ZWZ

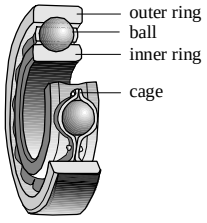
Bearing Integral Catalogue

WAFANGDIAN BEARING GROUP CORP., LTD.

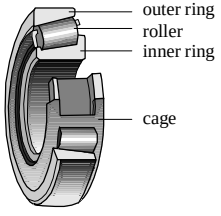
The Structure and Characteristics of Rolling Bearings

The Structures of Rolling Bearings

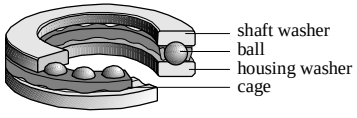
A rolling bearing normally consists of rings (inner ring and outer ring), rolling elements and cage. Between inner ring (or shaft washer) and outer ring (or housing washer) have a number of rolling elements between them, which are held by the cage to keep the rolling element with certain distance to ensure smooth rolling.



(Deep groove ball bearing)



(Tapered roller bearing)



(Thrust ball bearing)

Figure 1. Structure example

Rings (inner ring and outer ring)

The surface which carrying bearing load, is fit for the raceway of rolling element. The raceway appears groove shape, generally the cross section are the arch type, the diameter is slightly larger than ball diameter. Generally, the inner ring and outer ring work with shaft and housing respectively. The inner ring and outer ring of thrust bearing are also called the shaft washer and housing washer respectively.

Rolling Elements

Rolling elements have two types, one of which is balls and the other one is rollers. The rollers can be cylindrical rollers, needle rollers, tapered rollers and spherical rollers and etc.

Cage

The cage is applied to embrace the rolling elements partially to ensure a distance between the two neighbor rollers in the circumferential direction, and moving along with the rollers.The cage can be pressed cages, solid machined cages or engineering plastic cages.Comparing with the full complement (balls or rollers) bearings, the bearings with cages have less friction and are suitable for the high-speed rotation condition.

The Classification of Rolling Bearings

Based on the different contact angles, rolling elements can be divided into radial bearings and thrust bearings. Or according to the structures of the rolling elements and rings, they can be classified into deep groove ball bearings, self-aligning ball bearings, angular contact ball bearings, thrust ball bearings, cylindrical roller bearings, needle roller bearings, self-aligning roller bearings, tapered roller bearings, thrust spherical roller bearings and so on. According to the number of rows of rolling elements, it can also be divided into single row, double row and multi-row (e.g. three-row, four-row) bearings. For general classification of bearings, refer to Figure 2.

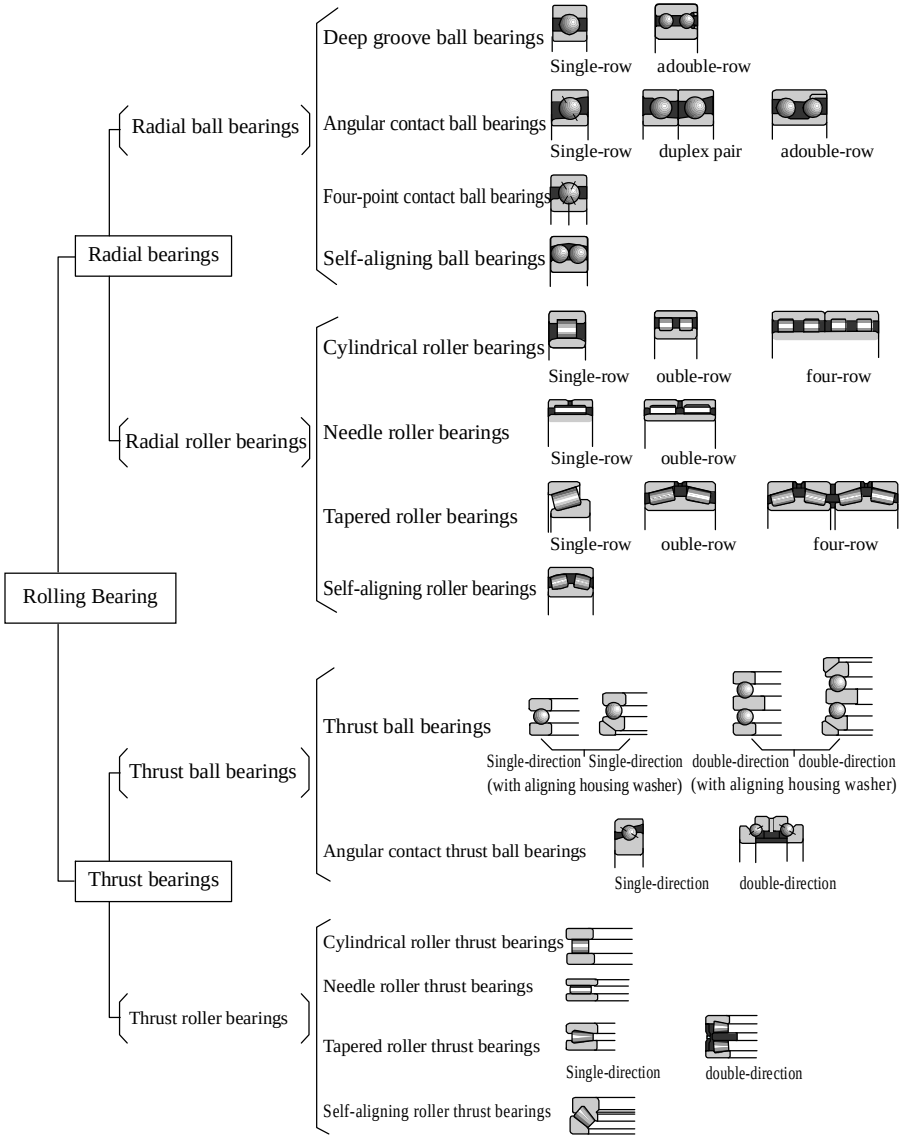


Figure 2. The bearing classification

Table 1 (Continued)

911	N10	NUP (0) 2	UC2	QJ10
912	N (0) 2	NUP22	UC3	QJ18
913	N22	NUP (0) 3		QJ19
914	N (0) 3	NUP23	UEL2	QJ29
	N23		UEL3	QJ39
991	N (0) 4	NF (0) 2		QJ2
992		NF (0) 3	UK2	QJ3
993	NU10	NF23	UK3	
994	NU (0) 2			QJF10
995	NU22	NN30		QJF18
	NU (0) 3	NNU49		QJF19
922	NU23			QJF29
923				QJF39
924	NJ (0) 4			QJF2
	NJ (0) 2			QJF3
	NJ22			
	NJ (0) 3			
	NJ23			
	NJ (0) 4			

The code of bearing types

0- Double-row angular contact ball bearing
1- Self-aligning ball bearing
2- Self-aligning roller bearing and thrust self-aligning roller bearing
3- Tapered roller bearing
4- Double-row deep groove ball bearing
5- Thrust ball bearing
6- Deep groove ball bearing
7- Angular contact ball bearing
8- Cylindrical roller thrust bearing
9- Tapered roller thrust bearing

The non-standard bearings

In recent year, due to the types of non-standard bearings increasing gradually, there are some unique, special and new products appears in the market, in order to let these product to compete in the global market, provide conveniencefor sell the products in domestic market, it is necessary to formulate the code system. The non-standard bearing code is consists of basic code and prefix & suffix code.

N- Cylindrical roller bearing

If there are one or more letters followed "N", the code will represents rib structure or types of the bearings. such as NJ, NU, NUP,

NN stands for double-row or multi-row cylindrical roller bearing.

Needle roller bearing

NA or NK is normally used to express needle roller bearings.
U- Spherical outside surface ball bearing
QJ- Four-point contact ball bearing

The basic code of the non-standard bearing consists of two parts, one is the bearing type code and the other is Indication of dimensions for bearing basic dimension .

The indication of of dimensions according to the two methods as follows.
1.Non-standard bearing represents by dimension series number a) Standard bore diameter and non-standard outside diameter or width（height）
The non-standard outside diameter or width (height) should be indicated by a letter following basic bearing code of a bearing, which has a most similar diameter series or width (height series) with this non-standard bearing. This bearing can be determined through comparing the standard OD dimension or width (height) dimension, or following the extensive rule of the standard boundary dimension. Please refer to Table 1.

b) Non-standard bore diameter, outside diameter and width
The non-standard bore diameter, outside diameter and width (height) should be indicated by indefinite series code because the comparison with standard dimension or, extensive rule of the standard boundary dimension is not available. Please refer to Table 2 for the indefinite series code of ZWZ bearings.

Table 1

Letter	Meaning
X1	Non-standard outside diameter
X2	Non-standard width (height)
X3	Non-standard outside diameter and width (height)
	(Standard bore diameter)

Table 2

Type of Bearing	Basic Bearing Code
Double-row angular contact ball bearing	4600
Self-aligning ball bearing	1600
Spherical roller bearing	20600
Tapered roller bearing	30600
Double-row tapered roller bearing with double-raceway cup	350600
Double-row tapered roller bearing with double-raceway cone	370600
Four-row tapered roller bearing	380600
Double-row deep groove ball bearing	40600
Thrust ball bearing	51700
Double-direction thrust ball bearing	52700
Deep groove ball bearing	6600
Angular contact ball bearing	7600
Four-point contact ball bearing (split inner bearing race)	QJ600
Four-point contact ball bearing (split outer bearing race)	QJF600
Thrust angular-contact ball bearing	561700
Double-direction angular contact ball thrust bearing	232700
Cylindrical roller thrust bearing	81700
Double-direction cylindrical roller thrust bearing	82700
Tapered roller thrust bearing	91700
Double-direction tapered roller thrust bearing	92700
Cylindrical roller bearing	N600、NU600、NJ600、NF600 NUP600 、NN600、NNU600
Self-aligning roller thrust bearing	21700

Note: "00" stands for any proper bore diameter code of bearing.

2. Non-standard bearing indicated by bore diameter code, please refer to Table 3 for the bore diameter code of the non-standard bearing.

Table 3

Inner diameter	Indication method
Standard dimension	Reference to the present standard.
Non-standard dimension	Bore diameter is indicated by the quotient divided by 5 if this bore diameter is smaller than 500mm and can be divided by 5. Other bore diameter are indicated with the actual bore diameter value (mm) or additive letter. When the bore diameter value (mm) is integer or with one place decimal, it can be indicated with this dimension directly, but be separated from the dimension series code with "/"; When the actual bore diameter value (mm) is with two or more places decimals, the dimension is indicated with the integral part and expressed with X4. For example, NCF6/27X4V, it indicates the cylindrical roller bearing, indefinite series, with the bore diameter of 27.762 and full filling with rollers.

Example 1:
66/6.4 Deep groove ball bearing, indefinite series, bore diameter is 6.4mm.
Example 2:
61936X1M Deep groove ball bearing, non-standard outside diameter, close to diameter series 9.
Example 3:
62/14.5 Deep groove ball bearing, dimension series 02, bore diameter is 14.5mm.
Example 4:
52706 Double-direction thrust ball bearing, indefinite series, bore diameter is 30mm.
When the code of several non-standard bearings are the same, which belong to the same type but with the slightly different dimensions, they are distinguished by adding "-"mark and add sequence number 1, 2, 3····· after each code name.
For example, 61956X1M
61956X1M-1
61956X1M-2
The prefix and suffix code for non-standard bearing according to the rules of present standard and this system.

Illustration of Cage Structure and Material Code:

SN	Bearing Type	Illustration of cage structure and material code
1	Deep Groove Ball Bearing	1)While bearing outer diameter D≤400mm, select steel plates (strips) or brass sheet (strips) pressed cage, the suffix code of the cage not marked.

Illustration of Cage Structure and Material Code:

SN	Bearing Type	Illustration of cage structure and material code
1	Deep Groove Ball Bearing	2) While bearing outer diameter D>400mm, select brass solid cage, the suffix code of the cage not marked; while select outer ring guided and brass cage, cage suffix code marked as MA. 3) While the cage suffix code not mark the guiding method, it means inner ring guided.
2	Self-aligning ball bearing	1) While bearing outer diameter D≤200mm, select steel plates (strips) pressed cage, the suffix code of the cage not marked. 2) While bearing outer diameter D>200mm, select brass solid cage, the suffix code of the cage not marked.
3	Cylindrical roller bearing	1) While select composite cage, the suffix code of the cage not marked. 2) While select pressed cage, the suffix code of the cage marked as J. If the different structure of pressed cage, successively expressed by J, J1, J2, J3..... 3) While select groove type cage, the suffix code of the cage marked as CJ. 4) While select brass solid cage, the suffix code of the cage marked as M. 5) While the bearing outer diameter D＞400mm, select steel solid cage, the suffix code of the cage not marked, but if the guiding method is inner or outer ring guided, shall mark the corresponding suffix code of the cage material and guiding method (outer ring guided expressed by A, inner ring guided expressed by B)
4	Double-row cylindrical roller bearing	Not marked while select brass solid cage.
5	Spherical roller bearing	1) While select brass solid cage, the suffix code of the cage not marked. 2) While select pressed cage, the code expressed by "C", "CC". 3) While select other solid cage, shall mark the suffix code accordingly. 4) If guided by outer ring, shall mark the corresponding suffix code of the cage material and guiding method "A"
6	Angular contact ball bearing	1) Angular contact ball bearing with split inner bearing or two-piece outer ring (three point or four point contact), while selecting solid brass cage, the suffix code of cage not marked. 2) Angular contact ball bearing and its variants While bearing outer diameter D ≤ 250mm, contact angle α=15°，

Illustration of Cage Structure and Material Code:

SN	Bearing Type	Illustration of cage structure and material code
6	Angular contact ball bearing	25° select phenolic cloth laminated tube solid cage; α=40° select steel sheet pressed cage; the suffix code of the cage all not marked. While bearing outer diameter D>250mm, select brass or duralumin solid cage; the P5, P4, P2 level bearing product select phenolic cloth laminated tube solid cage; The angular contact ball bearing with counter bore on inner ring and its variants select phenolic cloth laminated tube solid cage; suffix code of cage not marked. 3) Double row angular contact ball bearing, select steel plate (sheet) pressed cage, the suffix code of cage not marked.
7	Tapered roller bearing	1) While bearing outer diameter D≤650mm, select steel plate pressed cage, the suffix code of cage not marked. 2) While bearing outer diameter D>650mm, select steel solid pin-type cage, the suffix code of cage not marked.
8	Thrust ball bearing	1) While bearing outer diameter D≤250mm, select steel plate (sheet) pressed cage, the suffix code of cage not marked. 2) While bearing outer diameter D>250mm, select solid brass cage, the suffix code of cage not marked. Other suffix code marked accordingly.
9	Thrust angular contact ball bearing	Single & double direction thrust angular contact ball bearing While bearing outer diameter D ≤650mm, select brass solid cage, the suffix code of cage not marked. While bearing outer diameter D>650mm, select steel solid cage, the suffix code of cage not marked.
10	Thrust cylindrical roller bearing	While bearing outer diameter D ≤500mm, select brass solid cage, the suffix code of cage not marked. While bearing outer diameter D>500mm, select steel solid cage, the suffix code of cage not marked. Other suffix code marked accordingly.
11	Thrust spherical roller bearing	Select brass solid cage, the suffix code of cage not marked, other suffix code marked accordingly.
12	Thrust tapered roller bearing	Select brass solid cage, the suffix code of cage not marked, other suffix code marked accordingly.

The illustration to the Change of Dimensions and Structures

The suffix YA plus number indicates various kinds of technical changes. Please refer to the suffix illustration for details.

If one type of bearing has two changes on its structure, the bearing is indicated with YA plus two digitals. For example, /YA12, it indicates the surface of outer ring and inner bore of inner ring vary from the standard design. The specific change can be referenced to the product catalogue or the supplemented technical requirements.

If one type of bearing has two or more changes on its structure at the same time, the bearing is indicated with YAD.

The illustration to the Change of Technical Requirements

The suffix YB appended with digitals indicates all variations of the technical requirements. More details please refer to the specification of bearing suffix.

If one type of bearing has two changes on the technical requirements in the same time, the bearing is indicated by YB appended with two digitals. For example, /YB12, see specific change to the product catalogue or supplemented technical requirements.

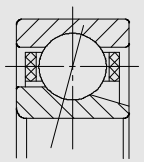
If one type of bearing has more than two changes on the technical requirements in the same time, indicated by /YBD.

If one type of bearing has changes both on the structure and the technical requirements in the same time, the bearing is indicated with /YAB.

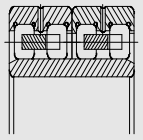
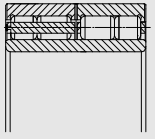
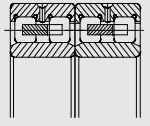
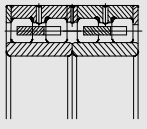
Note:

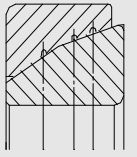
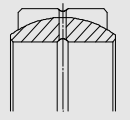
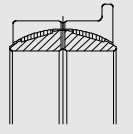
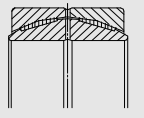
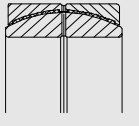
If the bearing suffix has Y and another letter or the appended number, it is suggested to reference the product catalogue or the supplemented technical requirements, in order to know the specific change.

Prefix of Bearing and Bearing Components

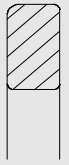
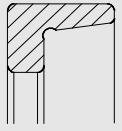
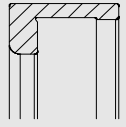
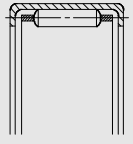
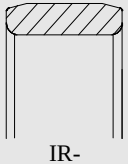
Code	Meaning	Example
B	Angular contact ball bearing with counter bore on inner ring	 B
F	If "F" added before the bearing series code of the inch tapered roller bearing, it indicates the cage of bearing.	Example: 25580/25520 Bearing Code of the Cage: F25500

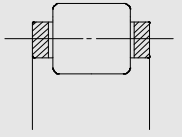
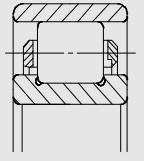
Prefix of Bearing and Bearing Components

Code	Meaning	Example
FC	Four-row cylindrical roller bearing with double outer ring and single inner ring without rib.	 FC
FC···ZW	Four-row cylindrical roller bearing with single inner ring, double outer rings with double ribs on each outer ring, double-row roller come together.	 FC···ZW
FCD	Four-row cylindrical roller bearing with double outer rings and double inner rings without rib.	 FCD
FCDP	Four-row cylindrical roller bearing, double outer rings, outer ring only have central rib but with loose rib, double inner rings, without rib.	 FCDP
G-	Represent bearing inner space or outer spacer in the inch series tapered roller bearing. The express method of inner spacer: add "G-" before the code of inch series inner ring assembly. The express method of outer spacer: add "G-" before the code of outer ring.	Example: M224749D/M224710-M224710D Bearing inner spacer expressed as: G-M224749D Bearing outer spacer expressed as: G-M224710

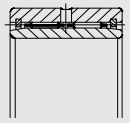
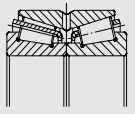
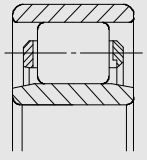
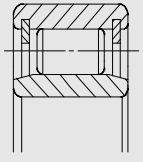
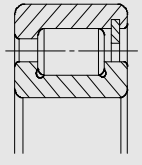
Code	Meaning	Example
GAC	Thrust plain bearing	 GAC
GE...ES	Plain radial bearing	 GE···ES
GET...CXS	Self lubricated self-aligning plain radial bearing, special series, and inner ring merged with bronze alloy, double gapped axially.	 GET...CXS
GET...CHS	Self-aligning plain radial bearing, special series, and inner ring merged with bronze alloy, double half outer ring.	 GET...CHS
GET...FHS	Self-aligning plain radial bearing, special series, outer ring merged with special self-lubricated material, double half outer ring.	 GET...FHS

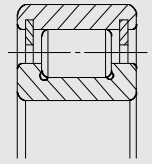
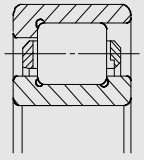
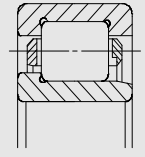
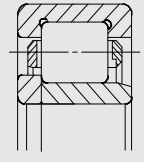
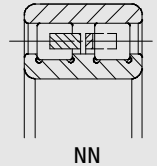
Prefix of Bearing and Bearing Components

Code	Meaning	Example
GS	Cylindrical roller thrust bearing housing washer.	 GS
HJ	Separate thrust collar	 HJ
HJR	Right angle retaining ring	
HJR1	Right angle retaining ring, dimension is different with HJR	
HJR2	Right angle retaining ring, dimension is different with HJR & HJR1	HJR、HJR1、HJR2
HK	Open type pressed outer ring needle roller bearing	 HK
IR-	Inner ring of radial bearing	 IR-

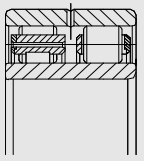
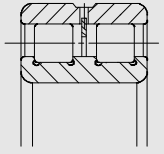
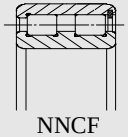
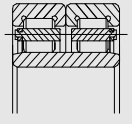
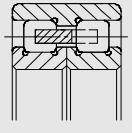
Code	Meaning	Example
IW-	Shaft washer of thrust bearing	 IW-
K	1. Assembly of rolling element and cage	
	2. The rings and rolling elements or only the rings of inch tapered roller bearing are made from the high carbon chromium bearing steel.	K K3979/K3920
K1	For the inch series tapered roller bearing, the rings and rolling elements or only the ring are made by 100CrMo7.	
K2	For the inch series tapered roller bearing, the rings and rolling elements or only the ring are made by ZGCr15.	
KIW-	Thrust bearing without housing washer.	
KOW-	Thrust bearing without shaft washer.	
L	Separable inner ring or outer ring of the separable bearing	LFC4056188
LR	The inner ring assembly or outer ring assembly of separable bearing	
N	Cylindrical roller bearing, inner ring with double ribs, outer ring without rib.	 N

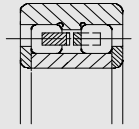
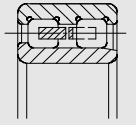
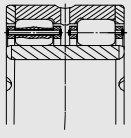
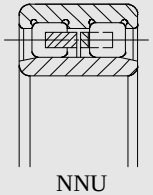
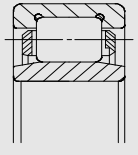
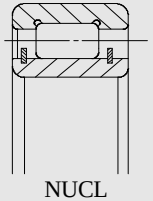
Prefix of Bearing and Bearing Components

Code	Meaning	Example
NA	1. Needle roller bearing	 NA
	2. Timken double-row cylindrical roller bearing with wide cone, no central spacer.	 NA551002/NA551701D
NB	Cylindrical roller bearing without rib.	 NB
NBCL	Cylindrical roller bearing, outer ring without rib but with double snap rings, inner ring without rib.	 NBCL
NCF	NF+ snap ring	 NCF...V

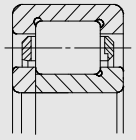
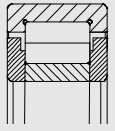
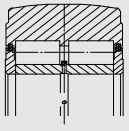
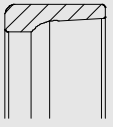
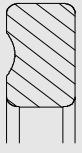
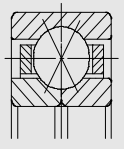
Code	Meaning	Example
NCL	Cylindrical roller bearing, outer ring without rib but with double snap rings, inner ring with double ribs.	 NCL...V
NF	Cylindrical roller bearing, inner ring with double ribs, outer ring with single rib.	 NF
NJ	Cylindrical roller bearing, outer ring with double ribs, inner ring with single rib.	 NJ
NJP	Cylindrical roller bearing, outer ring with double ribs, inner ring without rib but with loose rib.	 NJP
NN	Double-row cylindrical roller bearing, inner ring with three ribs, outer ring without rib.	 NN

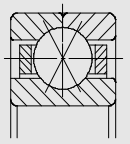
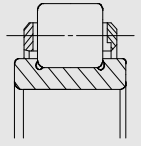
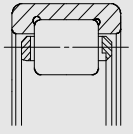
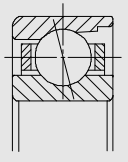
Prefix of Bearing and Bearing Components

Code	Meaning	Example
NNB	Double-row cylindrical roller bearing, double inner ring and outer ring without rib.	 NNB
NNCL	Double-row cylindrical roller bearing, inner ring with three ribs, outer ring without rib but with central spacer.	 NNCL
NNCF	Double-row cylindrical roller bearing, inner ring with three ribs, outer ring with single rib and with snap ring on the other side.	 NNCF
NND	Double-row cylindrical roller bearing, single inner ring, double outer rings with double ribs.	 NND
NNF	Double-row cylindrical roller bearing, double inner rings, single outer ring with central rib and no rib on both sides.	 NNF

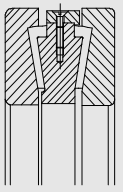
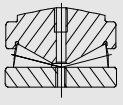
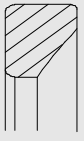
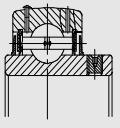
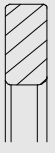
Code	Meaning	Example
NNFP	Double-row cylindrical roller bearing, single inner ring, with loose ring on two sides, single outer ring with central rib and no rib on both sides.	 NNFP
NNJ	Double-row cylindrical roller bearing, outer ring with three ribs, inner ring with single rib.	 NNJ
NNP	Double-row cylindrical roller bearing, inner ring with no rib, outer ring with central rib and with loose rib on both faces.	 NNP
NNU	Double-row cylindrical roller bearing, outer ring with three ribs, inner ring with no rib.	 NNU
NU	Cylindrical roller bearing, outer ring with double ribs, inner ring without rib.	 NU
NUCL	Cylindrical roller bearing, inner ring with no rib but with double snap rings	 NUCL

Prefix of Bearing and Bearing Components

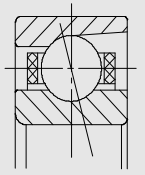
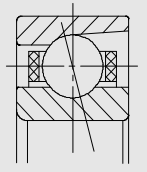
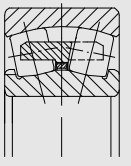
Code	Meaning	Example
NUP	Cylindrical roller bearing, outer ring with double ribs, inner ring with single rib and loose rib.	 NUP
NUTR	Cylindrical roller bearing, full components, with loose rib.	 NUTR...XS
NNTR	Double-row cylindrical roller bearing, full components	 NNTR
OR	Outer ring of radial bearing	 OR
OW	Housing washer of thrust bearing	 OW
QJ	Four-point contact bearing, two piece inner rings.	 QJ

Code	Meaning	Example
QJF	Four-point contact bearing, two piece outer rings.	 QJF
R	1.Bearing with inseparable inner ring or outer ring. 2.If "R" is added before bearing series code in the inch tapered roller bearing, it indicates the tapered roller.	Example: The designation of 392/393 roller is R395
RN	N type cylindrical roller bearing without outer ring.	 RN
RNU	NU type cylindrical roller bearing without inner ring.	 RNU
S	Separable angular contact ball bearing.	

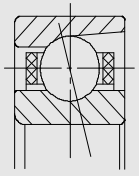
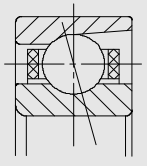
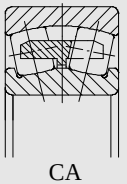
Prefix of Bearing and Bearing Components

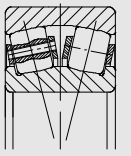
Code	Meaning	Example
T	1.Tapered roller bearing, the boundary dimension complying with GB273.1 appendix A. For example, T 2ED 020 T- Tapered roller bearing 2- Angle series code (reference to GB273.1 appendix B) ED- Series code (reference to GB273.1 appendix B) 020- Inner ring 20mm 2. Timken tapered roller thrust bearing	 T
TTSX	Full component tapered roller bearings with convex spherical shaft washer used on screw down mechanism of rolling mill.	 TTSX
U	Aligning seat washer	 U
UC	Spherical out surface ball bearing with set screw.	 UC
WS	Shaft washer of cylindrical roller thrust bearing.	 WS

Suffix of Bearing and Bearing Components

Code	Meaning	Example
-1,-2...	It indicates the non-standard series X1,X2, YA2,...	
A	1.Angular contact ball bearing, nominal contact angle α=30? 2. Tapered roller bearing, contact angle α and the outside diameter D1 not conform to the national standard, same as there are two or more α,D1 which is different from the national standard in one code, it will be indicated with A1, A2... by sequence. 3.Outer ring guided	 A Example: 32930X2A Example: 61936MA
AC	Angular contact ball bearing, nominal contact angle α=25°	 AC
ACA	Aligning roller bearing with movable central rib and asymmetrical rollers.	 ACA
/AS	The needle roller bearing outer ring with lubrication hole, the additional number indicates to the number of oil holes.	
/ARS	The needle roller bearing outer ring with oil groove and oil hole, the additional number indicates to the number of oil holes	

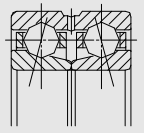
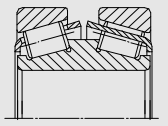
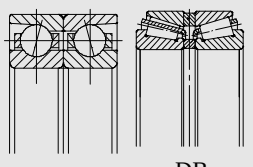
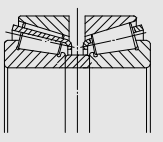
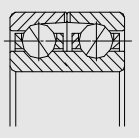
Suffix of Bearing and Bearing Components

Code	Meaning	Example
A6	Inch tapered roller bearing, assembly of chamfer differed from TIMKEN, if the assembly of chamfer in one code have two or more bearings different from TIMKEN, it will be indicated with A61, A62...	Example: KLM48548A6/ KLM48510A6
B	1.Angular contact ball bearing, nominal contact angle α=40° . 2.Tapered roller bearing, contact angle enlarged (enlarge with one larger angle series) 3.Inner ring guided.	 B Example: 61836MB
C	1.Angular contact ball bearing, nominal contact angle α=15° . 2.Spherical roller bearing, inner ring with no rib but movable central rib, with symmetrical rollers, pressed steel cage. 3.Matched pair tapered roller bearing, when the axial clearance not complying with ZWZ standard, the mean value of the axial clearance should be directly added after C.	 C Example: 32032T112/DBC345 mean axial clearance is 0.345
CA	Spherical roller bearing, inner ring with no rib in the middle, small ribs on outside of inner ring, filling with symmetrical rollers, solid brass cage.	 CA

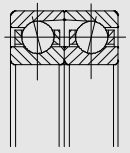
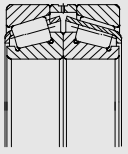
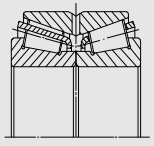
Code	Meaning	Example
CAB	CA type spherical roller bearing, pierced rollers, with pin type cage.	 CAB
CABC	CAB type spherical roller bearing, roller guiding methods improved (roller surface roughness, raceway surface roughness, change of heat treatment method), in order to reduce friction.	
CAC	CA type spherical roller bearing, roller guiding methods improved (roller surface roughness, raceway surface roughness,change of heat treatment method), in order to reduce friction.	
CAZ	CA type spherical roller bearing with symmetrical roller, with middle rib, solid cage.	
CB	Continuous casting machine bearing.	
CC	C type spherical roller bearing, roller guiding method improved (roller surface roughness, raceway surface roughness, change of heat treatment method), in order to reduce friction.	
CD	The dowel hole on the oil groove.	
/CM	Clearance of the deep groove ball bearing for electrical motor.	
/CN	0 group clearances. /CN combined with the letter H, M or L, it indicates the clearance scope decreased in half; or combined with P, it indicates the clearance scope deviated.	

Suffix of Bearing and Bearing Components

Code	Meaning	Example
/CN	Example: /CNH 0 group clearance decreased in half, belonging to the upper part. /CNM 0 group clearance decreased in half, belonging to the middle part. /CNL 0 group clearance decreased in half, belonging to the lower part. /CNP clearance scope lies in the upper part of 0 group clearance and the lower part of C3 grade.	
/C1	Clearance conforms to the standard group 1.	
/C2	Clearance conforms to the standard group 2.	
/C3	Clearance conforms to the standard group 3.	
/C4	Clearance conforms to the standard group 4.	
/C5	Clearance conforms to the standard group 5. Letter H, M, L or P can follow directly after the clearance code, it indicates the clearance scope decreased in half or deviated, see explanation of /CN, but P must be added after the lower clearance grade. For example, /C3P clearance scope lies in the upper part of group C3 and the lower part of grade C4.	
/C9	Bearing clearance not conforms to the present standard. When two or more clearances in one code are different from the present standard, it will be indicated with the added digitals, such as C91, C92...	Example: NN3020K/C9 NN3020K/C9 1indicates the two clearance it is different with current standard.
/C9T	The clearance of double-row cylindrical roller bearing's raceway are different.	

Code	Meaning	Example
/CR	When the matched pair tapered roller bearings have the radial clearance requirements, the mean value of clearance will be added after CR.	Example: 32048X2AT171/DBCR275 Tapered roller bearing back-to back arrangement, mean radial clearance is 0.275.
/CRA9	The radial bearing clearance none standard, requirements to axial clearance.	
D	1.Double row angular contact ball bearing, double inner ring, contact angle *=45? 2.Double row tapered roller bearing, no inner spacer or outer spacer, un-grinded end face. 3.Inch tapered roller bearing, inner ring with double raceway or outer ring with double raceway. 4.Split bearing.	 D  D
/DB	Two single deep groove ball bearings or angular contact ball bearings or tapered roller bearings used for the back to back paired mounting.	 DB DB
/DBY	Two single-row tapered roller bearing, for back to back mounting, with inner spacer, without outer spacer.	 DBY
/DC	Double row angular contact ball bearing with double outer ring.	 DC

Suffix of Bearing and Bearing Components

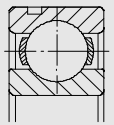
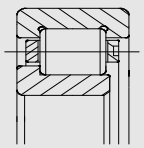
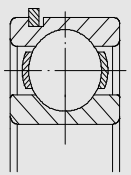
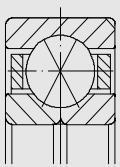
Code	Meaning	Example
/DF	Two single deep groove ball bearings or angular contact ball bearings or tapered roller bearings used for the face to face paired mounting.	 DF  DF
/DH	Single direction thrust bearing with two housing washers.	
/DS	Single direction thrust bearing with two shaft washers.	
/DT	Two single deep groove ball bearings or angular contact ball bearings or tapered roller bearings used for the same direction tandem paired mounting.	
D1	Double row tapered roller bearing, with no inner spacer, grinded end face.	 D1
E	Inside design is changed, enhanced structure.	
F	The materials of steel, nodular cast iron or power metallurgical solid cage are indicated by the added digitals. F1- Carbon steel F2- Graphite steel F3- Nodular cast iron	Example: 239/1180CAKF1/W33, Cage is made by 45 Steel

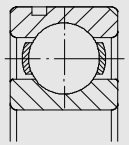
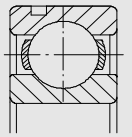
Code	Meaning	Example
F	F4- Powder metallurgy FA- Steel, nodular cast iron or power metallurgical solid cage, outer ring guided. FB- steel, nodular cast iron or power metallurgical solid cage, inner ring guided. FE- steel solid cage-phosphorized.	
-FS	Felt-ring sealed.	
/FT	Five set tandem arranged bearing.	
G1	Gear quenched.	
/GP	Dimension tolerance equals to level 0, rotating precision equals to level 5.	
/HA	Ring rolling elements and cage or only the ring and rolling elements are made from vacuum smelted bearing steel.	Example: 7309BM/HADBYA3
/HC	Ring and rolling elements or only ring or rolling elements are made from case hardened steel(/HC-20Cr2Ni4A; /HC1-20Cr2Mn2MoA; /HC2-15Mn).	Example: 3519/500/HC
/HCE	If the metric series bearing, indicates rings and rolling elements are choose high quality carburized steel.	
/HCER	For the metric series bearing, only the roller is are made by high quality carburized steel.	
/HCG2I	Indicates the outer ring & rolling elements are made by carburized steel, inner ring made by GCr18Mo.	
/HCI	Indicates the inner ring made by carburized steel.	

Suffix of Bearing and Bearing Components

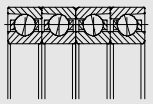
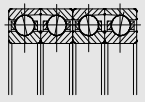
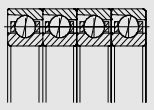
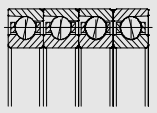
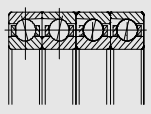
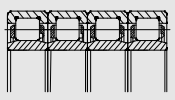
Code	Meaning	Example
/HCO	Indicates the outer ring made by carburized steel.	
/HCOI	Indicates only the outer ring & inner ring made by carburized steel.	
/HCOR	Indicates only the outer ring & rolling element are made by carburized steel.	
/HCR	To distinguish the bearing with same designations, only the rolling elements are made by carburized steel.	
/HE	Ring, rolling elements and cage or only the ring and rolling elements are made by electroslag remelting bearing steel (military first grade steel) ZGCr15.	
/HG	Ring, rolling elements and cage or only the ring and rolling elements are made by electroslag remelting bearing steel (military first grade steel) ZGCr15.	
/HG2CR	Indicates the bearing ring is made by GCr18Mo, rolling elements is made by carburized steel.	
/HG2I	If belongs to radial bearing, indicates the inner ring is made by GCr18Mo, outer ring & rolling elements is made by GCr15. If belongs to thrust ball bearing, indicates that the shaft washer is made by GCr18Mo, housing washer & rolling elements are made by GCr15.	
/HG2O	Indicates the bearing outer ring made by GCr18Mo.	
/HN	Ring and rolling elements are made by heat resistant steel (/HN-GCr4Mo4V; /HN1-Cr14Mo4;/HN2-Cr15Mo4V; /HN3-W18Cr4V).	
/HP	Ring and rolling elements are made from beryllium bronze or other anti-magnetic materials. When material is changed, it is indicated by the added digitals.	
/HQ	Ring and rolling elements are made from the unusual materials (/HQ- plastic; /HQ1-ceramic alloy)	
/HU	Ring, rolling elements and cage or only the ring and rolling elements are made from the unhardened stainless steel 1Cr18Ni9Ti.	
/HV	Ring, rolling elements and cage or only the ring and rolling elements are made from the unhardened stainless steel (/HV-9Cr18; /HV1-9Cr18Mo).	
J	Pressed steel cage. When material is changed, it is indicated with the added digitals.	
JA	Pressed steel cage, outer ring guided.	
JE	Pressed unhardened steel cage after phosphating.	
JR	Cage is riveted with two unhardened steel sheets(for large size thrust ball bearing).	
JW	Cage is welded with unhardened steel sheet.	
K	Tapered bore bearing. Conicity is 1: 12.	Example: 24040CAK30/W33
K30	Tapered bore bearing. Conicity is 1: 30.	
L	Light alloy solid cage. When the material of cage is changed, it is indicated with the appended digitals.	
L3	Zinky aluminum alloy ZznA127Cu2 or material is ZA30-C-Q/WZ.J41362.	
LA	Light alloy solid cage, outer ring guided.	
LB	Light alloy solid cage, inner ring guided.	

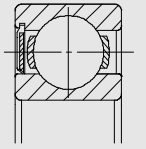
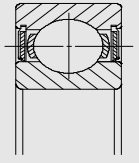
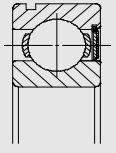
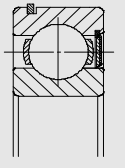
Suffix of Bearing and Bearing Components

Code	Meaning	Example
/LM	Cage is made by magnesium alloy.	
-LS	Dust proof ring.	
M	Brass solid cage.	Example: NU315M
MA	Brass solid cage, outer ring guided.	Example: 6034MA
MB	Brass solid cage, inner ring guided.	
N	Bearing with snap groove on outer ring.	 N
NB	Bearing with narrow inner ring.	
NB1	Bearing with narrow inner ring, one side is narrow.	 NB1
NR	Bearing with snap groove and snap ring on outer ring.	 NR
N1	Bearing with a positional notch on outer ring.	 N1*2
N2	Bearing with two or more symmetrical positional notch on outer ring.	

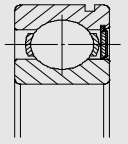
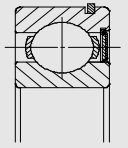
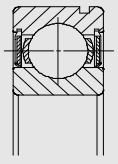
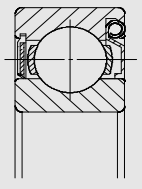
Code	Meaning	Example
N4	N+N2 Positional notch and snap groove are not on the same side.	 N4
N6	N+N2 Positional notch and snap groove are on the same side.	 N4
/P0	Tolerance grade conforms to the standard P0, code is omitted.	
/P6	Tolerance grade conforms to the standard P6.	
/P6X	Tolerance grade conforms to the standard P6X.	
/P5	Tolerance grade conforms to the standard P5.	
/P5C2H	Tolerance level comply with 5 level in standard, clearance is the upper limit in group 2.	
/P4	Tolerance grade conforms to the standard P4.	
/P2	Tolerance grade conforms to the standard P2.	
Q	Bronze solid cage, indicated with the appended digitals, which means different materials. Q1- Aluminum iron manganese bronze. Q2- Silicon iron zinc bronze. Q3- Silicon nickel bronze. Q4- Aluminum bronze. Q5- Stannum bronze (ZQSn10-1).	

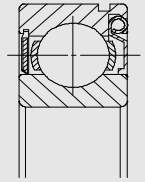
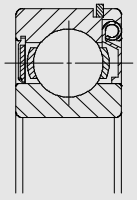
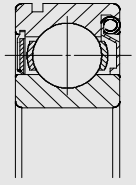
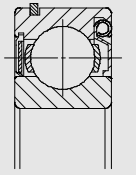
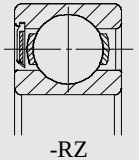
Suffix of Bearing and Bearing Components

Code	Meaning	Example
/QB	Four sets of bearings in pair tandem matched and back to back mounting.	 /QB
/QF	Four sets of bearings in pair tandem matched and face to face mounting.	 /QF
/QT	Four sets of bearings in tandem mounting.	 /QT
/QBT	Four sets of bearings, three in tandem and one in back to back mounting.	 /QBT
/QFT	Four sets of bearings, three in tandem and one in face to face mounting.	 /QFT
/QR	Four deep groove ball bearings or cylindrical roller bearings combined, radial lode distributed equally.	 /QR
R	Bearing with snap rib on outer ring (convex outer ring).	
R1	Track roller snap ring groove dimension comply with DZN471 standard.	

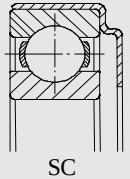
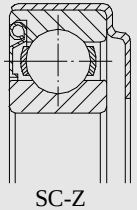
Code	Meaning	Example
R2	Track roller snap ring groove dimension comply with WRE standard.	
R3	Track roller snap ring groove dimension comply with JIS standard.	
R4	Track roller snap ring groove dimension comply is not standard.	
-RS	Bearing with frame system rubber seal ring (contact system)	
-RS1	Bearing with frame system rubber seal ring (contact system), the material of seal ring is sulfureted rubber.	
-RS2	Bearing with frame system rubber seal ring (contact system), the material of seal ring is fluoride rubber.	RS、RS1、RS2
-2RS	Bearing with RS sealed on both sides.	
-2RS1	Bearing with RS1 sealed on both sides.	
-2RS2	Bearing with RS2 sealed on both sides.	2RS、2RS1、2RS2
-RSN	RS+N Sealed on the opposite side of snap groove.	
-RS1N	RS1+N	
-RS2N	RS2+N	RSN、RS1N、RS2N
-RSNR	RS+NR Sealed on the opposite side of snap ring.	
-RS1NR	RS1+NR	
-RS2NR	RS2+NR	RSNR、RS1NR、RS2NR

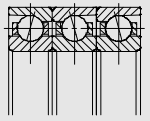
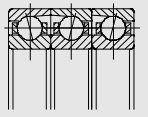
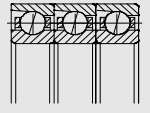
Suffix of Bearing and Bearing Components

Code	Meaning	Example
-RSNB	RS+NR Sealed on the opposite side of snap ring.	 RSNB、RS1NB、RS2NB
-RS1NB	RS1+N	
-RS2NB	RS2+N	
-RSNBR	RS+NR Sealed on the same side of snap ring.	 RSNBR、RS1NBR、RS2NBR
-RS1NBR	RS1+NR	
-RS2NBR	RS2+NR	
-2RSN	2RS+N	 2RSN、2RS1N、2RS2N
-2RS1N	2RS1+N	
-2RS2N	2RS2+N	
-2RSNR	2RS+NR	
-2RS1NR	2RS1+NR	
-2RS2NR	2RS2+NR	
-RSZ	RS+Z Bearing with frame type rubber sealing ring (contact system) on one side and with shield on the other side.	 RSZ、RS1Z、RS2Z
-RS1Z	RS+Z RS1+Z	
-RS2Z	RS2+Z	

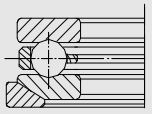
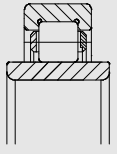
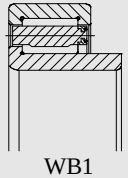
Code	Meaning	Example
-RSZN	RS+Z+N Sealed on the other side of snap groove.	 RSZN、RS1ZN、RS2ZN
-RS1ZN	RS1+Z+N	
-RS2ZN	RS2+Z+N	
-RSZNR	RS+Z+NR Sealed on the other side of snap ring.	 RSZNR、RS1ZNR、RS2ZNR
-RS1ZNR	RS1+Z+NR	
-RS2ZNR	RS2+Z+NR	
-RSZNB	RS+Z+N Sealed on the same side of snap groove.	 RSZNB、RS1ZNB、RS2ZNB
-RS1ZNB	RS1+Z+N	
-RS2ZNB	RS2+Z+N	
-RSZNBR	RS+Z+NR Sealed on the same side of snap ring.	 RSZNBR、RS1ZNBR、RS2ZNBR
-RS1ZNBR	RS1+Z+NR	
-RS2ZNBR	RS2+Z+NR	
-RZ	Bearing with frame type rubber sealing ring (non-contact type).	 -RZ

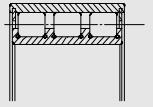
Suffix of Bearing and Bearing Components

Code	Meaning	Example
-2RZ	Bearing with RZ sealed on both sides.	
S	Martensite quenching.	
/SP	Ultra precision grade, dimension tolerance equals to P5, rotating precision equals to P4.	
/S0	Bearing ring tempered in high temperature, which can reach to 150℃.	
/S1	Bearing ring tempered in high temperature, which can reach to 200℃.	
/S2	Bearing ring tempered in high temperature, which can reach to 250℃.	
/S3	Bearing ring tempered in high temperature, which can reach to 300℃.	
/S4	Bearing ring tempered in high temperature, which can reach to 350℃.	
SC	Radial bearing with outer cover.	 SC
SC-Z	Radial bearing with outer cover and shield.	 SC-Z
T	1.When the assemble height dimension of the matched pair tapered roller bearing not conform to the standard specification, the assemble height dimension will be added directly after T. 2.Phenolic cloth laminated tube solid cage	Example: 32032T112/DBC345 Tapered roller bearing back-to-back arrangement, stand hight is 112

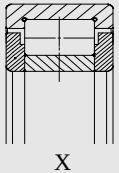
Code	Meaning	Example
/T	If the starting torque of bearing has special requirements, digitals added after indicates the starting torque.	
/RT	If the rotating torque of bearing has special requirements, digitals added after indicates the rotating torque.	
TA	Phenolic cloth laminated tube, outer ring guided.	 /TBT
TB	Phenolic cloth laminated tube, inner ring guided.	
/TBT	Three sets of bearings in tandem and face to face arrangement.	
TH	Engineering plastic cage.	
/TFT	Glass fibre-reinforced phenolic resin cage (tube shape)	 /TFT
TN	TN1- Nylon TN2-Polyamide (PA) TN3-Polyimide TN4- Polycarbonate TN5- Paraformaldehyde	
/TT	Three sets of bearings in tandem arrangement.	 /TT

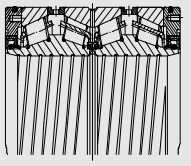
Suffix of Bearing and Bearing Components

Code	Meaning	Example
U	Thrust ball bearing with spherical seat washer.	 U
/UP	Super precision grade, dimension tolerance equals to P4, rotating precision is higher than P4.	
V	Full complement rolling elements (no cage).	
/V	Vibrating speed group of bearing. The appended digital indicates different groups. V1- vibrating speed group conforms to the standard V1 group. V2- vibrating speed group conforms to the standard V2 group. V3- vibrating speed group conforms to the standard V3 group.	
VB	Vibration Screen Bearing.	
WB	Bearing with wide inner ring (Both sides wide).	 WB
WB1	Bearing with wide inner ring (Single side wide).	 WB1

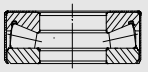
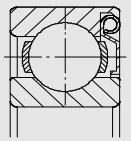
Code	Meaning	Example
WC	Bearing with wide outer ring.	 WC
/W124	Indicates precision electronic motor bearing (execute standard Q/WZ.14124).	
/W20	Bearing with three lubricating oil holes on outer ring (no oil groove).	
/W20A	Bearing with four lubricating oil holes on outer ring (no oil groove)	
/W20C	Bearing with six lubricating oil holes on outer ring (no oil groove)	
/W20D	Bearing with eight lubricating oil holes on outer ring (no oil groove)	
/W20T	Bearing with three lubricating oil holes on inner ring (no oil groove)	
/W23	Bearing with six lubricating oil holes on inner ring.	
/W26	Indicates the metallurgical bearings (execute standard Q/WZ.J14281)	
/W281	Bearing with oil groove and three lubricating oil holes on outer ring.	
/W33	Bearing with oil groove and four lubricating oil holes on outer ring.	
/W33A	Bearing with twelve lubricating holes on outer ring.	
/W33D	Bearing with eight lubricating holes on inner ring.	
/W33T	Bearing with six lubricating holes on inner ring.	
/WN26	Bearing with oil groove and six lubricating oil holes on outer ring.	

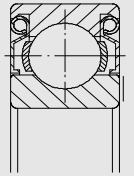
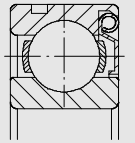
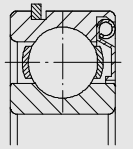
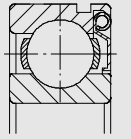
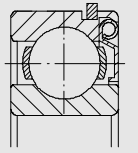
Suffix of Bearing and Bearing Components

Code	Meaning	Example
/W33X	Bearing with oil groove and six lubricating oil holes on outer ring.	
/W33XB	Bearing outer ring with six lubricating oil hole, and the diameter of the oil hole is ϕ15.	
/W512	/W512 W23+W33	
/W513	/W513 W26+W33	
/W518	/W518 W20+W26	
/W519	/W519 W33X+WN26	
/W520	/W520 W33+WN26	
/WN33	/WN33 Bearing with oil groove and three lubricating oil holes on inner ring.	
X	Full complement cylindrical roller bearing with loose rib.	 X

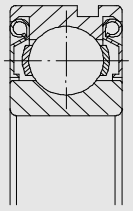
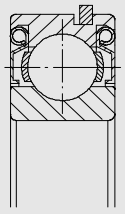
Code	Meaning	Example
X1	Non-standard outer diameter.	
X2	Non-standard width(height).	
X3	Non-standard outer diameter, width (height) (standard bore diameter).	Example:NCF6/27X4V Cylindrical roller bearing, Inner diameter is 27.762, Full complement rolling element.
X4	Inner diameter select the integer of non-standard bearing, while inner diameter is not integer and have two and more decimal places, indicated by X4 as select integer of the figures.	
-XRS	Four row tapered roller bearing, with multi sealed parts. (more than two sealings)	 -XRS 380680-XRS/HC
/Y	Y Combines with another letter (such as YA, YB) or more digitals to identify the change of the non-series which can not be indicated with the present suffix code. YA- Structure change. YA1- Outside surface of outer ring has changed comparing to standard design. YA2- Bore of inner ring has changed comparing to the standard design. YA3- End face of bearing ring has changed comparing to the standard design. YA4- Raceway of bearing ring has changed comparing to the standard design. YA5- Bearing rolling elements has changed comparing to the standard design. YA6- Bearing mounting chamfer has changed comparing to the standard design. YA7- Bearing rib or flange has changed comparing to the standard design.	

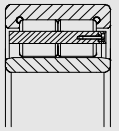
Suffix of Bearing and Bearing Components

Code	Meaning	Example
/Y	YA8- Bearing cage structure changed. YA9- Bearing contact angle has changed comparing to the standard design. YA10- Double-row tapered roller bearing, inner spacer with oil groove and oil hole. YAB- Structure and technical specification has changed at the same time. YAD- One type of bearing has two or more changes on structure. YB- Technical specification has changed. YB1-Surface of bearing ring has plated coating. YB2- Bearing dimension and tolerance changed. YB3- Surface roughness of bearing ring changed. YB4- Heat treating specification (e.g. hardness) changed. YB5- Structure and position tolerance have special requirements. YBD- One type of bearing has two or more changes on technical specification.	
ZH	Thrust bearing with shielded housing washer.	
ZL	Seal spring compression ring.	
ZS	Thrust bearing with shielded shaft washer.	 ZS
-Z	Bearing with shield on one side.	 -Z

Code	Meaning	Example
-2Z	Bearing with shields on both sides.	 -2Z
-ZN	Z+N: Shield is on the different side of snap groove.	 ZN
-ZNR	Z+NR: Shield is on the other side of snap groove and snap ring.	 -ZNR
-ZNB	Z+NB: Shield is on the same side of snap groove.	 ZNB
-ZNBR	Z+NR: Shield is on the same side of snap groove and snap ring.	 -ZNBR

Suffix of Bearing and Bearing Components

Code	Meaning	Example
/Z	Z1- vibrating acceleration rating group conforms to the standard Z1 group. Z2- vibrating acceleration rating group conforms to the standard Z2 group. Z3- vibrating acceleration rating group conforms to the standard Z3 group.	
-2ZN	2Z+N: Bearing with shields on both sides, outer ring with snap groove.	 2ZN
-2ZNR	2Z+NR: Bearing with shields on both sides, outer ring with snap groove and snap ring.	 2ZNR
/ZP	Dimensional tolerance equals to grade 6, rotating precision equals to grade 5.	
-ZT	Thrust cylindrical roller bearing, three row roller lean against together.	 ZT

Code	Meaning	Example
ZW	Double-row needle rollers and cage assembly.	 ZW
/Z	Four-row cylindrical roller bearing, tow-row roller lean against together. The bearing vibration acceleration rated group.The appended digital indicates different groups.	

1) The quantities of the bearing collocation group

/D- two sets of bearings
/T- three sets of bearings.
/Q- four sets of bearings.
/P- five sets of bearings.
/S- six sets of bearings.

2) Bearing arrangement of the bearing collocation

B- Back to back
F- Face to face
T- Tandem arrangement
G- Universal matching
BT- Back to back & Tandem.
FT- Face to face & Tandem
BC- Back to back tandem arrangement in pairs.
FC- Face to face tandem arrangement in pairs.
Notes: 1) & 2) can combines several kinds of collocation types. Details please see the meaning of bearing suffix code and examples.

3) The radial clearance in collocation, pre-load and allocation of axial- load.

The test appended after the collocation code indicates the property:
GA-Light pre-load. Pre-load value relative small (deep groove and angular contact ball bearing).
GB-Medium pre-load. Pre-load value larger than GA (deep groove and angular contact ball bearing).
GC- Heavy pre-load. Pre-load value larger than GB (Deep groove and angular contact ball bearing).
Gxxx- pre-load is xxx special preload value (append pre-load value after the code directly, unit is N)
For angular contact ball bearing,"G" can be omitted.
G- Special pre-load, the number append directly express the magnitude of pre-load.
CA- Axial clearance is relative small (deep groove and angular contact ball bearing).
CB- Axial clearance is larger than CA (deep groove and angular contact ball bearing).

CB- Axial clearance is larger than CB (deep groove and angular contact ball bearing).
CG- Axial clearance is 0 (tapered roller bearing)
R- Radial clearance equally distributed.
Example 1: 7210C/DBGA- angular contact ball bearing 7210C, contact angle α=15° ,back to back arrangement with light pre-load.
Example 2: 6210/DFGA-deep groove ball bearing 6210, after grinded endface, face to face arrangement, with light pre-load.
Example 3: 7210C/TFT- angular contact ball bearing 7210C, contact angle α=15° three sets matched arrangement, two sets of tandem arrangement and one set of face to face arrangement.
Example 4: 7210AC/QBT- angular contact ball bearing 7210AC, contact angle α=25° , four sets matched arrangement, three sets of tandem arrangement and 1 set back to back arrangement.
Example 5:NU210/QTR cylindrical roller bearing NU210, four sets matched arrangement, pre-load uniformly distributed.
Example 6:7210C/PT angular contact ball bearing 7210C, contact angle α=15° , five sets tandem arrangement.
Example 7: 7210C/G325-angular contact ball bearing 7210C, contact angle α=15° ,special pre-load value is 325N.

The illustration to the Sequence of Bearing Code

Bearing Code	Prefix Code		Components of Bearing
	Basic Code		
	Suffix Code	1	Internal structure changed
		2	Sealing, dust-proof, ring changed
		3	Cage and its material
		4	Bearing material
		5	Tolerance grade
		6	Clearance
		7	Application
		8	Vibration features
		9	Heat treatment features
		10	Lubrication features
		11	The structure and technical requirement change not in serial (YA/YB) and etc.

While composing the ZWZ bearing designations, the suffix code is located on the right side after the basic code with distance of half of Chinese characters (except the designation including "-" or "/") when there are more changed items, follows the sequence in the form above from left to right. While the change content after group 4 (including group 4), separate by "/" before the designation with previous code. The last 2 group changed items, which after the 4 groups changes, when the shown number or test meaning can make confusion, space half Chinese characters between 2 designation.
Example: 6215-2RS/HAP63 V2YA7

Case of the Combination of Beairng Basic Code and Suffix

1.6212-2RS/HAP93YA5

Basic code 6212 deep groove ball bearing, with inner diameter equals to 60mm.
Suffix code 2RS, with double side sealing ring.
HA Rings and rolling elements material is vacuum-degassed steel.
P63 Tolerance level comply with level 6 required, internal clearance of bearing comply with group 3.
YA5 Rolling element design is different with 6212-2RS.

2. FC3854168Q1/HG2P69YA4

Basic code FC3854168, four-row cylindrical roller bearing, single inner ring, double outer ring, inner diameter 190mm, outer diameter 270mm, width 168mm.
Suffix code Q1 indicates the cage material is bronze (ZCuAl10Fe3Mn2).
HG2 Ring material select GCr18Mo.
P69 Tolerance level comply with grade 5 required in the standard. Bearing internal clearance not comply with current standard.
YA4 bearing raceway on the ring have different design with standard design.

3. 22316X2CAKF3/HAC9W33YA8

Spherical roller bearing with basic code 22316, inner diameter 80mm.
Suffix code X2 indicates the bearing ring width is different with standard design.
CA type solid cage, symmetrical roller, inner ring without center rib, 2 small ribs on each end.
Tapered bore, conicity 1:12.
F3 cage material choose nodular cast iron.
HA bearing ring choose vacuum-degassed steel.
C9 bearing internal clearance not comply with current standard
W33 bearing outer ring have lubricating oil groove and three lubricating hole.
YA8 cage structure have different design other than standard design

4. 3806/685.8-XRS/HCC9

Basic code 3806/685.8, four-row tapered roller bearing, inner diameter is 685.8mm, Indefinite boundary dimension series.
Suffix code XRS with double sealing ring on both side. Double inner ring with sealing ring, outer ring double side with 0 shape ring, multi position sealing.
HC bearing ring and rolling element use carburized steel (G20Cr2Ni4).
C9 bearing internal clearance not comply with current standard.