3	2.2	BT2B328306/HA4		
660.400	812.800	176.212	176.212	3.2	6.4	3580	11200	195	660.400	0.33	2	3	2	331198		L281149D-L281110

英制双列圆锥滚子轴承

British—system Double—row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e　Pr=Fr+Y1Fa
当Fa/Fr>e　Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e　Pr=Fr+Y1Fa
Where Fa/Fr>e　Pr=0.67Fr+F2Fa

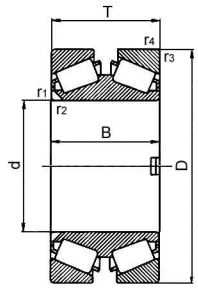
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model		
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	FAG	TIMKEN
mm						KN		kg	mm							
682.625	965.200	338.138	338.138	3.3	6.4	9520	25000	815	682.625	0.33	2	3	2	332129/HA4		M282249D-M282210
710	900	197	197	3	6	4730	13200	325	710	0.35	1.9	2.9	1.8	331581A	532828	
800	1260	375	375	12	12	14700	33500	1850	800	0.33	2	3	2	BT2B334032/HA4		
863.600	1130.300	323.850	323.850	4.8	12.7	10600	31000	895	863.600	0.33	2	3	2	331590		LM286249ADW-LM286210
901.700	1295.400	450.850	438.150	4.8	12.7	16800	43000	2000	901.700	0.35	1.9	2.9	1.8	331306	539945	EE634356D-634510

大锥角双列圆锥滚子轴承

Steep-angle Double-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

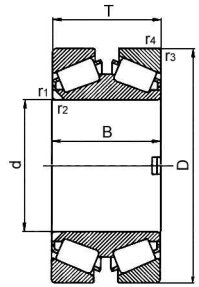
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	FAG
mm						KN		kg	mm						
300	440	105	105	4	4	1010	2040	48.5	300	0.88	0.77	1.15	0.8	332168	53529
305.033	560	200	200	3.3	6.4	2920	5300	205	305.033	0.88	0.77	1.15	0.8	BT2B334087/HA3	
305.070	500	200	200	6.4	4.8	2550	5200	150	305.070	0.88	0.77	1.15	0.8	332169	533062
	560	200	200	3.3	6	2920	5300	200		0.88	0.77	1.15	0.8	332068	
360	560	160	160	3	5	2380	4650	140	360	0.72	0.94	1.4	0.9	BT2-8000/HA3	
	600	200	200	3	5	3030	5850	220		0.94	0.72	1.07	0.7	BT2-8002/HA3	
380	560	200	200	5	5	2810	6550	165	380	0.79	0.85	1.25	0.8	BT2-8009/HA3	
	565	200	200	5	5	2810	6550	170		0.79	0.85	1.25	0.8	BT2-8003/HA3	
386	574	220	220	3	5	2750	6550	185	386	0.83	0.81	1.2	0.8	BT2-810/HA3VA901	
390	570	200	200	5	5	2750	6550	170	390	0.83	0.81	1.2	0.8	BT2B328896/HA3	
400	650	240	240	6.4	6.4	3910	8150	245	400	0.88	0.77	1.15	0.8	332167	531295A
445	620	160	160	2	5	2120	5100	135	445	0.83	0.81	1.2	0.8	BT2B334069/HA3	
460	680	180	180	2.5	6	2140	6950	210	460	0.99	0.7	1	0.7	BT2B328876/HA1	
510	733.500	200.025	200.025	3.3	4.8	3580	8500	265	510	0.88	0.77	1.15	0.8	617670	524209A
510.130	800	285	285	4.8	10	5610	12700	505	510.130	0.88	0.77	1.15	0.8	332171	531530

英制圆锥孔双列圆锥滚子轴承

British—system Tapered—bore Double—row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

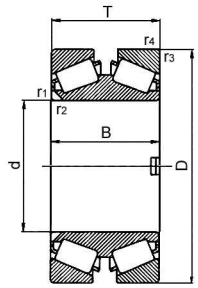
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size							内径 Inner Diameter	基本额定负荷 Basic Rated Load		计算系数 Calculation Coefficient			重量 Weight	轴承型号 Bearing Model
d	锥度	D	T	B	r1,2min	r3,4min	d	动 Cr	静 Cor	e	Y1	Y2		TIMKEN
mm							mm	KN					kg	
152.400	1:12	254.000	120.650	120.650	1.5	3.3	152.400	1060	2330	0.41	1.66	2.47	26	99600TD-99100
165.100	1:12	269.875	146.050	146.050	1.5	3.3	165.100	1460	3210	0.33	2.03	3.02	36.2	H234649TD-H234610
180.975	1:12	288.925	158.750	158.750	1.5	3.3	180.975	1060	2340	0.47	1.44	2.15	34	94713TD-421437
190.236	1:12	288.925	111.125	111.125	1.5	3.3	190.236	983	2160	0.36	1.89	2.81	26.9	82785TD-82720
190.500	1:12	365.049	158.750	152.400	1.5	3.3	190.500	1880	4140	0.40	1.68	2.50	77.5	EE420750TD-421437
198.438	1:12	282.575	87.312	87.312	1.5	3.3	198.438	684	1500	0.51	1.33	1.97	19.2	67980TD-67920
209.550	1:12	317.500	184.150	184.150	1.5	3.3	209.550	1170	2580	0.52	1.29	1.92	46.9	93826TD-93125
252.412	1:12	358.775	130.175	139.700	1.5	3.3	252.412	1550	3410	0.33	2.03	3.02	45.8	M249746TD-M249710
266.700	1:12	355.600	107.950	109.538	1.5	3.3	266.700	1190	2620	0.36	1.87	2.79	31.1	LM451349TD-LM451310
280.000	1:12	406.400	206.375	206.375	1.5	3.3	280.000	1480	3260	0.39	1.75	2.60	78.2	EE128113TD-128160
288.925	1:12	406.400	144.462	144.462	1.5	3.3	288.925	2030	4470	0.34	2.00	2.97	62.7	M255449TD-M255410
303.212	1:12	495.300	263.525	263.525	3.3	6.4	303.212	4890	10800	0.33	2.03	3.02	221	HH258249TD-HH258210
333.375	1:12	469.900	166.688	166.688	3.3	6.4	333.375	2730	6000	0.33	2.02	3.00	98.5	HM261049TD-HM261010
	1:12	523.875	185.738	185.738	3.3	6.4		3370	7500	0.33	2.03	3.02	167	HM265032TD-HM265010
346.075	1:12	488.950	174.625	174.625	3.3	6.4	346.075	2940	6470	0.33	2.02	3.00	114	LM262749TD-HM262710
349.250	1:12	457.200	120.650	120.650	3.3	6.4	349.250	1600	3520	0.32	2.12	3.15	57.3	LM263145TD-LM263110
368.300	1:12	523.875	187.738	187.738	3.3	6.4	368.300	3370	7420	0.33	2.03	3.02	138	HM265049TD-HM265010

英制圆锥孔双列圆锥滚子轴承

British-system Tapered-bore Double-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e　Pr=Fr+Y1Fa
当Fa/Fr>e　Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e　Pr=Fr+Y1Fa
Where Fa/Fr>e　Pr=0.67Fr+F2Fa

径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size							内径 Inner Diameter	基本额定负荷 Basic Rated Load		计算系数 Calculation Coefficient			重量 Weight	轴承型号 Bearing Model
d	锥度	D	T	B	r1,2min	r3,4min	d	动 Cr	静 Cor	e	Y1	Y2		TIMKEN
mm							mm	KN					kg	
384.175	1:12	546.100	193.675	193.675	3.3	6.4	384.175	3650	8030	0.33	2.03	3.02	160	HM266449TD-HM266410
415.925	1:12	590.550	209.550	209.550	3.3	6.4	415.925	4240	9330	0.33	2.03	3.02	199	M268749TD-M268710
447.675	1:12	635.000	223.838	223.838	3.3	6.4	447.675	4870	10700	0.33	2.03	3.02	246	M270749TD-M270710
479.425	1:12	679.450	238.125	238.125	3.3	6.4	479.425	5550	12210	0.33	2.03	3.02	305	M272749TD-M272710
501.650	1:12	711.200	250.825	250.825	3.3	6.4	501.650	6020	43250	0.33	2.03	3.02	348	M274149TD-M274110
519.112	1:12	736.600	258.762	258.762	3.3	6.4	519.112	6440	14200	0.33	2.03	3.02	396	M275349TD-M275310
571.500	1:12	812.800	285.750	296.862	3.3	6.4	571.500	7880	17400	0.33	2.03	3.02	523	M278748TD-M278710

四列圆锥滚子轴承

四列圆锥滚子轴承由两个双列内圈和一个双列外圈及两个单外圈组成，两内圈之间有一个内隔圈，三个外圈之间有两个中隔圈可以调整游隙。此轴承在承受较大的径向载荷时，可同时承受两个方向的轴向载荷，但轴承的允许转速不高，主要用于轧钢机的轧辊轴承。近年来该轴承开始生产带双面密封圈的四列圆锥滚子轴承，而且渐渐得到了广泛应用。

四列圆锥滚子轴承中小型的尺寸均采用轴承钢制造，大型的四列圆锥滚子轴承使用渗碳钢制造，特别大的尺寸使用空心滚子和支柱保持架，以求增长轴承的使用寿命。

保持架材料

四列圆锥滚子轴承一般采用钢板冲压保持架，特别大尺寸的采用支柱保持架必须是焊接型的。

允许角度对准误差

四列圆锥滚子轴承一般不允许轴相对于壳孔有倾斜最大不超过2′。如因生产工艺要求，作为轧辊轴承的四列圆锥滚子轴承承受弯辊力而轴线的倾斜超过2′的要求，轴承的滚子和滚道会产生额外应力，由此而增加轴承载荷会缩短轴承的寿命。

公差与游隙

四列圆锥滚子轴承一般为PO级公差，但也可根据用户需要生产公差等级更高的轴承.

四列圆锥滚子轴承的游隙，在装配时已安装调整规程按轴承生产协议(无生产协议按标准组游隙)调整好轴承游隙，用户在使用一定周期后，应该重新调整游隙，有关调整游隙的方法，请咨询ZWA技术服务部门。

Four row tapered roller bearing

Four row tapered roller bearing is composed of two double row inner rings and one double row outer ring consisting two single outer rings. Between two inner rings, there is one inner spacer. Among these three outer rings, two central spacer is furnished, which can be used to adjust clearance. When borne by heavy radial load, it can bear simultaneously axial load in two different directions. But its allowed speed is not much, which is mainly used for roller bearing of rolling mill. In recent years, four row tapered roller bearing with double face seal is manufactured and gradually used in different industries.

Small sized bearing of this kind is generally made by bearing steel. For large sized one, its is made by carburizing steel. For extremely large sized one, it is made consisting hollow roller and support cage to elongate its service life.

Cage material

Four row tapered roller bearing generally uses steel plate punching press cage. For extremely large-sized bearing, support cage used must be in welded structure.

Angular alignment tolerance

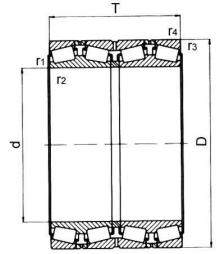
Maximum inclination angle between shaft and shell hole is not allowed to exceed 2′. If it is required from manufacturing process, it bears roll bending force as four row tapered roller bearing with inclination angle more than 2′.In this condition its roller and raceway create additional stress, therefore it will increase load and shorten its service life.

Tolerance and clearance

Its tolerance is PO generally. Bearing with much more high level tolerance can be tailored according to client's requirements. During assembly, its clearance shall be adjusted according to adjustment specification and bearing manufacturing agreement (or standard clearance if there is no manufacturing agreement). After operating a certain period, client can readjust clearance. Please consult with ZWA technical service department for clearance adjustment method.

四列圆锥滚子轴承

Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

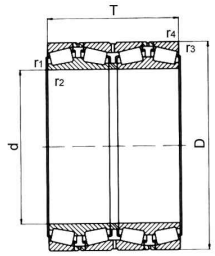
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size					重量 Weight	轴承型号 Bearing Model		内径 Inner Diameter	基本额定负荷 Basic Rated Load		极限转速 Limit Speed		计算系数 Calculation Coefficient			
d	D	T	r1,2min	r3,4min					动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	e	Y1	Y2	Y0
mm					kg	新 New	旧 Old	mm	KN		r/min					
150	210	165	2.5	2	21.2	382930	2077930	150	440	845	800	1000	0.27	2.5	3.7	2.4
170	260	230	3	2.5	39.5	382034	2077134	170	908	1720	670	850	0.44	1.5	2.3	1.5
220	340	305	4	3	98	382044	2077144	220	1500	3020	500	630	0.35	1.9	2.8	1.9
240	360	310	4	3	91	382048	2077148	240	1530	3120	450	560	0.31	2.2	3.2	2.1
250	385	255	5	4	108	381050	77150	250	1390	2570	430	530	0.38	1.8	2.6	1.7
260	360	265	3	2.5	76.3	382952	2077952	260	1270	2710	450	560	0.37	1.8	2.7	1.8
	400	345	5	4	153	382052	2077152		1970	3970	430	530	0.29	2.3	3.4	2.3
280	460	324	5	4	200	381156	1077756	280	2190	4050	360	450	0.33	2.1	3.1	2
300	420	300	4	3	130	382960	2077960	300	1690	3730	380	480	0.29	2.3	3.4	2.3
	460	390	5	4	219	382060	2077160		2310	4880	360	450	0.31	2.2	3.2	2.1
	500	370	5	4	285	381160	1077760		2610	4840	340	430	0.32	2.1	2.3	2.1
320	480	380	5	4	234	382064	2077164	320	2310	4880	340	430	0.42	1.6	2.4	1.6
340	460	310	4	4	145	382968	2077968	340	1770	4130	340	430	0.31	2.2	3.2	2.1
	520	325	5	4	234	381068	77168		2310	4340	320	400	0.29	2.3	3.4	2.3
	580	425	5	4	441	381168	1077768		3530	6500	280	360	0.42	1.6	3.4	1.6
360	540	325	5	4	248	381072	77172	360	2430	4670	300	380	0.3	2.3	2.3	2.2
380	620	420	5	4	487	381176	1077776	380	3630	6860	240	320	0.46	1.5	2.2	1.4
400	600	356	5	4	317	381080	77180	400	3000	6080	240	320	0.4	1.7	2.5	1.7
420	700	480	6	5	760	381184	1077784	420	5220	10300	190	260	0.32	2.1	3.2	2.1

四列圆锥滚子轴承

Four-row Tapered Roller Bearing



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当Fa/Fr>e　Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr≤e　Pr=Fr+Y1Fa
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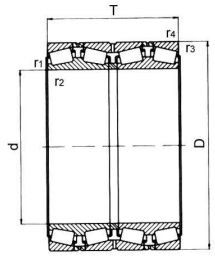
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size					重量 Weight	轴承型号 Bearing Model		内径 Inner Diameter	基本额定负荷 Basic Rated Load		极限转速 Limit Speed		计算系数 Calculation Coefficient			
d	D	T	r1,2min	r3,4min				d	动 Cr	静 Cor	脂润滑 Grease	油润滑 Oil	e	Y1	Y2	Y0
mm					kg	新 New	旧 Old	mm	KN		r/min					
440	650	376	6	5	401	381088	77188	440	3090	6480	200	280	0.43	1.6	2.3	1.5
460	620	310	4	3	173	381992	1077992	460	2430	5250	200	280	0.4	1.7	2.5	1.7
	680	410	6	5	476	381092	77192		3710	7490	180	240	0.31	2.2	3.2	2.1
480	650	338	5	4	301	381996	1077996	480	2450	5400	190	260	0.42	1.6	2.4	1.6
	700	420	6	5	547	381096	77196		4230	9000	170	220	0.32	2.1	3.1	2.1
500	720	420	6	5	565	3810/500	771/500	500	4250	9120	160	200	0.33	2.1	3.1	2
530	780	450	6	5	744	3810/530	771/530	530	5430	11400	140	180	0.38	1.8	2.6	1.7
	870	590	7.5	6	1422	3811/530	10777/530		7170	14500	120	160	0.46	1.5	2.2	1.4
560	750	368	5	4	456	3819/560	10779/560	560	3170	7410	140	180	0.43	1.6	2.3	1.5
	920	620	7.5	6	1635	3811/560	10777/560		8670	14500	100	140	0.39	1.7	2.6	1.7
600	800	380	5	4	536	3819/600	10779/600	600	3950	9710	120	160	0.33	2.1	3.1	2
	870	480	6	5	995	3810/600	771/600		6000	13300	100	140	0.41	1.7	2.5	1.6
	980	650	7.5	6	1970	3811/600	10777/600		9840	20400	90	120	0.32	2.1	3.2	2.1
630	850	426	6	5	720	3819/630	10779/630	630	4670	11000	100	140	0.4	1.7	2.5	1.7
	920	515	7.5	6	1158	3810/630	771/630		6650	14900	95	130	0.42	1.6	2.4	1.6
	1030	670	7.5	6	2201	3811/630	10777/630		11100	22200	85	110	0.3	2.2	3.3	2.2
670	900	412	6	5	959	3819/670	10779/670	670	5030	12400	95	130	0.44	1.5	2.3	1.5
	1090	710	7.5	6	2665	3811/670	10777/670		12100	22200	75	95	0.32	2.1	3.2	2.1
710	1030	555	7.5	6	1568	3810/710	771/710	710	8190	18800	75	95	0.43	1.6	2.3	1.5
	1150	750	9.5	8	3227	3811/710	10777/710		13200	28300	67	85	0.32	2.1	3.2	2.1
750	1090	605	7.5	6	1874	3810/750	771/750	750	9650	22300	70	90	0.43	1.6	2.4	1.6
	1220	840	9.5	8	3994	3811/750	10777/750		16900	37800	48	80	0.32	2.1	3.2	2.1

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



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Where Fa/Fr=e　Pr=Fr+Y1Fa
Where Fa/Fr>e　Pr=0.67Fr+F2Fa

径向当量静载荷
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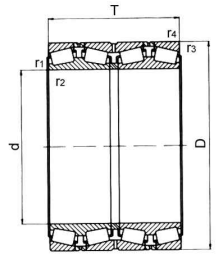
Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量	内径	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor	Weight	Inner Diameter d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
152.400	222.250	174.625	174.625	1.5	1.5	1120	2500	22.5	152.400	0.33	2	3	2	331329	
165.100	225.425	168.275	165.100	0.8	3.3	858	2200	20.5	165.100	0.37	1.8	2.7	1.8	330835C	
177.800	247.650	192.088	192.088	1.5	3.3	1230	3000	29	177.800	0.44	1.5	2.3	1.4	331480	
187.325	269.875	211.138	211.138	1.5	3.3	1650	3800	41	187.325	0.33	2	3	2	331382	
190.500	266.700	188.912	187.325	1.5	3.3	1340	3250	33.5	190.500	0.48	1.4	2.1	1.4	331249	75TQ0351AA229
198.438	284.162	225.425	225.425	1.5	3.3	1790	4150	47.5	198.438	0.33	2	3	2	330899A	
205	320	203.500	203.500	4	3	1900	3650	54.5	205	0.46	1.5	2.2	1.4	BT4B328065/HA1	
206.375	282.575	190.500	190.500	0.8	3.3	1300	3350	36.5	206.375	0.50	1.35	2	1.3	331486	81TQ09419AA1650
220	320	200	200	4	3	1760	4050	54.0	220	0.33	2	3	2	BT4B328348/HA1	
	340	303.500	303.500	1	3	3080	6700	100		0.43	1.6	2.3	1.6	BT4B328003/HA1	
220.662	314.325	239.712	239.712	1.5	3.3	2200	5200	61.5	220.662	0.33	2	3	2	331156	86TQ0411AA1525
228.600	311.150	200.025	200.025	1.5	3.3	1760	4050	43.5	228.600	0.33	2	3	2	BT4B332637/HA1	90TQ0396BA1254
234.950	327.025	196.850	196.850	1.5	3.3	1540	4250	54	234.950	0.40	1.7	2.5	1.6	331399	927909448BC/1788
240	338	248	248	4	3	2380	5500	70	240	0.40	1.7	2.5	1.6	BT4B328015/HA1	
	360	308.500	308.500	4	3	3300	7350	110		0.33	2	3	2	BT4B328508	
241.224	355.498	228.600	228.600	1.5	3.3	2160	5000	81.5	241.224	0.35	1.9	2.9	1.8	331787	95TQ0451BA1599
241.478	349.148	228.600	228.600	1.5	3.3	2160	5000	74.5	241.478	0.35	1.9	2.9	1.8	330782A	95TQ09451AC1607
244.475	327.025	193.675	193.675	1.5	3.3	1830	4300	46	244.475	0.33	2	3	2	330862B	96YQ09450AA1254

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

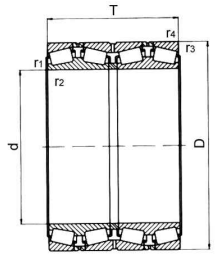
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量	内径	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor	Weight	Inner Diameter d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
244.475	381	304.800	304.800	3.3	4.8	2970	6700	130	244.475	0.52	1.3	1.9	1.3	BT4B328690/HA1	
245	380	254	255.500	1.5	4	2640	5600	105	245	0.44	1.5	2.3	1.4	331398	
247.650	400.050	253.995	249.235	1.5	6.4	2920	6300	120	247.650	0.40	1.7	2.5	1.6	614096B	
254	358.775	269.875	269.875	1.5	3.3	2860	7100	88	254	0.33	2	3	2	331275A	100TQ0459CD1598
260	440	298.500	298.500	2.5	5	3910	7350	190	260	0.54	1.25	1.8	1.3	BT4B328551/HA1	
260.350	422.275	317.500	314.325	6.4	3.3	4130	8000	180	260.350	0.33	2	3	2	BT4B331487G/HA1	102TQ0479BD266
266.700	355.600	228.600	230.188	1.5	3.3	2050	5600	63.5	266.700	0.37	1.8	2.7	1.8	330822B	105TQ0488BA1526
269.875	381.000	282.575	282.575	3.3	3.3	3080	7500	105	269.875	0.33	2	3	2	BT4B331168B	
276.225	393.700	269.875	269.878	1.5	6.4	2970	6400	100	276.225	0.40	1.7	2.5	1.6	331288	
279.400	381.000	269.875	269.875	1.5	3.3	2920	7500	91	279.400	0.35	1.9	2.9	1.8	BT4B328293/HA1	
	393.700	269.875	269.875	1.5	6.4	3030	7100	102		0.37	1.8	2.7	1.8	BT4B332390/HA1	
279.578	380.898	244.475	244.475	1.5	3.3	2290	6400	86	279.578	0.43	1.6	2.3	1.6	330540A	
280	380	290	290	1	2.5	3030	8000	95	280	0.28	2.4	3.6	2.5	BT4B328613G/HA1	
	395	288	288	2.5	4	3470	8300	110		0.28	2.4	3.6	2.5	BT4B328807/HA1	
	420	250	250	2	5	3190	6550	115		0.35	1.9	2.9	1.8	BT4B328664/HA1	
	460	324	324	6	6	4680	9300	215		0.35	1.9	2.9	1.8	BT4B332441G/HA1	
285.750	380.898	244.475	244.475	1.5	3.3	2290	6400	81	285.750	0.43	1.6	2.3	1.6	330337A	112TQ09546AA1254
292.100	422.275	269.875	269.875	6.4	3.3	3520	8000	125	292.100	0.31	2.2	3.3	2.2	331968	115TQ0514BB351
300	440	249.400	280.988	3.3	3.3	3190	7800	145	300	0.43	1.6	2.3	1.6	BT4B328725G/HA1	

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

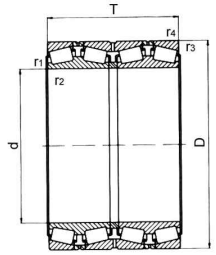
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量	内径	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor	Weight	Inner Diameter d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
300	460	388.500	388.500	5	5	5390	12500	240	300	0.33	2	3	2	BT4B332472	
300.038	422.275	311.150	311.150	3.3	3.3	3800	9500	140	300.038	0.33	2	3	2	331287	118TQ0518AA1159
304.648	438.048	279.400	280.990	3.3	4.8	3470	8000	135	304.648	0.48	1.4	2.1	1.4	331492	120TQ09532AB1293
304.800	419.100	269.875	269.875	1.5	6.4	3360	8150	110	304.800	0.33	2	3	2	BT4B331687/HA1	120TQ0530HD1503
	482.600	377.825	365.125	3.3	3.3	5010	10400	265		0.35	1.9	2.9	1.8	330693C	
304.902	412.648	266.700	266.700	3.3	3.3	3080	8000	105	304.902	0.31	2.2	3.3	2.2	330758A	120TQ0530GB1506
317.500	422.275	269.875	269.875	1.5	3.3	3080	8150	105	317.500	0.31	2.2	3.3	2.2	330870A	125TQ09555AA1254
	438.150	276.225	276.225	1.5	3.3	3520	8300	125		0.43	1.6	2.3	1.6	BT4B334020G/HA4	125TQ09506AA1254
	447.675	327.025	327.025	3.3	3.3	4400	10800	165		0.33	2	3	2	BT4B331161AG/HA1	125TQ0556AA957
330.200	444.500	301.625	301.625	3.3	3.3	3690	9650	135	330.200	0.33	2	3	2	BT4B332647G/HA1	
330.302	438.023	342.900	342.900	3.3	3.3	2600	7350	110	330.302	0.46	1.5	2.2	1.4	331664	130TQ0562BA1250
333.375	469.900	342.900	342.900	3.3	3.3	4570	11400	190	333.375	0.33	2	3	2	331381	131TQ0582AA712
340	520	323.500	323.500	1.5	5	5230	10400	245	340	0.30	2.3	3.4	2.2	BT4B332963/HA1	
342.900	571.500	342.900	342.540	3.3	6.4	6270	11600	365	342.900	0.33	2	3	2	BT4B331553/HA1	
343.052	457.098	254	254	1.5	3.3	2810	6800	110	343.052	0.48	1.4	2.1	1.4	330661C	135TQ0595AA1287
346.075	488.950	358.775	358.775	3.3	3.3	4950	12500	220	346.075	0.33	2	3	2	331228	136TQ0587AA1288
347.662	469.900	260.350	260.350	1.5	3.3	3800	10200	130	347.662	0.33	2	3	2	BT4B331077AG/HA1	U-2517-B
	469.900	292.100	292.100	3.3	3.3	3800	10200	150		0.33	2	3	2	331092A	136TQ09593AA1601
355	490	316	316	1.5	3.3	4130	11000	185	355	0.33	2	3	2	331508	

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

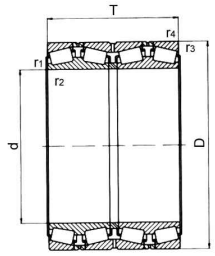
径向当量静载荷
Por=Fr+YoFa

Equivalent static load
Por=Fr+YoFa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
355.600	482.600	269.875	265.112	1.5	3.3	3190	8000	140	355.600	0.48	1.4	2.1	1.4	330662AC	140TQ0594CB957
	488.950	317.500	317.500	1.5	3.3	4130	11000	195		0.33	2	3	2	331271	140TQ09597AA1647
360	510	380	380	2	6	5610	14300	255	360	0.33	2	3	2	332059	
	540	280	280	5	5	4400	9000	230		0.44	1.5	2.3	1.4	BT4B328159/HA1	
368.300	523.875	382.588	382.588	3.3	6.4	5380	15000	275	368.300	0.33	2	3	2	331159A	145TQ0611AA957
380.000	560.000	325.000	325.000	2	5	5500	11800	265	380.000	0.31	2.2	3.3	2.2	BT4B328294/HA1	
	560	360	360	2	6	6160	13700	295		0.40	1.7	2.5	1.6		
	620	368	368	6	6	7040	13700	438		0.43	1.6	2.3	1.6		
384.175	546.100	400.050	400.050	3.3	6.4	6440	16600	310	384.175	0.33	2	3	2	331149A	151TQ0641AA1525
385.762	514.350	317.500	317.500	3.3	3.3	4290	12000	190	385.762	0.43	1.6	2.3	1.6	331202	151TQ0639AA1264
395	545	288.900	268	5	10	2910	9500	195	395	0.48	1.4	2.1	1.4	BT4B332824/HA1	
406.400	546.100	288.925	268.288	1.5	6.4	3910	9500	185	406.400	0.48	1.4	2.1	1.4	331465	160TQ09649BD1774
	546.100	288.925	288.925	1.5	6.4	4020	10200	185		0.48	1.4	2.1	1.4	BT4B330650CG	160TQ0673BA1726
	565.150	381	381	3.3	6.4	6050	15600	300		0.33	2	3	2	BT4B331347AG/HA1	B-8081-C
	590.550	400.050	400.050	3.3	6.4	6930	16600	370		0.33	2	3	2	331133A	160TQ0650AA957
409.575	546.100	334.962	334.962	1.5	6.4	4680	13200	220	409.575	0.43	1.6	2.3	1.6	BT4B331333/HA1	161TQ09660BA1776
415.925	590.550	434.975	434.975	3.3	6.4	7210	19300	395	415.925	0.33	2	3	2	331160A	163TQ0663AA957
420	560	437	437	4	6	5830	16300	285	420	0.31	2.2	3.3	2.2	BT4B328826G/HA1	
	620	355	355	2	5	6440	14600	375		0.31	2.2	3.3	2.2	BT4B328374/HA1	
430	570	336.550	336.550	1.5	3.3	4950	14000	240	430	0.44	1.5	2.3	1.4	331192A	

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

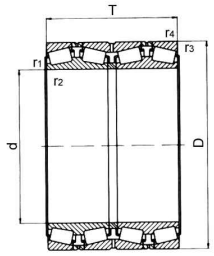
径向当量静载荷
Por=Fr+YoFa

Equivalent static load
Por=Fr+YoFa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
431.800	571.500	279.400	279.400	1.5	3.3	3690	9650	200	431.800	0.54	1.25	1.85	1.3	33125A	170TQ0688DB1528
	571.500	336.550	336.550	1.5	3.3	4950	14000	240		0.54	1.25	1.85	1.3	BT4B331226/HA1	170TQ09679AA1254
	635	355.600	355.600	6.4	6.4	6600	15000	385		0.33	2	3	2	332060	
440.000	580.000	420.000	420.000	4.5	6.7	6050	17600	300	440.000	0.26	2.6	3.9	2.5	BT4B328829/HA1	
	650	353.500	353.500	6.4	6.4	6600	15000	410		0.33	2	3	2	332313	
444.500	571.500	336.550	336.550	1.5	3.3	4950	14300	215	444.500	0.31	2.2	3.3	2.2	BT4B328670	
447.675	635	463.550	463.550	3.3	6.4	8250	22000	485	447.675	0.33	2	3	2	330608C	
450	580	450	450	3	6	6160	19600	280	450	0.24	2.8	4.2	2.8	BT4B328161/HA1	
	595	368	368	3	6	5500	16300	285		0.33	2	3	2	BT4B332773/HA1	N-3347-A
	595	404	404	3	6	5500	16300	305		0.33	2	3	2	BT4B328365/HA1	
457.073	730.148	419.100	412.750	1.5	6.4	8970	19600	630	457.073	0.40	1.7	2.5	1.6	BT4B328287G/HA1	
457.200	596.900	279.400	276.225	1.5	3.3	4180	10800	200	457.200	0.48	1.4	2.1	1.4	331169A	180TQ0691AA1288
	596.900	320	320	3.3	3.3	4840	13700	235		0.44	1.5	2.3	1.4	BT4B334006	
460	610	360	360	3	6	6050	16300	295	460	0.33	2	3	2	331977	
	610	400	400	2.5	4	6270	17300	315		0.28	2.4	3.6	2.5	BT4B328285	
	625	421	421	3	9	7210	20000	382		0.33	2	3	2	BT4B332502/HA1	
462	615.950	330.200	330.200	3.3	6.4	5500	15000	275	462	0.40	1.7	2.5	1.6	BT4B328692	
475	600	368	368	2	6	5280	16600	250	475	0.30	2.3	3.4	2.2	BT4B328913G/HA1	
	660	450	450	4	6	8580	22400	460		0.30	2.3	3.4	2.2	BT4B329007/HA1	
479.425	679.450	495.300	495.300	3.3	6.4	9350	22500	605	479.425	0.33	2	3	2	330886B	

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

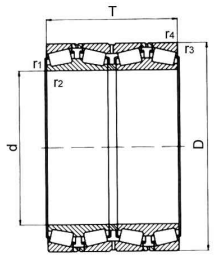
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
482.600	615.950	330.200	330.200	6.4	6.4	5120	15300	245	482.600	0.33	2	3	2	332096	190TQ09697AA1896
	615.950	330.200	419.100	3.5	6.4	5120	15300	265		0.33	2	3	2	BT4B331626A/HA1	
	630	420	420	3.3	6.4	6600	19300	345		0.33	2	3	2	BT4B328773G/HA1	
	647.700	417.512	417.512	3.3	6.4	7210	20000	400		0.33	2	3	2	331259	
488.950	622.300	365.125	365.125	3	3	5610	17300	265	488.950	0.35	1.9	2.9	1.8	BT4B328391G/HA1	
489.026	634.873	320.675	320.675	3.3	3.3	5120	14600	270	489.026	0.35	1.9	2.9	1.8	331090A	192TQ0707AA1250
500	720	400	400	3	6	8250	20400	550	500	0.35	1.9	2.9	1.8	BT4B328524/HA1	
501.650	673.100	387.350	400.050	3.3	6.4	7210	19300	395	501.650	0.31	2.2	3.3	2.2	BT4B331499G/HA1	197TQ0714AA1245
	711.200	520.700	520.700	3.3	6.4	10200	27500	755		0.33	2	3	2	331081A	197TQ0713AA1416
508	762	463.550	463.550	6.4	6.4	10100	23200	730	508	0.37	1.8	2.7	1.8	332131	200TQ0715AA957
510	655	379	377	1.5	6.4	6270	19000	330	510	0.33	2	3	2	BT4B331747A	
514.350	673.100	422.275	422.275	3.3	6.4	7210	21600	410	514.350	0.31	2.2	3.3	2.2	331157A	202TQ0730AA1254
519.112	736.600	536.575	536.575	3.3	6.4	11400	31000	755	519.112	0.33	2	3	2	331078A	
520.700	711.200	400.050	400.050	3.3	6.4	7480	19600	460	520.700	0.33	2	3	2	BT4B331243A/HA1	
536.575	761.873	558.800	558.800	3.3	6.4	11700	32000	835	536.575	0.33	2	3	2	BT4B331174/HA1	
540.000	690.000	400.000	400.000	3	6	5720	16300	375	540.000	0.33	2	3	2	331978	
	690	400	434	1	5	5720	16300	400		0.33	2	3	2	BT4B334038G/HA3	
558.800	736.600	322.268	322.268	3.3	6.4	6270	16600	375	558.800	0.35	1.9	2.9	1.8	31165A	
	736.600	409.575	409.575	3.3	6.4	7650	22000	475		0.35	1.9	2.9	1.8	330993BG	220TQ0745AA957
	736.600	457.200	455.612	3.3	6.4	8420	26000	545		0.33	2	3	2	BT4B331346A/HA1	W-3381-G

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

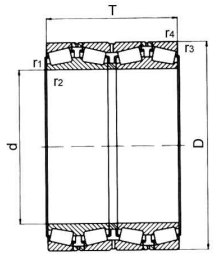
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
560	920	618	618	7.5	7.5	16500	34000	7100	560	0.40	1.7	2.5	1.6	BT4B328509/HA4	
571.500	812.800	593.725	593.725	3.3	6.4	12100	32000	1000	571.500	0.33	2	3	2	330529B	225TQ0756AA957
584.200	730.250	349.250	342.900	1.5	3.3	5500	17000	330	584.200	0.43	1.6	2.3	1.6	331189	
	762	401.638	396.875	3.3	6.4	7650	22400	485		0.48	1.4	2.1	1.4	331148A	
	901.700	539.747	523.080	3.3	9.7	13400	28000	1250		0.33	2	3	2	BT4B328314G/HA1	230TQ0758AA779
585.788	771.525	479.425	479.425	3.3	6.4	9900	30000	625	585.788	0.33	2	3	2	331093A	230TQ0771AA099
595.312	844.550	615.950	615.950	3.3	6.4	13400	36500	1115	595.312	0.33	2	3	2	331300	234TQ0770EC1799
596.900	980	609.600	604.838	6.4	12.7	16800	36500	1920	596.900	0.40	1.7	2.5	1.6	331566	
600	870	488	488	3	6	12500	29000	940	600	0.33	2	3	2	BT4B328350G/HA1	
603.250	857.250	622.300	622.300	3.3	6.4	14700	40500	1235	603.250	0.33	2	3	2	331625	T-4064-G
609.600	787.400	361.950	361.950	3.3	6.4	7370	21200	455	609.600	0.37	1.8	2.7	1.8	331175A	240TQ09776AA1653
	813.562	479.425	479.425	3.3	6.4	10600	30500	715		0.33	2	3	2	331925	H-1752-G
	863.600	660.400	660.400	3.3	6.4	15100	41500	1240		0.31	2.2	3.3	2.2	332391	M-4203-C
620	800	363.500	363.500	3	6	7480	21600	465	620	0.37	1.8	2.7	1.8	BT4B328510/HA1	
635	901.700	654.050	654.050	3.3	6.4	15700	45000	1420	635	0.33	2	3	2	330990A	250TQ0788BB1608
646.112	857.250	542.925	542.925	3.3	6.4	12100	36500	875	646.112	0.33	2	3	2	BT4B332671/HA1	250TQ0799AA957
650	915	674	674	3.3	6.4	16100	45000	1430	650	0.33	2	3	2	332307	
	1030	560	560	1.5	10	16500	36500	1830		0.31	2.2	3.3	2.2	BT4B332827AG/HA1	
657.225	933.450	676.275	676.275	3.3	6.4	17200	49000	1575	657.225	0.33	2	3	2	330824A	258TQ0804AA957

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

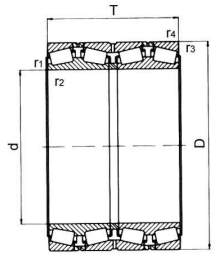
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量	内径	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor	Weight	Inner Diameter d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
660	855	318.480	319.192	4.8	9.7	6160	17000	490	660	0.35	1.9	2.9	1.8	BT4B331065AG/HA4	
	855	318.500	318.500	5	7.5	7040	18600	490		0.35	1.9	2.9	1.8	BT4B328511/HA1	
660.400	812.800	365.125	365.125	3.3	6.4	6710	22400	420	660.400	0.33	2	3	2	331190	260TQ0854AA957
676	910	620	620	4	8	14200	41500	1150	676	0.33	2	3	2	BT4B332906/HA4	
649.450	901.700	552.450	552.450	3.3	6.4	12300	36500	975	649.450	0.33	2	3	2	331700	267TQ0798BB957
682.625	965.200	701.675	701.675	3.3	6.4	17600	50000	1750	682.625	0.33	2	3	2	331503G/HA1	268TQ09811AA957
685.800	876.300	355.600	352.425	3.3	6.4	7210	22000	530	685.800	0.43	1.6	2.3	1.6	331089	270TQ09812AA1254
	876.300	355.600	434.975	3.3	6.4	7210	22000	580		0.43	1.6	2.3	1.6	BT4B328704G/HA1	
708.025	930.275	565.150	565.150	3.3	6.4	13000	39000	1030	708.025	0.33	2	3	2	BT4B332098A/HA1	I-1754-G
710	900	410	410	3	6	8800	26500	660	710	0.35	1.9	2.9	1.8	331351	280TQ0796CA1778
711.200	914.400	371.500	317.500	3.3	6.4	7040	19300	525	711.200	0.37	1.8	2.7	1.8	330882C	280TQ0815AA957
714.375	1016	704.850	704.850	3.3	6.4	18700	53000	1950	714.375	0.35	1.9	2.9	1.8	BT4B331358/HA4	281TQ0814AA957
717.550	946.150	565.150	565.150	3.3	6.4	13400	40500	1900	717.550	0.33	2	3	2	332244	282TQ0847AA957
730	940	500	500	3.5	8	12100	36000	925	730	0.35	1.9	2.9	1.8	331752	
730.250	1035.05	755.650	755.650	3.3	6.4	20500	58500	2170	730.250	0.33	2	3	2	330803A	287TQ0816AA1309
749.300	990.600	605	605	3.3	6.4	15000	45500	1250	749.300	0.33	2	3	2	331616	295TQ0821CA957
	1066.80	736.600	723.900	25.4	12.7	20500	58500	2250		0.33	2	3	2	331094A	295TQ0820AA957
750	1130	690	690	4	7.5	20100	46500	2430	750	0.48	1.4	2.1	1.4	BT4B328376/HA4	

英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

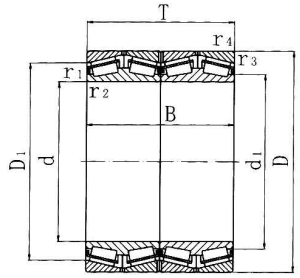
径向当量静载荷
Por=Fr+YoFa

Equivalent static load
Por=Fr+YoFa

基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		重量 Weight	内径 Inner Diameter	计算系数 Calculation Coefficient				轴承型号 Bearing Model	
d	D	T	B	r1,2min	r3,4min	动 Cr	静 Cor		d	e	Y1	Y2	Y0	SKF	TORRINGTON
mm						KN		kg	mm						
762	1066.80	736.600	723.900	8	12.7	20500	58500	2145	762	0.33	2	3	2	331907	300TQ0825AA1245
	1079.50	787.400	787.400	4.8	12.7	22400	65500	2480		0.33	2	3	2	330676B	300TQ0824AA1282
812.800	1143	768.350	768.350	6.4	12.7	22000	63000	2590	812.800	0.33	2	3	2	331248	
825.500	1168.40	844.550	844.550	4.8	12.7	26000	76500	3050	825.500	0.33	2	3	2	BT4B331066A/HA4	325TQ0832BA1028

无隔圈英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing without Spacer



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

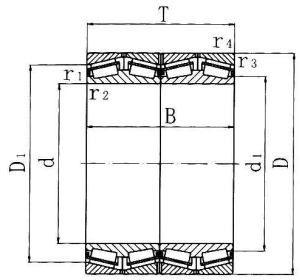
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size								重量 Weight	内径 Inner Diameter	基本额定负荷 Basic Rated Load		计算系数 Calculation Coefficient				轴承型号 Bearing Model SKF
d	D	T	B	d1	D1	r1,2min	r3,4min		d	动 Cr	静 Cor	e	Y1	Y2	Y0	
mm								kg	mm	KN						
489.026	634.876	320.675	320.675	522	584	3.3	3.3	265	489.026	5500	14600	0.35	1.9	2.9	1.8	31090BG
	634.873	320.675	320.675	516	588	2.5	3.3	240		5230	12500	0.37	1.8	2.7	1.8	BT4B334014AAG/HA1C300VA901
501.650	711.200	520.700	520.700	550	655	3.3	6.4	610	501.650	8090	19600	0.33	2	3	2	BT4-8059G/HA1VA901
510.000	655.000	379.000	377.000	539	602	1.5	6.4	325	510.000	6820	19000	0.33	2	3	2	BT4B331747AG/HA1
514.350	673.100	422.275	422.275	537	606	3.3	6.4	395	514.350	6820	19000	0.33	2.2	3	2	BT4-8045G/HA1VA901
	673.100	422.275	422.275	545	614	3.3	6.4	405		7810	21600	0.31	2	3.3	2.2	331157BG
530.000	680.000	440.000	440.000	558	624	1.5	3	405	530.000	8250	23600	0.33	2	3	2	BT4-8043G/HA1
540.000	690.000	400.000	400.000	568	635	2	5	370	540.000	7480	21200	0.33	2	3	2	331978BG
	690.000	400.000	440.000	565	636	2	5	395		7480	21200	0.33	2	3	2	BT4-8038G/HA1VA901
558.800	736.600	409.575	409.575	594	672	3.3	6.4	480	558.800	8250	22000	0.35	1.9	2.9	1.8	BT4B330993AG/HA1
	736.600	457.200	457.200	596	666	3.3	6.4	515		8580	23200	0.35	1.9	2.9	1.8	BT4-8022G/HA1VA919
585.788	711.525	479.425	479.425	622	704	3.3	6.4	620	585.788	10600	30000	0.33	2	3	2	BT4B331096BG/HA1
595.312	844.550	615.950	615.950	642	754	3.3	6.4	1180	595.312	15100	39000	0.33	2	3	2	BT4B331300CG/HA1
609.600	787.400	361.950	361.950	645	735	3.3	6.4	425	609.600	7370	18600	0.37	1.8	2.7	1.8	BT4-8054G/HA1VA902
620.000	800.000	363.500	363.500	655	740	2	6	440	620.000	7040	18000	0.37	1.8	2.7	1.8	BT4-8055G/HA1VA902
625.000	815.000	480.000	480.000	656	746	3.2	6.5	660	625.000	11700	31000	0.33	2	3	2	BT4-8031/HA1
650.000	1040.000	610.000	610.000	740	905	15	10	1970	650.000	17600	36500	0.31	2.2	3.3	2.2	BT4-8036G/HA1
	1040.000	610.000	610.000	730	905	15	10	1970		17600	36500	0.31	2.2	3.3	2.2	BT4-8037G/HA1VA901

无隔圈英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing without Spacer



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

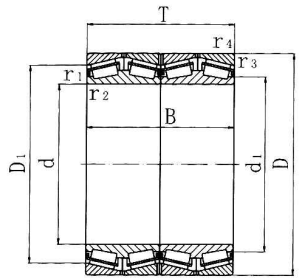
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size								重量 Weight	内径 Inner Diameter	基本额定负荷 Basic Rated Load		计算系数 Calculation Coefficient				轴承型号 Bearing Model
d	D	T	B	d1	D1	r1,2min	r3,4min		d	动 Cr	静 Cor	e	Y1	Y2	Y0	SKF
mm								kg	mm	KN						
260.350	422.275	317.500	314.325	298	372	6.4	3.3	165	260.350	4460	8000	0.33	2	3	3.2	BT4B661487BG/HA1
292.100	422.275	269.875	269.875	324	379	6.4	3.3	125	292.100	3800	8000	0.31	2.2	3.3	2.2	BT4B3319638BG/HA1
304.800	419.100	269.875	269.875	328	378	1	6.4	105	304.800	2920	6700	0.31	2.2	3.3	2.2	BT4-8057G/HA1C300VA901
	495.300	342.900	342.900	350	440	2	6.4	245		5120	9300	0.40	1.7	2.5	1.6	BT4-8061G/HA1C400VA901
304.902	412.648	266.700	266.700	325	374	3.3	3.3	100	304.902	3190	7500	0.31	2.2	3.3	2.2	BT-0004G/HA1
317.500	422.275	269.875	269.875	342	384	1.5	3.3	105	317.500	3360	8150	0.34	2.2	3.3	2.2	330870BG
	422.275	269.875	269.875	338	394	1.5	3.3	94.5		2640	6550	0.33	2	3	2	BT4B334023BG/HAVA901
	447.675	327.025	327.025	340	398	3.3	3.3	165		4730	10800	0.33	2	3	2	BT4B331161BG/HA1
330.302	438.023	254.000	247.650	354	394	1.5	3.3	105	330.302	2800	7350	0.46	1.5	2.2	1.4	BT4B331644AG/HA1
333.375	469.900	342.900	342.900	362	420	3.3	3.3	185	333.375	4130	10200	0.33	2	3	2	BT4-8017/HA1C600VA941
340.000	520.000	323.500	323.500	378	490	6	6	240	340.000	5610	10400	0.30	2.3	3.4	2.2	BT4B332963B/HA1
342.900	533.400	301.625	307.975	390	475	3.3	3.3	240	342.900	4730	8800	0.33	2	3	2	BT4-8034G/HA1
343.052	457.098	254.000	254.000	366	413	1.5	3.3	110	343.052	3030	6800	0.48	1.4	2.1	1.4	330661BG
	457.098	254.000	254.000	362	420	1	3.3	110		2750	6400	0.48	1.4	2.1	1.4	BT4B328817BG/HA1VA901
	457.098	254.000	254.000	362	420	1	3.3	105		2550	6000	0.68	1	1.5	1	BT4B334106BG/HA1C300VA901
347.662	469.900	260.350	360.350	372	430	1.5	3.3	125	347.662	3910	8500	0.33	2	3	2	BT4B331077BG/HA1
355.000	469.900	316.000	316.000	382	446	1.5	3.3	170	355.000	4460	10000	0.33	2	3	2	BT4-8020G/HA1VA901
355.600	482.600	269.875	265.113	382	432	1.5	3.3	140	355.600	3520	8000	0.48	1.4	2.1	1.4	330662BG
	482.600	269.875	265.113	380	436	1.5	3.3	134		3360	7500	0.46	1.5	2.2	1.4	BT4B328870BG/HA1VA901
	488.950	317.500	317.500	392	448	1.5	3.3	480		4460	11000	0.33	2	3	2	331271BG

无隔圈英制四列圆锥滚子轴承

British–system Four–row Tapered Roller Bearing without Spacer



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

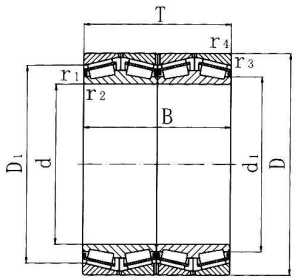
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size								重量 Weight	内径 Inner Diameter	基本额定负荷 Basic Rated Load		计算系数 Calculation Coefficient				轴承型号 Bearing Model
d	D	T	B	d1	D1	r1,2min	r3,4min		d	动 Cr	静 Cor	e	Y1	Y2	Y0	SKF
mm								kg	mm	KN						
355.600	488.950	317.500	317.500	382	446	1	3.3	170	355.600	4460	10000	0.33	2	3	2	BT4B328912BG/HA1C300VA903
360.000	540.000	325.000	325.000	398	485	1.5	3	250	360.000	5720	10800	0.30	2.3	3.4	2.2	BT4-8015G/HA1
380.000	560.000	360.000	360.000	417	500	3.3	5	300	380.000	61710	13700	0.40	1.7	2.5	1.6	TB4-8033G/HA1
384.175	546.100	400.050	400.050	416	496	3.3	6.4	300	384.175	6160	15000	0.35	1.9	2.9	1.8	BT4-8025G/HA1C300VA903
385.762	514.350	317.500	317.500	411	471	1	3.3	175	385.762	4180	10000	0.40	1.7	2.5	1.6	BT4B334042BG/HA1VA901
406.400	546.100	288.925	288.925	434	494	1.5	6.4	185	406.400	4400	10200	0.48	1.4	2.1	1.4	BT4B330650ABG/HA1
	546.100	288.925	288.925	434	498	1.5	6.4	180		4180	9500	0.48	1.4	2.1	1.4	BT4B328838BG/HA1VA901
	546.100	288.925	288.925	434	498	1.5	6.4	180		4180	9500	0.48	1.4	2.1	1.4	BT4B328838BG/HA1VA902
	546.100	288.925	288.925	434	498	1.5	6.4	185		3300	7800	0.68	1	1.4	1	BT4-8014G/HA1VA901
	546.100	288.925	288.925	434	494	1.5	6.4	180		4180	9500	0.48	1.4	2.1	1.4	331465BG
	546.100	330.000	330.000	434	498	1.5	6.4	200		4400	10200	0.48	1.4	2.1	1.4	BT4NB334093BG/HA1VA902
406.400	546.100	330.000	330.000	438	498	1.5	6.4	225	406.400	5010	13200	0.43	1.6	2.3	1.6	BT4B334092AB/HA1
	565.150	440.000	440.000	436	508	1.5	6.4	340		7650	18600	0.33	2	2	2	BT4-8002G/HA1.409.575
409.575	546.100	334.962	334.962	434	498	1	6.4	205	409.575	4840	12000	0.40	1.7	2.5	1.6	BT4-8021G/HA1VA919
	546.100	334.962	334.962	434	498	1	6.4	205		4840	12000	0.40	1.7	2.5	1.6	BT4B329004BG/HA1VA901
	546.100	334.962	334.962	438	490	1.5	6.4	220		5010	13200	0.43	1.6	2.3	1.6	BT4331333BG/HA1
420.000	574.000	480.000	480.000	450	530	2.5	5	345	420.000	7210	18600	1.31	2.2	3.3	2.2	BT4-8018G/H1VA901
430.000	570.000	380.000	380.000	458	510	2	5	260	430.000	5280	14000	0.44	1.5	2.3	1.4	BT4-8049G/HA1
	575.000	380.000	380.000	458	518	1.5	5	280		6440	16500	0.40	1.7	2.5	1.6	BT4-8006BG/HA1
	640.000	465.000	465.000	486	578	2.5	4	530		9520	21200	0.26	2.6	3.9	2.5	BT4-8040G/HA4
431.800	571.500	279.400	279.400	458	530	1.5	3.3	185	431.800	3740	9000	0.54	1.25	1.8	1.3	BT4-8019G/HA1VA901

无隔圈英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing without Spacer



径向当量动载荷
当Fa/Fr=e Pr=Fr+Y1Fa
当Fa/Fr>e Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e Pr=Fr+Y1Fa
Where Fa/Fr>e Pr=0.67Fr+F2Fa

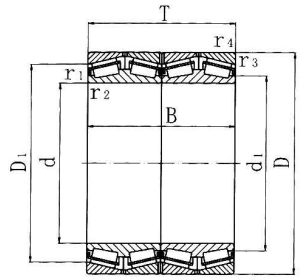
径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size								重量 Weight	内径 Inner Diameter	基本额定负荷 Basic Rated Load		计算系数 Calculation Coefficient				轴承型号 Bearing Model
d	D	T	B	d1	D1	r1,2min	r3,4min		d	动 Cr	静 Cor	e	Y1	Y2	Y0	SKF
mm								kg	mm	KN						
431.800	571.500	336.550	336.550	458	516	1.5	3.3	240	431.800	5280	14000	0.44	1.5	2.3	1.4	BT4B331226BG/HA1
	517.500	336.550	336.550	458	530	1.5	3.3	215		4840	12700	0.44	1.5	2.3	1.4	BT4-8003G/HA1VA902
440.000	590.000	480.000	480.000	468	539	1	5	365	440.000	7650	20000	0.28	2.4	3.6	2.5	BT4B334055ABG/HA1VA902
447.600	635.000	463.500	463.500	488	588	3.3	6.4	470	447.600	7650	20000	0.33	2	3	2	BT4-8039G/HA1VA901
450.000	595.000	368.000	368.000	484	550	3	6	265	450.000	5280	13700	0.31	2.2	3.3	2.2	BT4-8023G/HA1VA919
	595.000	368.000	368.000	486	542	3	6	285		5940	16300	0.33	2	3	2	BT4B3327773AG/HA1
	595.000	404.000	404.000	480	545	2	6	305		5940	16300	0.33	2	3	2	BT4-8044G/HA1VA902
	595.000	415.000	415.000	478	544	1.5	6	320		7040	19000	0.31	2.2	3.3	2.2	BT7-8024G/HA1
457.200	596.900	279.400	276.225	484	550	1.5	3.3	190	457.200	4290	10000	0.48	1.4	2.1	1.4	BT4B328827ABG/HA1VA902
	596.900	279.400	276.225	484	550	1.5	3.3	190		4290	10000	0.48	1.4	2.1	1.4	BT4B328827BG/HA1VA902
475.000	600.000	368.000	368.000	500	554	2	6	250	475.000	5720	16600	0.30	2.3	3.4	2.2	BT4B328913BG/HA1C555
	640.000	360.000	360.000	512	568	2	6	335		5500	15300	0.33	2	3	2	BT4-80358G/HA1
479.425	679.450	495.300	495.300	520	610	3.3	6.4	585	479.425	10100	25500	0.33	2	3	2	BT4B330866CG/HA1
	679.450	495.300	495.300	520	610	3.3	6.4	565		9350	22400	0.33	2	3	2	BT4B334116BG/HA1VA901
482.600	615.950	330.200	330.200	512	570	3.3	6.4	240	482.600	5500	15300	0.33	2	3	2	330641BG
	615.950	330.200	330.200	512	570	3.3	6.4	240		5500	15300	0.33	2	3	2	330641BG/HE1
	615.950	330.200	330.200	512	570	3.3	6.4	240		5500	15300	0.33	2	3	2	330641ABG/HE1
	615.950	330.200	330.200	505	777	1	6.4	230		5280	13700	0.33	2	3	2	BT4B328842BG/HAVA901
	615.950	330.200	330.200	505	777	1	6.4	230		5280	13700	0.33	2	3	2	BT4B328842BG/HAVA902
	615.950	330.200	330.200	505	777	1	6.4	230		5280	13700	0.33	2	3	2	BT4B328842ABG/HA1VA902
	615.950	330.200	330.200	512	570	6.4	6.4	240		5500	15300	0.33	2	3	2	332096BG3
	615.950	330.200	419.100	512	570	3.5	6.4	250		5500	15300	0.33	2	3	2	BT4B331626BG/HA1
	615.950	420.000	420.000	505	577	2.8	4.4	280		5500	15300	0.33	2	3	2	BT4-8062G/HA1VA901
	635.000	421.000	421.000	512	578	3	6.4	365		7370	20400	0.33	2	3	2	BT4B334105BG/AH1

无隔圈英制四列圆锥滚子轴承

British-system Four-row Tapered Roller Bearing without Spacer



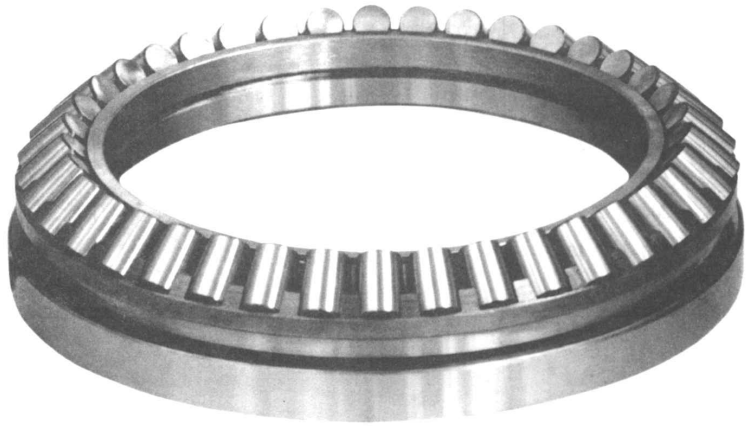
径向当量动载荷
当Fa/Fr=e　　Pr=Fr+Y1Fa
当Fa/Fr>e　　Pr=0.67Fr+F2Fa

Equivalent dynamic load
Where Fa/Fr=e　Pr=Fr+Y1Fa
Where Fa/Fr>e　Pr=0.67Fr+F2Fa

径向当量静载荷
Por=Fr+Y0Fa

Equivalent static load
Por=Fr+Y0Fa

基本尺寸 Basic Size								重量 Weight	内径 Inner Diameter	基本额定负荷 Basic Rated Load		计算系数 Calculation Coefficient				轴承型号 Bearing Model
d	D	T	B	d1	D1	r1,2min	r3,4min		d	动 Cr	静 Cor	e	Y1	Y2	Y0	SKF
mm								kg	mm	KN						
660.000	1070.000	648.000	648.000	760	960	6	10	2260	660.000	19000	38000	0.31	2.2	3.3	2.2	BT4-8060G/HA4C300VA901
660.400	812.800	365.125	365.125	698	756	3.3	6.4	415	660.400	7210	22400	0.33	2	3	2	BT4B331190BG/HA1
	812.800	365.125	365.125	692	784	2	6.4	395		7210	20400	0.33	2	3	2	BT4B328977BG/HA1VA901
679.450	901.700	552.450	552.450	722	824	3.3	6.4	970	679.450	13200	36000	0.33	2	3	2	BT4B334015BG/HA1VA901
685.800	876.000	355.600	355.600	730	805	3.3	6.4	525	685.800	7810	22000	0.43	1.6	2.3	1.6	BT4B331089CG/HA1
	876.300	355.600	355.600	730	818	3.3	6.4	505		7650	20000	0.37	1.8	2.7	1.8	BT4B328955ABG/HA1VA902
	876.300	355.600	355.600	730	818	3.3	6.4	505		7650	20000	0.37	1.8	2.7	1.8	BT4B328955BG/HA1VA902
710.000	900.000	410.000	410.000	750	835	3	6	620	710.000	9680	27000	0.35	1.9	2.9	1.8	BT4B331351BG/HA1
750.000	950.000	410.000	410.000	800	878	3	6	705	750.000	9350	26500	0.37	1.8	2.7	1.8	BT4-8048G/HA4
762.000	1066.800	736.600	723.900	825	952	8.9	12.7	2090	762.000	22000	58500	0.33	2	3	2	BT4B331907BG/HA4



推力滚子轴承

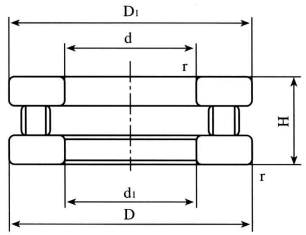
推力调心滚子轴承轴向负荷能力大、在承受轴向负荷的同时还可承受一定程度的径向负荷(不超过同时承受的轴向负荷的55%)。

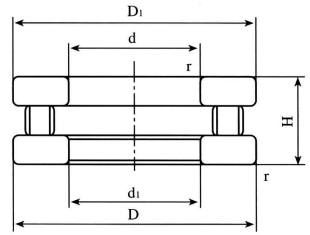
但不适用于高速旋转，座圈滚道面呈球面，具有调心性能，可允许轴有若干倾斜。

一般采用油润滑。

Thrust Roller Bearing

Concentric thrust roller bearing has a high capability to bear axial load. It can bear some radial load (not beyond 55% of axial load it bears simultaneously) in addition to axial load. However, it is not applicable to rotation at a high speed. The raceway is of spherical face, having self-aligning feature. The axis is allowed to have some inclination.
It is usually lubricated with oil.

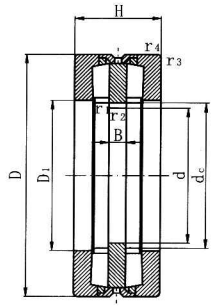




基本尺寸 Basic Size						基本额定负荷 Basic Rated Load		原代号 Original Code	现代号 Current Code	极限转速 Limit Speed		重量 Weight
d	dlmin	D	Dlmax	H	rsmin	动 Cr	静 Cor			脂润滑 Grease	油润滑 Oil	
mm						KN				r/min		kg
150	153	230	227	50	3	553	2370	9830	81730	800	1100	8.22
	150.3	300	300	35	2.1	698	4330	569730	87430X2	840	1100	11.3
153.988	153.988	228.6	227.6	50.8	4.76	426	1630	-	RT143240	800	1100	7.7
177.8	180	254	253	50.8	3.5	575	2526	-	IB448	700	950	10
180	183	280	277	54	3	803	3717	9836	81836	680	900	13.4
190	193	240	237	37	2	316	1398	9138	81138	800	1100	4.1
200	203	250	247	37	1.1	310	1400	9140	81140	700	900	4.4
	204	277	280	62	2	670	2490	9240	81240	500	750	12.4
220	225	420	420	130	6	2380	8095	549744H	81744ZW	380	560	94.2
240	244	340	335	78	2.1	990	3675	9248	81248	380	560	24.1
	245	440	435	122	6	2360	10770	9549448	89448	300	400	89.5
260	264	360	355	79	2.1	1045	4170	9252	81252	350	600	26.4
500	505	670	665	135	5	3400	17600	92/500	812/500	140	190	153
530	535	640	635	85	3	1739	9920	91/530	811/530	160	200	57.8
	532	710	708	82	5	2280	17800	75492/530	872/530	220	290	96.6
560	565	750	745	150	5	3900	20800	92/560	812/560	120	170	198
600	602	860	860	125	6	3870	12980	5497/600	817/600	130	180	264
670	672	900	900	103	6	3530	26500	75492/670	872/670	160	200	200
710	714	850	848	63	4	1440	13660	75491/710	871/710	240	300	79
800	800	950	950	90	4	1360	9440	90091/800	891/800	160	200	105
850	855	1000	995	67	4	1864	17480	75491/850	871/850	200	260	97.1
	855	1000	995	120	4	3347	22152	91/850	811/850	160	200	177.2
900	902	1180	1180	125	7.5	5300	50459	75492/900	972/900	100	130	386
1060	1065	1400	1400	155	9.5	8950	79390	75492/1060	872/1060	87	110	698
1180	1180	1325	-	88.5	63	4430	21700	97/1180	817/1180	100	150	173
		1400	1395	100	6	4430	48665	75491/1180	871/1180	110	150	311
1320	1325	1700	1700	175	9.5	10300	105400	75492/1320	872/1320	67	90	1.5

双向推力圆锥滚子轴承

Bi-directional Thrust Cylindrical Roller Bearing



轴向当量动载荷 Pa=Fa — Equivalent dynamic load Pa=Fa

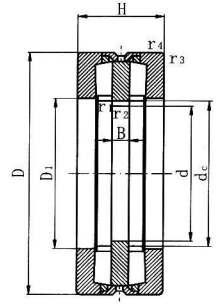
Equivalent static load

轴向当量静载荷 Poa=Fa — Poa=Fa

基本尺寸 Basic Size d	D	H	D1	B	de1	r1,2min	r3,4min	内径 Inner Diameter d	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	重量 Weight	参考轴承型号 Reference Bearing Model SKF	FAG
mm								mm	KN		kg		
160	300	110	190	34	182	1	1.5	160	825	3000	3.5	-	515805
170	240	84	184	20	182	0.6	2	170	330	1290	12.5	350980C	528974
180	280	90	196	20	192	1	2	180	561	2400	22	353162	528294
200	300	96	236	22	229	0.6	2	200	470	2230	20	-	563400
220	300	96	236	22	231	0.6	2	220	440	1660	20	351019C	528876
230	400	180	260	42	255	1	5	230	1500	5800	110	-	530852
240	320	96	256	22	251	0.6	2	240	418	1900	21.5	351182C	529086
	380	105	270	27	267	2	2		700	2800	42	-	545678
250	360	96	285	24	274	1.1	2.1	250	680	2780	30	-	547482
	380	100	275	22	265	0.6	2		897	4550	43.5	353005	522010
260	360	92	285	20	276	1	2	260	605	2600	28	350981C	509352
270	450	180	310	45	300	2	5	270	1650	6000	120	351164C	-
	450	180	316	44	302	2	5		2000	7500	115	-	527907
300	420	100	330	23	321	1.5	1.5	300	630	2620	41	-	524740
305	530	200	345	56	330	1.5	5	305	2100	8000	200	-	544025
310	490	130	350	29	340	3	3	310	1300	5000	84	-	524902
320	440	108	355	26	349	1.1	3	320	990	4650	48.5	353102C	528562
	470	130	350	30	340	1.1	3		1300	5700	80	350982C	509654
	500	218	350	60	340	2	5		2100	8360	175	-	540295
	600	240	380	50	360	2	4		3650	9980	324	-	522837

双向推力圆锥滚子轴承

Bi-directional Thrust Cylindrical Roller Bearing



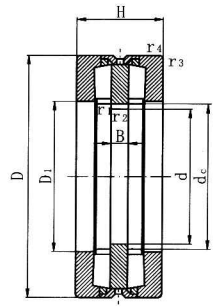
轴向当量动载荷 Pa=Fa — Equivalent dynamic load: Pa=Fa

轴向当量静载荷 Poa=Fa — Equivalent static load: Poa=Fa

基本尺寸 Basic Size d	D	H	D1	B	de1	r1,2min	r3,4min	内径 Inner Diameter d	基本额定负荷 Basic Rated Load 动 Cr	静 Cor	重量 Weight	参考轴承型号 Reference Bearing Model SKF	FAG
mm								mm	KN		kg		
350	490	130	390	30	380	1.1	3	350	1170	5100	73.5	351100C	530739
	540	135	400	30	385	1.1	3		1720	9150	115	353006	522008
360	530	145	410	45	398	2	4	360	1300	5780	110	-	573320
	560	200	396	48	383	2	5		1680	7000	180	-	524194
380	560	130	430	32	416	1.5	2.5	380	1720	9120	108	351175C	513125
	560	145	430	47	411	1.5	2.5		1720	9120	130	-	567356
	650	215	450	65	446	2	4		3360	16600	275	BFDB353204	545936
400	650	200	450	50	430	2	5	400	2700	13700	250		540162
410	560	160	440	40	429	2	5	410	2780	10200	111	-	524134
420	620	170	465	35	455	1.5	3	420	2420	12200	185	351121C	-
	620	170	470	35	450	1.5	3		2280	11000	185	-	509392
	620	185	465	50	453	1.5	3		2420	12200	200	BFDB353200/HA3	-
	620	185	470	50	450	1	5		2450	13300	202	-	545991
440	645	167	490	50	480	3	4	440	1980	10800	190	353152	534038
	660	155	505	35	485	3	5		2450	12300	178	-	523720
450	645	155	490	38	480	4	4	450	1980	10800	170	350916D	
	645	155	500	38	480	3	5		2240	12200	157	-	513401
470	720	200	535	50	517	2	4	470	3410	17600	285	353151	509391
	720	210	535	60	517	2	4		3410	17600	305	BFDB353238/HA3	549701
480	710	218	575	57	555	3	5	480	2700	13000	280	-	547584
530	710	218	575	57	560	2	3	530	2200	11000	245	351475C	511746

双向推力圆锥滚子轴承

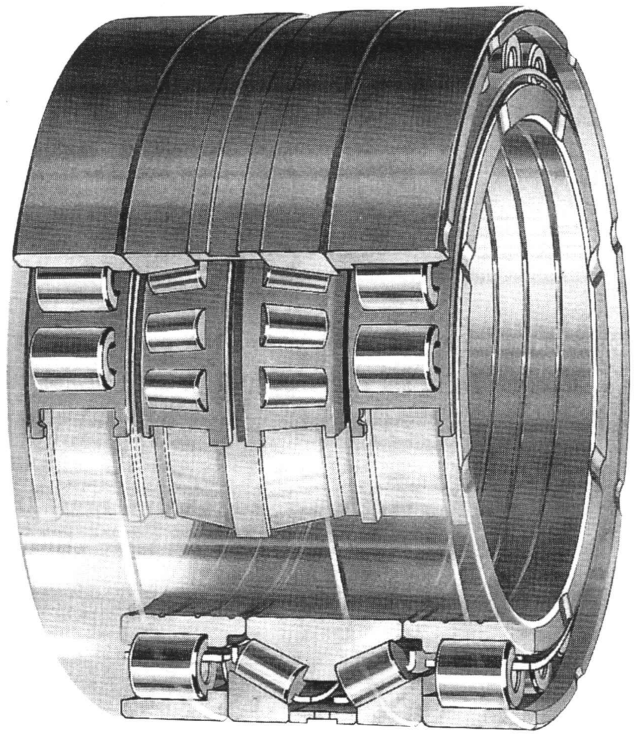
Bi-directional Thrust Cylindrical Roller Bearing



轴向当量动载荷 Pa=Fa — Equivalent dynamic load Pa=Fa

轴向当量静载荷 Poa=Fa — Equivalent static load Poa=Fa

基本尺寸 Basic Size								内径 Inner Diameter	基本额定负荷 Basic Rated Load		重量 Weight	参考轴承型号 Reference Bearing Model	
d	D	H	D1	B	de1	r1,2min	r3,4min	d	动 Cr	静 Cor		SKF	FAG
mm								mm	KN		kg		
550	760	230	610	50	585	2	5	550	2920	13200	310	350976C	515196
600	880	290	680	70	670	5	6	600	4730	21200	550	BFDB350824B/HA1	
	910	290	680	70	670	5	6		4730	21200	655	350901C	
670	900	230	725	50	705	2	5	670	3580	19000	425	351761A	521823
900	1180	220	990	48	960	2	6	900	4500	22000	580	-	522834



圆柱/圆锥组合轴承

此组合轴承已成功于上海宝钢2050热轧钢板机工作辊上。其特点为了：

1.结构紧凑，在轧制过程中所产生的轴向力由其中间的双列圆锥滚子轴承承受，省去了目前所有轧机中另为承受轴向力而设计安装诸如双列圆锥或双向推力圆锥滚子轴承，或双向推力球轴承或由两套角接独球轴承组成的双联轴承的机构，缩短了轧辊组件的总长度，从而降低了制造成本费用；

2.此组合轴承的径向承载能力与寿命可设计得大于外形尺寸相同的四列圆锥滚子轴承，这正是所有轧制设备所需要的；

3.此组合轴承安装在轧制板材的工作辊上，在轧制质量与精度上已显示其优越性，同时对轧辊的抗弯能力与轴向定位性能均有显著提高；

4.由于此组合轴承在实际工作中要频繁拆卸，故两侧圆滚子轴承内圈子为松配合，而中间的双列圆锥滚子轴承间隙配合，不承受径向力，同时为了减轻不可避免的磨损，在圆柱滚子轴承的内径表面设有螺旋形油槽，以及在其内圈和外圈两端面有径向直油槽，如有可能，在各内圈接触面之间设计一平键或圆销以完全避免接触面之间的相对滑动与磨损；

5.此组合轴承尺寸公差为了P6级，旋转精度为P5级，至于其圆柱滚子轴承的径向游隙，圆锥滚子轴承的轴向游隙应根据实际应用要求而定。

Combined cylindrical/conical bearing

Such combined bearing has been successfully used in the working rollers on Model 2050 hot-rolled steel plate machines in Baoshan Iron & Steel Company, Shanghai, which has the following features:

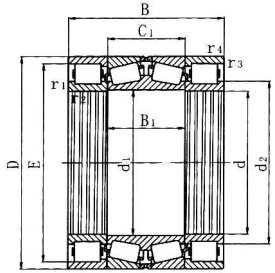
1. Compact structure: The axial force produced during rolling is borne by the double-row tapered roller bearing in the middle of it, so that additional design and installation of such bearings for axial force bearing planes currently on all rolling machines as double-row conical or bi-directional thrust tapered roller bearing or bi-directional thrust ball bearing or double-bearing mechanism consisting of two sets of separate bearing by angle joint are saved, resulting in shortened total length of roller assembly and reduced manufacture costs and expenses.

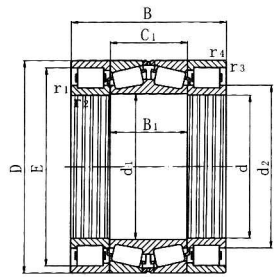
2. Such combined bearing can be designed to have both axial load bearing capability and service life greater than a four-row tapered roller bearing of the same size. This is what is wanted for rolling equipment.

3. Installed on the working roller for rolling plates, such combined bearing has shown its advantages in both rolling quality and accuracy. Furthermore, the roller is improved significantly in both bend-bearing capability and axial positioning performance.

4. As such combined bearing has to be removed frequently in practical work, the round roller bearing inner rings on both sides are in loose fit, the double-row tapered roller bearing in the middle are in clearance fit and bears no radial force. In addition, to reduce unavoidable wear, a spiral oil groove is provided on the ID surface of cylindrical roller bearing and radial straight oil grooves on both end faces of its inner and outer rings. If possible, a flat key or round pin is designed between the contact surfaces of inner rings to avoid relative slide and wear between them.

5. The tolerance of such combined bearing is of class P6 and the rotational accuracy of class P5. The radial play of cylindrical roller bearing and the axial play of tapered roller bearing should be determined according to requirements in practical applications.





基本尺寸 Basic Size			基本额定负荷 Basic Rated Load				重量	内径	其它尺寸 Other Sizes							型号
d	D	B	动 Cr	静 Cor	Ca	Coa	Weight	Inner Diameter d	d	d1	d2	B1	C1	r1,2min	r3,4min	Model SKF
mm							kg	mm								
187.325	269.875	211.138	539	930	500	1760	40.0	187.325	189.5	206	70	84.138	253	2	4	BVNB328735/HA1
241.478	349.148	240	781	1340	710	2160	73.5	241.478	243.5	268	74	90	327.5	2	4	BVNB328605/HA1
266.700	355.600	240	765	1530	655	2320	67.5	266.700	268.7	296	72	90	337	2	2	BVNB328587/HA1
290	415	290	1020	1860	1160	3800	130	290	292	325	108	128	390	1.5	3	BVNB329005/HA1
333.375	457.098	280	935	1700	1320	4750	135	333.375	335	380	110	130	432.5	3	3	BVNB328584/HA1
385.762	514.350	317.5	1250	2550	1460	5850	190	385.762	388	410	125	145.5	488.5	2	4	BVNB328733/HA1
406.400	546.100	330	1760	3600	1160	3800	220	406.400	408.4	440	90	112.925	522	2	4	BVNB328753/HA1
431.800	571.500	280	1280	2360	1630	5850	200	431.800	434	477	105	130	544	5	2.1	BVNB328540/HA1
457.200	596.600	280	1080	2120	1730	6300	210	457.200	459.2	482	105	130	568	2	4	BVNB328601/HA1
462.045	616.000	386	1940	4000	1800	7350	335	462.045	464	491	136	150	585	2	4	BVNB328362/HA1
489.026	634.949	320	2050	4300	1800	7350	310	489.026	491	536	128	148	605	5	3	BVNB328441/HA1
520	690	430	2050	4500	2280	10400	385	520	522	554	160	180	654	2	4	BVNB328360/HA1

注：Cr、Cor

为圆柱滚子轴承额定径向动载荷与静载荷

Ca、Coa为圆锥滚子轴承额定轴向动载荷与静载荷

Note：Cr and Cor are the rated radial dynamic and static loads of cylindrical roller bearing respectively.
Ca and Coa are the rated axial dynamic and static loads of cylindrical roller bearing respectively.

回转支承

回转支承是一种能够同时承受较大的轴向负荷、径向负荷和倾覆力矩等综合载荷的特殊的轴承。一般情况下，回转支承自身均带有安装孔、润滑油孔和密封装置，可以满足各种不同工况条件下工作的各类主机不同需求；另一方面，回转支承本身有结构紧凑、引导旋转方便、安装简单和维护容易等特点，被广泛用于起重运输机械、采掘机械、港口机械、医疗设备和军工等回转装置上。

回转支承根据不同的结构型式可以分为：四点接触球式、双排角接触球式、交叉圆柱滚子式和三排圆柱滚子组合式等。上述各类轴承按其是否带齿及齿轮的分布部位又分为无齿式、外齿式和内齿式等不同结构。

回转支承根据不同的结构特点可分别满足各种不同负荷条件下工作主机的需求。

结构形式

四点接触球式回转支承

单排四点接触球式支承一般由两个座圈组成，结构紧凑、重量轻、钢球与圆弧滚道四点接触，能同时承受轴向力、径向力和倾覆力矩。回转式运输机、焊接操作机、中小型起重机和挖掘机等工程机械均可选用。四点接触球式回转支承具有较高的动负荷能力。

双排角接触球式回转支承

双排角接触球式回转支承，具有三个座圈，钢球和隔离块可直接排入上下滚道，根据受力状况，安排了上下两直径不同的钢球。这种形式装配非常方便，能承受很大的轴向力和倾覆力矩。双排角接触球式回转支承的轴向、径向尺寸都比较大，结构坚固。特别适用于要求中等以上直径的塔式起重机、汽车起重机装卸机械上。

交叉圆柱滚子式回转支承

单排交叉圆柱滚子式回转支承，一般由两个座圈组成，结构紧凑、重量轻、制造精度高、装配间隙小，对安装精度要求高，滚柱为1：1交叉排列，能同时承受轴向力、倾覆力矩和较大的径向力，被广泛地用于起重运输、工程机械和军工产品上。交叉圆柱滚子式回转支承具有较高的静负荷能力，交叉圆柱式回转支承可通过其预过盈，能使轴承具有较大的支撑刚性和较高的回转精度。

Slewing bearing

Slewing bearing is a special bearing, which can bear combined axial, radial loads and tipping moment. Generally, slewing bearing is equipped with installation holes, lubricant hole and sealing device in order to meet various requirements of main equipment in various operation conditions. Besides, slewing bearing features compact in structure, convenient to guide and rotate, easy for installation and maintenance. It is widely used rotary device for rigging & transportation equipment, excavating equipment, port equipment, medical equipment and military equipment.

Slewing bearing is classified according to its structure into: four point contact ball type, double row angular contact ball type, crossed cylindrical roller type and three row cylindrical roller type etc… The above-mentioned bearings are classified according to gear and gear free into: gear-free type, outer gear type and inner gear type.

Featuring various structures, slewing bearing can meet requirements of main working equipment in various operation conditions.

Structure

Four point contact ball slewing bearing

Four point contact ball slewing bearing is generally composed of two housing washers, which is compact in structure and light with steel balls contacting with spherical cage at four points. It can bear combined axial, radial loads and tipping moment. It can be used for construction equipment including rotary transporter, welding machine, small/medium sized crane and excavators. Four point contact ball slewing bearing honors quite high dynamic load capacity.

Double row angular contact ball slewing bearing

Double row angular contact ball slewing bearing is equipped with three housing washers. Steel ball and separator can be directly led to top/bottom cage. Two steel balls in different bores are equipped to fit for different load condition. This kind of configuration is quite easy to operate, which can bear heavy axial load and tipping moment. It is quite big in axial/radial size and compact in structure, which makes it particularly suitable for those equipments like bridge crane and truck-mounted loading/unloading equipment.

Crossed cylindrical roller slewing bearing

Crossed cylindrical roller slewing bearing is generally composed of two housing washers, which features compact in structure, light, precise in manufacturing and small clearance during assembly. Thus it requires high-level precision for installation. Roller is laid across. It is capable to bear axial load, tripping moment and heavy radial load, which is widely used in rigging, transportation, construction equipment and military products. Besides, it can bear heavy static load. Furthermore, preloaded mounting can be reached to have rigid support and precise rotary.

三排圆柱滚子组合式回转支承

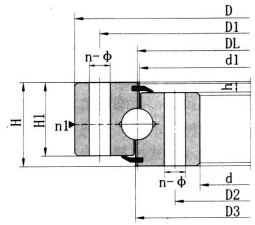
三排圆柱滚子组合式回转支承三个座圈，上下及径向滚道各自分开，使得每一排滚柱的负载都能确切地加以确定。能够同时承受各种载荷，是四种产品中承载能力最大地一种，轴、径向尺寸都较大，结构牢固，特别适用于要求较大直径的重型机械，如斗轮式挖掘机、轮式起重机、船式起重机、钢水回转台及大吨位汽车起重等机械上。三排圆柱滚子组合式回转支承由于把承载能力的提高引向轴承的高度方向，各种载荷又分别由不同滚道和滚子组承受，所以在同等受力条件下，其轴承的直径可大大缩小，因而具有使主机更为紧凑的特点，是一种高承载能力的回转支承。

Three row cylindrical roller combined slewing bearing

Three row cylindrical roller combined slewing bearing is composed of three housing washers, raceway of which is separable in top, bottom, radial and axial direction. This makes to accurately define load of each row of roller. It can bear various loads at same time rating first place in bearing capacity among four kinds of bearings. It has big axial/radial dimension as well as strong structure, which are particularly suitable for heavy equipment requiring big diameter, like wheel excavator, wheel crane, marine crane, liquid steel turret and heavy-duty truck-mounted crane. This bearing can lift bearing capacity and lead it to its radial direction and various loads can be born by each raceway and roller set, then its diameter can be decreased largely under same force condition, therefore it makes its main body compact featuring high bearing capacity as slewing bearing.

单排四点接触球式回转支承(01系列)

Single-row Four-point Contact Ball Slewing Bearing (Series 01)



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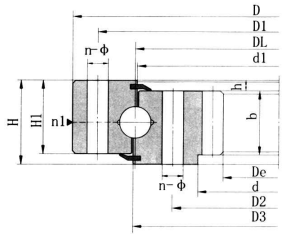
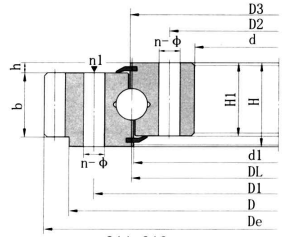


013, 014

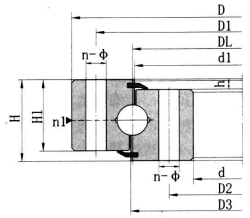


011, 012

承载曲线图编号 Load-carrying Curve No.	基本型号 Basic Model 无齿式 Toothless Type Dl	外齿式 External Tooth Type Dl	内齿式 Internal Tooth Type Dl	外型尺寸 External Dimension D	d	H	安装尺寸 Installation Size D1	D2	n	Ø	结构尺寸 Structure Size n1	D3	d1	H1	h	齿轮参数 Gear Parameter b	x	m	外齿参数 Parameter of External Tooth De	Z	内齿参数 Parameter of Internal Tooth De	Z	齿轮圆周力 Twisting Force of Bearing 正火 Normalizing Z	调质 Seasoning T	重量 Weight
	mm	mm	mm	mm	mm	mm	mm	mm				mm	mm	mm	mm	mm		mm	mm		mm		10^4n	10^4n	kg
1	010.30.500	011.30.500	013.30.500	602	398	80	566	434	20	18	4	501	498	70	10	60	+0.5	5	629	123	367	74	3.7	5.2	85
		012.30.500	014.30.500															6	628.8	102	368.4	62	4.5	6.2	
1'	010.25.500	011.25.500	013.25.500	602	398	80	566	434	20	18	4	501	499	70	10	60	+0.5	5	629	123	367	74	3.1	4.3	85
		012.25.500	014.25.500															6	628.8	102	368.4	62	3.8	5.2	
2	010.30.560	011.30.560	013.30.560	662	458	80	626	494	20	18	4	561	558	70	10	60	+0.5	5	689	135	427	86	3.7	5.2	95
		012.30.560	014.30.560															6	688.8	112	428.4	72	4.5	6.2	
2'	010.25.560	011.25.560	013.25.560	662	458	80	626	494	20	18	4	561	559	70	10	60	+0.5	5	689	135	427	86	3.1	4.3	95
		012.25.560	014.25.560															6	688.8	112	428.4	72	3.8	5.2	
3	010.30.630	011.30.630	013.30.630	732	528	80	696	564	24	18	4	631	628	70	10	60	+0.5	6	772.8	126	494.4	83	4.5	6.2	110
		012.30.630	014.30.630															8	774.4	94	491.2	62	6.0	8.3	
3'	011.25.630	011.25.630	013.25.630	732	528	80	696	564	24	18	4	631	629	70	10	60	+0.5	6	772.8	126	494.4	83	3.8	5.2	110
		012.25.630	014.25.630															8	774.4	94	491.2	62	5.0	6.9	
4	010.30.710	011.30.710	013.30.710	812	608	80	776	644	24	18	4	711	708	70	10	60	+0.5	6	850.8	139	572.4	96	4.5	6.2	120
		012.30.710	014.30.710															8	854.4	104	571.2	72	6.0	8.3	
4'	010.25.710	011.25.710	013.25.710	812	608	80	776	644	24	18	4	711	709	70	10	60	+0.5	6	850.8	139	572.4	96	3.8	5.2	120
		012.25.710	014.25.710															8	854.4	104	571.2	72	5.0	6.9	
5	010.40.800	011.40.800	013.40.800	922	678	100	878	722	30	22	6	801	798	90	10	80	+0.5	8	966.4	118	635.2	80	8.0	11.1	220
		012.40.800	014.40.800															10	968	94	634	64	10.0	14.0	
5;	010.30.800	011.30.800	013.30.800	922	678	100	878	722	30	22	6	801	798	90	10	80	+0.5	8	966.4	118	635.4	80	6.0	8.3	220
		012.30.800	014.30.800															10	968	94	634	64	7.5	10.5	
6	010.40.900	011.40.900	013.40.900	1022	778	100	978	822	30	22	6	901	898	90	10	80	+0.5	8	1062.4	130	739.2	93	8.0	11.1	240
		012.40.900	014.40.900															10	1068	104	734	74	10.0	14.0	
6'	010.30.900	011.30.900	013.30.900	1022	778	100	978	822	30	22	6	901	898	90	10	80	+0.5	8	1062.4	130	739.2	93	6.0	8.3	240
		012.30.900	014.30.900															10	1068	104	734	74	7.5	10.5	
7	010.40.1000	011.40.1000	013.40.1000	1122	878	100	1078	922	36	22	6	1001	998	90	10	80	+0.5	10	1188	116	824	83	10.0	14.0	270
		012.40.1000	014.40.1000															12	1185.6	96	820.8	69	12.0	16.7	
7'	010.30.1000	011.30.1000	013.30.1000	1122	878	100	1078	922	36	22	6	1001	998	90	10	80	+0.5	10	1188	116	824	83	12.5	10.5	270
		012.30.1000	014.30.1000															12	1185.6	96	820.8	69	9.0	12.5	
8	010.40.1120	011.40.1120	013.40.1120	1242	998	100	1198	1042	36	22	6	1121	1118	90	10	80	+0.5	10	1298	127	944	95	10.0	14.0	300
		012.40.1120	014.40.1120															12	1305.6	106	940.8	79	12.0	16.7	
8;	010.30.1120	011.30.1120	013.40.1120	1242	998	100	1198	1042	36	22	6	1121	1118	90	10	80	+0.5	10	1298	127	944	95	7.5	10.5	300
		012.30.1120	014.40.1120															12	1305.6	106	940.8	79	9.0	12.5	

单排四点接触球式回转支承(01系列)

Single-row Four-point Contact Ball Slewing Bearing (Series 01)



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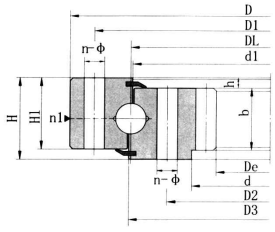

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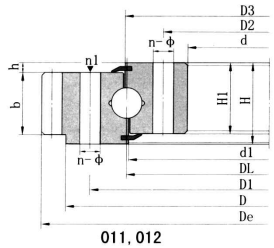
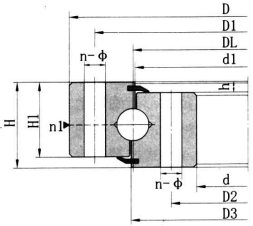


011, 012

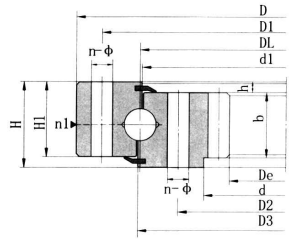
承载曲线图编号 Load-carrying Curve No.	基本型号 Basic Model 无齿式 Toothless Type Dl	外齿式 External Tooth Type Dl	内齿式 Internal Tooth Type Dl	外型尺寸 External Dimension D	d	H	安装尺寸 Installation Size D1	D2	n	Ø	结构尺寸 Structure Size n1	D3	d1	H1	h	齿轮参数 Gear Parameter b	x	m	外齿参数 Parameter of External Tooth De	Z	内齿参数 Parameter of Internal Tooth De	Z	齿轮圆周力 Twisting Force of Bearing 正火 Normalizing Z	调质 Seasoning T	重量 Weight
	mm	mm	mm	mm	mm	mm	mm				mm					mm		mm	mm		mm		10^4n	10^4n	kg
9	010.45.1250	011.45.1250	013.45.1250	1390	1110	110	1337	1163	40	26	5	1252	1248	100	10	90	+0.5	12	1449.6	118	1048.8	88	13.5	18.8	420
		012.45.1250	014.45.1250															14	1453.2	101	1041.6	75	15.8	21.9	
9'	010.35.1250	011.35.1250	013.35.1250	1390	1110	110	1337	1163	40	26	5	1251	1248	100	10	90	+0.5	12	1449.6	118	1048.8	88	10.5	14.6	420
		012.35.1250	014.35.1250															14	1453.2	101	1041.6	75	12.3	17.0	
10	010.45.1400	011.45.1400	013.45.1400	1540	1260	110	1487	1313	40	26	5	1402	1398	100	10	90	+0.5	12	1605.6	131	1192.8	100	13.5	18.8	480
		012.45.1400	014.45.1400															14	1607.2	112	1195.6	86	15.8	21.9	
10'	010.35.1400	011.35.1400	013.35.1400	1540	1260	110	1487	1313	40	26	5	1401	1398	100	10	90	+0.5	12	1605.6	131	1192.8	100	10.5	14.6	480
		012.35.1400	014.35.1400															14	1607.2	112	1195.6	86	12.3	17.0	
11	010.45.1600	011.45.1600	013.45.1600	1740	1460	110	1687	1513	45	26	5	1602	1598	100	10	90	+0.5	14	1817.2	127	1391.6	100	15.8	21.9	550
		011.45.1600	014.45.1600															16	1820.8	111	1382.4	87	18.1	25.0	
11'	010.35.1600	012.35.1600	013.35.1600	1740	1460	110	1687	1513	45	26	5	1601	1598	100	10	90	+0.5	14	1817.2	127	1391.6	100	12.3	17.0	550
		012.35.1600	014.35.1600															16	1820.8	111	1382.4	87	14.1	19.4	
12	010.45.1800	011.45.1800	013.45.1800	1940	1660	110	1887	1713	45	26	5	1802	1798	100	10	90	+0.5	14	2013.2	141	1573.6	113	15.8	21.9	610
		012.45.1800	014.45.1800															16	2012.8	123	1574.4	99	18.1	25.0	
12'	010.35.1800	011.35.1800	013.35.1800	1940	1660	110	1887	1713	45	26	5	1801	1798	100	10	90	+0.5	14	2013.2	141	1573.6	113	12.3	17.0	610
		012.35.1800	014.35.1800															16	2012.8	123	1574.4	99	14.1	19.4	
13	010.60.2000	011.60.2000	013.60.2000	2178	1825	144	2110	1891	48	33	8	2002	1998	132	12	120	+0.5	16	2268.8	139	1734.4	109	24.1	33.3	1100
		012.60.2000	014.60.2000															18	2264.4	123	1735.2	97	27.1	37.5	
13'	010.40.2000	011.40.2000	013.40.2000	2178	1825	144	2110	1891	48	33	8	2001	1998	132	12	120	+0.5	16	2268.8	139	1734.4	109	16.1	22.2	1100
		012.40.2000	014.40.2000															18	2264.4	123	1735.2	97	18.1	25.0	
14	010.60.2240	011.60.2240	013.60.2240	2418	2065	144	2350	2131	48	33	8	2242	2238	132	12	120	+0.5	16	2492.8	153	1990.4	125	24.1	33.3	1250
		011.60.2240	014.60.2240															18	2498.4	136	1987.2	111	27.1	37.5	
14'	010.40.2240	011.40.2240	013.40.2240	2418	2065	144	2350	2131	48	33	8	2241	2238	132	12	120	+0.5	16	2492.4	153	1990.4	125	16.1	22.2	1250
		012.40.2240	014.40.2240															18	2498.4	136	1987.2	111	18.1	25.0	
15	010.60.2500	011.60.2500	013.60.2500	2678	2325	144	2610	2391	56	33	8	2502	2498	132	12	120	+0.5	18	2768.4	151	2239.2	125	27.1	37.5	1400
		012.30.2500	014.60.2500															20	2776	136	2228	112	30.1	41.8	
15'	010.40.2500	011.40.2500	013.40.2500	2678	2325	144	2610	2391	56	33	8	2501	2498	132	12	120	+0.5	18	2768.4	151	2239.2	125	18.1	25.0	1400
		012.40.2500	013.40.2500															20	2776	136	2228	112	20.1	27.9	
16	010.60.2800	011.60.2800	013.60.2800	2978	2625	144	2910	2691	56	33	8	2802	2798	132	12	120	+0.5	18	3074.4	168	2527.2	141	27.1	37.5	1600
		012.60.2800	014.60.2800															20	3076	151	2528	127	30.1	41.8	
16'	010.40.2800	011.40.2800	013.40.2800	2978	2625	144	2910	2691	56	33	8	2801	2798	132	12	120	+0.5	18	3074.4	168	2527.2	141	18.1	25.0	1600
		012.40.2800	014.40.2800															20	3076	151	2528	127	20.1	27.9	

单排四点接触球式回转支承(01系列)

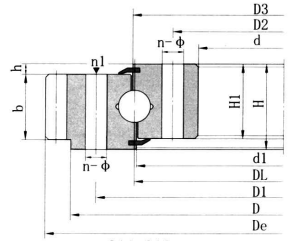
Single-row Four-point Contact Ball Slewing Bearing (Series 01)



010



013, 014

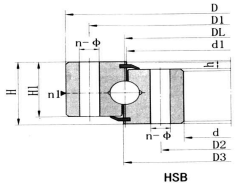


011, 012

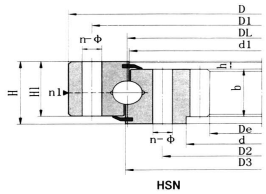
承载曲线图编号 Load-carrying Curve No.	基本型号 Basic Model 无齿式 Toothless Type Dl	外齿式 External Tooth Type Dl	内齿式 Internal Tooth Type Dl	外型尺寸 External Dimension D	d	H	安装尺寸 Installation Size D1	D2	n	Ø	结构尺寸 Structure Size n1	D3	d1	H1	h	齿轮参数 Gear Parameter b	x	m	外齿参数 Parameter of External Tooth De	Z	内齿参数 Parameter of Internal Tooth De	Z	齿轮圆周力 Twisting Force of Bearing 正火 Normalizing Z	调质 Seasoning T	重量 Weight
	mm	mm	mm	mm	mm	mm	mm				mm					mm		mm	mm		mm		10^4n	10^4n	kg
17	010.75.3150	011.75.3150	013.75.3150	3376	2922	174	3286	3014	56	45	8	3152	3147	162	12	150	+0.5	20	3476	171	2828	142	37.7	52.2	2800
		012.75.3150	014.75.3150															22	3471.6	155	2824.8	129	41.5	57.4	
17'	010.50.3150	011.50.3150	013.50.3150	3376	2922	174	3286	3014	56	45	8	3152	3148	162	12	150	+0.5	20	3476	171	2828	142	25.1	34.8	2800
		012.50.3150	014.50.3150															22	3471.6	155	2824.8	129	27.7	38.3	
18	010.75.3550	011.72.3550	013.75.3550	3776	3322	174	3686	3414	56	45	8	3552	3547	162	12	150	+0.5	20	3876	191	3228	162	37.7	52.2	3200
		012.75.3550	014.75.3550															22	3889.6	174	3220.8	147	41.5	57.4	
18'	010.50.3550	011.50.3550	013.50.3550	3776	3322	174	3686	3414	56	45	8	3552	3548	162	12	150	+0.5	20	3876	191	3228	162	25.1	34.8	3200
		012.50.3550	014.50.3550															22	3889.6	174	3220.8	147	27.7	38.3	
19	010.75.4000	011.75.4000	013.75.4000	4226	3772	174	4136	3864	60	45	10	4002	3997	162	12	150	+0.5	22	4329.6	194	3660.8	167	41.5	57.4	3600
		012.75.4000	014.75.4000															25	4345	171	3660	147	47.1	65.2	
19'	010.50.4000	011.50.4000	013.50.4000	4226	3772	174	4136	3864	60	45	10	4002	3998	162	12	150	+0.5	22	4329.6	194	3660.8	167	27.7	38.3	3600
		012.50.4000	014.50.4000															25	4345	171	3660	147	31.4	43.5	
20	010.75.4500	011.75.4500	013.75.4500	4726	4272	174	4636	4364	60	45	10	4502	4497	162	12	150	+0.5	22	4835.6	217	4166.8	190	41.5	57.4	4000
		012.75.4500	014.75.4500															25	4845	191	4160	167	47.1	65.2	
20'	010.50.4500	011.50.4500	013.50.4500	4726	4272	174	4636	4364	60	45	10	4502	4497	162	12	150	+0.5	22	4835.6	217	4166.8	190	27.7	38.3	4000
		012.50.4500	014.50.4500															25	4845	191	4160	167	31.4	43.5	

单排四点接触球式回转支承(HS系列)

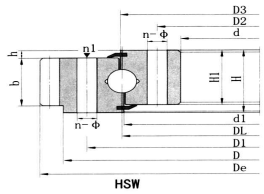
Single-row Four-point Contact Ball Slewing Bearing (Series HS)



HSB

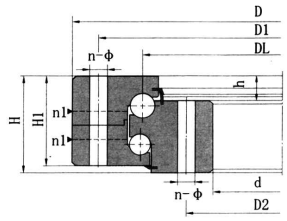


HSN

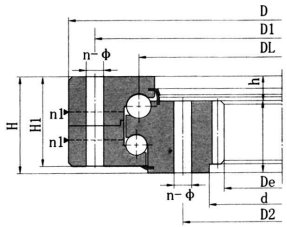


HSW

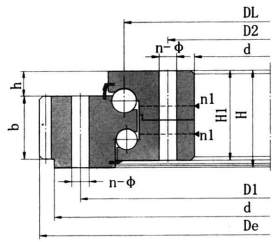
基本型号 Basic Model 无齿式 Toothless Type 外齿式 External Tooth Type 内齿式 Internal Tooth Type	外型尺寸 External Dimension			结构尺寸 Structure Size					安装尺寸 Installation Size				齿轮参数 Gear Parameter			外齿参数 Parameter of External Tooth		内齿参数 Parameter of Internal Tooth		齿轮圆周力 Twisting Force of Bearing		重量 Weight
Dl Dl Dl	D	d	H	n1	D3	d1	H1	h	D1	D2	n	Ø	b	x	m	De	Z	De	Z	正火 Normalizing Z	调质 Seasoning T	kg
HSB344	420	266	55	2	343	345	45	10	390	294	12	18										25.7
HSB411	496	338	55	2	412	413	45	10	460	364	12	18.5										33.4
HSB592	670	517	55	4	590	594	46	9	640	544	12	18										47.0
HSB822	940	705	95	4	820	824	83	12	893	749	24	18										186
V010.23.944Y	1048	834	56	4	942.5	945.5	47.5	8.5	102	862	32	18										59.7



020



023, 024

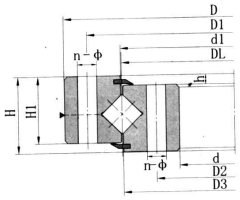


021, 022

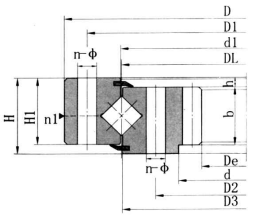
承载曲线图编号 Load-carrying Curve No.	基本型号 Basic Model 无齿式 Toothless Type Dl	外齿式 External Tooth Type Dl	内齿式 Internal Tooth Type Dl	外型尺寸 External Dimension D	d	H	安装尺寸 Installation Size D1	D2	n	Ø	结构尺寸 Structure Size n1	H1	h	齿轮参数 Gear Parameter b	x	m	外齿参数 Parameter of External Tooth De	Z	内齿参数 Parameter of Internal Tooth De	Z	齿轮圆周力 Twisting Force of Bearing 正火 Normalizing Z	调质 Seasoning T	重量 Weight
	mm	mm	mm	mm	mm	mm	mm				mm	mm	mm	mm		mm	mm		mm		10^4n	10^4n	kg
1	020.25.500	021.25.500	023.25.500	616	384	106	580	420	20	18	4	96	26	60	+0.5	5	644	126	357	72	3.7	5.2	100
		022.25.500	024.25.500													6	646.8	105	350.4	59	4.5	6.2	
2	020.25.500	021.25.560	023.25.560	676	444	106	640	480	20	18	4	96	26	60	+0.5	5	704	138	417	84	3.7	5.2	115
		022.25.560	024.25.560													6	706.8	115	410.4	69	4.5	6.2	
3	020.25.630	021.25.630	023.25.630	746	514	106	710	550	24	18	4	96	26	60	+0.5	6	790.8	129	482.4	81	4.5	6.2	130
		022.25.630	024.25.630													8	790.4	96	475.2	60	6.0	8.3	
4	020.25.710	021.25.710	023.25.710	826	594	106	790	630	24	18	4	96	26	60	+0.5	6	862.8	141	560.4	94	4.5	6.2	140
		022.25.710	024.25.710													8	862.4	105	555.2	70	6.0	8.3	
5	020.30.800	021.30.800	023.30.800	942	658	124	898	702	30	22	6	114	29	80	+0.5	8	982.4	120	619.2	78	8.0	11.1	200
		022.30.800	024.30.800													10	988	96	614	62	10.0	14.0	
6	020.30.900	021.30.900	023.30.900	1042	758	124	998	802	30	22	6	114	29	80	+0.5	8	1086.4	133	715.2	90	8.0	11.1	250
		022.30.900	024.30.900													10	1088	106	714	72	10.0	14.0	
7	020.30.1000	021.30.1000	023.30.1000	1142	858	124	1098	902	36	22	6	114	29	80	+0.5	10	1198	117	814	82	10.0	14.0	300
		022.30.1000	024.30.1000													12	1197.6	97	796.8	67	12.0	16.7	
8	020.30.1120	021.30.1120	023.30.1120	1262	978	124	1218	1022	36	22	6	114	29	80	+0.5	10	1318	129	924	93	10.0	14.0	340
		022.30.1120	024.30.1120													12	1317.6	107	916.8	77	12.0	16.7	
9	020.40.1250	021.40.1250	023.40.1250	1426	1074	160	1374	1126	40	26	5	150	39	90	+0.5	12	1497.6	122	1012.8	85	13.5	18.8	580
		022.40.1250	024.40.1250													14	1495.2	104	1013.6	73	15.8	21.9	
10	020.40.1400	021.40.1400	023.40.1400	1576	1224	160	1524	1272	40	26	5	150	39	90	+0.5	12	1641.6	134	1156.8	97	13.5	18.8	650
		022.40.1400	024.40.1400													14	1649.2	115	1153.6	83	15.8	21.9	
11	020.40.1600	021.40.1600	023.40.1600	1776	1424	160	1724	1476	45	26	5	150	39	90	+0.5	14	1845.2	129	1349.6	97	15.8	21.9	750
		022.40.1600	024.40.1600													16	1852.8	113	1350.4	85	18.1	25.0	
12	020.40.1800	021.40.1800	023.40.1800	1976	1624	160	1924	1676	45	26	5	150	39	90	+0.5	14	2055.2	144	1545.6	111	15.8	21.9	820
		022.40.1800	024.40.1800													16	2060.8	126	1542.4	97	18.1	25.0	
13	020.50.2000	021.50.2000	023.50.2000	2215	1785	190	2149	1851	48	33	8	178	47	120	+0.5	16	2300.8	141	1702.4	107	24.1	33.3	1150
		022.50.2000	024.50.2000													18	2300.4	125	1699.2	95	27.1	37.5	
14	020.50.2240	021.50.2240	023.50.2240	2455	2025	190	2389	2091	48	33	8	178	47	120	+0.5	16	2540.8	156	1942.4	122	24.1	33.3	1500
		022.50.2240	024.50.2240													18	2552.4	139	1933.2	108	27.1	37.5	
15	020.50.2500	021.50.2500	023.50.2500	2715	2285	190	2649	2351	56	33	8	178	47	120	+0.5	18	2804.4	153	2203.2	123	27.1	37.5	1700
		022.50.2500	024.50.2500													20	2816	138	2188	110	30.1	41.8	
16	020.50.2800	021.50.2800	023.50.2800	3015	2585	190	2949	2651	56	33	8	178	47	120	+0.5	18	3110.4	170	2491.2	139	27.1	37.5	1900
		022.50.2800	024.50.2800													20	3116	153	2488	125	30.1	41.8	
17	020.60.3150	021.60.3150	023.60.3150	3428	2872	226	3338	2962	56	45	8	214	56	150	+0.5	20	3536	174	2768	139	37.7	52.2	3300
		022.60.3150	024.60.3150													22	3537.6	158	2758.8	126	41.5	57.4	
18	020.60.3550	021.60.3550	023.60.3550	3828	3272	226	3738	3362	58	45	8	214	56	150	+0.5	20	3936	194	3168	159	37.7	52.2	3700
		022.60.3550	024.60.3550													22	3933.6	176	3176.8	145	41.5	57.4	
19	020.60.4000	021.60.4000	023.60.4000	4278	3722	226	4188	3812	60	45	10	214	56	150	+0.5	22	4395.6	197	3618.8	165	41.5	57.4	4200
		022.60.4000	024.60.4000													25	4395	173	3610	145	47.1	65.2	
20	020.60.4500	021.60.4500	023.60.4500	4778	4222	226	4688	4312	60	45	10	214	56	150	+0.5	22	4879.6	219	4122.8	188	41.5	57.5	4700
		022.60.4500	024.60.4500													25	4895	193	4110	165	47.1	65.2	

单排交叉滚柱式回转支承(11系列)

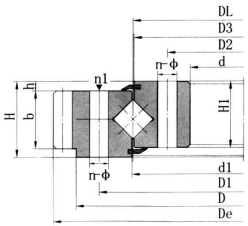
Single-row Crossed Roller Slewing Bearing (Series 11)



110



113, 114

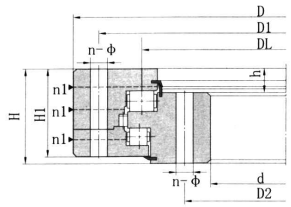


111, 112

承载曲线图编号 Load-carrying Curve No.	基本型号 Basic Model 无齿式 Toothless Type Dl	外齿式 External Tooth Type Dl	内齿式 Internal Tooth Type Dl	外型尺寸 External Dimension D	d	H	安装尺寸 Installation Size D1	D2	n	Ø	结构尺寸 Structure Size n1	D3	d1	H1	h	齿轮参数 Gear Parameter b	x	m	外齿参数 Parameter of External Tooth De	Z	内齿参数 Parameter of Internal Tooth De	Z	齿轮圆周力 Twisting Force of Bearing 正火 Normalizing Z	调质 Seasoning T	重量 Weight
	mm	mm	mm	mm	mm	mm	mm				mm					mm		mm	mm		mm		10^4n	10^4n	kg
1	110.25.500	111.25.500 112.25.500	113.25.500 114.25.500	602	398	75	566	434	20	18	4	498	502	65	10	60	+0.5	5 6	629 628.8	123 102	367 368.4	74 62	3.7 4.5	5.2 6.2	80
2	110.25.560	111.25.560 112.25.560	113.25.560 114.25.560	662	458	75	626	494	20	18	4	558	562	65	10	60	+0.5	5 6	689 688.8	135 112	427 428.4	86 72	3.7 4.5	5.2 6.2	90
3	110.25.630	111.25.630 112.25.630	113.25.630 114.25.630	732	528	75	696	564	24	18	4	628	632	65	10	60	+0.5	6 8	772.8 774.4	126 94	494.4 491.2	83 62	4.5 6.0	6.2 8.3	100
4	110.25.710	111.25.710 112.25.710	113.25.710 114.25.710	812	608	75	776	644	24	18	4	708	712	65	10	60	+0.5	6 8	850.8 854.4	139 104	572.4 571.2	96 72	4.5 6.0	6.2 8.3	110
5	110.28.800	111.28.800 112.28.800	113.28.800 114.28.800	922	678	82	878	722	30	22	6	798	802	72	10	65	+0.5	8 10	966.4 968	118 94	635.2 634	80 64	6.5 8.1	9.1 11.4	170
6	110.28.900	111.28.900 112.28.900	113.28.900 114.28.900	1022	778	82	978	822	30	22	6	898	902	72	10	65	+0.5	8 10	1062.4 1068	130 104	739.2 734	93 74	6.5 8.1	9.1 11.4	190
7	110.28.1000	111.28.1000 112.28.1000	113.28.1000 114.28.1000	1122	878	82	1078	922	36	22	6	998	1002	72	10	65	+0.5	10 12	1188 1185.6	116 96	824 820.8	83 69	8.1 9.7	11.4 13.6	210
8	110.28.1120	111.28.1120 112.28.1120	113.28.1100 114.28.1100	1242	998	82	1198	1042	36	22	6	1118	1122	72	10	65	+0.5	10 12	1298 1305.6	127 106	944 940.8	95 79	8.1 9.7	11.4 13.6	230
9	110.32.1250	111.32.1250 112.32.1250	113.32.1250 114.32.1250	1390	1110	91	1337	1163	40	26	5	1248	1252	81	10	75	+0.5	12 14	1449.6 1453.2	118 101	1048.8 1041.6	88 75	11.3 13.2	15.7 18.2	350
10	110.32.1400	111.32.1400 112.32.1400	113.32.1400 114.32.1400	1540	1260	91	1487	1313	40	26	5	1398	1402	81	10	75	+0.5	12 14	1605.6 1607.2	131 112	1192.8 1195.6	100 86	11.3 13.2	15.7 18.2	400
11	110.32.1600	111.32.1600 112.32.1600	113.32.1600 114.32.1600	1740	1460	91	1687	1513	45	26	5	1598	1602	81	10	75	+0.5	14 16	1817.2 1820.8	127 111	1391.6 1382.4	100 87	13.2 15.1	18.2 22.4	440
12	110.32.1800	111.32.1800 112.32.1800	113.32.1800 114.32.1800	1940	1660	91	1887	1713	45	26	5	1798	1802	81	10	75	+0.5	14 16	2013.2 2012.8	141 123	1573.6 1574.4	113 99	13.2 15.1	18.2 22.4	500
13	110.40.2000	111.40.2000 112.40.2000	113.40.2000 114.40.2000	2178	1825	112	2110	1891	48	33	8	1997	2003	100	12	90	+0.5	16 18	2268.8 2264.4	139 123	1734.4 1735.2	109 97	18.1 20.3	25.0 28.1	900
14	110.40.2240	111.40.2240 112.40.2240	113.40.2240 114.40.2240	2418	2065	112	2350	2131	48	33	8	2237	2243	100	12	90	+0.5	16 18	2492.8 2498.4	153 136	1990.4 1987.2	125 111	18.1 20.3	25.0 28.1	1000
15	110.40.2500	111.40.2500 112.40.2500	113.40.2500 114.40.2500	2678	2325	112	2610	2391	56	33	8	2497	2503	100	12	90	+0.5	18 20	2768.4 2776	151 136	2239.2 2228	125 112	20.3 22.6	28.1 31.3	1100
16	110.40.2800	111.40.2800 112.40.2800	113.40.2800 114.40.2800	2978	2625	112	2910	2691	56	33	8	2797	2803	100	12	90	+0.5	18 20	3074.4 3076	168 151	2527.2 2528	141 127	20.3 22.6	28.1 31.3	1250
17	110.50.3150	111.50.3150 112.50.3150	113.50.3150 114.50.3150	3376	2922	134	3286	3014	56	45	8	3147	3153	122	12	110	+0.5	20 22	3476 3471.6	171 155	2828 2824.8	142 129	27.6 30.4	38.3 42.1	2150
18	110.50.3550	111.50.3550 112.50.3550	113.50.3550 114.50.3550	3776	3322	134	3686	3414	56	45	8	3547	3553	122	12	110	+0.5	20 22	3876 3889.6	191 174	3228 3220.8	162 147	27.6 30.4	38.3 42.1	2470
19	110.50.4000	111.50.4000 112.50.4000	113.50.4000 114.50.4000	4226	3772	134	4136	3864	60	45	10	3997	4003	122	12	110	+0.5	22 25	4329.6 4345	194 171	3660.8 3660	167 147	30.4 34.5	42.1 47.8	2800
20	110.50.4500	111.50.4500 112.50.4500	113.50.4500 114.50.4500	4726	4272	134	4636	4364	60	45	10	4497	4503	122	12	110	+0.5	22 25	4835.6 4845	217 191	4166.8 4160	190 167	30.4 35.4	42.1 47.8	3100

三排滚柱式回转支承(13系列)

Three-row Roller Slewing Bearing (Series 13)



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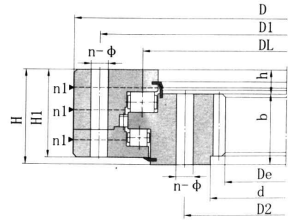

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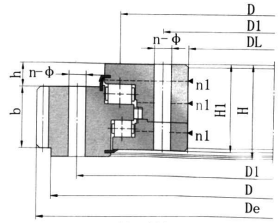

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承载曲线图编号 Load-carrying Curve No.	基本型号 Basic Model 无齿式 Toothless Type Dl	外齿式 External Tooth Type Dl	内齿式 Internal Tooth Type Dl	外型尺寸 External Dimension D	d	H	安装尺寸 Installation Size D1	D2	n	Ø	结构尺寸 Structure Size n1	H1	h	齿轮参数 Gear Parameter b	x	m	外齿参数 Parameter of External Tooth De	Z	内齿参数 Parameter of Internal Tooth De	Z	齿轮圆周力 Twisting Force of Bearing 正火 Normalizing Z	调质 Seasoning T	重量 Weight
	mm	mm	mm	mm	mm	mm	mm				mm	mm	mm	mm		mm	mm		mm		10^4n	10^4n	kg
1	130.25.500	131.25.500	133.25.500	634	366	148	598	402	24	18	4	138	32	80	+0.5	5	664	130	337	68	5.0	6.7	224
		132.25.500	134.25.500													6	664.8	108	338.4	57	6.0	8.0	
2	130.25.560	131.25.560	133.25.560	694	426	148	658	462	24	18	4	138	32	80	+0.5	5	724	142	397	80	5.0	6.7	240
		132.25.560	134.25.560													6	724.8	118	398.4	67	6.0	8.0	
3	130.25.630	131.25.630	133.25.630	764	496	148	728	532	28	18	4	138	32	80	+0.5	6	808.8	132	458.4	77	6.0	8.0	270
		132.25.630	134.25.630													8	806.4	98	459.2	58	8.0	11.0	
4	130.25.710	131.25.710	133.25.710	844	576	148	808	612	28	18	4	138	32	80	+0.5	6	886.8	145	536.4	90	6.0	8.0	300
		132.25.710	134.25.710													8	886.4	108	539.2	68	8.0	11.0	
5	130.32.800	131.32.800	133.32.800	964	636	182	920	680	36	22	4	172	40	120	+0.5	8	1006.4	123	595.2	75	12.1	16.7	500
		132.32.800	134.32.800													10	1008	98	594	60	15.1	20.9	
6	130.32.900	131.32.900	133.32.900	1064	736	182	1020	780	36	22	4	172	40	120	+0.5	8	1102.4	135	691.2	87	12.1	16.7	600
		132.32.900	134.32.900													10	1108	108	694	70	15.1	20.9	
7	130.32.1000	131.32.1000	133.32.1000	1164	836	182	1120	880	40	22	5	172	40	120	+0.5	10	1218	119	784	79	15.1	20.9	680
		132.32.1000	134.32.1000													12	1221.6	99	784.8	66	18.1	25.1	
8	130.32.1120	131.32.1120	133.32.1120	1284	956	182	1240	1000	40	22	5	172	40	120	+0.5	10	1338	131	904	91	15.1	20.9	820
		132.32.1120	134.32.1120													12	1341.6	109	904.8	76	18.1	25.1	
9	130.40.1250	131.40.1250	133.40.1250	1445	1055	220	1393	1107	45	26	5	210	50	150	+0.5	12	1509.6	123	988.8	83	22.9	31.4	1200
		132.40.1250	134.40.1250													14	1509.2	105	985.6	71	26.3	36.6	
10	130.40.1400	131.40.1400	133.40.1400	1595	1205	220	1543	1257	45	26	5	210	50	150	+0.5	12	1665.6	136	1144.8	96	22.9	31.4	1300
		132.40.1400	134.40.1400													14	1663.2	116	1139.6	82	26.3	36.6	
11	130.40.1600	131.40.1600	133.40.1600	1795	1405	220	1743	1457	48	26	6	210	50	150	+0.5	14	1873.2	131	1335.6	96	26.3	36.6	1520
		132.40.1600	134.40.1600													16	1868.8	114	1334.4	84	30.2	41.7	
12	130.40.1800	131.40.1800	133.40.1800	1995	1605	220	1943	1657	48	26	6	210	50	150	+0.5	14	2069.2	145	1531.6	110	26.3	36.6	1750
		132.40.1800	134.40.1800													16	2076.8	127	1526.4	96	30.2	41.7	
13	130.45.2000	131.45.2000	133.45.2000	2221	1779	231	2155	1845	60	33	6	219	54	160	+0.5	16	2300.8	141	1702.4	107	32.2	44.5	2400
		132.45.2000	134.45.2000													18	2300.4	125	1699.2	95	36.2	50.1	
14	130.45.2240	131.45.2240	133.45.2240	2461	2019	231	2395	2085	60	33	6	219	54	160	+0.5	16	2556.8	157	1926.4	121	32.2	44.5	2700
		132.45.2240	134.45.2240													18	2552.4	139	1933.2	108	36.2	50.1	
15	130.45.2500	131.45.2500	133.45.2500	2721	2279	231	2655	2345	72	33	8	219	54	160	+0.5	18	2822.4	154	2185.2	122	36.2	50.1	3000
		132.45.2500	134.45.2500													20	2816	138	2188	110	40.2	55.6	
16	130.45.2800	131.45.2800	133.45.2800	3021	2579	231	2955	2645	72	33	8	219	54	160	+0.5	18	3110.4	170	2491.2	139	36.2	50.1	3400
		132.45.2800	134.45.2800													20	3116	153	2488	125	40.2	55.6	
17	130.50.3150	131.50.3150	133.50.3150	3432	2868	270	3342	2958	72	45	8	258	65	180	+0.5	20	3536	174	2768	139	45.2	62.6	5000
		132.50.3150	134.50.3150													22	3637.6	158	2758.8	126	49.8	68.9	
18	130.50.3550	131.50.3550	133.50.3550	3832	3268	270	3742	3358	72	45	8	258	65	180	+0.5	20	3936	194	3168	159	45.2	62.6	5600
		132.50.3550	134.50.3550													22	3933.6	176	3154.8	144	49.8	68.9	
19	130.50.4000	131.50.4000	133.50.4000	4282	3718	270	4192	3808	80	45	8	258	65	180	+0.5	22	4395.6	197	3616.8	165	49.8	68.9	6400
		132.50.4000	134.50.4000													25	4395	173	3610	145	56.5	78.3	
20	130.50.4500	131.50.4500	133.50.4500	4782	4218	270	4692	4308	80	45	8	258	65	180	+0.5	22	4901.6	220	4122.8	188	49.8	68.9	7100
		132.50.4500	134.50.4500													25	4895	193	4110	165	56.5	78.3	