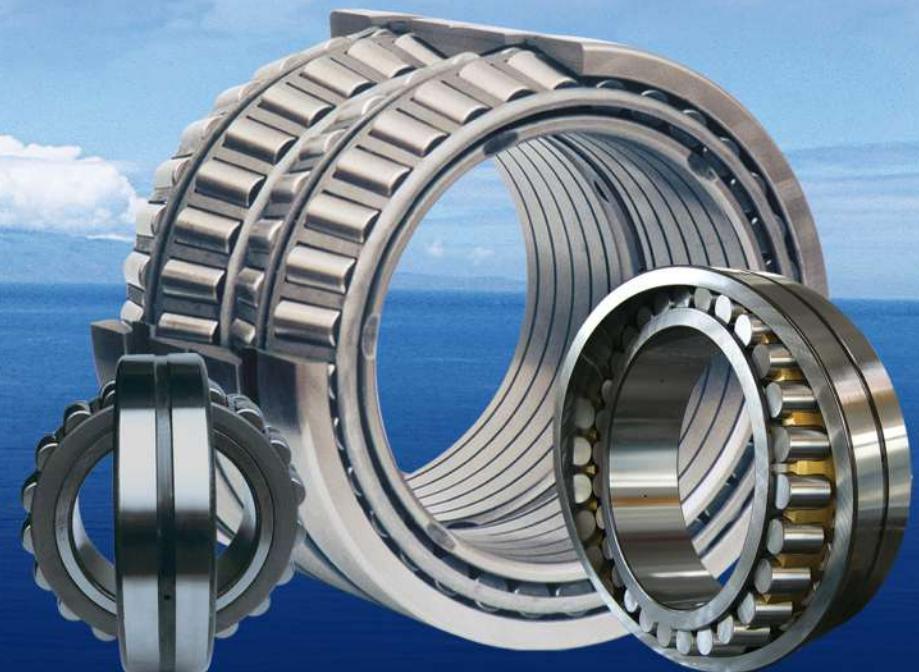


# ZWZ

## Bearing Integral Catalogue



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ZWZ

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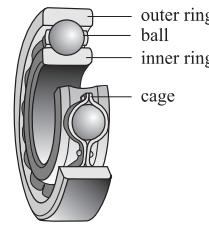
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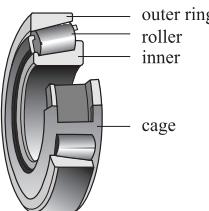
## Structures and types of rolling bearings

### Structures of rolling bearings

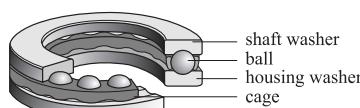
A rolling bearing normally consists of rings (inner ring and outer ring), rolling elements and a cage. The outer ring and inner ring have the rolling elements between them, which are held by the cage to ensure the smooth rolling.



(Deep groove ball bearing)



(Tapered roller bearing)



(Thrust ball bearing)

Figure 1. Structure examples

### Rings (inner ring and outer ring)

The position for the rolling of elements on the rings is called raceway and the surface of this position is called raceway surface. The raceway of ball bearings is also called groove.

Generally speaking, the inner ring and the outer ring works with shaft and housing respectively. The inner ring and the outer ring of thrust bearing is also called the shaft washer and the 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, spherical rollers or other shapes of rollers according to the structures.

### Cage

The cage is applied to embrace rolling elements partially to ensure certain distance to neighbor rollers in circumferential direction.

The cage can be pressed cages, solid machined cages or engineering plastic cages.

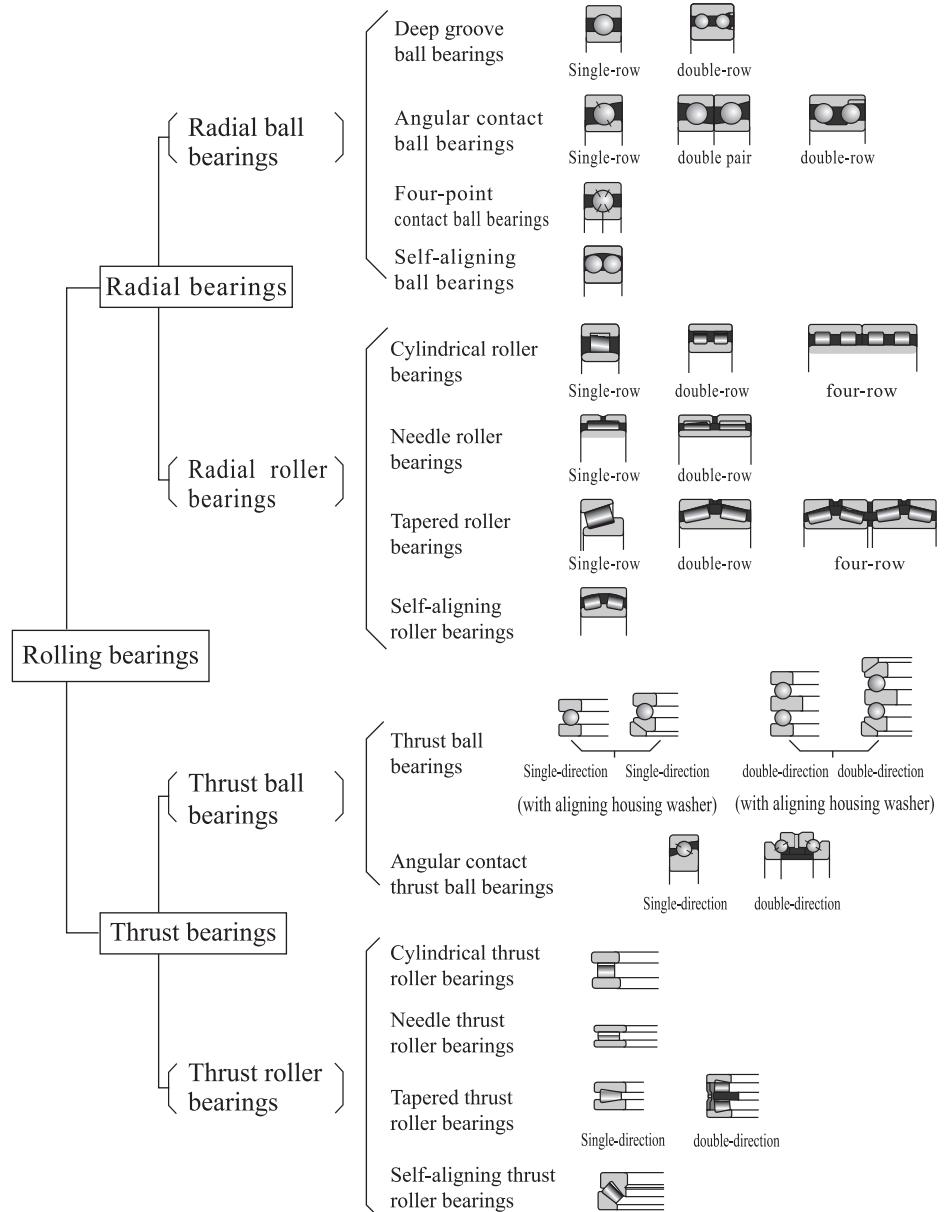
Comparing with full complement (balls or rollers) bearings, bearings with cage have less friction and are suitable for the high-speed rotation.

### Classification of rolling bearings

Based on different contact angles, rolling bearings can be divided into radial bearings and thrust bearings. Or according to the structure of the rolling elements and rings, rolling bearings 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 rows of rolling elements, they can be divided into single row, double row and multi-row (eg, three-row, four-row) bearings. For general classification of rolling bearings, please see Figure 2.

Structures and types of rolling bearings  
(Figure 2. Classification of Rolling Bearings)



## Characteristics of rolling bearings

Low starting friction coefficient.

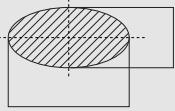
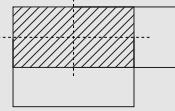
Uniform ISO standards and bearing designation. Convenient availability of Interchangeable products. Easy lubrication and less consumption of lubricant.

One bearing can carry axial and radial load simultaneously.

Convenient employ under high or low temperature condition.

Reinforcement of bearing rigidity by preload.

## Comparison of ball bearings with roller bearings

	Ball bearings	Roller bearings
Contact with raceway	Point contact Contact surface is in elliptical form when being loaded. 	Linear contact Contact surface is in quadrate form when being loaded. 
Characteristics	Resistance is small. It is suitable for the working condition of low torque, high rotation speed and low noise.	Torque is higher than ball bearings and rigidity is also higher.
Load capacity	Low-But can bear both radial load and axial load.	Higher Cylindrical roller bearings with rib can bear light axial load. Double-row tapered roller bearings can bear both radial and axial load.

## The radial and thrust bearings

Almost all rolling bearings can bear both radial and axial load simultaneously.

Generally speaking, one bearing should be considered as a radial bearing if this bearing has a contact angle smaller than  $45^\circ$  with higher radial load capacity if its contact angle smaller than  $45^\circ$ . And one bearing should be, otherwise, considered as a thrust bearing if this bearing has a contact angle larger than  $45^\circ$  with higher axial load capability. Some other bearings are considered as complex bearings, which can bear the combined axial and radial load.

## Standard bearings and non-standard bearings

Standard bearings are those which of the basic boundary dimension and the tolerance in accord with international specifications. Non-standard bearings are designed and manufactured according to the customers' requirements.

## System of bearing code

### Basic bearing code

#### Standard bearings

Each standard bearing, designed by ZWZ, has a basic code, which usually consists of three, four or five digits, or combined with letters and digits.

The meaning of digits (or letters and digits) is as below:

—The initial digital, or letter or letter group indicates bearing type.

—The second and the third digital indicates the dimension series. The second digital stands for the width (height) series, and the third digital stands for the diameter series.

—The last two digits of the basic bearing code multiplied by 5 will be the inner diameter in millimeter.

Under certain cases, the digital standing for the bearing type or the first digital standing for the dimension series are defaulted. The default digits have been listed with brackets in Table 1.

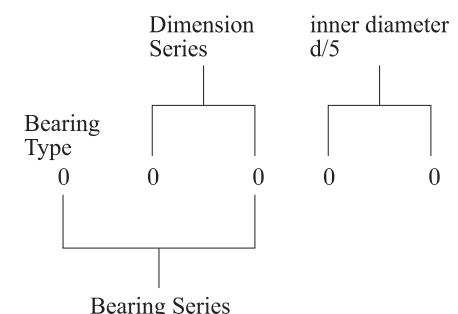


Table 1

(0)32	1(0)2	223	302	4(2)2	510	(6)(0)2	719	811
(0)33	(1)22	213	303	4(2)3	511	(6)(0)3	7(1)0	812
(0)40	1(0)3	232	310		512	6(0)2	7(0)2	822
(0)49	(1)23	222	313		513	6(0)3	7(0)3	823
		241	318		514	6(0)4	7(0)4	871
		231	319			6(1)0	2344	872
		240	320		522	16(0)0	2347	874
		230	322		523	617	2349	893
		249	323		524	618		894
		239	329			619	5600	
		248	330		532	637		
		238	331		533			
		202	332		534			
		203						
		204	3500		542			
			3700		543			
		294	3800		544			
		293						
		292						

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			

## Code of bearing type

- 0- Double-row angular contact ball bearing
- 1- Self-aligning ball bearing
- 2- Self-aligning roller bearing and self-aligning thrust 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
- N- Cylindrical roller bearing

The letters followed "N", such as NJ, NU, NUP, stand for types of the bearings.

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

NA or NK usually stands for needle roller bearings.

U- Spherical outside surface ball bearing

QJ- Four-point contact ball bearing

Table 2 Bearing series code

Table 2 Bearing series code

Bearing type	Bearing series code	Type code	Dimension series code
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
Double-row deep groove ball bearing (with filling slot)	64	6	(0)4
	42	4	(2)2
	43	4	(2)3
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
Double-row angular contact ball bearing (with filling slot)	32	(0)	32
	33	(0)	33
Four-point contact ball bearing	QJ2	QJ1	(0)2
	QJ3		(0)3
Self-aligning ball bearing	12	1	(0)2
	22	(1)	22
	13	1	(0)
	23	(1)	23
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
Tapered roller bearing	329	3	29
	320	3	20
	330	3	30
	331	3	31
	302	3	02

Table 2 (continue)

Bearing type	Bearing series code	Type code	Dimension series code
Tapered roller bearing	322	3	22
	332	3	32
	303	3	03
	313	3	13
	323	3	23
Self-aligning roller thrust 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
	511	5	11
Single-direction flat housing washer thrust ball bearing	512	5	12
	513	5	13
	514	5	14
Single-direction aligning housing washer thrust ball bearing	532	5	32
	533	5	33
	534	5	34
Double-direction flat housing washer thrust ball bearing	522	5	22
	523	5	23
	524	5	24
Double-direction aligning housing washer thrust ball bearing	542	5	42
	543	5	43
	544	5	44
Thrust cylindrical roller bearing	292	2	92
	293	2	93
	294	2	94

Note:

- Width series code showed in bracket will be defaulted in bearing series code.
- Cylindrical roller bearing includes NJ, NUP, N, NF and NH type besides NU type.

## Non-standard bearings

The basic code of non-standard bearings consists of two parts. One is bearing type code and the other is bearing dimension code.

### Type code

Reference to present ZWZ standards.

### Dimension code

Defined as following two methods

#### 1. Dimension series number

a) Standard inner 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 3**.

Table 3

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

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 4** for the indefinite series code of ZWZ bearings.

Table 4

Type of bearing	Basic bearing code
Double-row angular contact ball bearing	4600
Aligning ball bearing	1600
Aligning roller bearing	20600
Tapered roller bearing	30600
Double-row tapered roller bearing with a double-raceway cup	350600
Double-row tapered roller bearing with a double-raceway cone	370600
Four-row tapered roller bearing	380600
Double-row deep groove ball bearing	40600
Thrust ball bearing	51700
Double-direction ball thrust bearing	52700
Deep groove ball bearing	6600
Angular contact ball bearing	7600
Four-point contact ball bearing (double half inner ring)	QJ600
Four-point contact ball bearing (double half outer ring)	QJF600
Angular contact ball thrust bearing	561700

Type of bearing	Basic bearing code
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 inner diameter code of bearing.

## 2. Non-standard bearing notated by inner diameter code

Please refer to Table 5 for inner diameter code notation for non-standard bearings.

Table 5

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

### 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 ball thrust bearing, indefinite series, bore diameter is 30mm.

When the code names several non-standard bearings of same type but slight difference in dimension, the code are distinguished by adding "—"and seriate number 1, 2, 3 □

61956X1M-

For example, 61956X1M

61956X1M-1

61956X1M-2

## Illustration to the change of dimensions and structures

The suffix YA plus number indicates all 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 specification to the change of the technical requirements

The suffix YB appended with digitals indicates all variations of technical requirements. See more details to the specification of bearing suffix.

If one type of bearing has two changes on the technical requirements simultaneously, the bearing is indicated with YB appended with two digitals. For example, /YB12, see the specific

### 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.

change to the product catalogue or supplemented technical requirements.

If one type of bearing has two or more changes on its technical requirements, the bearing is indicated with /YBD.

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

## Bearing and the prefix of bearing

Code	Meaning
B	Angular contact ball bearing with locking slot on inner ring
F	If "F" added before the bearing series code of the inch tapered roller bearing, it indicates the cage of bearing.
FC	Four-row cylindrical roller bearing with double cups and single cone without rib
FCD	Four-row cylindrical roller bearing with double cups and double cones without rib
FCPD	Four-row cylindrical roller bearing with double cups and double cones without rib. The cup has central rib without loose rib.
GAC	Thrust plain bearing
GE...ES	Plain radial bearing
GET...CXS	Self-aligning plain radial bearing, special series, and inner ring merged with bronze alloy, double gapped axially.
GET...CHS	Self-aligning plain radial bearing, special series, and inner ring merged with bronze alloy, double half outer ring.
GET...FHS	Self-aligning plain radial bearing, special series, outer ring special self-lubricated material, double half outer ring.
GS	Housing washer cylindrical roller thrust bearing.
IR-	Inner ring of radial bearing
IW-	Shaft washer of thrust bearing
K	Rolling element and cage assembly
K1	2. The rings and rolling elements or only the rings of Inch tapered roller bearing are made from high carbon chromium bearing steel.
K2	The rings and rolling elements or only the rings of Inch tapered roller bearing are made from 100CrMo7. The rings and rolling elements or only the rings of Inch tapered roller bearing are made from ZGCr15.
KIW-	Thrust bearing without housing washer
KOW-	Thrust bearing without shaft washer
L	Separable inner ring or outer ring of the separable bearing

Code	Meaning
N	Cylindrical roller bearing, inner ring with double ribs, outer ring without rib.
NA	1. Needle roller bearing 2. Timken Double-row cylindrical roller bearing with extended cone, and without central spacer.
NB	Cylindrical roller bearing without rib.
NBCL	Cylindrical roller bearing, outer ring without rib but with double snap rings, inner ring without rib.
NCF	NF+ snap ring
NCL	Cylindrical roller bearing, outer ring without rib but with double snap rings, inner ring with double ribs.
NF	Cylindrical roller bearing, inner ring with double ribs, outer ring with a rib.
NFP	Cylindrical roller bearing, inner ring with double ribs, outer ring with a rib and a loose rib.
NJ	Cylindrical roller bearing, outer ring with double ribs, inner ring with a rib.
NJP	Cylindrical roller bearing, outer ring with double ribs, inner ring without rib but with a loose rib.
NN	Double-row cylindrical roller bearing, inner ring with three ribs, outer ring without rib.
NNB	Double-row cylindrical roller bearing, both inner ring and outer ring without rib.
NNCL	Double-row cylindrical roller bearing, inner ring with three ribs, outer ring without rib but with a central spacer.
NNCF	Double-row cylindrical roller bearing, inner ring with three ribs, outer ring with a rib and a snap ring on the other side.
NND	Double-row cylindrical roller bearing, single inner ring, double outer rings with double ribs.
NNF	Double-row cylindrical roller bearing, double inner rings, single outer ring with a central ribs and no rib on both sides.

## Bearing and the prefix of bearing

Code	Meaning
NNFP	Double-row cylindrical roller bearing, single inner ring, with loose ring on two sides, single outer ring with a central rib and no rib on both sides.
NNJ	Double-row cylindrical roller bearing, outer ring with three ribs, inner ring with a rib.
NNP	Double-row cylindrical roller bearing, inner ring with no rib, outer ring with a central rib and loose ribs on both faces.
FC...ZW	Four-row cylindrical roller bearing, single inner ring, double outer rings with double ribs, two rows of rollers close to each other.
NNU	Double-row cylindrical roller bearing, outer ring with three ribs, inner ring with no ribs.
NU	Cylindrical roller bearing, outer ring with double ribs, inner ring without rib.
NUCL	Cylindrical roller bearing, inner ring without ribs but with double snap rings.
NUP	Cylindrical roller bearing, outer ring with double ribs, inner ring with a rib and a loose rib.
NUTR	Cylindrical roller bearing, full components, with a loose rib.
-1,-2...	Indicates series of non-standard X1, X2, YA2...
A	1. Angular contact ball bearings with nominal contact angle of $\alpha=30^\circ$ 2. Tapered roller bearings with contact angle and outer ring raceway diameter D1 not conforming to national standards, and use A, A1, A2... to indicate when more than two non-national-standard a or D1 occurred in a code.
AC	Angular contact ball bearings with nominal contact angle of $\alpha=25^\circ$
ACA	Aligning roller bearings with central rib and not paralleled rollers.
A6	Inched tapered roller bearings with mounting chamfer not conforming to that of TIMKEN, and use A61, A62... to indicate when more than two non-national-standard mounting chamfer occurred in a code.
B	1. Angular contact ball bearings with nominal contact angle of $\alpha=40^\circ$ 2. Tapered roller bearings with bigger contact angle 3. Inner ring guided

Code	Meaning
C	1. Angular contact ball bearings with nominal contact angle of $\alpha=15^\circ$ 2. Aligning roller bearings with central rib, paralleled rollers and pressed cage, inner ring without rib 3. Matched tapered roller bearings, mean value of axial clearance added directly after C if not conforming to ZWZ standards.
CA	Aligning roller bearings with central rib, paralleled rollers and brass solid cage, inner ring without rib
/CM	Clearance of deep groove ball bearings for motors
/CN	0 group clearance. /CN combined with H, M or L indicates half of the clearance, combined with P indicates clearance shifting. For example: /CNH indicates half of 0 group clearance at the upper part /CNM indicates half of 0 group clearance at the middle part /CNL indicates half of 0 group clearance at the lower part /CNP indicates the upper part of 0 group clearance and the lower part of C3 group.
/C1	Clearance conforms to the standard group 1.
NNTR	Double-row cylindrical roller bearing, full components.
OR-	Outer ring of radial bearing.
OW-	Housing washer of thrust bearing.
QJ	Four-point contact ball bearing, double half inner rings.
QJF	Four-point contact bearing, double half outer rings.
R	1. Bearing without inseparable inner ring or outer ring. 2. If "R" added before bearing series code in Inch tapered roller bearing, it indicates tapered rollers.
RN	N type cylindrical roller bearing without outer ring.
RNU	NU type cylindrical roller bearing without inner ring.
S	Separable angular contact ball bearing.
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
TTSX	2. Timken tapered roller thrust bearing Full component tapered roller bearings with convex spherical shaft washer used on screw down mill mechanism.
U	Aligning seat washer
UC	Spherical outside surface ball bearing with set screw.
WS	Shaft washer of cylindrical roller thrust bearing.

## Postposition Code

Code	Meaning
/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 C3 and the lower part of C4.
/C9	Bearing clearance not conforms to the present standard. When two or more clearances in one code are different from present standard, it will be indicated with the added digits, such as C91, C92 ...
/CR	When matched tapered roller bearings have the radial clearance, the mean value of clearance will be added after CR.
D	1. Double-row angular contact ball bearing, double inner rings, contact angle $\alpha=45^\circ$ . 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 raceways or outer ring with double raceways. 4. Split bearing.
/DB	Two single-row deep groove ball bearings or angular contact ball bearings or tapered roller bearings used for back-to-back paired mounting.
/DC	Double-row angular contact ball bearing with double outer rings.
/DF	Two single deep groove ball bearings or angular contact ball bearings or tapered roller bearings used for face-to-face paired mounting.
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, without inner spacer, end face grinded .

Code	Meaning
E	Inside design is changed, belonging to reinforced type.
F	The material of steel, nodular cast iron or power metallurgical solid cage are indicated with added digitals. F1- carbon steel F2- graphite steel F3- nodular cast iron F4- powder metallurgy FA- steel, nodular cast iron or power metallurgical solid cage, outer ring guided. FAB- steel, nodular cast iron or power metallurgical solid cage, inner ring guided. FE- phosphated steel solid cage.
/HA	Ring, rolling elements and cage or only the ring and rolling elements are made from vacuum smelted bearing steel.
/HC	Ring and rolling elements or only ring or rolling elements are made from case hardened steel (/HC-20Cr2Ni4A; /HC1-20Cr2Mn2MoA; /HC2-15Mn).
/HE	Ring, rolling elements and cage or only the ring and rolling elements are made from electroslag remelting bearing steel (military first grade steel) ZGCr15.
/HG	Ring and rolling elements or only ring are made from other bearing steel (/HG-5GrMnMo; /HG1-55SiMoVA; /HG2-GCr18Mo; /HG3-42CrMo).
/HN	Ring and rolling elements are made from the heat resisting steel (/HN-GCr4Mo4V; /HN1-Cr14Mo4; /HN2-Cr15Mo4V; /HN3-W18Cr4V).
/HP	Ring and rolling elements are made from beryllium bronze or other anti-magnetic material. When the material changed, it is indicated with 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 the material changed, it is indicated with the added digitals.
JA	Pressed steel cage, outer ring guided.

## Postposition Code

Code	Meaning
JE	Phophated pressed unhardened steel cage.
JR	Cage is riveted with two unhardened steel sheets.
JW	Cage is welded with unhardened steel sheet.
K	Tapered bore bearing. Conicity is 1: 12
K30	Tapered bore beraing. 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
LA	Light alloy solid cage, outer ring guided.
LB	Light alloy solid cage, inner ring guided.
M	Brass solid cage
MA	Brass solid cage, outer ring guided.
MB	Brass solid cage, inner ring guided.
N	Bearing with snap groove on outer ring.
NB	Bearing with narrow inner ring.
NB1	Bearing with narrow inner ring, one narrow side.
NR	Bearing with snap groove and a snap ring on outer ring.
N1	Bearing with a positioning notch on outer ring.
N2	Bearing with two or more symmetrical positioning notches on outer ring.
N4	N+N2 Positioning notch and snap groove is not on the same side.
N6	N+N2 Positioning notch and snap groove is on the same side.
/P0	Tolerance grade conforms to standard P0, code is omitted.
/P6	Tolerance grade conforms to standard P6.

Code	Meaning
/P6X	Tolerance grade conforms to standard P6X.
/P5	Tolerance grade conforms to standard P5.
/P4	Tolerance grade conforms to standard P4.
/P2	Tolerance grade conforms to standard P2.
Q	Bronze solid cage, indicated with appended digitals, means different material. Q1- aluminum iron manganese bronze. Q2- silicon iron zinc bronze. Q3- silicon nickel bronze. Q4- aluminum bronze. Q5- stannum bronze (ZQSn10-1)
/QB	Four sets of bearings in pair tandem matched and back-to-back mounting.
/QF	Four sets of bearings in pair tandem matched and face-to-face mounting.
/QT	Four sets of bearings in tandem mounting.
/QBT	Four sets of bearings, three in tandem and one in back-to-back mounting.
/QFT	Four sets of bearings, three in tandem and one in face-to-face mounting.
/QR	Four deep groove ball bearings or cylindrical roller bearings combined, radial load distributed equally.
R	Bearing with snap rib on outer ring (convex outer ring)
-RS	Bearing with frame system rubber seal ring on one side (contact system)
-RS1	Bearing with frame system rubber seal ring on one side (contact system), the material of seal ring is sulfureted rubber.
-RS2	Bearing with frame system rubber seal ring on one side (contact system), the material of seal ring is fluoride rubber.
-2RS	Bearing with RS seal on both sides.
-2RS1	Bearing with RS1 seal on both sides.
-2RS2	Bearing with RS2 seal on both sides.

## Postposition Code

Code	Meaning	Code	Meaning
-RSN -RS1N -RS2N	RS+N Seal on the opposite side of snap groove. RS1+N RS2+N	-RS1ZNBR -RS2ZNBR	RS1+Z+NR NS2+Z+NR
-RSNR -RS1NR -RS2NR	RS+NR Seal on the opposite side of snap ring. RS1+NR NS2+NR	-RZ	Bearing with frame system rubber seal ring (non-contact system)
-RSNB -RS1NB -RS2NB	RS+N Seal on the same side of snap groove. RS1+N RS2+N	-2RZ	Bearing with RZ seal on both sides.
-RSNBR -RS1NBR -RS2NBR	RS+NR Seal on the same side of snap ring. RS1+NR RS2+NR	/SP	Super precision grade, dimension tolerance equals to P5, rotating precision equals to P4.
-2RSN -2RS1N -2RS2N	2RS+N 2RS1+N 2RS2+N	/S0	Bearing ring tempered in high temperature, up to 150°C.
-2RSNR -2RS1NR -2RS2NR	2RS+NR 2RS1+NR 2RS2+NR	/S1	Bearing ring tempered in high temperature, up to 200*.
-RSZ	Bearing with frame system rubber seal ring on one side (contact system) and with shield on the other. RS+Z RS1+Z TS2+Z	/S2	Bearing ring tempered in high temperature, up to 250*.
-RSZN -RS1ZN -RS2ZN	RS+Z+N Seal on the opposite side of snap groove.	/S3	Bearing ring tempered in high temperature, up to 300*.
-RSZNR -RS1ZNR -RS2ZNR	RS+Z+NR Seal on the opposite side of snap ring.	/S4	Bearing ring tempered in high temperature, up to 350*.
-RSZNB -RS1ZNB -RS2ZNB	RS+Z+N Seal on the same side of snap groove.	SC	Radial bearing with outer cover.
-RSZNBR	RS+Z+NR Seal on the same side of snap ring.	SC-Z	Radial bearing with outer cover and shield.
		T	1. When the assembly width of matched pair tapered roller bearing doesn't conform to the standard specification, the assembly width will be added directly after T. 2. Solid cage with phenolic coat
		/T	If the starting torque of bearing has special requirements, digits added after indicates the starting torque.
		/RT	If the rotating torque of bearing has special requirements, digits added after indicates the rotating torque.
		TA	Solid cage with phenolic coat, outer ring guided.
		TB	Solid cage with phenolic coat, inner ring guided.
		/TBT	Three sets of bearings in tandem and back to back mounting.
		/TFT	Three sets of bearings in tandem and face to face mounting.
		TH	Glass fiber reinforced phenolic cage

## Postposition Code

Code	Meaning
TN	Engineering plastic cage TN1- nylon TN2-polyamide (PA) TN3-polyimide TN4- polycarbonate TN5- paraformaldehyde
/TT	Three sets of bearings in tandem mounting.
U	Thrust ball bearing with spherical seat washer.
/UP	Super precision grade, dimension tolerance equals to P4, rotating precision is higher than P4.
V	Full filling with rolling elements (no cage)
/V	Bearing vibrating speed group . The appended digitals indicates different groups. V1- vibrating speed group conforms to standard V1 group. V2- vibrating speed group conforms to standard V2 group. V3- vibrating speed group conforms to standard V3 group.
WB	Bearing with wide inner ring (Both sides)
WB1	Bearing with wide inner ring (One side)
WC	Bearing with wide outer ring.
/W20	Bearing with three lubricating oil holes on outer ring (no oil slot)
/W20A	Bearing with four lubricating oil holes on outer ring (no oil slot)
/W20C	Bearing with six lubricating oil holes on outer ring (no oil slot)
/W20T	Bearing with eight lubricating oil holes on outer ring (no oil slot)
/W23	Bearing with three lubricating oil holes on inner ring (no oil slot)
/W26	Bearing with six lubricating oil holes on inner ring.
/W33	Bearing with oil slot and three lubricating oil holes on outer ring.
/W33A	Bearing with oil slot and four lubricating oil holes on outer ring.
/W33X	Bearing with oil slot and six lubricating oil holes on outer ring.

Code	Meaning
/W513	W26+W33
/W518	W20+W26
/W512	W23+W33
/WN33	Bearing with oil grooves and three lubricating oil holes on inner ring.
X	Cylindrical roller bearing, full components with loose rib.
X1	Non-standard outside diameter.
X2	Non-standard width (height).
X3	Non-standard outside diameter, width (height) (standard bore diameter)
-XRS	Four-row tapered roller bearing, with several sealed parts. (two at least)
/Y	Bearing with wide inner ring (both sides)  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 is different from standard design. YA2- bore of inner ring is different from standard design. YA3- end face of bearing ring is different from standard design. YA4- raceway of bearing ring is different from standard design. YA5- bearing rolling elements is different from standard design. YAB- structure and technical specification changes simultaneously. YAD- one type of bearing has two or more changes on structure.  YB- technical specification has changes. YB1- surface of bearing rings has coating. YB2- bearing dimension and tolerance has change. YB3- surface roughness of bearing ring has change. YB4- heat treatment (e.g. hardness) has change. 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 seat washer.
ZS	Thrust bearing with shielded shaft washer.
-Z	Bearing with shield on one side.
-2Z	Bearing with shields on both sides.

## Postposition Code

Code	Meaning
-ZN	Z+N: Shield is on the opposite side of the snap groove.
-ZNR	Z+NR: Shield is on the opposite side of the snap groove and the snap ring
-ZNB	Z+NB: Shield is on the same side of the snap groove.
-ZNBR	Z+NR: Shield is on the same side of the snap groove and the snap ring.
-2ZN	2Z+N: Bearing with shields on both sides, outer ring with snap groove.
-2ZNR	2Z+NR: Bearing with shields on both sides, outer ring with snap groove and snap ring.
ZW	Assembly double-row needle rollers and cage .
/Z	Bearing vibrating acceleration rating group. The appended digital indicates different groups. Z1- vibrating acceleration rating group conforms to standard Z1 group. Z2- vibrating acceleration rating group conforms to standard Z2 group. Z3- vibrating acceleration rating group conforms to standard Z3 group.

## Selection of Bearings

The variety in kinds, types and dimensions of bearings makes the most selection appropriate very important in order to achieve expected functions of the mechanical devices.

Analyses and evaluations from different viewpoints on the factors are to be considered in order to choose the bearings. There are no special regulations on such selection procedures, but the steps below are to be followed:

Understand the work conditions of the mechanical device and the bearings.

Understand the requirements on the bearing.  
Choose the types of the bearing.

Choose the configuration of the bearing.

Choose the dimensions of the bearing.

Choose the specifications of the bearing

Choose the mounting method for the bearing

### The application conditions and environments conditions of the bearings

Correct definitions of the application position in the mechanical device and the application conditions and environments are the pre-conditions of choosing a proper bearing. For this purpose, the following figures and data are required:

The functions and structures of the mechanical device.  
The application position  
Loads (and directions);  
Rotating speed.  
Vibration and impact.  
Temperature of the bearing (ambient and temperature riseing).  
Surrounding ambience (corrosion, cleanliness, lubrication).

## The Selection of Bearing Type

Items of Analyses	Methods of choice
Mounting space	Those can be put in the mounting space Determine the inner diameter of the bearing first or the rigidity and strength are considered important in design. Choose the most appropriate roller bearing through various dimension series and types.
Load	Strength, direction and nature of the load [the loading capacity is indicated by basic load rating and the value is provided in bearing dimension tables] The load is subjected to changes, such as the amount of the load, radial or axial load , whether single or double direction, the degree of vibration or impact etc., These factors must be considered before choosing the most appropriate bearing type. Normally, the radial load carrying capacity of the bearings with the same ID are listed in the following order: [deep groove ball bearings < angular contact ball bearings < cylindrical roller bearings < tapered roller bearings < spherical roller bearings]
Rotating speed	Those are suitable for mechanical rotations. [The limit value of the rotating speed is indicated by limit speed (rpm) and the value is provided in the bearing dimension tables.] The limit speed of the bearing rests with not only the bearings type but also bearing dimensions, cage type, precision, load carrying conditions, and lubrication methods. These factors must be considered for the choice. The following bearings are applied for high speed rotation: [deep groove bearings, angular contact ball bearings, cylindrical roller bearings]
Rotating precision	Those can satisfy the required rotation precision. [The dimension and rotation precision have been standardized by GB according to bearing types.] Machine tool spindles, gas turbines and control machines require high rotation precision, high speed and low friction. Bearings with precision 5 or over should be applied in this cases. Normally the following bearings are applied: [deep groove ball bearings, angular contact ball bearings, cylindrical roller bearings]

Items of Analyses		Methods of choice
Rigidity	<p>Those can satisfy the rigidity of mechanical shaft system. [When carrying loads, the contact surface between the rolling elements and the raceways may occur elastic deformation. "high rigidity" means smaller elastic deformation.]</p>	<p>In machine tool spindles and final deceleration device of automobiles and other applications, the rigidity of the bearing must be increased when the rigidity of the shaft is increased.</p> <p>The deformation of roller bearings when carrying load is smaller than that of the ball bearings.</p> <p>Rigidity can be increased by applying pre-load (negative clearance). This method is suitable for angular contact ball bearings and tapered roller bearings.</p>
The relative leaning of the inner ring and the outer ring	<p>Reasons to the relative leaning of the inner ring and the outer ring must be analyzed (such loading induced shaft deflection, poor precision or mounting errors of the shaft and housing). And the bearings fit these conditions should be chosen.[The permissible sloping angle is indicated in the notes before bearing dimensions tables].</p>	<p>If the relative leaning between the inner ring and outer ring is too big, the inside load thereof shall do harm to the bearings. So bearing types that can carry this leaning should be chosen.</p> <p>Normally, the allowable sloping angle increased with the following order: [cylindrical roller bearings, tapered roller bearing, deep groove ball bearings (angular contact ball bearings), thrust ball (spherical roller) bearings]</p>
Mounting and dismounting	<p>Check the frequency and methods of bearings mounting and dismounting regularly.</p>	<p>It is comparatively convenient to choose cylindrical roller bearings, needle roller bearings and tapered roller bearings with separable inner ring and outer ring if too much mounting and dismountings required.</p>

## The selection of bearing Collocation

Normally, the shaft is supported by two bearings in radial and axial direction. Then, one of the bearings is called the fixing-end bearing which carries load in radial and axial direction. And controls the comparative axial movement between the shaft and the bearing. The other one is called free-end bearing that only carries radial load and comparatively moves in the axial direction in order to solve problems of shaft expansion caused by temperature changed and clearance errors when mounting.

Bearings on the fixing-end should avoid axial movement. Bearings on the free-end should move axially on the sliding surface (such as cylindrical roller bearings) or move on the mounting surface (such as radial ball bearings). On the comparatively short shaft, if there is no difference between the fixing-end and the free-end bearings applied shall only move in the axial direction (such as radial thrust ball bearings).

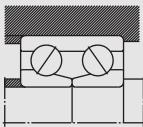
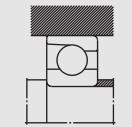
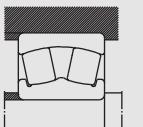
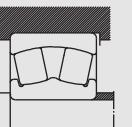
### Bearings on the fixing end and the free end

	Content	Applicable bearing types
Bearings on the fixing end	<p>Position and fix the bearing in the axial direction. Choose bearings that can carry both the radial and the axial load. In order to carry double-direction axial load, strength must be considered according to the amount of the axial load while mounting.</p>	<p>Deep groove ball bearings Combined angular contact ball bearings Self-aligning ball bearings Cylindrical roller bearings with flanges (NUP and NH types.) Double-row tapered roller bearings Spherical roller bearings</p>
Bearings on the free end	<p>To avoid the shaft expansion caused by the temperature when rotating changes and adjust the bearing position in the axial direction.</p> <p>Only the bearing with separable inner ring and outer ring that can carry radial load should be chosen.</p> <p>With non-separable bearings, there should be a clearance between the outer ring and the housing in order to adapt the bearing to the shaft expansion in the axial direction.</p> <p>Sometimes, the adaptation is achieved by the contact surface between the shaft and the inner ring.</p>	<p>Separable cylindrical roller bearings (NU or N type) Non-separable types Deep groove ball bearings Combined angular contact ball bearings (back-to-back arrangement) Double-row angular contact ball bearings Self-aligning ball bearings Double-row tapered roller bearings (3700 type) Spherical roller bearings</p>

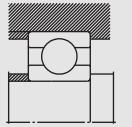
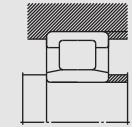
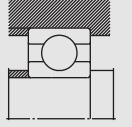
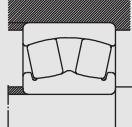
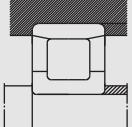
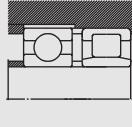
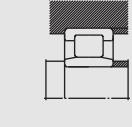
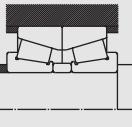
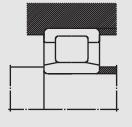
Bearings on the fixing end and the free end

	Content	Applicable bearing types
Regardless of fixing end or free end	When distance between two bearings is small, and effects of shaft expansion are not important, two angular contact ball bearings or tapered roller bearings that can carry axial load can be used together in face-to-face or back-to-back arrangement. Use screw nut or filling pieces to adjust the axial clearance after mounting.	Deep groove ball bearings Angular contact ball bearings Self-aligning ball bearings Cylindrical roller bearings (NJ and NF types) Tapered roller bearings Radial roller bearings
Vertical shaft	Bearings that can carry both radial and axial load should be chosen for the fixing end. If the axial load is too big, use the combination of thrust bearings and radial bearings. Similarly, only bearings that can carry radial load should be used to adapt the shaft expansion for the free end	For fixing end Combined angular contact ball bearing (back-to-back arrangement) Double-row tapered roller bearings (37000 type) Combined thrust bearing and radial bearing arrangements

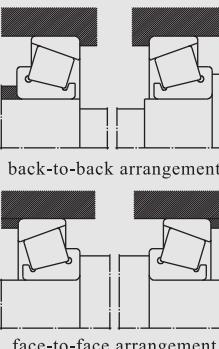
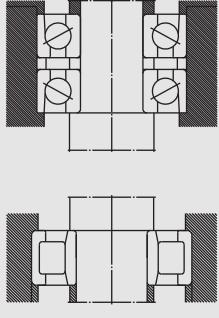
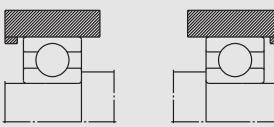
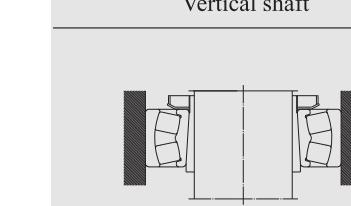
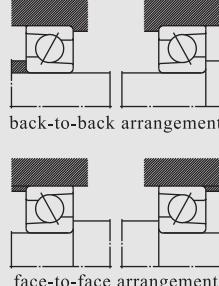
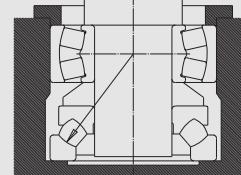
## The Specification of Bearing Collocation

Bearing collocation		Application introduction	Application position
Fixing-end	Free-end		
		◇ Suitable for carrying larger axial load in double directions ◇ Use the combined angular contact ball bearings to replace double-row angular contact ball bearing in the fixing-end.	Worm and worm wheel Decelerator
		◇ Suitable for the situation of mounting error and shaft deflection. ◇ Not only carry large radial load, but also carry certain axial load.	Rolling mill Reductor of table roller Road wheel of bridge crane

## The Specification of Bearing Collocation

Bearing collocation	Application introduction	Application position
Fixing-end	Free-end	
		◇ Widely used in the situation of high speed rotation and used widely ◇ Not suitable for the situation that shaft deflection and bearing eccentricity might happen.  Medium-size motor Air-blower
		◇ Suitable for the situation of high speed rotation, heavy axial or shock load. ◇ Suitable for the interference fit of inner ring and outer ring because of separable bearings. ◇ Not suitable for the situation of shaft deflection and bearing eccentricity.  Main electric motor of railway vehicles
		◇ Suitable for the situation that the axial load is not very large. ◇ Suitable for the interference fit of inner ring and outer ring  Calendar roll of papermaking Vehicle shaft of diesel locomotive
		◇ Suitable for high speed rotation, large radial load with axial load. ◇ In order to make deep groove ball bearings free from radial load, there is a gap between outer ring and housing.  Transmission of diesel locomotive
		◇ Suitable for carrying large load or shock load ◇ This application requires high rigidity on the fixing-end and bearings are mounted in back-to-back arrangement and preloaded ◇ This application also requires to improve the precision of shaft and housing and reduce mounting error  Rolling mill Lathe spindle

## The Specification of Bearing Collocation

Regardless of fixing-end or free-end	Application introduction	Application position	Bearing collocation	Application introduction	Application position
			Fixing-end		
 <p>back-to-back arrangement face-to-face arrangement</p>	<ul style="list-style-type: none"> <li>◇ Suitable for carrying large load or shock load</li> <li>◇ Suitable for improving the rigidity of shaft through preloading</li> <li>u Back to back arrangement is in order to carry torque.</li> <li>◇ Face-to-face arrangement is convenient to mount when inner ring requires interference fit. Suitable for the situation of mounting error</li> <li>◇ Pay attention to the adjustment when preload.</li> </ul>	Decelerator Axe shaft of automobile		<ul style="list-style-type: none"> <li>◇ Use combined angular contact ball bearing on fixing end, and cylindrical bearing on free end. Suitable for high speed rotation.</li> </ul>	Vertical motor Vertical pump
	<ul style="list-style-type: none"> <li>◇ Normally used in small-size mechanisms or for carrying small load</li> <li>◇ When applying preload, a spring or a shim, of adjusted thickness, can be used on one side of outer ring end face</li> </ul>	Small size motor Small size decelerator Small size pump		Vertical shaft	Application introduction Application position
 <p>back-to-back arrangement face-to-face arrangement</p>	<ul style="list-style-type: none"> <li>◇ In order to improve the rigidity of shaft through preload. Widely used in the situation of high rotation speed and large axial load.</li> <li>◇ Back-to-back arrangement is fit for carrying torque.</li> <li>◇ When applying preload, a spring or a shim, of adjusted thickness, can be used on one side of outer ring end face</li> </ul>	Machine tool spindle		<ul style="list-style-type: none"> <li>◇ Suitable for low speed, heavy load and the axial load is greater than radial load.</li> <li>◇ Suitable for the situation that can generate shaft deflection and eccentricity.</li> </ul>	Central shaft of crane Vertical pump

## Selection of bearing dimensions

### Life of bearing

When the bearing is carrying load, material fatigue shall happen even under normal operating conditions due to the effects of changing load on the raceways of rings and the sliding surface of the rolling elements, and it will cause scaling damage to the raceways and the sliding surface (called flaking of spalling). The total number of revolutions before such scaling happens is called the (Fatigue) life of the bearing.

The bearing (fatigue) life varies greatly even for those with the same structure, dimensions, materials and manufacturing processes under the same rotation conditions.

Because the material fatigue is of diversity, it must be considered statistically.

Suppose a number of bearings of the same specification are operated individually under the same working conditions. After a certain period of time, 10% of the fail as a result of flaking caused by rolling fatigue. In this case, the total number of revolutions is defined as the fatigue life rating.(Reliahd life is 90%)

When the bearings rotate at constant speed, its life can also be expressed with total rotation time.

In fact, however, other damage or impair may happen besides fatigue scaling.

The damage of impair may be avoided by choosing the correct bearing, mounting and lubrication.

### Basic dynamic load rating

Basic dynamic load rating indicates the fatigue resistant capacity (i.e. load carrying capacity). It shows that with pure radial load (for radial bearings), and with the presumption of running inner ring and motionless outer ring (or vice versa), the basic rating life can exceed 1 million

rotations. The basic load rating for radial bearings and thrust bearing is called radial basic load rating respectively, indicated by Cr and Ca, whose values are provided in the bearing dimension tables.

### Basic life rating

Formula (1) shows the relations among basic dynamic load rating, equivalent dynamic load rating and basic life rating.

When the rotation speed is constant, it is more convenient to express the life rating by time, as shown in formula (2).

In addition, for railway vehicles or automobiles, it is more common to use distance of movement (km) to express the life of relative bearings.

$$(\text{Total rotation}) L_{10} = \left( \frac{C}{P} \right)^P \quad \dots \dots \dots (1)$$

$$(\text{Time}) \quad L_{10h} = \left( \frac{10^6}{60n} \right)^P \quad \dots \dots \dots (2)$$

$$(\text{Distance of movement}) \quad L_{10s} = p D L_{10} \quad \dots \dots \dots (3)$$

Where

$L_{10}$  : basic life rating,  $10^6$  rotations

$L_{10h}$  : basic life rating, h

$L_{10s}$  : basic life rating, km

P : equivalent dynamic load rating,  
N{kgf}

C : basic dynamic load rating, N{kgf}

n : rotation speed, rpm

p : life index,

ball bearing ..... P=3

roller bearing ..... P=  $\frac{10}{3}$

D : diameter of the wheel or tire, mm

Therefore, we assume the working conditions of the bearing are: equivalent dynamic load is P, rotation speed is n, and then the basic dynamic load rating that satisfies the design requirement of the bearing can be calculated with formula (4). From the dimension tables, we can select the bearing that can meet the requirement of value C, and then we can define the dimension of the bearing.

$$C=P \left( L_{10h} \times \frac{60n}{10^6} \right)^{\frac{1}{P}} \quad \dots \dots \dots (4)$$

We use life factor (fh) and speed factor (fn) and get the following formula:

$$L_{10h} = 500fh^P \quad \dots \dots \dots (5)$$

Life factor:

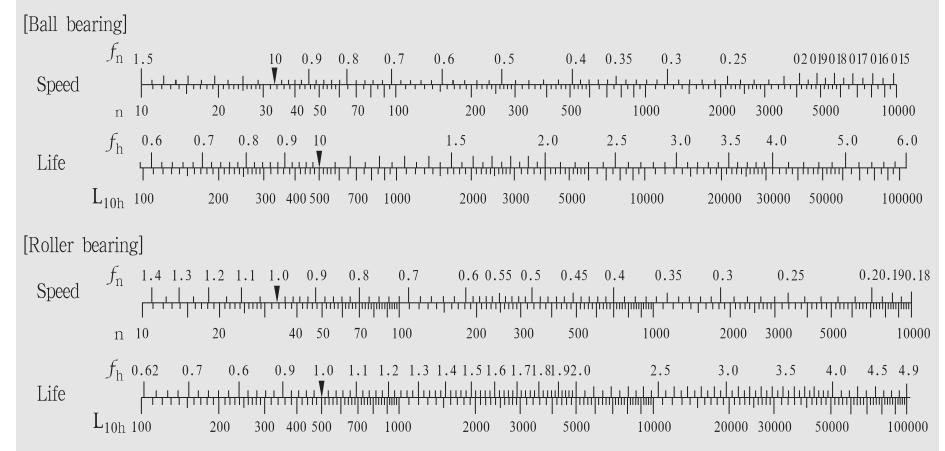
$$fh=fn \frac{C}{P} \quad \dots \dots \dots (6)$$

Speed factor:

$$fn = \left( \frac{10^6}{500 \times 60n} \right)^{\frac{1}{P}}$$

$$= (0.03n)^{\frac{1}{P}} \quad \dots \dots \dots (7)$$

We can easily get fh, fn and L10h with the calculated figure [Reference figure].



Correction of basic dynamic load rating based on temperature and treatment on stability of bearing dimensions

When applied in high temperature, the internal microstructure of the material shall change and the hardness shall be decreased, while the basic dynamic load rating shall be smaller than that

in normal temperature. And the changed microstructure of the material shall not recover even when the bearing is put back to the normal temperature again.



Table 4 required bearing life

Application conditions	Machines	Time (h)
Running for short time or discontinuously	Household electronic appliances, electrical tools, agricultural machines, winding engines	4000-8000
Not usually used but running with high reliability	Air conditioner motors, construction, machines, belt machines, elevators	8000-12000
Used discontinuously but running for long time periods	Mill roll necks, small motors, cranes	8000-12000
	General industrial motors, general gear devices	12000-20000
	Machine tools, vibration screens, pulverizers	20000-30000
	Compressors, pumps, important gear devices	40000-60000
Normally running over 8 hours daily or continuously for long time periods	Automatic elevators	12000-20000
	Centrifugal machines, air-conditioning equipment, air-blowers, wood processing machines, shafts for railway vehicles	20000-30000
	Large motors, mining elevators, main motors for railway vehicles, locomotives	40000-60000
	Paper-making machines	100000-200000
24-hour continuous running without stoppage	Running water equipment, power station equipment, mining drainage works	100000-200000

## Equivalent dynamic load

Bearings usually carry the combination of radial load and axial load, and the load conditions are varied, such as the changes in the amount and so on.

Therefore, the actual load can not be directly compared with its dynamic load rating.

In this case, it is necessary to convert the actual load into a perceived load with definite amount and direction that passes the bearing center. The bearing with this perceived load shall have

the same life as with actual load and the same rotational speed.

This perceived load after conversion is called the equivalent dynamic load, indicated by P.

### The calculation of equivalent dynamic load

The equivalent dynamic load of the radial bearings and thrust bearings ( $\alpha=90^\circ$ ) can be calculated with formula below:

$$P = X F_r + Y F_a \quad \dots \dots \dots (9)$$

Where,

P: equivalent dynamic load, n {kgf}

For radial bearings, it is expressed as  
Pr: radial dynamic load  
For thrust bearings, it is expressed as  
Pa: axial dynamic load

F<sub>r</sub>: radial load, N {kgf}

F<sub>a</sub>: axial load, N {kgf}

X : radial load factor

Y : axial load factor

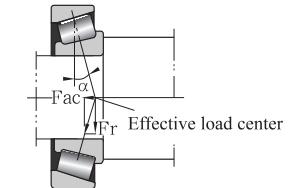
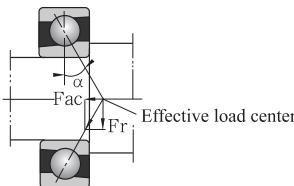
(Load factors X and Y are given in the bearing dimension tables.)

For single-row radial bearings, when  $F_a/F_r \leqslant 1$ , let X=1, Y=0

Hence, in this case equivalent dynamic load  
Pr=Fr

[e indicates the critical value  $F_a/F_r$  which is given in the bearing dimension tables.]

For single-row angular contact ball bearings and tapered roller bearings, as shown in Figure 1, since the axial component of force(Fac) shall happen when the bearing carries radial load, normally these two types of bearings are used in face-to-face or back-to-back arrangements.



[The location dimensions of effective load center are listed in the bearing dimension table]

Figure 1 Axial component of force

The axial component of force can be calculated with the following formula:

$$F_{ac} = \frac{F_r}{2Y} \quad \dots \dots \dots (10)$$

The calculation method for the equivalent dynamic load of these bearings when they carry radial load and outside axial load are shown in Table 5.

Thrust ball bearings with  $\alpha=90^\circ$  can only carry axial load, therefore the equivalent dynamic load Pa=Fa.

The equivalent dynamic load of thrust spherical roller bearings can be calculated with the following formula:

$$P_a = F_a + 1.2 F_r \quad \dots \dots \dots (11)$$

Where,  $\frac{F_r}{F_a} \leqslant 0.55$

Table 5 Calculation of equivalent dynamic load for two single-row angular contact ball bearings or tapered roller bearings matched in face-to-face or back-to-back arrangement

Bearings collocations		Load conditions	Bearing	Axial load	Equivalent dynamic load
Back-to-back	Face-to-face				
A      B      B      A		$\frac{F_{rB}}{2Y_B} + K_a \geq \frac{F_{rA}}{2Y_A}$	BearingA	$\frac{F_{rB}}{2Y_B} + K_a$	$P_A = X F_{rA} + Y_A \left( \frac{F_{rB}}{2Y_B} + K_a \right)$ When $P_A < F_{rA}$ , let $P_A = F_{rA}$
			BearingB	—	$P_B = F_{rB}$
A      B      B      A		$\frac{F_{rB}}{2Y_B} + K_a < \frac{F_{rA}}{2Y_A}$	BearingA	—	$P_A = F_{rA}$
			BearingB	$\frac{F_{rA}}{2Y_A} - K_a$	$P_B = X F_{rB} + Y_B \left( \frac{F_{rA}}{2Y_A} - K_a \right)$ When $P_B < F_{rB}$ , let $P_B = F_{rB}$
A      B      B      A		$\frac{F_{rB}}{2Y_B} \leq K_a + \frac{F_{rA}}{2Y_A}$	BearingA	—	$P_A = F_{rA}$
			BearingB	$\frac{F_{rA}}{2Y_A} + K_a$	$P_B = X F_{rB} + Y_B \left( \frac{F_{rA}}{2Y_A} + K_a \right)$ When $P_B < F_{rB}$ , let $P_B = F_{rB}$
A      B      B      A		$\frac{F_{rB}}{2Y_B} > \frac{F_{rA}}{2Y_A} + K_a$	BearingA	$\frac{F_{rB}}{2Y_B} - K_a$	$P_A = X F_{rA} + Y_A \left( \frac{F_{rB}}{2Y_B} - K_a \right)$ When $P_A < F_{rA}$ , let $P_A = F_{rA}$
			BearingB	—	$P_B = F_{rB}$

Note:

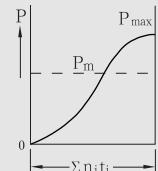
- Applicable to situations where the internal clearance and pre-load equal 0 when the bearing is running.
- The radial load is positive although it is in the opposite direction of the arrow in the above figure.

## The average equivalent dynamic load when the load changes

When the bearing carries a changing load in either amount or direction, it is necessary to calculate the average equivalent dynamic load which makes the bearing have the same life under actual changing circumstances.

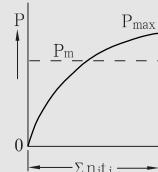
The calculation methods for average equivalent dynamic load in changing situations are shown in (1) to (4). In addition, as shown in Figure 5, the average equivalent dynamic load can be calculated with formula (16) when the static load rotational load is carried simultaneously.

### (3) Sine changes



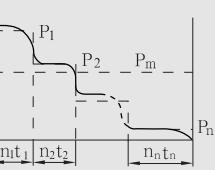
$$P_m = 0.68P_{max} \dots\dots (14)$$

### (4) Sine changes (Upper part of sine curve)



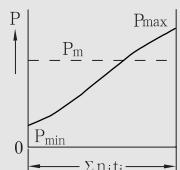
$$P_m = 0.75P_{max} \dots\dots (15)$$

### (1) Stepped changes



$$P_m = \sqrt{\frac{P_1^2 n_1 t_1 + P_2^2 n_2 t_2 + \dots + P_n^2 n_n t_n}{n_1 t_1 + n_2 t_2 + \dots + n_n t_n}} \dots\dots (12)$$

### (2) Monotonous changes



$$P_m = \frac{P_{min} + 2P_{max}}{3} \dots\dots (13)$$

From (1) to (4),

$P_m$  : Average Equivalent Dynamic Load, N {kgf}

$P_1$  : AEDL when rotational speed =  $n_1$  and effective time =  $t_1$ , N {kgf}

$P_2$  : AEDL when rotational speed =  $n_2$  and effective time =  $t_2$ , N {kgf}

$P_n$  : AEDL when rotational speed =  $n_n$  and effective time =  $t_n$ , N {kgf}

$P_{min}$  : the minimum AEDL, N {kgf}

$P_{max}$  : the maximum AEDL, N {kgf}

$\Sigma n_i t_i$  :  $t_f - t_i$  the total rotation number within the time

P : life index

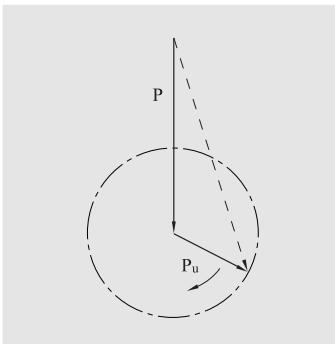
For ball bearings,  $p=3$

For roller bearings,  $p=10/3$

(Reference) Average rotation speed can be calculated with the following formula:

$$n_m = \frac{n_1 t_1 + n_2 t_2 + \dots + n_n t_n}{t_1 + t_2 + \dots + t_n}$$

(5) Static load and rotational load working together



$$P_m = f_m (P + P_u) \quad (16)$$

Where,

$P_m$  : average equivalent dynamic load, N {kgf}

$f_m$  : factor (Figure 2)

$P$  : static load, N {kgf}

$P_u$  : rotation load, N {kgf}

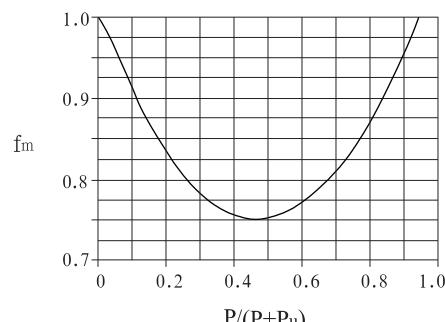


Figure 2 Factor  $f_m$

## Basic static load rating

Partial permanent deformation will happen to the contact surfaces of the rolling elements and raceways when the bearing carries too heavy the static load or work at extremely low rotational speed. The amount of deformation shall increase with the growing load and shall affect the normal rotation when it exceeds certain limit.

The basic static load rating means the static load which can produce stress in the center of contact surface between the rolling elements carrying the maximum load and the raceways, the contact stress can be calculated as the following:

- Self-aligning ball bearings ..... 4600MPa {469kgf/sq.mm<sup>2</sup>}
- Other ball bearings ..... 4200MPa {469kgf/sq.mm<sup>2</sup>}
- Roller bearings ..... 4000MPa {469kgf/sq.mm<sup>2</sup>}

The total amount of permanent deformation of the rolling elements an raceway under such stress equals 0.0001 times of the diameter of the rolling elements.

For radial bearings and thrust bearings, the basic static load rating is called radial basic static load rating and the axial basic static load rating, indicated by  $C_{or}$  and  $C_{oa}$  respectively. The values of them are given in the bearings dimension tables.

## Equivalent static load rating

Equivalent static load rating is a perceived load. When the bearing is motionless or rotates at extremely low speed, the contact stress in the center of the surface between the rolling elements carrying maximum load and the raceway under such perceived load shall be the same as that will happen in actual load conditions.

The radial load and axial load passing the bearing central line is used as the equivalent static load rating of radial bearing and axial bearing respectively.

Equivalent static load rating can be calculated with the following formula:

$$P_{or} = X_o F_r + Y_o F_a \quad (17)$$

$$P_{or} = F_r \quad (18)$$

## [Thrust bearings]

$$(\alpha \neq 90^\circ)$$

$$P_{oa} = X_o F_r + F_a \quad (19)$$

(However, the accuracy decreased when  $F_a < X_o F_r$ )

$$(\alpha = 90^\circ)$$

$$P_{oa} = F_a \quad (20)$$

Where,

$P_{or}$  : radial equivalent static load rating, N {kgf}

$P_{oa}$  : axial equivalent static load rating, N {kgf}

$F_r$  : radial load, N {kgf}

$F_a$  : axial load, N {kgf}

$X_o$  : radial static load factor

$Y_o$  : axial static load factor (Static factor  $X_o$  and  $Y_o$  are given in the bearing dimension tables.)

## Safety factors

Although the permissible equivalent static load depends on the basic static load rating of the bearing, the use limit of the bearing restricted by the above-mentioned permanent deformation (the amount of partial surface hollow) will vary with the requirements on the functionality and the application conditions of the bearing.

Therefore, an empirical safety factor is defined in order to analyze the safe level of the basic static load rating.

$$f_s = \frac{C_o}{P_o} \quad (21)$$

Where,

$f_s$  : safety factor (Table 6)

$C_o$  : basic static load rating, N {kgf}

$P_o$  : equivalent static load, N {kgf}

Table 6 Safety factor  $f_s$

Application conditions	fs (minimum)	
	Ball bearing	Roller bearing
Rotating in normal way	High rotational precision	2
	Under normal conditions	1
	With shock load	1.5
(sometimes oscillating)	Rotating rarely	0.5
	Under normal conditions	1
With shock load or unevenly-distributed load		2

[Note]: For thrust spherical roller bearings, let  $f_s \geq 4$ .

## Pretension of bearing

During working and under the running condition, the bearings usually have proper internal clearance. In order to improve the rigidity or running accuracy of bearing under different working conditions, the bearing is preloaded to make it with certain negative internal clearance, i.e. taking some measures to generate certain predeformation among rolling elements, inner ring and outer ring to keep the condition of being pressed between inner ring and outer ring. This process is called pretension. It is normally applicable for angular contact ball bearings and tapered roller bearings.

## Purpose of pretension

To improve the axial and radial positioning accuracy of shaft and reduce the run-out of shaft.

To improve the rigidity of bearings

To avoid the bearing noise generated by vibration and resonance vibration

To keep correct relative position among rolling elements and rings.

## Types of preload

Radial or axial pretension can be adopted according to different bearing types. The pretension is realized by applying preload on bearing and make inner ring and outer ring have relative displacement.

## Positioning preload

In order to fix the relative axial position of bearing and improve the rigidity of bearing

## Constant pressure preload

The pretension is realized by a spring. Therefore, pre-pressure can be kept steadily even though the position between bearings may change due to temperature rise or load during operation.

Cylindrical bearing: radial preload  
Thrust bearing: axial preload

Single-row angular contact ball bearing and tapered roller bearing:  
Generally, they're applied axial preload and used with other bearings of the same type in face-to-face arrangement or back-to-back arrangement.

Deep groove ball bearing is usually applied with axial load.

Normally, preload is adjusted under certain ambient temperature during mounting. (or preset according to this temperature). During operating, if the temperature rise of shaft is greater than that of bearing block, the preload will be increased. And the preload amount of face-to-face arrangement increases greater than the preload amount of back-to-back arrangement.

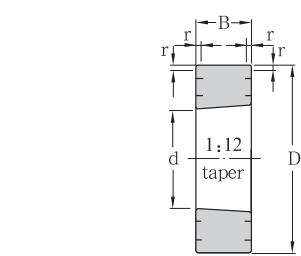
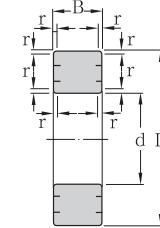
## Data of bearings

### Main dimensions

The main dimensions of bearings indicate the boundary dimensions of inner ring, outer ring, width or height, chamfer and others that are used to describe the outline of the bearing. They are the necessary dimensions required for the mounting on the shaft or in the housing.

These main dimensions have been standardized by international standard (ISO15). GB307 (main dimensions for rolling bearings) are also based on ISO standards.

The national standards have defined the main dimensions according to types of radial bearings (except the regulations for tapered roller bearings) and thrust bearings. The details are provided in the bearing catalogue.



(1) Radial bearing  
(Excluding tapered roller bearing)

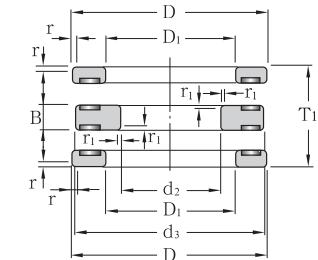
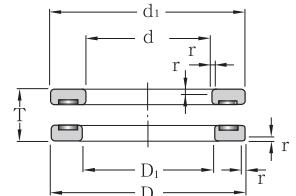
Radial bearing  
(Excluding tapered roller bearing)

d: bearing nominal bore diameter  
D: bearing nominal outer diameter  
B: bearing nominal width  
r: inner and outer rings chamfer dimension

(2) Tapered roller bearing

### Tapered roller bearing

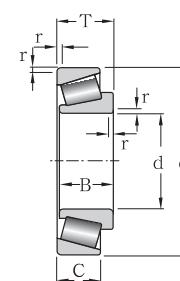
d : bearing nominal bore diameter  
D : bearing nominal outer diameter  
T : bearing nominal width (assembly width)  
B : inner ring nominal width  
C : outer ring nominal width  
r : inner and outer rings chamfer dimension



(3) Thrust bearing (single direction, double direction)

### Thrust bearing (Plain housing washer type)

d : Shaft washer nominal bore diameter  
d1 : Shaft washer nominal outer diameter  
2) of inner ring  
d2 : Central shaft washer nominal bore diameter  
d3 : Central shaft washer nominal outer diameter 2)  
D : Housing washer nominal out diameter  
D1 :Housing washer nominal bore diameter 1)



T : Nominal height of single direction bearing

T1: Nominal height of double direction bearing

B : Central shaft washer height

r : Shaft washer and housing washer chamfer dimension 1)

r1: Central shaft washer chamfer dimension 1)

[Note]

1). The minimum value is listed in bearing dimension tables

2). The maximum value is listed in bearing dimension tables.

## Bearing Precision

Rolling bearing precision class has been standardized and has been classified into 6 levels of P0, P6X, P6, P5, P4 and P2.

The precision level increases beginning from P0. P0 class is applicable for normal purpose. When bearings are working in such conditions or circumstances as described in Table 1, P5 or even higher precision is needed.

Although the above mentioned precision class is made on the ISO basis, it is named differently in some countries.

Applicable precision classes to all kinds of bearing types and comparisons among different countries' standards are listed in Table 2.

■ Dimension precision (relative to shaft and housing mounting)

- Bore diameter, outer diameter, width and permissible deviation of assembly width

- Permissible deviation of roller group inner and outer inscribed circle diameters

- Permissible limit value of chamfer dimension

- Permissible variation of width

- Permissible deviation and variation of tapered bore

■ Rotation precision (relative to rotation object runout)

- Permissible radial and axial runout of inner and ring and outer ring
- Permissible horizontal runout of inner ring
- Permissible variation of outer diameter surface leaning slop
- Permissible raceway thickness variation of thrust bearing

Table 1: Application examples of precise bearings

Performance requirements	Application	Applicable precision class
High runout precision of rolling elements is required	Acoustics, video device spindles(video, recorder) Radar, paraboloid antenna retarding axle Machine tools spindle Computer, disc driver spindle Roll neck for aluminum foil mill Bearings for multi-process rolling mills	P5,P4 P4 P5,P4,P2,ABEC9 P5,P4,P2,ABEC9 P5 P4
High rotation speed	Super chargers Jet propelled generator spindle, auxiliary machine Centrifugal separator Hydraulic natural gas pumps Turbine molecular pump spindle, protection bearing Machine tool spindle Tensioners	P5,P4 P5,P4 P5,P4 P5 P5,P4 P5,P4,P2,ABEC9 P5,P4
Low friction and small friction variation is required	Devices for control (synchronism motor, sevo motor, gyro gimbal) Meters and instruments Machine tool spindles	P4,ABMA 7P P5 P5,P4,P2,ABEC9

Table 2: Bearing type and applicable precision class

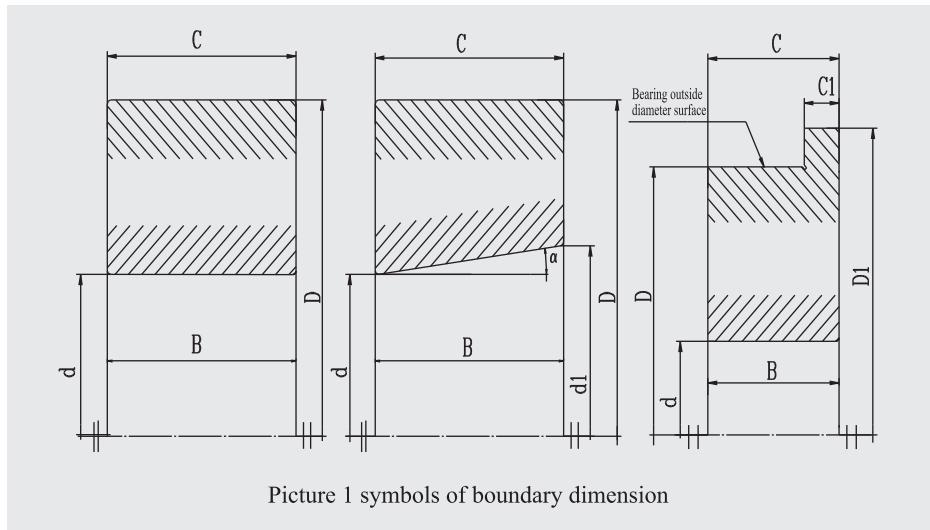
Bearing type	Applicable standard	Applicable precision class					
		P0	—	P6	P5	P4	P2
Deep groove ball bearings	GB307	P0	—	P6	P5	P4	P2
Angular contact ball bearings		P0	—	P6	P5	P4	P2
Self-aligning ball bearing		P0	—	—	—	—	—
Cylindrical roller bearings		PP0	—	P6	P5	P4	P2
Tapered roller bearings	GB307	P0	P6X	P6	P5	P4	—
		P0	—	—	—	—	—
	SB/T53419-94	(double-row, four-row)	—	—	—	—	—
		inch series	—	—	—	—	—
Spherical roller bearings	GB307	Class4	—	Class2	Class3	Class0	Class0
Thrust ball bearings		P0	—	—	—	—	—
Spherical thrust roller bearings		P0	—	P6	P5	P4	—

## Tolerance symbols

### Outline dimension symbols (Figure 1)

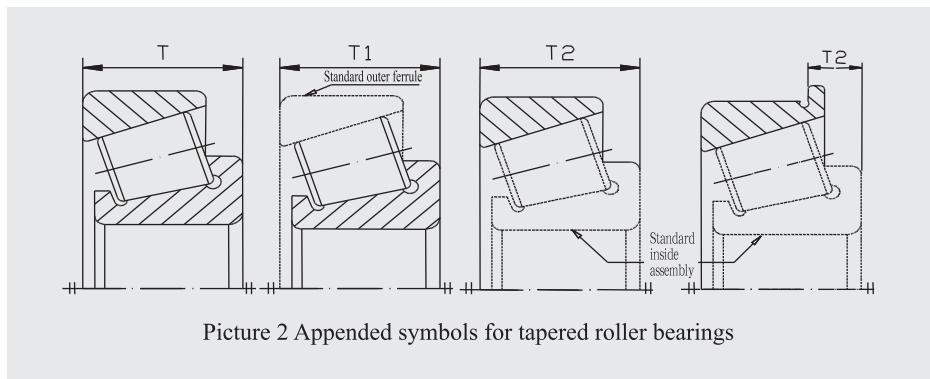
d: nominal bearing bore diameter  
 d<sub>1</sub>: basic diameter of basic tapered hole on theoretical big end  
 $\Delta d_s$ : diameter deviation of single inner hole  
 $\Delta d_{mp}$ : deviation of mean inner diameter on the single plain (For tapered hole  $\Delta d_{mp}$  only refers to theoretical small end of inner hole)  
 $\Delta d_{1mp}$ : mean inner diameter deviation of basic tapered hole on theoretical big end  
 $\Delta d_p$ : inner diameter variation on the single radial plain  
 Vdmp: mean inner diameter variation (only suitable for cylindrical hole)  
 $\alpha$ : nominal half tapered angle  
 D: nominal bearing outer diameter  
 D<sub>1</sub>: nominal outer diameter of outer ring flange  
 $\Delta D_s$ : single outer diameter deviation  
 $\Delta D_{mp}$ : mean outer diameter deviation on the single plain  
 $\Delta D_{1s}$ : single outer diameter deviation of outer ring flange  
 $\Delta D_p$ : outer diameter variation on the single radial plain  
 $\Delta D_{mp}$ : mean variation of outer diameter  
 B: inner ring nominal width

$\Delta B_s$ : single width deviation of inner ring  
 VBs: width variation of inner ring  
 C: nominal width of outer ring  
 C<sub>1</sub>: nominal width of outer ring flange  
 $\Delta C_s$ : single width deviation of outer ring  
 $\Delta C_{1s}$ : single width deviation of outer ring flange  
 VC<sub>s</sub>: width variation of outer ring  
 VC<sub>1s</sub>: width variation of outer ring flange  
 Kia: radial runout of assembled bearing inner ring  
 Kea: radial runout of assembled bearing outer ring  
 Sd: runout of inner ring reference face (back face) to the bore  
 SD: inclination variation of outer diameter generatrix with reference face (back face)  
 SD<sub>1</sub>: inclination variation of outer diameter generatrix to the flange back face  
 Sia: runout of assembly bearing's inner ring end face (back face) to the race way  
 Sea: runout of assembly bearing's outer ring end face (back face) to the raceway  
 Seal: runout of flange back face to raceway of assembly bearings



### Appended symbols for tapered roller bearings (Table 2)

T: Nominal width of the bearing  
 $\Delta T_s$ : Deviation of assembly width  
 T<sub>1</sub>: Effective width of cone assembled with master cup  
 $\Delta T_{1s}$ : Deviation of single width of cone assembled with master cup  
 T<sub>2</sub>: Effective width of cone assembled with master cup  
 $\Delta T_{2s}$ : Deviation of single width of cup assembled with master cone



## Tolerance value

Radial bearing (excluding tapered roller bearings)

Tolerance of P0 (Table 3, Table 4)

Table 3: Tolerance of Class P0 inner ring

d mm		$\Delta d_{mp}$		V <sub>dp</sub> <sup>2)</sup>		V <sub>dmp</sub>	Kia	$\Delta Bs$			V <sub>Bs</sub>	$\mu m$						
				Diameter series				All	Normal	Revision <sup>3)</sup>		$\mu m$						
				9	0, 1							High	Low	High	Low			
Over	To	High	Low	max		max	max	High	Low									
0.6 <sup>1)</sup>	2.5	0	-8	10	8	6	6	10	0	-40	-	12						
2.5	10	0	-8	10	8	6	6	10	0	-120	-250	15						
10	18	0	-8	10	8	6	6	10	0	-120	-250	20						
18	30	0	-10	13	10	8	8	13	0	-120	-250	20						
30	50	0	-12	15	12	9	9	15	0	-120	-250	20						
50	80	0	-15	19	19	11	11	20	0	-150	-380	25						
80	120	0	-20	25	25	15	15	25	0	-200	-380	25						
120	180	0	-25	31	31	19	19	30	0	-250	-500	30						
180	250	0	-30	38	38	23	23	40	0	-300	-500	30						
250	315	0	-35	44	44	26	26	50	0	-350	-500	35						
315	400	0	-40	50	50	30	30	60	0	-400	-630	40						
400	500	0	-45	56	56	34	34	65	0	-450	-	50						
500	630	0	-50	63	63	38	38	70	0	-500	-	60						
630	800	0	-75	-	-	-	-	80	0	-750	-	70						
800	1000	0	-100	-	-	-	-	90	0	-1000	-	80						
1000	1250	0	-125	-	-	-	-	100	0	-1250	-	100						
1250	1600	0	-160	-	-	-	-	120	0	-1600	-	120						
1600	2000	0	-200	-	-	-	-	140	0	-2000	-	140						

[Note]: 1) 0.6mm is included.

2) The values are not given for bearing diameter series 7 and 8

3) Suitable for the inner ring of a single bearing in matched pair or combined arrangements.

Table 4: Tolerance of Class P0 outer ring

D mm	$\Delta D_{mp}$	V <sub>Dp</sub> <sup>2)</sup>				V <sub>Dmp</sub> <sup>4)</sup>	Kea	$\Delta Cs$		V <sub>Cs</sub>							
		Open bearing		Capped bearing				$\Delta C_{1s}^{5)}$									
		9	0, 1	2, 3, 4	2, 3, 4			V <sub>C1s</sub> <sup>5)</sup>									
Over	To	High	Low	max	max	High	Low	High	Low	max							
2.5 <sup>1)</sup>	6	0	-8	10	8	6	6	10	8	6	10	6	15				
6	18	0	-8	10	8	6	6	10	8	6	10	6	15				
18	30	0	-9	12	9	7	7	12	9	7	12	7	15				
30	50	0	-11	14	11	8	8	16	11	8	16	8	20				
50	80	0	-13	16	13	10	10	20	13	10	20	10	25				
80	120	0	-15	19	19	11	11	26	19	11	26	11	35				
120	150	0	-18	23	23	14	14	30	23	14	30	14	40				
150	180	0	-25	31	31	19	19	38	31	19	38	19	45				
180	250	0	-30	38	38	23	23	44	38	23	44	23	50				
250	315	0	-35	44	44	26	26	44	44	26	44	26	60				
315	400	0	-40	50	50	30	30	40	50	30	40	30	70				
400	500	0	-45	56	56	34	34	45	56	34	45	34	80				
500	630	0	-50	63	63	38	38	50	63	38	50	38	100				
630	800	0	-75	-	-	-	-	75	94	94	55	55	120				
800	1000	0	-100	-	-	-	-	100	125	125	75	75	140				
1000	1250	0	-125	-	-	-	-	125	-	-	-	-	160				
1250	1600	0	-160	-	-	-	-	160	-	-	-	-	190				
1600	2000	0	-200	-	-	-	-	200	-	-	-	-	220				
2000	2500	0	-250	-	-	-	-	250	-	-	-	-	250				

[Note]: 1) 2.5mm is included.

2) The values are not given for bearing diameter series 7 and 8

3) The values are not given for bearing diameter series of 9,0,1

4) Suitable before mounting and after dismounting the inner or outer snap ring.

5) Only applicable for deep groove bearings.

Tolerance of P6 (Table 5, Table 6)

Table 5: Tolerance of Class P6 inner ring

d mm	$\Delta d_{mp}$	V <sub>dp</sub> <sup>2)</sup>				V <sub>dmp</sub>	Kia	$\Delta_{Bs}$			V <sub>Bs</sub>	$\mu m$					
		Diameter series						All	Normal	Revision <sup>3)</sup>		$\mu m$					
		9	0, 1	2 3	4												
Over	To	High	Low	max		max	max	High	Low								
0.6 <sup>1)</sup>	2.5	0	-7	7	9	5	5	5	0	-40	-	12					
2.5	10	0	-7	7	9	5	5	6	0	-120	-250	15					
10	18	0	-7	7	9	5	5	7	0	-120	-250	20					
18	30	0	-8	8	10	6	6	8	0	-120	-250	20					
30	50	0	-10	10	13	8	8	10	0	-120	-250	20					
50	80	0	-12	15	15	9	9	10	0	-150	-380	25					
80	120	0	-15	19	19	11	11	13	0	-200	-380	25					
120	180	0	-18	23	23	14	14	18	0	-250	-500	30					
180	250	0	-22	28	28	17	17	20	0	-300	-500	30					
250	315	0	-25	31	31	19	19	25	0	-350	-500	35					
315	400	0	-30	38	38	23	23	30	0	-400	-630	40					
400	500	0	-35	44	44	26	26	35	0	-450	-	45					
500	630		-40	50	50	30	30	40	0	-500	-	50					

[Note]: 1) 0.6mm is included.

2) The values are not given for bearing diameter series 7 and 8.

3) Suitable for the inner ring of a single bearing in matched pair or combined arrangement.

Table 6: Tolerance of Class P6 outer ring

D mm	$\Delta D_{mp}$	V <sub>Dp</sub> <sup>2)4)</sup>				V <sub>Dmp</sub> <sup>4)</sup>	Kea	$\Delta_{Cs}$			V <sub>Cs</sub>	$\mu m$					
		Open bearing						9	0, 1	2, 3, 4		Over	To	High	Low		
2.5 <sup>1)</sup>	6	0	-7	9	7	5	9	5	8								
6	18	0	-7	9	7	5	9	5	8								
18	30	0	-8	10	8	6	10	6	9								
30	50	0	-9	11	9	7	13	7	10								
50	80	0	-11	14	11	8	16	8	13								
80	120	0	-13	16	16	10	20	10	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	75								

[Note]: 1) 2.5mm is included.

2) The values are not given for bearing diameter series 7 and 8.

3) The values are not given for bearing diameter series of 9,0, and 1.

4) Suitable before mounting and after dismounting the inner or outer snap ring.

5) Only applicable for deep groove bearings.

Tolerance of P5 (Table 7, Table 8)

Table 7: Tolerance of Class P5 inner ring

d mm	$\Delta D_{mp}$	V <sub>Dp</sub> <sup>2)</sup>		V <sub>Dmp</sub>	K <sub>ia</sub>	S <sub>d</sub>	S <sub>ia</sub> <sup>3)</sup>	$\Delta_{Bs}$			V <sub>Bs</sub>					
		Diameter series						$\Delta_{Bs}$								
		9	0,1,2,3,4					All	Normal	Revision <sup>4)</sup>						
Over	To	High	Low	max	max	max	max	max	High	Low						
0.6 <sup>1)</sup>	2.5	0	-5	5	4	3	4	7	7	0	-40	-250	5			
2.5	10	0	-5	5	4	3	4	7	7	0	-40	-250	5			
10	18	0	-5	5	4	3	4	7	7	0	-80	-250	5			
18	30	0	-6	6	5	3	4	8	8	0	-120	-250	5			
30	50	0	-8	8	6	4	5	8	8	0	-120	-250	5			
50	80	0	-9	9	7	5	5	8	8	0	-150	-250	6			
80	120	0	-10	10	8	5	6	9	9	0	-200	-380	7			
120	180	0	-13	13	10	7	8	10	10	0	-250	-380	8			
180	250	0	-15	15	12	8	10	11	13	0	-300	-500	10			
250	315	0	-18	18	14	9	13	13	15	0	-350	-500	13			
315	400	0	-23	23	18	12	15	15	20	0	-400	-630	15			

[Note]: 1) 0.6mm is included.

2) The values are not given for bearing diameter series 7 and 8

3) Only suitable for deep groove bearings

4) Suitable for the inner ring of a single bearing in matched pair or combined arrangement.

Table 8: Tolerance of Class P5 outer ring

D mm	$\Delta D_{mp}$	V <sub>Dp</sub> <sup>2)3)</sup>		V <sub>Dmp</sub>	K <sub>ea</sub>	S <sub>d</sub> <sup>4)</sup>	S <sub>ea</sub> <sup>4)5)</sup>	S <sub>eal</sub> <sup>4)5)</sup>	$\Delta_{Cs}$		V <sub>Cs</sub>						
		Diameter series							$\Delta_{Cs}$								
		9	0,1,2,3,4						All	$\Delta_{C1s}$ <sup>5)</sup>							
Over	To	High	Low	max	max	max	max	max	max	max	max						
2.5 <sup>1)</sup>	6	0	-5	5	4	3	5	8	8	11	5						
6	18	0	-5	5	4	3	5	8	8	11	5						
18	30	0	-6	6	5	3	6	8	8	11	Same as the						
30	50	0	-7	7	5	4	7	8	8	11	$\Delta_{Bs}$ of the						
50	80	0	-9	9	7	5	8	8	10	14	inner ring of						
80	120	0	-10	10	8	5	10	9	11	16	the same						
120	150	0	-11	11	8	6	11	10	13	18	bearing I.D.						
150	180	0	-13	13	10	7	13	10	14	20	8						
180	250	0	-15	15	11	8	15	11	15	21	10						
250	315	0	-18	18	14	9	18	13	18	25	11						
315	400	0	-20	20	15	10	20	13	20	28	13						
400	500	0	-23	23	17	12	23	15	23	33	15						
500	630	0	-28	28	21	14	25	18	25	35	18						
630	800	0	-35	35	26	18	30	20	30	42	20						

[Note]: 1) 2.5mm is included.

2) The values are not given for bearing diameter series 7 and 8

3) The values are not given for closed bearings

4) No suitable for bearings with flanged outer ring

5) Only applicable for deep groove bearings

Tolerance of P4 (Table 9, Table 10)

Table 9: Tolerance of Class P4 inner ring

d mm		$\Delta d_{mp}$		$\Delta ds^{(2)}$		V <sub>dp</sub> <sup>(2)</sup>		V <sub>dmp</sub>	K <sub>ia</sub>	S <sub>d</sub>	S <sub>ia</sub>	V <sub>Bs</sub>			V <sub>Bs</sub>	$\mu m$					
						Diameter series						All	Normal	Revision <sup>(3)</sup>							
9	0,1,2,3,4																				
Over	To	High	Low	High	Low	max		max	max	max	max	High	Low								
0.6 <sup>(1)</sup>	2.5	0	-4	0	-4	4	3	2	2.5	3	3	0	-40	-250	2.5						
2.5	10	0	-4	0	-4	4	3	2	2.5	3	3	0	-40	-250	2.5						
10	18	0	-4	0	-4	4	3	2	2.5	3	3	0	-80	-250	2.5						
18	30	0	-5	0	-5	5	4	2.5	3	4	4	0	-120	-250	2.5						
30	50	0	-6	0	-6	6	5	3	4	4	4	0	-120	-250	3						
50	80	0	-7	0	-7	7	5	3.5	4	5	5	0	-150	-250	4						
80	120	0	-8	0	-8	8	6	4	5	5	5	0	-200	-380	4						
120	180	0	-10	0	-10	10	8	5	6	6	7	0	-250	-380	5						
180	250	0	-12	0	-12	12	9	6	8	7	8	0	-300	-500	6						

[Note]: 1) 0.6mm is included.

2) Only suitable for diameter series of P0, P1, P2, P3 and P4

3) The values are not given for bearing diameter series 7 and 8

4) Only suitable for deep groove bearings

5) Suitable for the inner ring of a single bearing in matched pair or combined arrangement.

Table 10: Tolerance of Class P4 outer ring

d mm		$\Delta d_{mp}$		$\Delta ds^{(2)}$		V <sub>dp</sub> <sup>(3)4)</sup>		V <sub>D<sub>mp</sub></sub>	K <sub>ea</sub>	S <sub>D<sub>6)</sub></sub> <sup>(5)</sup> S <sub>D<sub>1</sub></sub> <sup>(6)</sup>	S <sub>ea<sub>6)</sub></sub> <sup>(5)</sup> S <sub>ea<sub>1</sub></sub> <sup>(6)</sup>	Seal <sup>(6)</sup>	$\mu m$			
				Diameter series		All	Normal									
9	0,1,2,3,4															
Over	To	High	Low	High	Low	max		max	max	max	max	max	max	max	max	max
2.5 <sup>(1)</sup>	6	0	-4	0	-4	4	3	2	3	4	5	7				2.5
6	18	0	-4	0	-4	4	3	2	3	4	5	7				2.5
18	30	0	-5	0	-5	5	4	2.5	4	4	5	7	Same as the $\triangle Bs$ of the inner ring of the same bearing I.D.		2.5	
30	50	0	-6	0	-6	6	5	3	5	4	5	7				3
50	80	0	-7	0	-7	7	5	3.5	5	4	5	7				4
80	120	0	-8	0	-8	8	6	4	6	5	6	8				5
120	150	0	-9	0	-9	9	7	5	7	5	7	10				5
150	180	0	-10	0	-10	10	8	5	8	5	8	11				5
180	250	0	-11	0	-11	11	8	6	10	7	10	14				7
250	315	0	-13			-13	13	10	7	11	8	10	14			7
315	400	0	-15			-15	15	11	8	13	10	13	18			8

[Note]: 1) 2.5mm is included

2) Only suitable for diameter series of P0, P1, P2, P3 and P4

3) The values are not given for bearing diameter series 7 and 8

4) The values are not given for closed bearings

5) No suitable for bearings with flanged outer ring

6) Only applicable for deep groove bearings

## Tolerance of P2 (Table 11, Table 12)

Table 11: Tolerance of Class P2 inner ring

d mm		$\Delta d_{mp}$		$\Delta ds$		$V_{dp}^{(2)}$	$V_{dmp}$	$K_{ia}$	$S_d$	$S_{ia}^{(3)}$	$\Delta Bs$			$V_{Bs}$	$\mu m$
Over	To	High	Low	High	Low	max	max	max	max	max	All	Normal	Revision	max	
0.6 <sup>1)</sup>	2.5	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-40	-250	1.5	
2.5	10	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-40	-250	1.5	
10	18	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-80	-250	1.5	
18	30	0	-2.5	0	-2.5	2.5	1.5	2.5	1.5	2.5	0	-120	-250	1.5	
30	50	0	-2.5	0	-2.5	2.5	1.5	2.5	1.5	2.5	0	-120	-250	1.5	
50	80	0	-4	0	-4	4	2	2.5	1.5	2.5	0	-150	-250	1.5	
80	120	0	-5	0	-5	5	2.5	2.5	2.5	2.5	0	-200	-380	2.5	
120	150	0	-7	0	-7	7	3.5	2.5	2.5	2.5	0	-250	-380	2.5	
150	180	0	-7	0	-7	7	3.5	5	4	5	0	-250	-380	4	
180	250	0	-8	0	-8	8	4	5	5	5	0	-300	-500	5	

[Note]: 1) 0.6mm is included in this dimension range.

2) The values are not given for bearing diameter series 7, 8 and 9.

3) Only suitable for deep groove bearings

4) Refers to inner ring width deviation of single bearings in matched pair of combined arrangement.

Table 12: Tolerance of Class P2 outer ring

D mm		$\Delta D_{mp}$		$\Delta Ds^{(2)}$		$V_{dp}^{(2)}$	$V_{Dmp}$	$K_{ea}$	$S_d^{(3)}$ $S_{di}^{(4)}$	$S_{ea}^{(3)(4)}$	$S_{el}^{(4)}$	$\Delta Cs$ $\Delta C_{1s}^{(4)}$	$V_{Cs}$ $V_{C_{1s}^{(4)}}$	$\mu m$	
Over	To	High	Low	High	Low	max	max	max	max	max	High	Low	max		
2.5 <sup>1)</sup>	6	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	3			1.5	
6	18	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	3			1.5	
18	30	0	-4	0	-4	4	2	2.5	1.5	2.5	4			1.5	
30	50	0	-4	0	-4	4	2	2.5	1.5	2.5	4	Same as the $\Delta Bs$		1.5	
50	80	0	-4	0	-4	4	2	4	1.5	4	6			1.5	
80	120	0	-5	0	-5	5	2.5	5	2.5	5	7	of the		2.5	
120	150	0	-5	0	-5	5	2.5	5	2.5	5	7	same		2.5	
150	180	0	-7	0	-7	7	3.5	5	2.5	5	7	bearing		2.5	
180	250	0	-8	0	-8	8	4	7	4	7	10	I.D.		4	
250	315	0	-8	0	-8	8	4	7	5	7	10			5	
315	400	0	-10	0	-10	10	5	8	8	11				7	

[Note]: 1) 2.5mm is included.

2) Only suitable for open and closed bearings with diameter series of P0, P1, P2, P3 and P4

3) Not suitable for bearings with flanged outer ring

4) Only applicable for deep groove bearings

## Precision of metric tapered roller bearings

Tolerance of P0 (Table 13, Table 14 and Table 15)

Table 13: Diameter tolerance and radial runout of inner ring

d mm		$\Delta d_{mp}$		$V_{dp}$	$V_{dmp}$	$K_{ia}$	$\mu m$
Over	To	High	Low	max	max	max	
10	18	0	-12	12	9	15	
18	30	0	-12	12	9	18	
30	50	0	-12	12	9	20	
50	80	0	-15	15	11	25	
80	120	0	-20	20	15	30	
120	180	0	-25	25	19	35	
180	250	0	-30	30	23	50	
250	315	0	-35	35	26	60	
315	400	0	-40	40	30	70	

Table 14: Diameter tolerance and radial runout of outer ring

D mm		$\Delta D_{mp}$		$V_{Dp}$	$V_{Dmp}$	$K_{ea}$	$\mu m$
Over	To	High	Low	max	max	max	
18	30	0	-12	12	9	18	
30	50	0	-14	14	11	20	
50	80	0	-16	16	12	25	
80	120	0	-18	18	14	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	50	38	100	

Table 15: Width Inner ring, outer ring, single-row bearing and its assembly  $\mu\text{m}$

d mm		$\triangle_{Bs}$		$\triangle_{Cs}$		$\triangle_{Ts}$		$\triangle_{T1s}$		$\triangle_{T2s}$	
Over	To	High	Low	High	Low	High	Low	High	Low	High	Low
10	18	0	-120	0	-120	+200	0	+100	0	+100	0
18	30	0	-120	0	-120	+200	0	+100	0	+100	0
30	50	0	-120	0	-120	+200	0	+100	0	+100	0
50	80	0	-150	0	-150	+200	0	+100	0	+100	0
80	120	0	-200	0	-200	+200	-200	+100	-100	+100	-100
120	180	0	-250	0	-250	+350	-250	+150	-150	+200	-100
180	250	0	-300	0	-300	+350	-250	+150	-150	+200	-100
250	315	0	-350	0	-350	+350	-250	+150	-150	+200	-100
315	400	0	-400	0	-400	+400	-400	+200	-200	+200	-200

Tolerance of P5 (Table 17, Table 18)

Table 17: Inner ring and single row bearing width  $\mu\text{m}$

d mm		$\triangle_{dmp}$		Vdp	Vdmp	Kia	Sd	$\triangle_{Bs}$		$\triangle_{Ts}$	
Over	To	High	Low	max	max	max	max	High	Low	High	Low
10	18	0	-7	5	5	5	7	0	-200	+200	-200
18	30	0	-8	6	5	5	8	0	-200	+200	-200
30	50	0	-10	8	5	6	8	0	-240	+200	-200
50	80	0	-12	9	6	7	8	0	-300	+200	-200
80	120	0	-15	11	8	8	9	0	-400	+200	-200
120	180	0	-18	14	9	11	10	0	-500	+350	-250
180	250	0	-22	17	11	13	11	0	-600	+350	-250

Tolerance of P6X

The tolerance of diameter and radial runout of inner ring and outer ring with in this tolerance class are the same with those given in Class P0. Width tolerance values listed in Table 13 and Table 14..

Table 16: Width Inner ring, outer ring, single-row bearing and its assembly  $\mu\text{m}$

d mm		$\triangle_{Bs}$		$\triangle_{Cs}$		$\triangle_{Ts}$		$\triangle_{T1s}$		$\triangle_{T2s}$	
Over	To	High	Low	High	Low	High	Low	High	Low	High	Low
10	18	0	-50	0	-100	+100	0	+50	0	+50	0
18	30	0	-50	0	-100	+100	0	+50	0	+50	0
30	50	0	-50	0	-100	+100	0	+50	0	+50	0
50	80	0	-50	0	-100	+100	0	+50	0	+50	0
80	120	0	-50	0	-100	+100	0	+50	0	+50	0
120	180	0	-50	0	-100	+100	0	+50	0	+50	0
180	250	0	-50	0	-100	+150	0	+50	0	+100	0
250	315	0	-50	0	-100	+150	0	+50	0	+100	0
315	400	0	-50	0	-100	+200	0	+100	0	+100	0

Table 18: Outer ring  $\mu\text{m}$

D mm		$\triangle_{Dmp}$		Vdp	Vdmp	Kea	Sd <sup>1)</sup>	Sd1	$\triangle_{Cs}$	
Over	To	High	Low	max	max	max	max	max	High	Low
18	30	0	-8	6	5	6	8	8	Same as the $\triangle_{Bs}$ of the same bearing I.D.	
30	50	0	-9	7	5	7	8	8		
50	80	0	-11	8	6	8	8	8		
80	120	0	-13	10	7	10	9	9		
120	150	0	-15	11	8	11	10	10		
150	180	0	-18	14	9	13	10	10		
180	250	0	-20	15	10	15	11	11		
250	315	0	-25	19	13	18	13	13		
315	400	0	-28	22	14	20	13	13		

1) Not suitable for bearings with flanged outer ring

Tolerance of P4 (Table 19, Table 20)

Table 19: Inner ring and single row bearing width

$\mu\text{ m}$

d mm		$\triangle d_{mp}$		$\triangle ds$		V <sub>Dp</sub>	V <sub>Dmp</sub>	K <sub>ia</sub>	S <sub>d</sub>	S <sub>ia</sub>	$\triangle Bs$		$\triangle Ts$	
Over	To	High	Low	High	Low	max	max	max	max	max	High	Low	High	Low
10	18	0	-5	0	-5	4	4	3	3	3	0	-200	+200	-200
18	30	0	-6	0	-6	5	4	3	4	4	0	-200	+200	-200
30	50	0	-8	0	-8	6	5	4	4	4	0	-240	+200	-200
50	80	0	-9	0	-9	7	5	4	5	4	0	-300	+200	-200
80	120	0	-10	0	-10	8	5	5	5	5	0	-400	+200	-200
120	180	0	-13	0	-13	10	7	6	6	7	0	-500	+350	-250
180	250	0	-15	0	-15	11	8	8	7	8	0	-600	+350	-250

Table 20: Outer ring

$\mu\text{ m}$

D mm		$\triangle D_{mp}$		$\triangle ds$		V <sub>Dp</sub>	V <sub>Dmp</sub>	K <sub>ea</sub>	S <sub>D</sub> <sup>1)</sup>	S <sub>D1</sub>	Seal	Seal	$\triangle cs$	
Over	To	High	Low	High	Low	max	max	max	max	max	max	High	Low	
18	30	0	-6	0	-6	5	4	4	4	5	7	Same as the $\triangle Bs$ of the same bearing I.D.		
30	50	0	-7	0	-7	5	5	5	4	5	7	Same as the $\triangle Bs$ of the same bearing I.D.		
50	80	0	-9	0	-9	7	5	5	4	5	7	Same as the $\triangle Bs$ of the same bearing I.D.		
80	120	0	-10	0	-10	8	5	6	5	6	8	Same as the $\triangle Bs$ of the same bearing I.D.		
120	150	0	-11	0	-11	8	6	7	5	7	10	Same as the $\triangle Bs$ of the same bearing I.D.		
150	180	0	-13	0	-13	10	7	8	5	8	11	Same as the $\triangle Bs$ of the same bearing I.D.		
180	250	0	-15	0	-15	11	8	10	7	10	14	Same as the $\triangle Bs$ of the same bearing I.D.		
250	315	0	-18	0	-18	14	9	11	8	10	14	Same as the $\triangle Bs$ of the same bearing I.D.		
315	400	0	-20	0	-20	15	10	13	10	13	18	Same as the $\triangle Bs$ of the same bearing I.D.		

1) Not suitable for bearings with flanged outer ring

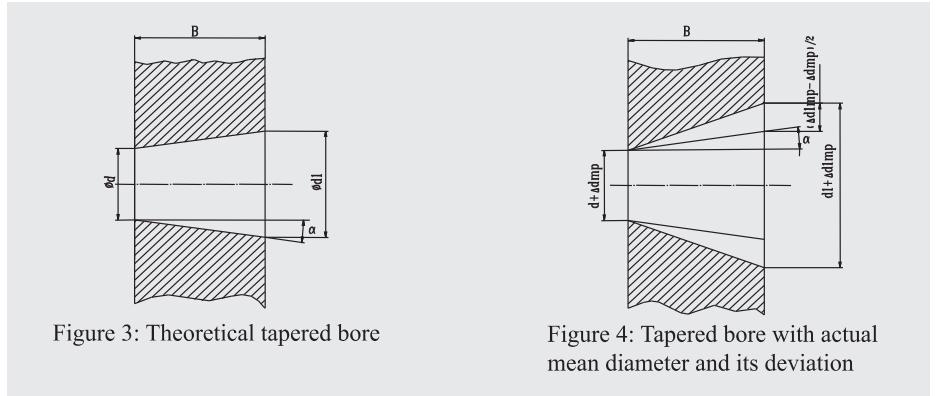
Outer ring flange of radial bearings

Table 21: Flanged outer ring tolerance

$\mu\text{ m}$

D1 mm	Over	To	$\triangle DIs$		Non-mounting flange
			Mounting flange	Non-mounting flange	
—	—	10	0	-36	+220 -36
10	10	18	0	-43	+270 -43
18	18	30	0	-52	+330 -52
30	30	50	0	-62	+390 -62
50	50	80	0	-74	+460 -74
80	80	120	0	-87	+540 -87
120	120	180	0	-100	+630 -100
180	180	250	0	-115	+720 -115
250	250	315	0	-130	+810 -130
315	315	400	0	-140	+890 -140
400	400	500	0	-155	+970 -155
500	500	630	0	-175	+1100 -175
630	630	800	0	-200	+1250 -200
800	800	1000	0	-230	+1400 -230
1000	1000	1250	0	-260	+1650 -260
1250	1250	1600	0	-310	+1950 -310
1600	1600	2000	0	-370	+2300 -370
2000	2000	2500	0	-440	+2800 -440

Tapered bore, tapered of 1:12 and 1:30 (Figure 3 and Figure 4)



Tapered1: 12:

Nominal half tapered angle  $\alpha = 2^\circ 23'$

$9.4'' = 2.38594^\circ = 0.041643$  Radian

Basic diameter of theoretical large end of tapered bore

$$d_1 = d + \frac{1}{12} B$$

Tapered1: 30:

Nominal half tapered angle

$\alpha = 0^\circ 57' 17.4'' = 0.95484^\circ = 0.01667$  Radian

$$d_1 = d + \frac{1}{30} B$$

Basic diameter of theoretical large end of tapered bore

The tolerance of tapered bore includes:

— Mean diameter tolerance indicated by limit value of actual mean diameter deviation  $\Delta d_{mp}$  of theoretical small end of tapered bore.

— Tapered tolerance indicated by limit value of the difference of actual mean diameter deviation of two ends of tapered bore.

— Diameter variation tolerance indicated by maximum value of inner diameter variation  $V_{dp}$  on any radial plane of tapered bore.

Tolerance of P0 (Table 22, Table 23)

Table 22: Tapered bore (1:12)

d mm		$\Delta d_{mp}$		$\Delta d_{imp} - \Delta d_{mp}$		$V_{dp}$ <sup>1)2)</sup>	$\mu m$
Over	To	High	Low	High	Low	max	
10	10	+22	0	+15	0	9	
10	18	+27	0	+18	0	11	
18	30	+33	0	+21	0	13	
30	50	+39	0	+25	0	16	
50	80	+46	0	+30	0	19	
80	120	+54	0	+35	0	22	
120	180	+63	0	+40	0	40	
180	250	+72	0	+46	0	46	
250	315	+81	0	+52	0	52	
315	400	+89	0	+57	0	57	
400	500	+97	0	+63	0	63	
500	630	+110	0	+70	0	70	
630	800	+125	0	+80	0	—	
800	1000	+140	0	+90	0	—	
1000	1250	+165	0	+105	0	—	
1250	1600	+195	0	+125	0	—	

[Note]: 1). Suitable for any single radial plane of bore

2). Not suitable for diameter series 7 and 8

Table 23: Tapered bore (1:30)

d mm		$\Delta d_{mp}$		$\Delta d_{imp} - \Delta d_{mp}$		$V_{dp}$ <sup>1)2)</sup>	$\mu m$
Over	To	High	Low	High	Low	max	
50	80	+15	0	+30	0	19	
80	120	+20	0	+35	0	22	
120	180	+25	0	+40	0	40	
180	250	+30	0	+46	0	46	
250	315	+35	0	+52	0	52	
315	400	+40	0	+57	0	57	
400	500	+45	0	+63	0	63	
500	630	+50	0	+70	0	70	

[Note]: 1). Suitable for any single radial plane of bore

2). Not suitable for diameter series 7 and 8

Tolerance values of inch tapered roller bearings are listed in from Table 24 to Table 26

Table 24: I.D. tolerance of bearing cone

d mm		$\Delta d_s$								$\mu m$	
Over	To	High	Low	High	Low	High	Low	High	Low	High	Low
—	76.200	+13	0	+13	0	+13	0	+8	0		
76.200	101.600	+25	0	+13	0	+13	0	+8	0		
101.600	266.700	+25	0	+13	0	+13	0	+8	0		
266.700	304.800	+25	0	+13	0	+13	0	—	—		
304.800	609.600	+51	0	+25	0	+25	0	—	—		

Table 25: Bearing O.D. tolerance and radial runout of cone and cup

D mm		$\Delta d_s$				Kia, Kea, Sia, Sea,				$\mu m$			
		CL4, CL2		CL3, CL0		CL00		CL4	CL2	CL3	CL2	CL00	
Over	To	High	Low	High	Low	High	Low	max	max	max	max	max	
—	266.700	+25	0	+13	0	+8	0	51	38	8	4	2	
266.700	304.800	+25	0	+13	0	—	—	51	38	8	4	—	
304.800	609.600	+51	0	+25	0	—	—	51	38	18	—	—	

Table 26: Bearing's width tolerance

d mm		$\Delta T_s$						$\mu\text{m}$
		CL4, CL2		CL3, CL0		CL00		
Over	To	High	Low	High	Low	High	Low	
—	101.600	+203	0	+203	-203	+203	-203	
101.60	266.700	+356	-254	+203	-203	+203	-203	
266.700	304.800	+356	-254	+203	-203	+203	-203	
304.800	609.600	+381	-381	+203	-203	+203	-203	

## Tolerance of thrust bearings

### Symbols

d: nominal bore diameter of single direction bearing shaft washer

d<sub>2</sub>: nominal bore diameter of double direction bearing shaft washer

$\Delta_{dmp}$ : Single radial plane mean bore diameter deviation of single direction bearing shaft washer

$\Delta_{d2mp}$ : Single radial plane mean bore diameter deviation of double direction bearing shaft washer

V<sub>dP</sub>: Single radial plane mean bore diameter variation of single direction bearing shaft washer

V<sub>d2P</sub>: Single radial plane mean bore diameter variation of double direction bearing shaft washer

D: nominal outer diameter of housing washer

$\Delta_{Dmp}$ : Single radial plane mean outer diameter deviation of housing washer

$\Delta_{Dp}$ : Single radial plane mean outer diameter variation of housing washer

S<sub>i</sub>: Variation of raceway thickness of shaft washer or central shaft washer

Remarks: only suitable for thrust ball bearing and thrust cylindrical roller bearing with contact angle of 90°

S<sub>e</sub>: Variation of raceway thickness of housing washer

Remarks: only suitable for thrust ball bearing and thrust cylindrical roller bearing with contact angle of 90°

T: Nominal height of single direction bearing

T<sub>1</sub>: Nominal height of double direction bearing

$\Delta_{Ts}$ : Actual height deviation of single direction bearing

$\Delta_{T1S}$ : Actual height deviation of double direction bearing

Tolerances of thrust bearings are listed in from **Table 27** to **Table 34**

Table 27: Tolerance P0: Shaft washer and bearing height

d and d <sub>2</sub> /mm		$\Delta d_{mp}, \Delta d_{2mp}$		V <sub>dP</sub>	V <sub>d2P</sub>	S <sub>i</sub>	$\Delta T_s$		$\Delta T_{1S}$	
Over	To	High	Low	max	max	High	Low	High	Low	
—	18	0	-8	6	10	+20	-250	+150	-400	
18	30	0	-10	8	10	+20	-250	+150	-400	
30	50	0	-12	9	10	+20	-250	+150	-400	
50	80	0	-15	11	10	+20	-300	+150	-500	
80	120	0	-20	15	15	+25	-300	+200	-500	
120	180	0	-25	19	15	+25	-400	+200	-600	
180	250	0	-30	23	20	+30	-400	+250	-600	
250	315	0	-35	26	25	+40	-400			
315	400	0	-40	30	30	+40	-500			
400	500	0	-45	34	30	+50	-500			
500	630	0	-50	38	35	+60	-600			
630	800	0	-75	55	40	+70	-750			
800	1000	0	-100	75	45	+80	-1000			
1000	1250	0	-125	95	50	+100	-1400			
1250	1600	0	-160	120	60	+120	-1600			
1600	2000	0	-200	150	75	+140	-1900			
2000	2500	0	-250	190	90	+160	-2300			

[Note]: For double direction bearings, the tolerances are only suitable for bearings whose  $d_2 \leq 190\text{mm}$ .

Table 28: Tolerance P0: housing washer

μ m

D/mm		Δ D <sub>mp</sub>		V <sub>Dp</sub>	S <sub>e</sub>
Over	To	High	Low	max	max
10	18	0	-11	8	
18	30	0	-13	10	
30	50	0	-16	12	
50	80	0	-19	14	
80	120	0	-22	17	
120	180	0	-25	19	
180	250	0	-30	23	Same as
250	315	0	-35	26	shaft
315	400	0	-40	30	washer's
400	500	0	-45	34	Si value
500	630	0	-50	38	of the same
630	800	0	-75	55	bearing
800	1000	0	-100	75	
1000	1250	0	-125	95	
1250	1600	0	-160	120	
1600	2000	0	-200	150	
2000	2500	0	-250	190	
2500	2850	0	-300	225	

[Note]: For double direction bearings, the tolerances are only suitable for bearings whose D≤360mm.

Table 29: Tolerance P6: Shaft washer and bearing height

μ m

d and d <sub>2</sub> /mm		Δ d <sub>mp</sub> , Δ d <sub>2mp</sub>		V <sub>dP</sub>	V <sub>d2P</sub>	Si	Δ Ts		Δ T <sub>IS</sub>	
Over	To	High	Low	max	max	High	Low	High	Low	
—	18	0	-8	6	5	+20	-250	+150	-400	
18	30	0	-10	8	5	+20	-250	+150	-400	
30	50	0	-12	9	6	+20	-250	+150	-400	
50	80	0	-15	11	7	+20	-300	+150	-500	
80	120	0	-20	15	8	+25	-300	+200	-500	
120	180	0	-25	19	9	+25	-400	+200	-600	
180	250	0	-30	23	10	+30	-400	+250	-600	
250	315	0	-35	26	13	+40	-400			
315	400	0	-40	30	15	+40	-500			
400	500	0	-45	34	18	+50	-500			
500	630	0	-50	38	21	+60	-600			
630	800	0	-75	55	25	+70	-750			
800	1000	0	-100	75	30	+80	-1000			
1000	1250	0	-125	95	35	+100	-1400			
1250	1600	0	-160	120	40	+120	-1600			
1600	2000	0	-200	150	45	+140	-1900			
2000	2500	0	-250	190	50	+160	-2300			

[Note]: For double direction bearings, the tolerances are only suitable for bearings whose D≤190mm.

Table 30: Tolerance P6: housing washer

$\mu\text{m}$

D/mm		$\Delta D_{mp}$		V <sub>Dp</sub>	S <sub>e</sub>
Over	To	High	Low	max	max
10	18	0	-11	8	
18	30	0	-13	10	
30	50	0	-16	12	
50	80	0	-19	14	
80	120	0	-22	17	The same as Si value of shaft
120	180	0	-25	19	
180	250	0	-30	23	washer of
250	315	0	-35	26	the same
315	400	0	-40	30	bearing
400	500	0	-45	34	
500	630	0	-50	38	
630	800	0	-75	55	
800	1000	0	-100	75	
1000	1250	0	-125	95	
1250	1600	0	-160	120	
1600	2000	0	-200	150	
2000	2500	0	-250	190	
2500	2850	0	-300	225	

[Note]: For double direction bearings, the tolerances are only suitable for bearings whose  $D \leq 360\text{mm}$ .

Table 31: Tolerance P5: Shaft washer and bearing height

$\mu\text{m}$

d and d <sub>2</sub> /mm		$\Delta d_{mp}, \Delta d_{2mp}$		V <sub>dP</sub>	V <sub>d2p</sub>	Si	$\Delta Ts$		$\Delta T_{IS}$	
Over	To	High	Low	max	max	High	Low	High	Low	
—	18	0	-8	6	3	+20	-250	+150	-400	
18	30	0	-10	8	3	+20	-250	+150	-400	
30	50	0	-12	9	3	+20	-250	+150	-400	
50	80	0	-15	11	4	+20	-300	+150	-500	
80	120	0	-20	15	4	+25	-300	+200	-500	
120	180	0	-25	19	5	+25	-400	+200	-600	
180	250	0	-30	23	5	+30	-400	+250	-600	
250	315	0	-35	26	7	+40	-400			
315	400	0	-40	30	7	+40	-500			
400	500	0	-45	34	9	+50	-500			
500	630	0	-50	38	11	+60	-600			
630	800	0	-75	55	13	+70	-750			
800	1000	0	-100	75	15	+80	-1000			
1000	1250	0	-125	95	18	+100	-1400			
1250	1600	0	-160	120	25	+120	-1600			
1600	2000	0	-200	150	30	+140	-1900			
2000	2500	0	-250	190	40	+160	-2300			

[Note]: For double direction bearings, the tolerances are only suitable for bearings whose  $D \leq 190\text{mm}$ .

Table 32: Tolerance P5: housing washer

μ m

D/mm		Δ D <sub>mp</sub>		V <sub>Dp</sub>	S <sub>e</sub>
Over	To	High	Low	max	max
10	18	0	-11	8	
18	30	0	-13	10	
30	50	0	-16	12	
50	80	0	-19	14	The same as Si value of shaft washer of the same bearing
80	120	0	-22	17	
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	95	
1250	1600	0	-160	120	
1600	2000	0	-200	150	
2000	2500	0	-250	190	
2500	2850	0	-300	225	

[Note]: For double direction bearings, the tolerances are only suitable for bearings whose D≤360mm.

Table 33: Tolerance P4: Shaft washer and bearing height

μ m

d and d <sub>2</sub> /mm		Δ d <sub>mp</sub> , Δ d <sub>2mp</sub>		V <sub>dP</sub>	V <sub>d2P</sub>	Si	Δ Ts		Δ T <sub>IS</sub>	
Over	To	High	Low	max	max	High	Low	High	Low	
—	18	0	-7	5	2	+20	-250	+150	-400	
18	30	0	-8	6	2	+20	-250	+150	-400	
30	50	0	-10	8	2	+20	-250	+150	-400	
50	80	0	-12	9	3	+20	-300	+150	-500	
80	120	0	-15	11	3	+25	-300	+200	-500	
120	180	0	-18	14	4	+25	-400	+200	-600	
180	250	0	-22	17	4	+30	-400	+250	-600	
250	315	0	-25	19	5	+40	-400			
315	400	0	-30	23	5	+40	-500			
400	500	0	-35	26	6	+50	-500			
500	630	0	-40	30	7	+60	-600			
630	800	0	-50	40	8	+70	-750			

[Note]: For double direction bearings, the tolerances are only suitable for bearings whose d<sub>2</sub>≤190mm.

Table 34: Tolerance P4: housing washer

μ m

D/mm		Δ D <sub>mp</sub>		V <sub>Dp</sub>	S <sub>e</sub>
Over	To	High	Low	max	max
10	18	0	-7	5	The same as Si value of shaft washer of the same bearing
18	30	0	-8	6	
30	50	0	-9	7	
50	80	0	-11	8	
80	120	0	-13	10	
120	180	0	-15	11	
180	250	0	-20	15	
250	315	0	-25	19	
315	400	0	-28	21	
400	500	0	-33	25	
500	630	0	-38	29	
630	800	0	-45	34	
800	1000	0	-60	45	

[Note]: For double direction bearings, the tolerances are only suitable for bearings whose D≤360mm.

## Limit dimension of chamfer

(1) Radial bearings (except tapered roller bearings) Unit: mm

r (min.) or r <sub>1</sub> (min.)	Nominal bore diameter of the bearing d mm	Radial	Axial
		Over To	
0.05	—	0.1	0.2
0.08	—	0.16	0.3
0.1	—	0.2	0.4
0.15	—	0.3	0.6
0.2	—	0.5	0.8
0.3	— 40	0.6	1
	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
0.3	— 280	4	6.5
	280 —	4.5	7
0.3	— 100	3.8	6
0.3	100 280	4.5	6
	280 —	5	7
0.3	— 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
12	— —	18	24
15	— —	21	30
19	— —	25	38

(2) Metric tapered roller bearing Unit: mm

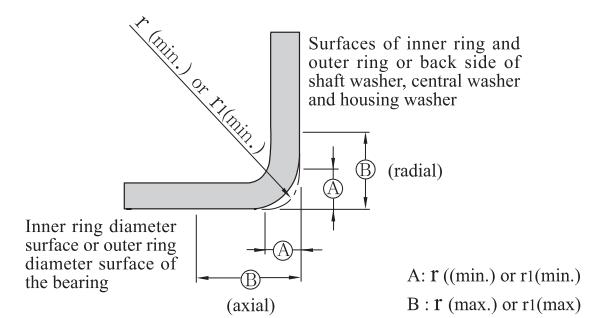
r(min.) or r <sub>1</sub> (min.)	Bearing nominal bore diameter d or outer diameter D mm	Radial	Axial
		Over To	
0.3	— 40	0.7	1.4
	40 —	0.9	1.6
0.6	— 40	1.1	1.7
	40 —	1.3	2
1	— 50	1.6	2.5
	50 —	1.9	3
1.5	— 120	2.3	3
	120 250	2.8	3.5
	250 —	3.5	4
2	— 120	2.8	4
	120 250	3.	4.5
	250 —	4	5
2.5	— 120	3.5	5
	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
	— 120	5	7
4	120 250	5.5	7.5
	250 400	6	8
5	— 180	6.5	8
	180 —	7.5	9
6	— 180	7.5	10
	180 —	9	11

(3) Thrust bearing Unit: mm

r(min.) or r <sub>1</sub> (min.)	radial and axial
	r(min.) or r <sub>1</sub> (min.)
0.05	0.1
0.08	0.16
0.1	0.2
0.15	0.3
0.2	0.5
0.3	0.8
0.6	1.5
1	2.2
1.1	2.7
1.5	3.5
2	4
2.1	4.5
3	5.5
4	6.5
5	8
6	10
7.5	12.5
9.5	15
12	18
15	21
19	25

Basic tolerance Unit: mm

Basic dimension mm	Basic tolerance class IT									
	Over To	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9
— 3	0.8	1.2	2	3	4	6	10	14	25	40
3 6	1	1.5	2.5	4	5	8	12	18	30	48
6 10	1	1.5	2.5	4	6	9	15	22	36	58
10 18	1.2	2	3	5	8	11	18	27	43	70
18 30	1.5	2.5	4	6	9	13	21	33	52	84
30 50	1.5	2.5	4	7	11	16	25	39	62	100
50 80	2	3	5	8	13	19	30	46	74	120
80 120	2.5	4	6	10	15	22	35	54	87	140
120 180	3.5	5	8	12	18	25	40	63	100	160
180 250	4.5	7	10	14	20	29	46	72	115	185
250 315	6	8	12	16	23	32	52	81	130	210
315 400	7	9	13	18	25	36	57	89	140	230
400 500	8	10	15	20	27	40	63	97	155	250
500 630	9	11	16	22	30	44	70	110	175	280
630 800	10	13	18	25	35	50	80	125	200	320
800 1000	11	15	21	29	40	56	90	140	230	360
1000 1250	13	18	24	34	46	66	105	165	260	420
1250 1600	15	21	29	40	54	78	125	195	310	500
1600 2000	18	25	35	48	65	92	150	230	370	600
2000 2500	22	30	41	57	77	110	175	280	440	700
2500 3150	26	36	50	69	93	135	210	330	540	860



## Bearing clearance

Before mounting the bearing to the shaft or the housing, fix the inner ring or the outer ring and move the other unfixed ring in the radial or axial direction, the amount of movement is called bearing clearance. According to the direction, it can be either radial clearance or the axial clearance.

The amount of clearance while the bearing is rotating (the so-called working clearance) shall have effects on the rolling fatigue life, temperature rise, noise, vibration and other functions.

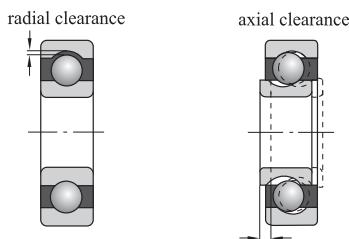


Figure 1 The clearance of the bearing

In order to get the stable value of the clearance, normally a required load is put on the bearing in order to measure the bearing clearance. Therefore, the measured value is larger than the true clearance (called the theoretical clearance), which means the amount of the elastic deformation caused by the load is increased.

But for roller bearings, this elastic deformation can be ignored since it is comparatively small. Before the mounting the internal clearance of the bearing, is expressed with theoretical clearance.

## The selection of the clearance

If the amount of expansion or contraction of the rings caused by the interference fit when mounting the bearing on the shaft or in the housing is deducted from the theoretical

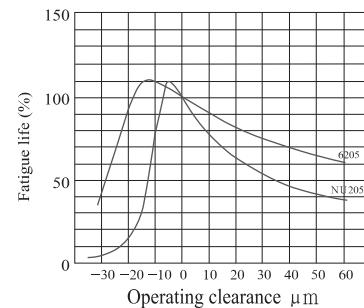
clearance, then we have the "Mounting Clearance".

Furthermore, the dimension variation caused by the temperature difference inside the bearing is added to or reduced from the mounting clearance, and then we have the so-called "effective Clearance".

When the bearing rotates while carrying a certain magnitude of load in the machine, if the elastic deformation caused by the load is added to the effective clearance, we then have the "Working Clearance".

As shown in Figure 2, when the working clearance is a slightly negative, the bearing has the longest service life. But with the negative clearance changing to be positive, the fatigue life shall decrease. Therefore, when choosing the clearance, it is preferred to choose the 0 or slightly positive working clearance.

Figure 2 The relations between the working clearance and the fatigue life.



In addition, when a higher rigidity or a lower noise is required, a further negative working clearance is preferred, and when the temperature increases inside the bearing, a bigger positive value of the working clearance will be better. In these or many other cases, concrete analyses should be made according to the application conditions.

The values of clearance of the bearings are shown in Table 1 to Table 9.

Table 1 Radial clearance of deep groove ball bearings (Cylindrical bore)

$\mu\text{m}$

Nominal inner ring diameter mm		Clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	min.	max	min.	max	min.	max	min.	max	min.	max
2.5	6	0	7	2	13	8	23	—	—	—	—
6	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73
50	65	1	15	8	28	23	43	38	61	55	90
65	80	1	15	10	30	25	51	46	71	65	105
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

Table 2 Radial clearance of self-aligning ball bearings

(1) Radial clearance of self-aligning ball bearings with cylindrical bore  $\mu\text{m}$

Nominal inner ring diameter d mm		Clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	min.	max	min.	max	min.	max	min.	max	min.	max
2.5	6	1	8	5	15	10	20	15	25	21	33
6	10	2	9	6	17	12	25	19	33	27	42
10	14	2	10	6	19	13	26	21	35	30	48
14	18	3	12	8	21	15	28	23	37	32	50
18	24	4	14	10	23	17	30	25	39	34	52
24	30	5	16	11	24	19	35	29	46	40	58
30	40	6	18	13	29	23	40	34	53	46	66
40	50	6	19	14	31	25	44	37	57	50	71
50	65	7	21	16	36	30	50	45	69	62	88
65	80	8	24	18	40	35	60	54	83	76	108
80	100	9	27	22	48	42	70	64	96	89	124
100	120	10	31	25	56	50	83	75	114	105	145
120	140	10	38	30	68	60	100	90	135	125	175
140	160	15	44	35	80	70	120	110	161	150	210

(2) Radial clearance of self-aligning ball bearings with tapered bore  $\mu\text{m}$

Nominal inner ring diameter d mm		Clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	min.	max	min.	max	min.	max	min.	max	min.	max
18	24	7	17	13	26	20	33	28	42	37	55
24	30	9	20	15	28	23	39	33	50	44	62
30	40	12	24	19	35	29	46	40	59	52	72
40	50	14	27	22	39	33	52	45	65	58	79
50	65	18	32	27	47	41	61	56	80	73	99
65	80	23	39	35	57	50	75	69	98	91	123
80	100	29	47	42	68	62	90	84	116	109	144
100	120	35	56	50	81	75	108	100	139	130	170
120	140	40	68	60	98	90	130	120	165	155	205
140	160	45	74	65	110	100	150	140	191	180	240

Table 3: Radial clearance of cylindrical roller bearings

(1) Radial clearance of cylindrical roller bearings with cylindrical bore  $\mu\text{m}$

Nominal inner ring diameter d mm		Clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	min.	max	min.	max	min.	max	min.	max	min.	max
	10	0	25	20	45	35	60	50	75	—	—
	10	24	0	25	20	45	35	60	50	75	65
	24	30	0	25	20	45	35	60	50	75	95
	30	40	5	30	25	50	45	70	60	85	80
	40	50	5	35	30	60	50	80	70	100	95
	50	65	10	40	40	70	60	90	80	110	110
	65	80	10	45	40	75	65	100	90	125	130
	80	100	15	50	50	85	75	110	105	140	155
	100	120	15	55	50	90	85	125	125	165	180
	120	140	15	60	60	105	100	145	145	190	200
	140	160	20	70	70	120	115	165	165	215	225
	160	180	25	75	75	125	120	170	170	220	250
	180	200	35	90	90	145	140	195	195	250	275
	200	225	45	105	105	165	160	220	220	280	305
	225	250	45	110	110	175	170	235	235	300	330
	250	280	55	125	125	195	190	260	260	330	370
	280	315	55	130	130	205	200	275	275	350	410
	315	355	65	145	145	225	225	305	305	385	455
	355	400	100	190	190	280	280	370	370	460	510
	400	450	110	210	210	310	310	410	410	510	565
	450	500	110	220	220	330	330	440	440	550	625
											735

Table 4: Radial clearance of Self-aligning roller bearings

(1) Self-aligning roller bearings with cylindrical bores  $\mu\text{m}$

Nominal inner ring diameter d mm		Clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	min.	max	min.	max	min.	max	min.	max	min.	max
14	18	10	20	20	35	35	45	45	60	60	75
18	24	10	20	20	35	35	45	45	60	60	75
24	30	15	25	25	40	40	55	55	75	75	95
30	40	15	30	30	45	45	60	60	80	80	100
40	50	20	35	35	55	55	75	75	100	100	125
50	65	20	40	40	65	65	90	90	120	120	150
65	80	30	50	50	80	80	110	110	145	145	180
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	500	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

(2) Self-aligning roller bearings with tapered bores  $\mu\text{m}$

Nominal inner ring diameter d mm		Clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	min.	max	min.	max	min.	max	min.	max	min.	max
18	24	15	25	25	35	35	45	45	60	60	75
24	30	20	30	30	40	40	55	55	75	75	95
30	40	25	35	35	50	50	65	65	85	85	105
40	50	30	45	45	60	60	80	80	100	100	130
50	65	40	55	55	75	75	95	95	120	120	160
65	80	50	70	70	95	95	120	120	150	150	200
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	180	180	240	240	300	300	340	340	430
180	200	110	200	200	280	280	350	350	370	370	470
200	225	120	225	225	320	320	350	350	370	370	410
225	250	140	250	250	370	370	470	470	500	500	570
250	280	150	280	280	420	420	520	520	570	570	620
280	315	170	315	315	470	470	570	570	630	630	680
315	355	190	355	355	520	520	620	620	690	690	740
355	400	210	355	355	570	570	670	670	750	750	820
400	450	230	400	400	620	620	720	720	790	790	910
450	500	250	500	500	670	670	770	770	830	830	1000
500	560	290	500	500	720	720	820	820	870	870	1100
560	630	320	560	560	780	780	880	880	920	920	1230
630	710	350	630	630	830	830	930	930	980	980	1360
710	800	390	710	710	880	880	980	980	1020	1020	1500
800	900	430	800	800	930	930	1030	1030	1070	1070	1370
900	1000	480	900	900	980	980	1080	1080	1120	1120	1690

Table 5: Recommended radial clearance of double-row cylindrical roller bearings with cylindrical bores  $\mu\text{m}$

Nominal inner ring diameter d mm		Clearance					
		Group 1		Group 2		Group 3	
Over	To	min.	max	min.	max	min.	max
	24	5	15	10	20	20	30
24	30	5	15	10	25	25	35
30	40	5	15	12	25	25	40
	40	5	18	15	30	30	45
50	65	5	20	15	35	35	50
65	80	10	25	20	40	40	60
	80	100	10	30	25	45	45
100	120	10	30	25	50	50	80
120	140	10	35	30	60	60	90
	140	160	10	35	35	65	65
160	180	10	40	35	75	75	110
180	200	15	45	40	80	80	120
	200	225	15	50	45	90	90
225	250	15	50	50	100	100	150
250	280	20	55	55	110	110	165
	280	315	20	60	60	120	120
315	355	20	65	65	135	135	200
355	400	25	75	75	150	150	225
	400	450	25	85	85	170	170
450	500	25	95	95	190	190	285

Table 6: Recommended radial clearance of double-row cylindrical roller bearings with tapered bores  $\mu\text{m}$

Nominal inner ring diameter d mm		Clearance					
		Group 1		Group 2			
Over	To	min.	max	min.	max	min.	max
	24	24	10	20	20	30	30
24	30	30	15	25	25	35	35
30	40	40	15	25	25	40	40
	40	50	17	30	30	45	45
50	65	65	20	35	35	50	50
65	80	80	25	40	40	60	60
	80	100	35	55	45	70	70
100	120	100	40	60	50	80	80
120	140	120	45	70	60	90	90
	140	160	50	75	65	100	100
160	180	160	55	85	75	110	110
180	200	180	60	90	80	120	120
	200	225	60	95	90	135	135
225	250	225	65	100	100	150	150
250	280	250	75	110	110	165	165
	280	315	80	120	120	180	180
315	355	315	90	135	135	200	200
355	400	355	100	150	150	225	225
	400	450	110	170	170	255	255
450	500	450	120	190	190	285	285

Table 7: Radial clearance of four-row cylindrical roller bearings

μ m

Nominal inner ring diameter d mm		Clearance									
		Group 2		Group 0		Group 3		Group 4		Group 5	
Over	To	min.	max	min.	max	min.	max	min.	max	min.	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	—	—

Table 8: Radial clearance of double-row and four-row tapered roller bearings

μ m

Nominal inner ring diameter d mm		Clearance											
		Group 1		Group 2		Group 0		Group 3		Group 4			
Over	To	min.	max	min.	max	min.	max	min.	max	min.	max	min.	max
—	30	0	10	10	20	20	30	40	50	50	60	70	80
30	40	0	12	12	25	25	40	45	60	60	75	80	95
40	50	0	15	15	30	30	45	50	65	65	80	90	110
50	65	0	15	15	30	30	50	50	70	70	90	90	120
65	80	0	20	20	40	40	60	60	80	80	110	110	150
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	6	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	500	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	820			
1120	1250	0	220	220	450	450	670	670	900	900			
1250	1400	0	250	250	500	500	750	750	980	980			

Table 9: Radial clearance of four-point contact ball bearings

Nominal inner ring diameter d mm		Clearance								$\mu\text{m}$
		Group 2		Group 0		Group 4		Group 5		
Over	To	min.	max	min.	max	min.	max	min.	max	
—	18	15	55	45	85	75	115	105	145	
18	40	26	66	56	106	96	146	136	186	
40	60	36	86	76	126	116	166	156	206	
60	80	46	96	86	136	126	176	166	216	
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	
300	350	155	235	215	295	275	355	335	415	
350	400	175	265	245	325	305	385	365	465	
400	500	205	305	285	385	355	455	435	525	
500	600	255	355	335	445	425	545	525	615	

## Bearing material

The performance and reliability of rolling bearings mostly depend on bearing material property. The rolling bearings are required to undergo large stress frequently on the interface between rings and rolling elements, meanwhile, to keep the high precision rotation. So it is required that the materials of the rings and the

rolling elements possess the characteristics of hardness coinciding with loading capability, anti-fatigue and anti-wear, and dimension stability under different conditions of rolling contact and lubrication. Too much non-metallic impurity can cause fatigue and chapping easily. The less the impurity is, the cleaner the materials are and the longer life of rolling bearings is.

## Rings and rolling elements

High carbon chrome bearing steel is generally used for the rolling bearing rings and the rolling elements. The carburizing steel is used for the bearings with high impact load and alternating bending stress.

High carbon chrome bearing steel is widely used for the rolling bearings, which are required to be through hardened, the surface and bore of the bearing both are hardened. Recently, the quality of the bearing steel is being improved, the material property is improved greatly by vacuumed degassed treatment, and the oxygen content and non-metal content are reduced. Electroslag refining bearing steel with higher clean degree is used for bearings with long service life and high liability.

ZWZ heat treatment technology for rolling bearing rings and rolling elements ensures the dimension steadability when under 120°C. For higher operating temperature, special bearing heat treatment technology are demanded to ensure its dimensional steadability. But this special technology will reduce bearing's material hardness and shorten bearing's fatigue life. For bearing whose operating temperature is more than 300°C, high temperature steel of hyperpyrexia hardness is used.

## Cage

The cage is applied to embrace the rolling elements partially to ensure a distance between the two neighbor rollers to reduce operating friction and generated heat, to keep the same distance among rolling elements and distribute load equally, to prevent rolling elements from falling off from separable bearings, and to guide rolling elements. Cages can take functions in lubrication grease storage to improve bearings' lubrication. For cage material, it is required to undergo operating vibration and impacting strength and to ensure small friction with rolling

elements. The material should be light and be suitable for bearing's operating temperature.

## Pressed cage

ZWZ pressed cage is generally made out of cool-rolled and hot-rolled sheet steel which has light weight and takes small space in bearings so that lubricant can go inside easily. Pressed cage is usually used in deep groove ball bearings, self-aligning roller bearings and most taper roller bearings.

## Solid cage

ZWZ solid cage is made out of metal, phenolic bakelite and plastic.

Metal solid cage is usually made out of brass, carbon steel etc. It is used in situations where cages of high strength are required and where the temperature is high.

Solid cage can be used where guide ring is needed. High speed bearing with guide ring is often made out of light material, such as light alloy, phenolic bakelite, and soon to endure its small inertia.

Plastic injection molding can be adopted when solid cage is made out of glass fiber reinforced nylon 66 according to its outline suitable for the highest load requirement. Glass fiber reinforced nylon 66 has big flexibility, light weight and is suitable for vibration impact stress, acceleration or deceleration or mutual clopping of inner ring and outer ring. This bearing cage holds property of well lubrication and self-aligning. Cages made out of glass fiber reinforced nylon 66 can be used in steady situations where the operating temperature is less than 120°C. Nylon will lost its flexibility under temperature lower than -40°C.

## Pin cage

Linked by hollow roller, pin and gasket, pin



Table 1  
The friction factor  $\mu$  for different bearings

Bearing type	Friction factor $\mu$
Deep-groove ball bearings	0.0010–0.0015
Angular contact ball bearings	0.0012–0.0020
Self-aligning ball bearings	0.0008–0.0012
Cylindrical roller bearings	0.0008–0.0012
Needle roller bearings with full complement	0.0025–0.0035
Caged needle roller bearings	0.0020–0.0030
Tapered roller bearings	0.0017–0.0025
Spherical roller bearings	0.0020–0.0025
Thrust ball bearings	0.0010–0.0015
Spherical roller thrust bearings	0.0020–0.0025

## Fits of bearings

### Purpose of fits

The purpose of fit is to make the inner ring or the outer ring fixed to the shaft or housing so that no bad circular slide shall happen on the fit surface.

The bad circular slide (called creep deformation) will bring about abnormal heat, scratches on the fit surface (hence making the ground iron power enter into the bearing), vibration and other problems, which cause the insufficient function of the bearing.

Therefore, since the bearing rotates with load, normally the rings must have interference fit so that they are fixed to the shaft or the house.

### Dimension tolerances and fits of shaft and housing

The dimension tolerance of the metric shaft and housing bore have been standardized in the GB/T275-93. The fits of Rolling Bearings dimensional tolerances are available, we can

define the fit of the bearing with the shaft or the housing.

The fit relations between the dimension tolerances of the shaft and housing bore and the bearings with PO class precision degree are given in Figure 1.

### The selection of fit

The selection of fit is according to the following principles.

According to the direction and nature of applied load and which of the two rings rotates, the load carried by each of the rings can be divided into rotation load, static load or indeterminate direction load. The ring carrying rotation load or indeterminate direction load should use static fit (interference fit), and the ring carrying static load should use transitional fit or dynamic fit (clearance fit).

If the bearing load is big or there is vibrating or shock load, the interference fit should be increased. When using hollow shaft, bearing box with thin wall or light alloy or plastic bearing box, the interference should also be increased.

If high rotation precision is required, the high precision bearing should be used, and the dimension precision of the shaft or bearing box should be increased to avoid much interference fit. If the interference is too big, the geometric precision of the shaft or bearing box shall affect the geometric shape of the bearing rings, and accordingly damage the bearing rotation precision.

If both inner ring and outer ring of non-separable bearing (such as deep groove ball bearing) adopt static fits, the mounting and dismantling of bearing is very inconvenient. It is better to adopt dynamic fit for inner ring or outer ring.

### 1) Effects of the load nature

According to its nature, bearing load can be divided into inner ring rotation load, outer ring rotation load and indeterminate direction load. The relations between them and the fit are shown in Figure 1.

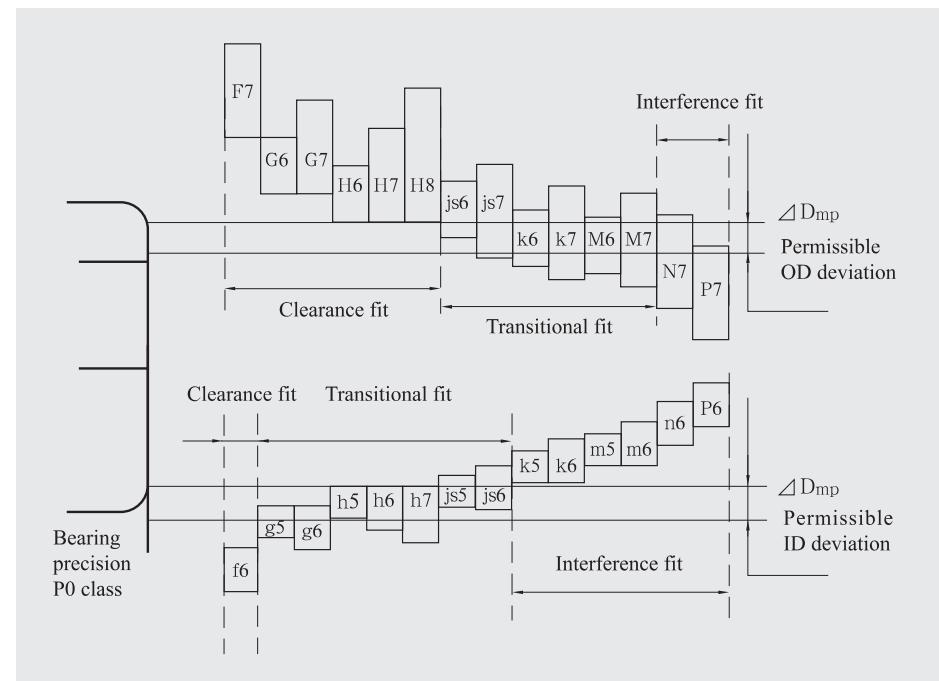
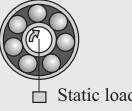
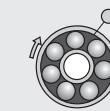
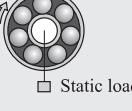
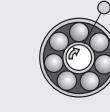


Figure 1 Relations between dimension tolerances of shaft and housing bore and fit (bearings of PO class precision).

Table1. Nature of load and relations with fit

Bearing rotational conditions	Figure example	Nature of load	Fit choice
Inner ring: rotating Outer ring: static Direction of load: fixed		I.R. rotating load	I.R.: use static fit (interference fit)
Inner ring: static Outer ring: rotating Direction of load: Rotating simultaneously with outer ring		O.R. static load	O.R.: use dynamic (clearance fit)
Inner ring: static Outer ring: rotating Direction of load: fixed		I.R. static load	I.R. use dynamic fit (clearance fit)
Inner ring: rotating Outer ring : static Direction of load: Rotating simultaneously with inner ring		O.R. rotating load	O.R. use static fit (interference fit)

## 2) Effects of load magnitude

For inner ring with radial load, it is both compressed and expanded in the radial direction, and the circumference tends to increase slightly, therefore the initial interference will decrease.

The amount of decrease can be calculated with the following formula:

[ When  $F_r \leq 0.25 C_0$  ]

$$\Delta d_F = 0.08 \sqrt{\frac{d}{B}} \cdot F_r \times 10^{-3} \quad (1)$$

[ When  $F_r > 0.25 C_0$  ]

$$\Delta d_F = 0.02 \frac{F_r}{B} \times 10^{-3} \quad (2)$$

Where,

$\Delta d_F$ : a mount of decrease of the interference, mm

d: bearing nominal bore diameter, mm

B: nominal bore width, mm

$F_r$ : radial load, N {kgf}

$C_0$ : basic static load rating, N {kgf}

Therefore, when the radial load is a heavy one (exceeding the value of  $C_0$  by 25%), the fit must be tighter than with light load.

If there is the shock load, the fit must be even tighter.

## 3) Effects of the fit surface roughness

When taking the plastic deformation of the

fit surface into consideration, the effective interference after fit is influenced by the processing quality of the fit surface. It can be approximately expressed with the following formula:

[ground shaft]

$$\Delta d_{eff} \approx \frac{d}{d+2} \Delta_d \quad (3)$$

[turned shaft]

$$\Delta d_{eff} \approx \frac{d}{d+3} \Delta_d \quad (4)$$

Where,

$\Delta d_{eff}$ : effective interference, mm

$\Delta_d$ : apparent interference, mm

d: bearing nominal inner diameter, mm

## 4) Effects of temperature

Generally speaking, the bearing temperature in operation is higher than the surrounding temperature, and if the bearing rotates with load, the temperature of the inner ring is higher than that of the shaft, and the heat expansion shall reduce the effective interference.

Now assume the temperature difference between the inside of the bearing and the surrounding temperature of the housing is  $\Delta_t$ , we can presume that the temperature difference between the inner ring and the shaft on the fit surface is approximately  $(0.10 \sim 0.15)\Delta_t$ .

The reduced amount of interference caused by temperature change can be calculated with the following formula:

$$\Delta d_{dt} = (0.10 \text{ to } 0.15) \Delta_t \cdot \alpha \cdot d$$

$$\approx 0.0015 \Delta_t \cdot d \times 10^{-3} \quad (5)$$

Where,

$\Delta d_{dt}$ : reduced amount of the interference caused by the temperature difference, mm

$\Delta_t$ : temperature difference between that inside the bearing and the temperature surrounding housing, °C

a: linear expansion factor of bearing steel,  $(12.5 \times 10^{-6}) 1/^\circ\text{C}$

d: bearing nominal inner diameter, mm

Therefore, when the temperature of the bearing is higher than that of the shaft, the fit must be very tight.

On the other hand, the interference between the outer ring and housing may increase due to the temperature difference or linear expansion factor difference. Hence it must be noted when considering using the slide in the fit surface between the outer ring and the housing to adapt to the expansion.

## 5) The maximum stress inside the bearing caused by the fit

When mounting the bearing with interference fit, the rings sometimes may expand or contact, bringing about stress.

If the stress is too big, the rings sometimes may break, to which attention must be paid.

The maximum stress inside the bearing caused by fit can be calculated with the formula in Table2. As the reference value, it is safe to let the maximum interference not exceed 1/1000 of the shaft radius, or the maximum stress should not exceed 120MPa{12kgf/mm<sup>2</sup>}.

## 6) Others

When a much higher accuracy is required, the precision level of the shaft and housing should be increased. Compared with shaft, it is more difficult to process the housing and the precision level is low. Therefore, the loosened fit between the shaft and the housing is recommended.

When using hollow shaft or thin wall-thickness, the fit must be higher than in normal.

When using two half housings, the fit with the outer ring must be loosened. For housing of cast aluminum or light alloy, the fit must be tighter than in normal.

Table2 the maximum stress inside the bearing caused by fit

Shaft and inner ring
(hollow shaft) $s = \frac{E}{2} \cdot \frac{\Delta_{\text{eff}}}{d} \cdot \left[ 1 - \frac{d_0^2}{d^2} \right] \left[ 1 + \frac{d^2}{D_i^2} \right]$
(solid shaft) $s = \frac{E}{2} \cdot \frac{\Delta_{\text{eff}}}{d} \cdot \left[ 1 + \frac{d^2}{D_i^2} \right]$
Housing bore and outer ring
( $D_h \neq \infty$ ) $s = E \cdot \frac{\Delta_{\text{Deff}}}{D} \cdot \left[ 1 - \frac{D^2}{D_h^2} \right]$
( $D_h = \infty$ ) $s = E \cdot \frac{\Delta_{\text{Deff}}}{D}$

Where

d: maximum stress, MPa {kgf/mm<sup>2</sup>}

d: nominal bore diameter (shaft diameter), mm

D<sub>i</sub>: inner ring raceway diameter, mm

Ball bearing.....Di=0.2(D+4d)

Roller bearing.....Di=0.25(D+3d)

□

Δ<sub>eff</sub>: effective interference of inner ring, mm  
do: hollow shaft radius, mm

De: outer ring raceway diameter, mm

Ball bearing.....De=0.2(4D+d)

Roller bearing.....De=0.25(3D+d) □

D: bearing nominal outer diameter (housing bore diameter), mm

Δ<sub>Deff</sub>: effective interference of outer ring, mm

D<sub>h</sub>: housing outer diameter

E: modulus of elasticity

$2.08 \times 10 \text{ MPa} \{21200 \text{ kgf/mm}^2\}$

## Lubrication

Lubrication has important effects on the function of the bearing. Whether the lubricant and the method are suitable or not shall influence the bearing life. That is to say, the lubrication is a necessary condition to assure the normal operation of bearing and the lubrication plays an important role in improving load-carry capability and service life of bearing.

### Purpose of lubrication

The purpose of bearing lubrication is to form a thin grease film on rolling or sliding surfaces in order to prevent the direct contact of the metals.

### The function of lubrication:

Reducing the friction of metals and slow the wear.

The grease film formed expands the touching area and reduces the contacting stress.

Assure the rolling bearing can work normally under a high-frequency contact stress for a long time and elongates the bearing fatigue life.

Take away the heat generated by friction and reduce the temperature of bearing working surface in order to prevent burns.

Prevent the bearing from rust, dust and corrosion.

### Methods of lubrication

The lubricating methods of rolling bearing include oil lubrication and grease lubrication.

## Oil lubrication

Oil lubrication is applied to high-speed and heat-resistant bearings and is effective for reducing vibration and lowering noise.

Oil lubrication has the following methods:

### 1). Oil drip lubrication

Oil drip lubrication can lubricate the bearing by dripping oil through the orifice of oil cup.

The orifice of oil cup can be adjusted according to the magnitude of oil.

The advantage of lubrication method is the simple configuration and convenient use. But the viscosity degree of oil can not be too high. Or it can not go through smoothly and influence the lubrication effect.

### 2). Oil bath lubrication

Oil bath lubrication also can be called soak oil lubrication. A part of bearing is dipped into the lubricant and make sure that every rollers can be dipped into the lubricant when rolling the bearing. Then the lubricant with rollers can go around working parts of the bearing. Considering the churning waste and temperature increase, in order to slow down the aging of lubrication, oil bath lubrication should not be adopted when bearings at high rotate speed.

### 3) Splash lubrication

Splash lubrication is often adopted when rolling bearing works in closed gearing. It splashes the lubricant by using rotating parts, such as gear, swing oil plate and so on. The lubricant scatters on the bearing or flow into the rolling bearing through a designed oil groove along the box wall to lubricate the rolling bearing. The used lubricant can mass again in the box for recycling. Since splash lubrication doesn't need any other accessory equipment, it is normally adopted by the gearing with simple and compact configuration. But the following three points should be paid more attention when using splash lubrication:

(1). The of the lubricant should not be too much, or else the wastage caused by oil churning will be overmuch. And it can also cause granule abrasion because of the sediment such as grinding scraps taken from oil pool to bearing part when churning oil.

(2). The lubricant in the box should be often

kept clean. Magnetism adsorber should be used in the oil pool to clear away grinding scraps and eyewinker for reducing granule abrasion.

(3). When designing the configuration, an oil trough for storing and a throttle orifice towards bearing could be set up against box wall to make bearing in the similar situation where they are oil bath lubricated and dripping oil lubricated for supplying lubricant and preventing from the lack of oil.

### 4). Oil cycling lubrication

Oil cycling lubrication is a way of actively lubricating the part of rolling bearing. It pumps the lubricant from oil box using a lift pump and transmits the lubricant into the rolling bearing supporting through an oil pipe and an oil bore. Then the lubricant returns to the oil box through the orifice of the bearing housing for reusing after cooled and filtrated. Therefore, this method of lubrication can eliminate much more heat and simultaneously expel friction heat effectively. So it is applied to the bearing supporting with overload and high-speed rotation.

### 5). Oil jet lubrication

Oil jet lubrication is a kind of oil circulating lubrication. But in order to make the lubricant adequately enter into the inside relative motion surface of high-speed bearing and synchronously avoid overheating and overmuch friction due to the condition of high-speed rotation, a nozzle is mounted against the oil orifice of bearing support and augment the stress of oil supply to spurt oil onto the bearing by dint of the nozzle for bearing lubrication and cooling. Thus, oil jet lubrication is a favorable lubrication method mainly adopted in rolling bearings with high-speed rotation. It is also the same with the situation where the dmn of rolling bearings exceeds 200000mm r/min. The oil pump stress of oil jet lubrication is about 3~5 bar. For overcoming and avoiding

clinging effect under the condition of high speed, what have to be done is to make sure that the speed of oil spurting from oil orifice is twenty percent larger than that of linear velocity of rolling bearing.

## 6). Oil mist lubrication

Oil mist lubrication is a kind of micro-lubricating. It meets the lubricating demand of rolling bearing with a spot of lubricant. Oil mist lubrication is to lubricate bearing with the oil mist that converted from lubricating oil in the oil mist generator. Actually, rolling bearing still keep the status of sparse lubricating since oil mist coagulate into oil drippings on the working surface of the rolling bearing. To avoid overmuch of oil supply and increase working temperature caused by the augment of friction inside the oil, oil mist lubrication is normally adopted when the linear velocity of roller is quite high. Generally, the stress of oil mist is around 0.05~0.1bar. But the following two points should be paid much attention when adopt this lubrication method:

(1). The viscosity degree of lubricant should not exceeds 340mm<sup>2</sup>/s (40℃) because exorbitant viscosity degree can not bring the effect of atomization.

(2). The oil mist after lubricating may spread with air partially and result in environmental pollution. The oil mist should be collected using oil-gas separator if necessary or eliminated by aerator.

## 7). Oil air lubrication

Transmit little oil to the constringent airflow inside the pipe every third moment or so using stopcock ration distributor to form a continuous flowing of oil against the wall of the pipe for supplying to bearing. The oil won't aging because of the new lubricant coming continuously.

Compressing the air can make the impurity outside not to break into the inside of bearing easily.

The little oil supplying can reduce the pollution to surrounding environment. Oil air lubrication use less oil than oil mist lubrication and has well stability, small friction moment, slowly temperature increasing. It is especially applied to high speed bearing.

## Grease lubrication

Grease lubrication used inside the bearing can last a comparatively long time without replenishment, and the sealing device is very simple. Therefore, it is extensively applied.

There are two methods for grease lubrication: one is to fill grease inside the sealed bearings in advance. The other is to fill the grease of certain amount inside the housing and refill it or change the grease at intervals.

Moreover, for machines with several bearings required lubrication, the method of centralized greasing through pipes connecting the places to be lubricated is adopted.

The effect of grease lubrication is to put the grease onto every motional surface of rolling bearing directly. But when lubricating the raceway of rolling bearing and sliding surface, the principle below must be followed:

(1). To lubricate bearings adequately, the grease should penetrate to the working surface and the interspace of bearing.

(2). Some of grease should be hold on the working surface of rolling bearings and last for a period of time. But overmuch loss of grease by flowing away should be prevented.

(3). The flowing direction of inputting and venting of grease should according to the seal for it is propitious to the venting of contamination.

(4). Reduce the amount of grease at full steam when making sure well lubricated.

(5). Set up an exit at the end of flowing direction of grease in order to the new grease can jostle the old one thereby making sure the bearings are well lubricated.

## The selection principle of lubricant oil

From the invalidation instance of oil lubricated rolling bearing, we can see most of invalidations are caused by the low viscosity degree of lubricant. The lower viscosity degree of lubricant is, the smaller carrying capacity of oil film owns and the easier oil film breaks resulted the metal material connect each other directly when doing relative motions inside the rolling bearing which shortened the bearing life for the increase of friction and abrasion or the burn and rupture accident occurs. But if the viscosity degree is overmuch, it can cause the increase of friction. So the quantity of heat increases when churning the lubricant, that is to say, the consumed energy of the system will increase. On the other hand, for working under the condition of high-speed, high load and high temperature, the rolling bearing may have special demand of antirust, antioxidant, wearability and the increase of lubricant adsorbability. Therefore, for selecting lubricant, it is mainly to ensure the viscosity degree and additive kind or different lubricant with some additive.

The following is a general principle for selecting lubricant:

### (1) Operating temperature

Operating temperature influences the viscosity degree of lubricant and the lubricating effect.

So, when the operating temperature is lower, the low viscosity degree of lubricant should be selected; when the operating temperature is higher, the high viscosity degree of lubricant or the lubricant with proper additive should be selected. For different temperature of surrounding, the viscosity degree of selected lubricant should varies synchronously. For

example, much lower viscosity of degree lubricant should be selected when lubricating bearings in north area or winter than that of in south area or summer. When the operating temperature varies frequently, the lubricant with excellent viscosity temperature quality should be selected.

Namely, the viscosity degree of lubricant doesn't change a lot when the operating temperature ascending or descending to ensure the thickness of oil film in a certain range steadily.

### (2) Motion Velocity

The higher rotation speed, the lower viscosity of lubricating oil should be selected, to avoid moving resistance and producing more heat. On the contrary, under the situation of the lower rotation speed, using the higher viscosity will be beneficial to improve the ability of load for bearings.

### (3) Velocity Characteristic

In motion, there are pounding, vibration, frequent changes of load and speed, and starting. Stop motion, rolling back frequent and intercourse or intermittence moving, they are not beneficial to form the oil film. Sometimes, would rather adopt lubricating grease, even the solid lubricating, to make sure the reliable lubrication.

### (4) Loading

The bigger load of rolling bearings, the higher viscosity, the better oiliness and extreme-pressure of lubricating oil should be selected, to avoid squeezing the lubricating oil from friction pair, or producing the direct contact of metal .

### (5) Structure feature

The smaller roller bearing radial clearance is, the higher friction surface process precision, the lower the viscosity of oil lubrication.

### (6) Circumstance condition

When the bearing works under the condition of moisture corrosive gas, lower temperature,

dust, radiation, the oil lubrication is easy to be polluted. Choosing the oil lubrication has feature of wearability, anti-corrosion, cold-resistant, anti-radiate. When the circumstance is water pollution, latex ejection, moisture or heavy dust, don't choose the oil lubrication but the grease lubrication.

## (7) The precision of the bearing

When the friction surface is crudity, generally, the high viscosity of oil lubrication should be selected so that it can carry part pressure owing to the mal of contacting, but when the precision of motion friction is high, the low viscosity of lubricant should be chosen to reduce the unnecessary waste of energy and increase of temperature.

## (8) Bearing hardness

When the hardness of bearing motion friction surface is low, the high viscosity degree of lubricant should be selected and the amount of oil should be rich. Contrarily, the viscosity degree of lubricant could be reduced.

## The selection of grease

Grease is made by thickener, additive and base oil. Base oil shares 70-95%, thickener 30-50% and a dram of additive. The method of choosing grease and oil is the same. Different grease has different type, base oil viscosity and cone degree. We can chose different types, base oil viscosity and cone degree grease according to the working condition, for example the circumstance darkness, working temperature, speed parameter dm<sub>n</sub>, load and the way of lubrication. Meanwhile, we should consider about other points as below:

1) The dropping point of the grease should be 20-30 higher than the working temperature to assure the lubricating effect.

2) Grease can not be used as circulation lube, because the grease flowability is bad, friction drag is big, the torque efficiency is low and the heat conduction modulus is less. When the grease is used as dry oil for the concentrating lubrication, the cone degree should be above 300 (1/10mm).

3) For the grease will not be changed with normal temperature, but suitable for the different loads and high rotation speed, so mostly the grease are used in machine which is with high different temperature and speed or with reverse and intermission movement. And they can also used in the agriculture, architecture, mine field machine and so on.

4) Grease put inside the bearings are not easy to loose or be extruded, and needn't to be changed regularly. For these advantages they are easy way for seal and they can seal themselves. The grease are mostly suitable for some special place which are better not to put in oil regularly, install complicated seal, and the place which can't be contaminated by the grease as well as high dust environment.

The feature of grease normally used:

Appellation	Brand No.	Titration temperature °C not lower than	Cone degree 1/10mm	Operating temperature range °C	Characteristic and primary purpose
General lithium radicle grease	1 2 3	170 175 180	310~340 265~295 220~250	-20~120	Having anti-water and mechanical security. Normally used in the rolling and sliding part of machinery equipment. Grease is often adopted when lubricating rolling bearings.
Electrode tension lithium grease	0 1 2		355~385 316~340 265~295	-20~120	Having well mechanical security, anti-water, anti-permeating, electrode tension, wearability, the speciality of pump transmit. Normally used in the lubrication of heavy load machinery equipment, gear and bearings.
Calcium radicle grease	1 2 3 4	80 85 90 95	310~340 265~295 220~250 175~205	Temperature<55	Often used in the bearing lubrication with small load and self-supporting lubricating. Also print-sized machine in the lower temperature area. Be applied to medium-size and print-sized rolling bearing and the friction part of small load, high-speed machine in equipment with the temperature within 55°C. Medium motor rolling bearings, motor and friction part of medium load and medium rotating speed machine with the temperature below 60°C. Adopted by automotive water pump bearing, heavy load automatic machine bearing and other heavy load, low-speed machinery with the temperature below 60°C.
Calcium-sodium radicle grease	ZGN-1 ZGN-2	120 135	250~290 200~240	80~100	Dissolving-resistant, water-resistant, with temperature 80~100°C (can not be used under low temperature). Railway engine, train, small size motor and dynamo as well as other high-temperature bearings.

## Bearing Applications

### Precautions

Compared with normal mechanical parts, rolling bearings have high precision levels, and attention must be paid to their applications:  
1) Keep the bearing and its surrounding room clean.

2) Apply the bearings carefully.

Carelessness may cause strong shock to the bearing and may lead to scratches and breaks to the bearing.

3) Use appropriate tools.

4) Pay attention to prevention from rusting.  
The bearings should not be used in moist places. Gloves should be worn to prevent the sweat drops adhere to the bearing.

5) The operators must know bearings well.

6) Application instructions must be formulated for correct usage of the bearings.

### The bearing preservation

The washing of the bearing and surroundings  
Inspection on the mounting dimensions and the processing quality

### Mounting operation

### Inspection after mounting

### Dismounting operation

### Maintenance (regular inspection)

### Replenishment of lubricate

## Bearing preservation

The bearings are painted with rust-preventive oil and wrapped up with rust-preventive paper. The quality of the bearing can be ensured when the packaging is kept in good condition.

It is recommended that the bearings are kept under air moist of 65% and in temperature 20°C and on shelves of 30cm above the ground for long time storage. Besides, the storage should avoid direct sunshine and cold walls.

For the bearings with seals or shields, the characteristics of grease will be degraded after

a long time storage. The bearings should be protected free of pollution and corrosion after they are taken out of original package.

The large size bearings should be placed horizontally and the whole side face of bearings shall be supported. If the bearings have a small thickness and are placed vertically, the weight of rings and rolling elements shall result in permanent bearing deformation.

## Bearing mounting

### 1. Preparation of the bearings

#### 1.1 The ambient of bearing mounting

The mounting of bearing shall be done in dry and dust free room as possible and mounting work also shall be away from the equipments with metalworking or generating metal debris and dust. When the mounting must be done without any protections happens to (large size bearings always experience), proper measures must be taken to prevent the bearings from dust and humid air until the mounting is finished.

#### 1.2 Preparation of the bearings

Do not open the packaging of the bearing until mounting operation since the bearing has received rust-prevention handling and been properly packaged. In addition, the rust-preventive on the bearing is a good lubricant, for bearings of general applications or filled with lubricating grease, there is no need of washing before using the bearings. But for bearings applied to instruments or rotating at high speed, washing with cleaning oil should be used to rid the bearings of the rust-preventive oil. In this case, the bearings may easily become rusty, therefore they should not be kept for a long time.

#### 1.3 The preparation of mounting tools

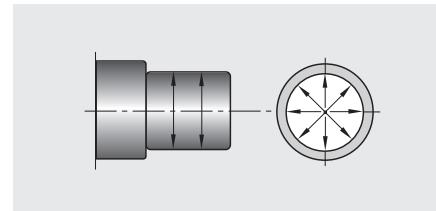
The mounting tools should be made from wood

or light metal and the materials, which can generate chips, shall be avoided to use. The mounting tools shall be kept clean.

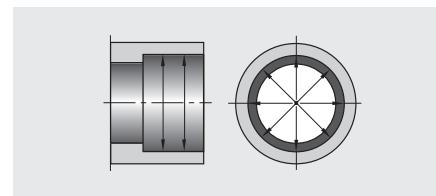
**1.4 The inspections on the shaft and housing**  
Wash the shaft and the housing to ensure that there are no burs or scratches from machining. In no way should there be grinding agents (SiC, Al<sub>2</sub>O<sub>3</sub> and so on), foundry sand or smear metal. Then check if the dimensions, shape and processing quality of the shaft and housing are in conformity with the drawings.

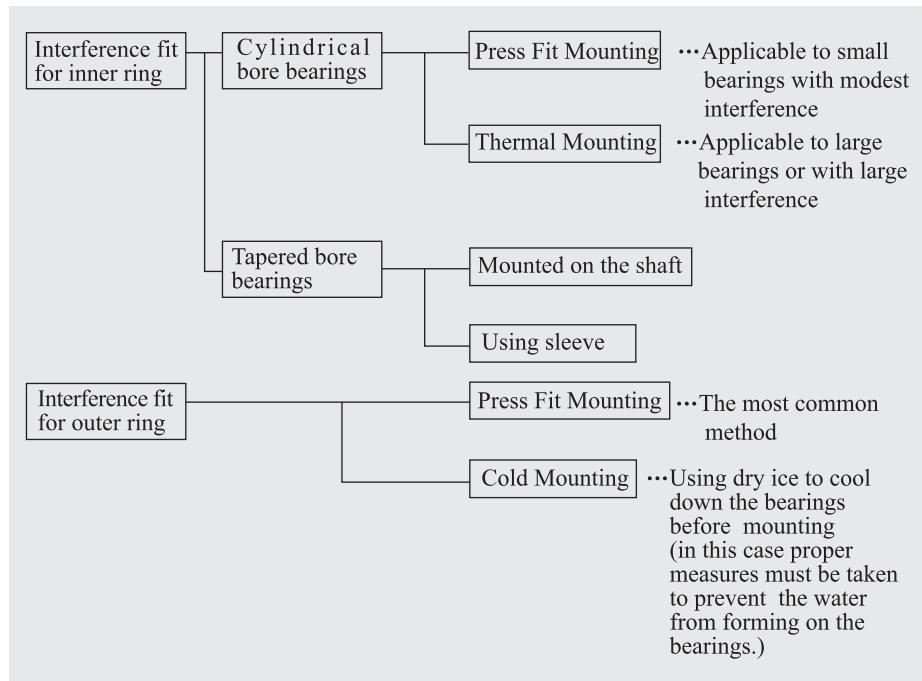
As shown in Figure 1 and 2, measuring should be done at several places. Also it is necessary to inspect the dimensions of the fillet and the verticality of the abutment. Before mounting, lubricate the qualified shaft and housing on all the fit surfaces.

Picture 1 The measuring position of the shaft diameter



Picture 2 The measuring position of housing bore diameter

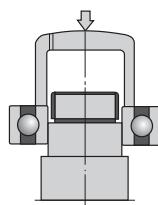




### 3. The mounting of cylindrical bore bearing

#### 3.1 Press fit mounting

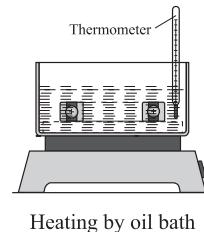
Hydraulic press is normally used, sometimes nuts and screws are also employed. Hammers can be used also when absolutely needed.



When the inner ring of the bearing is interference fit and need to be mounted on shaft, the pressure shall be applied on the inner ring. When the outer ring of bearing is interference fit and need to be mounted in housing, the pressure shall be applied on the outer ring. When both inner ring and outer ring is interference fit, a shim plate must be used to make sure pressure applied on both inner ring and outer ring simultaneously.

#### 3.2 Thermal mounting

This method heats the bearings to make it expand and then mounts the bearing on the shaft. It can prevent the bearing from being affected by unnecessary external forces and finish the mounting within very short time. The heating methods mainly are oil bath and induction.



Heating by oil bath

The advantage of electric induction heating:

- 1) Clear, no pollution
- 2) Timing, constant temperature
- 3) Easy operation

When bearing is heated to the expected temperature (below 120°C), take it out and then mount it on the shaft quickly. Bearing will shrink along with cooling. Sometimes, the gap will occur between shaft shoulder and bearing end face, therefore the bearing should be pushed by tools towards shaft shoulder.

Due to the pre-lubricating grease or seal material has limitation with temperature, the heating temperature of the shielded or sealed bearing can not surpass 80°C and also such bearings can not be heated by oil bath. Make sure temperature is distributed uniformly when heating the bearings and no overheated position.

#### 4. The mounting of tapered bore bearing

Most of the tapered bore bearings are mounted with interference fit of inner ring. Tapered bore bearing can be directly mounted to tapered shaft or to cylindrical shaft through adapter sleeve and withdrawal sleeve.

Interference degree is defined by checking

clearance decreased volume or the axial displacement of the inner ring on tapered shaft. On certain circumstances, it also can be defined by testing lock angle of the locknut or the expansion volume of inner ring.

As for the tapered bore bearing, when the inner ring is pressed on the tapered shaft, adapter sleeve or withdrawal sleeve, interference degree will be increased and the radial clearance will be decreased. The interference degree can be defined through checking the decreased volume.

#### 4.1 Measure of the decreased clearance volume

The measure method of using feeler gauge to check the radial clearance before and after mounting is only suitable for medium size and extra large size bearings. The measured clearance must be at the position between the unloaded rollers and the raceway of outer ring. Before measuring, running the outer ring for several revolutions, and make sure the central lines of the outer ring and roller group are overlapped.

In the first measure, feeler gauge should have a measuring value lower than the minimum value of the clearance, and then choose a thicker feeler gauge to measure the clearance for several times till feeler gauge meets resistance in the following situation when being moved.

Before mounting—measuring place is between outer ring and the highest roller;

After mounting—measuring place is between inner ring (outer ring) and the lowest roller, according to different cages.

#### 5. The mounting of outer ring

When mounting the outer ring to bearing box with interference fit, for the small size bearing, the outer ring can be pressed in normal temperature. When interference is big, the outer ring can be pressed through heating bearing box

or cooling outer ring. When applying the dry ice or other refrigerant, the moisture in the air will agglomerate on the bearing, it is a must to take the anti-rust measures.

## The dismounting of bearing

Dismounting of bearing is necessary for purposes of regular check and replacement of parts. Normally, the bearing shall be further used, as well as the shaft and bearing box. Therefore, dismounting must be considered during design in order to not damage bearing, shaft, bearing box or other parts. Tools for dismounting must be properly prepared. When dismounting the rings with static fit, the withdrawal force can only be applied to the said ring and should not work on the rings through rolling elements.

## The dismounting tools of bearing

The most proper dismounting tool for bearing is press machine. When it is applied, it is necessary to check if the axial lines of lift part of press machine and the dismounted bearing are perpendicular with each other. In addition, there are some other simple manual dismounting tools for bearings and they are also useful and convenient.

## The dismounting method of cylindrical bore bearing

As for non-separable bearing, it should be dismounted firstly from the looser fit position (it is usual the fit between outer ring and housing bore diameter), then pressed it out from the tight fit position by press machine.

Provided the dismounted bearings would be used once again, it is not allowed to pass the dismounting force through rolling elements. Otherwise the rolling elements and raceway of ring will be damaged.

## The dismounting of tapered bore bearing

The medium size and small size bearings mounted on the tapered shaft neck can be easily dismounted through pulling the inner ring with normal puller. If applying the automatical aligning puller, damage on the shaft neck can be avoided when pulling out the bearing.

The bearings dismounted from the tapered shaft neck become loose in short time; therefore, certain equipment should be added to prevent the bearings dropping from the shaft.

The medium size and small size bearings, which are mounted on the cylindrical vertical shaft with adapter sleeve, can be dismounted firstly to loosen the nut, and then strike the side of bearing through punch in hammer.

The medium size and small size bearings, which lean against the supporting ring on multi-diameter shaft fitted with adapter sleeve, can be dismounted by striking the smaller end face of adapter through a special made sleeve in hammer. In addition, the nut should be loosened firstly.

It is a simple and practical method to dismount the large size bearings on the adapter sleeve by the hydraulic nut, but the bearing should be leaned against a supporting ring. Filling oil is a more simple way to dismount, but the adapter sleeve must have oil raceway and oil slot. When dismounting the bearings on the withdrawal sleeve, it is a must to dismount some axial lock equipment firstly, such as locknut, end cap. As for the medium size and small size bearings, they can be dismounted by locknut, hook type wrench or punch wrench.

## Bearing maintenance

Regular maintenance (regular check) must be carried out to ensure the play of the functions within a long time period.

Regular check is very important to improve the productivity and economy by finding the trouble or problem before such occurrence.

## Washing

Make appearance records of the bearings by photo before dismounting and check.

In addition, determine the amount of lubricant left inside the bearing and analyze the lubricant by sampling before washing the bearing.

The bearing can be washed roughly or carefully, and a metal net or rack can be used in the bottom of container.

For rough washing, use a brush in the oil to clean away the lubricant or any adhesive. Rotating the bearing at this moment may damage the bearing surface due to the foreign matter inside.

For careful washing, rotate the bearing in the oil slowly and carefully.

The normally used cleaning agent is of neural nature, without water, diesel oil or kerosene. Sometimes lukewarm alkali liquid is used upon necessity.

Filtering of the cleaning agent is required to keep clean no matter which agent is used. Paint immediately the rust-preventing oil or grease on the bearing after washing.

## Check and make judgement

In order to judge whether the dismounted bearing can be reused or not, the dimensional precision, rotational precision, internal clearance should be especially checked, as well as the interference fit surface, raceway surface, rolling surface, cage and seals and so on. Concerning the results of such checks, please consult the bearing specialist for judgement.

The criteria for judgement vary with the mechanical functions and importance and the regularities of the checks. Replacement of the

bearing must be done in case of the following damages:

There are cracks or defects on the bearing parts  
There are peelings-off from the raceways or the rolling surface.

## Identification of bearing problems

It is important for improvement in productivity and economy to identify or predict if there are any problems or troubles inside the bearing without dismounting it for check purposes.

The main identification methods are as the following:

### 1) Identification through sound

Rich experience is required to identify the bearing problems or troubles by listening to the sound of the bearing. Much training in this respect is entailed to tell the sound of the bearing or that of other parts.

It is recommended that a special worker should be responsible for this job. The sound of the bearings can be heard clearly when putting a stethoscope or the rod on the housing.

### 2) Identification through working temperature

This method uses comparisons, and is applied only in cases without big changes when the bearing is rotating. Therefore, continuous records of the temperature must be kept.

The temperature not only increases but also presents irregular changes in case of trouble. It is preferred to use these two methods together.

### 3) Identification through the status of the lubricant

Identify the trouble by taking samples of the lubricant and analyzing the dirty level and if there is any foreign matter or metal particles inside.

This method is especially effective for bearings that can not be approached for inspection or the large bearings.

## Bearing damages and solutions

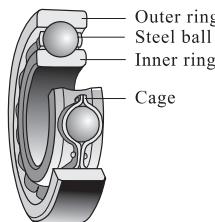
There is no method to view directly when the bearing is operating, but it can be known abnormality by the status of noise, vibration, temperature and lubricant. Typical bearing injury examples are listed in following table:

Item	Appearances	Possible reasons	Solutions
Peeling off	Peeling off and deformation of the rotational surface	Too heavy load or improper applications Mal-mounting Poor precision of the shaft or bearing box Clearance too small Intrusion of foreign matter Rusting Hardness decrease caused by a normal high temperature	Re-consider the application condition Consider other bearing specifications Re-consider the clearance Check the processing precision of the shaft and the bearing box Consider the surrounding design Check the mounting method Check the lubricant and lubricating method
Burns	Overheat color varying, then burning, leading to failure to rotate	Clearance too small (including clearance for the deforming part) Insufficient lubrication or inappropriate lubricant Load too heavy (pre-load too heavy) Skewing rollers	Choose proper clearance (increasing clearance) Check lubricant type and ensure the amount Check application condition Avoid positioning error Check surrounding design (including the heat to bearings) Improve the mounting method
Cracks	Partial breach and even cracks	Too big shock load Interference too heavy Big peeling off and frictional cracks Poor precision of the mounting side (corner circle too big) Frictional cracks Mal-applications (using copper hammer, intrusion of big foreign matter)	Check the application condition Set proper interference and check material quality Improve mounting and application method Prevent frictional cracks (check lubricants) Check bearing surrounding design
Cage damage	Loosening or broken rivet Broken cage	Too big torque load High speed rotation or speed changing frequent Poor lubrication Intrusion of foreign matter Yoo big vibration Bad mounting (mounting in leaning condition) Abnormal increase in temperature (resin cage)	Check application conditions Check lubrication conditions Re-consider choice of cage Pay attention to application Consider rigidity of the shaft and the bearing box

Item	Appearances	Possible reasons	Solutions
Scratches	Rough surface with small deposit Scratches between the flanges of rings and the side surfaces of the rollers	Poor lubrication Intrusion of foreign matter Skewing rollers caused by leaning Too big axial load leading to no lubricant on flange surface Bad surface roughness Big sliding of the rolling elements	Re-consider lubricant and lubricating method Check application method Set proper pre-load Reinforce the sealing function Use bearings correctly
Rusting corrosion	Rusting on all or part of the surface Rust on rolling elements in pitch shape	Poor maintenance Improper packaging Insufficient rust-preventive Intrusion of moist acid liquid Taking the bearing by hands	Maintenance to prevent rusting Reinforcing the sealing function Check the lubricant regularly Pay attention to bearing application
Corrosion	Red corroded particles in the fit surface	Insufficient amount of interference Small bearing oscillating angle Insufficient lubrication (or without lubrication) Not stable load Vibration in the transit	Check the interference and the condition of the lubricant Separable packing of inner rings and outer rings when in transit, pre-load shall prevail if the bearings are un-separable Re-consider choice of lubricant Re-consider choice of bearings
Wear	Surface worn, with scratches and traces leading to dimension changes	Foreign matters in the lubricant Poor lubrication Rollers skewing	Check lubricant and lubrication method Reinforce sealing function Prevent positioning error
Electric corrosion	Crater-like pits on the rolling surface and to be corrugation shape	Electrical current in the rolling surface	Use current by-pass value Adopt insulation to avoid current passing through inside of the bearing
Dent and bruise	Intrusion of solid foreign matter or pits in the surface caused by shock or scratches from mounting	Solid foreign matter intrusion Peels inside the bearing Shock from mal-mounting Peeling off Mounting in learning conditions	Improve mounting and application methods Prevent foreign matter from intruding Check other parts if caused by metal pieces
Creep deformation	Slippery ID surface and OD surface leading to mirror surface and sometimes blocking	Insufficient interference at the fit surface Sleeve not fastened enough Abnormal increase in temperature Too heavy load	Re-consider the interference amount Consider the application condition Check precision of shaft and bearing box

## Product Characteristics

Deep groove ball bearing consists of four basic parts, which are an inner raceway (inner ring), an outer raceway (outer ring), steel balls and a cage. With normal rotation, inner raceway, outer raceway and steel balls accommodate the load while the cage plays a role in separating the balls and keeping stable. Single-row deep groove ball bearing has a simple structure, non-split inner ring and outer ring and easy to be used so it is widely used in machinery industry such as precision meter, low noise electric motor, automobile, motorcycle, woodworker, transmission shaft of textile machinery, mining machinery, electromechanical equipments, plastic machinery, office equipments, medical equipments, fitness equipments, national defense industry, aeronautic industry, aerospace industry, excise equipments and other general machinery.



(Deep groove ball bearing)

Single-row deep groove ball bearing is mainly used for accommodating radial load and certain axial load. When this bearing is given a larger radial clearance, this bearing will have a feature as radial thrust bearing to carry larger axial load and also can limit the axial movement in two direction. Different clearances allow a relative misalignment of inner ring and outer ring ranging from 8° to 16°.

## Types of bearing

ZWZ manufactures following categories of deep groove ball bearing currently:

- Single-row deep groove ball bearing

- Single-row deep groove ball bearing with shield(s)
- Single-row deep groove ball bearing with seal(s)
- Single-row deep groove ball bearing with snap groove or snap ring on the outer ring

**Single-row deep groove ball bearing** is used for the applications without special requirements for mounting, sealing and interface.

**Single-row deep groove ball bearing with shield(s)** is used for the applications with difficulties in lubricating and checking lubrication or special situations. There is gap between shield(s) and inner ring. Single-row deep groove ball bearing with two shields has been filled with lubricant when manufacturing, so it is unnecessary to wash and fill lubricant before mounting. It is also unnecessary to add lubricant within lubricating period during operating.

**Single-row deep groove ball bearing with seal(s)** has a seal or seals with steel frame. The seal is contact type and has a more superior waterproof property than single-row deep groove ball bearing with shield(s). However, the rotation speed of this bearing is lower than single-row deep groove ball bearing with shield(s) due to the larger friction force.

**Single-row deep groove ball bearing with snap groove or snap ring on the outer ring** simplifies the mounting in housing as a result of positioning with snap ring in axial direction.

## Dimension scope

The basic dimensions of deep groove ball bearing manufactured by ZWZ are listed in the dimension table.

Dimension range of bore diameter: 10mm~1320mm  
 Dimension range of outer diameter: 30mm~1600mm  
 Dimension range of overall width: 9mm~300mm

## Tolerance

The standard tolerance of deep groove ball bearing manufactured by ZWZ is Normal class, which conforms to GB307.1. Please refer to tolerance value listed in the table of preface pages.

## Radial Clearance

The standard internal clearances of deep groove ball bearing manufactured by ZWZ are C2, normal (C0), C3, C4 and C5, which conforms to GB4604. Please refer to radial clearances listed in the table of preface pages. The values are available for the bearings before mounting or without load.

The bearings with internal clearance large or lower than standard values also can be developed.

## Cage

Deep groove ball bearing has stamped steel cage or solid brass cage. When outer diameter

is lower than 400mm, stamped steel cage is adopted without suffix after basic bearing number. When outer diameter is larger than 400mm, solid brass cage is adopted without suffix after basic bearing number.

## Allowable Angle Error

Deep groove ball bearing allows different relative misalignments of inner ring with outer ring by radial clearance as follows:

Radial clearance	Allowable angle error
Normal	8°
C 3	12°
C 4	16°

Dynamic Equivalent Load:

$$P_0 = XFr + YFa \text{ [KN]}$$

Where,

Fr: Radial load KN

Fa: Axial load KN

$\frac{Fa}{Co}$	Normal				C3				C4						
	$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$		$e$		$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$		$e$				
	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

Static Equivalent Load:

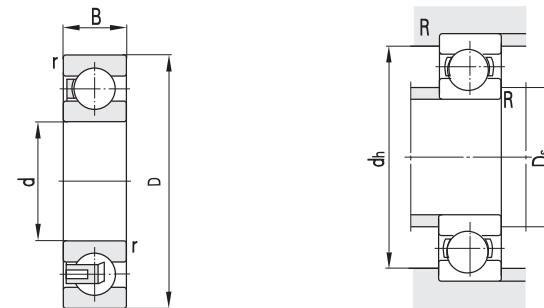
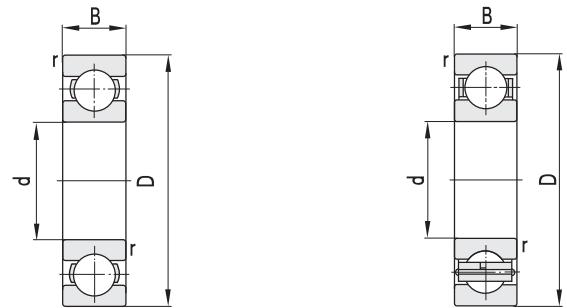
$$P_0 = Fr \text{ [KN]} \quad Fa/Fr \geq 0.8$$

$$P_0 = 0.6Fr + 0.5Fa \text{ [KN]} \quad Fa/Fr > 0.8$$

# Deep Groove Ball Bearings

**ZWZ**

d 10~30 mm



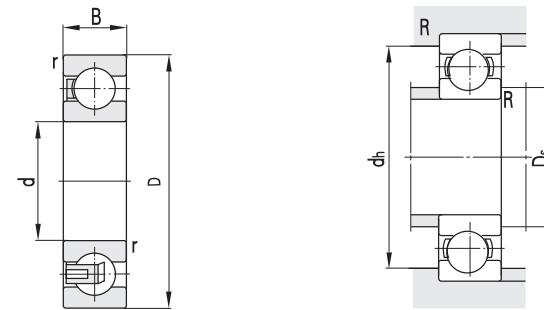
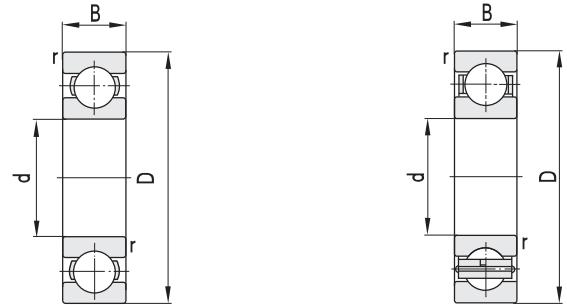
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
10	30	9	0.6	6.50	3.00	24000	30000
12	32	10	0.6	6.50	3.00	22000	28000
15	35	11	0.6	8.00	4.00	19000	24000
17	40	12	0.6	9.10	5.00	17000	20000
20	47	14	1	13.0	6.70	15000	18000
	47	14	1	13.0	6.70	15000	18000
	62	16	1	18.2	10.0	13000	16000
22	56	16	1.1	14.2	9.25	12000	15000
23	56	15	1	18.5	9.30	12000	15000
	56	15	1	18.5	9.30	12000	15000
25	42	9	0.3	9.50	4.55	16000	19000
	47	12	0.6	10.6	5.00	15000	18000
	47	8	0.3	8.45	5.00	14000	17000
	52	15	1	14.3	8.00	12000	15000
	52	15	1	14.3	8.00	12000	15000
	62	17	1.1	22.4	11.5	11000	14000
	68	18	1.1	26.3	12.9	11000	14000
	80	21	1.5	37.5	19.0	9000	11000
26	68	19.5	2	40.3	17.0	9500	12000
28	68	18	1.1	32.5	13.0	9000	11000
30	47	9	0.3	9.75	4.95	14000	17000
	59	22	0.4	13.0	8.00	10000	13000
	62	16	1	19.2	11.4	10000	13000
	72	19	1.1	26.7	15.0	9000	11000
	90	23	1.5	44.5	22.8	8500	10000

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm			Kg	
6200	14	26	0.6	0.0277
6201	16	28	0.6	0.0365
6202	19	31	0.6	0.0431
6203	21	36	0.6	0.0661
6204	25	42	1	0.110
6204TN1	25	42	1	0.104
6304X3/C3	28	54	1	0.252
63/22/C3	29	47	1	0.183
66/23/P53YB2	29	47	1	0.131
66/23/P53Z2	29	47	1	0.125
61905	27	40	0.3	0.0415
6005	29	43	0.6	0.078
16005	27	45	0.3	0.0562
6205	30	47	1	0.134
6205TN1	30	47	1	0.126
6305	31.5	55.5	1	0.214
6305X3/C3YA5	33	62	1	0.296
6405	33	72	1.5	0.530
6605X2WBTN1/HA	33	61	2	0.272
63/28/HA	34.5	61.5	1	0.299
61906	32	45	0.3	0.0433
1-0005	33	55	0.4	0.191
6206	35	57	1	0.218
6306	36.5	65.5	1	0.354
6406	38	82	1.5	0.805

# Deep Groove Ball Bearings

**ZWZ**

d 33~45 mm



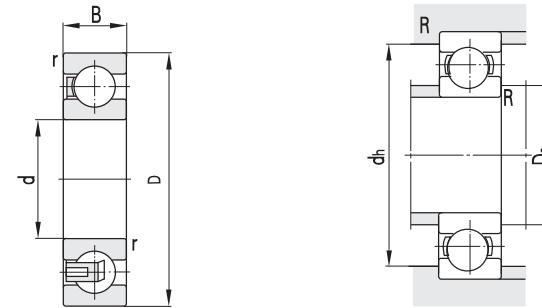
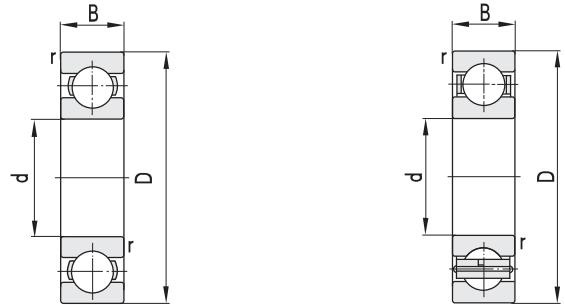
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
33	72	17	1.1	22.5	13.6	9100	11000
35	62	14	1	16.3	10.5	10000	13000
	72	17	1.1	25.7	15.3	9000	11000
	80	21	1.5	35.5	19.2	8500	10000
	80	21	1.5	35.5	19.2	8500	10000
	100	25	1.5	55.5	29.5	7000	8500
40	68	15	1	21.8	11.6	9500	12000
	80	18	1.1	31.0	17.9	8500	10000
	80	18	1.1	31.0	17.9	8500	10000
	80	18	1.1	31.0	17.9	8500	10000
	80	18	1.1	31.0	17.9	8500	10000
	90	23	1.5	41.0	24.0	7500	9000
	90	23	1.5	41.0	24.0	7500	9000
	90	23	1.5	41.0	24.0	7500	9000
	90	23	1.5	41.0	24.0	7500	9000
	110	27	2	67.5	36.0	6700	8000
41	80	17	1.1	31.0	19.0	8500	10000
45	75	10	0.6	14.9	11.4	9000	11000
	75	16	1	20.0	14.0	9000	11000
	85	19	1.1	31.5	20.4	7500	9000
	85	19	1.1	31.5	20.4	7500	9000
	85	19	1.1	31.5	20.4	7500	9000
	85	19	1.1	31.5	20.4	7500	9000
	85	19	1.1	42.5	32.0	5300	7500
	100	25	1.5	52.5	30.0	6700	8000
	100	25	1.5	52.5	30.0	6700	8000
	100	25	1.5	52.6	30.1	6700	8000
	100	25	1.5	52.7	30.2	6700	8000
	100	25	1.5	52.5	30.0	6700	8000
	100	25	1.5	52.5	30.0	6700	8000

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
62/33	38	66.5	1	0.308
6007	40	57	1	0.148
6207	41.5	65.5	1	0.284
6307	43	72	1.5	0.456
6307TN1	43	72	1.5	0.443
6407	43	92	1.5	0.919
6008/C3	44.6	63.4	1	0.191
6208	46.5	73.5	1	0.361
6208/HAP6	46.5	73.5	1	0.361
6208/P5YB2	46.5	73.5	1	0.361
370208	46.5	73.5	1	0.362
6308/P5YB2	48	82	1.5	0.642
6308	48	82	1.5	0.642
6308TN1	48	82	1.5	0.611
6308/HA	48	82	1.5	0.642
6308/C9YA4	48	82	1.5	0.642
6408	49	101	2	1.20
62/41/HAP53	46.5	73.5	1	0.342
16009	49	71	0.6	0.165
6009	50	70	1	0.246
6209	51.5	78.5	1	0.428
6209TN1	51.5	78.5	1	0.416
6209K	51.5	78.5	1	0.419
6209MA	51.5	78.5	1	0.492
209	51.5	78.5	1	0.492
6309/YB5	53	92	1.5	0.850
6309/HAC3V2YA7	53	92	1.5	0.807
309U2	53	92	1.5	0.850
309HU	53	92	1.5	1.05
6309A	53	92	1.5	0.859
6309	53	92	1.5	0.850

# Deep Groove Ball Bearings

**ZWZ**

d 45~60 mm



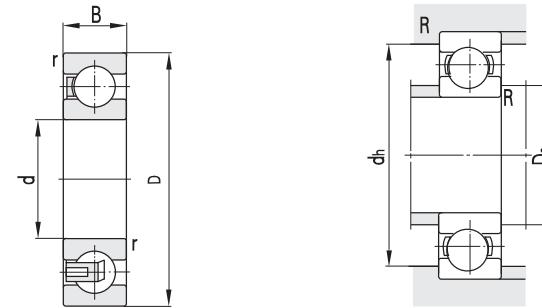
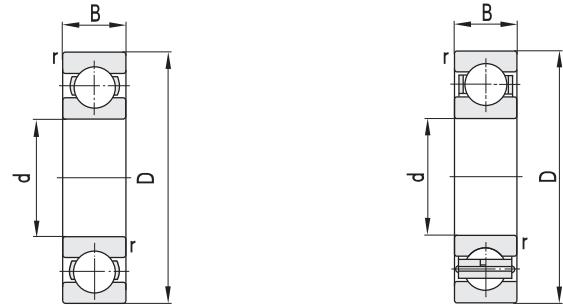
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
				KN		r/min	
45	100	25	1.5	52.5	30.0	6700	8000
	120	29	2	78.0	46.0	6000	7000
50	72	12	0.6	13.5	11.0	8500	100000
	80	10	0.6	15.4	12.3	8500	100000
	80	16	1	22.0	16.3	6500	10000
	90	20	1.1	35.0	23.2	7100	8500
	90	20	1.1	35.0	23.2	7100	8500
	90	20	1.1	35.0	23.2	7100	8500
	110	27	2	62.0	38.0	6300	7500
	110	27	2	62.0	38.0	6300	7500
	110	27	2	62.0	38.0	6300	7500
	110	27	2	62.0	38.0	6300	7500
	111	27	2.3	62.0	38.0	6300	7500
	130	31	2.1	92.0	55.0	5300	6300
55	72	9	0.3	8.80	8.10	8500	10000
	90	11	0.6	21.3	14.2	7500	9000
	90	18	1.1	31.5	18.4	7500	9000
	100	21	1.5	43.5	28.8	6300	7500
	100	21	1.5	43.5	28.8	6300	7500
	120	29	2	71.5	45.0	5600	6700
	120	29	2	71.5	45.0	5600	6700
	140	33	2.1	100	62.0	5000	6000
60	85	13	1	17.0	15.1	7500	9000
	95	11	0.6	19.1	16.5	6700	8000
	95	18	1.1	30.0	23.0	6700	8000
	95	18	1.1	30.0	23.0	6700	8000
	110	22	1.5	53.0	33.0	5600	7100
	110	22	1.5	53.0	33.0	5600	7100
	110	22	1.5	53.0	33.0	5600	7100
	110	22	1.5	53.0	33.0	5600	7100
	110	22	1.5	53.0	33.0	5600	7100
	110	31	2.1	82.0	48.5	5300	6300

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
6309TN1	53	92	1.5	0.811
6409	54	111	2	1.69
61910	53.2	68.8	0.6	0.134
16010	54	76	0.6	0.179
6010	55	75	1	0.248
6210/H.A	56.5	83.5	1	0.504
6210/C9YA6	56.5	83.5	1	0.474
6210	56.5	83.5	1	0.504
6310	59	101	2	1.07
6310A	59	101	2	1.12
6310TN1	59	101	2	0.998
6310TN11	59	101	2	0.998
810	61	101	2	1.10
6410	61	119	2	1.85
61811	57	70	0.3	0.0845
7000111	59	85	0.6	0.307
6011	61	84	1	0.384
6211K	63	92	1.5	0.620
6211	63	92	1.5	0.605
6311	64	111	2	1.39
6311TN1	64	111	2	1.31
6411	66	129	2	2.31
61912	64.5	80.5	1	0.201
16012	64	91	0.6	0.27
6012	66.5	88.5	1	0.426
6012M	66.5	88.5	1	0.497
6212	68	102	1.5	0.793
212	68	102	1.5	0.793
212U	68	102	1.5	0.793
212U1	68	102	1.5	0.793
6212/YA5	68	102	1.5	0.772
6212K	68	102	1.5	0.781
6312A	71	119	2	1.75

# Deep Groove Ball Bearings

**ZWZ**

d 60~75 mm



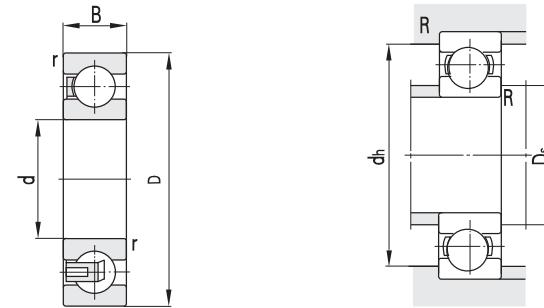
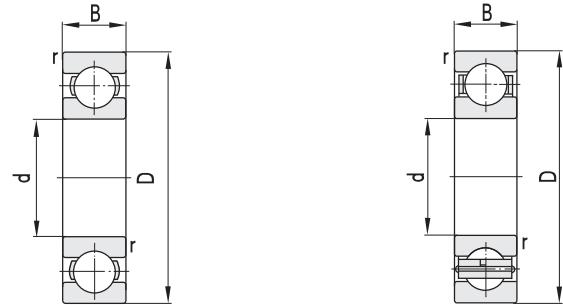
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings	
				rsmin	Cr	Cor	Grease
mm				KN		r/min	Oil
60	130	31	2.1	82.0	48.5	5300	6300
	130	31	2.1	82.0	48.5	5000	6000
	130	31	2.1	82.0	48.5	5000	6000
	150	35	2.1	109	70.0	4800	5600
65	90	13	1	19.5	17.0	6700	8000
	100	18	1.1	32.0	25.0	6300	7500
	100	18	1.1	32.0	25.0	6300	7500
	120	23	1.5	56.0	41.0	5300	6300
	120	23	1.5	56.0	41.0	5300	6300
	120	23	1.5	56.0	41.0	5300	6300
	120	23	1.5	56.0	41.0	5300	6300
	120	23	1.5	56.0	41.0	5300	6300
	140	33	2.1	92.5	59.5	4800	5600
	140	33	2.1	92.5	59.5	4800	5600
	140	33	2.5	92.5	59.5	4800	5600
	140	33	2.1	92.5	59.5	5600	4800
	160	37	2.1	118	78.5	4500	6300
70	110	20	1.1	38.0	31.0	6000	7000
	110	20	1.1	38.0	31.0	6000	7000
	125	24	1.5	60.5	46.0	5000	6000
	125	24	1.5	60.5	46.0	5000	6000
	150	35	2.1	104	68.0	4500	5300
	150	35	2.1	104	68.0	4500	5300
	150	35	2.1	104	68.0	4500	5300
	150	35	2.1	104	68.0	4500	5300
	150	35	2.1	104	68.0	4500	5300
	150	35	2.1	104	68.0	4500	5300
	180	42	3	143	103	3800	4500
72	110	20	1.1	38.0	31.0	4500	5300
75	115	20	1.1	38.0	31.0	5600	6700
	115	20	1.1	38.0	31.0	5600	6700

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				Kg
6312	71	119	2	1.71
6312Q1	71	119	2	2.07
6312TN1	71	119	2	1.64
6412	71	139	2	2.78
61913	70	85	1	0.203
6013	71.5	93.5	1	0.428
6013M	71.5	93.5	1	0.553
6213	73	112	1.5	0.973
6213MA	73	112	1.5	1.23
6213A	73	112	1.5	1.00
213G	73	112	1.5	1.01
180213	73	112	1.5	1.06
6313	76	129	2	2.10
6313A	76	129	2	1.85
6313/YA6	76	129	2.5	2.09
6313M	76	129	2	2.10
6413	76	149	2	3.25
6014	76.5	103.5	1	0.620
6014M	76.5	103.5	1	0.757
6214	78	117	1.5	1.34
6214A	78	117	1.5	1.12
6314A	81	139	2	2.60
6314/P6CMV2	81	139	2	2.55
314U1	81	139	2	2.55
6314	81	139	2	2.55
6314/C9	81	139	2	2.55
6314/YA6	81	139	2	2.55
6314TN1	81	139	2	2.46
6414	83	167	2.5	4.73
60/72	77	105	1	0.584
6015	81.5	108.5	1	0.630
6015M	81.5	108.5	1	0.804

# Deep Groove Ball Bearings

**ZWZ**

d 75~85 mm



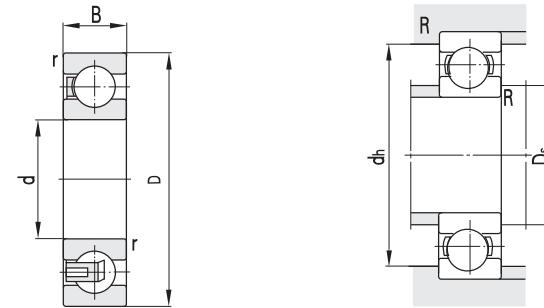
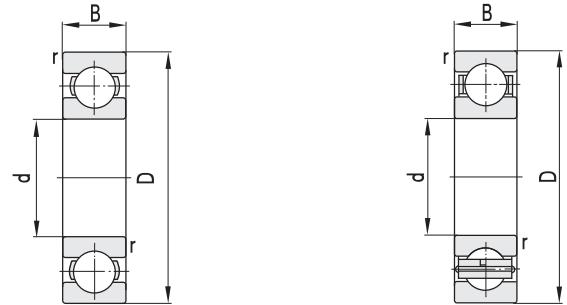
Principal dimensions d	D	B	rsmin	Basic load ratings		Limit speed ratings	
				Cr	Cor	Grease	Oil
mm				KN	r/min		
75	115	13	0.6	22.1	22.0	5600	6700
	130	25	1.5	66.0	50.0	4800	5600
	130	25	1.5	66.0	50.0	4800	5600
	130	25	1.5	66.0	50.0	4800	5600
	130	25	1.5	66.0	50.0	4800	5600
	160	37	2.1	113	116	4300	5000
	160	37	2.1	113	116	4300	5000
	160	37	2.1	113	116	4300	5000
	160	37	2.1	113	116	4300	5000
	160	37	2.1	113	116	4300	5000
	190	45	3	153	114	3600	4300
80	110	16	1	27.5	25.0	5600	6700
	125	22	1.1	47.5	40.0	5300	6300
	125	14	0.6	32.0	30.0	5300	6300
	125	22	1.1	47.5	40.0	5300	6300
	140	26	2	71.5	54.5	4500	5300
	140	26	2	71.5	54.5	4500	5300
	170	39	2.1	119	86.5	3800	4500
	170	39	2.1	119	86.5	3800	4500
	170	39	2.1	119	86.5	3800	4500
	200	48	3	164	125	3400	4000
85	120	18	1.1	30.3	27.0	5300	6300
	130	14	0.6	31.5	30.0	5000	6000
	130	22	1.1	47.5	40.0	5000	6000
	130	22	1.1	47.5	40.0	5000	6000
	150	28	2	83.0	64.0	4300	5000
	150	28	2	83.0	64.0	4300	5000
	150	28	2	83.0	64.0	4300	5000
	150	28	2	83.0	64.0	4300	5000
	180	41	3	102	96.5	3800	4500
	180	41	3	102	96.5	3800	4500
	180	41	3	102	96.5	3800	4500

Designations	Abutment and fillet dimensions			Weight Kg
	Ds(min)	dh(max)	R(max)	
	mm			Kg
16015	81.5	108.5	1	0.583
6215	83	122	1.5	1.16
6215A	83	122	1.5	1.21
6215M	83	122	1.5	1.45
6215K	83	122	1.5	1.16
6315	86	149	2	3.10
6315A	86	149	2	3.03
315U1	86	149	2	3.02
6315/YA8	86	149	2	3.03
6315M	86	149	2	3.77
6415	88	177	2.5	5.57
61916	85	105	1	0.350
6016	86.5	118.5	1	0.860
16016	84	121	0.6	0.599
6016M	86.5	118.5	1	1.08
6216A	89	131	2	1.47
6216	89	131	2	1.43
6316	91	159	2	3.64
6316M/HQ1	91	159	2	4.54
6316A	91	159	2	3.68
6416	93	187	2.5	6.63
61917	91	114	1	0.557
16017	89	126	0.6	0.636
6017	91.5	123.5	1	0.935
6017M	91.5	123.5	1	1.12
6217	94	141	2	1.80
6217K	94	141	2	1.81
6217A	94	141	2	1.85
6217/HA	94	141	2	1.80
6217M	94	141	2	1.91
6317	98	167	2.5	4.33
6317/P6CMV2	98	167	2.5	4.33
6317M	98	167	2.5	4.97
317U1	98	167	2.5	4.33

# Deep Groove Ball Bearings

**ZWZ**

d 85~100 mm



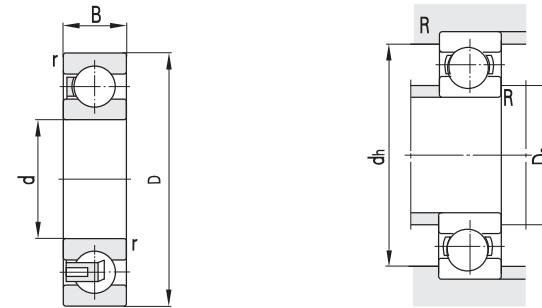
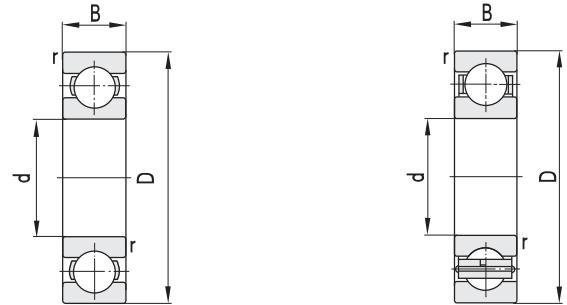
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
85	210	52	4	165	136	3200	3800
90	125	18	1.1	33.0	31.5	5000	6000
	125	18	1.1	33.0	31.5	5000	6000
	125	18	0.6	33.0	31.5	5000	6000
140	24	1.5	58.5	50.0	4800	5600	
140	24	1	58.5	50.0	4800	5600	
140	24	1.5	58.5	50.0	4800	5600	
160	30	2	95.5	72.0	3800	4500	
160	30	2	95.5	72.0	3800	4500	
190	43	3	144	108	3400	4000	
190	43	3	144	108	3400	4000	
190	43	3	144	108	3400	4000	
190	43	5.5	144	108	3400	4000	
225	54	4	193	158	3000	3600	
95	120	13	1	19.3	20.4	5000	6000
130	18	1.1	33.8	33.0	4800	5600	
145	16	1	40.5	39.0	4500	5300	
145	24	1.5	78.5	54.0	4500	5300	
170	32	2.1	108	81.5	3600	4300	
170	32	2.1	108	81.5	3600	4300	
200	45	3	152	122	3200	3800	
200	45	3	152	122	3200	3800	
200	45	3	152	122	3200	3800	
200	45	3	152	122	3200	3800	
240	55	4	204	171	3400	3600	
100	125	13	1	19.6	21.2	4800	5600
140	20	1.1	34.5	35.0	4500	5300	
140	20	1.1	34.5	35.0	4500	5300	
150	16	1	43.6	44.0	4300	5000	
150	24	1.5	57.5	56.5	4300	5000	
150	24	1.5	57.5	56.5	4300	5000	
180	28	1.8	116	92.0	3400	4000	

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
6417	101	194	3	8.12
61918	96.5	118.5	1	0.572
61918M	96.5	118.5	1	0.680
61918/YA6	96.5	118.5	0.5	0.572
6018	98	132	1.5	1.16
16018M	95	135	1	0.941
6018M	98	132	1.5	1.39
6218	99	151	2	2.19
218U1	99	151	2	2.19
6318	103	177	2.5	4.97
6318/CM	103	177	2.5	4.97
6318M/C4	103	177	2.5	6.37
6318/YA6	103	177	2.5	4.97
6418	106	209	3	9.47
Kg				
61819	99.6	115	1	0.288
61919	101	124	1	0.610
16019	100	140	1	0.884
6019	103	137	1.5	1.14
6219	106	159	2	2.61
6219M	106	159	2	3.26
6319	108	187	2.5	5.65
6319/CM	108	187	2.5	5.58
6319A	108	187	2.5	5.84
6319F1/HQ1	108	187	2.5	6.93
6319M/HQ1	108	187	2.5	7.11
6419M	108	215	2.5	13.4
61820	105	120	1	0.326
61920M	106.5	133.5	1	0.960
61920	106.5	133.5	1	0.850
16020	108	142	1	0.916
6020	108	142	1.5	1.17
6020M	108	142	1.5	1.40
720	111.5	171.5	1.8	2.70

# Deep Groove Ball Bearings

**ZWZ**

d 100~120 mm



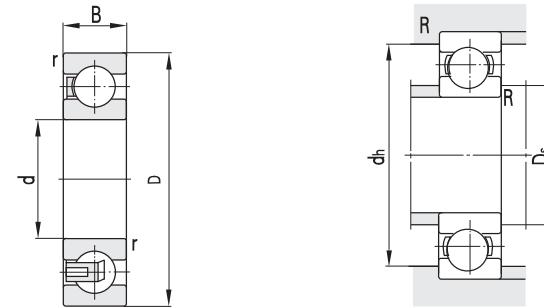
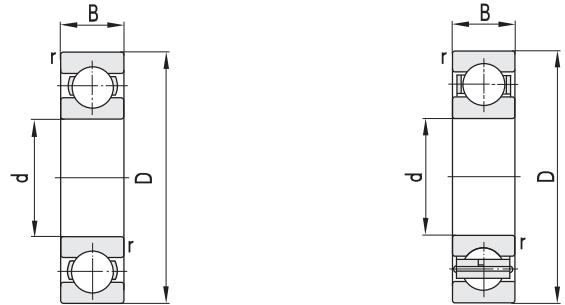
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings	
				rsmin	Cr	Cor	Grease
mm				KN		r/min	
100	180	34	2. 1	122	93. 0	3400	4000
	215	47	3	173	141	2800	3600
	215	47	3	173	141	2800	3600
	215	47	3	173	141	2800	3600
	215	47	3	173	141	2800	3600
	215	47	3	173	141	2800	3600
	250	58	4	224	195	2600	3400
	250	58	4	224	195	2600	3400
105	130	13	1	19. 5	21. 0	4500	5300
	160	26	2	73. 0	65. 5	4000	4800
	160	26	2	73. 0	66. 5	4000	4800
	160	26	2	73. 0	65. 5	4000	4800
	180	22	1. 1	68. 0	65. 0	4200	5000
	190	36	2. 1	132	105	3200	3800
	225	49	3	240	154	2800	3400
110	140	16	1	24. 8	28. 0	4300	5000
	150	20	1. 1	43. 5	44. 5	4000	4800
	150	20	1. 1	43. 5	44. 5	4000	4800
	170	19	1	57. 2	57. 0	3800	4500
	170	28	2	82. 0	73. 5	3800	4500
	170	28	2	82. 0	73. 5	3800	4500
	170	28	2	82. 0	73. 5	3800	4500
	200	38	2. 1	133	106	2800	3400
	200	38	2. 1	133	106	2800	3400
	240	50	3	205	176	2400	3000
	240	50	3	205	176	2400	3000
	240	50	3	205	176	2400	3000
	280	65	4	265	226	2200	3000
	280	65	4	265	226	2200	3000
120	150	16	1	24. 7	28. 0	3800	4500
	165	22	1. 1	53. 0	54. 0	3600	4300
	165	22	1. 1	53. 0	54. 0	3600	4300
	180	19	1	60. 5	64. 0	3400	4000

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
	mm		Kg	
6220	111	169	2	3. 20
6320	113	202	2. 5	7. 01
6320A	113	202	2. 5	7. 10
6320M	113	202	2. 5	8. 94
6320MA	113	202	2. 5	9. 28
6320/YA8	113	202	2. 5	7. 11
6420	116	234	3	12. 8
6420M	116	234	3	15. 4
61821M	110	125	1	0. 362
6021	114	151	2	1. 62
6021A	114	151	2	1. 65
6021M	114	151	2	1. 92
721	113. 5	173. 5	1	2. 61
6221	116	179	2	3. 66
6321	118	212	2. 5	7. 84
61822	115	135	1	0. 505
61922	116. 5	143. 5	1	0. 888
61922M	116. 5	143. 5	1	1. 01
16022	115	165	1	1. 48
6022	119	161	2	2. 09
6022M	119	161	2	2. 72
6022M/YB5	119	161	2	2. 71
6222	121	189	2	4. 29
6222M	121	189	2	5. 46
6322	123	227	2. 5	9. 49
6322A	123	227	2. 5	9. 72
6322M	123	227	2. 5	11. 8
6422	126	264	3	18. 3
6422M	126	264	3	19. 0
61824	125	145	1	0. 568
61924	126. 5	158. 5	1	1. 21
61924M	126. 5	158. 5	1	1. 54
16024	125	175	1	1. 64

# Deep Groove Ball Bearings

**ZWZ**

d 120~140 mm



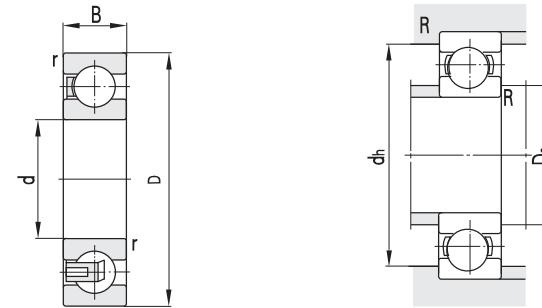
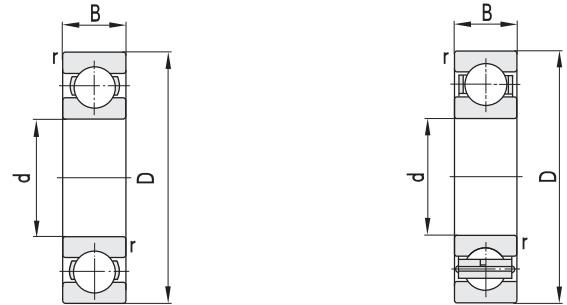
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
120	180	19	1	60.5	64.0	3400	4000
	180	28	2	85.5	80.0	3400	4000
	180	28	2	85.5	80.0	3400	4000
	180	28	2	85.5	80.0	3400	4000
	215	40	2.1	156	131	2800	3400
	215	40	2.1	156	131	2800	3400
	260	55	3	228	207	2200	2800
	260	55	3	228	207	2200	2800
	260	55	3	228	207	2200	2800
	260	55	3	228	207	2200	2800
120.65	165.1	22.225	1.1	53.3	54.0	3600	4300
121	165	22	1.1	53.3	54.0	3600	4300
127	228.6	34.925	2	148	133	2200	2800
130	165	18	1.1	35.8	38.0	3600	4300
	180	24	1.5	65.0	67.0	3400	4000
	180	24	1.5	65.0	67.0	3400	4000
	190	19	0.7	56.0	60.0	3200	3800
	190	19	0.7	56.0	60.0	3200	3800
	200	22	1.1	79.5	81.5	3200	3800
	200	22	1.1	79.5	81.5	3200	3800
	200	33	2	101	94.0	3200	3800
	200	33	2	101	94.0	3200	3800
	200	33	2	101	94.0	3200	3800
	230	40	3	165	148	2600	3200
	230	40	3	165	148	2600	3200
	230	40	3	165	148	2600	3200
	230	40	3	165	148	2600	3200
	280	58	4	250	239	2200	2600
	280	58	4	250	239	2200	2600
	280	58	4	250	239	2200	2600
	280	58	4	250	239	2200	2600
140	175	18	1.1	37.0	40.0	3400	4000

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
16024M	125	175	1	1.82
6024	129	171	2	2.21
6024A	129	171	2	2.02
6024M	129	171	2	2.68
6224	131	204	2	5.26
6224M	131	204	2	6.33
6324	133	247	2.5	12.2
6324A	133	247	2.5	12.5
6324M/C3	133	247	2.5	13.7
6324F1/HQ1	133	247	2.5	13.4
619/121X4M	126.5	158.5	1	1.48
619/121M	126.5	158.5	1	1.48
925	136	219.6	2	7.00
61826MA	136	159	1	0.898
61926M	138	172	1.5	1.92
61926	138	172	1.5	1.56
726	134	186	0.7	1.70
726H	134	186	0.7	1.91
16026M	136.5	193.5	1	2.32
16026	136.5	193.5	1	2.19
6026	139	191	2	3.29
6026M	139	191	2	3.96
6026MA	139	191	2	3.98
6226	143	217	2.5	6.04
226HU1	143	217	2.5	7.51
226U1	143	217	2.5	6.16
6226MA	143	217	2.5	7.91
6326	146	264	3	14.7
6326A	146	264	3	14.9
6326F1/HQ1	146	264	3	16.7
6326M	146	264	3	18.3
61828M	146.5	168.5	1	0.930

# Deep Groove Ball Bearings

**ZWZ**

d 140~160 mm



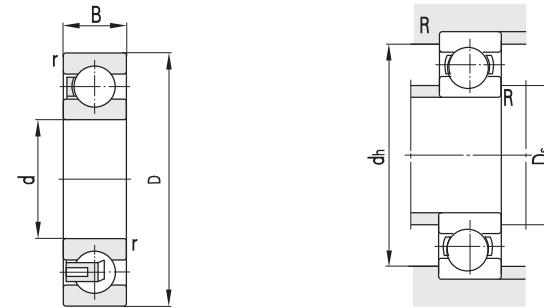
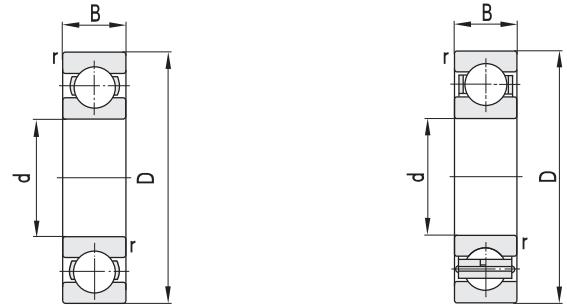
Principal dimensions d mm	D	B	rsmin	Basic load ratings		Limit speed ratings	
				Cr	Cor	Grease	Oil
140	175	18	1.1	37.0	40.0	3400	4000
	190	24	1.5	64.0	67.5	3200	3800
	210	22	1.1	80.5	86.5	3000	3600
	210	33	2	106	102	3000	3600
	210	33	2	106	102	3000	3600
	210	33	2	106	102	3000	3600
	210	33	2	106	102	3000	3600
	250	42	3	166	150	2400	3000
	250	42	3	166	150	2400	3000
	300	62	4	253	246	2000	2600
	300	62	4	253	246	2000	2600
144	185	22	0.7	62.5	70.0	3600	4000
149	201	33	0.7	105	102	3000	3600
150	190	20	1.1	46.4	53.0	3000	3600
	210	28	2	84.5	90	2800	3400
	225	24	1.1	89.0	96.0	2600	3200
	225	24	1.1	91.0	98.5	2600	3200
	225	35	2.1	131	125	2600	3200
	225	35	2.1	131	125	2600	3200
	225	35	2.1	131	125	2600	3200
	270	45	3	175	169	2000	2600
	270	45	3	175	169	2000	2600
	320	65	4	277	280	1800	2200
	320	65	4	360	280	1800	2200
	320	65	4	277	280	1800	2200
160	200	20	1.1	49.5	59	2600	3200
	220	28	2	87.5	90.0	2600	3200
	240	25	1.5	94.0	104	2400	3000
	240	25	1.5	95.0	104	2400	3000
	240	38	2.1	143	138	2400	3000
	240	38	2.1	143	138	2400	3000
	240	38	2.1	143	138	2400	3000

Designations	Abutment and fillet dimensions			Weight Kg
	Ds(min)	dh(max)	R(max)	
61828MA	146.5	168.5	1	0.930
61928M	148	182	1.5	2.11
16028M	146.5	203.5	1	3.08
6028	146.5	201	2	3.25
6028/C9	149	201	2	3.24
6028/C9YB2	149	201	2	3.25
6028M	149	201	2	3.89
6228	153	237	2.5	7.41
6228M	153	237	2.5	9.44
6328	156	284	3	18.5
6328M	156	284	3	21.3
928T3	148	181	0.7	1.07
930T3	153	197	0.7	1.79
61830M	156	184	1	1.36
61930M	159	201	2	3.04
16030	156.5	218.5	1	3.14
16030M	156.5	218.5	1	3.63
6030	161	214	2	4.14
6030/C9	161	214	2	4.14
6030M	161	214	2	5.01
6230	163	257	2.5	9.76
6230M	163	257	2.5	11.8
6330	166	304	3	21.4
IS-6330	166	304	3	22.2
6330M	166	304	3	26.0
61832M	168	192	1.1	1.32
61932M	169	211	2	3.28
16032	168	232	1.5	3.95
16032M	168	232	1.5	4.61
6032	171	229	2	5.63
6032/C9	171	229	2	5.34
6032M	171	229	2	6.41

# Deep Groove Ball Bearings

**ZWZ**

d 160~190 mm



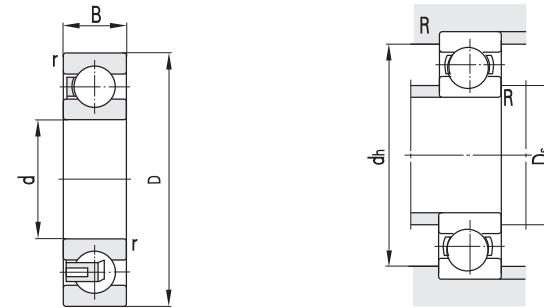
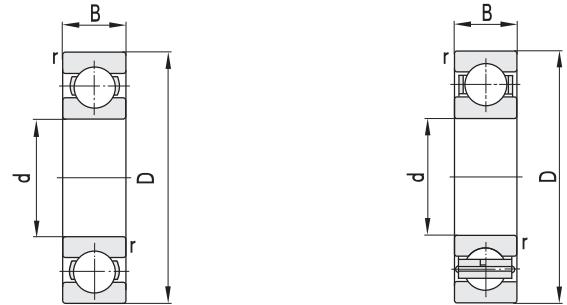
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
			KN			r/min	
160	290	48	3	210	210	1900	2400
	290	48	3	210	210	1900	2400
	340	68	4	310	325	1800	2200
165	250.5	35	2.5	147	143	2200	2600
170	215	22	1.1	65.0	61.0	2600	3200
	215	22	1.1	65.0	61.0	2600	3200
	230	28	2	115	100	2400	3000
	260	28	1.5	119	128	2200	2800
	260	28	1.5	119	129	2200	2800
	260	42	2.1	170	171	2200	2800
	260	42	2.1	170	171	2200	2800
	260	42	2.1	170	171	2200	2800
	260	42	2.1	170	171	2200	2800
	310	52	4	227	240	1900	2400
	310	52	4	227	240	1900	2400
	310	52	4	242	256	1900	2400
	360	72	4	350	380	1700	2000
	360	72	4	350	380	1700	2000
180	225	22	1.1	61.8	65.0	2400	3000
	225	22	1.1	61.8	65.0	2400	3000
	250	33	2	127	137	2200	2800
	259.5	33	2	127	137	2200	2800
	259.5	52	2	127	137	2200	2800
	280	31	2	135	145	2100	2700
	280	46	2.1	195	202	2200	2600
	280	46	2.1	195	202	2200	2600
	320	52	4	256	279	1800	2200
	320	52	4	256	279	1800	2600
	320	52	4	256	279	1800	2600
	380	75	4	340	400	1700	1900
190	240	24	1.5	72.5	83.5	2200	2800
	260	33	2	127	138	2200	2800

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
6232	173	277	2.5	12.3
6232M	173	277	2.5	14.4
6332M	176	324	3	31.3
733	177	238	2.5	6.44
61834M	176.5	208.5	1	1.87
61834MA	176.5	208.5	1	1.88
61934M	179	221	2	5.19
16034	178	252	1.5	5.01
16034M	178	252	1.5	5.83
6034M	181	249	2	8.23
6034MA	181	249	2	8.25
6034	181	249	2	6.78
6034Q	181	249	2	7.94
6234	186	294	3	15.2
6234M	186	294	3	18.4
6234/YA5	186	294	3	15.2
6334	186	344	3	30.9
6334M	186	344	3	34.9
61836M	186	219	1	1.97
61836MA	186	219	1	2.07
61936M	189	241	2	5.27
61936X1M	189	241	2	6.05
63936X1M	189	250.5	2	8.87
16036M	189	270	2	6.58
6036	191	269	2	8.83
6036M	191	269	2	10.7
6236	196	304	3	15.4
6236M	196	304	3	17.8
6236MA	196	304	3	17.8
6336M	198	363	3	49.5
61838M	198	232	1.5	2.38
61938M	199	251	2	5.85

# Deep Groove Ball Bearings

**ZWZ**

d 160~240 mm



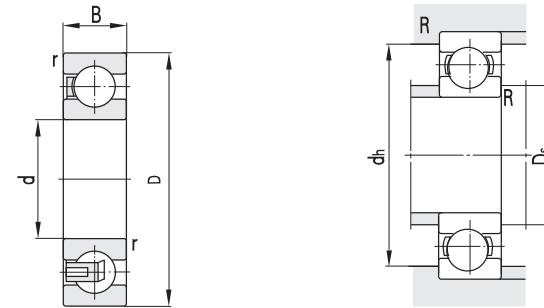
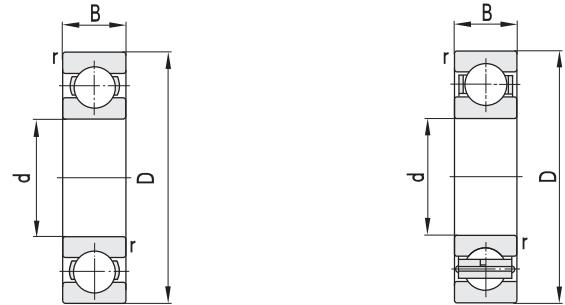
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
				KN		r/min	
190	269.5	33	2	127	138	2200	2800
	290	31	2	140	155	2000	2600
	290	31	2	140	155	2000	2600
	290	46	2.1	193.5	204	2000	2600
	290	46	2.1	193.5	204	2000	2600
	340	55	4	265	320	1700	2000
	340	55	4	265	320	1700	2000
	400	78	5	360	425	1600	1900
200	250	24	1.5	72.3	84.0	2200	2800
	280	38	2.1	125	144	2000	2600
	279.5	38	2.1	125	144	2000	2600
	289.5	38	2.1	125	144	2000	2600
	310	34	2	160	179	1900	2400
	310	51	2.1	222	245	1900	2400
	310	51	2.1	222	245	1900	2400
	360	58	4	288	335	1700	2000
	360	58	4	288	335	1700	2000
220	270	24	1.5	74.1	89.0	1900	2400
	300	38	2.1	175	162	1900	2400
	309.5	38	2.1	175	162	1900	2400
	340	37	2.1	181	215	1800	2200
	340	56	3	245	293	1800	2200
	340	56	3	245	293	1800	2200
	400	65	4	297	365	1500	1800
	460	88	5	403	520	1300	1600
	460	88	5	403	520	1300	1600
230	329.5	40	2.1	191	227	1600	2000
240	300	28	2	103	116	1800	2200
	320	38	2.1	155	186	1800	2200
	360	37	2.1	188	228	1700	2000
	360	56	3	255	315	1700	2000
	359.5	56	3	255	315	1700	2000

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
61938X1M	199	260.5	2	6.87
16038	199	281	2	6.88
16038M	199	281	2	8.11
6038M	201	279	2	11.1
6038	201	279	2	9.58
6238	206	324	3	18.9
6238M	206	324	3	23.2
6338M	210	382	4	50
61840MA	207	243	1.5	2.68
61940MA	210	270	2	7.63
61940X1MA-1	210	270	2	7.59
61940X1MA	210	270	2	8.89
16040M	209	301	2	10.3
6040M	211	299	2	14.3
6040	211	299	2	11.7
6240	216	344	3	22.6
6240M	216	344	3	24.4
61844M	227	263	1.5	3.21
61944M	231	289	2	7.96
61944X1M	231	298.5	2	9.30
16044	233	327	2	11.7
6044	233	327	2.5	15.6
6044M	233	327	2.5	18.8
6244	236	384	3	31.2
6344	240	440	4	71.4
6344/C9	240	440	4	71.4
6646M	241	319	2.1	10.4
61848M	249	291	2	4.78
61948M	251	309	2	8.10
16048M	253	347	2	15.8
6048M	253	347	2.5	20.7
6048X1M	253	346.5	2.5	20.7

# Deep Groove Ball Bearings

**ZWZ**

d 240~320 mm



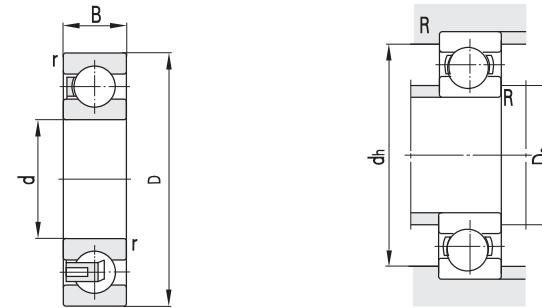
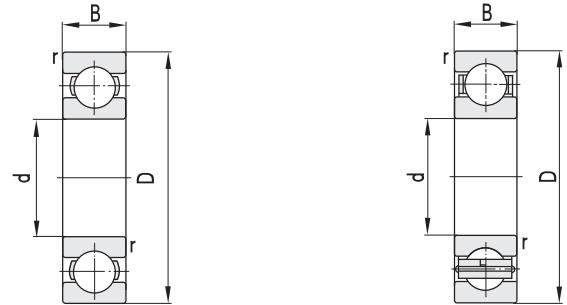
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm				KN		r/min	
240	440	72	4	360	470	1300	1600
500	95	5		442	595	1100	1400
260	320	28	2	122	128	1700	2000
	360	46	2.1	212	269	1600	1900
	360	46	2.1	212	269	1600	1900
	369.5	46	2.1	212	269	1600	1900
	370	46	2.1	212	269	1600	1900
	369.5	68	2.1	227	288	1600	1900
	369.5	60	2.1	227	288	1600	1900
	399.5	65	4	294	375	1500	1800
	400	44	3	230	300	1500	1800
	400	65	4	294	375	1500	1800
	400	65	4	294	375	1500	1800
	480	80	5	430	592	1100	1400
	480	80	5	430	592	1100	1400
	540	102	6	501	710	1000	1300
280	350	33	2	131	188	1600	1900
	380	46	2.1	215	282	1500	1800
	389.5	46	4	215	282	1500	1800
	420	44	3	235	330	1300	1600
	390	46	4	215	282	1500	1800
	420	65	4	305	405	1400	1700
	500	80	5	410	600	1000	1300
	580	108	6	560	840	1000	1200
300	380	38	2.1	163	206	1400	1700
419.5	56	3		267	370	1400	1700
420	56	3		267	370	1300	1600
460	50	4		289	400	1200	1500
460	74	4		340	480	1200	1500
	540	85	5	450	665	950	1200
320	400	38	2.1	164	220	1300	1600
	400	38	2.1	164	220	1300	1600

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm			Kg	
6248	256	424	3	51.8
6348F1	260	480	4	95.0
61852M	269	311	2	4.85
61952M	276	349	2	14.4
61952MA	271	349	2	14.4
61952X1M	276	349	2	16.3
752	271	359	2	16.5
62952X3M	271	358.5	2	22.9
62952X1M-1	271	358.5	2	20.3
6052X1F3	276	384	3	28.5
16052M	272	388	2.5	22
6052M	276	384	3	28.8
6052M/YA3	276	384	3	27.0
6252/C3	280	460	4	68.8
6252F1	280	460	4	67.6
6352F1	286	514	5	120
61856M	289	341	2	7.17
61956M	291	369	2	15.6
61956X1M	291	379	2	17.5
16056	292	407	2.5	22.5
61956X1M-1	291	379	2	17.6
6056	296	404	3	32.2
6256	300	480	4	72
	305	553	5	141
61860M	309	371	2	10.4
61960X1	313	406.5	2.5	20.6
61960	313	407	2.5	20.7
16060/H.A	316	444	3	33.1
6060	316	444	3	48.4
	320	520	4	88
61864M	331	389	2	11.4
61864F3	331	389	2	11.1

# Deep Groove Ball Bearings

**ZWZ**

d 320~400 mm



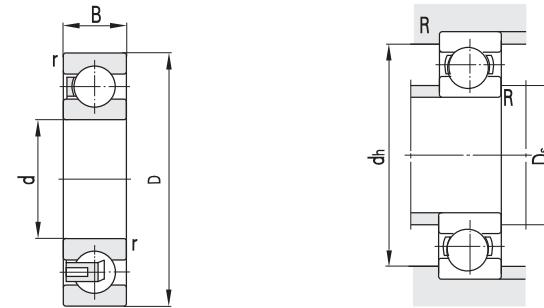
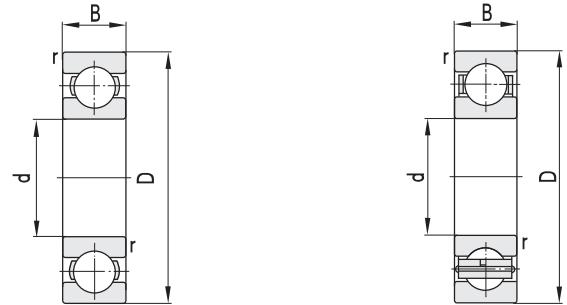
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm				KN		r/min	
320	412	38	2.5	180	292	1300	1600
	440	37	2.1	210	305	1200	1400
	440	56	3	278	395	1300	1600
	480	50	4	275	400	1100	1300
	480	74	4	355	510	1100	1400
	480	74	4	355	510	1100	1400
	580	92	5	515	780	1000	1200
340	420	38	2.1	169	227	1200	1500
	460	56	3	282	420	1100	1400
	520	57	4	335	520	950	1200
	520	82	5	403	620	1000	1300
	620	92	6	545	890	900	1000
360	440	25	1.5	118	210	1130	1450
	440	38	2.1	173	242	1100	1400
	480	56	3	282	425	1100	1400
	480	56	3	282	425	1100	1400
	509.5	70	3	335	510	1000	1300
	530	82	5	355	620	1000	1300
	540	57	4	340	540	1000	1200
	540	82	5	440	620	1000	1300
380	480	46	2.1	278	345	1000	1300
	520	65	4	345	550	1000	1300
	560	57	4	368	615	940	1100
	560	82	5	439	665	950	1200
	560	82	5	435	665	950	1200
400	500	31	2	159	277	1000	1200
	500	46	2.1	242	403	1000	1200
	540	44	3	258	435	980	1250
	540	65	4	355	585	950	1200
	540	65	4	355	585	950	1200
	600	90	5	495	780	900	1100
	600	90	5	495	780	900	1100

Designations	Abutment and fillet dimensions			Weight Kg
	Ds(min)	dh(max)	R(max)	
mm			Kg	
864	332	400	2.5	12.7
60964	331	428	2	15.5
61964	333	427	2.5	24.9
16064	336	466	3	34
6064	336	464	3	50.3
6064/C4YA8	336	464	3	49.6
6264	340	560	4	111
61868	352	408	2	11.6
61968	353	447	2.5	27.0
16068	356	505	3	46
6068	360	500	4	63.4
6268	366	599	4	112
60872	367	432	1.5	6.5
61872	351	429	2	12.2
61972	373	467	2.5	30.9
61972F3	373	467	2.5	30.2
62972X3	374	495.5	2.5	48.0
6072X1/C9	382	508	4	59.8
16072	376	524	3	50
6072F1	380	520	4	64.7
61876F1	391	469	2	19.0
61976	396	504	3	39.8
16076	394	545	3	50
6076F3	398	542	4	65.6
6076N1F3	400	540	4	65.6
60880	410	490	2	15
61880	413	488	2	21
60980	411	525	2.5	27.5
61980	416	524	3	43.6
61980F3	416	524	3	39.4
6080F1	420	580	4	86.5
6080M	420	580	4	87.9

# Deep Groove Ball Bearings

**ZWZ**

d 420~560 mm



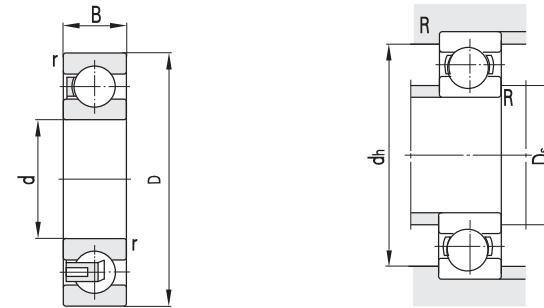
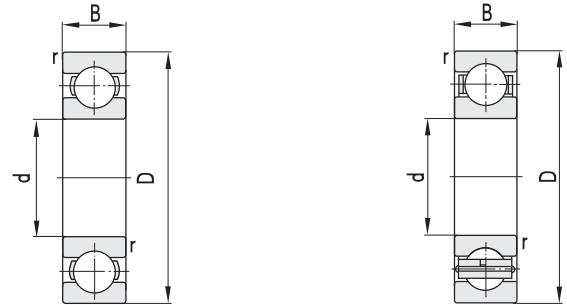
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm				KN		r/min	
420	520	46	2. 1	245	420	980	1250
	560	65	4	335	520	900	1100
	560	65	4	335	520	900	1100
	560	65	4	320	520	900	1100
	620	90	5	495	875	910	1110
440	540	31	2	155	285	870	1000
	540	46	2. 1	245	445	870	1000
	600	50	4	305	550	870	1000
	600	74	4	390	650	900	1100
	650	94	6	525	880	850	1000
460	580	56	3	303	435	900	1100
	620	72	4	410	765	870	1100
	620	74	4	405	680	850	1000
	680	100	6	553	945	800	950
480	600	56	3	315	610	870	1100
	650	78	5	417	743	800	950
	700	100	6	605	1130	740	900
500	620	37	2. 1	220	445	800	950
	620	56	3	315	465	800	950
	660	75	5	440	720	750	900
	670	78	5	450	860	760	900
	720	100	6	575	1020	750	900
530	650	56	3	315	480	750	900
	710	57	4	410	810	690	840
	710	82	5	468	885	700	850
	780	112	6	635	1260	670	810
	780	112	6	665	1290	670	800
560	680	37	2. 1	220	460	710	860
	680	56	3	328	525	700	850
	680	56	3	328	525	700	850

Designations	Abutment and fillet dimensions			Weight Kg
	Ds(min)	dh(max)	R(max)	
61884	431	508	2	21. 5
61984F3/C9	436	544	3	41. 9
61984F3	436	544	3	41. 9
61984MA	436	544	3	46. 2
6084	437	603	4	90. 5
60888	450	531	2	16. 5
61888	453	528	2	22
60988	456	585	3	41
61988F3	456	584	3	60. 5
6088	466	624	5	108
61892	473	567	2. 5	34. 3
61992	475	604	3	63
61992F3	476	604	3	63. 0
6092F1	483	657	5	121
61896	492	587	2. 5	36
61996F3	498	632	4	74. 1
6096	504	676	5	126
608/500	510	609	2	20
618/500M	513	607	2. 5	37. 3
619/500X3F1	520	650	4	68. 8
619/500	519	651	4	79
60/500	526	694	5	135
618/530F1	543	637	2. 5	41. 1
609/530	545	696	3	60
619/530F1	548	692	4	91. 6
60/530	552	757	5	188
60/530N1MA	556	754	5	185
608/560	572	670	2	30
618/560F1	573	667	2. 5	42. 1
618/560MA	573	667	2. 5	42. 7

# Deep Groove Ball Bearings

**ZWZ**

d 560~750 mm



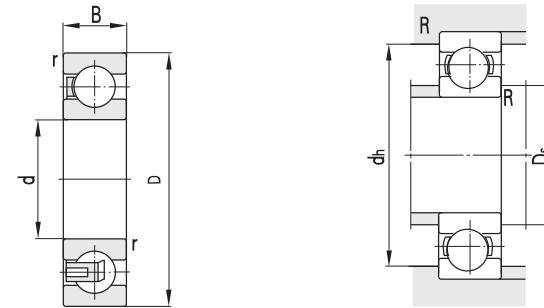
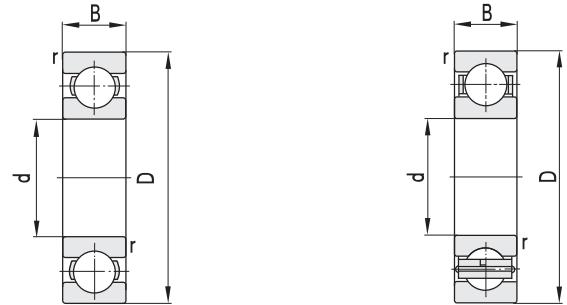
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
560	750	85	5	475	925	670	800
820	115	115	6	670	1370	630	750
820	115	6		630	1500	630	750
570	799	115	6	641	1280	480	600
600	700	100	3	345	710	670	800
730	42	3		260	550	670	800
730	42	3		260	550	670	800
730	60	3		345	710	670	800
870	118	6		692	1450	600	700
630	780	48	3	355	765	640	760
780	69	4		420	760	630	750
850	71	5		475	1050	600	710
850	100	6		610	1330	600	710
920	128	7.5		800	1750	550	660
670	820	69	4	420	780	560	670
820	69	4		420	780	560	670
820	69	4		420	780	560	670
900	73	5		540	1210	580	700
900	103	6		670	1450	530	630
980	136	7.5		904	1900	500	600
980	136	7.5		904	1900	500	600
710	870	74	4	451	905	530	630
870	74	4		451	905	530	630
950	78	5		545	1280	500	610
950	106	6		645	1510	500	610
1030	140	7.5		935	2180	490	560
750	920	78	5	515	1240	480	610
1000	112	6		745	1790	490	570
1090	150	7.5		975	2370	450	530

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm			Kg	
619/560F1	578	732	4	110
60/560F3	586	794	5	75.7
60/560N1MAS/C9	586	794	5	208
66/570X1M	598	770	5	181
D66/600	610	690	2.5	60.6
608/600	614	718	2.5	41
608/600MA	614	718	2.5	40
618/600	613	717	2.5	52.7
60/600/HC	623	847	5	233
608/630	643	767	2.5	41
618/630L/P5	645	765	3	65.7
609/630	649	832	4	112
619/630	654	829	5	163
60/630	657	891	6	280
618/670F3	685	805	3	80.8
618/670Q1	685	805	3	82.8
618/670/C4	685	805	3	82.2
609/670	689	882	4	143
619/670MA	693	877	5	194
60/670F3	698	952	6	361
60/670N1	698	952	6	366
618/710F3	725	855	3	96.1
618/710	725	855	3	98.1
609/710	729	932	4	148
619/710	732	928	5	218
60/710	738	1002	6	375
618/750	766	901	4	110
619/750	774	977	5	260
60/750	778	1061	6	490

# Deep Groove Ball Bearings

**ZWZ**

d 800~1180 mm



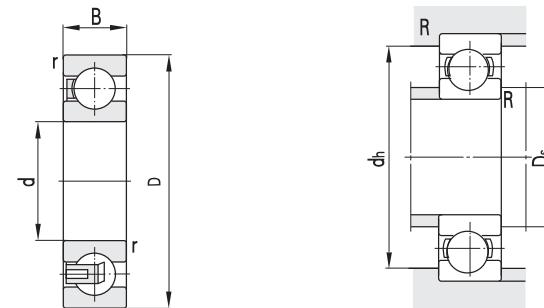
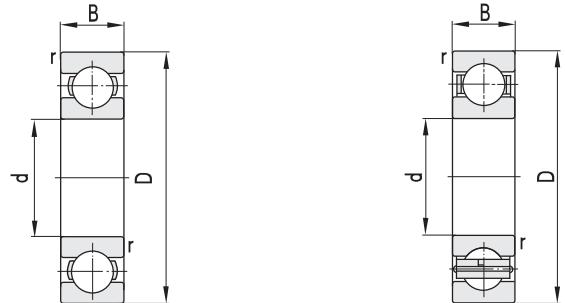
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm				KN		r/min	
800	980	57	4	390	990	430	510
	980	82	5	545	1360	430	510
	980	82	5	545	1360	430	510
	1060	115	6	815	2100	430	500
	1150	115	7.5	950	2080	500	550
	1150	155	7.5	985	2530	400	480
850	1030	57	4	385	1000	450	500
	1030	82	5	555	1310	450	530
	1030	82	5	555	1300	450	530
	1120	118	6	815	2150	400	480
	1220	165	7.5	1090	2980	370	430
900	1090	85	5	600	1430	380	450
	1180	122	6	830	2270	360	440
	1280	170	7.5	1080	3120	330	410
950	1150	90	5	663	1620	360	430
	1250	132	7.5	985	2850	330	410
	1360	180	7.5	1145	3315	310	380
1000	1220	71	5	540	1550	350	400
	1220	100	6	635	1720	340	400
	1320	103	6	800	2340	330	380
	1320	140	7.5	985	2880	330	380
	1420	185	7.5	1320	3900	280	340
1060	1280	100	6	710	2140	310	350
	1400	150	7.5	985	3030	290	330
	1500	195	9.5	1320	3860	250	330
1120	1360	106	6	725	2180	290	350
	1460	150	7.5	1010	3070	270	330
	1580	200	9.5	1430	4480	250	300
1180	1420	106	6	920	2580	320	360

Designations	Abutment and fillet dimensions			Weight Kg
	Ds(min)	dh(max)	R(max)	
608/800	815	966	3	100
618/800	820	960	4	132
618/800MA	820	960	4	133
619/800	823	1037	5	280
160/800X2F1	820	1130	6	427
60/800	828	1120	6	540
608/850	865	1015	3	75
618/850	870	1010	4	144
618/850F3	870	1010	4	144
619/850	873	1098	5	315
60/850	879	1190	6	640
618/900F3	918	1072	4	155
619/900	923	1156	5	355
60/900	928	1252	6	725
618/950F1/C9	968	1132	4	188
619/950	979	1222	6	395
60/950	979	1330	6	850
608/1000	1018	1201	4	175
618/1000F1	1026	1194	5	230
609/1000	1023	1297	5	405
619/1000	1028	1292	6	525
60/1000	1028	1392	6	925
618/1060	1084	1259	5	265
619/1060	1089	1371	6	615
60/1060	1094	1466	8	1090
618/1120	1143	1336	5	310
619/1120	1148	1432	6	640
60/1120	1155	1546	8	1245
618/1180F1	1206	1394	5	310

# Deep Groove Ball Bearings

**ZWZ**

d 1180~1700 mm



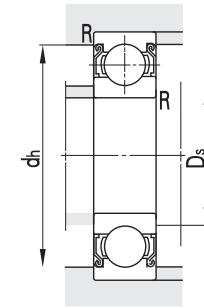
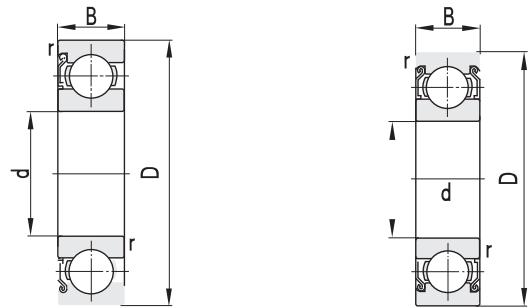
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
		KN		r/min			
1180	1540	160	7.5	1115	3630	210	270
1240	1480	112	6	930	2660	300	340
1250	1500	112	6	830	2740	210	270
1280	1560	150	6	939	2750	220	280
1320	1600	150	6	956	2830	200	260
	1600	122	6	955	2830	200	260
	1720	128	7.5	1180	4060	190	230
	1720	175	7.5	1140	3500	360	450
1400	1700	132	7.5	1070	3980	190	230
	1820	185	9.5	1550	5520	180	230
1500	1820	140	7.5	1190	4310	170	210
	1950	195	9.5	1680	6220	160	190
1600	1950	155	7.5	1240	4750	150	180
	2060	200	9.5	1820	6300	260	300
	2060	200	9.5	1820	6300	260	300
1700	2060	160	7.5	1240	4950	130	160
	2180	212	9.5	1950	7680	120	150

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
619/1180	1209	1513	6	765
618/1240X1	1266	1454	5	356
618/1250	1274	1479	5	390
66/1280F1/C9	1306	1534	5	606
618/1320X2F1/C9	1343	1577	5	520
618/1320F3	1343	1377	5	512
609/1320	1348	1691	6	835
619/1320F3/YB2	1348	1692	6	1112
618/1400	1427	1672	6	620
619/1400	1434	1777	8	1260
618/1500	1528	1791	6	695
619/1500	1535	1915	8	1515
618/1600	1627	1923	6	975
619/1600	1634	2026	8	1711
619/1600F3	1634	2026	8	1681
618/1700	1729	2032	6	1110
619/1700	1735	2145	8	1930

# Deep Groove Ball Bearings (With Shields)

**ZWZ**

d 10~40 mm



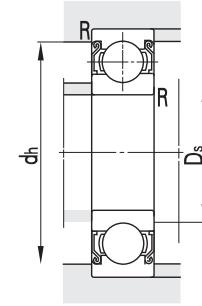
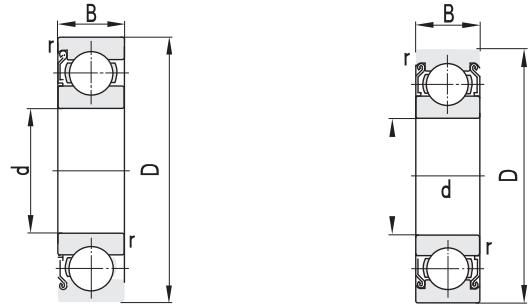
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
10	30	9	0.6	6.50	3.00	24000	30000
	30	9	0.6	6.50	3.00	24000	30000
12	32	10	0.6	6.50	3.00	22000	28000
	32	10	0.6	6.50	3.00	22000	28000
15	35	11	0.6	8.00	4.00	19000	24000
	35	11	0.6	8.00	4.00	19000	24000
17	40	12	0.6	9.10	5.00	17000	20000
	40	12	0.6	9.10	5.00	17000	20000
20	47	14	1	13.0	6.70	15000	18000
	47	14	1	13.0	6.70	15000	18000
25	52	15	1	14.3	8.00	12000	18000
	52	15	1	14.3	8.00	12000	15000
	62	17	1.1	22.4	11.5	11000	14000
30	55	13	1	13.3	6.90	12000	15000
	62	16	1	19.2	11.4	10000	13000
	62	16	1	19.2	11.4	10000	13000
	62	16	1	19.2	11.4	10000	13000
	72	19	1.1	26.7	15.0	9000	11000
	72	19	1.1	26.7	15.0	9000	11000
35	62	14	1	16.0	10.3	10000	13000
	72	17	1.1	25.7	15.3	9000	11000
	72	17	1.1	25.7	15.3	9000	11000
	80	21	1.5	35.5	19.2	8500	10000
	80	21	1.5	35.5	19.2	8500	10000
40	68	15	1	16.8	11.6	9500	12000
	68	15	1	16.8	11.6	9500	12000
	80	18	1.1	31.0	16.8	8500	10000
	80	18	1.1	31.0	16.8	8500	10000

Designations	Abutment and fillet dimensions				Weight
	Ds(min)	Ds(max)	dh(max)	R(max)	
mm				Kg	
6200- Z	13.5	14.5	26	0.6	0.0271
6200- 2Z	13.5	14.5	26	0.6	0.0270
6201- Z	16	16.5	28	0.6	0.0369
6201- 2Z	16	16.5	28	0.6	0.0373
6202- Z	19	31	0.6	0.0432	
6202- 2Z	19	31	0.6	0.0450	
6203- 2Z	21	36	0.6	0.0642	
6203- Z	21	36	0.6	0.0665	
6204- 2Z	25	42	1	0.111	
6204- Z	25	42	1	0.109	
6205- 2Z	30	47	1	0.135	
6205- Z	30	47	1	0.136	
6305- 2Z	32	55	1	0.218	
6006- 2Z	35	50	1	0.120	
6206- 2Z	35	57	1	0.224	
6206- Z	35	57	1	0.223	
6206- ZS	35	57	1	0.223	
6306- 2Z	36.5	65.5	1	0.357	
6306- Z	36.5	65.5	1	0.356	
6007- Z/C3	40	57	1	0.154	
6207- 2Z	41.5	65.5	1	0.300	
6207- Z	41.5	65.5	1	0.290	
6307- 2Z	43	72	1.5	0.476	
6307- Z	43	72	1.5	0.466	
6008- 2Z	45	63	1	0.191	
6008- RZ	45	63	1	0.196	
6208- 2Z	46.5	73.5	1	0.380	
6208- Z	46.5	73.5	1	0.371	

# Deep Groove Ball Bearings (With Shields)

**ZWZ**

d 40~60 mm



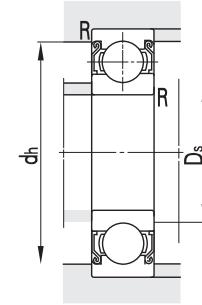
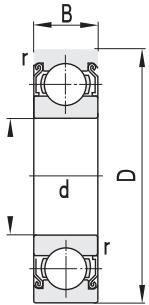
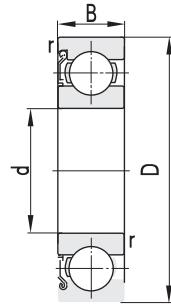
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
40	80	18	1.1	31.0	16.8	5600	
	90	23	1.5	41.0	24.0	7500	9000
90	23	1.5	41.0	24.0	7500	9000	
	90	23	1.5	41.0	24.0	7500	9000
45	75	16	1	20.0	14.0	9000	11000
	75	16	1	20.0	14.0	9000	11000
85	19	1.1	31.5	20.4	7500	9000	
85	19	1.1	31.5	20.4	7500	9000	
85	19	1.1	31.5	20.4	7500	9000	
100	25	1.5	52.5	30.0	6700	8000	
100	25	1.5	52.5	30.0	6700	8000	
100	25	1.5	52.5	30.0	6700	8000	
50	80	16	1	20.8	15.4	8500	10000
	80	16	1	20.8	15.4	8500	10000
90	20	1.1	35.0	23.2	7000	8500	
90	20	1.1	35.0	23.2	7000	8500	
90	20	1.1	35.0	23.2	7000	8500	
110	27	2	62.0	38.0	6300	7500	
110	27	2	62.0	38.0	6300	7500	
110	27	2	62.0	38.0	6300	7500	
55	90	18	1.1	26.7	18.4	7500	9000
	90	18	1.1	26.7	18.4	7500	9000
100	21	1.5	43.5	28.8	7500	9000	
100	21	1.5	43.5	28.8	7500	9000	
100	21	1.5	43.5	28.8	7500	9000	
120	29	2	71.5	45.0	5600	6700	
120	29	2	71.5	45.0	5600	6700	
120	29	2	71.5	45.0	5600	6700	
120	29	2	71.5	45.0	5600	6700	
60	95	18	1.1	28.1	20.1	6700	8000
	110	22	1.5	53.0	33.0	6000	7000
110	22	1.5	53.0	33.0	6000	7000	

Designations	Abutment and fillet dimensions				Weight
	Ds(min)	Ds(max)	dh(max)	R(max)	
mm				Kg	
6208- 2RZ	46.5	50.5	73.5	1	0.408
6308- 2Z	48	50.5	82	1.5	0.651
6308- 2Z/YA7	48		82	1.5	0.641
6308- Z	48		82	1.5	0.644
6009- 2Z	50.8		69.2	1	0.245
6009- 2Z/C3	50.8		69.2	1	0.245
6209- 2Z	51.5		78.5	1	0.435
6209- Z	51.5	54	78.5	1	0.436
6209- 2Z/YA7	51.5		78.5	1	0.429
6309- 2Z	53		92	1.5	0.850
6309- Z	53	56.5	92	1.5	0.846
6309- 2Z/YA7	53		92	1.5	0.836
6010- 2Z	54.6		75.4	1	0.257
6010- Z	54.6		75.4	1	0.257
6210- 2Z	56.5		83.5	1	0.484
6210- Z	56.5	58	83.5	1	0.468
6210- 2Z/YA7	56.5		83.5	1	0.432
6310- 2Z	59		101	2	1.09
6310- Z	59	63	101	2	1.09
6310- 2Z/YA7	59		101	2	1.07
6011- Z	61		84	1	0.388
6011- 2Z	61		84	1	0.386
6211- 2Z	63		92	1.5	0.582
6211- Z	63	65	92	1.5	0.639
6211- 2Z/YA7	63		92	1.5	0.551
6311- 2Z	64		111	2	1.39
6311- Z	64	69	111	2	1.40
6311- 2Z/YA7	64		111	2	1.38
6311- 2RZ	64		111	2	1.37
6012- 2Z	66		89	1	0.417
6212- Z	68	71	102	1.5	0.794
6212- 2Z/YA7	68		102	1.5	0.792

# Deep Groove Ball Bearings (With Shields)

**ZWZ**

d 60~80 mm



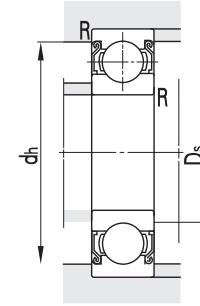
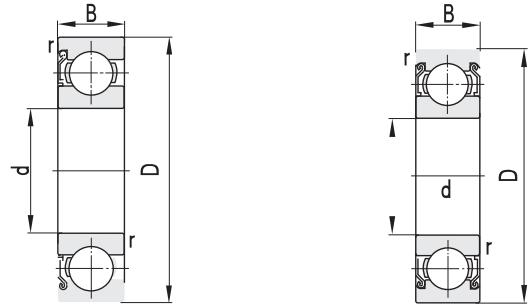
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
				KN		r/min	
60	130	31	2.1	82.0	48.5	5000	6000
	130	31	2.1	82.0	48.5	5000	6000
	130	31	2.1	82.0	48.5	5000	6000
65	100	18	1.1	32.0	25.0	6300	7500
	120	23	1.5	56.0	41.0	5300	6300
	120	23	1.5	56.0	41.0	5300	6300
	120	23	1.5	56.0	41.0	5300	6300
	120	23	1.5	56.0	41.0	5300	6300
	140	33	2.1	92.5	59.5	5000	6000
	140	33	2.1	92.5	59.5	5000	6000
	140	33	2.1	92.5	59.5	5000	6000
70	110	20	1.1	35.8	27.3	6000	7000
	125	24	1.5	60.5	46.0	5000	6000
	125	24	1.5	60.5	46.0	5000	6000
	125	24	1.5	60.5	46.0	5000	6000
	150	35	2.1	104	68.0	4500	5300
	150	35	2.1	104	68.0	4500	5300
	150	35	2.1	104	68.0	4500	5300
	150	35	2.1	104	68.0	4500	5300
75	115	20	1.1	38.0	31.0	5600	6700
	115	20	1.1	38.0	31.0	5600	6700
	130	25	1.5	66.0	50.0	4800	5600
	130	25	1.5	66.0	50.0	4800	5600
	130	25	1.5	66.0	50.0	4800	5600
	130	25	1.5	66.0	50.0	4800	5600
	160	37	2.1	113	116	4300	5000
	160	37	2.1	113	116	4300	5000
	160	37	2.1	113	116	4300	5000
80	125	22	1.1	47.5	40.0	5300	6300
	125	22	1.1	47.5	40.0	5300	6300
	140	26	2	71.5	54.5	4500	5300
	140	26	2	71.5	54.5	4500	5300

Designations	Abutment and fillet dimensions				Weight
	Ds(min)	Ds(max)	dh(max)	R(max)	
mm					
6312- 2Z	71	76	119	2	1. 69
6312- 2Z/YA7	71	119	2	1. 66	
6312- Z	71	119	2	1. 66	
6013- 2Z	71.5		93.5	1	0. 459
6213- 2Z	73	112	1.5	1. 02	
6213- Z	73	112	1.5	1. 01	
6213- Z/HQ1	73	112	1.5	1. 05	
6213- 2Z/YA7	73	112	1.5	1. 00	
6313- 2Z/YA7	76	81	129	2	2. 15
6313- 2Z	76	129	2	2. 12	
6313- Z	76	129	2	2. 12	
6014- 2Z	76		104	1	0. 625
6214- 2Z/YA7	78	83	117	1.5	1. 15
6214- 2Z	78	117	1.5	1. 13	
6214- Z	78	117	1.5	1. 16	
6314- 2Z	81		139	2	2. 35
6314- 2Z/P6CMV2	81		139	2	2. 51
6314- 2Z/YA7	81	87	139	2	2. 51
6314- Z	81	139	2	2. 58	
6015- 2Z	81.5		108.5	1	0. 624
6015- Z	81.5	108.5	1	0. 658	
6215- 2Z	83	122	1.5	1. 18	
6215- Z	83	122	1.5	1. 16	
6215- Z/HQ1	83	122	1.5	1. 22	
6215- 2Z/YA7	83	87	122	1.5	1. 17
6315- 2Z	86	149	2	3. 17	
6315- Z	86	149	2	3. 01	
6315- 2Z/YA7	86	94	149	2	3. 14
6016- Z	86.5		118.5	1	0. 86
6016- 2Z	86.5	118.5	1	0. 848	
6216- 2Z/YA7	89	94	131	2	1. 42
6216- 2Z	89	131	2	1. 46	

# Deep Groove Ball Bearings (With Shields)

**ZWZ**

d 80~100 mm



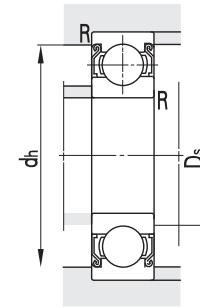
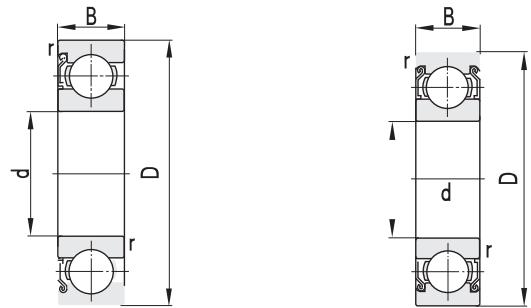
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
80	140	26	2	71.5	54.5	4500	5300
	170	39	2.1	119	86.5	3800	4500
	170	39	2.1	119	86.5	3800	4500
	170	39	2.1	119	86.5	3800	4500
85	130	22	1.1	47.5	40.0	5000	6000
	150	28	2	83.0	64.0	4300	5000
	150	28	2	83.0	64.0	4300	5000
	150	28	2	83.0	64.0	4300	5000
	180	41	3	102	96.5	4300	5000
	180	41	3	102	96.5	4300	5000
	180	41	3	102	96.5	4300	5000
	180	41	3	102	96.5	4300	5000
90	140	24	1.5	58.5	50.1	4800	5600
	140	24	1.5	58.5	50.0	4800	5600
	160	30	2	95.5	72.0	3800	4500
	160	30	2	95.5	72.0	3800	4500
	160	30	2	95.5	72.0	3800	4500
	190	43	3	144	108	3400	4000
	190	43	3	144	108	3400	4000
	190	43	3	144	108	3400	4000
	190	43	3	144	108	3400	4000
95	145	24	1.5	78.5	54.0	4500	5300
	145	24	1.5	78.5	54.0	4500	5300
	145	24	1.5	78.5	54.0	4500	5300
	170	32	2.1	108	81.5	3600	4300
	170	32	2.1	108	81.5	3600	4300
	170	32	2.1	108	81.5	3600	4300
	200	45	3	152	122	3200	3800
	200	45	3	152	122	3200	3800
100	150	24	1.5	57.5	56.5	4300	5000
	150	24	1.5	57.5	56.5	4300	5000

Designations	Abutment and fillet dimensions				Weight
	Ds(min)	Ds(max)	dh(max)	R(max)	
mm				Kg	
6216- Z	89		131	2	1. 44
6316- Z	91		159	2	3. 36
6316- 2Z	91		159	2	3. 72
6316- 2Z/YA7	91	100	159	2	3. 67
6017- 2Z	92		123	1	0. 965
6217- Z	94		141	2	1. 85
6217- 2Z	94	99	141	2	1. 85
6217- 2Z/YA7	94	99	141	2	1. 78
6317- Z	98		167	2. 5	4. 35
6317- 2Z	98		167	2. 5	4. 35
6317- 2Z/YA7	98	107	167	2. 5	4. 35
IS- 6317- 2Z/P6CMV2	98		167	2. 5	4. 30
6317- 2Z/P6CMV2	98		167	2. 5	4. 30
6018- Z	98		132	1. 5	1. 16
6018- 2Z	98		132	1. 5	1. 18
6218- Z	99		151	2	2. 21
6218- 2Z	99		151	2	2. 21
6218- 2Z/YA7	99	105	151	2	2. 20
6318- 2Z/YA7	103	114	177	2. 5	5. 04
6318M- Z/YA8P54	103		177	2. 5	6. 39
6318- 2Z	103		177	2. 5	5. 07
6318- Z	103		177	2. 5	5. 04
6019- Z	103		137	1. 5	1. 16
6019- Z/HQ1	103		137	1. 5	1. 31
6019- 2Z	103		137	1. 5	1. 17
6219- Z	106	111	159	2	2. 63
6219- 2Z	106	111	159	2	2. 65
6219- 2Z/YA7	106	111	159	2	2. 38
6319- 2Z	108	113	187	2. 5	5. 93
6319- 2Z/YA7	108	113	187	2. 5	5. 72
6020- 2Z	108	110	142	1. 5	1. 20
6020- 2Z/C9	108		142	1. 5	1. 16

# Deep Groove Ball Bearings (With Shields)

**ZWZ**

d 100~140 mm



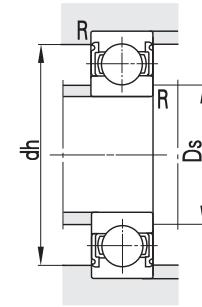
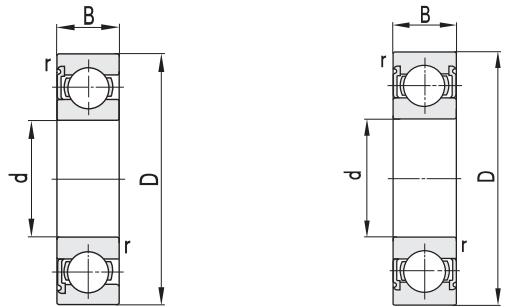
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm				KN		r/min	
100	150	24	1.5	57.5	56.5	4300	5000
180	34	2.1		122	93.0	3400	4000
180	34	2.1		122	93.0	3400	4000
180	34	2.1		122	93.0	3400	4000
215	47	3		173	141	2800	3600
215	47	3		173	141	2800	3600
215	47	3		173	141	2800	3600
105	160	26	2	78.0	55.0	4000	4800
190	36	2.1		126	98.0	3200	3800
110	170	28	2	82.0	73.5	3800	4500
170	28	2		82.0	73.5	3800	4500
175	31	2.3		205	176	3800	4500
200	38	2.1		132	106	2800	3400
200	38	2.1		132	106	2800	3400
240	50	3		205	176	2400	3000
240	50	3		205	176	2400	3000
120	180	28	2	85.5	80.0	3400	4000
180	28	2		85.5	80.0	3400	4000
180	28	2		85.5	80.0	3400	4000
215	40	2.1		154	130	2800	
130	200	33	2	101	94.0	3200	3800
200	33	2		100	94.0	3200	
230	40	3		153	134	2600	3200
230	40	3		153	134	2600	
280	58	4		240	226	2300	
140	210	33	2	106	102	2700	3200

Designations	Abutment and fillet dimensions				Weight Kg
	Ds(min)	Ds(max)	dh(max)	R(max)	
6020- Z	108		142	1.5	1.19
6220- Z	111		169	2	3.26
6220- 2Z	111		169	2	3.22
6220- 2Z/YA7	111	118	169	2	3.20
6320- Z	113		202	2.5	7.12
6320- 2Z	113	131	202	2.5	7.14
6320- 2Z/YA7	113	131	202	2.5	6.93
6021- 2Z/C3Z1	116		149	2	1.66
6221- 2Z	117		178	2	3.94
6022- Z/HQ1	119		161	2	2.40
6022- 2Z	119		161	2	2.14
60722	122		163	2.3	2.67
6222- Z	121		189	2	4.58
6222- 2Z	121		189	2	4.61
6322- 2Z	123		227	2.5	9.55
6322- 2Z/YA7	123	146	227	2.5	9.59
6024- 2Z	129	132	171	2	2.13
6024- Z	129	132	171	2	2.26
6024- Z/C9	129	132	171	2	2.26
6224- 2Z	131		204	2	5.24
6026- Z	139		191	2	3.29
6026- 2Z	139		191	2	3.29
6226- Z	144		216	2.5	6.35
6226- 2Z	144		216	2.5	6.36
6326- 2Z	150		265	3	15.4
6028- Z	149		201	2	3.25

# Deep Groove Ball Bearings (With Seals)

**ZWZ**

d 12~35 mm



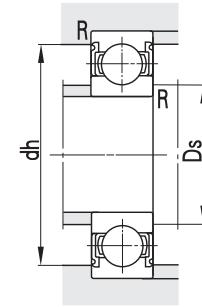
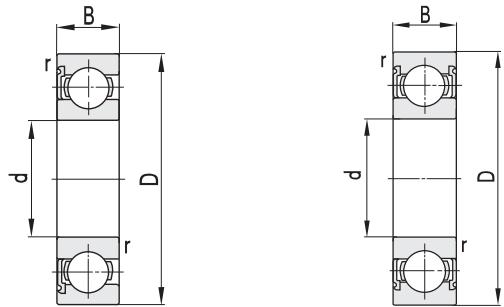
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
12	28	8	0.3	4.8	2.16	26000	
20	47	14	1	13.0	6.70	10000	
25	47	12	0.6	10.6	5.00	9500	
	52	15	1	14.3	8.00	8500	
	52	15	1	14.3	8.00	8500	
	52	15	1	14.3	8.00	8500	
	52	15	1	14.3	8.00	8500	
	52	15	1	14.3	8.00	8500	
62	17	1.1	22.4	11.5	7500		
62	17	1.1	22.4	11.5	7500		
28	68	18	1.1	32.5	13.0	6300	
30	55	13	1	13.3	6.90	8000	
	62	16	1	19.2	11.4	10000	
62	16	1	19.2	11.4	10000		
62	16	1	19.2	11.4	10000		
72	19	1.1	26.7	15.0	6300		
72	19	1.1	26.7	15.0	6300		
72	19	1.1	26.7	15.0	6300		
75	20	0.5	32.5	18.0	9000		
32	80	23	0.5	36.5	20.0	9000	
	72	25	0.5	26.7	15.0	9400	
35	64	14	1	16.0	10.3	7000	
	62	14	1	16.0	10.3	7000	
62	14	1	16.0	10.3	7000		
72	17	1.1	25.7	15.3	6300		
72	17	1.1	25.7	15.3	6300		
72	17	1.1	25.7	15.3	6300		
72	17	1.1	25.7	15.3	6300		
80	21	1.5	35.5	19.2	6000		
80	21	1.5	35.5	19.2	6000		

Designations	Abutment and fillet dimensions				Weight
	Ds(min)	Ds(max)	dh(max)	R(max)	
mm					
6001- 2RS		14	14.5	26	0.0228
6204- 2RS		25.6		41.4	0.121
6005- 2RS	29	31	43	0.6	0.0787
6205- 2RS	30		47	1	0.130
6205- 2RZ	30		47	1	0.125
6205- RS2	30		47	1	0.130
6205- RS	30		47	1	0.130
6205- 2RS/FR	30		47	1	0.130
6305- 2RS	31.5		55.5	1	0.232
6305- RS	31.5		55.5	1	0.223
63/28- RS/HA	34.5		61.5	1	0.305
6006- 2RS	35		50	1	0.120
6206- RS	35		56	1	0.224
6206- RS2	35		56	1	0.212
6206- 2RZ	35	38	56	1	0.240
6306- 2RS	36.5	41.5	65.5	1	0.355
6306- RS	36.5	41.5	65.5	1	0.353
6306- 2RS/YA6	36.5	41.5	65.5	1	0.338
450706K	36.5		68.5	0.5	0.474
4507/32KU	38.5		73.5	0.5	0.534
66/32WB1- 2RSZ/C9	39		69.5	1	0.408
6007X1- 2RS/C3	39.6		57.4	1	0.196
6007- 2RZ	39.6		57.4	1	0.169
6007- 2RS	39.6		57.4	1	0.175
6207- RS	41.5		65.5	1	0.296
6207- RS2	41.5		65.5	1	0.296
6207- 2RS2	41.5		65.5	1	0.299
6207- 2RS	41.5		65.5	1	0.291
6307- RS	43		72	1.5	0.480
6307- 2RS	43		72	1.5	0.491

# Deep Groove Ball Bearings (With Seals)

**ZWZ**

d 40~55 mm



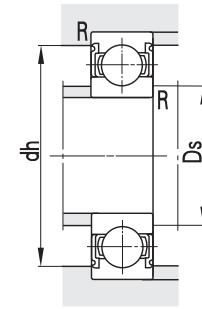
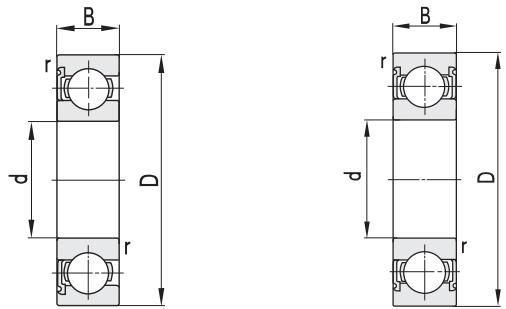
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
40	80	18	1.1	31.0	16.8	5600	
	80	18	1.1	31.0	16.8	5600	
	80	18	1.1	31.0	16.8	5600	
	80	21	1.1	31.0	16.8	5600	
	90	23	1.5	41.0	24.0	5000	
	90	23	1.5	41.0	24.0	5000	
	90	23	1.5	41.0	24.0	7500	
	85	22	1.5	32.5	20.4	5000	
	109.5	31	1.5	41.0	24.0	5000	
45	75	16	1	20.0	14.0	5600	
	75	16	1	20.0	14.0	5600	
	75	16	1	20.0	14.0	5600	
	75	16	1	20.0	14.0	5600	
	85	19	1.1	31.5	20.4	5300	
	85	19	1.1	29.3	19.5	7500	
	85	19	1.1	31.5	20.4	5300	
	85	19	1.1	31.5	20.4	5300	
	85	19	1.1	31.5	20.4	5300	
	85	21	1.1	31.5	20.4	5300	
	100	25	1.5	52.5	30.0	4500	
	100	25	1.5	52.5	30.0	4500	
	100	25	1.5	48.5	29.5	7000	
	127	31.5	1.5	48.5	29.5	4500	
	100	36	1.5	54.0	32.0	4500	
50	80	16	1	20.8	15.4	5000	
	80	16	1	20.8	15.4	5000	
	90	20	1.1	35.0	23.2	4800	
	90	33	1.1	33.0	21.8	4800	
	110	27	2	62.0	38.0	4800	
	110	27	2	62.0	38.0	4800	
	110	27	2	62.0	38.0	4800	
	163	46	2	57.5	35.0		
55	90	18	1.1	26.7	18.4	4500	
	100	21	1.5	43.5	28.8	4300	

Designations	Abutment and fillet dimensions				Weight
	Ds(min)	Ds(max)	dh(max)	R(max)	
mm				Kg	
6208- RS	46.5	50.5	73.5	1	0.385
6208- RS2	46.5	50.5	73.5	1	0.385
6208- 2RS	46.5	50.5	73.5	1	0.406
62208X2WB- 2RS/P53	46.5	50.5	73.5	1	0.525
6308- RS	48	82	1.5	0.617	
6308- 2RS	48	82	1.5	0.610	
6308- 2RZ	48	82	1.5	0.643	
6308X3- 2RS	48	78	1.5	0.704	
6308X3- 2RS/YA6	48	82	1.5	1.48	
6009- RS	50	70	1	0.245	
6009- RS2	50	70	1	0.245	
6009- 2RS	50	70	1	0.250	
6009- 2RS/FR	50	70	1	0.250	
6209- RS	51.5	78.5	1	0.441	
6209- 2RZ	51.5	78.5	1	0.435	
6209- RS2	51.5	78.5	1	0.435	
6209- 2RS	51.5	78.5	1	0.452	
6209- 2RSK	51.5	78.5	1	0.433	
62209X2WB- 2RS/P53	51.5	78.5	1	0.544	
6309- 2RS	53	92	1.5	0.619	
6309- RS	53	92	1.5	0.604	
6309- 2RZ	53	92	1.5	0.861	
6309X3- 2RS/YA6	53	112	1.5	2.04	
62309- 2RS	53	92	1.5	1.18	
6010- 2RZ	54.6	75.4	1	0.255	
6010- 2RS	54.6	75.4	1	0.258	
6210- 2RS	56.5	83.5	1	0.494	
62210X2- XRS2	57	83	1	0.727	
6310- 2RS	59	101	2	1.13	
6310- 2RS/HAC3V2YA7	59	63	2	1.07	
6310TN1- 2RZ/C4L	59	63	2	1.08	
6310X3- 2RS	67.5	96	4100	5.84	
6011- 2RS	61	84	1	0.389	
6211- 2RS	63	92	1.5	0.594	

# Deep Groove Ball Bearings (With Seals)

**ZWZ**

d 55~85 mm



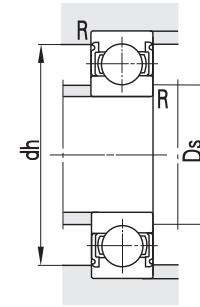
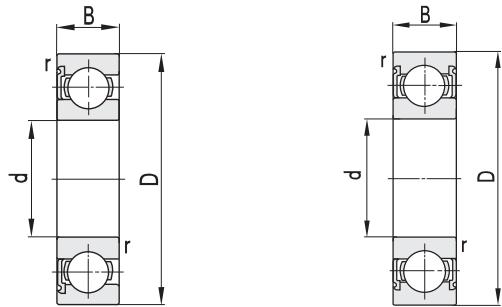
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
55	120	29	2	71.5	45.0	3800	
	120	29	2	71.5	45.0	3800	
	120	49.2	2	71.5	45.0	3800	
60	95	18	1.1	30.0	23.0	4300	
	95	18	1.1	30.0	23.0	4300	
	110	22	1.5	53.0	33.0	4000	
	110	22	1.5	53.0	33.0	4000	
	110	22	1.5	53.0	33.0	4000	
	110	22	1.5	53.0	33.0	4000	
	130	31	2.1	82.0	48.5	3400	
	130	31	2.1	82.0	48.5	3400	
	130	31	2.1	77.0	49.0	5200	
65	100	18	1.1	32.0	25.0	4000	
	140	33	2.1	92.5	49.5	3200	
	140	33	2.1	92.5	49.5	3200	
70	110	20	1.1	38.0	31.0	3600	
	125	24	1.5	60.5	46.0	3400	
	130	41	1.5	61.0	45.0	3200	
	150	35	2.1	104	68.0	3000	
	150	35	2.1	104	68.0	3000	
75	115	20	1.1	38.0	31.0	3400	
	130	25	1.5	66.0	50.0	3200	
	160	37	2.1	113	71.0	2800	
80	125	22	1.1	47.5	40.0	3200	
	140	26	1.5	71.5	54.5	3000	
	170	39	2.1	119	86.5	2600	
	170	39	2.1	119	86.5	2600	
85	130	22	1.1	47.5	40.0	3000	
	150	28	2	83.0	64.0	2800	

Designations	Abutment and fillet dimensions				Weight Kg
	Ds(min)	Ds(max)	dh(max)	R(max)	
6311- 2RS	64		111	2	1.39
6311- RS	64		111	2	1.40
63311TN1- 2RZ/C3H	64		111	2	2.2
6012- 2RS	66.5		88.5	1	0.443
6012- RS	66.5		88.5	1	0.431
6212- 2RS	68		102	1.5	0.780
6212- 2RS/HAC3V2YA7	68		102	1.5	0.788
6212WB- 2RS/P53	68		102	1.5	0.974
6212/HAC3YAB- 2RSZ	68		102	1.5	0.928
6212- 2RS2/HAYA57	68		102	1.5	0.792
6312- 2RS	71		119	2	1.73
6312- RS	71		119	2	1.68
6312- 2RZ	71		119	2.1	1.75
6013- 2RS	71		94	1	0.444
6313- 2RS	76		129	2	2.30
6313- RS	76		129	2	2.19
6014- 2RS	76.5		103.5	1	0.606
6214- 2RS	78		117	1.5	1.06
180714	78.5		121.5	1.5	2.05
6314- 2RS	81		139	2	2.57
6314- RS	81		139	2	2.59
6015- 2RS	81		108.5	1	0.604
6215- 2RS	83		122	1.5	1.19
6315- 2RS	87		148	2	3.00
6016- 2RS	86.5		118.5	1	0.829
6216- 2RS	89		131	2	1.49
6316- RS	91		159	2	3.64
6316- 2RS	91		159	2	3.75
6017- 2RS	91.5		123.5	1	0.966
6217- 2RS	94		141	2	1.81

# Deep Groove Ball Bearings (With Seals)

**ZWZ**

d 85~130 mm



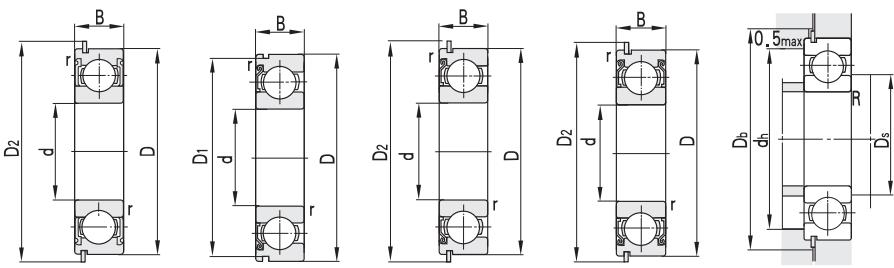
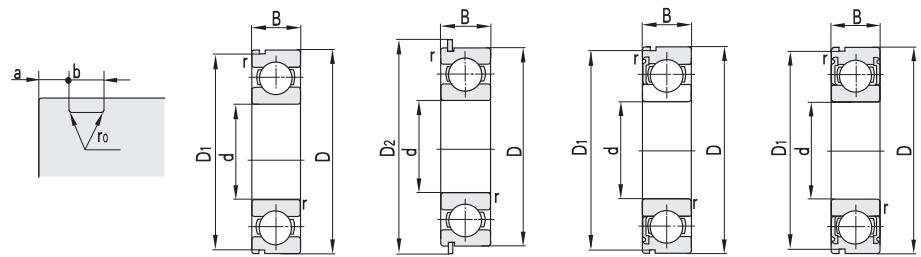
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm				KN		r/min	
85	180	41	3	102	96.5	2400	
	180	41	3	102	96.5	2400	
90	140	24	1.5	58.5	50.0	2800	
	160	30	2	95.6	72.0	2600	
	190	43	3	144	108	2400	
95	145	24	1.5	60.5	54.0	2800	
	170	32	2.1	108	81.5	2400	
	200	45	3	152	122	2400	
	200	45	3	152	122	2400	
100	150	24	1.5	57.5	56.5	2600	
	180	34	2.1	122	93.0	2400	
105	160	26	2	73.0	65.5	2400	
110	140	16	1	26.7	28.2	2600	
	170	28	2	77.8	67.5	2400	
120	180	28	2	85.5	80.0	2200	
	260	55	3	217	196	2000	
130	200	33	2	100	94.0	3200	

Designations	Abutment and fillet dimensions				Weight
	Ds(min)	Ds(max)	dh(max)	R(max)	
mm					
6317- RS	98		167	2.5	4.32
6317- 2RS	98		167	2.5	4.35
6018- 2RS	98		132	1.5	1.18
6218- 2RS	101		149	2	2.21
6318- 2RS	104	114	176	2.5	5.10
6019- 2RS/C3	102		138	1.5	1.17
6219- 2RS	106		159	2	2.44
6319- RS	108		187	2.5	5.68
6319- 2RS	108		187	2.5	5.92
6020- 2RS	108		142	1.5	1.20
6220- 2RS	111		169	2	3.25
6021- 2RS	114		151	2	1.65
61822- 2RS2/S3YA7	115		135	1	0.517
6022- 2RS	119		161	2	1.98
6024- 2RS	129		171	2	2.48
6324- 2RS	134		246	2.5	12.7
6026- 2RS	139		191	2	3.33

# Deep Groove Ball Bearings (With Snap Groove Or Snap Ring)

**ZWZ**

d 25~40 mm



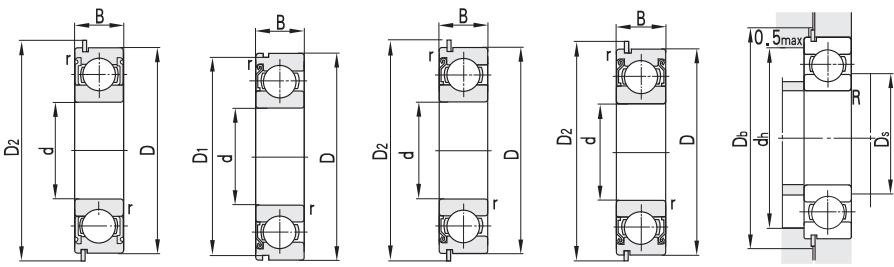
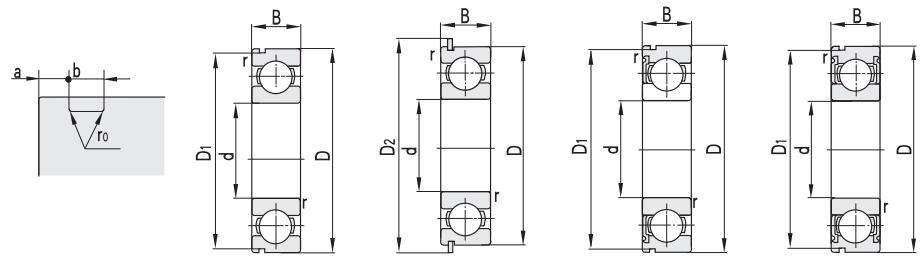
Principal dimensions			Basic load ratings			Snap ring dimensions		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	D2	f	Grease	Oil
mm				KN		KN		r/min	
25	52	15	1	14.3	8.00			12000	15000
	52	15	1	14.3	8.00	57.9	1.12	12000	15000
28	58	16	1	15.6	9.00			11000	14000
	68	18	1.1	23.5	13.0			11000	14000
30	75	20	0.5	32.5	18.0			9000	11000
	72	19	1.1	26.7	15.0			9000	11000
	75	21	1.5	33.0	17.5			9000	11000
	72	19	1.1	26.7	15.0	78.6	1.7	9000	11000
32	75	20	1.5	28.5	16.0			9000	11000
	75	20	1.5	28.5	16.0			6300	
	80	23	2	36.5	19.6			9000	11000
	80	23	0.5	36.5	20.0			9000	11000
35	62	14	1	16.3	10.5			7000	
	72	17	1.1	25.7	15.3			6300	
	72	17	1.1	25.7	15.3			6300	
	72	17	1.1	25.7	15.3			9000	11000
	72	17	2	25.7	15.3	78.6	1.7	9000	11000
	72	17	1.1	25.7	15.3			9000	11000
	80	21	1.5	35.5	19.2			8500	10000
	80	21	1.5	35.5	19.2			8500	10000
	90	21	1.5	37.1	20.7			8500	10000
100	25	1.5	55.5	29.5				7000	8500
40	80	18	1.1	31.0	16.8			8500	10000
	80	18	1.1	31.0	16.8			8500	10000
	80	18	1.1	31.0	16.8	86.6	1.7	8500	10000
	90	23	1.5	41.0	24.0			7500	9000
	90	23	1.5	41.0	24.0	96.5	2.46	7500	9000
	90	23	1.5	41.0	24.0	96.5	2.46	7500	9000
	90	23	1.5	41.0	24.0	96.5	2.46	7500	9000
	90	23	1.5	41.0	24.0			5000	

Designations	Abutment and fillet dimensions				Snap ring groove dimensions				Weight
	Ds(min)	dh(max)	R(max)	D1(max)	a1	b	r0(max)		
mm									
6205N/C3	30	47	1	49.73	2.46	1.35	0.4	0.131	
6205- ZNR	30	47	1	49.73	2.46	1.35	0.4	0.136	
62/28- ZN	33	53	1	55.6	3.28	1.9	0.4	0.179	
63/28- ZN	34	62	1	64.82	3.28	1.9	0.6	0.294	
450706K	36.5	68.5	0.5	71.7	3.2	1.9	0.6	0.474	
6306- 2RZN/C4	36.5	65.5	1	68.81	3.28	1.9	0.6	0.340	
6306X3- 2RSN/HAY	36.5	68.5	1.5	71.83	3.25	1.9	0.6	0.477	
6306- ZNR	36.5	65.5	1	68.81	3.28	1.9	0.6	0.365	
63/32N	38.5	68.5	1.5	71.83	3.28	1.9	0.6	0.391	
63/32- 2RSN	38.5	68.5	1.5	71.83	3.28	1.9	0.6	0.413	
63/32X3- 2RSN/HAY	38.5	73.5	2	76.5	4.7	2	0.6	0.534	
4507/32KU	38.5	73.5	0.5	76.5	4.7	2	0.6	0.534	
6007- RSNB	40	57	1	59.61	2.08	1.9	0.6	0.157	
6207- 2RSN	41.5	65.5	1	68.81	3.28	1.9	0.6	0.290	
6207- XRSN	41.5	65.5	1	68.81	3.28	1.9	0.6	0.294	
6207N	41.5	65.5	1	68.81	3.28	1.9	0.6	0.279	
6207- 2RSNR/P53YAB	41.5	65.5	2	68.81	3.28	1.9	0.6	0.305	
6207NKTN1- 2RZ/C3H	41.5	65.5	2	68.81	3.28	1.9	0.6	0.278	
6307N	43	72	1.5	76.81	3.28	1.9	0.6	0.443	
6307- ZN	43	72	1.5	76.81	3.28	1.9	0.6	0.443	
6307X1NR	43	75	1.5	76.81	3.28	1.9	0.6	0.638	
6407N	43	92	1.5	96.8	3.25	2.7	0.6	0.901	
6208N	46.5	73.5	1	76.8	3.25	1.9	0.6	0.361	
6208- ZN	46.5	73.5	1	76.8	3.25	1.9	0.6	0.364	
6208- ZNR	46.5	73.5	1	76.8	3.25	1.9	0.6	0.382	
6308N	48	82	1.5	86.8	3.25	2.7	0.6	0.640	
6308- ZNR	48	82	1.5	86.8	3.25	2.7	0.6	0.673	
6308N/HAP63	48	82	1.5	86.8	3.25	2.7	0.6	0.640	
6308X2NR/C3	48	82	1.5	86.8	3.25	2.7	0.6	0.600	
6308- ZN	48	82	1.5	86.79	3.28	2.7	0.6	0.642	
6308- 2RSN	48	82	1.5	86.79	3.28	2.7	0.6	0.622	

# Deep Groove Ball Bearings (With Snap Groove Or Snap Ring)

**ZWZ**

d 40~60 mm



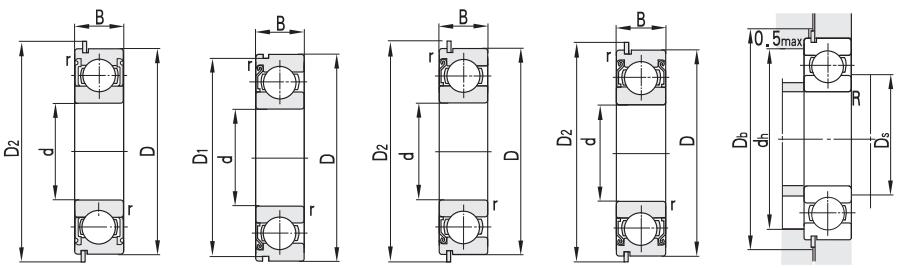
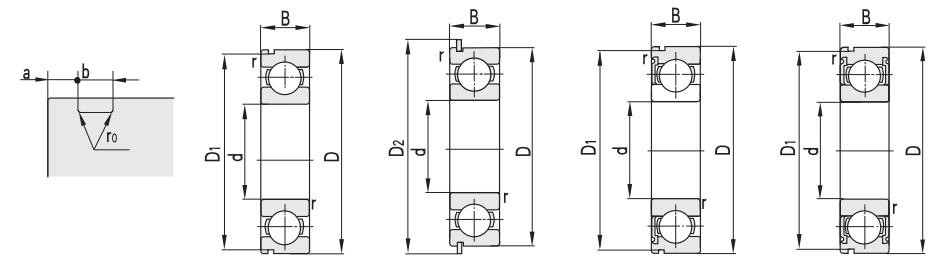
Principal dimensions				Basic load ratings		Snap ring dimensions		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	D2	f	Grease	Oil
mm				KN		KN		r/min	
40	110	27	2	67.5	36.0			6700	8000
45	85	19	1.1	31.5	20.4			7500	9000
	85	19	1.1	31.5	20.4			7500	9000
	85	19	1.1	31.5	20.4	91.6	1.7	7500	9000
	100	25	1.5	52.5	30.0			6700	8000
	100	25	1.5	52.5	30.0			6700	8000
	100	25	1.5	52.5	30.0			6700	8000
	100	25	1.5	48.5	29.5	106.5	2.46	6700	8000
	100	21	1.5	52.5	30.0	106.5	2.46	6700	8000
	120	29	2	78.0	46.0			6000	7000
50	90	20	1.1	35.0	23.2			7000	8500
	90	20	1.1	35.0	23.2			7000	8500
	90	20	1.1	35.0	23.2	96.5	2.46	7000	8500
	110	27	1.5	62.0	38.0			6300	7500
	110	27	1.5	62.0	38.0	116.6	2.46	6300	7500
	130	31	2.1	92.0	55.0			5300	6300
55	100	21	1.5	43.5	28.8			6300	7500
	100	21	1.5	43.5	28.8	106.5	2.46	6300	7500
	100	25	1	43.5	28.8			6300	7500
	120	29	2	71.5	45.0			5600	6700
	120	29	2	71.5	45.0			5600	6700
	120	29	2	71.5	45.0	129.7	2.82	5600	6700
	120	29	2	71.5	45.0	139.7	2.77	5300	6400
	130	31	1.1	77.0	49.0	139.7	2.77	5300	6400
	140	33	2.1	100	62.0			5000	6000
60	110	22	1.5	53.0	33.0	117	2.46	6000	7000
	110	22	1.5	53.0	33.0			6000	7000
	110	22	1.5	53.0	33.0			6000	7000
	110	22	1.5	53.0	33.0	117	2.46	6000	7000
	130	31	2.1	82.0	48.5			5000	6000
	130	31	2.1	82.0	48.5			5000	6000
	150	35	2.1	109	70.0			4800	5600

Designations	Abutment and fillet dimensions				Snap ring groove dimensions			Weight
	Ds(min)	dh(max)	R(max)	D1(max)	a1	b	r0(max)	
mm								
6408N		49	101	2	106.81	3.28	2.7	0.6 1.19
6209N		51.5	78.5	1	81.81	3.28	1.9	0.6 0.422
6209- ZN		51.5	78.5	1	81.81	3.28	1.9	0.6 0.379
6209- ZNR		51.5	78.5	1	81.81	3.28	1.9	0.6 0.434
6309N		53	92	1.5	96.8	3.25	2.7	0.6 0.840
6309- ZN		53	92	1.5	96.8	3.25	2.7	0.6 0.837
309N/HAYAB		53	92	1.5	96.8	3.25	2.7	0.6 0.900
6309NR		53	92	1.5	96.8	3.25	2.7	0.6 0.861
6309X2NR/C3		52	94	1.5	96.8	3.25	2.7	0.6 0.861
6409N		54	111	2	125.22	4.06	3.1	0.6 1.67
6210N		56.5	83.5	1	86.79	3.28	2.7	0.6 0.494
6210- ZN		56.5	83.5	1	86.79	3.28	2.7	0.6 0.469
6210- ZNR		56.5	83.5	1	86.79	3.28	2.7	0.6 0.605
6310N		59	101	2	107	3.25	2.7	0.6 1.03
6310- ZNR		59	101	2	107	3.25	2.7	0.6 1.23
6410N		61	119	2	115.21	4.06	3.1	0.6 1.78
6211N		63	92	1.5	96.8	3.28	2.7	0.6 0.595
6211- ZNR		63	92	1.5	96.8	3.28	2.7	0.6 0.645
62211WB- 2RSZN		63	92	1	96.8	3.28	2.7	0.6 1.08
6311- 2ZN		64	111	2	115.21	4.06	3.1	0.6 1.37
6311N		64	111	2	115	4.06	3.1	0.6 1.37
6311- 2RSN		64	111	2	115	4.06	3.1	0.6 1.35
6311- 2RSNR		64	111	2	115	4.06	3.1	0.6 1.41
6611NR		71	119	1.1	125.3	4.05	3.1	0.6 1.89
6411N		66	129	2	135.23	4.9	3.1	0.6 2.29
6212- ZNBR/YB2		68	102	1.5	107	3.28	2.69	0.6 0.794
6212- ZN		68	102	1.5	107	3.28	2.69	0.6 0.766
6212- ZNB/HAYAB		68	102	1.5	107	3.28	2.69	0.6 0.782
6212- ZNR		68	102	1.5	107	3.28	2.69	0.6 0.778
6312N		71	119	2	125.3	4.05	3.1	0.6 1.67
6312- ZN		71	119	2	125.3	4.05	3.1	0.6 1.73
6412N		71	139	2	145.24	4.9	3.1	0.6 2.75

# Deep Groove Ball Bearings (With Snap Groove Or Snap Ring)

**ZWZ**

d 65~105 mm



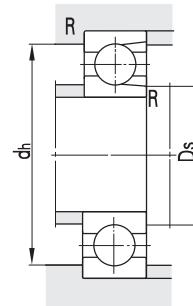
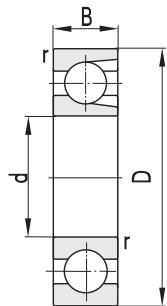
Principal dimensions			Basic load ratings		Snap ring dimensions		Limit speed ratings		
d	D	B	rsmin	Cr	Cor	D2	f	Grease	Oil
mm			KN		KN		r/min		
65	120	23	1.5	56.0	41.0			5300	6300
	140	33	2.1	87.5	57.0			4800	5600
	140	33	2.1	87.5	57.0	149.7	2.82	4800	5600
	140	33	2.1	87.5	57.0	149.7	2.82	4800	5600
	160	37	2.1	118	78.5	169.7	2.82	4500	5300
70	110	20	1.1	38.0	31.0	116.6	2.46	6000	7000
	125	24	1.5	56.0	41.0			4800	5800
	150	35	2.1	104	68.0			4500	5300
	150	35	0.5	104	68.0	159.7	2.82	4500	5300
	150	35	2.1	104	68.0	159.7	2.82	4500	5300
75	130	25	1.5	66.0	50.0			4800	5600
	160	37	2.1	149	115	169.7	2.82	4500	5200
	160	37	2.1	149	115	169.7	2.82	4500	5200
80	140	26	2	71.5	54.5			4500	5300
	170	39	2.1	119	86.5			4000	4800
	200	48	3	164	125			3400	4000
85	150	28	2	83.0	64.0			4300	5000
	150	28	2	83.0	64.0			4300	5000
	160	30	2	83.0	64.5			4300	5000
90	140	24	1.5	55.6	45.0			4800	5600
	140	24	1.5	61.0	51.0			4800	5600
	140	24	1.5	55.5	45.0			4800	5600
	160	30	2	95.5	72.0			3800	4500
	190	43	3	144	108			3000	3800
95	200	45	3	152	118			2800	3600
100	250	58	4	224	195			2600	3400
105	190	36	2.1	132	105			3200	3800

Designations	Abutment and fillet dimensions				Snap ring groove dimensions			Weight
	Ds(min)	dh(max)	R(max)	D1(max)	a1	b	r0(max)	
mm								
50213K	73	112	1.5	115.21	4.06	3.1	0.6	1.00
6313N	76	129	2	135.23	4.9	3.1	0.6	2.13
6313NR/C3YA6	76	129	2	135.23	4.9	3.1	0.6	2.17
6313NR/C3	76	129	2	135.23	4.9	3.1	0.6	2.20
6413NR/C3	76	149	2	155.22	4.9	3.1	0.6	3.26
6014NR	76.5	103.5	1	106.81	2.87	2.7	0.6	0.655
6214N	78	117	1.5	120.22	4.06	3.1	0.6	1.1
6314N	81	139	2	145.24	4.9	3.1	0.6	1.35
6314N/YA6	81	139	0.5	145.24	4.9	3.1	0.6	2.56
6314NR/C3	81	139	2	145.24	4.9	3.1	0.6	2.64
6215N	83	122	1.5	125.2	4.05	3.1	0.6	1.16
315NR/YA8-1	86	149	2.1	155.22	4.9	3.1	0.6	4.27
315NR/YA68-1	86	149	2.1	155.22	4.9	3.1	0.6	4.27
6216N	89	131	2	135.23	4.9	3.1	0.6	1.41
6316N	91	159	2	163.65	5.69	3.5	0.6	3.62
6416N	93	187	2.5	193.6	5.7	3.5	0.6	6.58
6217N	94	141	2	145.2	4.9	3.1	0.6	1.92
6217-ZN	94	141	2	145.2	4.9	3.1	0.6	1.82
6317X3N	96	145	2	155.22	4.9	3.1	0.6	2.44
6018N	98	132	1.5	135.23	3.71	3.1	0.6	1.15
6018N/HAYAB	98	132	1.5	135.23	3.71	3.1	0.6	1.12
6018N/YAB-1	98	132	1.5	135.23	3.71	3.1	0.6	1.15
6218N	99	151	2	155.22	4.9	3.1	0.6	2.18
6318N	100	180	2.5	183.64	3.69	3.5	0.6	4.73
6319N	110	185	2.5	193.65	5.69	3.5	0.6	5.79
6420N	116	234	3	242	6.5	4.5	0.6	12.7
6221N	116	179	2	183.6	5.7	3.5	0.6	3.61

# Deep Groove Ball Bearings (Full Elements)

**ZWZ**

d 50~440 mm



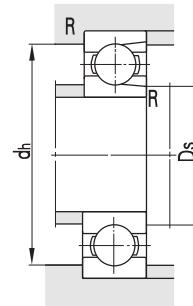
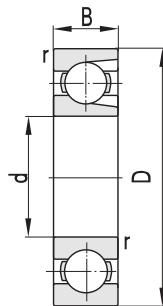
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm				KN		r/min	
50	110	27	2	85.5	62.0	4500	6300
60	130	31	2.1	113	83.5	3800	5300
65	140	33	2.1	130	90.0	3400	4800
70	125	24	1.5	84.5	73	4800	5800
	150	35	2.1	163	110	3200	4500
75	160	37	2.1	204	125	3000	4300
107	145	16	1.3	52.0	66.0	1500	1900
170	260	42	3.5	206	294		
220	270	24	1.5	99.0	161	1100	1300
	300	38	2.1	201	292	1000	1300
240	300	28	2	142	212	1000	1300
320	412	38	2.5	319	530	900	1100
340	460	56	3	420	740	850	1000
440	600	74	4	730	1170	800	950

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
310V	59	101	2	1.01
312V	71	119	2	1.82
313V	76	129	2	2.15
214V	78	117	1.5	1.19
314V	81	139	2	2.65
315V/C9	86	149	2	3.23
970921	114.6	137.4	1.3	0.821
6034V/YA7	182	248	3.5	7.11
61844V	228	262	1.5	2.62
61944V	231	289	2	7.24
61848V	249	291	2	4.93
970864	332	400	2.5	11.8
61968V	353	447	2.5	25.6
61988V	456	584	3	55.6

# Deep Groove Ball Bearings (With Filling Slot)

**ZWZ**

d 30~165 mm

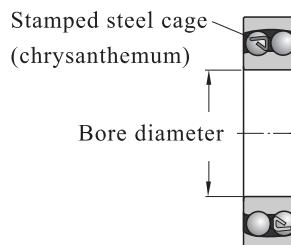


Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
KN				r/min			
30	62	16	1	23.6	16.0	10000	13000
45	85	19	1.1	43.0	32.0	5300	7500
50	110	27	1.5	80.0	57.0	4500	6300
65	120	23	1.5	78.0	64.0	4300	6000
	140	33	2.1	110	90.0	3400	4800
75	130	25	1.5	84.5	74.5	3400	4800
165	250.5	35	2.5	187	204	1200	1500

Designations	Abutment and fillet dimensions			Weight
	Ds(min)	dh(max)	R(max)	
mm				
206	35	57	1	0.217
209	51.5	78.5	1	0.492
310	59	101	2	1.10
370213	73	112	1.5	1.01
313	76	129	2	2.4
215	83	122	1.5	1.32
370833	177	239	2.5	6.56

## Product Characteristics

Self-aligning ball bearing has two-row balls and one concave outer raceway. The center of outer raceway curvature and bearing is the same. Therefore, this bearing also can rotate even if the inner ring, balls and cage are tilting against the outer ring. This bearing is self-aligning accordingly and can resist the misalignment of shaft with bearing box. This bearing is mainly used for carrying radial load and small axial load, but can not carry axial load if without radial load. This bearing is used especially for the applications with serious shaft deflection or misalignment so this bearing it is widely used bearing in machinery industry such as precision meter, low noise electric motor, automobile, motorcycle, woodworker, transmission shaft of textile machinery, mining machinery, electromechanical equipments, plastic machinery, office equipments, medical equipments, fitness equipments, excise equipments and other general machinery.



## Types of bearing:

ZWZ manufactures two types of self-aligning ball bearings:

- **Self-aligning ball bearing with cylindrical bore**
- **Self-aligning ball bearing with tapered bore**

**Self-aligning ball bearing with cylindrical bore** realizes self-aligning automatically because of two-row steel balls and arc outer raceway. This bearing also can resist the angle error between the shaft and bearing housing so it is suitable for the application with shaft deflection and skew shaft center due to eccentricity. Self-aligning ball bearing has light internal friction among all rolling bearings so it has small temperature raise even if rotating with high speed.

**Self-aligning ball bearing with tapered bore** has the same features with Self-aligning ball bearing with cylindrical bore. This bearing has a tapered bore (normal tapered 1:12) and the clearance of bearing can be adjusted slightly when mounting onto tapered shaft. Such bearings usually applied to the double-supporting shafts that under loads bend greatly and also applied to the parts where there are 2 supporting holes that misalignnng can not be strictly ensured. These bearings mainly bear radial loads, meanwhile , can bear slight axial loads. Normally, they can not bear pure axial loads. Such bearings applications are simmilar as deep groove ball bearings'. But the limited rotation speed is smaller than that of deep groove bearings. The loads they can bear are higher than deep groove ball bearings.

## Dimension Range

The basic dimensions of self-aligning ball bearing manufactured by ZWZ are listed in dimension table.

Dimension range of bore diameter: 25mm ~ 1100mm

Dimension range of outer diameter: 52mm ~ 1300mm

Dimension range of overall width: 15mm ~ 300mm

## Tolerance

The standard tolerance of Self-aligning ball bearing manufactured by ZWZ is Normal class, which conforms to GB307.1. Please refer to tolerances listed in the table of preface pages.

## Radial Clearance

The standard internal clearances of Self-aligning ball bearing manufactured by ZWZ are C2, normal (C0), C3, C4 and C5, which conforms to GB4604. The standard clearance of Self-aligning ball bearing with tapered bore is C3. Please refer to radial clearances listed in the table of preface pages. The values are available for the bearings before mounting or without load.

The bearings with internal clearance larger or lower than standard values can also be manufactured according to castomes requirements.

## Dynamic Equivalent Load

when  $F_a/F_r \leq e$ ,

$P = F_r + Y_1 F_a$

when  $F_a/F_r > e$ ,

$P = 0.65 F_r + Y_2 F_a$

Where, the values of  $e$ ,  $Y_1$  and  $Y_2$  can be found in dimension table of bearing.

## Static Equivalent Load

$P_0 = F_r + Y_0 F_a$

Where, the value of  $Y_0$  can be found in dimension table of bearing.

## Cage

Self-aligning ball bearing has stamped steel cage, solid brass cage or nylon cage. The material of cage is sheet steel, brass synthetic resin. When outer diameter is lower than roequal to 200mm, stamped sheet (strap) steel cage is adopted without suffix after basic bearing code. When outer diameter is larger than 200mm, solid brass cage is adopted without suffix after basic bearing code.

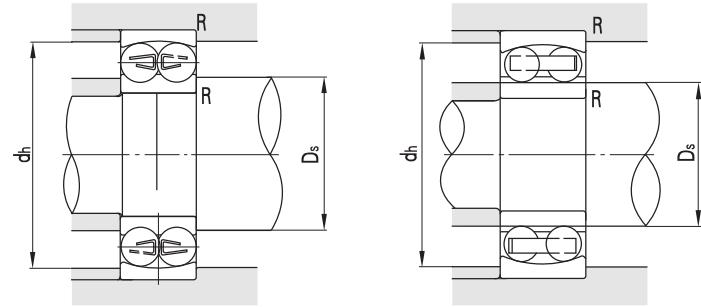
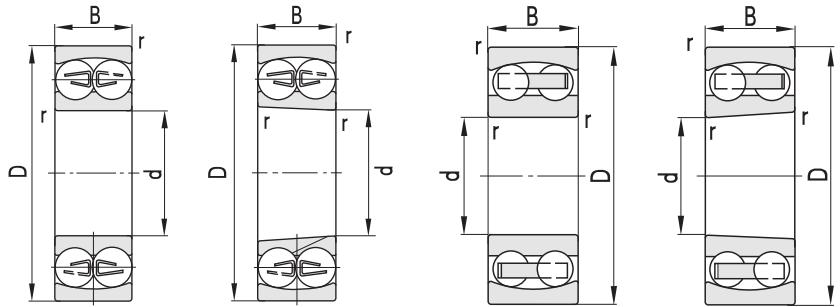
The bearing with nylon cage can operate under ambient temperature of 120 or higher. The solid brass cage is considered when the bearing is used under high temperature or critical conditions.

Please contact with ZWZ if requesting for the bearing with non-standard cage.

# Self-aligning Ball Bearings

**ZWZ**

d 25~45 mm



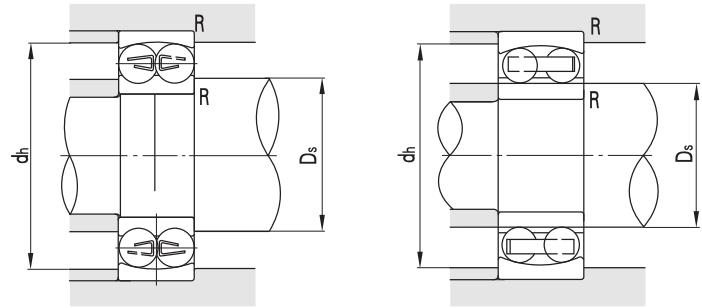
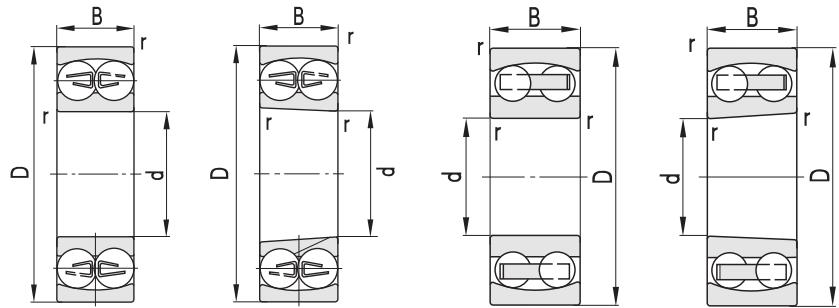
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
25	52	15	1	12.1	3.30	13000	16000
	62	17	1.1	13.8	5.05	9500	12000
30	62	16	1	15.6	4.70	10000	13000
	62	20	1	22.5	4.60	9500	12000
	62	20	1	22.5	4.60	9500	12000
	72	27	1.1	31.0	8.70	8500	10000
	72	27	1.1	31.0	8.70	8500	10000
35	72	17	1.1	18.1	5.15	9000	11000
	72	17	1.1	18.1	5.15	9000	11000
	72	23	1.1	29.2	6.70	8500	10000
	72	23	1.1	29.2	6.70	8500	10000
	80	21	1.5	25.5	7.95	7500	9000
	80	21	1.5	25.5	7.95	7500	9000
	80	31	1.5	39.0	11.1	7000	8500
	80	31	1.5	39.0	11.1	7000	8500
40	80	18	1.1	19.5	6.55	8500	10000
	80	18	1.1	19.5	6.55	8500	10000
	80	23	1.1	30.5	7.40	7500	9000
	80	23	1.1	30.5	7.40	7500	9000
	90	23	1.5	32.0	9.85	6700	8000
	90	23	1.5	32.0	9.85	6700	8000
	90	33	1.5	51.5	13.2	6300	7500
	90	33	1.5	51.5	13.2	6300	7500
45	85	19	1.1	21.7	7.35	7500	9000
	85	19	1.1	21.7	7.35	7500	9000
	85	23	1.1	31.0	8.55	7000	8500
	85	23	1.1	31.0	8.55	7000	8500
	100	25	1.5	38.5	12.8	6300	7500
	100	25	1.5	38.5	12.8	6300	7500
	100	36	1.5	61.0	16.3	5600	6700
	100	36	1.5	61.1	17.3	5600	6700

Designations		Abutment and fillet dimensions			Axe load coefficient			Weight		
Cylindrical bore	Tapered bore	Ds(min)	dh(max)	R(max)	e	Y1	Y2	Y0	Cylindrical bore	Tapered bore
1205TN1		30	47	1	0.28	2.2	3.5	2.5	0.137	
1305TN1		31.5	55.5	1	0.28	2.2	3.5	2.5	0.249	
1206	1206K	35	57	1	0.25	2.5	3.87	2.62	0.228	0.223
2206	2206K	35	57	1	0.39	1.63	2.53	1.71	0.260	0.254
2206TN1		35	57	1	0.39	1.63	2.53	1.71	0.242	
2306	2306K	36.5	65.5	1	0.44	1.43	2.22	1.5	0.515	0.515
2306TN1		36.5	65.5	1	0.44	1.43	2.22	1.5	0.494	
1207	1207K	41.5	65.5	1	0.23	2.74	4.24	2.87	0.318	0.312
1207TN1	1207KTN1	41.5	65.5	1	0.23	2.74	4.24	2.87	0.309	0.303
2207	2207K	41.5	65.5	1	0.37	1.69	2.61	1.77	0.604	0.544
2207TN1		41.5	65.5	1	0.37	1.69	2.61	1.77	0.587	
1307	1307K	43	72	1.5	0.25	2.56	3.97	2.69	0.507	0.480
1307TN1	1307KTN	43	72	1.5	0.25	2.56	3.97	2.69	0.486	0.475
2307	2307K	43	72	1.5	0.46	1.36	2.11	1.43	0.675	0.662
2307TN1		43	72	1.5	0.46	1.36	2.11	1.43	0.659	
1208	1208K	46.5	73.5	1	0.22	2.87	4.45	3.01	0.410	0.402
1208TN1	1208KTN1	46.5	73.5	1	0.22	2.87	4.45	3.01	0.402	0.391
2208	2208K	46.5	73.5	1	0.33	1.9	2.94	1.99	0.520	0.520
2208TN1	2208KTN1	46.5	73.5	1	0.33	1.9	2.94	1.99	0.476	0.475
1308	1308K	48	82	1.5	0.24	2.62	4.05	2.74	0.714	
1308TN1	1308KTN1	48	82	1.5	0.24	2.62	4.05	2.74	0.688	
2308	2308K	48	82	1.5	0.43	1.45	2.25	1.52	0.959	0.944
2308TN1	2308KTN1	48	82	1.5	0.43	1.45	2.25	1.52	0.901	0.901
1209	1209K	51.5	78.5	1	0.21	2.94	4.55	3.08	0.469	0.460
1209TN1	1209KTN1	51.5	78.5	1	0.21	2.94	4.55	3.08	0.458	0.446
2209	2209K	51.5	78.5	1	0.31	2.04	3.15	2.13	0.553	0.500
2209TN1	2209KTN1	51.5	78.5	1	0.31	2.04	3.15	2.13	0.553	0.500
1309	1309K	53	92	1.5	0.25	2.53	3.92	2.66	0.951	0.946
1309TN1	1309KTN1	53	92	1.5	0.25	2.53	3.92	2.66	0.920	0.915
2309	2309K	53	92	1.5	0.42	1.51	2.33	1.58	1.24	1.23
2309M		53	92	1.5	0.42	1.51	2.33	1.58	1.36	

# Self-aligning Ball Bearings

**ZWZ**

d 50~70 mm



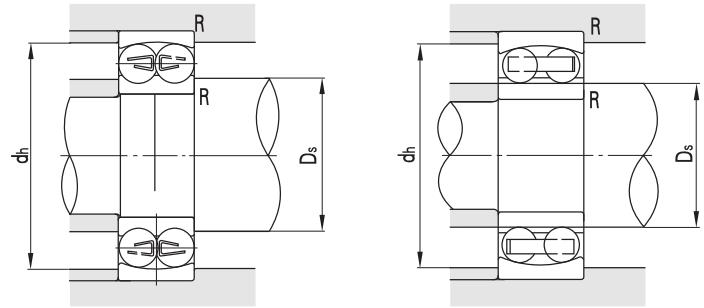
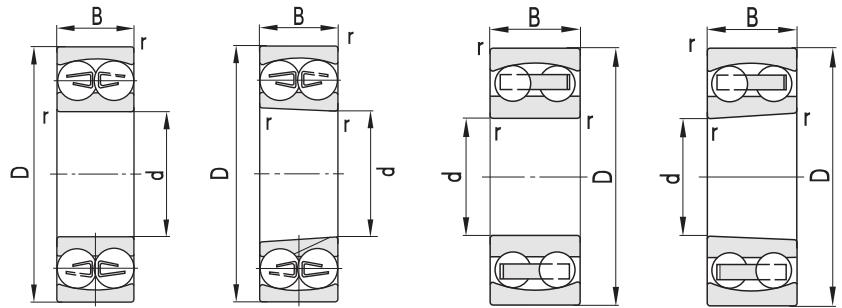
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
50	90	20	1.1	25.5	8.50	7000	8500
	90	20	1.1	25.6	8.51	7000	8500
	90	20	1.1	25.5	8.50	7000	8500
	90	23	1.1	32.0	10.5	6300	7500
	90	23	1.1	32.0	10.5	6300	7500
	110	27	2	43.5	14.1	5600	6700
	110	40	2	63.5	20.0	5300	6300
55	100	21	1.5	27.0	10.6	6300	7500
	100	21	1.5	27.0	10.6	6300	7500
	100	25	1.5	37.0	9.50	6000	7000
	120	29	2	51.5	18.0	5000	6000
	120	29	2	51.5	18.0	5000	6000
	120	43	2	75.0	23.5	4300	5000
60	110	22	1.5	31.0	11.6	5600	6700
	110	22	1.5	31.0	11.6	5600	6700
	110	28	1.5	46.5	14.5	5300	6300
	110	28	1.5	46.5	14.5	5300	6300
	130	31	2.1	58.5	21.1	4500	5300
	130	31	2.1	58.5	21.1	4500	5300
	130	46	2.1	86.5	27.6	4500	5300
	130	46	2.1	86.5	27.6	4500	5300
	150	35	2.1	76.5	28.4	3800	4500
	150	35	2.1	73.5	26.7	3800	4500
65	120	23	1.5	33.5	12.3	5300	6300
	120	23	1.5	33.5	12.3	5300	6300
	120	31	1.5	54.5	16.3	5000	6000
	140	33	2.1	63.0	22.9	4300	5000
	140	48	2.1	95.5	32.5	4000	4800
70	125	24	1.5	34.5	13.5	5000	6000
	125	31	1.5	44.0	17.0	4800	5600
	150	35	2.1	74.5	27.8	4000	4800
	150	51	2.1	109	37.5	3800	4500

Designations		Abutment and fillet dimensions			Axe load coefficient			Weight		
Cylindrical bore	Tapered bore	Ds(min)	dh(max)	R(max)	e	Y1	Y2	Y0	Cylindrical bore	Tapered bore
1210	1210K	56.5	83.5	1	0.2	3.13	4.85	3.28	0.547	0.543
1210U1		56.5	83.5	1	0.2	3.13	4.85	3.28	0.547	
1210TN1	1210KTN1	56.5	83.5	1	0.2	3.13	4.85	3.28	0.535	0.531
2210	2210K	56.5	83.5	1	0.29	2.2	3.41	2.31	0.618	0.539
2210TN1	2210KTN1	56.5	83.5	1	0.29	2.2	3.41	2.31	0.567	0.489
1310	1310K	59	101	2	0.24	2.68	4.14	2.8	1.21	1.19
2310	2310K	59	101	2	0.42	1.49	2.3	1.56	1.66	1.65
1211	1211K	63	95	1.5	0.2	3.23	4.99	3.38	0.708	0.708
1211TN1	1211KTN1	63	95	1.5	0.2	3.23	4.99	3.38	0.681	0.680
2211	2211K	63	95	1.5	0.28	2.26	3.5	2.37	0.824	0.812
1311	1311K	64	111	2	0.23	2.7	4.18	2.83	1.57	1.57
1311TN1	1311KTN1	64	111	2	0.23	2.7	4.18	2.83	1.51	1.52
2311	2311K	64	111	2	0.41	1.53	2.36	1.6	2.10	2.05
1212	1212K	68	102	1.5	0.19	3.39	5.25	3.56	0.892	0.877
1212TN1	1212KTN1	68	102	1.5	0.19	3.39	5.25	3.56	0.870	0.855
2212	2212K	68	102	1.5	0.28	2.27	3.51	2.38	1.16	1.14
2212TN1	2212KTN1	68	102	1.5	0.28	2.27	3.51	2.38	1.09	1.07
1312	1312K	71	119	2	0.23	2.8	4.33	2.93	1.98	1.98
1312TN1	1312KTN1	71	119	2	0.23	2.8	4.33	2.93	1.92	1.90
2312	2312K	71	119	2	0.4	1.56	2.41	1.63	2.61	2.60
2312M		71	119	2	0.4	1.56	2.41	1.63	2.68	
1412		71	139	2	0.22	2.81	4.35	2.95	3.26	
1412H		71	139	2	0.22	2.81	4.35	2.95	3.31	
1213	1213K	73	112	1.5	0.17	3.71	5.73	3.88	0.915	0.915
1213TN1	1213KTN1	73	112	1.5	0.17	3.71	5.73	3.88	0.915	
2213	2213K	73	112	1.5	0.28	2.25	3.48	2.35	1.50	1.49
1313	1313K	76	129	2	0.23	2.78	4.31	2.92	2.38	2.37
2313	2313K	76	129	2	0.38	1.65	2.55	1.72	3.22	3.21
1214	1214K	78	117	1.5	0.18	3.51	5.44	3.68	1.29	1.25
2214	2214K	78	117	1.5	0.27	2.36	3.66	2.48	1.63	1.63
1314	1314K	81	139	2	0.22	2.81	4.35	2.95	2.98	2.90
2314		81	139	2	0.39	1.62	2.5	1.69	3.92	

# Self-aligning Ball Bearings

**ZWZ**

d 75~100 mm



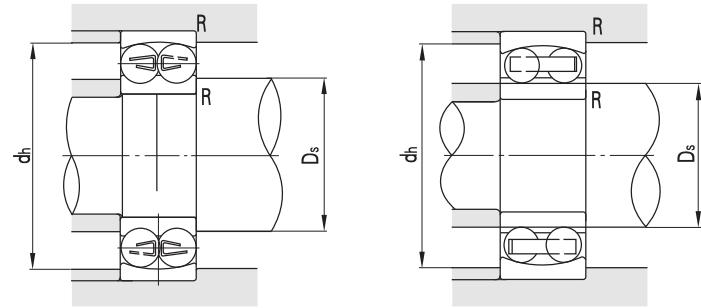
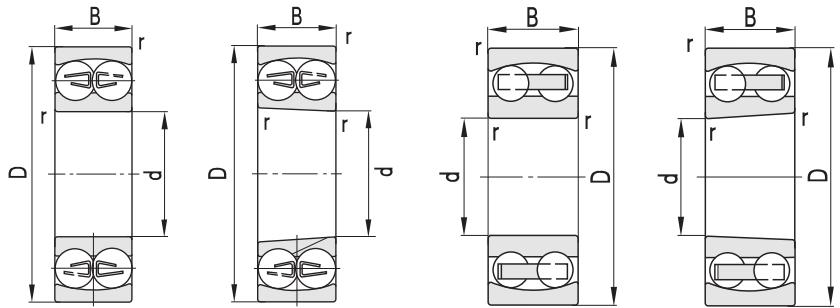
Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm			KN			r/min	
75	130	25	1.5	39.0	15.5	4800	5600
	130	31	1.5	55.5	17.9	4500	5300
	160	37	2.1	79.5	29.9	3800	4500
	160	55	2.1	123	43.0	3400	4000
	160	55	2.1	123	43.0	3400	4000
80	140	26	2	40.0	16.9	4500	5300
	140	26	2	40.0	16.9	4500	5300
	140	33	2	62.0	19.9	4000	4800
	170	39	2.1	89.0	33.5	3600	4300
	170	58	2.1	128	45.5	3200	3800
	170	58	2.1	128	45.5	3200	3800
	170	58	2.1	128	45.5	3200	3800
85	150	28	2	49.0	20.5	4000	4800
	150	36	2	58.5	23.6	3800	4500
	180	41	3	98.5	38.0	3400	4000
	180	60	3	139	51.5	3000	3600
90	160	30	2	57.0	23.4	3800	4500
	160	40	2	70.0	28.5	3400	4300
	190	43	3	117	45.0	3200	3800
	190	43	3	117	45.0	3200	3800
	190	64	3	151	57.0	2800	3400
	190	64	3	151	57.0	2800	3400
95	170	32	2.1	64.0	27.0	3600	4300
	170	43	2.1	83.5	34.0	3400	4000
	200	45	3	132	51.0	3000	3600
	200	67	3	164	64.5	2600	3200
100	180	34	2.1	69.0	29.5	3400	4000
	180	34	2.1	69.0	29.5	3400	4000
	180	46	2.1	97.5	40.5	3200	3800
	180	46	2.1	97.5	40.5	3200	3800
	215	47	3	143	58.0	2800	3400

Designations		Abutment and fillet dimensions			Axe load coefficient			Weight		
Cylindrical bore	Tapered bore	Ds(min)	dh(max)	R(max)	e	Y1	Y2	Y0	Cylindrical bore	Tapered bore
1215	1215K	83	122	1.5	0.17	3.6	5.58	3.77	1.35	1.35
2215	2215K	83	122	1.5	0.25	2.49	3.86	2.61	1.71	1.68
1315	1315K	86	149	2	0.22	2.84	4.39	2.97	3.55	3.49
2315	2315K	86	149	2	0.38	1.66	2.56	1.73	4.71	4.63
2315TN1		86	149	2	0.38	1.66	2.56	1.73	4.71	
1216	1216K	89	131	2	0.16	3.94	6.1	4.13	1.65	1.59
1216TN1	1216TN1	89	131	2	0.16	3.94	6.1	4.13	1.59	1.54
2216	2216K	89	131	2	0.25	2.49	3.86	2.61	2.19	2.05
1316	1316K	91	159	2	0.22	2.92	4.52	3.06	4.19	4.18
2316	2316K	91	159	2	0.39	1.63	2.53	1.71	5.70	5.55
2316TN1		91	159	2	0.39	1.63	2.53	1.71	5.77	
2316M		91	159	2	0.39	1.63	2.53	1.71	5.93	
1217	1217K	94	141	2	0.17	3.69	5.7	3.86	2.10	2.07
2217	2217K	94	141	2	0.25	2.48	3.84	2.6	2.53	2.48
1317	1317K	98	167	2.5	0.22	2.9	4.49	3.04	4.95	4.90
2317	2317K	98	167	2.5	0.38	1.67	2.59	1.75	6.73	6.56
1218	1218K	99	151	2	0.17	3.76	5.81	3.94	2.44	2.44
2218	2218K	99	151	2	0.27	2.36	3.65	2.47	3.22	3.15
1318	1318K	103	177	2.5	0.22	2.81	4.35	2.94	5.99	5.70
1318K	111318K	103	177	2.5	0.22	2.81	4.35	2.94	5.70	
2318	2318K	103	177	2.5	0.38	1.67	2.58	1.74	8.27	8.23
1618K	111618K	103	177	2.5	0.38	1.64	2.54	1.72	7.82	7.79
1219	1219K	106	159	2	0.17	3.68	5.69	3.85	3.06	3.02
2219	2219K	106	159	2	0.26	2.38	3.69	2.5	5.38	5.30
1319	1319K	108	187	2.5	0.23	2.77	4.29	2.9	6.98	6.96
1619K	111619K	108	187	2.5	0.38	1.68	2.59	1.76	9.20	9.16
1220	1220K	111	169	2	0.17	3.64	5.63	3.81	3.68	3.67
1220K	1112320K	111	169	2	0.17	3.64	5.63	3.81	3.69	3.68
2220	2220K	111	169	2	0.27	2.34	3.62	2.45	4.95	4.94
1520K	111520K	111	169	2	0.27	2.34	3.62	2.45	4.61	4.61
1320		113	202	2.5	0.24	2.67	4.13	2.8	8.64	

# Self-aligning Ball Bearings

**ZWZ**

d 100~1100 mm



Principal dimensions			Basic load ratings			Limit speed ratings	
d	D	B	rsmin	Cr	Cor	Grease	Oil
mm							
				KN		r/min	
100	215	47	3	143	58.0	2800	3400
	215	73	3	191	78.5	2400	3000
	215	73	3	191	78.5	2400	3000
	215	73	3	191	78.5	2400	3000
105	190	36	2.1	75.0	32.0	3200	3800
	225	77	3	194	79.5	3200	2800
110	200	38	2.1	88.0	38.5	3000	3600
	200	38	2.1	88.0	38.5	3000	3600
	200	53	2.1	124	52.0	2800	3400
	200	53	2.1	124	52.0	2800	3400
	240	50	3	163.5	72.0	2400	3000
	240	50	3	163.5	72.0	2400	3000
	240	80	3	215.5	94.0	2200	2800
	240	80	3	215.5	94.0	2200	2800
	240	80	3	215.5	94.0	2200	2800
120	215	42	2.1	119.5	52.5	2000	2600
	215	42	2.1	115	50.0	2000	2600
	215	42	2.1	115	50.0	2000	2600
130	230	46	3	125	56.0	3600	5600
140	250	50	3	155	72.0	1900	2500
150	235	36	3	104	53.0	2000	2600
680	900	300	6	360	370	300	350
1100	1300	300	6	910	440	130	160

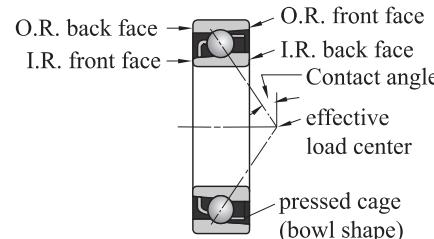
Designations		Abutment and fillet dimensions			Axe load coefficient			Weight		
Cylindrical bore	Tapered bore	Ds(min)	dh(max)	R(max)	e	Y1	Y2	Y0	Cylindrical bore	Tapered bore
1320K	111320K	113	202	2.5	0.24	2.67	4.13	2.8	8.28	
2320	2320K	113	202	2.5	0.37	1.69	2.62	1.77	12.4	12.3
2320TN1		113	202	2.5	0.37	1.69	2.62	1.77	11.4	
2320J	2320KJ	113	202	2.5	0.37	1.69	2.62	1.77	11.7	11.7
1221		116	179	2	0.18	3.55	5.5	3.72	4.71	
2321		118	212	2.5	0.39	1.64	2.53	1.71	14.4	
1222	1222K	121	189	2	0.17	3.64	5.64	3.82	5.20	5.12
	111222K	121	189	2	0.17	3.64	5.64	3.82	5.18	5.14
2222	2222k	121	189	2	0.28	2.25	3.49	2.36	7.16	7.00
1522K	111522K	121	189	2	0.28	2.25	3.49	2.36	6.66	6.65
1322	1322k	123	227	2.5	0.22	2.83	4.39	2.97	11.9	11.8
1322K	111322K	123	227	2.5	0.22	2.83	4.39	2.97	11.3	11.1
2322	2322K	123	227	2.5	0.38	1.67	2.59	1.75	17.6	17.3
2322TN1		123	227	2.5	0.38	1.67	2.59	1.75	15.9	
2322J	2322KJ	123	227	2.5	0.38	1.67	2.59	1.75	16.1	15.8
10001224		131	204	2	0.2	3.21	4.97	3.36	7.04	
1001224K		131	204	2	0.2	3.21	4.97	3.36	5.96	
1111224K		131	204	2	0.2	3.21	4.97	3.36	5.90	
1226		144	216	2.5	0.2	3.3	5.1	3.6	8.64	
1001228		153	237	2	0.2	3.12	4.83	3.27	11.3	
1730		163	222	2	0.15	4.18	6.46	4.38	6.25	
150/680D1L		703	877	5.5	0.26	2.38	3.69	2.5	447	
150/1100D1L		1123	1277	5.5	0.21	2.99	4.62	3.13	614	

## Product Characteristics

Single-row angular contact ball bearing consists of a outer ring, a inner ring, one-row balls and a cage. This bearing can carry radial load and axial load simultaneously, even pure axial load operating with higher rotation speed. However, this bearing only can carries axial load in one direction. When this bearing carry radial load, an additional axial force will occur and can only limit the axial movement of shaft and housing in one direction. Although this bearing only can carry axial load in one direction, yet it can be mounted with the other bearing carrying a load in contrary direction. If paired mounted, make the end faces of outer rings of two bearings face to face, i.e. wide end face to wide end face (DB type) and narrow end face to narrow end face (DF type). This arrangement can avoid the occurrence of additional axial force and limit the movement of shaft and housing within axial end play of bearing in two directions.

Single-row angular contact ball bearing has more balls than that of deep groove ball bearing with the same boundary dimensions and therefore this kind of bearing has the highest load rating among ball bearings, strong rigidity and steady operation. The radial clearance can be adjusted by the relative movement of the inner ring and the outer ring. The rigidity of system can be improved by pre-interference amount generated by placing several bearings in tandem arrangement. Angular contact ball bearing can not be separated and has poor self-aligning property.

The contact angle of this bearing is not zero. The contact angle of single-row angular contact ball bearing can be  $15^\circ$  ,  $25^\circ$  ,  $30^\circ$  or  $40^\circ$  . Contact angle determines how big radial load and axial load the bearing can carry. The bigger the contact angle is, the bigger axial load is. But the smaller contact angle is positive to high speed rotation.



Single-row angular contact ball bearing doesn't have clearance. Internal clearance can only be achieved through stack mounting. According to applications, stack-mounting bearings are preloaded or have pre-clearance. The internal clearance of preloaded stack mounting bearings is zero or negative. This bearing is often used on main shaft of machine tool to improve the rigidity and rotation precision of main shaft. The clearance or preload of matched pair bearing has been set in ZWZ and it is unnecessary for customers to adjust. The width tolerance and end face projection of an individual single-row angular contact ball bearings is produced as per normal class so these bearings can not be stack-mounted in random.

ZWZ also can produce universal stack mounting angular-contact ball bearings with DB, DF or in tandem arrangement. The universal stack mounting bearings have two types, which are preloaded or have pre-clearance. Except universal stack mounting bearings, all individual bearings of other kinds of stack mounting bearings are not interchangeable.

This bearing is most used in applications with high rotation speed, high precision and small axial load such as main shaft of airplane motor, main shaft of machine tool and other main shafts of high speed and precision machinery. It is also used on high frequency motor, gas turbine, oil pump, air compressor, printing machines etc. It's a most widely used bearing in machinery industry.

## Types of bearing

ZWZ can manufacture four types of angular contact ball bearing:

- **Single-row angular contact ball bearing**  
7000C、7000AC、7000A、7000B

- **Stack mounting angular contact ball bearing**

Face to Face(DB)、Back to Back(DF)、Tandem(DT)、Triplet

- **Double-row angular contact ball bearing**

Two-raceway inner ring and two outer rings

Two-raceway outer ring and two inner rings

Two outer rings and two inner rings

- **Four-point contact ball bearing**

QJ0000、QJF0000

## Single-row angular contact ball bearing and stack mounting angular contact ball bearing

In order to improve the rigidity and load-carry property, the same angular contact ball bearings are often stack mounted in twosome (DB, DF, DT), triplet (TBT, TFT, TT), quaternion (QBC, QFC, QT) and even quintuplet (PBC, PFC, PT, PBT, PFT). For twosome bearings, the type of matched pair can be back to back (DB), face to face (DF) or tandem (DT).

Stack mounting bearings in DB type is suitable for carrying individual or combined radial load and axial load. These bearings can also carry axial loads in two direction and have, larger tilting moment and strong rigidity. These bearings can be preloaded properly according to working conditions.

While Stack mounting bearings in DF type only can carry smaller tilting moment and provide inferior system rigidity. But the advantage of these bearings is not sensible to concentricity error of bearing housing.

Stack mounting bearings in tandem arrangement only can carry a larger axial load in one direction. In most occasions, these bearings need to be preloaded by spring and the preload value is associated with the value of radial load and bearing rigidity.

Stack mounting bearings have two types, which are preloaded or have pre-clearance.

### Preload type:

GA-- Light preload

GB-- Moderate preload

GC-- Heavy preload

### Pre-clearance:

CA-- Small axial clearance

CB-- Moderate axial clearance

CC-- Large axial clearance

### Preload

The preload value of DB or DF pair matched bearings is listed in the below table:

# Angular Contact Ball Bearings

**ZWZ**

Contact angle 15°

ID Code	(B)71900C			(B)7000C			(B)7200C		
	A	B	C	A	B	C	A	B	C
00	10	20	40	15	30	60	20	40	80
01	10	20	40	15	30	60	20	40	80
02	15	30	60	20	40	80	30	60	120
03	15	30	60	25	50	100	35	70	140
04	25	50	100	35	70	140	45	90	180
05	25	50	100	35	70	140	50	100	200
06	25	50	100	50	100	200	90	180	360
07	35	70	140	60	120	240	120	240	480
08	45	90	180	60	120	240	150	300	600
09	50	100	200	110	220	440	160	320	640
10	50	100	200	110	220	440	170	340	680
11	70	140	280	150	300	600	210	420	840
12	70	140	280	150	300	600	250	500	1000
13	80	160	320	160	320	640	290	580	1160
14	130	260	520	200	400	800	300	600	1200
15	130	260	520	200	400	800	310	620	1240
16	140	280	560	240	480	960	370	740	1480
17	170	340	680	250	500	1000	370	740	1480
18	180	360	720	300	600	1200	480	960	1920
19	190	380	760	310	620	1240	520	1040	2080
20	230	460	920	310	620	1240	590	1180	2360
21	230	460	920	360	720	1440	650	1300	2600
22	230	460	920	420	840	1680	670	1340	2680
24	290	580	1160	430	860	1720	750	1500	3000
26	350	700	1400	560	1120	2240	800	1600	3200
28	360	720	1440	570	1140	2280			
30	470	940	1880	650	1300	2600			
32	490	980	1960	730	1460	2920			
34	500	1000	2000	800	1600	3200			
36	630	1260	2520	900	1800	3600			
38	640	1280	2560	950	1900	3800			
40	800	1600	3200	1100	2200	4400			
44	850	1700	3400	1250	2500	5000			
48	-	-	-	1300	2600	5200			

Contact angle 25° 、 Contact angle 40°

ID Code	(B)71900C			(B)7000AC			(B)7200AC			7200B、7300B		
	A	B	C	A	B	C	A	B	C	A	B	C
00	15	30	60	25	50	100	35	70	140	80	330	660
01	15	30	60	25	50	100	35	70	140	80	330	660
02	25	50	100	30	60	120	45	90	180	80	330	660
03	25	50	100	40	80	160	60	120	240	80	330	660
04	35	70	140	50	100	200	70	140	280	120	480	970
05	40	80	160	60	120	240	80	160	320	120	480	970
06	40	80	160	90	180	360	150	300	600	120	480	970
07	60	120	240	90	180	360	190	380	760	160	630	1280
08	70	140	280	100	200	400	240	480	960	160	630	1280
09	80	160	320	170	340	680	260	520	1040	160	630	1280
10	80	160	320	180	360	720	260	520	1040	160	630	1280
11	120	240	480	230	460	920	330	660	1320	380	1500	3050
12	120	240	480	240	480	960	400	800	1600	380	1500	3050
13	120	240	480	240	480	960	450	900	1800	380	1500	3050
14	200	400	800	300	600	1200	480	960	1920	380	1500	3050
15	210	420	840	310	620	1240	500	1000	2000	380	1500	3050
16	220	440	880	390	780	1560	580	1160	2320	380	1500	3050
17	270	540	1080	400	800	1600	600	1200	2400	410	1600	3250
18	280	560	1120	460	920	1840	750	1500	3000	410	1600	3250
19	290	580	1160	480	960	1920	850	1700	3400	410	1600	3250
20	360	720	1440	500	1000	2000	950	1900	3800	410	1600	3250
21	360	720	1440	560	1120	2240	1000	2000	4000	410	1600	3250
22	370	740	1480	650	1300	2600	1050	2100	4200	410	1600	3250
24	450	900	1800	690	1380	2760	1200	2400	4800	410	1600	3250
26	540	1080	2160	900	1800	3600	1250	2500	5000	540	2150	4300
28	560	1120	2240	900	1800	3600				540	2150	4300
30	740	1480	2960	1000	2000	4000				540	2150	4300
32	800	1600	3200	1150	2300	4600				540	2150	4300
34	800	1600	3200	1250	2500	5000				540	2150	4300
36	1000	2000	4000	1450	2900	5800				540	2150	4300
38	1000	2000	4000	1450	2900	5800				940	3700	7500
40	1250	2500	5000	1750	3500	7000				940	3700	7500
44	1300	2600	5200	2000	4000	8000				940	3700	7500
48				2050	4100	8200				940	3700	7500

For stacking mounting bearings, preload value is the product of following coefficient with the preload value of DB or DF matched pair bearings.

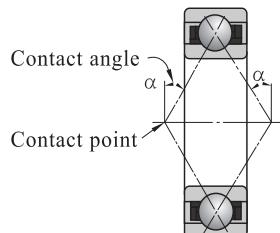
Stack mounting type	Coefficient
TBT	1.35
QBT	1.60
QBC	2
DBT	1.75
PBC	2.45

## Pre-clearance

Axial clearance in micron of 7200B series and 7300B series pair matched bearing

d mm		CA		CB		CC	
Over	Up to	min	max	min	max	min	max
-	10	4	12	14	22	22	30
10	18	5	13	15	23	24	32
18	30	7	15	18	26	32	40
30	50	9	17	22	30	40	48
50	80	11	23	26	38	48	60
80	120	14	26	32	44	55	67
120	180	17	29	35	47	62	74
180	250	21	37	45	61	74	90

## Four-point contact ball bearing



- Two-raceway outer ring and two inner rings 0000D type

The old designation is 86000 type. This bearing has a contact angle of 45°, or 26°, 32° and 40°. in special occasions. This bearing is used to carry larger radial load, axial load or the combination of them. This bearing is used on the component to limit axial movement of shaft or housing. It has high limit speed.

- Two-raceway outer rings and two-raceway inner rings 0000 and 000A

The old designation is 56000 type. This bearing has a contact angle of 30°, 26° or 35° in special occasions. This bearing has a similar structure with DB pair matched angular-contact ball bearings but the width is smaller. This bearing can carry larger combined axial load and radial load, or axial load in any direction and larger tilting moment. This bearing is used on the component to limit axial movement of shaft or housing. It has high limit speed. Generally, this bearing has a filling slot at one side. The cage is brass. If a bearing with a suffix TN, the material of cage is nylon and there is no filling slot on rings.

### Dimension range:

The following dimension data table is about the basic dimensions of ZWZ angular contact ball bearing,

#### Single-row angular contact ball bearing

Dimension range of bore diameter: 25mm ~ 1180mm  
Dimension range of outer diameter: 62mm ~ 1420mm  
Dimension range of overall width: 16mm ~ 106mm

#### Matched pair angular contact ball bearing

Dimension range of bore diameter: 30mm ~ 1320mm  
Dimension range of outer diameter: 62mm ~ 1600mm  
Dimension range of overall width: 32mm ~ 244mm

#### Double-row angular contact ball Bearing

Dimension range of bore diameter: 35mm ~ 320mm  
Dimension range of outer diameter: 72mm ~ 460mm  
Dimension range of overall width: 27mm ~ 160mm

#### Four-point contact ball bearing

Dimension range of bore diameter: 30mm ~ 560mm  
Dimension range of outer diameter: 72mm ~ 780mm  
Dimension range of overall width: 19mm ~ 90mm

## Tolerance

The standard tolerance of single-row angular-contact ball bearing is manufactured by Class P0 but ZWZ can also supply the bearings meeting precision Class P6 or higher. For a single bearing with contact angle  $\alpha$  of 15° and 25° used for paired mounting, the precision class meets P5. For a single bearing with contact angle  $\alpha$  of 40° used for paired mounting, the precision class meets P6. ZWZ also can supply the bearings with precision 4A, 2A or other precision requirements. Please refer to tolerance standard listed in the table of preface pages.

## Tolerance

Self-aligning ball bearing has stamped steel cage, solid brass cage or nylon cage. The material of cage is sheet steel, brass or synthetic resin.

Four-point angular contact bearing has solid brass cage without suffix after basic bearing code.

For a single bearing, the bearings in matched pair: when outside diameter is less than 250mm and contact angle is 15° or 25°, the material of cage is cotton fabric phenolic laminate; when outside diameter is more than 250mm, the material of cage is solid brass or hard aluminum.

Cotton fabric phenolic laminate cage is adopted for the bearings meeting precision P5, P4 and P2. And there is no suffix following basic bearing code.

Cotton fabric phenolic laminate cage is also adopted for angular contact ball bearings with locking slot on inner ring or any changed bearings based on them. And there is no suffix following basic bearing code.

Stamped sheet (strip) steel cage is adopted for double-row angular contact ball bearings and there is no suffix following basic bearing number.

The bearing with nylon cage can operate under ambient temperature of 120° or higher. The solid brass cage is considered when the bearing is used under high temperature or critical conditions.

Please contact with ZWZ if request for the bearing with non-standard cage.

## Dynamic Equivalent Load

Single-row angular contact ball bearing with contact angle of 15°

Single bearing or two bearings in tandem arrangement

$$P=Fr \quad [\text{kN}] \text{ when } Fa/Fr \leq e$$

$$P=0.44Fr+YFa \quad [\text{kN}] \text{ when } Fa/Fr > e$$

Two bearings in back-to-back arrangement or face-to-face arrangement

$$P=Fr+Y1Fa \quad [\text{kN}] \text{ when } Fa/Fr \leq e$$

$$P=0.72Fr+Y2Fa \quad [\text{kN}] \text{ when } Fa/Fr > e$$

The values of  $e$ ,  $Y$ ,  $Y1$  and  $Y2$  are as follows:

Fa/C0	e	Y	Y1	Y2
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

Note: C0 is basic static load rating of a single bearing.

Single-row angular contact ball bearing with contact angle of 25°

Single bearing or two bearings in tandem arrangement

$$P=Fr \quad [\text{kN}] \text{ when } Fa/Fr \leq 0.68$$

$$P=0.41Fr+0.87Fa \quad [\text{kN}] \text{ when } Fa/Fr > 0.68$$

Two bearings in back-to-back arrangement or face-to-face arrangement

$$P=Fr + 0.92Fa \quad [\text{kN}] \text{ when } Fa/Fr \leq 0.68$$

$$P=0.67Fr+1.41Fa \quad [\text{kN}] \text{ when } Fa/Fr > 0.68$$

Single-row angular contact ball bearing with contact angle of 40°

Single bearing or two bearings in tandem arrangement

$$P=Fr \quad [\text{kN}] \text{ when } Fa/Fr \leq 1.14$$

$$P=0.35Fr+0.57Fa \quad [\text{kN}] \text{ when } Fa/Fr > 1.14$$

Two bearings in back-to-back arrangement or face-to-face arrangement

$$P=Fr + 0.55Fa \quad [\text{kN}] \text{ when } Fa/Fr \leq 1.14$$

$$P=0.57Fr+0.93Fa \quad [\text{kN}] \text{ when } Fa/Fr > 1.14$$

Double-row angular contact ball bearing

When contact angle is 30°

$$P=Fr + 0.78 Fa \quad [\text{kN}] \text{ when } Fa/Fr \leq 0.8$$

$$P=0.63Fr+1.24Fa \quad [\text{kN}] \text{ when } Fa/Fr > 0.8$$

When contact angle is 45°

$$P=Fr + 0.47Fa \quad [\text{kN}] \text{ when } Fa/Fr \leq 1.34$$

$$P=0.54Fr+0.81Fa \quad [\text{kN}] \text{ when } Fa/Fr > 1.34$$

Four-point contact ball bearing

$$P=Fr + 0.66 Fa \quad [\text{kN}] \text{ when } Fa/Fr \leq 0.95$$

$$P=0.6Fr+1.07Fa \quad [\text{kN}] \text{ when } Fa/Fr > 0.95$$

Static Equivalent Load

Single-row angular contact ball bearing with contact angle of 15°

Single bearing or two bearings in tandem arrangement

$$P0=0.5Fr + 0.46Fa \quad [\text{kN}]$$

When  $F0 < Fr$  Choose  $P0 = Fr$

Two bearings in back-to-back arrangement or face-to-face arrangement

$$P0=Fr + 0.92Fa \quad [\text{kN}]$$

Single-row angular contact ball bearing with contact angle of 25°

Single bearing or two bearings in tandem arrangement

$$P0=0.5Fr + 0.38Fa \quad [\text{kN}]$$

When  $F0 < Fr$  Choose  $P0 = Fr$

Two bearings in back-to-back arrangement or face-to-face arrangement

$$P0=Fr + 0.76Fa \quad [\text{kN}]$$

Single-row angular contact ball bearing with contact angle of 40°

Single bearing or two bearings in tandem arrangement

$$P0=0.5Fr + 0.26Fa \quad [\text{kN}]$$

When  $F0 < Fr$  Choose  $P0 = Fr$

Two bearings in back-to-back arrangement or face-to-face arrangement

$$P0=Fr + 0.52Fa \quad [\text{kN}]$$

Four-point contact ball bearing

$$P0=Fr + 0.58Fa \quad [\text{kN}]$$

Double-row angular contact ball bearing

When contact angle is 30°

$$P0=Fr + 0.66Fa \quad [\text{kN}]$$

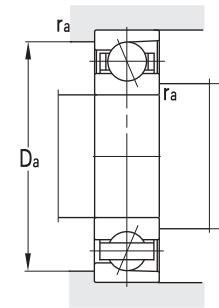
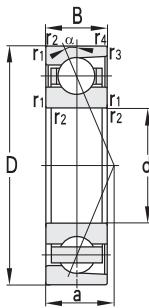
When contact angle is 45°

$$P0=Fr + 0.44Fa \quad [\text{kN}]$$

# Single-row Angular Contact Ball Bearings

ZWZ

d 25~50 mm



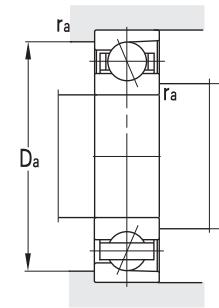
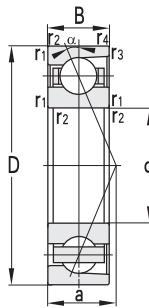
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	B	r1,2min	r3,4min	Cr	Cor	Grease	Oil
mm				KN		r/min		
25	62	17	1.1	0.6	28.6	16.0	10000	15000
	62	17	1.1	0.6	24.7	14.0	9000	13000
30	72	19	1.1	0.6	31.8	21.0	9000	13000
	72	19	1.1	0.6	31.0	19.5	8000	11000
	72	19	1.1	0.6	33.6	18.0	8000	11000
35	72	17	1.1	0.6	32.5	22.0	9000	12000
	72	17	1.1	0.6	29.0	18.0	8000	11000
	80	21	1.5	0.6	40.3	26.0	8000	11000
35	80	21	1.5	0.6	39.0	25.0	7800	1050
	80	21	1.5	0.6	39.0	25.0	7500	10000
	80	21	1.5	0.6	39.0	25.0	6000	8000
	100	25	1.5	0.6	70.2	42.0	6300	8500
40	80	18	1.1	0.6	36.4	25.0	8000	11000
	80	18	1.1	0.6	36.4	25.0	6400	8800
	80	18	1.1	0.6	47.2	21.5	10000	15000
	90	23	1.5	0.6	46.8	32.5	7600	10000
	90	23	1.5	0.6	46.8	31.0	6000	8000
	90	23	1.5	0.6	46.8	30.0	5100	6800
	90	23	1.5	0.6	46.8	30.0	6300	8500
	110	27	2	1	90.5	39.0	5600	7500
45	85	19	1.1	0.6	40.3	29.0	9600	13600
	85	19	1.1	0.6	40.3	29.0	12000	17000
	100	25	1.5	0.6	63.7	42.5	7000	9500
	100	25	1.5	0.6	65.0	45.0	6000	8000
	100	25	1.5	0.6	68.3	39.5	5600	7500
50	80	16	1	0.3	26.5	17.3	8000	10000
	80	16	1	0.3	25.0	20.5	7000	9000
	90	20	1.1	0.6	42.9	32.0	7600	10000
	90	20	1.1	0.6	42.9	32.0	6080	8000
	90	20	1.1	0.6	40.3	30.0	5800	7800
	90	20	1.1	0.6	37.7	29.0	4480	6400

Designations	Contact points	Abutment and fillet dimensions			Weight
	a	da(max)	Da(max)	ra(max)	
	mm				Kg
7305C	14.3	32	55	1	0.224
7305BM	27.2	32	55	1	0.277
7306C	16.3	37	65	1	0.346
7306ACM	21.6	37	65	1	0.413
7306BM	30.9	37	65	1	0.371
7207C	15.7	42	65	1	0.304
7207BM	30.9	42	65	1	0.328
7307C	18.2	44	71	1.5	0.335
7307ACM	24.1	44	71	1.5	58.5
7307BM	35	44	71	1.5	0.551
7307B	35	44	71	1.5	0.481
7407ACM	28.3	44	91	1.5	1.14
7208C	17	47	73	1	0.364
B7208C	17	47	73	1	0.383
7208CTN1/HQ1	17	47	73	1	0.312
7308C	20.2	49	81	1.5	0.624
7308ACM	26.7	49	81	1.5	0.711
7308B	38.8	49	81	1.5	0.653
7308BM	38.8	49	81	1.5	0.711
7408BM	45	60	100	2	1.47
B7209C	18.2	52	78	1	0.418
7209C	18.2	52	78	1	0.403
7309C	22.2	64	91	1.5	0.834
7309ACM	29.4	64	91	1.5	1.02
7309BM	42.9	64	91	1.5	1.02
7010CM	16.7	57	73	1	0.309
7010ACM	23.2	57	73	1	0.314
7210C	19.4	57	83	1	0.458
B7210C	19.4	57	83	1	0.506
7210AC	26.3	57	83	1	0.460
7210B	39.4	57	83	1	0.487

# Single-row Angular Contact Ball Bearings

ZWZ

d 50~65 mm



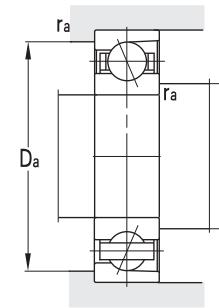
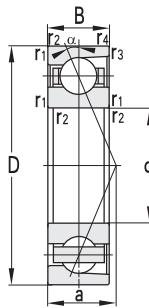
Principal dimensions					Basic load ratings		Limit speed ratings	
d	D	B	r1,2min	r3,4min	Cr	Cor	Grease	Oil
mm					KN		r/min	
50	110	27	2	1	71.5	49.0	5600	7500
	110	27	2	1	70.0	44.0	5000	6700
	110	27	2	1	75.4	51.0	7000	8700
	110	27	2	1	75.4	51.0	7000	8700
	110	27	2	1	70.0	44.0	4000	5400
	130	31	2.1	1.1	105	70.0	5000	7000
	130	31	2.1	1.1	96.4	64.0	4000	6000
55	90	18	1.1	0.6	31.2	26.0	10000	12000
	100	21	1.5	0.6	53.3	40.0	8000	10000
	100	21	1.5	0.6	53.3	40.0	8000	10000
	100	21	1.5	0.6	50.7	38.0	7100	10000
	100	21	1.5	0.6	53.3	40.0	10000	14000
	100	21	1.5	0.6	50.7	32.0	10000	14000
	100	21	1.5	0.6	34.0	34.0	5600	8000
	120	29	2	1	92.3	65.0	7000	8700
	120	29	2	1	92.3	65.0	7000	8700
	120	29	2	1	91.0	65.0	5000	6700
	120	29	2	1	88.4	63.0	5000	6700
	120	29	2	1	88.4	63.0	5000	6700
	120	29	2	1	81.0	56.0	4500	6300
	140	33	2.1	1.1	121	84.0	4500	6300
60	95	18	1.1	0.6	35.1	30.0	7100	10000
	110	22	1.5	0.6	55.9	43.0	6700	9000
	110	22	1.5	0.6	55.9	43.0	6700	9000
	110	22	1.5	0.6	58.5	45.0	9500	13000
	110	22	1.5	0.6	49.4	36.0	5600	7800
	130	31	2.1	1.1	94.9	67.0	4800	6300
	130	31	2.1	1.1	94.9	67.0	4800	6300
	130	31	2.1	1.1	91.0	60.0	4300	5600
	130	31	2.1	1.1	91.0	60.0	3500	4500
	150	35	2.1	1.1	131	95.0	3800	5000
	150	35	2.1	1.1	120	86.0	3000	4000
65	100	18	1.1	0.6	33.8	31.0	6700	9500

Designations	Contact points	Abutment and fillet dimensions			Weight
	a	da(max)	Da(max)	ra(max)	
	mm			Kg	
7310ACM	32.2	60	100	2	1.16
7310BM	47.1	60	100	2	1.16
7310C	24.2	60	100	2	1.04
7310CM	24.2	60	100	2	1.16
7310B	47.1	60	100	2	1.05
7410ACM	36.5	62	118	2.1	2.30
7410BM	53.3	62	118	2.1	2.36
7011AC	25.9	62	83	1	0.385
7211C	20.9	64	91	1.5	0.599
B7211C	20.9	64	91	1.5	0.600
7211AC	28.6	64	91	1.5	0.599
7211CM	20.9	65	91	1.5	0.698
7211C/HQ1	20.9	65	91	1.5	0.578
7211BM	43	65	91	1.5	1.698
7311CM	26.2	65	110	2	1.65
7311C	26.2	65	110	2	1.44
7311AC	34.9	65	110	2	1.44
7311ACM	34.9	65	110	2	1.65
7311ACQ1	34.9	65	110	2	1.64
7311BM	51.2	65	110	2	1.61
7411ACM	39.3	67	128	2.1	2.79
7012AC	27.1	67	88	1	0.392
7212AC	30.8	69	101	1.5	0.786
7212ACM	30.8	69	101	1.5	0.951
7212C	22.4	69	101	1.5	0.786
7212BM	46.7	69	101	1.5	0.947
7312AC	37.7	72	118	2	1.80
7312ACM	37.7	72	118	2	2.02
7312BM	55.4	72	118	2	2.11
7312B	55.4	72	118	2	1.86
7412ACM	42	72	138	2	3.65
7412BM	61.6	72	138	2	3.42
7013AC	28.2	72	93	1	0.414

# Single-row Angular Contact Ball Bearings

ZWZ

d 65~70 mm



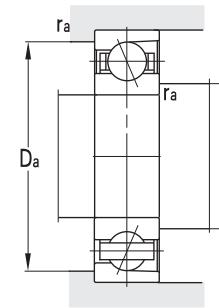
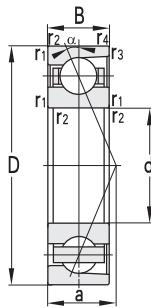
Principal dimensions					Basic load ratings		Limit speed ratings	
d	D	B	r1,2min	r3,4min	Cr	Cor	Grease	Oil
mm					KN		r/min	
65	100	18	1.1	0.6	37.7	34.0	5400	7600
	100	18	1.1	0.6	33.8	31.0	6700	9500
	120	23	1.5	0.6	72.8	59.0	9000	12000
	120	23	1.5	0.6	72.8	56.0	6000	8500
	120	23	1.5	0.6	70.2	56.0	6000	8500
	120	23	1.5	0.6	70.2	56.0	6000	8500
	120	23	1.5	0.6	72.8	59.0	9000	12000
	140	33	2.1	1.1	120	88.0	8000	10000
	140	33	2.1	1.1	120	88.0	6400	8000
	140	33	2.1	1.1	120	88.0	6300	8000
	140	33	2.1	1.1	114	84.0	4300	6000
	140	33	2.1	1.1	114	84.0	3400	4800
	140	33	2.1	1.1	114	84.0	4300	6000
	140	33	2.1	1.1	101	75.0	3800	5300
	140	33	2.1	1.1	114	84.0	3500	4800
	140	33	2.1	1.1	101	75.0	3000	4200
	160	37	2.1	1.1	129	97.0	2800	4300
70	110	20	1.1	0.6	44.2	41.0	6300	8500
	110	20	1.1	0.6	44.2	41.0	6300	8500
	125	24	1.5	0.6	79.3	65.0	8500	11000
	125	24	1.5	0.6	79.3	65.0	8500	11000
	125	24	1.5	0.6	75.4	62.0	5600	8000
	125	24	1.5	0.6	75.4	62.0	5600	8000
	125	24	1.5	0.6	79.3	65.0	6800	8800
	125	24	1.5	0.6	79.3	65.0	8500	11000
	125	24	1.5	0.6	68.0	54.0	4000	5600
	150	35	2.1	1.1	134	100	6500	8000
	150	35	2.1	1.1	134	100	6500	8000
	150	35	2.1	1.1	129	96.0	4000	5300
	150	35	2.1	1.1	129	96.0	4000	5300
	150	35	2.1	1.1	114	86.0	3200	4200
70	150	35	2.1	1.1	114	86.0	3600	5000
	180	42	3	1.1	164	131	3600	5000
	180	42	3	1.1	164	131	2900	4000
	180	42	3	1.1	148	118	2500	3500

Designations	Contact points	Abutment and fillet dimensions			Weight
	a	da(max)	Da(max)	ra(max)	
	mm			Kg	
7013ACJ	28.2	72	93	1	0.410
7013ACM	28.2	72	93	1	0.504
7213C	23.9	74	111	1.5	1.02
7213AC/P5	33.1	74	111	1.5	1.02
7213ACM	33.1	74	111	1.5	1.16
7213AC/YB5	33.1	74	111	1.5	1.02
7213CM	23.9	74	111	1.5	1.16
7313CM	30.2	77	128	2	2.60
7313CJ	30.2	77	128	2	2.23
7313C	30.2	77	128	2	2.23
7313ACM	40.4	77	128	2	2.61
7313ACJ	40.4	77	128	2	2.24
7313AC	40.4	77	128	2	2.24
7313BM	59.5	77	128	2	2.48
B7313ACM	40.4	77	128	2	2.61
7313B	59.5	77	128	2	1.95
7413BM	65.7	77	148	2	3.82
7014AC	31	77	103	1	0.626
7014ACM	31	77	103	1	0.725
7214CM	25.1	79	116	1.5	1.26
7214C	25.1	79	116	1.5	1.10
7214ACM	34.7	79	116	1.5	1.26
7214AC	34.7	79	116	1.5	1.10
B7214C	25.1	79	116	1.5	1.16
7214CTN1	25.1	79	116	1.5	1.09
7214BM	52.9	79	116	1.5	1.27
7314C	32.2	82	138	2	2.69
7314CM	32.2	82	138	2	3.01
7314AC	43.2	82	138	2	2.69
7314ACM	43.2	82	138	2	3.01
7314B	63.7	82	138	2	2.85
7314BM	63.7	82	138	2	3.20
7414ACM	50.1	84	166	2.5	5.22
7414ACJ	50.1	84	166	2.5	4.86
7414BM	73.4	84	166	2.5	5.64

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 75~85 mm



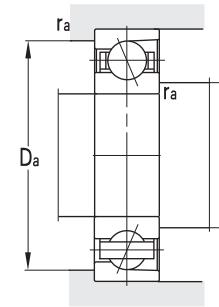
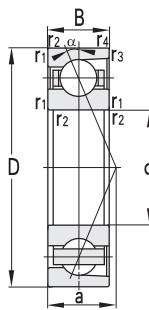
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings	
				r1,2min	r3,4min	Cr	Cor
mm				KN		r/min	
75	130	25	1.5	0.6	78.7	66.5	6800 8500
	130	25	1.5	0.6	79.3	67.0	5600 7500
	130	25	1.5	0.6	79.3	67.0	5600 7500
	130	25	1.5	0.6	79.3	67.0	4480 6000
	130	25	1.5	0.6	79.3	67.0	4480 6000
	160	37	2.1	1.1	146	113	5800 7000
	160	37	2.1	1.1	146	113	4800 5600
	160	37	2.1	1.1	140	109	3800 5000
	160	37	2.1	1.1	140	109	3800 5000
	160	37	2.1	1.1	140	109	3800 5000
	160	37	2.1	1.1	125	97.0	3400 4800
	160	37	2.1	1.1	125	97.0	3400 4800
	160	37	2.1	1.1	125	97.0	2700 3800
	160	37	2.1	1.1	140	109	3400 4800
	160	37	2.1	1.1	140	109	3800 5000
	190	45	3	1.1	159	130	2400 3800
80	125	22	1.1	0.6	55.9	53.0	6500 8000
	125	22	1.1	0.6	55.9	53.0	6500 8000
	125	22	1.1	0.6	55.9	53.0	4500 6000
	125	22	1.1	0.6	55.9	53.0	5600 7500
	140	26	2	1	97.5	83.0	7500 10000
	140	26	2	1	92.3	79.0	5000 7100
	140	26	2	1	97.5	83.0	6000 8000
	140	26	2	1	92.3	79.0	5000 7100
	170	39	2.1	1.1	152	122	3600 4800
	170	39	2.1	1.1	152	122	2800 3800
	170	39	2.1	1.1	152	122	3600 4800
	170	39	2.1	1.1	152	122	3600 4800
	170	39	2.1	1.1	135	109	3400 4500
	200	48	3	1.1	195	168	2600 3800
	200	48	3	1.1	195	168	2600 3800
	200	48	3	1.1	195	168	2100 3000
	200	48	3	1.1	178	153	2200 3200
85	130	22	1.1	0.6	57.2	56.0	5300 7100

Designations	Contact points a	Abutment and fillet dimensions			Weight Kg
		da(max)	Da(max)	ra(max)	
7215C/P5	26.2	84	121	1.5	1.24
7215ACM	36.4	84	121	1.5	1.29
7215AC	36.4	84	121	1.5	1.18
7215ACJ	36.4	84	121	1.5	1.18
7215ACTN1	36.4	84	121	1.5	1.21
7315CM	34.2	87	148	2	3.57
7315CJ	34.2	87	148	2	3.11
7315AC	45.9	87	148	2	3.11
7315ACM	45.9	87	148	2	3.57
7315ACQ1	45.9	87	148	2	3.52
7315B	67.8	87	148	2	3.70
7315BM	67.8	87	148	2	3.64
7315B	67.8	87	148	2	3.26
7315ACJ	45.9	87	148	2	3.10
7315ACTN1	45.9	87	148	2	3.08
7415BM	78.2	89	176	2.5	6.80
7016CA/P4	24.7	87	118	1	0.845
7016CA/HQ1P4	24.7	87	118	1	0.845
7016ACJ	34.9	87	118	1	0.849
7016ACM	34.9	87	118	1	0.983
7216CM	27.7	90	130	2	1.74
7216ACM	38.7	90	130	2	1.73
B7216C	27.7	90	130	2	1.47
7216AC	38.7	90	130	2	1.48
7316ACM	48.7	92	158	2	4.21
7316ACJ	48.7	92	158	2	3.88
7316AC	48.7	92	158	2	3.59
7316ACF3	48.7	92	158	2	4.15
7316BM	71.9	92	158	2	4.25
7416ACM	56.7	94	186	2.5	8.60
7416AC	56.7	94	186	2.5	7.18
7416ACJ	56.7	94	186	2.5	7.22
7416BM	82.7	96	184	2.5	8.05
7017ACM	36.1	92	123	1	1.12

# Single-row Angular Contact Ball Bearings

ZWZ

d 85~95 mm



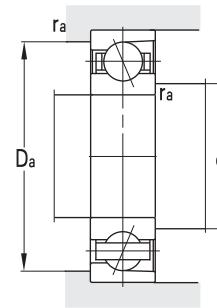
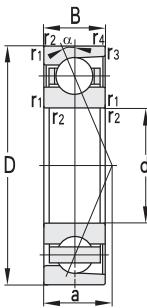
Principal dimensions					Basic load ratings		Limit speed ratings	
d	D	B	r1, 2min	r3, 4min	Cr	Cor	Grease	Oil
mm					KN		r/min	
85	130	22	1. 1	0. 6	57. 2	56. 0	5300	7100
	150	28	2	1	104	90. 0	6700	9500
	150	28	2	1	104	90. 0	5400	7600
	150	28	2	1	98. 8	86. 0	4800	6700
	150	28	2	1	98. 8	86. 0	4800	6700
	150	28	2	1	98. 8	86. 0	4800	6700
	150	28	2	1	98. 8	86. 0	4800	6700
	150	28	2	1	98. 8	86. 0	3800	5400
	150	28	2	1	85. 8	75. 0	3600	4800
	180	41	3	1. 1	164	137	3400	4500
	180	41	3	1. 1	146	122	3000	4000
	180	41	3	1. 1	146	122	3000	4000
	180	41	3	1. 1	146	122	3000	4000
90	140	24	1. 5	0. 6	67. 6	66. 0	4800	6700
	140	24	1. 5	0. 6	69. 0	66. 0	4800	6700
	140	24	1. 5	0. 6	58. 5	57. 0	4300	6200
	160	30	2	1	122	105	6300	9000
	160	30	2	1	122	105	6300	9000
	160	30	2	1	117	100	4500	6000
	160	30	2	1	117	100	3600	4800
	160	30	2	1	117	100	4500	6000
	160	30	2	1	103	88. 0	3200	4300
	190	43	3	1. 1	183	158	5200	6300
	190	43	3	1. 1	176	152	3200	4300
	190	43	3	1. 1	156	135	2800	3800
	190	43	3	1. 1	172	145	4200	8800
	190	43	3	1. 1	156	135	2200	3000
95	225	54	4	1. 5	233	214	2900	4000
	225	54	4	1. 5	210	193	1900	2900
	145	24	1. 5	0. 6	53. 5	69. 0	5200	6300
	170	32	2. 1	1. 1	139	120	6000	8500
95	170	32	2. 1	1. 1	139	120	4800	6800
	170	32	2. 1	1. 1	133	114	4300	5600
	170	32	2. 1	1. 1	133	114	3400	4500
	170	32	2. 1	1. 1	116	101	3000	4000

Designations	Contact points	Abutment and fillet dimensions			Weight
	a	da(max)	Da(max)	ra(max)	
	mm			Kg	
7017AC	36.1	92	123	1	0.95
7217CM	29.7	95	140	2	1.72
7217CJ	29.7	95	140	2	1.96
7217AC	41.4	95	140	2	1.91
7217ACTN1	41.4	95	140	2	1.96
7217ACM	41.4	95	140	2	1.72
7217ACJ	41.4	95	140	2	1.97
7217BM	63.4	95	140	2	2.23
7317ACM	51.4	99	166	2.5	4.99
7317BM	76.1	99	166	2.5	4.98
7317BT	76.1	99	166	2.5	4.34
7317BTN1	76.2	99	166	2.5	4.26
7018ACM	38.8	99	131	1.5	1.39
7018ACMA/P5	38.8	99	131	1.5	1.37
7018BM	60.2	99	131	1.5	1.43
7218CM	31.7	100	150	2	2.47
7218C	31.7	100	150	2	2.09
7218ACM	44.1	100	150	2	2.35
7218ACJ	44.1	100	150	2	2.16
7218AC	44.1	100	150	2	2.11
7218BM	67.4	100	150	2	3.38
7318CM	40.3	104	176	2.5	5.79
7318ACM	54.1	104	176	2.5	6.18
7318BM	80.2	104	176	2.5	5.26
B7318C	40.3	104	176	2.5	4.90
7318B	80.2	104	176	2.5	4.94
7418ACM	63.8	108	207	3	11.5
7418BM	93.1	110	205	3	11.4
7019ACM	40	93	135	1.5	1.44
7219CM	33.8	107	158	2	3.20
7219CJ	33.8	107	158	2	2.76
7219ACM	46.9	107	158	2	2.97
7219ACJ	46.9	107	158	2	2.76
7219B	71.7	107	158	2	3.00

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 95~110 mm



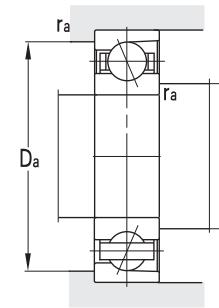
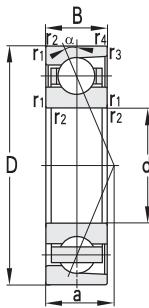
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings			
				r1,2min	r3,4min	Cr	Cor	Grease	Oil
mm									
						KN	r/min		
95	200	45	3	1.1	196	174	5000	6000	
	200	45	3	1.1	189	167	3000	4000	
	200	45	3	1.1	168	150	2900	3900	
100	150	24	1.5	0.6	76.7	77.0	4500	6000	
	180	34	2.1	1.1	156	136	5600	8000	
	180	34	2.1	1.1	148	130	4000	5300	
	180	34	2.1	1.1	130	114	2800	3800	
	180	34	2.1	1.1	148	130	4000	5300	
	215	47	3	1.1	213	199	2800	3800	
	215	47	3	1.1	190	177	2400	3400	
	215	47	3	1.1	190	177	1900	2700	
	215	47	3	1.1	190	177	1900	2700	
105	225	49	3	1.1	202	193	2400	3200	
110	170	21	1.5	1.5	76.7	82.0	4800	6800	
	170	28	2	1	98.8	101	3200	4200	
	170	28	2	1	98.8	101	3200	4200	
	170	28	2	1	98.8	101	4000	5300	
	170	28	2	1	98.8	101	4000	5300	
	175	30	1.1	0.7	103	104	3200	4200	
	200	38	2.1	1.1	185	171	5000	7100	
	200	38	2.1	1.1	185	171	4000	5700	
	200	38	2.1	1.1	185	171	5000	7100	
	200	38	2.1	1.1	176	164	3600	4800	
	200	38	2.1	1.1	176	164	3600	4800	
	200	38	2.1	1.1	176	164	2900	3800	
	200	38	2.1	1.1	153	144	2600	3400	
	240	50	3	1.1	191	240	3600	4800	
	240	50	3	1.1	239	231	2600	3400	
	240	50	3	1.1	213	212	2200	3000	
	240	50	3	1.1	213	212	2200	3000	
	240	50	3	1.1	213	212	1800	2400	
	240	50	3	1.1	213	212	1800	2400	
	240	50	3	1.1	213	212	1800	2400	

Designations	Contact points a	Abutment and fillet dimensions			Weight Kg
		da(max)	Da(max)	ra(max)	
mm					
7319CM	42.3	109	186	2.5	6.67
7319ACM	56.9	109	186	2.5	6.67
7319BM	84.4	109	186	2.5	6.67
7020AC	41.2	109	141	1.5	1.25
7220CM	35.8	112	168	2	3.71
7220ACM	49.6	112	168	2	3.74
7220BM	75.7	112	168	2	4.00
7220AC	49.6	112	168	2	3.25
7320ACM	60.2	114	201	2.5	9.61
7320BM	89.6	114	201	2.5	8.41
7320B	89.6	114	201	2.5	7.29
7320BT	89.6	114	201	2.5	7.58
7321BM	93.7	119	211	2.5	9.51
7022AX2M	50.9	115	165	1.5	1.86
7022ACJ	46.6	120	160	2	1.90
B7022AC	47	120	160	2	2.03
7022ACM	46.7	120	160	2	2.41
7022AC	46.7	120	160	2	2.16
46722K	49.7	117	168	1	2.38
7222CM	39.8	122	188	2	5.03
7222CJ	39.8	122	188	2	4.14
7222C	39.8	122	188	2	4.07
7222ACM	55.1	122	188	2	4.81
7222AC	55.1	122	188	2	4.07
7222ACJ	55.1	122	188	2	4.14
7222BM	84	122	188	2	3.95
7322CM	48.4	124	210	2.5	9.67
7322ACM	65.8	124	226	2.5	9.97
7322BM	99.3	124	226	2.5	11.5
7322BM/YA8	98.4	124	226	2.5	11.7
7322B	99.3	124	226	2.5	9.84
B7322BQ1	99.2	124	226	2.5	11.4

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 120~160 mm



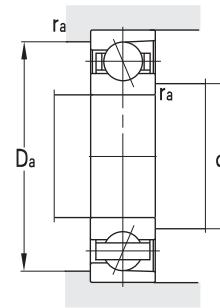
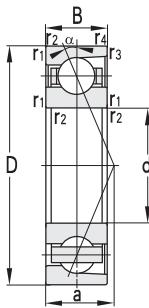
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings	
				r1,2min	r3,4min	Cr	Cor
mm							
						KN	r/min
120	180	28	2	1	100	107	3600 5000
	180	28	2	1	100	107	3600 5000
	215	40	2, 1	1, 1	190	184	3200 4500
	215	40	2, 1	1, 3	247	184	2600 3600
	260	55	3	1, 1	251	262	1600 2200
	260	55	3	1, 1	278	288	3400 4000
	260	55	3	1, 1	268	277	1800 2400
	260	55	3	1, 1	268	277	1800 2400
	260	55	3	1, 1	265	269	2200 3000
130	200	33	2	1	129	137	5400 6500
	230	40	3	1, 1	207	209	4400 5200
	230	40	3	1, 1	196	200	2400 3200
	230	40	3	1, 1	196	200	1900 2600
	280	58	4	1, 5	250	268	1800 2400
140	210	33	2	1	125	137	3200 4300
	210	33	2	1	125	137	3200 4300
	250	42	3	1, 1	231	243	4200 5000
	250	42	3	1, 1	220	237	2200 3000
	250	42	3	1, 1	217	235	2200 3000
	250	42	3	1, 1	191	207	2000 2800
	300	62	4	1, 5	275	300	1600 2200
	300	62	4	1, 5	275	300	1600 2200
	300	62	4	1, 5	276	301	2100 2800
150	225	35	2, 1	1, 1	153	170	2400 3000
	270	45	3	1, 1	242	268	2000 2800
	270	45	3	1, 1	226	254	1600 2200
	320	65	4	1, 5	359	429	1800 2400
	320	65	4	1, 5	317	380	2300 2000
160	240	38	2, 1	1, 1	161	183	1800 2200
	240	38	2, 1	1, 1	161	183	1800 2200
	240	38	2, 1	1, 1	161	183	1800 2200

Designations	Contact points a	Abutment and fillet dimensions			Weight Kg
		da(max)	Da(max)	ra(max)	
mm					
7024ACM	49	130	170	2	2.62
7024AC	49	130	170	2	2.31
7224ACM	59, 1	132	203	2	6.04
B7224ACQ1/HAS0	59	132	203	2	6.45
7324B	107, 2	134	246	2, 5	14, 6
7324CM	52, 9	134	246	2, 5	14, 2
B7324ACM	71, 8	134	246	2, 5	14, 2
B7324ACQ1	71, 8	134	246	2, 5	14, 0
7324AC	71, 8	134	246	2, 5	13, 7
7026C	38, 6	140	190	2	3.33
7226CM	44, 1	144	216	2, 5	7.28
7226ACM	62	144	216	2, 5	7.26
7226ACJ	62	144	216	2, 5	6.23
7226BM	95, 5	144	216	2, 5	7.56
7326B	115, 1	148	262	3	17, 9
7028AC	57, 3	150	200	2	3.46
7028ACM	57, 3	150	200	2	4.14
7228CM	47, 1	154	236	2, 5	8.83
7228ACM	66, 5	154	236	2, 5	8.71
B7228ACYQ1	68, 5	154	236	2, 5	8.70
7228BM	102, 9	154	236	2, 5	8.59
7328B	123, 3	158	282	3	21, 2
7328B/YA8	123, 3	158	282	3	23, 1
7328BA	123, 3	158	282	3	21, 6
7030ACM	61, 2	162	213	2	4.80
7230AC	71, 5	164	256	2, 5	12, 1
B7230AC	71, 4	164	256	2, 5	10, 6
7330AC	87, 6	168	302	3	25, 8
7330B	131	168	302	3	26, 2
B7032ACQ1	65, 6	172	228	2	5.74
B7032ACM	65, 6	172	228	2	5.81
7032ACM	65, 6	172	228	2	5.95

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 160~240 mm



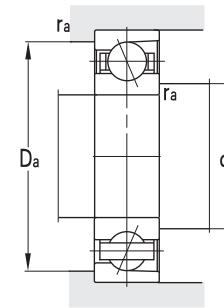
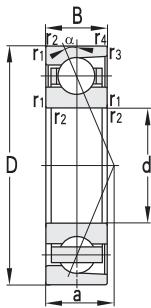
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		
				r1,2min	r3,4min	Cr	Cor	Grease
<b>mm</b>								
						KN		r/min
160	290	48	3	1.1	263	304	2900	3600
	290	48	3	1.1	250	289	1900	2600
	340	68	4	1.5	337	409	1200	1600
	400	88	5	2	449	580	1100	1600
170	260	42	2.1	1.1	199	227	2000	2600
	260	42	2.1	1.1	199	227	2000	2600
	310	52	4	1.5	321	389	2800	3400
	310	52	4	1.5	306	371	1800	2400
	310	52	4	1.5	266	325	1600	2200
	310	52	4	1.5	282	343	1500	1900
	360	72	4	1.5	380	495	1350	1800
180	250	33	2	1	160	196	3200	4300
	280	46	2.1	1.1	190	235	1650	2200
	320	52	4	1.5	333	418	2700	3200
	320	52	4	1.5	317	399	1700	2200
	380	75	4	1.5	404	536	1300	1800
190	290	46	2.1	1.1	215	263	1800	2400
	340	55	4	1.5	257	430	1500	2000
	400	78	5	2	430	600	1150	1600
200	310	51	2.1	1.1	264	331	1700	2200
	310	51	2.1	1.1	264	331	1700	2200
	360	58	4	1.5	363	487	2500	3000
	360	58	4	1.5	345	462	1500	2000
	360	58	4	1.5	309	417	1300	1800
	420	80	5	2	450	660	1000	1500
220	400	65	4	1.5	423	605	1100	1600
	400	65	4	1.5	423	605	1100	1600
	460	88	5	2	480	730	1000	1400
240	320	48	2.1	1.1	185	250	1000	1500
	360	56	3	1.1	250	380	1150	1600

Designations	Contact points a	Abutment and fillet dimensions			Weight Kg
		da(max)	Da(max)	ra(max)	
mm					
7232C	54.1	174	276	2.5	14.5
7232AC	76.5	174	276	2.5	14.5
7332B	138.9	178	322	3	30.8
7432BM	161	180	382	4	61.4
7034ACQ1	71.1	182	248	2	8.27
7034AC	71.1	182	248	2	7.98
7234C	58.2	188	292	3	17.2
7234AC	82	188	292	3	17.2
7234B	126.7	187	293	3	17.8
B7234AC	82	188	292	3	17.4
7334B	147	188	342	3	34.5
71936CM	45.3	192	235	2	4.88
7036B	119	192	268	2	10
7236C	59.5	198	302	3	17.9
7236AC	84.3	198	302	3	17.9
7336B	155	198	362	3	37.0
7038AC	79	202	278	2	10.7
7238AC	89.3	222	324	3	22.4
7338B	164	212	380	4	48
7040AC	85	212	298	2	14.9
7040ACN1	85	212	298	2	14.8
7240C	66.5	218	342	3	25.2
7240AC	94.3	218	342	3	25.2
7240B	146.5	218	342	3	25.8
7340B	170	222	400	4	53
7244AC	104.7	238	382	3	36.1
7244AC	104.7	238	382	3	36.1
7344B	187	242	440	4	71
72948AC	89.3	252	308	2	10.0
7048B	154	256	345	2.5	19.5

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 240~400 mm



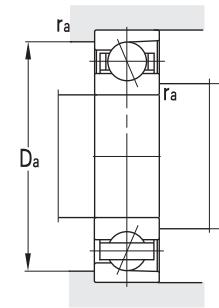
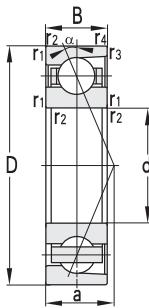
Principal dimensions			Basic load ratings			Limit speed ratings		
d	D	B	r1,2min	r3,4min	Cr	Cor	Grease	Oil
mm								
					KN		r/min	
240	440	72	4	1.5	419	626	1000	1500
	500	95	5	2	540	850	850	1200
260	360	46	2.1	1.1	260	380	900	1400
	480	80	5	2	495	790	850	1200
280	380	46	2.1	1.1	268	405	800	1300
	420	65	4	1.5	310	500	900	1300
	500	80	5	2	500	840	800	1200
285	380	46	2.1	1.1	244	366	800	1200
300	460	74	4	1.5	410	690	950	1300
	460	74	4	1.5	360	620	900	1200
320	440	56	3	1.1	340	580	940	1400
	480	74	4	1.5	416	700	800	1100
340	460	56	3	1.1	330	575	900	1350
	520	82	5	2	510	1050	800	1100
	620	92	6	3	685	1320	700	1000
360	440	38	2.1	1.1	228	430	1800	2650
	480	56	3	1.1	340	630	900	1300
	480	56	3	1.1	330	620	850	1000
	480	56	3	1.1	290	540	850	1000
	540	82	5	1.3	532	965	600	1000
	650	95	6	3	635	1240	700	950
380	480	31	2	1	185	340	860	1200
	480	46	2.1	1.1	285	495	860	1200
	520	65	4	1.5	355	630	500	800
	560	82	5	2	495	940	810	1100
	560	82	5	2	455	880	760	1000
400	540	65	4	1.5	410	760	810	1100
203								

Designations	Contact points a	Abutment and fillet dimensions			Weight Kg
		da(max)	Da(max)	ra(max)	
7248B	178.5	258	411	3	50.9
7348B	203	262	481	4	89
71952AC	95.3	272	348	2	13.8
7252B	195	280	460	4	67
71956AC	99.9	292	368	2	15.7
7056B	179	296	406	3	31
7256B	204	300	480	4	70.5
B71957Y	119	297	368	2	14.7
7060A	147	318	442	3	43
7060B	196	318	442	3	43
71964AC	116	334	426	2.5	26.5
7064AC/P6	130	385	445	3	47.5
71968AC	126	354	446	2.5	24.5
7068AC	141.3	360	500	4	61.0
7268B	248	366	593	5	128
71872AC	112	371	430	2	12.5
71972AC	126	374	468	2.5	29.5
71972A	149	374	468	2.5	29.5
71972B	204	374	468	2.5	29.5
7072CF3	101.3	382	518	4	65.3
7272B	261	387	624	5	152
70876A	142	390	470	2	13.5
71876AC	123	392	470	2	18.5
71976B	221.4	398	502	3	42.1
7076A	177	399	541	4	66
7076B	238	399	541	4	66
71980A	168	416	525	3	42.5

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 400~560 mm



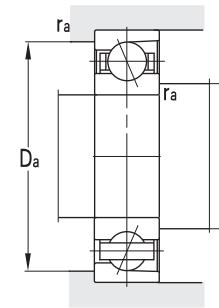
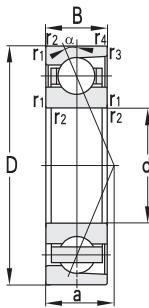
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Grease	Oil
				r1,2min	r3,4min	Cr	Cor		
<b>mm</b>									
						KN	r/min		
400	600	90	5	2	590	1170	740	1000	
	600	90	5	2	515	1010	710	960	
420	560	65	4	1.5	410	820	810	1100	
	560	65	4	1.5	355	670	810	1100	
	620	90	5	2	590	1160	710	960	
	620	90	5	2	525	1040	680	910	
440	600	74	4	1.5	495	1050	740	1000	
	650	94	6	3	635	1300	710	960	
	650	94	6	3	560	1170	630	840	
460	580	37	2.1	1	259	550	760	1000	
	580	56	3	3	362	760	760	1000	
	620	74	4	1.5	495	1050	680	740	
	680	100	6	3	675	1450	670	910	
	680	100	6	3	605	1280	610	800	
480	700	100	6	3	685	1540	630	840	
	700	100	6	3	610	1330	550	740	
500	620	37	2.1	1.1	270	610	660	890	
	620	56	3	1.1	390	810	600	850	
	670	78	5	2	540	1210	620	850	
	720	100	6	3	700	1610	610	810	
	720	100	6	3	620	1410	550	760	
530	650	56	3	1.1	380	890	620	840	
	710	82	5	2	600	1350	610	810	
	780	112	6	3	815	1880	550	740	
	780	112	6	3	725	1690	510	680	
560	680	56	3	1.1	385	920	600	810	
	750	85	5	2	580	1270	550	740	
	820	115	6	3	880	2140	520	710	

Designations	Contact points a	Abutment and fillet dimensions			Weight Kg
		da(max)	Da(max)	ra(max)	
mm					
7080A	189	418	580	4	91.5
7080B	255	418	580	4	91.5
71984A	174	436	545	3	46.5
71984B	238	436	545	3	46.5
7084A	195	439	601	4	97
7084B	263	440	602	4	93
71988AC	158	456	585	3	60
7088A	204	464	626	5	100
7088B	276	464	626	5	100
70892A	169	472	568	2	25.5
71892A	178	474	566	2.5	34.5
71992AC	163	476	606	3	58.5
7092A	215	484	656	5	121
7092B	289	484	656	5	121
7096A	220	503	677	5	126
7096B	298	503	677	5	126
708/500A	180	512	610	2	27.5
718/500AMB	189.7	513	607	2.5	37.4
719/500A	208	520	651	4	77.5
70/500A	226	526	696	5	132
70/500B	306	526	696	5	132
718/530A	198	544	637	2.5	38.5
719/530AC	186	559	691	4	93
70/530A	245	554	756	5	178
70/530B	332	554	756	5	182
718/560A	207	574	668	2.5	42
719/560A	232	578	733	4	107
70/560A	257	584	798	5	193

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 600~1180 mm



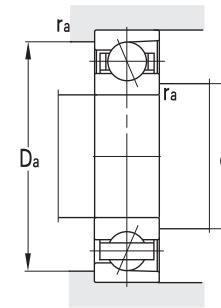
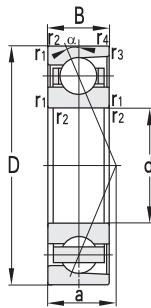
Principal dimensions	Basic load ratings				Limit speed ratings				
	d	D	B	r <sub>1,2min</sub>	r <sub>3,4min</sub>	Cr	Cor	Grease	Oil
<u>mm</u>									
						KN		r/min	
600	730	42	3	1.1	330	730	560	740	
	730	60	3	1.1	405	880	720	1120	
	800	90	5	2	700	1720	740	710	
	870	118	6	3	865	2150	470	620	
630	920	128	7.5	4	935	2460	420	550	
670	820	69	4	1.5	540	1280	490	640	
	980	136	7.5	4	1140	3180	470	630	
710	870	74	4	1.5	580	1630	440	580	
	950	106	6	3	830	2220	810	1120	
	1030	140	7.5	4	1160	3200	400	530	
750	920	78	5	2	630	1850	400	530	
	1090	150	7.5	4	1270	3630	350	470	
800	1150	155	7.5	4	1320	3780	330	440	
850	1030	82	5	2	675	1850	330	440	
	1220	165	7.5	4	1490	4600	290	400	
900	1090	85	5	2	670	1830	300	400	
	1280	170	7.5	4	1520	4980	270	370	
950	1360	180	7.5	4	1590	5150	250	350	
1000	1220	100	6	3	900	2700	270	360	
	1420	185	7.5	4	1590	5450	210	310	
1060	1500	195	9.5	5	1640	5650	200	310	
1120	1360	106	6	3	1030	3700	190	290	
	1580	200	9.5	5	1680	5800	180	280	
1180	1420	106	6	4	865	3650	100	200	

Designations	Contact points a	Abutment and fillet dimensions			Weight Kg
		da(max)	Da(max)	ra(max)	
708/600A	212	613	717	2.5	39
718/600ACM	185.1	613	717	2.5	54.6
719/600AC	208	620	781	4	123
70/600A	273	624	845	5	230
70/630A	240	659	891	6	275
718/670AC	208	686	804	3	77.5
70/670A	306	699	951	6	345
718/710AC	221	726	854	3	94.5
719/710AC	247	734	926	5	200
70/710A	321	739	1000	6	375
718/750AC	234	768	901	4	112
70/750A	341	779	1062	6	450
70/800A	359	830	1120	6	510
718/850A	312	869	1011	4	141
70/850A	381	880	1191	6	605
718/900ACF1	274.5	944	1046	4	163
70/900A	400	930	1251	6	675
70/950A	424	979	1331	6	800
718/1000A	370	1024	1196	5	245
70/1000A	442	1029	1390	6	905
70/1060A	467	1095	1465	8	1060
718/1120A	411	1145	1336	5	325
70/1120A	497	1155	1545	8	1160
718/1180CAF1	356	1225	1377	5	329

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 1180~1250 mm



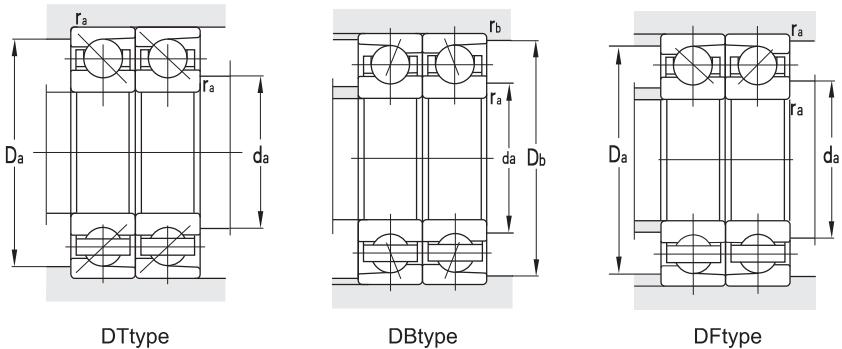
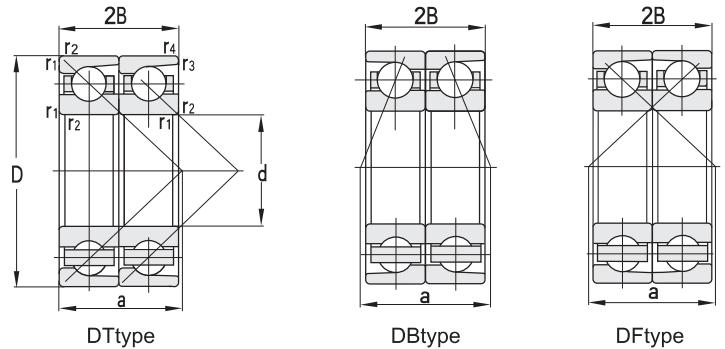
Principal dimensions			Basic load ratings			Limit speed ratings		
d	D	B	r1,2min	r3,4min	Cr	Cor	Grease	Oil
<u>mm</u>								
1180	1660	212	9.5	5	1700	6000	170	230
1250	1500	80	6	3	780	2650	180	250
	1500	112	6	3	1110	3900	180	250
	1750	218	9.5	5	1740	6500	160	220

Designations	Contact points	Abutment and fillet dimensions			Weight
	a	da(max)	Da(max)	ra(max)	
mm					
70/1180A	516	1215	1625	8	1340
708/1250A	437	1275	1476	5	300
718/1250A	453	1275	1476	5	395
70/1250A	542	1286	1715	8	1580

# Matched Pair Angular Contact Ball Bearings

**ZWZ**

d 30~70 mm



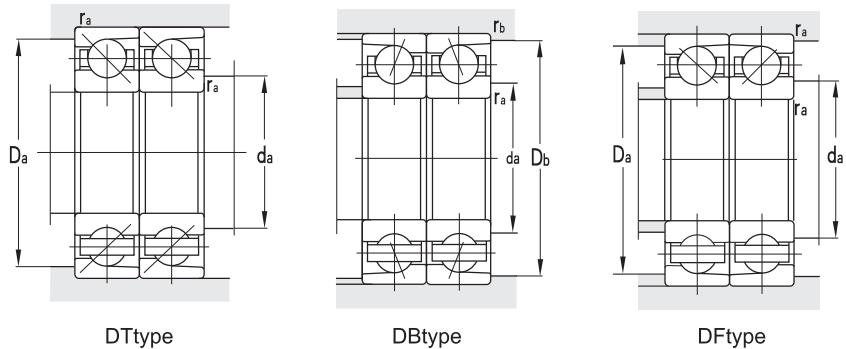
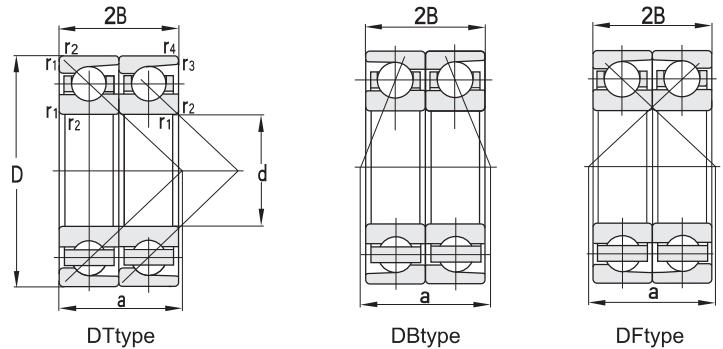
Principal dimensions				Basic load ratings				Limit speed ratings				Designations		
d	D	2B	r12	r34	Cr	Cor	Grease	Oil						
				KN				r/min						
mm														
30	62	32	1	0.3	30	24.5	7300	10000	7206BM/DT					
35	72	34	1.1	0.6	48.1	38	6300	8400	7207BTNT/DB					
	72	34	1.1	0.6	41.5	34	6300	8400	7207BM/DT					
80	42	1.5	0.6	63.1	50	11000	18000	7307AC/DBA						
80	42	1.5	-	62.4	49	11000	15000	7307BM/DFYA3						
80	42	1.5	0.6	62	49	6000	8000	7307BM/DT						
45	85	38	1.1	0.6	56	49	6000	7400	7209BM/DT					
100	50	1.5	0.6	108	88	9000	12000	7309ACM/DB						
100	50	1.5	0.6	97.5	79	9000	12000	7309BM/HADB						
100	50	1.5	0.6	75	80	9000	12000	7309BT/DB						
50	90	40	1.1	0.6	580	53.5	4800	6300	7210BM/DT					
110	54	2	1	117	98	8200	11000	7310ACM/DB						
110	54	2	1	113	88	8200	11000	7310BM/DB						
110	54	2	-	113	88	8200	11000	7310BM/DFYA3						
110	54	2	-	122	102	8200	11000	7310CM/DF						
55	90	36	1.1	0.6	50.7	51	9200	1200	7011ACQ5/DB					
100	42	1.5	0.6	82	76	4300	5600	7211ACM/DB						
100	42	1.5	0.6	80.5	78	9000	12000	7211CHA/P4ADBA						
120	58	2	1	143	126	4000	5000	7311ACM/DB						
120	58	2	1	127	113	7500	9900	7311BM/DB						
60	110	44	1.5	0.6	72.5	98.8	7700	10000	7212C/DT					
110	44	1.5	0.6	89.5	86	7700	10000	7212ACM/DB						
130	62	2.1	-	154	134	4000	5000	7312ACM/DF						
130	62	2.1	1.1	106	138	5600	7800	7312BT/DB						
130	62	2.1	1.1	155	135	6900	9200	7312AC/DB						
65	100	36	1.1	0.6	54.6	62	7800	10000	7013AC/DT					
120	46	1.5	0.6	118	117	7100	9500	7213ACQ5/DBYA3						
140	66	2.1	1.1	186	169	6400	8500	7313ACM/DB						
70	110	40	1.1	1.1	58.5	86	6900	9200	7014CM/P5DB					

DB Type	DF Type	DT Type	Abutment and fillet dimensions					Weight
			da(min)	Da(max)	Db(max)	ra(max)	rb(max)	
mm								
								Kg
-	-	27.3	35.6	56.5	-	1	-	0.497
61.9	-	-	42	-	67.5	1	0.6	0.571
-	-	31	42	65	-	1	-	0.656
47.8	-	-	43.5	-	74.5	1.5	0.6	0.907
-	28.1	-	43.5	-	74.5	1.5	-	1.10
-	-	35	43.5	71.5	-	1.5	-	1.1
mm								
								Kg
-	-	36.8	52	78	-	1	-	1.97
58.8	-	-	54	-	94	1.5	1	2.03
85.8	-	-	54	-	94	1.5	1	2.03
85.8	-	-	54	-	94	1.5	1	1.83
-	-	39.4	57	83	-	1	-	1.17
64.3	-	-	60	-	104	2	1	2.32
94.1	-	-	60	-	104	2	1	2.32
-	40.1	-	60	100	-	2	-	2.32
-	-	5.6	60	100	-	2	-	2.32
51.8	-	-	62	-	85	1	0.6	0.947
57.1	-	-	64	-	91	1.5	1	1.4
41.8	-	-	64	-	91	1.5	1	1.26
69.8	-	-	66	-	109	2	1	3.3
102.4	-	-	65	-	114	2	1	13.55
-	-	22	69	101	-	1.5	-	1.57
61.6	-	-	69	-	101	1.5	1	1.9
-	13.3	-	72	118	-	2	-	4.05
111	-	-	69	-	127	2	1	1.83
75.3	-	-	72	-	123	2	1	3.61
-	-	28.2	72	93	-	1	-	0.828
66.1	-	-	74	-	114	1.5	1	2.43
80.8	-	-	77	-	133	2	1	5.22
62	-	-	77	-	102	1	1	1.45

# Matched Pair Angular Contact Ball Bearings

**ZWZ**

d 70~100 mm



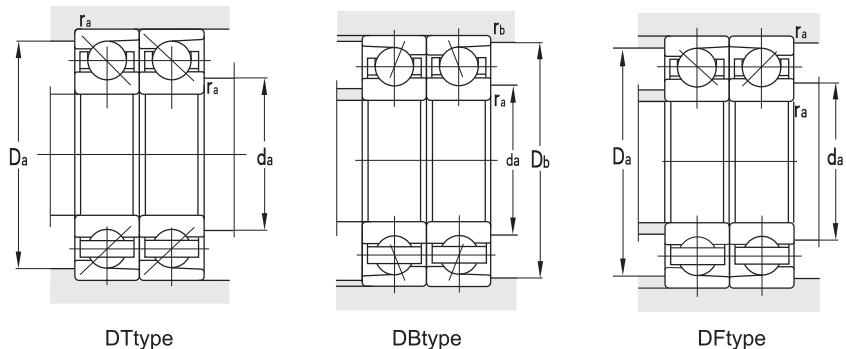
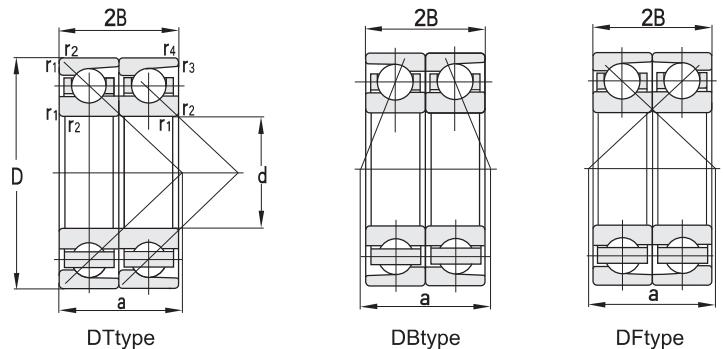
Principal dimensions	Basic load ratings						Limit speed ratings		Designations
	d	D	2B	r12	r34	Cr	Cor	Grease	Oil
mm						KN		r/min	
70	125	48	1.5	0.6	124	123	3300	4600	7214ACM/DB
	125	48	1.5	0.6	108	108	3300	4600	7214BM/DT
	150	70	2.1	1.1	209	193	5900	7900	7314ACM/DB
	150	70	2.1	1.1	209	193	5900	7900	7314ACM/DF
	150	70	2.1	1.1	186	173	3800	5000	7314BM/DB
	150	70	2.1	-	185	171	3000	4000	7314BM/DT
75	130	50	1.5	0.6	112	116	6200	8200	7215BM/DB
	160	74	2.1	1.1	228	218	5500	7400	7315ACM/DB
	160	74	2.1	1.1	228	218	5500	7400	7315ACM/DT
	160	74	2.1	1.1	203	194	3600	4800	7315B/DT
	160	74	2.1	1.1	203	194	3600	4800	7315BQ1/P6DTGASO
	160	74	2.1	1.1	203	194	3600	4800	7315BQ1/P6DTGASO
80	125	44	1.1	0.6	89.7	105	6400	8500	7016ACM/DB
	140	52	2	1	150	158	7200	7216ACQ5/DBYA3	7216ACQ5/DBYA3
	140	52	2	1	150	158	3000	4000	7216ACM/DB
	170	78	2.1	1.1	218	218	3400	4500	7316BM/DT
	170	78	2.1	1.1	246	245	2500	3600	7316ACM/DB
	200	96	3	1.1	320	339	4000	6000	7416AC/DT
85	150	56	2	1	148	151	5400	7200	7217BM/DB
	180	82	3	1.1	265	273	4900	6500	7317ACM/DB
	180	82	3	-	265	273	4900	6500	7317ACM/DF
90	190	86	3	1.1	286	305	4500	6300	7318ACM/DB
95	170	64	2.1	-	215	229	4800	6400	7219ACQ5/DF
	200	90	3	1.1	306	335	4300	5800	7319ACM/DB
	200	90	3	-	305	335	2000	3000	7319ACM/DF
	200	90	3	-	355	300	4000	5000	7319BM/DF
100	180	68	2.1	1.1	242	260	4600	6100	7220ACM/DB
	215	94	3	-	345	395	1900	2800	7320ACM/DF
	215	94	3	305	355	1900	2800	7320BM/DF	7320BT/DT
	215	94	3	1.1	309	354	4100	5500	7320BT/DT

Contact points a	Abutment and fillet dimensions					Weight			
	DB Type	DF Type	DT Type	da(min)	Da(max)	Db(max)	ra(max)	rb(max)	
				mm					Kg
69.5	-	-	-	79	-	116	1.5	1	2.52
-	-	52.9	-	79	-	-	1.5	-	2.54
86.3	-	-	-	82	-	143	2	1	6.20
-	16.3	-	-	82	-	138	2	-	6.14
127.3	-	-	-	82	-	143	2	1	6.40
-	-	64	-	82	138	-	2	-	6.40
111	-	-	-	84	-	124	1.5	1	2.63
91.8	-	-	-	87	-	153	2	1	7.14
-	-	45.9	-	87	-	148	2	-	7.14
-	-	45.9	-	87	148	-	2	-	7.04
-	-	67.8	-	87	148	-	2	-	6.51
-	-	67.8	-	87	148	-	2	-	7.41
69.8	-	-	-	87	-	120	1	0.6	1.97
77.5	-	-	-	90	-	134	2	1	3.26
77.5	-	-	-	91	-	129	2	1	3.46
-	-	71.9	-	92	158	-	2	-	8.50
97.3	-	-	-	92	-	158	2	1	8.41
-	-	56.7	-	94	186	-	2.5	-	14.4
126.7	-	-	-	95	-	144	2	1	4.47
102.8	-	-	-	99	-	173	2.5	1	9.95
-	20.8	-	-	99	166	-	2.5	-	9.97
108.2	-	-	-	104	-	173	2.5	1	12.4
113.8	29.8	-	-	107	158	-	2	-	5.95
-	23.8	-	-	109	186	-	2.5	1	13.3
-	78.8	-	-	109	186	-	2.5	-	13.4
99.3	-	-	-	112	-	173	2	1	7.48
-	26.5	-	-	114	201	-	2	-	19.2
-	85.2	-	-	114	201	-	2	-	16.8
-	-	89.6	-	114	201	-	2.5	-	15.2

# Matched Pair Angular Contact Ball Bearings

**ZWZ**

d 110~170 mm



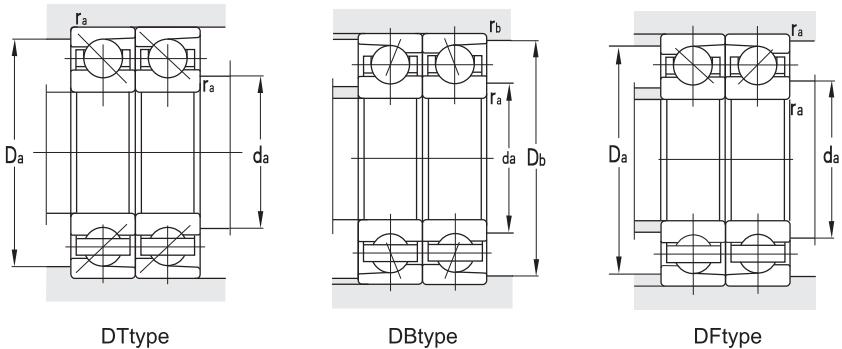
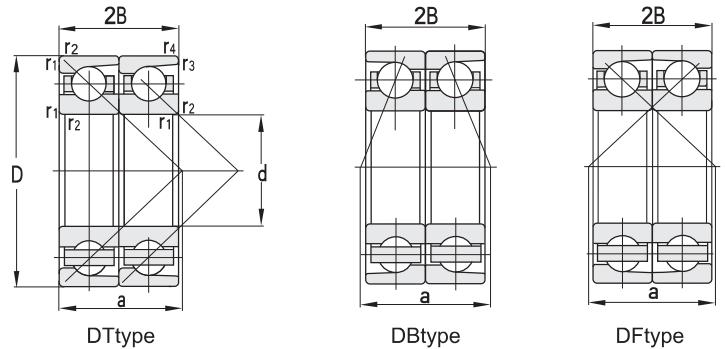
Principal dimensions				Basic load ratings				Limit speed ratings				Designations	
d	D	2B	r12	r34	Cr	Cor	Grease	Oil					
				KN				r/min					
mm	mm	mm	mm	mm	KN	KN	KN	KN	r/min	r/min	r/min	r/min	
110	200	76	2.1	1.1	299	342	4100	5500	7222CM/DB				
	200	76	2.1	1.1	286	325	2000	3000	7222ACM/DB				
	200	76	2.1	1.1	250	289	4000	6000	7222BM/P5DBC				
	240	100	3	1.1	389	463	3700	5000	7322ACM/DT				
	240	100	3	1.1	389	463	3700	5000	7322ACM/DF				
	240	100	3	1.1	347	425	3700	5000	7322BM/DB				
	240	100	3	1.1	347	425	3700	5000	7322BM/DF				
120	180	56	2	-	164	214	4200	5600	7024AC/DF				
	180	56	2	1	140	185	2000	2900	7024BM/DT				
	215	80	2.1	1.1	307	367	3800	5000	7224ACQ5/DB				
	260	110	3	-	400	540	3300	4500	7324AC/DF				
	260	110	3	1.1	410	525	3300	4500	7324B/DT				
130	230	80	3	1.1	278	350	1800	2600	7226BM/P5DBC				
	280	116	4	-	403	537	3000	4000	7326B/DF				
	280	116	4	1.5	403	537	3000	4000	7326B/DT				
140	210	66	2	-	203	275	3600	4800	7028AC/DF				
	250	84	3	1.1	309	414	3200	4200	7228BM/DB				
	250	84	3	1.1	310	415	1700	2300	7228BM/P5DBC				
	300	124	4	1.5	447	616	2800	3800	7328B/DT				
	300	124	4	1.5	445	600	2900	3900	7328BA/DT				
150	225	70	2.1	1.1	213	294	1700	2300	7030BM/DB				
	270	90	3	-	310	430	1600	2000	7230B/DF				
	320	130	4	-	582	857	2600	3600	7330AC/DF				
	320	130	4	-	582	856	2600	3600	7330B/DF				
160	240	76	2.1	1.1	225	315	3100	4100	7032BM/DB				
	290	96	3	1.1	340	500	1400	1900	7232B/DB				
	340	136	4	-	547	819	2000	3000	7332B/DF				
170	229.5	56	2	-	147	225	3600	4800	71934X1B/DFYA3				
	260	84	2.1	1.1	310	435	1500	2000	7034A/C2DB				
	260	84	2.1	1.1	272	380	1500	2000	7034B/DB				

DB Type	DF Type	DT Type	Abutment and fillet dimensions					Weight		
			da(min)	Da(max)	Db(max)	ra(max)	rb(max)			
mm										
										Kg
79.5	-	-	122	-	188	2	1	10.0		
103.3	-	-	122	-	188	2	1	9.84		
167.9	-	-	122	-	188	2	1	7.92		
-	65.8	-	124	226	-	2.5	-	19.8		
-	31.6	-	124	226	-	2.5	-	19.9		
198.5	-	-	124	-	233	2.5	1	22.9		
-	98.5	-	124	226	-	2.5	-	23.5		
-	42	-	130	170	-	2	-	4.62		
-	-	77	130	170	-	2	-			
118.1	-	-	132	-	208	2	1	13.1		
-	33.6	-	134	246	-	2.5	-	27.4		
-	-	107.2	134	246	-	2.5	-	29.2		
191	-	-	144	-	216	2.5	1	15.1		
-	114	-	148	262	-	3	-	35.9		
-	-	115.1	148	262	-	3	-	35.9		
-	48.6	-	150	200	-	2	-	6.92		
205.8	-	-	154	-	243	2.5	1	17.2		
205.6	-	-	154	-	243	2.5	1	17.2		
-	-	123.2	158	282	-	3	-	42.3		
-	-	123	158	282	-	3	-	42.3		
192.3	-	-	160	-	215	2	1	9.61		
-	132	-	165	256	-	2.5	-	22		
-	45.3	-	168	302	-	3	-	51.6		
-	132	-	168	302	-	3	-	52.3		
205.8	-	-	172	-	233	2	1	12.6		
236.8	-	-	174	-	276	2.5	1	27.8		
-	141.8	-	178	322	-	3	-	61.6		
-	139	-	168	225	-	1.5	-	7.04		
166.2	-	-	181	-	249	2	1	15.6		
222.6	-	-	181	-	249	2	1	16.6		

# Matched Pair Angular Contact Ball Bearings

**ZWZ**

d 170~360 mm



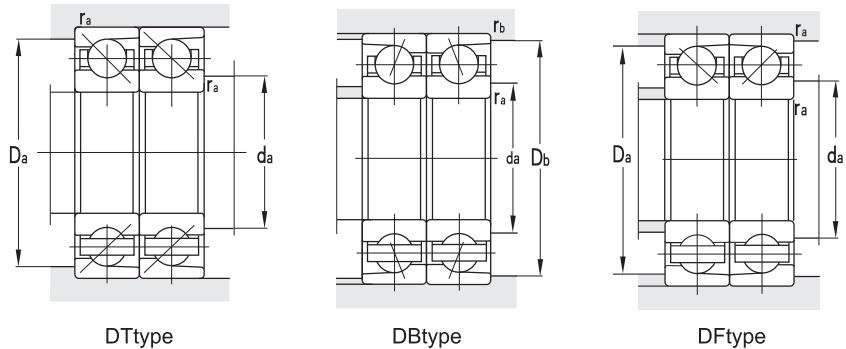
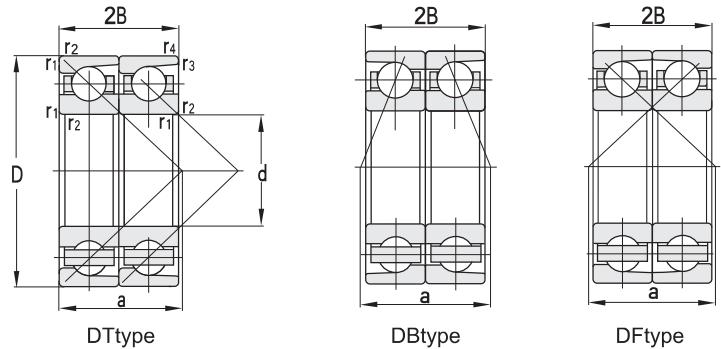
Principal dimensions	Basic load ratings						Limit speed ratings		Designations
	d	D	2B	r <sub>12</sub>	r <sub>34</sub>	Cr	Cor	Grease	Oil
mm						KN		r/min	
170	310	104	4	1.5	462	685	2900	3900	B7234AC/DT
	310	104	4	1.5	495	740	1800	2500	7234AC/DT
	360	144	4	1.5	570	905	1000	1500	7334B/DB
180	280	92	2.1	1.1	310	485	1200	1700	7036B/DT
	320	104	4	-	400	645	1000	1500	7236B/DF
	380	150	4	2	590	970	1000	1400	7336B/DT
190	290	92	2.1	1.1	347	526	2600	3400	7038AC/DT
	400	156	5	2	640	1100	900	1400	7338B/DT
200	310	102	2.1	1.1	370	575	1600	2100	7040B/DB
	360	116	4	1.5	503	834	2200	3000	7240B/DB
	360	116	4	-	589	974	2200	3000	7240C/DF
	360	116	4	-	728	920	2200	3000	7240AC/DF
	420	160	5	2	720	1270	900	1200	7340B/DT
220	340	112	3	1.1	400	700	900	1300	7044B/DB
	400	130	4	1.5	505	910	900	1200	7244B/DB
	460	176	5	-	800	1450	800	1200	7344B/DF
230	329.5	80	2.1	1.1	358	605	900	1200	7646AMB/DB
240	360	112	3	-	410	760	900	1200	7048B/DF
	370	112	3	-	410	760	900	1200	366748K
260	360	92	2.1	-	277	630			71952B/DF
280	380	92	2.1	1.1	436	810	950	1400	71956AC/DB
	380	92	2.1	1.1	410	745	950	1400	71956A/DBA
	420	130	4	1.5	490	1000	800	1000	7056B/DB
340	520	164	5	-	725	1620	660	900	7068B/DF
360	440	76	2.1	1.1	365	840	1500	1900	71872AC/DB
	480	112	3	3	560	1250	740	1000	71972AC/DB

DB Type	DF Type	DT Type	Abutment and fillet dimensions					Weight
			d <sub>a</sub> (min)	D <sub>a</sub> (max)	D <sub>b</sub> (max)	r <sub>a</sub> (max)	r <sub>b</sub> (max)	
mm								Kg
-	-	82	181	249	-	3	-	34.8
-	-	82	181	249	-	3	-	34.5
294	-	-	188	-	351.5	3	1.5	69.8
-	-	119	192	269	-	2	-	21
-	158	-	198	304	-	3	-	35
-	-	156	198	362	-	3	-	81
-	-	79	202	278	-	2	-	21.4
-	-	164	210	380	-	4	-	97
265	-	-	211	-	299	2	1	28.3
292.9	-	-	218	-	351	3	1.5	51.6
-	17	-	218	342	-	3	-	50.3
-	72.6	-	218	342	-	3	-	50.3
-	-	170	220	400	-	4	-	108
290	-	-	234	-	325	2.5	1	36.5
328	-	-	238	-	384	3	1.5	70.6
-	198	-	240	440	-	4	-	142
201.6	-	-	245	-	321	2	1	22.7
-	196	-	255	345	-	2.5	-	39
-	199.9	-	254	356	-	2.5	-	48.7
-	214	-	272	348	-	2	-	28.8
200	-	-	292	-	372	2	1	31.4
236.6	-	-	290	-	370	2	1	33.2
358	-	-	298	-	404	3	1.5	60
228	-	-	360	500	-	4	-	124
224	-	-	372	-	430	2	1	24
252	-	-	374	-	465	2.5	2.5	57.5

# Matched Pair Angular Contact Ball Bearings

**ZWZ**

d 380~1320 mm



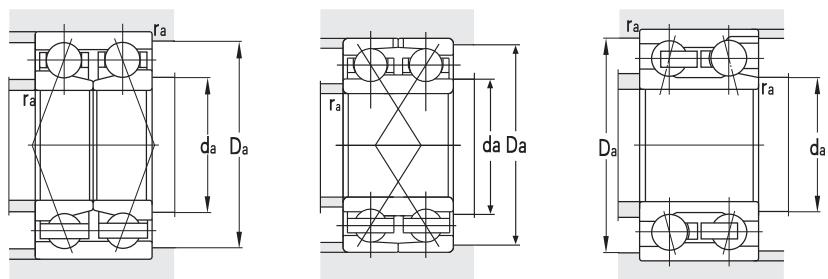
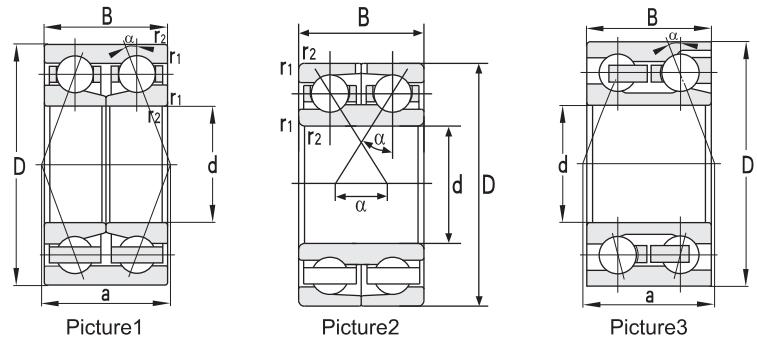
Principal dimensions				Basic load ratings				Limit speed ratings				Designations			
d	D	2B	r12	r34	Cr	Cor	Grease	Oil	KN	r/min					
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm					
380	480	92	2.1	1.1	359	730	700	910	71876B/DB						
	520	130	4	4	640	1470	700	910	71976AC/DT						
420	620	180	5	2	850	2130	520	700	7084B/DT						
460	580	112	3	3	580	1530	610	810	71892A/DT						
500	620	74	2.1	-	430	1230	520	700	708/500A/DF						
	670	156	5	2	86	860	500	660	719/500A/DT						
530	615	70	3	1.1	210	520	1000	1400	718/530X3AC/P5DB						
	650	112	3	-	620	1810	510	680	718/530A/DF						
	650	112	3	1.1	645	1850	910	1250	718/530AC/DB						
	710	164	5	2	1030	2530	500	700	719/530A/DB						
560	680	112	3	1.1	635	1850	470	620	718/560A/DT						
600	730	120	3	3	740	2330	790	1100	718/600AC/DB						
670	820	138	4	1.5	830	2510	380	500	718/670A/DT						
710	870	148	4	-	955	3240	370	480	718/710AC/DF						
	950	212	5	2	1370	4500	640	850	719/710AC/DB						
750	920	156	5	-	985	3450	310	420	718/750A/DF						
1320	1600	244	6	-	1930	8230	200	300	718/1320ACF3/DF						

DB Type	DF Type	DT Type	Abutment and fillet dimensions					Weight		
			da(min)	Da(max)	Db(max)	ra(max)	rb(max)			
mm										
601	-	-	137	392	505	473	2	1	37.2	83.5
-	-	263	439	602	-	4	-	-	176	
-	-	178	474	567	-	2.5	-	68		
-	286	-	512	610	-	2	-	54.5		
-	-	208	519	653	-	4	-	154		
296.7	-	-	544	-	608	2.5	1	37.1		
-	285	-	544	638	-	2.5	-	77		
331	-	-	544	-	638	2.5	1	77		
440	-	-	552	-	700	4	2	189		
-	-	207	575	667	-	2.5	-	95		
370	-	-	614	-	718	2.5	2.5	94.5		
-	-	250	686	806	-	3	-	156		
494	294	-	726	856	-	3	-	192		
-	-	734	-	926	5	2.5	389			
-	404	-	768	902	-	4	-	220		
-	558.9	-	1348	1572	-	5	-	987		

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 35~170 mm



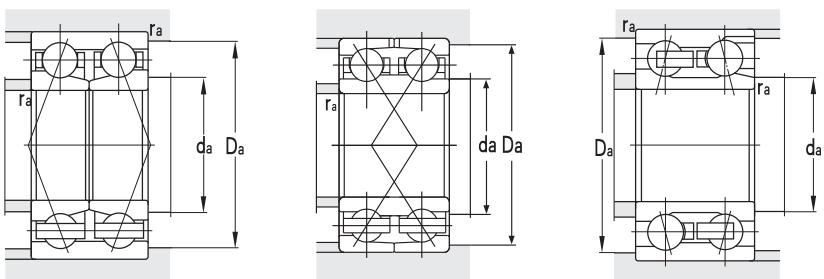
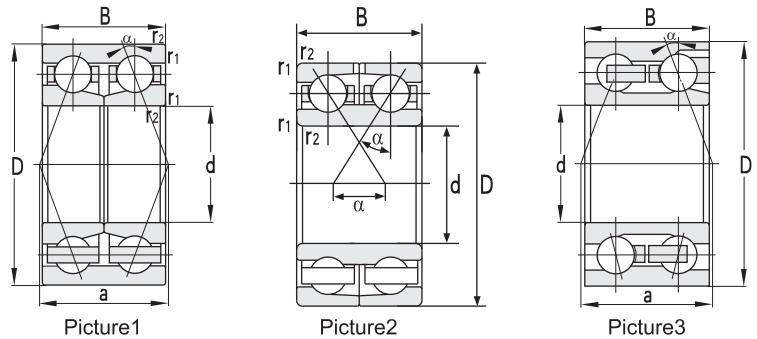
Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	r12	Cr	Cor	Grease	Oil
mm							
35	72	27	1.1	32.5	35.0	6500	8000
45	85	30.2	1.1	50.7	46.0	5000	6700
	85	30.2	1.1	50.7	46.0	5000	6700
55	100	33.3	1.5	54.0	47.0	4500	5800
60	110	36.5	1.5	82.6	81.0	3800	5000
65	120	38.1	1.5	91.0	96.0	3600	4500
	120	38.1	1.5	51.0	60.0	3600	4500
	140	58.74	2.1	164	150	3200	4300
75	130	41.3	1.5	111	119	3200	4300
	130	41.3	1.5	107	115	3200	4300
	160	68.3	2.1	208	197	3000	4100
	160	68.3	2.1	203	191	3000	4100
80	170	68.3	2.1	221	216	2800	3600
100	180	60.3	2.1	198	215	2000	2700
110	240	92.1	3	358	429	1800	2400
120	190	66	2	179	237	2500	3600
130	200	75	2	150	200	2200	3200
150	225	73	2	199	275	2200	3200
	230	70	2.1	185	250	2200	3200
160	240	76	2.1	225	315	1900	2500
	240	80	2.1	210	289	1900	2500
	240	80	2.1	210	289	1900	2500
170	260	84	2.1	207	385	1600	2100

Designations	Picture sample	Contact points a	Abutment and fillet dimensions			Weight
			da(min)	Da(max)	ra(max)	
mm						
3207M	Picture3	46.3	39	68	1	0.51
3209M	Picture3	53.5	52	78	1	0.719
3209F1/C3	Picture3	53.5	52	78	1	0.710
3211ATN1/V1	Picture3	60.2	63	96	1.5	0.990
3212M	Picture3	69.7	69	101	1.5	1.47
3213YM	Picture3	64.7	74	111	1.5	1.84
3213ATN1/V1	Picture3	71.8	74	111	1.5	1.70
3313DYM	Picture1	79.4	77	128	2	4.89
3215DYM	Picture1	70.6	84	121	1.5	2.81
3215	Picture3	73	84	121	1.5	2.09
3315DYM	Picture1	91.5	87	148	2	6.82
3315	Picture3	103.8	87	148	2	6.27
3316M	Picture3	105.6	92	158	2	7.21
3220YM	Picture3	129.5	112	168	2	6.46
3322M	Picture3	151	124	226	2.5	19.9
4024X3DM/W34	Picture1	130.1	133	175.8	2	6.78
4026X2DM	Picture1	202.5	140	190	2	8.29
4030X2DYM/YA6W34	Picture1	193.8	164	212	2	6.78
4030X3DM	Picture1	200.1	162	218	2	10.7
4032X2M/DCYA1	Picture2	129.9	172	228	2	12.5
4032DM	Picture1	240	172	228	2	12.2
4032DM/C91W33A	Picture1	239.8	172	228	2	12.2
4034X2BM/YA1	Picture2	138.5	182	248	2	16.2

# Single-row Angular Contact Ball Bearings

**ZWZ**

d 170~320 mm



Principal dimensions				Basic load ratings		Limit speed ratings	
d	D	B	r12	Cr	Cor	Grease	Oil
mm							
170	260	90	2. 1	250	355	1600	2100
180	259.5	66	2. 1	281	313	1400	1800
	259.5	66	2. 1	216	312	1400	1800
	259.5	66	2. 1	281	313	1400	1800
280	100	2. 1	275	400	1300	1700	
280	100	2. 1	275	400	1300	1700	
190	269.5	66	2. 1	220	324	1350	1700
	269.5	66	2. 1	220	324	1350	1700
200	310	109	2. 1	343	538	1200	1600
220	309.5	76	2. 1	250	381	1100	1500
	340	118	3	359	596	1000	1400
	340	118	3	385	645	1000	1400
240	360	118	3	470	650	900	1250
	359.5	118	3	376	648	900	1250
	359.5	118	3	470	650	900	1250
260	369.5	92	4	373	662	800	1200
	369.5	92	4	373	662	800	1200
	400	130	4	470	855	800	1100
	400	140	4	450	830	800	1100
	400	140	4	450	830	800	1100
280	389.5	92	4	377	683	750	1100
300	419.5	112	2. 1	423	791	700	1000
	460	160	4	569	1149	640	960
320	440	112	2. 1	460	920	630	850

Designations	Picture sample	Contact points a	Abutment and fillet dimensions			Weight
			da(min)	Da(max)	ra(max)	
mm						
4034DM	Picture1	260	182	248	2	16. 9
4936X3DM	Picture1	253	192	248	2	10. 8
4936X3DM/W33	Picture1	253	192	248	2	10. 7
4936X3DM/W34	Picture1	253	192	248	2	10. 7
4036DM/C9W33	Picture1	280	192	268	2	22. 4
4036DM/W33	Picture1	280	192	268	2	22. 4
4938X3DM	Picture1	262. 7	202	258	2	11. 5
4938X3DM/W34	Picture1	262. 7	202	258	2	11. 5
4040DM/W34	Picture1	309. 5	212	298	2	28. 0
4944X3DM	Picture1	303	232	298	2	18. 0
4044DM/W34	Picture1	339	234	326	2. 5	38. 8
4044/DCYA1	Picture2	118	234	326	2. 5	39. 6
4048DM/W33	Picture1	359	254	346	2. 5	42. 8
4048X1DM/W34	Picture1	359	254	346	2. 5	44. 9
4048X1DM/C9W33	Picture1	359	254	346	2. 5	42. 5
4952X3DM/W34	Picture1	361	278	352	3	31. 3
4952X3DM	Picture1	361	278	352	3	31. 3
4052X2/DCYA1	Picture2	212	278	382	3	60. 2
4052DM	Picture1	400	278	382	3	62
4052DM/C9W33	Picture1	400	278	382	3	62
4956X3DM/W34- 1	Picture1	381	298	372	3	34. 0
4960X3DM	Picture1	416	342	408	2	43. 0
4060DYM	Picture1	398. 6	348	442	3	97. 9
4964X2DM/W33	Picture1	374. 9	332	428	2	53. 2

## Product Characteristics

The cylindrical rollers linear contact with raceway, and the bearings can carry heavier radial load. They can be applied to the situation not only with heavy load and shock load but also with high rotation speed.

Cylindrical roller bearings have bigger load-carry capacity after amending the raceway and the geometry of rolling elements, and the new design of ribs and roller end surfaces improves lubricating conditions of contact area between roller end surface and ribs, increases bearings service life.

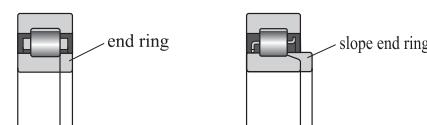
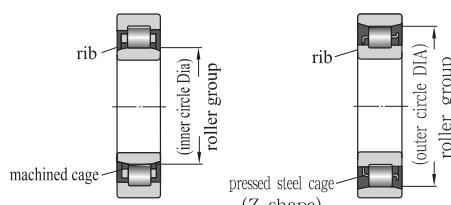
These bearings are mainly used in medium and large size motors, electricity generators, internal combustion engines, gas turbines, machine tool spindles, deceleration devices, unloading and lifting machines and other industrial machinery.

## Types of bearing

ZWZ cylindrical roller bearings can be classified into following types:

- Sing -row cylindrical roller bearings
- Double -row cylindrical roller bearings
- Four -row cylindrical roller bearings

## Single-row cylindrical roller bearings



### NU Type and N Type

NU type cylindrical roller bearings have double ribs on the outer ring. The outer ring, rollers and the cage can be separated from inner ring. N type cylindrical roller bearings have double ribs on the inner ring. The inner ring, rollers and the cage can be separated from the outer ring.

NU and N type cylindrical roller bearings permit the shaft move relatively to housing in axial direction. They can adapt to the position changes between the shaft and housing caused by the thermal expansion or the mounting error and is most suitable for free end shafts. They can only carry radial load and do not limit the axial displacement of shaft and housing.

### NJ Type and NF Type

NJ type cylindrical roller bearings have double ribs on the outer ring, and single rib on the inner ring.

NF type cylindrical roller bearings have double ribs on inner ring and single rib on outer ring. They can carry a certain axial load in single direction.

### NUP type and NH type

NUP type cylindrical roller bearings have double ribs on the outer ring and single rib and loose rib on inner ring .NH type cylindrical roller bearings have double ribs on the outer ring, single rib and angular ring on the inner ring. Their inner rings and outer rings can be mounted separately (with complete roller and cage assembly). These bearings can limit the axial movement of shaft and housing in double direction within the bearing axial clearance. Besides radial load, this type bearing can carry small axial load in two directions so they can be used on the fixed end of the shaft.

### NCL ... VType

NCL ...V type cylindrical roller bearings do not have ribs and cage, but they have double snap rings on the outer ring.

This type bearing can carry heavier radial load with lower limit rotation speed in comparing with others cylindrical roller bearings with the same dimensions. Their outer ring and inner ring are not separable, can not be mounted separately.

These bearings can limit the axial displacement of shaft and housing in double direction within the bearing axial clearance.

### NB Type

NB type bearings do not have ribs on inner and outer rings. There are lubricating holes on the outer ring. Their inner ring, outer ring and cage with rollers can be mounted separately. They can not limit the axial displacement of the shaft or housing and can not carry radial load.

### NJ...VType

This type bearing has single rib on inner ring and does not have cage. This type bearing can carry heavier radial load with lower limit rotation speed in comparing with others cylindrical roller bearings with the same dimensions, they cannot limit the axial displacement of the shaft or housing within bearing's axial clearance, can not carry axial load.

### NCF...VType

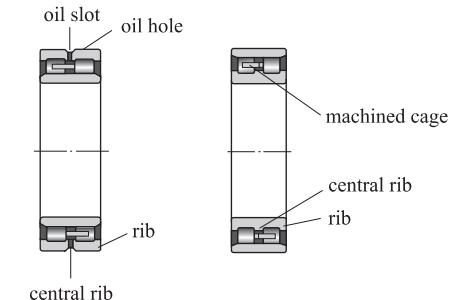
NCF ...V type cylindrical roller bearings belong to short cylindrical roller bearings. This type bearing can carry heavier radial load with lower limit rotating speed comparing with others cylindrical roller bearings with the same dimensions, which can limit the axial displacement of the shaft or housing in two directions within bearing's axial clearance.

### ...N Type (with stop slots)

N types cylindrical roller bearings have stop slots on the outer ring. The stop slot is denoted with suffix N. The axial location of bearings

in outer housing can be simplified by stop slots. The axial dimension can be shortened.

## Double row cylindrical roller bearings



## NN Type

NN type cylindrical roller bearings have ribs only on inner ring. The outer ring and inner ring assembly can be mounted separately. They can not limit the axial displacements of the shaft and outer housing, can only carry heavier radial load comparing with other cylindrical roller bearings with the same dimensions.

These bearings are mostly suitable for machine tool shafts due to compact structure and smaller deformation caused by load.

## NN...K Type

The structure of NN...K type cylindrical roller bearings is the same as the NN type. The difference is that their inner bore is tapered, which makes easy to adjust the radial clearance and convenient to mount.

## NNU Type and NNU...K Type

NNU, NNU...K type cylindrical roller bearings have ribs only on the outer rings. According to the shape of bores, they can be divided into cylindrical and tapered bores. They do not limit

the axial displacement of the shaft and outer cover, and can not carry axial load. But they can carry heavier radial load comparing with other cylindrical roller bearings with the same dimensions.

## NNCF Type

NNCF type cylindrical roller bearings have three ribs on the inner ring and one rib on the outer ring. They can be located axially on one direction. One fixed ring equipped on the opposite of outer ring make the bearing.

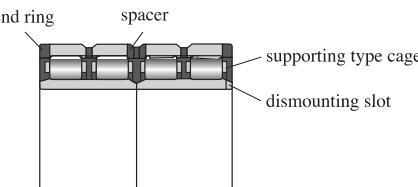
## NNCL Type

NNCL type cylindrical roller bearings have three ribs only on inner rings and have stop slots on two sides of the outer ring which make the bearing become separable.

## NNCS Type

NNCS types cylindrical roller bearings are separable with three ribs only on the inner ring, and one central locked ring on the middle of the outer ring. They can be mounted on the free end of shafts.

## Four-row cylindrical roller bearings



Four-row cylindrical roller bearings can carry heavier radial load and shock load with higher manufacturing precision, and are suitable for application where the rotational speed is big.

It is favorable for rolling accuracy by simultaneous rubbing the inner raceway surface and mill rollers after pressing inner ring into roller neck. The assembly clearances can be adjusted freely.

These bearings are mostly used on working roller or support rollers of cold, hot rolling mills and banked rolling mills, also can be used on others applications.

FC: two ribs on the outer ring, single on the inner ring without ribs

FCD: double outer rings, double inner rings, no ribs on inner rings

FCDP: double outer rings with central ribs and a flat ring, double inner rings without ribs

### Dimension scope

The boundary dimensions of ZWZ cylindrical roller bearing are listed in the bearings dimensions datasheet.

Inner diameter dimension range:  
25mm to 1900mm

Outer diameter dimension range:  
52mm to 2300mm

Width dimension range: 13mm to 400mm

### Tolerance

ZWZ manufactures single row, double row and four row cylindrical roller bearings with P0, P1, P2, P3 and P4 precision grade. Also ZWZ can manufacture double-row cylindrical roller bearing with SP, UP precision grade. The standard tolerance is listed in the preface tables.

### Radial clearance

ZWZ manufactures single-row cylindrical roller bearings with C0, C3 and, C4 group clearances.

ZWZ manufactures double-row cylindrical rollerbearings with C1 group clearances. Senke manufactures double-row cylindrical bore

cylindrical roller bearings with C2, C3 group clearance, and also manufactures tapered bore cylindrical roller bearings with C2 group clearance.

ZWZ manufactures four-row cylindrical roller bearings with C3 group clearance and other clearance group.

The standard clearance value is listed in the preface table.

ZWZ also manufactures the bearings with smaller or bigger radial clearance than normal one according to customer demands.

### Cage

Normally, single-row cylindrical roller bearings use machined solid cages, pressed steel cages and nylon cages. But double-row cylindrical roller bearings mostly use machined brass cages, sometimes use nylon cages.

Four-row cylindrical roller bearings mostly use machined brass solid cages. For big size bearings, it is suitable to use machined solid supporting cages.

The code name of cages is denoted as followed:

1. The pressed steel cages are denoted with the suffix J, different structures are denoted with the suffix J, J1, J2...
2. Slot type cages are denoted with the suffix CJ.
3. Brass solid cages are denoted with suffix M.
4. When the outside diameter of bearings is bigger than 400mm, the code name of steel solid cages are not denoted. If guided by inner or outer rings, the material of cage and guide method should be denoted (A means outer ring guide, B means inner ring guide).
5. The solid brass cage for double-row cylindrical roller bearings is not denoted in code name.

### Equivalent dynamic load

When only with radial load,

$$P = Fr$$

### Equivalent static load

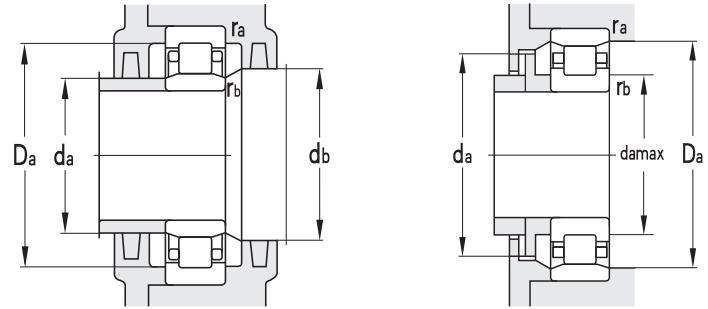
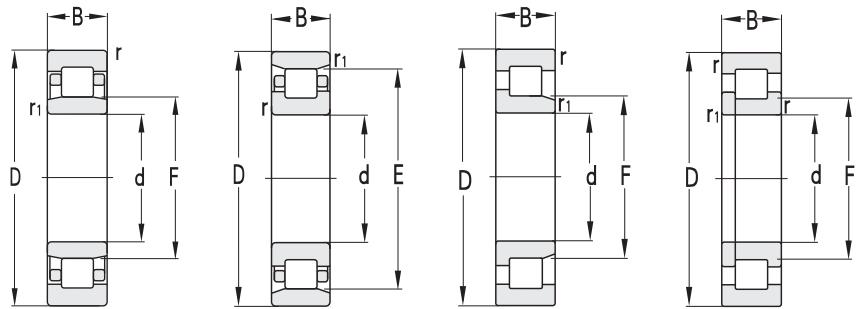
$$P_{eq} = Fr$$

Both of outer ring and inner ring of cylindrical roller bearings with ribs or end rings can carry a certain axial load when they carry radial load. In this case, the axial carrying load capacity depends on the end surface of roller, carrying load capacity of ribs, lubricating conditions and rotational speed.

# Cylindrical Roller Bearings

**ZWZ**

d 25~35 mm



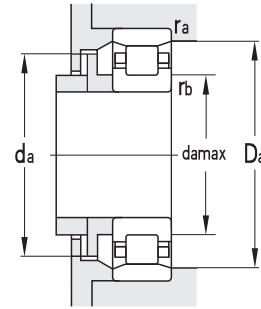
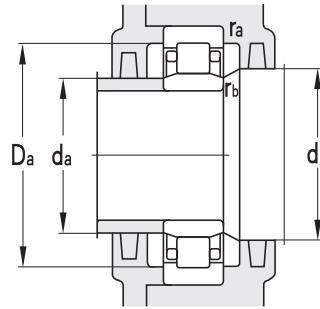
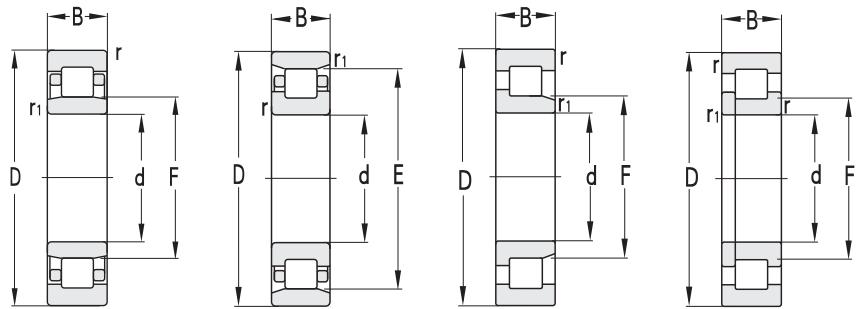
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm							KN	r/min		
25	52	15	1	0.6	31.5		28.6	24.0	11000	14000
	52	15	1	0.6	31.5		27.2	26.0	11000	14000
	52	15	1	0.6	31.5		29	31.0	11000	14000
	52	18	1	1	31.5		35	34.5	11000	14000
	62	17	1.1	1.1	34		41.8	37.0	9500	12000
	62	17	1.1	1.1	34		41	41.0	9500	12000
	62	17	1.1	1.1	34		41.8	37.0	9500	12000
	62	24	1.1	1.1	35		53.4	49.0	9500	12000
30	55	13	1	0.6	36.5		18.2	18	12000	15000
	55	13	1	0.6	36.5		20	23	12000	15000
	62	16	1	0.6	37.5		37.4	35.0	9500	12000
	62	16	1	0.6	37.5		39	42	9500	12000
	62	16	1	0.6	37.5		37.4	35.0	9500	12000
	62	20	1	0.6	37.5		46.2	70.5	9500	12000
	62	20	1	0.6	37.5		47	54	9500	12000
	70	18	1.1	0.6	40		57.2	55.0	9000	11000
	72	19	1.1	1.1	40.5		53.3	51.0	9000	11000
	72	19	1.1	1.1	40.5		52	55	9000	11000
	72	27	1.1	1.1	42		70.0	64	9000	11000
	72	27	1.1	1.1	40.5		72.6	75.0	8000	95000
	90	23	1.5	1.5	45		77.6	65.5	7500	9000
35	62	14	1	0.6	42		24.5	24	9000	11000
	62	14	1	0.6	42		26.5	29	9000	11000
	72	17	0.6	1.1		64	47.3	46.5	8500	10000
	72	17	1.1	0.6	44		47.3	46.5	8500	10000
	72	17	1.1	0.6	44		49	55	8500	10000
	72	17	1.1	0.6	44		47.3	46.5	8500	10000
	72	23	1.1	1.1	44		57.2	59	8500	10000
	72	23	1.1	1.1	44		57.2	59.0	8500	10000
	72	23	1	0.6	44		66.0	70	8500	10000
	80	21	1.5	1.5		67.8	61.2	46.5	8000	9500
	80	21	1.5	1.1	46.2		62.7	60	8000	9500
	80	21	1.5	1.5	46.2		70.2	62.7	60.0	8000
	80	21	1.5	1.1	46.2		66.6	65.5	8000	9500

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NU205EM	29	30	36	47		1	0.7	0.159
NJ205M	29	30	36	47		1	0.6	0.164
NJ205ETN1	29	30	36	47		1	0.6	0.134
NUP2205ETN1	30.6		36	46.4		1	1	0.171
NJ305M	31.5	32	40	55.5		1	1	0.267
NJ305ETN1	31.5	32	40	55.5		1	1	0.239
NUP305EM	31.5		40	55.5		1	1	0.28
NJ2305M/HAP6	31.5	32	40	55.5		1	1	0.453
NU1006M	34	35	38	50		1	0.6	0.138
NU1006TN1	34	35	38	50		1	0.6	0.119
NJ206EM	34	36	43	57		1	0.6	0.264
NJ206ETN1	34	36	43	57		1	0.6	0.203
NU206EM	34	36	39	57		1	0.6	0.259
NJ2206EM	34	36	43	57		1	0.6	0.297
NJ2206ETN1	34	36	43	57		1	0.6	0.265
NJ306X3WB/C9	35	38	45	63.5		1	1	0.342
NJ306EM	36.5	39	47	65.5		1	1	0.411
NJ306ETN1	36.5	39	47	65.5		1	1	0.374
NUP2306M	36.5		47	65.5		1	1	0.585
NU2306EM	36.5		47	65.5		1	1	0.593
NJ406M	38	43	52	82		1.5	1.5	0.882
NU1007M	38.2	41	44	56				
NU1007TN1	38.2	41	44	56				
N207EM	41.5	62		68		66	1	0.331
NJ207EM	39	42	50	65.5		1	0.6	0.338
NJ207ETN1	39	42	50	65.5		1	0.6	0.303
NU207EM	39	42	46	65.5		1	0.6	0.331
NJ2207EM	39	42	50	65.5		1	0.6	0.363
NU2207EM	39	42	46	65.5		1	0.6	0.445
NJ2207ETN1	39	42	50	65.5		1	0.6	0.404
NCL307E/YA	41.5	44	48	72		1.5	1	0.503
NJ307M	41.5	44	53	72		1.5	1	0.604
N307M	41.5	44	73.5			72	1.5	0.595
NJ307E	41.5	44	53	72		1.5	1	0.54

# Cylindrical Roller Bearings

**ZWZ**

d 35~45 mm



Principal dimensions					Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	Cr	Cor	Grease	Oil
mm					KN		r/min	

35	80	21	1.5	1.1	70.2	62.7	70.0	8000	9500
	80	21	1.5	1.1	70.2	57	60	8000	9500
	80	21	1.5	1.1	46.2	62.7	70.0	8000	9500
	80	21	1.5	1.1	46.2	66.6	70.0	8000	9500
	80	21	1.5	1.1	46.2	62.7	70.0	8000	9500
	80	31	1.5	1.5	46.2	86.8	75	7000	8500
	80	31	1.5	1.5	46.2	85	100	7000	8500
	80	31	1.1	1.1	46.2	93.5	100	7000	8500
	80	31	1.5	1.5	46.2	71.5	75.0	7000	8500
	100	25	1.5	1.5	53	89	85	6700	8000

38	83	25.4	1.1	1.1	48.5	73.5	74.5	7500	9000	
40	68	15	1	0.6	47	26.4	28.0	9500	12000	
	68	15	1	0.6	47	27	32	9500	12000	
	80	18	1.1	1.1	49.5	55.6	55.5	7500	9000	
	80	18	1.1	1.1	49.5	55.5	55.5	7500	9000	
	80	18	1.1	1.1	49.5	55.6	55.5	7500	9000	
	80	18	1.1	1.1	49.5	50.5	55.5	7500	9000	
	80	18	1.1	1.1	49.5	71.5	55.6	7500	9000	
	80	23	1.1	1.1	49.5	72.6	72	7500	9000	
	80	23	1.1	1.1	49.5	72.6	77.0	7500	9000	
	80	23	1.1	1.1	49.5	69	83	7500	9000	
	90	23	1.5	1.5	49.5	77.5	88.0	73.0	6700	8000
	90	23	1.5	1.5	80	88.0	87.0	6700	80000	
	90	23	1.5	1.5	80	88.0	87.0	6700	8000	
	90	23	1.5	1.5	52	88.0	87.0	6700	8000	
	90	23	1.5	1.5	52	80	87.5	6700	8000	
	90	23	1.5	1.5	52	88.0	87.5	6700	8000	
	90	33	1.5	1.5	52	110	107	6300	7500	
	90	33	1.5	1.5	52	110	116	6300	7500	

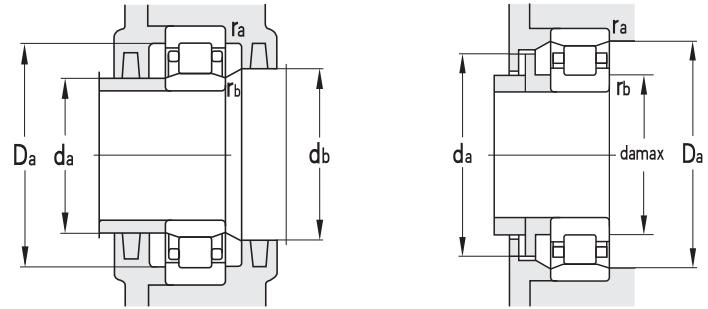
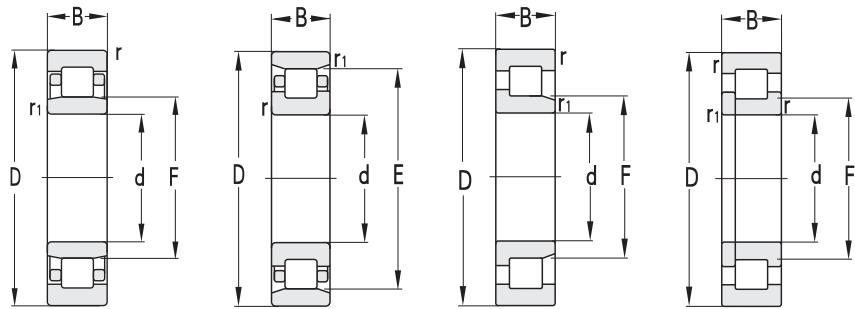
45	85	19	1.1	1.1	55	57.5	52	6700	8000
	85	19	1.1	1.1	54.5	67.5	72.5	6700	8000
	85	19	1.1	1.1	76.5	67.5	72.5	6700	8000

Designations	Abutment and fillet dimensions						Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)
mm							Kg
NF307M	41.5	67	73.5	72	1.5	1	0.610
NF307ETN1	41.5	67	73.5	72	1.5	1	0.519
NU307M	41.5	44	48	72	1.5	1	0.591
NU307E	41.5	44	48	72	1.5	1	0.526
NU307EQ1	41.5	44	48	72	1.5	1	0.591
NJ2307M	41.5	44	53	72	1.5	1	0.833
NJ2307EM	41.5	44	53	72	1.5	1	0.823
NU2307EM	41.5	44	48	72	1.5	1	0.81
NU2307EM	41.5	44	48	72	1	1	0.851
NJ407M	44	49	59	85	1.5	1.5	1.10
NUP6/38X2NM	44.5	47	55	75	1	1	0.705
NU1008M	42	45	50	65	1	0.6	0.231
NU1008TN1	42	45	50	65	1	0.6	0.183
NJ208EM	46.5	48	56	73.5	1	1	0.460
NU208EM	46.5	48	51	73.5	1	1	0.439
NUP208EM	46.5	48	56	73.5	1	1	0.460
NUP208ETN1	46.5	48	56	73.5	1	1	0.40
N208EM	46.5	69	73.5	73	1	1	0.425
NJ2208EM	46.5	48	56	73.5	1	1	0.539
NU2208EM	46.5	48	51	73.5	1	1	0.530
NU2208ETN1	46.5	48	51	73.5	1	1	0.487
NCL308E/YA	48	50	60	82	1.5	1.5	0.683
N308EM	48	78	82	82	1.5	1.5	0.794
NF308E	48	82	82	82	1.5	1.5	0.750
NJ308EM	48	50	60	82	1.5	1.5	0.815
NJ308ETN1	48	50	60	82	1.5	1.5	0.669
NUP308EM/C2	48	60	82	82	1.5	1.5	0.819
NU2308EM	48	49	55	82	1.5	1.5	1.01
NJ2308E	48	49	60	82	1.5	1.5	1.10
NJ209M	51.5	53	61	78.5	1	1	0.487
NJ209EM	51.5	53	61	78.5	1	1	0.51
NF209EM	51.5	73	78.5	78	1	1	0.510
NF209ETN1	51.5	73	78.5	78	1	1	0.444

# Cylindrical Roller Bearings

Z W Z

d 45~50 mm



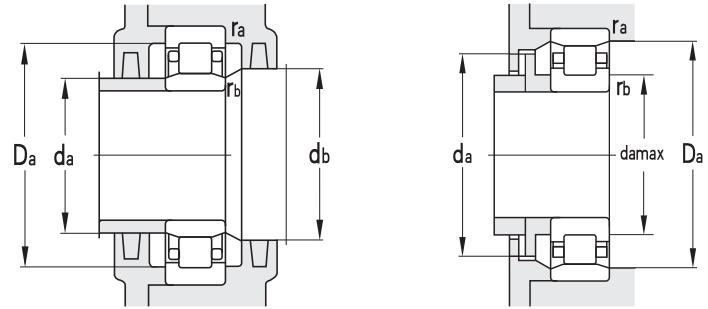
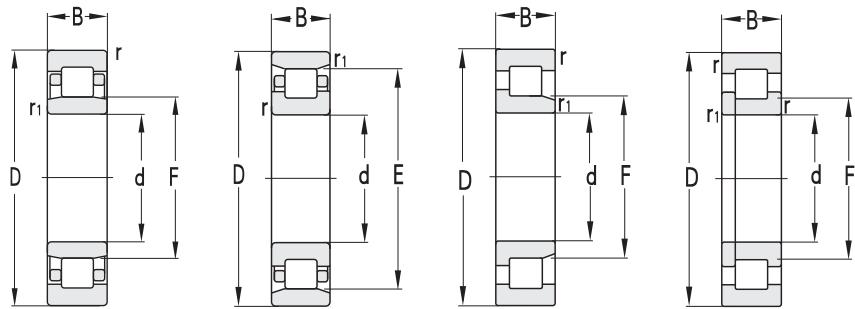
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	rsmin	r1smin	F	E	Cr	Cor	Grease	Oil
mm							KN		r/min	
45	85	19	1.1	1.1	54.5	67.5	72.5	6700	8000	
	85	23	1.1	1.1	54.5	77.5	84.5	5600	6700	
	85	23	1.1	1.1	54.5	80	91	5600	6700	
	85	23	1.1	1.1	54.5	77.5	84.5	5600	6700	
	85	23	1.1	1.1	54.5	77.5	84.5	5600	6700	
	85	30.16	1.1	1.1	55.52	94.6	119	6300	7500	
	100	25	1.5	1.5		86.5	83.6	84.0	6300	7500
	100	25	1.5	1.5		86.5	83.6	84.0	6300	7500
	100	25	1.5	1.5		88.5	100	101	6300	7500
	100	25	1.5	1.5	58.5	83.6	84.0	6300	7500	
	100	25	1.5	1.5	58.5	100	93.5	6300	7500	
	100	25	1.5	1.5		88.5	100	101	6300	7500
	100	25	1.5	1.5	58.5	100	102	6300	7500	
	100	25	1.5	1.5		88.5	100	109	6300	7500
	100	25	1.5	1.5		88.5	100	109	6300	7500
	100	25	1.5	1.5		88.5	100	109	6300	7500
	100	25	1.5	1.5		100	109	6300	7500	
	100	25	1.5	1.5	58.5	100	109	6300	7500	
	100	25	1.5	1.5	58.5	100	109	6300	7500	
	100	25	1.5	1.5	56.4	111	112	6300	7500	
	100	25	1.5	0.8	58.5	100	102	6300	7500	
50	100	31	1.5	4.5		88	119	120	6300	7500
	100	36	1.5	1.5	58.5	145	157	5600	6700	
	100	36	1.5	1.5	58.5	145	164	5600	6700	
	100	36	1.5	1.5	58.5	145	164	5600	6700	
	100	36	1.5	1.5	58.5	145	164	5600	6700	
	120	29	2	2		100.5	124	123	5600	6700
	120	29	2	2	64.5	124	123	5600	6700	
	120	29	2	2	64.5	124	123	5600	6700	
	80	16	1	0.6	57.5	39.3	46.5	8500	10000	
	80	16	1	0.6	57.5	40	55	8500	10000	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
	mm							Kg
NUP209EM	52		61	78		1		0.507
NU2209EM	51	53	58	79		1	1	0.635
NU2209ETN1	51	53	58	79		1	1	0.571
NJ2209E/C3	51.5	53	61	78.5		1	1	0.639
NJ2209EM	51.5	53	61	78.5		1	1	0.645
NU5209XPC3	51	53	58	79		1		0.843
N309M	53	84		92	90.5	1.5	1.5	0.920
N309J	53	84		92	90.5	1.5	1.5	0.820
NCL309E/YA	53	84		92	90.5	1.5	1.5	0.872
NU309M/C3	53	56	61	92		1.5	1.5	0.992
NJ309EM	53	56	67	92		1.5	1.5	1.00
N309EM	53	86		92	91	1.5	1.5	0.959
NUP309E	53		67	92		1.5	1.5	1.01
N309E	53	86		92	91	1.5	1.5	0.964
N309ETN1	53	86		92	91	1.5	1.5	0.846
NF309E	53			92	91	1.5	1.5	0.995
NJ309E	53	56	67	92		1.5	1.5	1.01
NU309E	53	56	61	92		1.5	1.5	0.986
NU309NRB1/YA6	51	54	60	92		1.5	1.5	0.912
NUP309ETN1/HAC3YA6	53		67	92		1.5	1.5	0.892
NF2309X2J/YA6	53			92	91	1	1	1.12
NU2309EM/C3	53	56	61	93		1.5	1.5	1.49
NJ2309E	53	56	67	92		1.5	1.5	1.45
NJ2309EM	53	56	67	92		1.5	1.5	1.52
NU2309E	53	56	61	93		1.5	1.5	1.42
N409M	54	97		111	103	2	2	1.67
NU409M	54	62	67	111		2	2	1.87
NJ409M	54	62	74	111		2	2	1.88
NJ1010M	54	56	60	75		1	0.6	0.316
NJ1010TN1	54	56	60	75		1	0.6	0.279
N210M	56.5	79		83.5	82	1	1	0.559
N210EM	56.5	79		83.5	82	1	1	0.566
NF210M	56.5			83.5	82	1	1	0.565
NU210M	56.5	57	62	83.5		1	1	0.564
NU210Q1	56.5	57	62	83.5		1	1	0.557

# Cylindrical Roller Bearings

**ZWZ**

d 50~55 mm



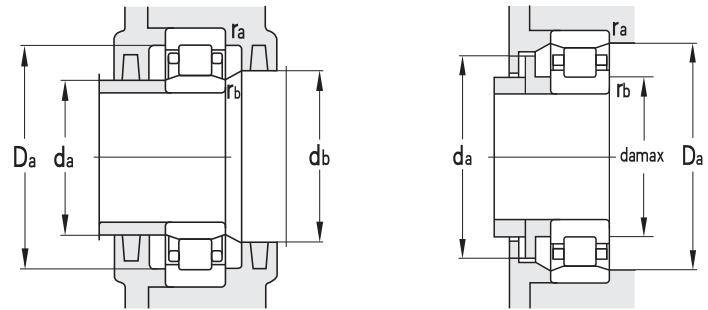
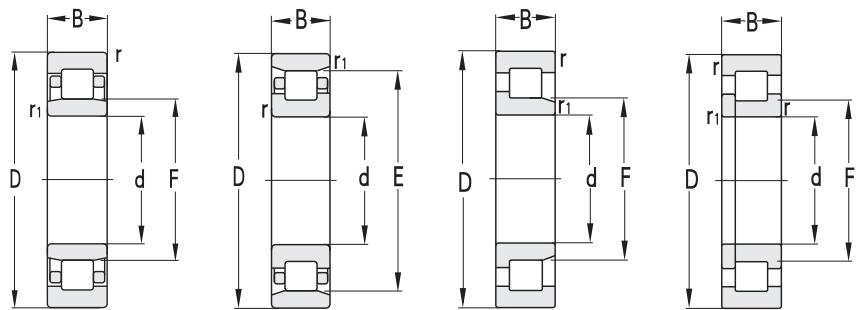
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings			
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm											
50	90	20	1.1	1.1	59.5			70.4	67.5	6300	7500
	90	20	1.1	1.1	59.5			70.4	74.0	6300	7500
	90	20	1.1	1.1	59.5			64	78	6300	7500
	90	20	1.1	1.1	59.5	81.5		70.4	78.0	6300	7500
	90	20	1.1	1.1	59.5			70.4	78.0	6300	7500
	90	23	1.1	1.1	59.5			82.5	90	6300	7500
	90	23	1.1	1.1	59.5			82.5	90	6300	7500
	90	23	1.1	1.1	59.5			76	98	6300	7500
	90	30.16	1.1	1.1	60.45			99.0	128	6300	7500
	110	27	2	2	95	94.6	97.0	5000	6000		
	110	27	2	2	65	94.6	97.0	5000	6000		
	110	27	2	2	65	94.5	97	5000	6000		
	110	27	2.0	2.0	65	94.6	97.0	5000	6000		
	110	27	2	2	97	119	115	5000	6000		
	110	27	2	2	97	119	125	5000	6000		
	110	27	2	2	65	119	125	5000	6000		
	110	27	2	2	65	119	125	5000	6000		
	110	27	2	2	65	94.5	97	5000	6000		
	110	40	2	2	65	128	142	5000	6000		
	110	40	2	2	65	171	198	5000	6000		
	110	40	2	2	65	171	198	5000	6000		
	110	40	2	2	65	171	198	5000	6000		
	110	40	2	2	65	155	198	5000	6000		
	110	40	2	2	65	155	198	5000	6000		
	130	31	2.1	2.1	110	151	151	5000	6000		
	130	31	2.1	2.1	110	151	151	5000	6000		
	130	31	2.1	2.1	70	151	151	5000	6000		
	130	31	2.1	2.1	70	151	151	5000	6000		
	130	31	2.1	2.1	70	151	151	5000	6000		
	130	31	2.1	2.1	70	150	151	5000	6000		
	55	90	18	1.1	1	64.5	42	50	7000	8500	
	90	18	1.1	1	64.5	43	53	7000	8500		
	100	21	1.5	1.5	88.5	80.0	84.5	6000	7000		
	100	21	1.5	1.5	90	91.3	106	6000	7000		
	100	21	1.5	1.1	66	91.3	106	6000	7000		

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm							Kg	
NU210EM	56.5	57	62	83.5		1	1	0.562
NJ210EM	56.5	57	66	83.5		1	1	0.573
NJ210ETN1	56.5	57	66	83.5		1	1	0.503
NF210E	56.5		66	83.5	82	1	1	0.578
NUP210E	56.5		66	83.5		1	1	0.591
NU2210EM	56.5	57	62	83.5		1	1	0.65
NJ2210EM	56.5	57	66	83.5		1	1	0.666
NJ2210ETN1	56.5	57	66	83.5		1	1	0.579
NU5210XPC3	56	58	62	84		1	1	0.902
N310M	59	93		101	97	2	2	1.17
NJ310M	59	63	73	101		2	2	1.36
NJ310M+HJ310	59	63	73	101		2	2	1.52
NU310M/C3	59	63	67	101		2	2	1.29
N310EM	59	95		101	99	2	2	1.30
N310E	59	95		101	99	2	2	1.30
NJ310E	59	63	73	101		2	2	1.33
NU310E	59	63	67	101		2	2	1.29
NUP310M	61		73	99		2	2	1.37
NU2310M	59	61	67	101		2	2	1.91
NJ2310E	59	62	73	101		2	2	1.95
NJ2310EM	59	62	73	101		2	2	1.92
NU2310E	59	61	62	67	101	2	2	1.92
NU2310EM	59	61	67	101	2	2	1.89	
NU2310ETN1	59	61	67	101	2	2	1.71	
N410M	61	107		119	113	2	2	2.18
N410	61	107		119	113	2	2	2.09
NU410M	61	68	73	119		2	2	2.20
NU410	61	68	73	119		2	2	2.11
NJ410	61	68	81	119		2	2	2.15
NJ410M	61	68	81	119		2	2	2.24
NU1011M	59.6	63	67	84		1	1	0.479
NU1011TN1	59.6	63	67	84		1	1	0.403
NF211M	63			93.5	92	1.5	1.5	0.806
NF211E	63			93.5	92	1.5	1.5	0.757
NJ211E	61.5	64	73	92		1.5	1	0.767

## Cylindrical Roller Bearings

ZWZ

d 55~60 mm



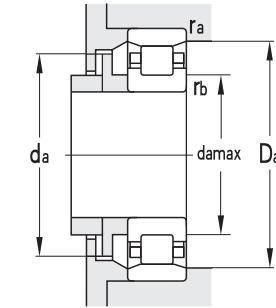
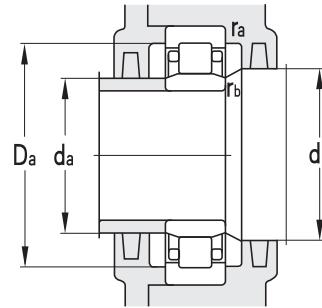
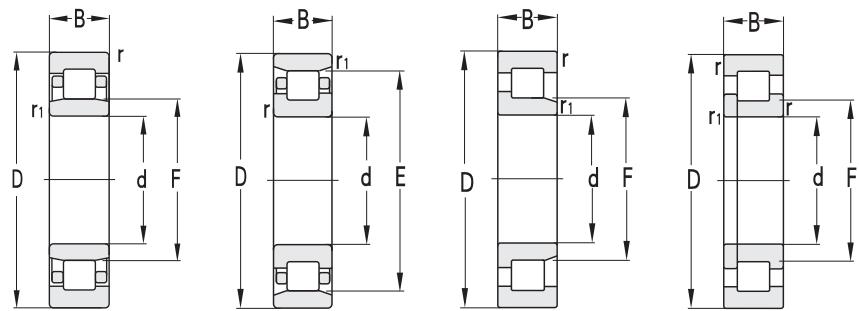
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	rsmin	r1smin	F	E	Cr	Cor	Grease	Oil
mm							KN		r/min	
55	100	21	1.5	1.5	66	85	95	6000	7000	
	100	21	1.5	1.5	66	91	106	6000	7000	
	100	25	1.5	1.1	66	101	122	6000	7000	
	100	25	1.5	1.1	66	97	129	6000	7000	
	100	25	1.5	1.1	66	101	122	6000	7000	
	100	33.3	1.5	1.1	88.9	73.7	85.0	6000	7000	
	100	33.34	1.1	1.1	66.9	118	155	4800	5600	
	120	29	2	2	104.5	120	123	4800	5600	
	120	29	2	2	104.5	120	123	4800	5600	
	120	29	2	2	104.5	120	123	4800	5600	
	120	29	2	2	70.5	120	123	4800	5600	
	120	29	2	2	70.5	120	123	4800	5600	
	120	29	2	2	70.5	120	123	4800	5600	
	120	29	2	2	70.5	120	123	4800	5600	
	120	29	2	0.5	68.75	138	145	4800	5600	
	120	29	2	2	68.75	138	145	4800	5600	
	120	29	2	2	106.5	139	144	4800	5600	
	120	29	2	2	106.5	139	156	4800	5600	
	120	29	2	2	70.5	139	156	4800	5600	
	120	29	2	2	70.5	139	156	4800	5600	
	120	29	2	2	70.5	139	156	4800	5600	
	120	29	2	2	106.5	139	156	4800	5600	
	120	29	2	2	70.5	139	156	4800	5600	
	120	29	2	2	70.5	139	156	4800	5600	
	120	43	2	2	70.5	156	174	4800	5600	
	120	43	2	2	106.5	210	246	4800	5600	
	120	43	2	2	70.5	210	246	4800	5600	
	120	43	2	2	70.5	210	246	4800	5600	
	140	33	2.1	2.1	117.2	162	168	4800	5600	
	140	33	2.1	2.1	77.2	162	168	4800	5600	
	140	33	2.1	2.1	77.2	162	168	4800	5600	
60	95	18	1.1	1	85.5	50.6	66.0	6700	8000	
	95	18	1.1	1	85.5	48	69	6700	8000	
	95	18	1.1	1	69.5	50.6	66.0	6700	8000	
	110	22	1.5	1.5	97.5	80.3	85.0	5300	6300	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
	mm							Kg
NUP211EM	61.5	64	73	92	1	1	0.762	
NUP211ETN1	61.5	64	73	92	1	1	0.667	
NJ2211EM	61.5	64	73	92	1.5	1	0.783	
NJ2211ETN1	61.5	64	73	92	1.5	1	0.666	
NU2211EM	61.5	64	68	92	1.5	1	0.763	
N3211M	63	87	93.5	92	1.5	1	1.20	
NU5211XPC3	61	65	69	93	1	1	1.21	
NF311M	64		111	107	2	2	1.7	
N311M	64	102	111	107	2	2	1.65	
N311J	64	102	111	107	2	2	1.45	
NU311M	64	68	73	111	2	2	1.74	
NJ311M	64	68	79	111	2	2	1.75	
NUP311M	64		79	111	2	2	1.76	
NJ311M/YA6	64	68	80	111	2	2	1.75	
NUP311NJC	64		80	111	2	2	1.65	
NUP311NRJC	64		80	111	2	2	1.71	
N311EM	64	104		111	109	2	2	1.60
N311E	64	104		111	109	2	2	1.61
NJ311E	64	68	80	111	2	2	1.67	
NU311E	64	68	73	111	2	2	1.64	
NUP311E	64		80	111	2	2	1.69	
N311ETN1	64	104		111	109	2	2	1.42
NU311EM	64	68	73	111	2	2	1.64	
NU311EM/C9	64	68	73	111	2	2	1.63	
NU2311M	64	68	73	111	2	2	2.43	
N2311E	64	104		111	110	2	2	2.56
NJ2311E	64	68	80	111	2	2	2.62	
NU2311E	64	68	73	111	2	2	2.59	
N411M	66	114		129	119	2	2	2.86
NJ411M/C5	66	74	88	129	2	2	2.95	
NU411M	66	74	88	129	2	2	2.85	
N1012M	65	83	88.5	87	1	1	0.432	
N1012TN1	65	83	88.5	87	1	1	0.387	
NU1012M	65	67	72	90	1	1	0.466	
NF212M	68			102	1.5	1.5	0.957	

# Cylindrical Roller Bearings

**ZWZ**

d 60 mm



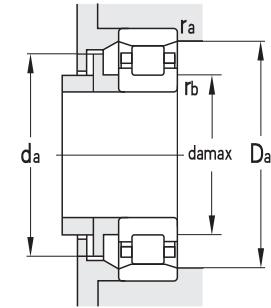
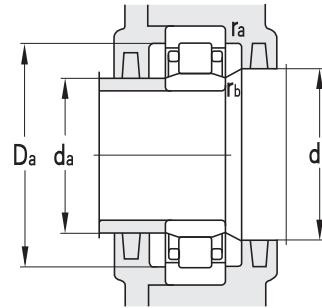
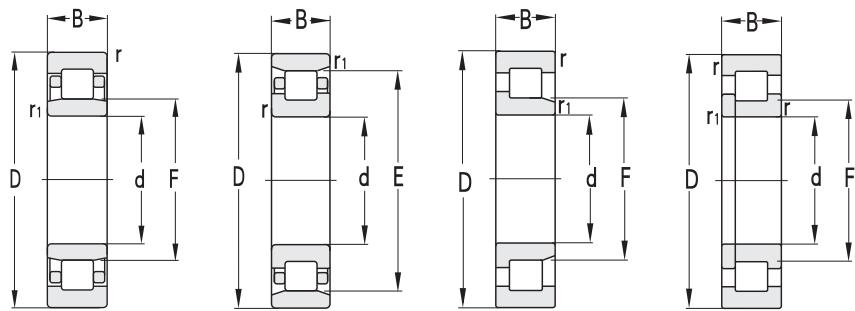
Principal dimensions	d	D	B	rsmin	r1smmin	F	E	Basic load ratings		Limit speed ratings		Weight
								Cr	Cor	Grease	Oil	
mm								KN	r/min			
60	110	22	1.5	1.5	73.5			80.3	93.0	5300	6300	
	110	22	1.5	1.5	72			93.5	102	5300	6300	
	110	22	1.5	1.5	73.5			80.3	93.0	5300	6300	
	110	22	1.5	1.5	72			103	116	5300	6300	
	110	22	1.5	1.5	72			103	102	5300	6300	
	110	22	1.5	1.5	72			94	116	5300	6300	
	110	22	1.5	1.5	73.5			80.5	92.5	5300	6300	
	110	28	1.5	1.5	73.5			91.3	131	5300	6300	
	110	28	1.5	1.5	72			123	145	5300	6300	
	110	28	1.5	1.5	72			123	145	5300	6300	
	110	28	1.5	1.5	72			118	155	5300	6300	
	110	36.51	1.5	1.5	72.39			150	194	4800	5600	
	110	60	1.5	1.5	73.5			106	130	5300	6300	
	130	31	2.1	2.1	77		113	141	150	4300	5000	
	130	31	2.1	2.1	77			141	150	4300	5000	
	130	31	2.1	2.1	77			141	150	4300	5000	
	130	31	2.1	2.1	77			141	150	4300	5000	
	130	31	2.1	2.1	77			115	163	174	4300	5000
	130	31	2.1	2.1	77			115	163	174	4300	5000
	130	31	2.1	2.1	77			115	163	174	4300	5000
	130	31	2.1	2.1	77			115	163	174	4300	5000
	130	31	2.1	2.1	77			115	163	174	4300	5000
	130	31	2.1	2.1	77			163	174	4300	5000	
	130	31	2.1	2.1	77			163	174	4300	5000	
	130	31	2.1	2.1	77			163	174	4300	5000	
	130	31	2.1	2.1	77			163	174	4300	5000	
	130	31	2.1	2.1	77			163	174	4300	5000	
	130	31	2.1	2.1	77			163	174	4300	5000	
	130	31	2.1	2.1	77			163	174	4300	5000	
	130	46	2.1	2.1	77		113	188	217	4300	5000	
	130	46	2.1	2.1	77			188	217	4300	5000	
	130	46	2.1	2.1	77			188	217	4300	5000	
	130	46	2.1	2.1	77			234	279	4300	5000	
	130	46	2.1	2.1	77			234	279	4300	5000	
	130	46	2.1	2.1	77			234	279	4300	5000	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm	mm							Kg
NU212M	68	70	75	102		1.5	1.5	0.938
NU212EM	68	70	80	102		1.5	1.5	0.916
NJ212M	68	70	80	102		1.5	1.5	0.952
NJ212E	68	70	80	102		1.5	1.5	0.947
NJ212EM	68	70	80	102		1.5	1.5	0.938
NJ212ETN1	68	70	80	102		1.5	1.5	0.842
NUP212NM/YB2	68	70	80	102		1.5	1.5	0.978
NUP2212M	68		80	102		1.5	1.5	1.27
NU2212EM	68	70	74	102		1.5	1.5	1.21
NJ2212EM	68	70	80	102		1.5	1.5	1.23
NJ2212ETN1	68	70	80	102		1.5	1.5	1.07
NUP2212XPC3	66	70	75	103		1	1	1.75
NU2212WBM/C3	68	70	74	102		1.5	1.5	1.57
N312M	71	110	119			2	2	2.04
NU312M	71	72	80	119		2	2	2.06
NU312Q1	71	72	80	119		2	2	2.03
NJ312M	71	72	86	119		2	2	2.10
N312E	71	112	119	118		2	2	1.94
N312EM	71	112	119	118		2	2	2.06
N312ETN1	71	112	119	118		2	2	1.79
NF312E	71		119	118		2	2	2.00
NF312EM	71		119	118		2	2	2.12
NJ312E	71	74	87	119		2	2	1.98
NU312E	71	74	79	119		2	2	1.94
NU312EM	71	74	79	119		2	2	2.06
NUS312ETN1	71	74	79	119		2	2	1.78
NUP312E	71		87	119		2	2	2.03
NUP312E/C9	71		87	119		2	2	2.03
NUP312ENRM	71		87	119		2	2	2.2
NUP312ENRJ/C3	71		87	119		2	2	1.92
N2312M	71	110	119			2	2	2.95
N2312M	71	73	80	119		2	2	3.37
NJ2312M	71	73	87	119		2	2	3.38
N2312E	71	112	119			2	2	2.93
NU2312E	71	73	80	119		2	2	2.95
NJ2312E	71	73	87	119		2	2	3.00

# Cylindrical Roller Bearings

**ZWZ**

d 60~65 mm



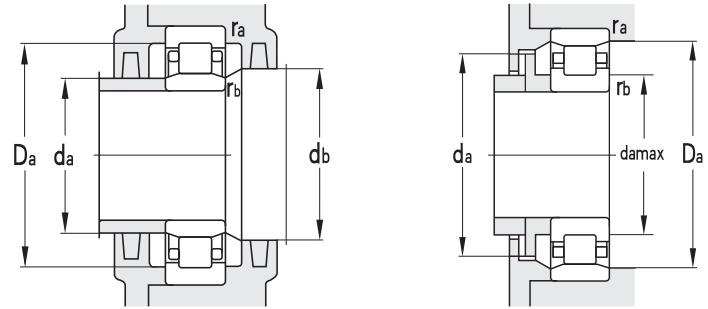
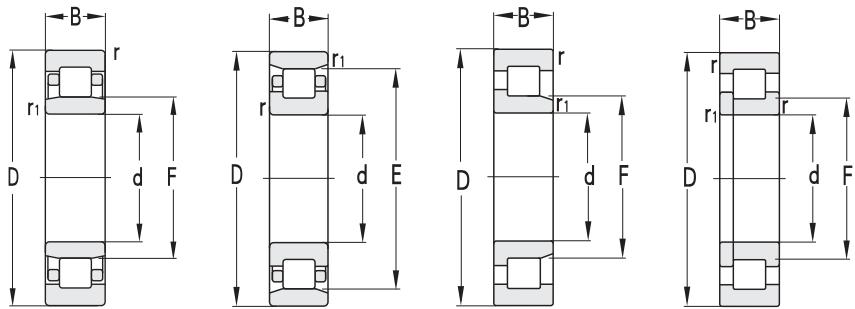
Principal dimensions							Basic load ratings		Limit speed ratings		
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil	
mm							KN		r/min		
60	140	51	2.5	2.5			122	252	282	4300	5000
	140	51	2.5	2.5			122	268	310	4300	5000
	140	51	2.5	2.5			122	268	310	4300	5000
	150	35	2.1	2.1			127	193	202	4300	5000
	150	35	2.1	2.1			127	193	202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
	150	35	2.1	2.1	83		193		202	4300	5000
65	120	30.2	1.1	1.1			80.4	90	110	4500	5600
	120	23	1.5	1.5			105.6	89.1	102	4800	5600
	120	23	1.5	1.5	79.6			89.1	102	4800	5600
	120	23	1.5	1.5	79.6			89.1	102	4800	5600
	120	23	1.5	1.5	79.6			89.1	102	4800	5600
	120	23	1.5	1.5			108.5	118	133	4800	5600
	120	23	1.5	1.5			108.5	118	133	4800	5600
	120	23	1.5	1.5	78.5			118	133	4800	5600
	120	23	1.5	1.5	78.5			118	133	4800	5600
	120	23	1.5	1.5	78.5			118	133	4800	5600
	120	23	1.5	1.5	78.5			118	133	4800	5600
	120	23	1.5	1.5	78.5			107	133	4800	5600
	120	23	1.5	1.5	78.5			153	133	4800	5600
	120	31	1.5	1.5	79.6			131	167	4800	5600
	120	31	1.5	1.5	79.6			131	167	4800	5600
	120	31	1.5	1.5	79.6			131	167	4800	5600
	120	31	1.5	1.5	78.5			149	182	4800	5600
	120	38.1	1.5	1.5	80.42			166	218	4000	4800
	140	33	2.1	2.1			121.5	156	168	4000	4800
	140	33	2.1	2.1			121.5	156	168	4000	4800
	140	33	2.1	2.1			121.5	195	210	4000	4800
	140	33	2.1	2.1	83.5			156	168	4000	4800

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
	mm							Kg
N612J	72	119		128	125	2	2	3.47
N612M	72	119		128	125	2	2	3.96
N612M/C9	72	119		128	125	2	2	3.96
N412M	71	124		139	130	2	2	3.29
N412	71	124		139	130	2	2	3.18
NU412M	71	80	85	139		2	2	3.23
NU412	71	80	85	139		2	2	3.13
NJ412J	71	80	94	139		2	2	3.13
NJ412M	71	80	94	139		2	2	3.36
NJ412	71	80	94	139		2	2	3.25
NUP412	71		94	139		2	2	3.43
NUP412J	71		94	139		2	2	3.31
NUP412M	71		94	139		2	2	3.42
RNU3210M				87	85	1	1	0.647
N213M	73	103		112	111	1.5	1.5	1.11
NU213M	73	76	81	112		1.5	1.5	1.12
NJ213M	73	76	87	112		1.5	1.5	1.14
NUP213M	73		87	112		1.5	1.5	1.22
NF213E	73			112	111	1.5	1.5	1.14
N213E	73	106		112	111	1.5	1.5	1.05
NU213E	73	76	81	112		1.5	1.5	0.994
NJ213E	73	76	87	112		1.5	1.5	1.13
NUP213E	73		87	112		1.5	1.5	1.16
NUP213EM	73		87	112		1.5	1.5	1.22
NUP213ETN1	73		87	112		1.5	1.5	1.07
NU213ETN1	73	76	81	112		1.5	1.5	1.00
NJ2213M	73	76	87	112		1.5	1.5	1.65
NU2213M	73	76	81	112		1.5	1.5	1.65
NUP2213M	73		87	112		1.5	1.5	1.75
NU2213EM	73	76	81	112		1.5	1.5	1.61
NU5213XPC3	72	78.5	82.5	113.5		1	1	1.96
N313	76	119		129	124	2	2	2.24
N313M	76	119		129	124	2	2	2.45
N313ETN1	76	119		129	124	2	2	2.15
NJ313M	76	81	93	129		2	2	2.60

# Cylindrical Roller Bearings

**ZWZ**

d 65 ~ 70 mm



Principal dimensions						Basic load ratings		Limit speed ratings		
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm						KN		r/min		

65	140	33	2.1	2.1	83.5		156	168	4000	4800
	140	33	2.1	2.1	83.5		156	168	4000	4800
	140	33	2.1	2.1	82.5		173	157	4000	4800
	140	33	2.1	2.1	82.5	124.5	173	194	4000	4800
	140	33	2.1	2.1	82.5	124.5	183	194	4000	4800
	140	33	2.1	2.1	82.5		173	194	4000	4800
	140	33	2.1	2.1	82.5		195	210	4000	4800
	140	33	2.1	2.1	82.5	124.5	173	211	4000	4800
	140	33	2.1	2.1	82.5		173	211	4000	4800
	140	33	2.1	2.1	82.5		173	211	4000	4800
	140	33	2.1	2.1	82.5		183	194	4000	4800
	140	48	2.1	2.1	83.5		211	248	4000	4800
	140	48	2.1	2.1	83.5		211	248	4000	4800
	140	48	2.1	2.1	83.5	124.5	261	305	4000	4800
	140	48	2.1	2.1	82.5		261	305	4000	4800
	140	48	2.1	2.1	82.5		261	305	4000	4800
	160	37	2.1	2.1	82.5	135.5	209	222	4000	4800
	160	37	2.1	2.1	82.5	135.5	209	222	4000	4800
	160	37	2.1	2.1	89.5		209	222	4000	4800
	160	37	2.1	2.1	89.5		209	222	4000	4800
	160	37	2.1	2.1	89.5		209	222	4000	4800
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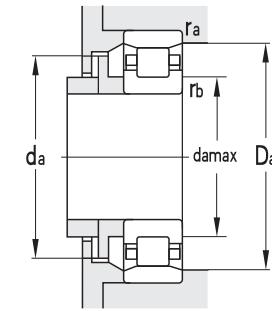
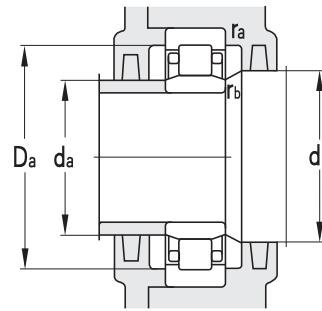
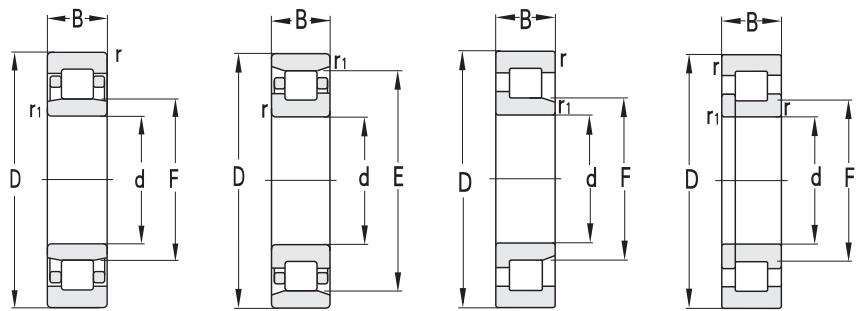
70	125	24	1.5	1.5	84.5	92.4	96	4500	5300	
	125	24	1.5	1.5		110.5	92.4	110	4500	5300
	125	24	1.5	1.5		110.5	92.4	110	4500	5300
	125	24	1.5	1.5	84.5	92.4	116	4500	5300	
	125	24	1.5	1.5	84.5	92.4	116	4500	5300	
	125	24	1.5	4.3		113.5	123	143	4500	5300
	125	24	1.5	4.3		113.5	129	152	4500	5300
	125	24	1.5	4.3		113.5	129	152	4500	5300
	125	24	1.5	4.3		113.5	129	152	4500	5300
	125	24	1.5	4.3		113.5	129	152	4500	5300
	125	24	1.5	4.3	83.5	129	152	4500	5300	
	125	24	1.5	4.3	83.5	129	152	4500	5300	

Designations	Abutment and fillet dimensions						Weight	
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm						Kg		
NU313M	76	81	86	129	127	2	2	2.54
NU313Q1	76	81	86	129	127	2	2	2.46
NJ313EM	76	80	93	129	127	2	2	2.5
N313EM	76	122	122	129	127	2	2	2.42
NF313EM	76	122	122	129	127	2	2	2.48
NU313EM	76	80	85	129	127	2	2	2.45
NU313ETN1	76	80	85	129	127	2	2	2.18
N313E	76	122	122	129	127	2	2	2.43
NJ313E	76	80	93	129	127	2	2	2.59
NU313E	76	80	85	129	127	2	2	2.46
NUP313EM	77	93	128	129	127	2	2	2.64
NJ2313M	76	79	93	129	127	2	2	3.67
NU2313M	76	79	85	129	127	2	2	3.60
NF2313E	76	79	85	129	127	2	2	3.60
NJ2313E	76	79	93	129	127	2	2	3.55
NU2313E	76	79	85	129	127	2	2	3.48
N413M	76	132	149	139	137	2	2	4.01
N413	76	132	149	139	137	2	2	3.92
NU413M	76	86	92	149	147	2	2	4.03
NU413	76	86	92	149	147	2	2	3.94
NJ413M	76	86	101	149	147	2	2	4.09
NJ413W1	76	86	101	149	147	2	2	4.00
NUP413M	76	101	149	147	145	2	2	4.19
NUP214M	78	92	117	116	114	1.5	1.5	1.35
N214M	78	108	117	116	114	1.5	1.5	1.27
NF214M	78	81	86	117	116	1.5	1.5	1.30
NU214Q1	78	81	86	117	116	1.5	1.5	1.23
NU214M	78	81	86	117	116	1.5	1.5	1.24
NF214E/C9YB2	78	81	86	117	116	4	1.5	1.21
N214E	78	111	117	116	114	1.5	1.5	1.29
NF214E	78	81	86	117	116	1.5	1.5	1.31
NF214E/C9YB2	78	81	86	117	116	4	1.5	1.33
NF214ETN1/C9YB2	78	81	86	117	116	4	1.5	1.17
NUP214E	78	92	117	116	114	1.5	1.5	1.39
NJ214E	78	81	92	117	116	1.5	1.5	1.34

# Cylindrical Roller Bearings

**ZWZ**

d 70 mm



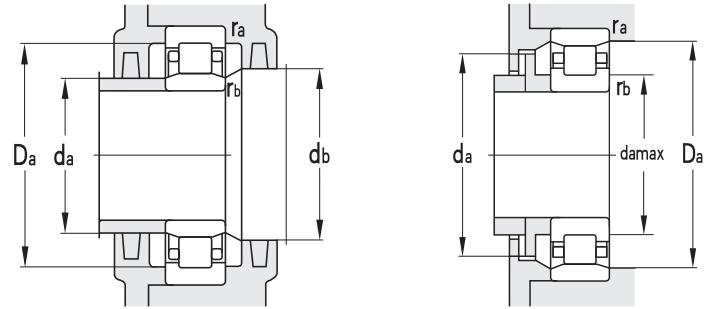
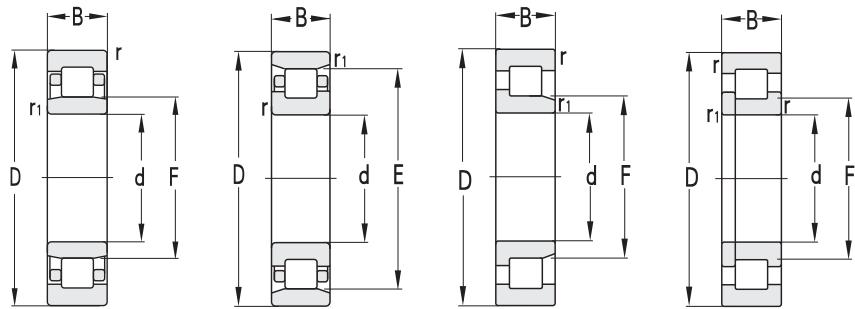
Principal dimensions	d	D	B	rsmin	r1smin	F	E	Basic load ratings		Limit speed ratings		Weight
								Cr	Cor	Grease	Oil	
mm												
70	125	24	1.5	1.5	83.5			129	152	4500	5300	
	125	24	1.5	1.5	83.5			129	152	4500	5300	
	125	31	1.5	1.5	84.5			130	155	4500	5300	
	125	31	1.5	1.5	84.5			130	169	4500	5300	
	125	31	1.5	1.5	84.5			130	169	4500	5300	
	125	39.69	1.5	1.5	84.5			166	232	4500	5300	
	125	41	1.5	1.5	84.5			130	155	4500	5300	
	150	35	2.1	2.1	90			182	202	3600	4300	
	150	35	2.1	2.1	90			130	182	202	3600	
	150	35	2.1	2.1	90			182	202	3600	4300	
	150	35	2.5	2.5	90			182	202	3600	4300	
	150	35	2.5	2.5	90			182	202	3600	4300	
	150	35	2.1	2.1	90			130	182	202	3600	
	150	35	2.1	2.1	90			182	202	3600	4300	
	150	35	2.1	2.1	90			182	202	3600	4300	
	150	35	2.1	2.1	90			182	202	3600	4300	
	150	35	2.1	2.1	90			133	219	242	3600	
	150	35	2.1	2.1	90			219	242	3600	4300	
	150	35	2.1	2.1	89			219	242	3600	4300	
	150	35	2.1	2.1	89			219	242	3600	4300	
	150	35	2.1	2.1	89			219	242	3600	4300	
	150	35	2.1	2.1	89			219	242	3600	4300	
	150	35	2.1	2.1	89			219	242	3600	4300	
	150	35	2.1	2.1	89			189	226	3600	4300	
	150	35	2.1	2.1	89			189	226	3600	4300	
	150	35	2.1	2.1	89			248	300	3600	4300	
	150	51	2.1	2.1	90			248	300	3600	4300	
	150	51	2.1	2.1	90			248	345	3600	4300	
	150	51	2.1	2.1	89			286	345	3600	4300	
	150	51	2.1	2.1	89			286	345	3600	4300	
	150	51	2.1	2.1	89			286	345	3600	4300	
	180	42	3	3	99			151	262	283	3600	
	180	42	3	3	100			152	262	283	3600	
	180	42	3	3	100			262	283	3600	4300	
	180	42	3	3	100			262	283	3600	4300	
	180	42	3	3	100			262	283	3600	4300	
	180	42	3	3	100			262	283	3600	4300	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NJ214E/YA6	78	81	92	117		1.5	1.5	1.34
NU214E	78	81	86	117		1.5	1.5	1.32
NUP2214M	78		92	117		1.5	1.5	1.8
N2214M	78	81	86	117	100	1.5	1.5	1.68
NU2214M	78	81	92	117		1.5	1.5	1.70
NJ2214M	78	81	92	117		1.5	1.5	1.73
NU5214XPC3	76.5	82.5	86.5	118.5		1	1	2.17
NU2214WBM/C2	78	81	86	117		1.5	1.5	1.88
NJ314Q1	81	86	100	139		2	2	3.11
N314M	81	127		139		2	2	3.00
N314J	81	127		139	133	2	2	2.78
NU314M	81	86	93	139		2	2	3.05
NJ314M	81	86	100	139		2	2	3.12
NF314M	81			139		2	2	3.08
NU314Q1	81	86	92	139		2	2	3.03
NU314NRM/YAB	81	86	92	139		2	2	3.05
N314E	81	130		139	136	2	2	3.00
N314EM	81	130		139	136	2	2	3.08
NJ314E/C9	81	86	100	139		2	2	3.06
NU314E	81	86	92	139		2	2	3.01
NJ314E	81	86	100	139		2	2	3.06
NUP314E	81			139		2	2	3.14
NU314EM	82	86	91	138		2	2	3.45
NU314ETN1	82	86	91	138		2	2	2.7
NU2314M	81	86	93	139		2	2	4.52
NJ2314M	81	86	101	139		2	2	4.62
N2314E	81	130		139	136	2	2	4.27
NU2314E	81	86	92	139		2	2	4.24
NJ2314E	81	86	100	139		2	2	4.33
N414M	83	148		167	155	2.5	2.5	5.66
N414	83	148		167	155	2.5	2.5	6.40
NU414M	83	97	102	167		2.5	2.5	5.79
NU414	83	97	102	167		2.5	2.5	6.38
NJ414	83	97	113	167		2.5	2.5	6.68
NJ414M	83	97	113	167		2.5	2.5	5.94

# Cylindrical Roller Bearings

**ZWZ**

d 75~80 mm



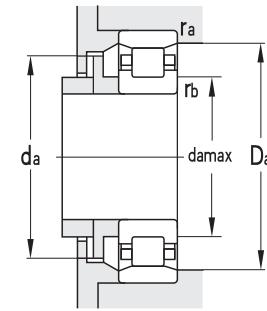
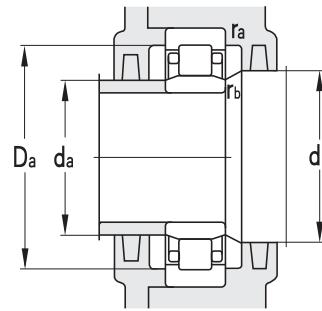
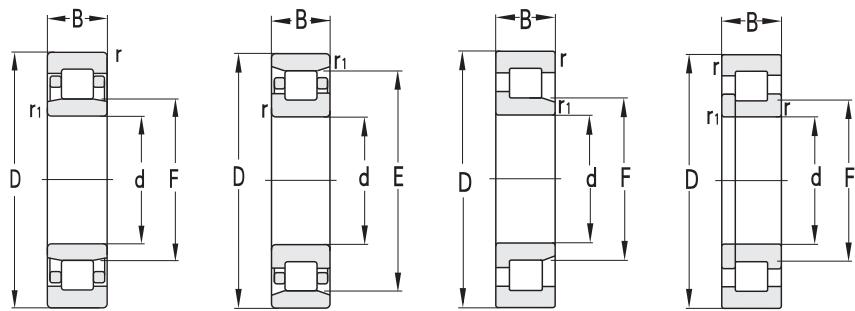
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings		
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease
mm										
75	115	20	1.1	1	85		64.9	83.0	5600	6700
	130	25	1.5	1.5	85	116.5	107	127	4500	5300
	130	25	1.5	1.5	88.5		107	127	4500	5300
	130	25	1.5	1.5	88.5	118.5	107	127	4500	5300
	130	25	1.5	1.5	88.5		141	173	4500	5300
	130	25	1.5	1.5	88.5	141	173	4500	5300	
	130	25	1.5	1.5	88.5		140	172	4500	5300
	130	25	1.5	1.5	88.5	141	173	4500	5300	
	130	25	1.5	1.5	88.5	146	161	4500	5300	
	130	25	1.5	1.5	88.5	146	161	4500	5300	
	130	30	1.5	1.5	88.5	132	166	4500	4500	
	130	31	1.5	1.5	88.5	132	166	4500	5300	
	130	31	1.5	1.5	88.5	132	166	4500	5300	
	130	41.28	1.5	1.5	89	116.5	132	166	4500	5300
	160	37	2.1	2.1	95.5		204	268	4000	4000
	160	37	2.1	2.1	95.5	139.5	204	226	3400	4000
	160	37	2.1	2.1	95.5	139.5	204	264	3400	4000
	160	37	2.1	2.1	95		204	226	3400	4000
	160	37	2.1	2.1	95	143	241	285	3400	4000
	160	37	2.1	2.1	95	143	241	285	3400	4000
	160	37	2.1	2.1	95	204	226	3400	4000	
	160	37	2.1	2.1	95	204	264	3400	4000	
	160	37	2.1	2.1	95	204	264	3400	4000	
	160	37	2.1	2.1	95	241	264	3400	4000	
	160	37	2.1	2.1	95	241	285	3400	4000	
	160	37	2.1	2.1	95	241	285	3400	4000	
	160	37	2.1	2.1	95	139.5	255	226	3400	4000
	160	37	2.1	2.1	95.5	255	226	3400	4000	
	160	37	2.1	2.1	95.5	255	226	3400	4000	
	160	37	2.1	2.1	95.5	300	285	3400	4000	
	160	55	2.1	2.1	139.5	287	345	3400	4000	
	160	55	2.1	2.1	139.5	287	345	3400	4000	
	160	55	2.1	2.1	95.5	287	345	3400	4000	
	160	55	2.1	2.1	95.5	287	345	3400	4000	
	190	45	3	3	104.5	160.5	300	325	3400	4000
	190	45	3	3	104.5	300	325	3400	4000	
	190	45	3	3	104.5	300	325	3400	4000	
80	125	22	1.1	1	113.5	78.1	100	5300	6300	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NU1015M	80	83	87	108.5		1	1	0.739
N215M	83	114	122	121	1.5	1.5	1.40	
NU215M	83	86	91	122	1.5	1.5	1.42	
NJ215M	83	86	97	122	1.5	1.5	1.45	
N215E	83	116	122	121	1.5	1.5	1.38	
NU215E	83	86	91	122	1.5	1.5	1.39	
NU215ETN1	83	86	91	122	1.5	1.5	1.24	
NJ215E	83	86	97	122	1.5	1.5	1.38	
NU215EL3/HAP53	83	86	91	122	1.5	1.5	1.3	
NUP215EL3/HAP53	83	97	122	1.5	1.5	1.35		
NUP2215M	83	97	122	1.5	1.5	2.03		
NU2215M	83	86	91	122	1.5	1.5	1.75	
N2215M	83	86	122	121	1.5	1.5	1.77	
NU5215XPC3	81.5	92	91	123.5	1	1	2.27	
NJ315Q1	86	137	107	149	142	2	3.75	
N315EM	86	140	149	146	2	2	3.65	
N315J	86	92	149	149	2	2	3.28	
NU315EM	86	92	97	149	2	2	3.62	
NU315Q1	86	92	97	149	2	2	3.68	
N315E	86	140	149	146	2	2	3.59	
NU315ETN1	86	92	97	149	2	2	3.25	
NUP315EM	86	107	149	149	2	2	3.75	
N315M	86	140	149	146	2	2	3.59	
NU315M	86	92	97	149	2	2	3.56	
NU315E	86	92	97	149	2	2	3.56	
NJ315M	86	92	107	149	2	2	3.63	
NJ315E	86	157	107	149	163	2	3.64	
N2315M	86	136	149	143	143	2	5.30	
N2315Q1	86	136	149	143	2	2	5.84	
NJ2315M	86	91	107	149	2	2	5.86	
NU2315M	86	91	98	149	2	2	5.96	
NJ415M	88	87	119	177	2.5	2.5	7.14	
N415M	88	101	107	177	2.5	2.5	6.86	
NU415M	88	101	177	2.5	2.5	2.5	6.94	
N1016M	85	110		118.5	116.5	1	1	1.00

# Cylindrical Roller Bearings

ZWZ

d 80 mm



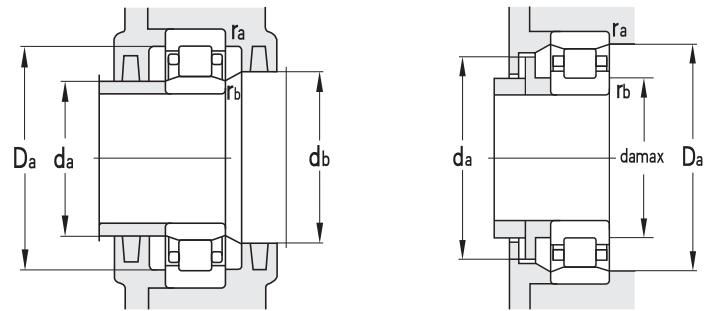
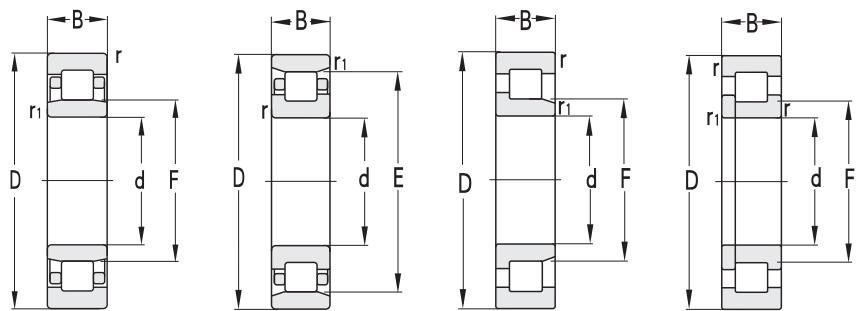
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm							KN		r/min	
80	125	22	1. 1	1	91. 5	78. 1	100	5300	6300	
	140	26	2	2		125	120	144	4000	4800
	140	26	2	2		125	127	154	4000	4800
	140	26	2	2	95	127	154	4000	4800	
	140	26	2	2	95	127	154	4000	4800	
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	140	33	2	2	59. 3	152	195	4000	4800	
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	140	33	2	2	95. 3	197	260	4000	4800	
	140	44. 5	2	2	95. 28	217	305	4000	4800	
	150	45	2	2	97	245	320	3800	4500	
	150	45	2	2	97	245	320	3800	4500	
	170	39	2. 1	2. 1		151	217	246	3200	3800
	170	39	2. 1	2. 1	103	217	246	3200	3800	
	170	39	2. 1	2. 1	103	217	246	3200	3800	
	170	39	2. 1	2. 1	103	217	246	3200	3800	
	170	39	2. 1	2. 1	103	217	246	3200	3800	
	170	39	2. 1	2. 1	101	275	285	3200	3800	
	170	39	2. 1	2. 1	101	151	275	286	3200	3800
	170	39	2. 1	2. 1	101	275	286	3200	3800	
	170	39	2. 1	2. 1	101	240	265	3200	3800	
	170	39	2. 1	2. 1	101	151	275	310	3200	3800
	170	39	2. 1	2. 1	101	275	310	3200	3800	
	170	39	2. 1	2. 1	101	275	310	3200	3800	
	170	39	2. 1	2. 1	101	275	310	3200	3800	
	170	39	2. 1	2. 1	101	275	310	3200	3800	
	170	39	2. 1	2. 1	101	275	310	3200	3800	
	170	39	2. 1	2. 1	101	275	310	3200	3800	
	170	58	2. 1	2. 1		147	304	380	3200	3800

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
	mm							
NU1016M	85	90	94	118.5	1	1		1.21
NF216M	89			131	2	2		1.72
N216M	89	123		131	2	2		1.66
NJ216M	89	93	104	131		2	2	1.73
NU216M	89	93	98	131		2	2	1.69
NUP216M	89			104	128	2	2	1.77
NU216E	89	93	98	131		2	2	1.65
NUP216E	89			104	131	2	2	1.72
N216E	89	125		131	130	2	2	1.67
NJ216E	89	93	104	131		2	2	1.68
NUP216ENRJ/C3YA6	89			104	131	2	2	1.66
NUP216ENRM/YA6	89			104	131	2	2	1.81
NU2216M	89	93	98	131		2	2	2.32
NJ2216M	89	93	104	131		2	2	2.35
NU2216EM	89	93	98	131		2	2	2.39
NJ2216E	89	93	104	131		2	2	2.34
NU2216E	89	93	98	131		2	2	2.30
N2216E	89	124		131	130	2	2	2.16
NUP2216E	89			104	131	2	2	2.13
NU5216	88	93	97	132		1.5	1.5	3.03
NJ3216X3M/P54	90	94	104	136		2	2	3.69
NJP3216X3M/P54	90	94	104	136		2	2	3.69
N316M	91	144		159		2	2	4.30
NU316M	91	100	106	159	150	2	2	4.37
NU316Q1	91	100	106	159		2	2	4.45
NJ316M	91	98	113	159		2	2	4.47
NUP316M	91			113	159	2	2	4.58
NJ316EM	91	98	113	159		2	2	4.32
N316EM	91	148		159		2	2	4.22
NU316EM	91	98	104	159	154	2	2	4.26
NU316EF1/C9	91	98	104	159		2	2	4.20
N316E	91	148		159		2	2	3.98
NJ316E	91	98	113	159	154	2	2	4.08
NU316E	91	98	104	159		2	2	4.25
NU316ETN1	91	98	104	159		2	2	3.89
N2316M	91	144		159		2	2	6.15

## Cylindrical Roller Bearings

ZWZ

d 50~85 mm



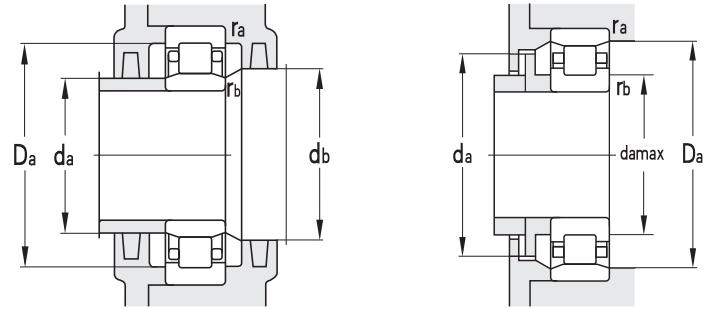
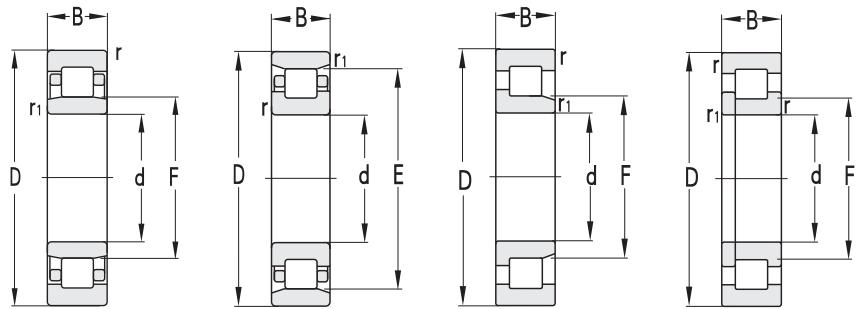
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	rsmin	r1smin	F	E	Cr	Cor	Grease	Oil
mm							KN		r/min	
80	170	58	2.1	2.1	103		304	380	3200	3800
	170	58	2.1	2.1	103		304	380	3200	3800
	170	58	2.1	2.1	101		374	460	3200	3800
	170	58	2.1	2.1		151	374	460	3200	3800
	170	58	2.1	2.1	101		374	460	3200	3800
	170	58	2.1	2.1	101		370	435	3200	3800
	170	58	2.1	2.1	100		266	384	3200	3800
	170	58	2.1	2.1	98		350	510	3200	3800
	200	48	3	3		170	341	375	3200	3800
	200	48	3	3	110		341	375	3200	3800
	200	48	3	3	110		341	375	3200	3800
85	130	22	1.1	1.1	96.5		89	109	5000	6000
	150	28	2	2		133.8	143	175	3800	4500
	150	28	2	2	101.8		143	175	3800	4500
	150	28	2	2	101.8		143	175	3800	4500
	150	28	2	2		136.5	179	217	3800	4500
	150	28	2	2	100.5		179	217	3800	4500
	150	28	2	2	100.5		179	217	3800	4500
	150	28	2	2	100.5		179	217	3800	4500
	150	36	2	2	101.8		196	263	3800	4500
	150	36	2	2	100.5		218	279	3800	4500
	150	36	2	2	100.5		215	279	3800	4500
	150	49.2	2	2	102		223	310	3800	4500
	150	49.21	2	2	102		252	350	3800	4500
	180	41	3	3		160	298	208	3000	3600
	180	41	3	3		160	312	360	3000	3600
	180	41	3	3	108		312	360	3000	3600
	180	41	3	3	108		312	360	3000	3600
	180	41	3	3	108		312	360	3000	3600
	180	41	3	3	108		298	350	3000	3600
	180	41	3	3	108		312	360	3000	3600
	180	41	3	3		160	312	360	3000	3600
	180	41	3	3		160	312	360	3000	3600
	180	41	3	3		160	312	360	3000	3600
	180	41	3	3	108		312	360	3000	3600

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
	mm							
NU2316M	91	98	106	159	154	2	2	6.34
NJ2316M	91	98	113	159	2	2	6.44	
NU2316E	91	98	104	159	2	2	6.28	
N2316E	91	148		159	150	2	2	6.26
NJ2316E	91	98	113	159	2	2	6.94	
NJ2316EM	91	98	113	159	2	2	6.62	
NUP2316M/YAB	91	98	118	159	2	2	7.23	
NUP2316X2V	91	97	118	159	2	2	7.19	
N416M	93	167		187	2.5	2.5	8.02	
NU416M	93	106	113	187	2.5	2.5	8.19	
NJ416M	93	106	125	187	2.5	2.5	8.31	
NJ1017TN1/C9YA6	90	95	99	122	1	1	0.972	
N217M	94	132		141	139	2	2	2.08
NU217M	94	98	103	141	2	2	2.09	
NJ217M	94	98	110	141	2	2	2.15	
N217E	94	134		141	139	2	2	2.08
NU217E	94	98	103	141	2	2	2.08	
NJ217E	94	98	110	141	2	2	2.12	
NUP217EM	94		110	141	2	2	2.27	
NU2217M/C3	94	98	103	141	2	2	2.8	
NU2217EM	94	98	103	141	2	2	2.82	
NJ2217EM	94	98	110	139	2	2	2.86	
NU3217M/C3	94	98	103	141	2	2	3.88	
NU5217XPC3	94	100	104	141	1.5	1.5	3.88	
IS- N317EM	98	157		167	163	2.5	2.5	5.2
N317EQ1	98	157		167	163	2.5	2.5	5.20
NJ317EQ1	98	105	120	167	2.5	2.5	5.27	
NU317E	98	105	111	167	2.5	2.5	5.12	
NU317EM	98	105	111	167	2.5	2.5	5.16	
NU317ETN1	98	105	111	167	2.5	2.5	4.57	
N317EQ1	98	105	111	167	2.5	2.5	5.18	
N317E	98	157		167	163	2.5	2.5	5.14
N317EM	98	157		167	163	2.5	2.5	5.20
N317EN1T	98	157		167	163	2.5	2.5	4.59
NJ317E	98	105	120	167	2.5	2.5	5.21	

# Cylindrical Roller Bearings

**ZWZ**

d 85~90 mm



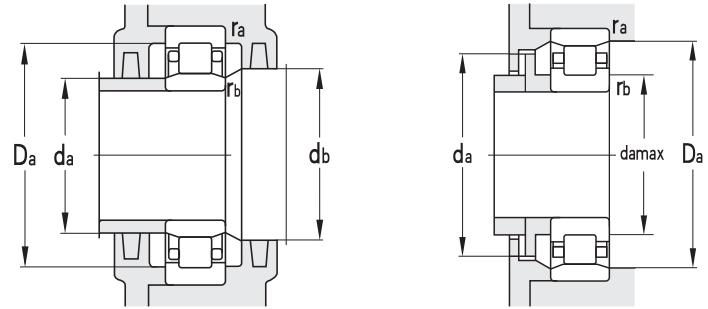
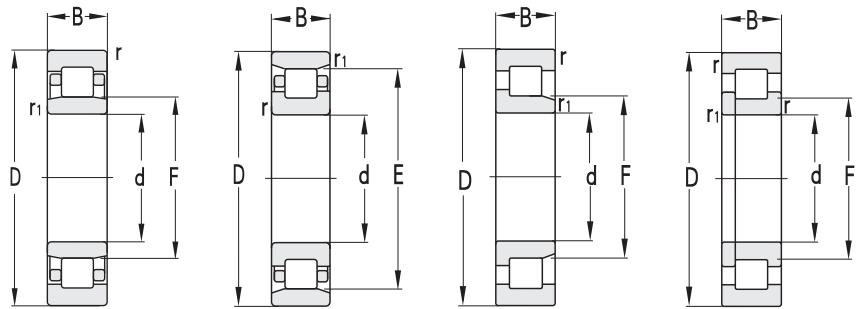
Principal dimensions	d	D	B	rsmin	r1smin	F	E	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
								KN	r/min		
85	180	41	1.1	1.1	108			312	360	3000	3600
	180	60	3	3	108			347	435	3000	3600
	180	60	3	3	108			347	435	3000	3600
	180	60	3	3	108	160		413	515	3000	3600
	180	60	3	3	108			413	515	3000	3600
	180	60	3	3	108			413	515	3000	3600
	210	52	4	4	115.5	179.5		385	425	3000	3600
	210	52	4	4	115.5			385	425	3000	3600
	210	52	4	4	115.5			385	425	3000	3600
	210	52	4	4	115.5			385	425	3000	3600
90	140	24	1.5	1.1	103			88.0	114	3600	4300
	160	30	2	2		143		163	195	3600	4300
	160	30	2	2		143		163	195	3600	4300
	160	30	2	2		143		171	207	3600	4300
	160	30	2	2		143		171	207	3600	4300
	160	30	2	2		143		171	207	3600	4300
	160	30	2	2		143		171	207	3600	4300
	160	30	2	2		143		171	207	3600	4300
	160	30	2	2		143		197	241	3600	4300
	160	30	2	2		143		197	241	3600	4300
	160	30	2	2		143		197	241	3600	4300
	160	30	2	2		143		197	241	3600	4300
	160	30	2	2		143		197	241	3600	4300
	160	40	2	2	107	107		215	287	3600	4300
	160	40	2	2	107	145		256	335	3600	4300
	160	40	2	2	107	145		256	335	2800	3400
	160	40	2	2	107	145		256	335	3600	4300
	160	52.4	2	2	107.218	107.218		281	390	3600	4300
	160	52.4	2	2	107.218	165		281	390	3200	3800
	190	43	3	3		165		274	295	2800	3400
	190	43	3	3		165		274	315	2800	3400
	190	43	3	3		165		274	315	2800	3400
	190	43	3	3	115			274	315	2800	3400
	190	43	3	3	115			274	315	2800	3400
	190	43	3	3	115			274	315	2800	3400
	190	43	3	3	115			274	315	2800	3400
	190	43	3	3	115	169.5	336	385	2800	3400	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NJ317EM	98	105	111	167		2.5	2.5	5.27
NU2317M	96	103	111	169		2.5	2.5	7.36
NJ2317M	96	103	120	169		2.5	2.5	7.81
N2317E	96	157	169			2.5	2.5	7.44
NU2317E	96	104	111	169		2.5	2.5	7.40
NJ2317E	96	104	120	169	163	2.5	2.5	7.57
N417M	101	176	194		183	3	3	9.48
NU417M	101	112	119	194		3	3	9.66
NJ417M	101	109	129	194		3	3	9.83
NUP417M	101	129	194			3	3	10.1
NUP1018M	96.5	101	106	132		1.5	1	1.4
N218J	99	140	151	148		2	2	2.37
N218J1	99	140	151	148		2	2	2.47
NF218M	99		151	148		2	2	2.71
N218M	99	140	151	148		2	2	2.64
NU218M	99	104	110	151		2	2	2.66
NJ218M	99	104	117	151		2	2	2.72
NF218E	99		151	148		2	2	2.55
N218E	99	142	151	148		2	2	2.49
NU218E	99	104	110	151		2	2	2.49
NJ218E	99	104	117	151		2	2	2.54
N2218M	99	105	158	151		2	2	3.62
NUP2218EM	99		117	151		2	2	3.68
NU2218ETN1	100	105	110	150		2.5	2.5	3.12
NUP2218EM	104		117	149		2	2	3.59
NU3218A	99	104	110	151		2	2	4.50
NU5218XPC3	95	105	110	151		1.5	1.5	4.50
NF318	103		177	168		2.5	2.5	5.78
NF318M	103		177	168		2.5	2.5	6.21
N318M	103	162	177	168		2.5	2.5	6.05
NU318M	103	112	118	177		2.5	2.5	6.06
NU318Q1	103	112	118	177		2.5	2.5	5.88
NJ318M	103	110	127	177		2.5	2.5	6.19
NUP318M	103	127	177	173		2.5	2.5	6.33
N318EM	103	166	177	173		2.5	2.5	5.99

# Cylindrical Roller Bearings

**ZWZ**

d 90~95 mm



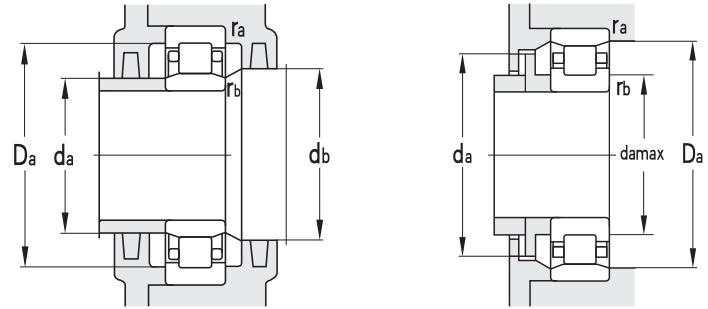
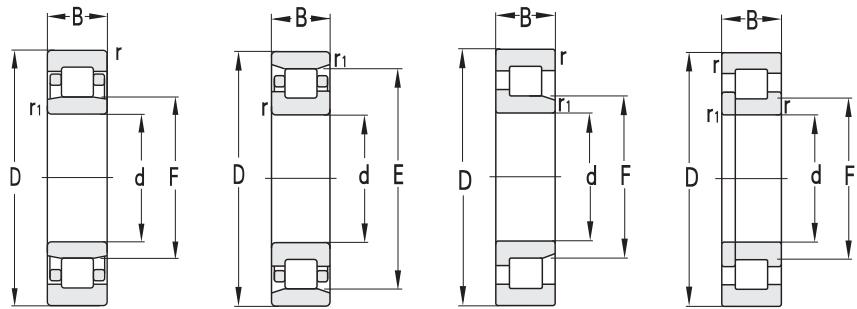
Principal dimensions	d	D	B	rsmin	r1smin	F	E	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
90	190	43	3	3	3	113.5		336	385	2800	3400
	190	43	3	3	3	113.5	169.5	320	410	2800	3400
	190	43	3	3	3	113.5		336	385	2800	3400
	190	43	3	3	3	113.5		336	385	2800	3400
	190	43	3	3	3	113.5		336	385	2800	3400
	190	43	3	3	3	113.5		363	300	2800	3400
	190	43	3	3	3	113.5		284	305	2700	3300
	190	64	3	3	3	115		396	505	2800	3400
	190	64	3	3	3	113.5		451	565	2800	3400
	190	64	3	3	3	113.5		451	565	2800	3400
	190	64	3	3	3	115		400	505	2800	3400
	225	54	4	4	4	123.5	191.5	429	480	2800	3400
	225	54	4	4	4	123.5		429	480	2800	3400
	225	54	4	4	4	123.5		429	480	2800	3400
95	145	24	1.5	1.1	108			117	166	4500	5300
	170	32	2.1	2.1	151.5	189		231	3400	4000	
	170	32	2.1	2.1	113.5	189		231	3400	4000	
	170	32	2.1	2.1	112.5	189		231	3400	4000	
	170	32	2.1	2.1	113.5	201		236	3400	4000	
	170	32	2.1	2.1	113.5	238	154.5	291	3400	4000	
	170	32	2.1	2.1	112.5	238		291	3400	4000	
	170	32	2.1	2.1	112.5	238		291	3400	4000	
	170	32	2.1	2.1	112.5	238		291	3400	4000	
	170	32	2.1	2.1	112.5	216		291	3400	4000	
	170	32	2.1	2.1	112.5	154.5	237	291	3400	4000	
	170	32	2.1	2.1	112.5	154.5	237	291	3400	4000	
	170	32	2.1	2.1	112.5	151.5	272	315	3400	4000	
	170	43	2.1	2.1	113.5	242		315	3200	3900	
	170	55.56	3.2	2.1	113.5	149.61	305	445	3400	4000	
											NU5219XPC3
							173.5	295	340	2600	3200
							173.5	295	340	2600	3200
								295	340	2600	3200
								295	340	2600	3200
								319	365	2600	3200

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NU318EM	103	110	116	177		2.5	2.5	5.9
NU318ETN1	103	110	116	177	173	2.5	2.5	5.36
N318E	103	166	177			2.5	2.5	5.93
NJ318E	103	110	127	177		2.5	2.5	6.09
NUP318E	103	110	127	177		2.5	2.5	6.05
NU318E	103	110	116	177		2.5	2.5	5.84
NH318EQ1/YB2	103	110	127	177		2.5	2.5	6.64
NJ318M/C4YA8	103	110	127	177		2.5	2.5	6.37
NJ2318M/C4	103	110	127	177		2.5	2.5	9.29
NJ2318E	103	110	127	177		2.5	2.5	8.84
NU2318E	103	110	118	177		2.5	2.5	8.69
NUP2318M	103	110	127	177		2.5	2.5	9.36
N418M	106	188	209	195		3	3	11.3
NU418M	106	120	126	209		3	3	11.5
NJ418M/C5	106	120	140	209		3	3	11.9
NJ1019M	101.5	104	116	137		1.5	1	1.53
N219M	106	149	159	157		2	2	3.07
NU219M	106	110	116	159		2	2	3.13
NJ219M	106	110	123	159		2	2	3.23
N219EJ	106	152		159	157	2	2	2.91
N219E	106	152		159	157	2	2	3.07
NU219E	106	110	115	159		2	2	3.06
NJ219E	106	110	123	159		2	2	3.12
NJ219EM	106	110	123	159		2	2	3.24
NJ219ETN1	106	110	123	159		2	2	2.86
N219EM	106	152		159	157	2	2	3.19
NF219EM	106	152		159	157	2	2	3.23
N2219M	106	152		159	157	2	2	4.27
NU2219M	107	110	115	158		2	2	4.31
NU5219XPC3	107.5	112	116	161		1.5	3	5.48
N319M	108	170		187	178	2.5	2.5	6.67
N319J	108	170		187	181	2.5	2.5	6.74
NU319M	108	118	124	187		2.5	2.5	7.00
NJ319M	108	118	133	187		2.5	2.5	7.06
NU319EM/Z1	108	118	124	187		2.5	2.5	6.68

# Cylindrical Roller Bearings

**ZWZ**

d 95~100 mm



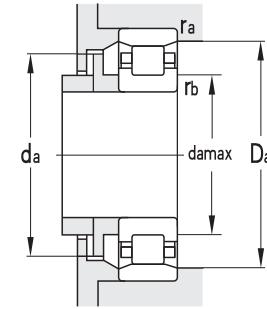
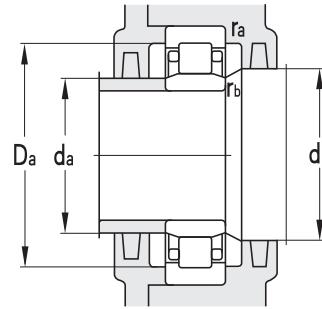
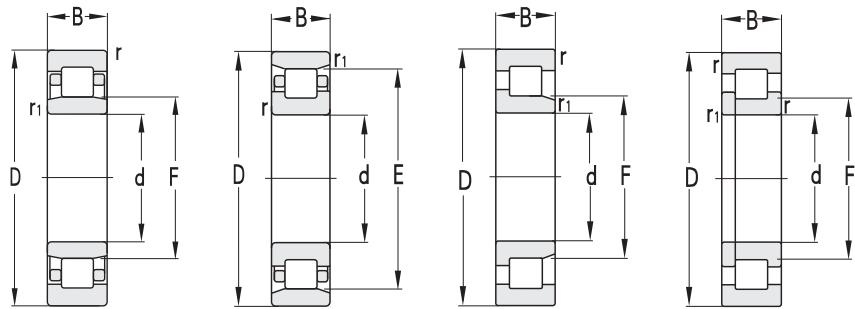
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings				
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil	
mm												
95	200	45	3	3				177.5	358	420	2600	3200
	200	45	3	3				177.5	358	420	2600	3200
	200	45	3	3				177.5	358	420	2600	3200
	200	45	3	3	121.5			358	420	2600	3200	
	200	45	3	3	121.5			358	420	2600	3200	
	200	67	3	3	121.5			413	530	2600	3200	
	200	67	3	3	121.5			435	565	2600	3200	
	200	67	3	3	121.5			435	565	2600	3200	
	200	67	3	3	121.5			479	615	2600	3200	
	200	67	3	3	121.5			479	615	2600	3200	
	200	67	3	3	121.5	177.5		479	615	2600	3200	
	200	67	3	3	121.5			435	565	2600	3200	
	240	55	4	4	133.5	201.5		457	525	2600	3200	
	240	55	4	4	133.5			457	525	2600	3200	
	240	55	4	4	133.5			457	525	2600	3200	
	240	55	4	4	133.5			457	525	2600	3200	
99.5	180	46	2.1	2.1	120			274	385	3200	3800	
100	140	20	1.1	1.1	110			75.5	108	3600	4300	
	180	34	2.1	2.1	160			208	256	3200	3800	
	180	34	2.1	2.1	160			208	256	3200	3800	
	180	34	2.1	2.1	120			208	256	3200	3800	
	180	34	2.1	2.1	120			208	256	3200	3800	
	180	34	2.1	2.1	120			208	256	3200	3800	
	180	34	2.1	2.1	120	163		266	330	3200	3800	
	180	34	2.1	2.1	120	163		242	333	3200	3800	
	180	34	2.1	2.1	119			266	330	3200	3800	
	180	34	2.1	2.1	119			242	333	3200	3800	
	180	34	2.1	2.1	119			266	330	3200	3800	
	180	34	2.1	2.1	119			242	333	3200	3800	
	180	34	2.1	2.1	119			242	333	3200	3800	
	180	34	2.1	2.1	119			231	238	3200	3800	
	180	46	2.1	2.1	120	160		274	385	3200	3800	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
N319EM	108	174		187	181	2.5	2.5	7.00
N319E	108	174		187	181	2.5	2.5	6.92
N319ETN1	108	174		187	181	2.5	2.5	6.31
NJ319E	108	118	135	187		2.5	2.5	6.86
NU319E	108	118	124	187		2.5	2.5	6.74
NU2319Q1	108	116	124	187		2.5	2.5	9.86
NU2319M	108	116	124	187		2.5	2.5	10.3
NJ2319M	108	116	135	187		2.5	2.5	10.2
NU2319E	108	116	124	187		2.5	2.5	9.84
NJ2319E	108	116	135	187		2.5	2.5	9.77
N2319E	108	116	187	181		2.5	2.5	9.76
NJ2319M/W20	108	116	135	187		2.5	2.5	10.2
N419M	111	198	224	205		3	3	13.3
NU419M	111	130	136	224		3	3	13.6
NJ419M	111	130	150	224		3	3	13.9
NUP419M	111		150	224		3	3	14.2
NJ2220X4M/P63	111	116	130	169		2	2	5.42
NU1920M	102	107	118	133		1	1	0.900
N220M	111	157		163		2	2	3.45
NF220M	111			169		2	2	3.55
NJ220M	111	116	130	169		2	2	3.61
NU220M	111	116	123	169		2	2	3.52
NU220Q1	111	116	123	169		2	2	3.57
N220E	111	160		169		2	2	3.77
N220ETN1	111	160		169		2	2	3.75
NU220E	111	116	122	169		2	2	3.75
NU220ETN1	111	116	122	169		2	2	3.39
NJ220E	111	116	130	169		2	2	3.81
NJ220ETN1	111	116	130	169		2	2	3.45
NUP220E	111		130	169		2	2	3.90
NUP220ETN1	111		130	169		2	2	3.54
NUP220M	112		130	168		2	2	3.71
N2220M	111	116	169	166		2	2	5.25
NUP2220M	111	116	30	169		2	2	5.49

# Cylindrical Roller Bearings

**ZWZ**

d 100~105 mm



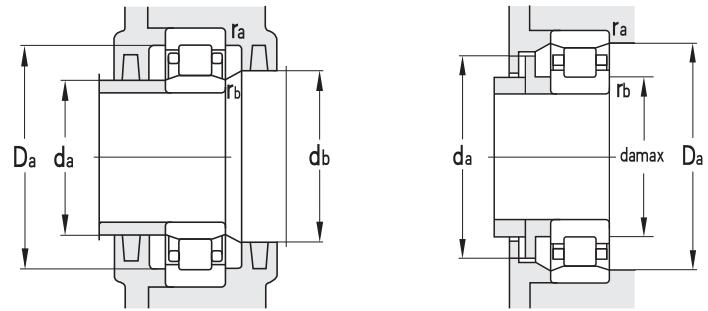
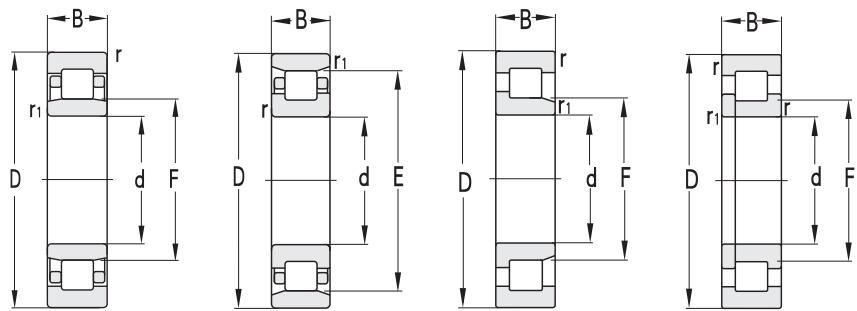
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings		Weight
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	
mm										
100	180	46	2.1	2.1	120	274	385	3200	3800	
	180	46	2.1	2.1	120	274	385	3200	3800	
	180	46	2.1	2.1	120	274	385	3200	3800	
	180	46	2.1	2.1	119	347	470	3200	3800	
	180	46	2.1	2.1	119	347	470	3200	3800	
	180	60.3	2.1	2.1	120	208	256	3200	3800	
	180	60.3	3*45*	2.1	120	208	256	3200	3800	
	180	60.32	4	2.1	121.005	358	515	3200	3800	
	215	41	3	3	125.1	391	440	2400	3000	
	215	47	3	3	129.5	336	395	2400	3000	
	215	47	3	3	129.5	336	400	2400	3000	
	215	47	3	3	129.5	336	400	2400	3000	
	215	47	3.6	4	130.19	352	420	2400	3000	
	215	47	3	3	128.925	385	410	2400	3000	
	215	47	3	3	127.5	391	440	2400	3000	
	215	47	3	3	127.5	407	465	2400	3000	
	215	47	3	3	191.5	407	465	2400	3000	
	215	47	3	3	191.5	407	465	2400	3000	
	215	47	3	3	127.5	407	465	2400	3000	
	215	47	3	3	127.5	407	465	2400	3000	
	215	47	3	3	127.5	407	465	2400	3000	
	215	73	3	3	185.5	479	625	2400	3000	
	215	73	3	3	129.5	479	625	2400	3000	
	215	73	3	3	129.5	479	625	2400	3000	
	215	73	3	3	191.5	594	760	2400	3000	
	215	73	3	3	127.5	594	760	2400	3000	
	215	73	3	3	127.5	594	760	2400	3000	
	215	73	3	3	127.5	594	760	2400	3000	
	215	82.6	3	3	127.5	594	760	2400	3000	
	250	58	4	4	185.5	560	760	2400	3000	
	250	58	4	4	211	506	590	2400	3000	
	250	58	4	4	139	506	590	2400	3000	
	105	160	26	2	1.1	145.5	119	168	4000	4800
	160	26	2	1.1	145.5	119	168	4000	4800	
	190	36	2.1	2.1	168.8	227	283	3000	3600	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								Kg
NJP2220M/P63	111	116	130	169	2	2	5.38	
NJ2220M	111	116	130	169	2	2	5.86	
NU2220M	111	116	122	169	2	2	5.20	
NU2220E	111	116	122	169	2	2	5.08	
NU2220ETN1	111	116	122	169	2	2	4.69	
NU3220M/C3	121	140	147	244	3	3	6.81	
NU3220M/P59YAD	121	140	147	244	3	3	7.06	
NU5220XPC3	115	119	123	170	2	2	7.69	
NJ320EM	113	124	142	202	2.5	2.5	9.82	
NU320Q1	113	124	132	202	2.5	2.5	8.78	
NH320M	113	124	142	202	2.5	2.5	9.64	
NUP320M	113	142	202	2.5	2.5	9.05		
A-0320-22	113	124	142	202	2.5	2.5	9.15	
NH320EQ1/HAYB2	113	124	142	202	2.5	2.5	9.69	
NJ320EQ1/HA	113	124	142	202	2.5	2.5	9.59	
N320E	113	188	202	195	2.5	2.5	8.24	
N320EM	113	188	202	195	2.5	2.5	9.67	
NU320E	113	124	130	202	2.5	2.5	8.35	
NU320EM	113	124	130	202	2.5	2.5	9.67	
NU320EQ1	113	124	130	202	2.5	2.5	9.59	
NJ320E	113	124	142	202	2.5	2.5	8.50	
N320M	113	182	202	190	2.5	2.5	13.1	
NU320M	113	125	133	202	2.5	2.5	13.2	
NJ320M	113	125124	142	202	2.5	2.5	13.5	
N320E	113	188	202	195	2.5	2.5	12.9	
NU320E	113	124	130	202	2.5	2.5	12.7	
NJ320E	113	124	142	202	2.5	2.5	12.9	
NJ320EQ1	113	142	202	195	2.5	2.5	15.6	
NF320Q1	113	202	195	2.5	2.5	2.5	15.4	
N420M	116	208	234	215	3	3	15.5	
NU420M	116	135	142	234	3	3	15.5	
NJ420M	116	135	156	234	3	3	15.9	
NF1021M	111.5	141	151	149	1	1	1.93	
N1021M	111.5	166	151	149	2	1	1.85	
N221M	116	121	179	172	2	2	4.33	

# Cylindrical Roller Bearings

**ZWZ**

d 105~110 mm



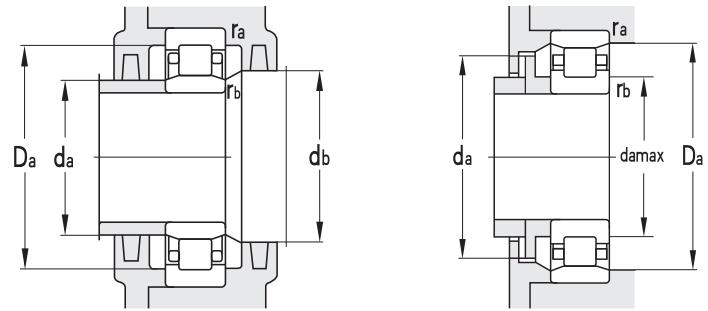
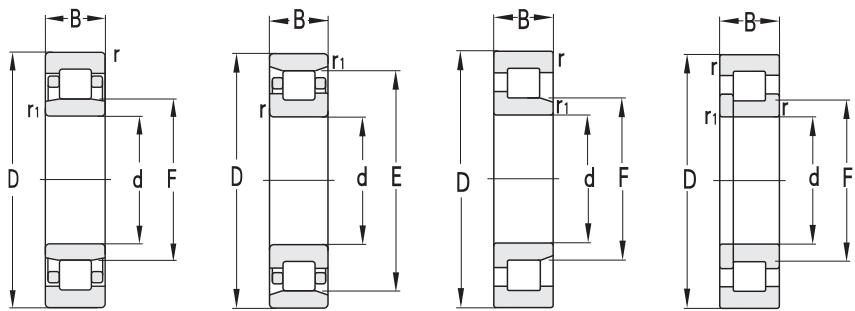
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings			
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm											
105	190	36	2.1	2.1	126.8			227	283	3000	3600
	190	36	2.1	2.1	125			264	315	3000	3600
	190	36	2.1	2.1	125			260	315	3000	3600
	190	65.1	2.1	2.1	126.8	196	660	500	910	2200	3600
	225	87.3	3	3		201	457	525	910	2200	2800
	225	49	3	3			457	525	2200	2800	
	225	49	3	3	133		457	525	2200	2800	
	225	49	3	3	133		457	525	2200	2800	
	260	60	4	4		220.5	561	655	2200	2800	
	260	60	4	4	144.5		560	655	2200	2800	
	260	60	4	4	144.5		561	655	2200	2800	
107.95	165.1	57.15	2.5	2.5	127		285	590	3000	3600	
110	170	28	2	1.1		155	143	194	3800	4500	
	170	28	2	1.1	125		143	194	3800	4500	
	170	28	2	1.1	125		143	194	3800	4500	
	170	28	2	2	125		143	194	3800	4500	
	170	28	2	2	125		143	194	3800	4500	
	200	38	2.1	2.1		178.5	257	315	2800	3400	
	200	38	2.1	2.1	132.5		257	315	2800	3400	
	200	38	2.1	2.1	132.5		257	315	2800	3400	
	200	38	2.1	2.1	132.5	178.5	270	335	2800	3400	
	200	38	2.1	2.1	132.5		270	335	2800	3400	
	200	38	2.1	2.1	132.5		270	335	2800	3400	
	200	38	2.1	2.1	132.5		270	335	2800	3400	
	200	38	2.1	2.1	132.5	180.5	297	372	2800	3400	
	200	38	2.1	2.1	132.5		297	372	2800	3400	
	200	38	2.1	2.1	132.5	180.5	311	395	2800	3400	
	200	38	2.1	2.1	132.5		311	395	2800	3400	
	200	38	2.1	2.1	132.5		311	395	2800	3400	
	200	53	2.1	2.1	132		352	470	2800	3400	
	200	53	2.1	2.1	132		352	470	2800	3400	
	200	53	2.1	2.1	132		352	470	2800	3400	
	200	69.8	2.1	2.1	132.5		451	655	2800	3400	
	240	50	3	3		207	407	480	2000	2600	
	240	50	3	3		207	429	515	2000	2600	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NJ221M	116	198	137	179	2	2	4.34	
NJ221EM	116	198	137	179	2	2	4.43	
NU221EM	116	198	137	179	2	2	4.33	
NU3221M/C3	116	122	128	179	2	2	8.22	
N3321	116	193	208	199	2.5	2.5	18.3	
N321EM	118	130	212	203	2.5	2.5	10.5	
NJ321EM	118	130	212	212	2.5	2.5	10.7	
NU321EM	118	217	136	212	2.5	2.5	10.6	
N421M	121	151	244	224	3	3	17.2	
NU421M	121	217	136	244	3	3	17.3	
NJ421M/C5	121	217	136	244	3	3	17.6	
NA6/107X4/C9	114	121	125	155	2	1	5.11	
N1022M	116.5	123	161	157	2	1	2.31	
NU1022M	116.5	175	128	161	2	1	2.32	
NJ1022M	116.5	175	128	161	2	1	2.39	
NUP1022M	116	135	161	2.45				
NUP1022TN1/C9YB2	116	135	161	2.17				
N222J	121	175	189	181	2	2	4.70	
NU222M/YA8	121	129	135	189	2	2	5.30	
NU222Q1	121	177	135	189	2	2	5.36	
N222M	121	129	189	181	2	2	5.02	
NJ222M	121	129	145	189	2	2	5.10	
NU222M	121	129	135	189	2	2	5.05	
N222EM	121	129	189	183	2	2	5.27	
NJ222EM	121	204	145	189	2	2	5.38	
N222E	121	177	189	183	2	2	5.11	
NU222E	121	129	135	189	2	2	5.12	
NJ222E	121	204	145	189	2	2	5.02	
NUP2222M	121	145	189	2.95				
NU2222M	121	129	135	189	2	2	7.63	
NJ2222M	121	138	145	189	2	2	7.83	
NU3222M/C3	121	129	135	189	2	2	9.92	
N322	123	208	227	210	2.5	2.5	10.2	
N322M	123	139	227	210	2.5	2.5	11.4	

# Cylindrical Roller Bearings

**ZWZ**

d 110~120 mm



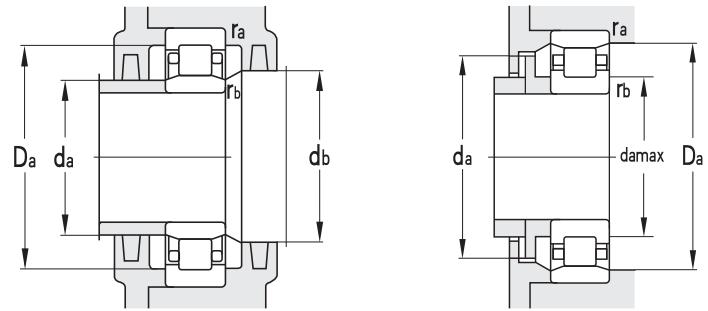
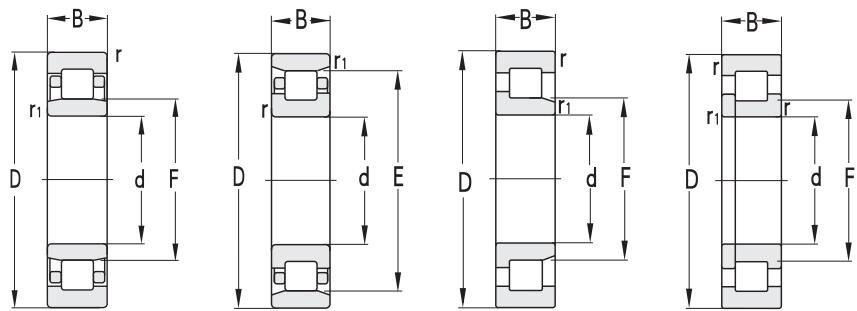
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings			
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm											
110	240	50	3	3	3	143		429	515	2000	2600
	240	50	3	3	3	143		429	515	2000	2600
	240	50	3	3	3	143		429	515	2000	2600
	240	50	3	3	3	143		211	462	2000	2600
	240	50	3	3	3	143		462	530	2000	2600
	240	50	3	3	3	143		462	530	2000	2600
	240	50	3	3	3	143		484	575	2000	2600
	240	50	3	3	3	143		484	575	2000	2600
	240	50	3	3	3	143		484	575	2000	2600
	240	50	3	3	3	143		648	795	2000	2600
	240	80	3	3	3	143		666	800	2000	2600
	240	80	3	3	3	143		666	800	2000	2600
	240	80	3	3	3	143		666	800	2000	2600
	240	80	3	3	3	143		704	930	2000	2600
	240	80	3	3	3	143		211	704	930	2000
	280	65	4	4	4	155	235	616	725	2000	2600
	280	65	4	4	4	155		616	725	2000	2600
	280	65	4	4	4	155		616	725	2000	2600
120	180	28	2	1.1	1.1	135		146	205	3400	4000
	180	28	2	1.1	1.1	135		162	205	3400	4000
	180	28	2	1.1	1.1	135		146	205	3400	4000
	215	40	2.1	2.1	143.5	191.5		292	210	2400	3000
	215	40	2.1	2.1	2.1	143.5		304	390	2400	3000
	215	40	2.1	2.1	2.1	143.5		304	390	2400	3000
	215	40	2.1	2.1	2.1	143.5		304	390	2400	3000
	215	40	2.1	2.1	2.1	143.5		358	460	2400	3000
	215	40	2.1	2.1	2.1	143.5		358	460	2400	3000
	215	40	2.1	2.1	2.1	143.5		358	460	2400	3000
	215	40	2.1	2.1	2.1	143.5		358	460	2400	3000
	215	40	2.1	2.1	2.1	143.5		358	460	2400	3000
	215	40	2.1	2.1	2.1	143.5		374	485	2400	3000
	215	40	2.1	2.1	2.1	143.5		355	460	2400	3000
	215	58	2.1	2.1	2.1	143.5	191.5	396	550	2400	3000
	215	58	2.1	2.1	2.1	143.5		396	550	2400	3000

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NJ322M	123	139	159	227		2.5	2.5	11.8
NU322M	123	139	146	227		2.5	2.5	11.6
NU322Q1	123		146	227		2.5	2.5	11.6
NUP322M	123	230	159	227		2.5	2.5	10.3
N322EM	123	204		227	215	2.5	2.5	11.4
NU322EM	123	139	146	227		2.5	2.5	11.5
N322E	123	204		227	215	2.5	2.5	11.2
NJ322E	123	139	159	227		2.5	2.5	11.4
NU322E	123	139	146	227		2.5	2.5	11.3
NU322EQ1/C9	123	139	146	227		2.5	2.5	11.8
NU2322EQ1	123	138	146	227		2.5	2.5	17.6
NJ322EM	123	138	159	227		2.5	2.5	18.7
NU322EM	123	138	146	227		2.5	2.5	18.3
NU2322M/C9	123	133	146	227		2.5	2.5	18.3
NU2322E	123	138	146	227		2.5	2.5	17.6
N2322E	123	138		227	215	2.5	2.5	17.5
N422M	126	150		264	240	3	3	21.8
NU422M	126	150	158	264		3	3	22.0
NJ422M	126	129	174	264		3	3	22.3
NU1024M	126.5	133	138	171		2	1	2.96
NU1024MA	126.5	133	138	171		2	1	2.96
NJ1024M	126.5	188	144	171		2	1	3.09
NU224M/P59	131	140	146	204		2	2	6.27
N224M	131	140		204	195			6.11
NJ224M	131	140	156	204		2	2	6.39
NU224M	131	192	146	204		2	2	6.27
N224E	131	140		204	199	2	2	6.32
NU224E	131	140	146	204		2	2	6.73
NJ224E	131		156	204		2	2	6.67
NUP224E	131		156	204		2	2	6.80
NU224EQ1	131		146	204		2	2	6.88
NU224EM	131	140	146	204		2	2	6.8
N2224M	131	188		204	195	2	2	8.92
NU2224M	131	139	146	204		2	2	9.31
NJ2224M	131	139	156	204		2	2	9.46

# Cylindrical Roller Bearings

**ZWZ**

d 120~129 mm



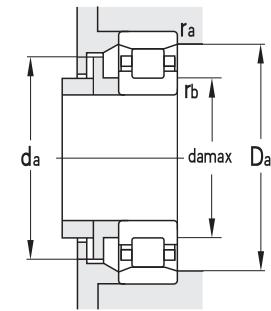
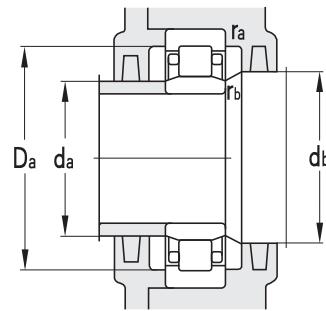
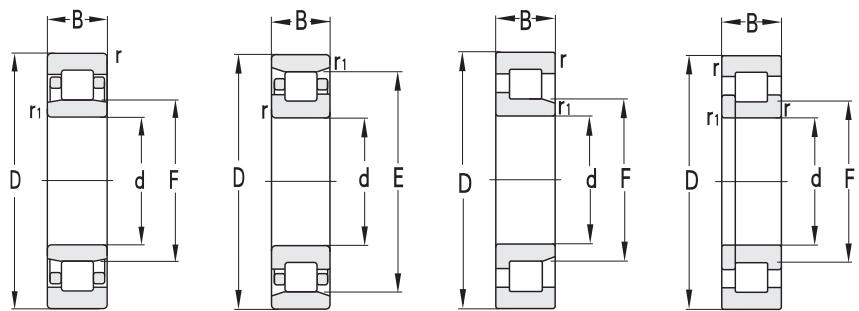
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings			
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm										KN	r/min
120	215	58	2.1	2.1	195.5	195.5	195.5	451	620	2400	3000
	215	58	2.1	2.1				473	660	2400	3000
	215	58	2.1	2.1	143.5			473	660	2400	3000
	215	58	2.1	2.1	143.5			473	660	2400	3000
	215	58	2.1	2.1	143.5			473	660	2400	3000
	215	76	2.1	2.1	145.14			517	780	2400	3000
	215	76.2	5.1	2	145.14			550	845	2200	2800
	240	80	3.7	3.7	150			583	790	2400	3200
	260	55	3	3		226		506	600	2400	3000
	260	55	3	3		226		539	645	1900	2400
	260	55	3	3		226		539	645	1900	2400
	260	55	3	3	154			539	645	1900	2400
	260	55	3	3	154			539	645	1900	2400
	260	55	3	3	154			539	645	1900	2400
	260	55	3	3	154			539	645	1900	2400
	260	55	3	3	154	230		594	710	1900	2400
	260	55	3	3	154			594	710	1900	2400
	260	55	3	3	154			594	710	1900	2400
	260	86	3	3		226		737	970	1900	2400
	260	86	3	3		226		737	970	1900	2400
	260	86	3	3	154			737	970	1900	2400
	260	86	3	3	154			737	970	1900	2400
	260	86	3	3	154			737	970	1900	2400
	260	86	3	3	154			860	1040	1900	2400
	260	86	3	3	154			860	1040	1900	2400
	260	104.775	3	3	154			860	1040	1900	2400
	260	106	3	3		230		910	1240	1900	2400
	310	72	5	5		260		990	1380	1900	2400
	310	72	5	5		260		770	915	1900	2400
	310	72	5	5	170			770	915	1900	2400
	310	72	5	5	170			770	915	1900	2400
	310	72	5	5	170			770	915	1900	2400
127	228.6	34.925	2		1.1	199.8		297	410	1900	2400
129	250	80	3		3.7	158		664	807	1800	2200
	250	80	3		3.7	158		664	807	1800	2200

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm							Kg	
NF2224EM	130			206	199	2	2	9.72
N2224E	131	192		204	199	2	2	9.15
NU2224E	131	140	146	204		2	2	9.00
NU2224ETN1	131	140	146	204		2	2	8.33
NJ2224E	131	140	156	204		2	2	9.15
NU3224M/C4	131	140	146	204		2	2	12.4
NU5224XPC3	135.6	142	148	204		1.5	2	12.6
NJ624M	140	147	165	222		2.5	2.5	17.7
NF324M	133	222		247	230	2.5	2.5	14.3
N324M	133			247	230	2.5	2.5	15.1
N324J	133	222		247	230	2.5	2.5	13.9
NU324M	133	150	157	247		2.5	2.5	15.4
NU324Q1	133	150	157	247		2.5	2.5	15.2
NJ324M	133	150	171	247		2.5	2.5	15.7
NUP324M	133		171	247		2.5	2.5	16.0
N324E	133	226		247	234	2.5	2.5	14.3
NU324E	133	150	157	247		2.5	2.5	15.8
NJ324E	133	150	171	247		2.5	2.5	16.0
N2324M	133	223		247	229	2.5	2.5	22.9
NU2324M	133	149	157	247		2.5	2.5	23.1
NJ2324M	133	149	170	247		2.5	2.5	23.6
NJ2324M/C4YA8	133	149	170	247		2.5	2.5	24.6
FL-NJ2324EQ1A	133	149	170	247		2.5	2.5	31.0
FL-NJ2324EQ1A/C3	133	149	170	247		2.5	2.5	31.0
N3324X2M	133	226		247	234	2.5	2.5	28.0
NF3324Q1	133	149	170	247		2.5	2.5	29.9
N424M	140	254		290	266	4	4	29.0
NU424M	140	165	173	290		4	4	29.1
NU424Q1	140	165	173	290		4	4	28.8
NJ424M	140	165	191	290		4	4	29.7
N6/127M/YAB	134	196		223	204	1	1	5.60
NJP3226X1K2	150	170	200	230		3	3	18.6
NJ3226X1K2	150	170	200	230		3	3	18.4

## Cylindrical Roller Bearings

Z W Z

d 129.5~130 mm



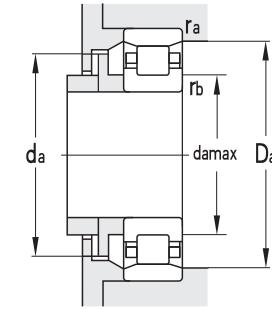
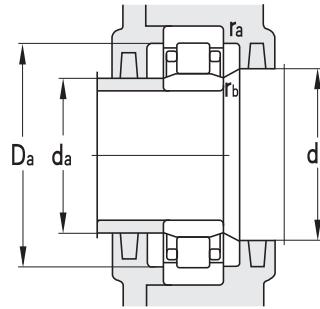
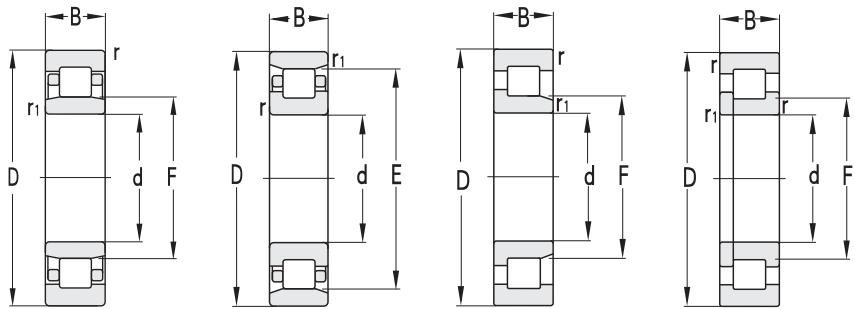
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	rsmin	r1smin	F	E	Cr	Cor	Grease	Oil
mm							KN	r/min		
129.5	250	80	3	3.7	158	664	807	1800	2200	2200
	250	80	3	3.7	158	664	807	1800	2200	2200
130	180	50	1.5	1.5	150	220	555	1900	2400	
	200	33	2	1.1	182	191	274	3200	3800	
	200	33	2	1.1	148	191	274	3200	3800	
	200	42	2	1.1	147	280	415	3000	3700	
	220	62	2	2.1	150	528	675	2200	2800	
	220	62	2.1	2.1	150	528	675	2200	2800	
	230	40	3	3	204	301	395	2200	2800	
	230	40	3	3	204	315	415	2200	2800	
	230	40	3	3	156	315	415	2200	2800	
	230	40	3	3	156	315	415	2200	2800	
	230	40	3	3	153.5	369	465	2200	2800	
	230	40	3	3	153.5	369	465	2200	2800	
	230	40	3	3	209.5	385	495	2200	2800	
	230	40	3	3	209.5	340	420	2200	2800	
	230	40	3	3	153.5	385	495	2200	2800	
	230	40	3	3	153.5	385	495	2200	2800	
	230	40	3	3	153.5	385	495	2200	2800	
	230	40	3	3	153.5	385	495	2200	2800	
	230	64	3	3	204	429	625	2200	2800	
	230	64	3	3	204	429	625	2200	2800	
	230	64	3	3	156	429	625	2200	2800	
	230	64	3	3	156	429	625	2200	2800	
	230	64	3	3	156	429	625	2200	2800	
	230	64	3	3	156	429	625	2200	2800	
	230	64	3	3	153.5	528	735	2200	2800	
	230	64	3	3	153.5	595	795	2200	2800	
	230	64	3	3	153.5	528	735	2200	2800	
	230	64	3	3	153.5	550	780	2200	2800	
	230	93	4	4	243	869	1180	1800	2200	
	240	80	3	3	158	655	975	1800	2200	
	240	85	3	3	158	655	975	1800	2200	
	240	87	3	3	156	580	800	1800	2200	
	240	87	3	3	156	580	800	1800	2200	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
	mm							Kg
NJP3226X1K1	150	170	200	230		3	3	18.5
NJ3226X1K1	150	170	200	230		3	3	18.4
NA4926/C9	150	170	145	160		1.5	1.5	4.36
N1026M	136.5	178	191		184	2	1	4.52
NU1026M	136.5	145	151	191		2	1	4.61
NU2026EMA	143	149	167	217		1	1	4.95
NJP2226X3TN1/HG2	143	149	167	217		2.5	2.5	8.68
NJ2226X3TN1/HG2	143	149	167	217		2.5	2.5	8.69
N226J	143	200		217	207	2.5	2.5	6.52
N226M	143	200		217	207	2.5	2.5	7.08
NU226M	143	153	159	217		2.5	2.5	7.22
NJ226M	143	153	167	217		2.5	2.5	7.32
NU226EQ1	143	150	156	217		2.5	2.5	7.38
NJ226EQ1	143	150	167	217		2.5	2.5	7.50
N226E	143	206		217	213	2.5	2.5	7.09
NF226EM	143	206		217	213	2.5	2.5	7.57
NJ226E	143	150	167	217		2.5	2.5	7.38
NJ226EM	143	150	167	217		2.5	2.5	7.66
NU226E	143	150	156	217		2.5	2.5	7.26
NUP226E	143		167	217		2.5	2.5	7.49
NF2226M	143			217	209	2.5	2.5	11.7
N2226M	143	200		217	209	2.5	2.5	11.6
NU2226M	143	153	159	217		2.5	2.5	11.8
NJ2226M	143	153	167	217		2.5	2.5	11.9
NJ2226Q1	143	153	167	217		2.5	2.5	11.9
NUP2226M	143		167	217		2.5	2.5	12.2
NU2226E	143	149	156	217		2.5	2.5	11.5
FL- NU2226EMA/C3	143	149	156	217		2.5	2.5	11.2
NU2226EQ1	143	149	156	217		2.5	2.5	11.1
NJ2226EQ1	143	149	167	217		2.5	2.5	11.5
N2326M	146	240		264		3	3	29.0
NJ3226X1M-1	146	153	167	227		2.5	2.5	17.0
NJP3226X1WBM-1	146	153	167	227		2.5	2.5	17.3
NJ3226X1SCTN	146	153	167	227		2.5	2.5	14.95
NJP3226X1SCTN	146	153	167	227		2.5	2.5	14.79

# Cylindrical Roller Bearings

**ZWZ**

d 130~140 mm



Principal dimensions						Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	Cr	Cor	Grease	Oil
mm						KN		r/min	

130	250	80	3	3	158	664	807	1800	2200
	250	80	3	3	158	664	807	1800	2200
	260	58	3	3	167	732	780	1800	2200
	280	58	4	4	167	594	725	1800	2200
	280	58	4	4	167	594	725	1800	2200
	280	58	4	4	167	594	725	1800	2200
	280	58	4	4	167	594	725	1800	2200
	280	58	4	4	167	655	795	1800	2200

280	58	4	4	167	655	795	1800	2200
280	58	4	4	167	595	795	1800	2200
280	58	4	4	167	655	795	1800	2200
280	93	4	4	167	869	1180	1800	2200
280	93	4	4	167	869	1180	1800	2200
280	93	4	4	167	869	1180	1800	2200
280	93	4	4	167	869	1180	1800	2200
280	93	4	4	167	869	1180	1800	2200
280	93	4	4	167	780	1060	1800	2200
280.01	58.001	4.318	6.477	166.848	660	795	1800	2200
340	78	5	5	185	941	1110	1800	2200

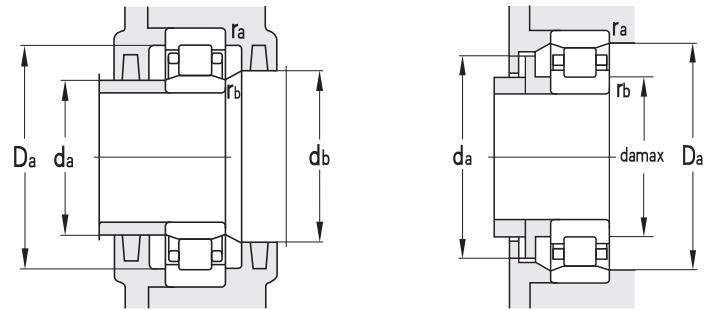
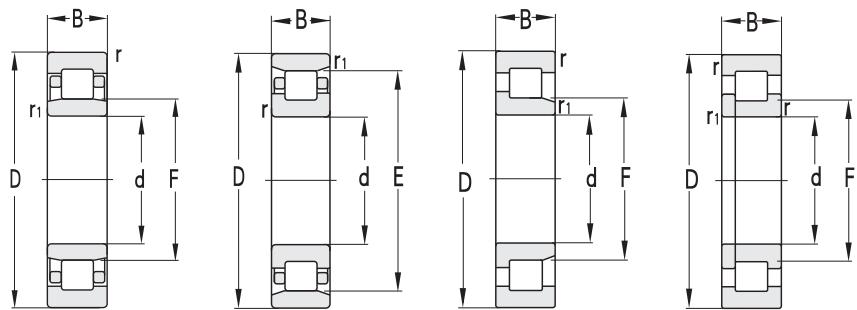
140	210	33	2	1.1	158	183	263	3000	3600
	210	53	2	1.1	158	358	630	2600	3400
	220	36	2.3	2.3	160	245	345	660	1300
	250	42	3	3	169	221	319	410	2400
	250	42	3	3	169	221	341	450	2000
	250	42	3	3	169	221	363	490	2400
	250	42	3	3	169	225	363	490	2000
	250	42	3	3	169	402	530	2400	3000
	250	42	3	3	169	402	530	2000	2600
	250	42	3	3	169	402	530	2000	2600
	250	42	3	3	169	400	530	2000	2600
	250	42	3	3	169	402	530	2000	2600
	250	68	3	3	169	506	755	2000	2600

Designations	Abutment and fillet dimensions						Weight	
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm						Kg		
NJP3226X1TN1	146	153	167	227		2.5	2.5	16.8
NJ3226X1TN1	146	153	167	227		2.5	2.5	16.8
NU326Q1/HAC9YA5	146	163	170	264		3	3	19
N326M	146	239		264		3	3	17.8
NU326M	146	163	170	264		3	3	17.9
NU326Q1	146	163	170	264		3	3	17.9
NJ326M	146	163	185	264		3	3	18.2
N326E	146	243		264		3	3	18.5
NU326E	146	163	170	264		3	3	18.7
FL- NU326EMA	146	163	170	264		3	3	18.7
NJ326E	146	163	185	264		3	3	19.0
NU2326M	146	161	170	264		3	3	28.7
NJ2326M	146	161	185	264		3	3	29.0
NJ2326J	146	161	185	264		3	3	30.0
NUP2326M	146	161	185	264		3	3	29.5
32626QTY	146	161	170	264		3	3	29.3
A- 0326- WAB- 30- 1	146	161	170	264		3	3	18.7
NU426M	150	180	190	320		4	4	39.5
NU1028M	146.5	155	161	201		1	1	3.89
NU3028M	147	154	162	200		2	2	7.64
NU1128X3M	151	157	163	209		2	2	5.03
N228Q1	153	218		237		2.5	2.5	8.66
NCF228J	153			237		2.5	2.5	7.77
N228M	153	218		237		2.5	2.5	9.14
NU228M	153	166	172	237		2.5	2.5	9.16
NJ228M	153	166	183	237		2.5	2.5	9.38
NUP228M	153	183	237			2.5	2.5	9.51
N228E	153	221		237		2.5	2.5	9.01
NJ228E	150	167	181	237		2.5	2.5	9.20
NU228E	150	167	171	237		2.5	2.5	9.05
NU228EM	150	167	171	237		2.5	2.5	9.23
NU228EQ1	153	166	172	237		2.5	2.5	9.37
NU2228M	153	164	172	237		2.5	2.5	14.4
NJ2228M	153	164	183	237		2.5	2.5	14.8

# Cylindrical Roller Bearings

**ZWZ**

d 140~150 mm



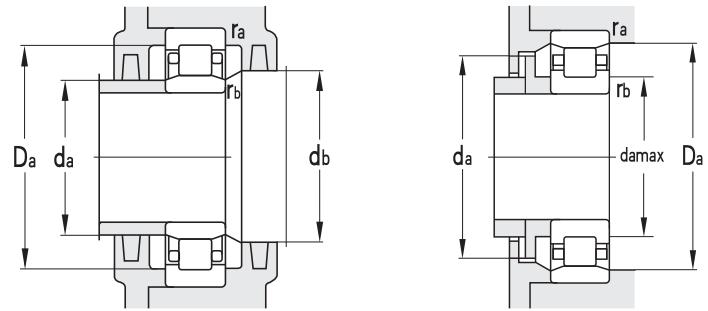
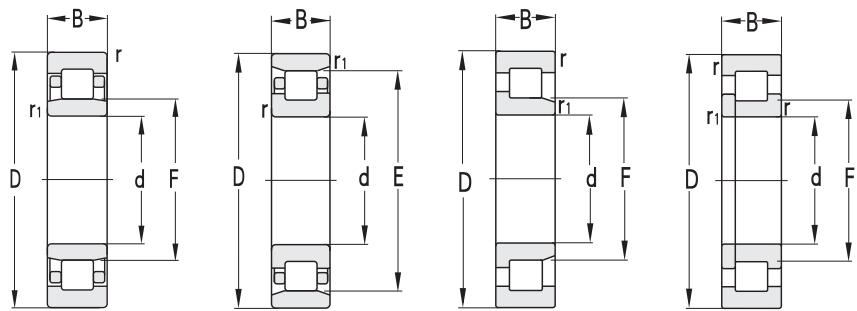
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings			
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm											
140	250	68	3	3	169			517	770	2000	2600
	250	68	3	3	169			572	840	2000	2600
	250	68	3	3	169			572	840	2000	2600
	250	68	3	3	169	225		570	840	2000	2600
	250	80	3	3	169			682	1040	2000	2600
	250	82.5	5.1	3	168.46			693	1060	2000	2600
	250	100	3	3	169			506	755	2000	2600
	300	62	4	4	169	260		655	805	1900	2400
	300	62	3.7	3.7	169	260		655	805	1900	2400
	300	62	4	4	180			655	805	1800	2200
	300	62	4	4	180			655	805	1800	2200
	300	62	4	4	180			655	805	1800	2200
	300	62	4	4	180			655	805	1800	2200
	300	62	4	4	180			715	880	1800	2200
	300	102	4	4	180	260		957	1310	1800	2200
	300	102	4	4	180			960	1310	1800	2200
	300	102	4	4	180			960	1310	1800	2200
	300	102	4	4	180			960	1310	1800	2200
	360	82	5	5	196			1010	1200	1800	2200
	360	82	6	6	196			950	1120	1800	2200
149.959	320	65	3	3	189.796			864	930	1700	2000
	320	65	3	3	190.144			880	950	1700	2000
150	210	28	4	3	165	238		171	270	2700	3300
	210	28	3	4	165			171	270	2700	3300
	210	28	2	4	165			170	270	2700	3300
	225	35	2.1	1.5	169.5			212	310	2600	3200
	225	35	2.1	2.1	169.5			212	310	2600	3200
	225	35	2	1.5	169.5			238	320	2600	3200
	225	56	2.1	2.1	169.5			363	620	2400	3000
	270	45	3	3	182	238		418	565	2000	2600
	270	45	3	3	182			418	565	1900	2400
	270	45	3	3	182			418	565	1900	2400

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NJ2228M/C4YA8	153	164	183	237		2.5	2.5	15.0
NJ2228E	153	164	183	237		2.5	2.5	14.5
NU2228E	153	164	172	237		2.5	2.5	14.2
N2228E	154	218	224	236		2.5	2.5	14.2
NJ3228X2M	153	164	183	237		2.5	2.5	17.8
NU5228XPC3	155	166	172	237		2.5	4	18.3
NU2228MWB	153	164	172	237		2.5	2.5	16.2
N328M	156	256	284	264	3	3	21.9	
NF328M	156	284	284	264	3	3	21.8	
NJ328M	156	176	199	284		3	3	22.6
NU328M	156	176	183	284		3	3	22.2
NU328Q1/S0	156	176	183	284		3	3	21.7
NUP328M	156	199	284			3	3	22.3
NJ328Q1	156	176	199	284		3	3	22.1
NU328EM	156	176	183	284		3	3	21.8
N2328M	156	256	284	264	3	3	34.6	
NU2328M	156	176	183	284		3	3	33.6
NJ2328M	156	176	199	284		3	3	34.8
NJ2328M/W20	156	176	199	284		3	3	34.8
NJ428M	160	192	219	340	4	4	46.3	
NJ428MA/YAD	160	192	219	340	4	4	48.6	
NU3/149X4EM	166	189	196	304	3	3	26.4	
NU3/149X4Q1/HAYB2	166	189	196	304	3	3	26.7	
NJ1930NB1M/YA16	166	189	165	180	3	3	2.86	
NJ1930B1M/YA6	166	189	165	180	3	3	2.94	
NJ1930B1M/YA6-1	166	189	165	180	3	3	2.94	
NJ1030M	159	166	178	214	2	2	5.05	
NU1030M	159	166	172	214	2	2	4.94	
NU1030Q1/HAYA6	159	166	172	214	2	2	5.13	
NU3030M/P6	159	166	172	214	2	2	7.99	
N230M	163	234	257	242	2.5	2.5	11.6	
NU230M	163	178	185	257	2.5	2.5	11.8	
NJ230M	163	178	197	257	2.5	2.5	12.0	
NUP230M	163	197	257	2.5	2.5	2.5	12.3	

# Cylindrical Roller Bearings

**ZWZ**

d 150~160 mm



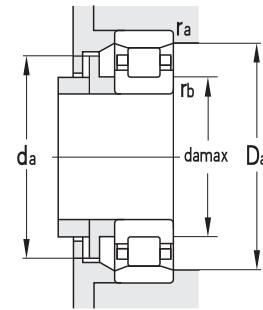
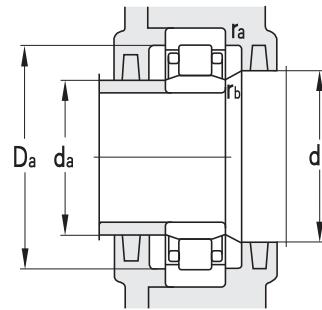
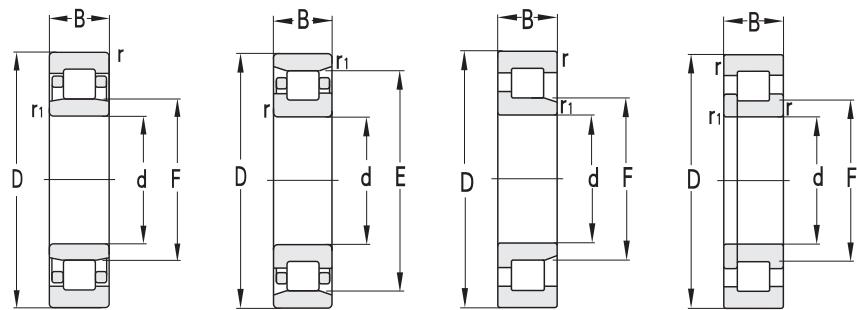
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings				
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil	
mm												
150	270	45	3	3	3			242	457	610	1900	2400
	270	45	3	3	3	182			457	610	1900	2400
	270	45	3	3	3	182			457	610	1900	2400
	270	45	3	3	3	182			457	610	1900	2400
	270	45	3	3	3	182			405	550	2000	2600
	270	73	3	3	3	182			660	980	1900	2400
	270	88.9	6.4	2.6	181.53		277		1020	1610	1800	2200
	320	65	4	4	4				715	890	1700	2000
	320	65	4	4	4	193			715	890	1700	2000
	320	65	4	4	4	193			715	890	1700	2000
	320	65	4	4	4	193			715	890	1700	2000
	320	65	4	4	4	193			814	1010	1700	2000
	320	65	4	4	4	193			814	1010	1700	2000
	320	65	4	4	4	193			814	1010	1700	2000
	320	65	4	4	4	193			996	920	1700	2000
	320	108	4	4	4	193			814	1010	1700	2000
	320	108	4	4	4	193			1030	1420	1700	2000
	320	108	4	4	4	193			1070	1480	1700	2000
	320	108	4	4	4	193			1070	1480	1700	2000
	320	108	4	4	4	193			1070	1480	1700	2000
	320	108	4	4	4	193			1030	1420	1700	2000
	320	128	4	4	4	193			1320	1880	1400	1800
158.75	231.775	161.925	2.1	2.1	176.5			1020	2390	2400	3000	
160	220	36	2	2	173			255	435	2500	3200	
	230	22	1.5	1.5	209			160	240	2900	3500	
	240	25	1.5	1.5	209			193	300	2800	3400	
	240	38	2.1	2.1	220			260	365	2400	3000	
	240	38	2.1	1.5	180			259	380	2400	3000	
	240	38	2.1	2.1	180			259	380	2400	3000	
	240	38	2.1	2.1	180			259	380	2400	3000	
	290	48	3	3	257			495	655	1800	2200	
	290	48	3	3	193			495	655	1800	2200	
	290	48	3	3	193			495	655	1800	2200	
	290	48	3	3	193			495	655	1800	2200	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
N230E	163	238		257	246	2.5	2.5	11.5
NU230E	163	178	185	247		2.5	2.5	11.2
NU230EQ1	163	178	185	257		2.5	2.5	11.8
NJ230E	163	178	197	257		2.5	2.5	11.6
IS_NU230M	163	178	185	247		2.5	2.5	11.8
NJ2230E	163	177	197	257		2.5	2.5	18.1
NU5230XPC3	167	180	185	260.5		2	2	23.6
N330M	166	272		304	282	3	3	26.5
NU330M	166	189	196	304		3	3	26.6
NJ330M	166	189	213	304		3	3	26.9
NUP330M	166		213	304		3	3	27.4
NU330EQ1	166	189	196	304		3	3	26.2
NU330EQ1/C9	166	189	196	304		3	3	26.2
NJ330EM	166	189	213	304		3	3	26.2
NU330EQ1/YB2	166	189	196	304		3	3	26.7
NU330EWBM	166	189	196	304		3	3	29.5
NUP2330M	166		213	304		3	3	43.1
NF2330M	166		304	284		3	3	43.6
NU2330M	166		186	304		3	3	41.5
NJ2330M	166	186	213	304		3	3	42.4
N2330M	166		304	284		3	3	42.8
NJ3330M	166	189	213	304		3	3	49.9
Kg								
N231.775Q4/W33	167	172	177	220		2	2	23.9
NJ2932M	169	171	181	211		1.5	1.5	4.17
N032X3M	168	205		220	210	1.5	1.5	3.37
N032M	168	213		229	220	1.5	1.5	4.47
N1032M	168	217		232	223	2	2	5.96
NJ1032M	168	177	191	229		2	1.5	6.13
NU1032M	168	177	183	229		2	2	5.96
NU1032Q1	168	177	183	229		2	2	5.86
N232M	173	255		277	263	2.5	2.5	14.3
NU232M	173	191	198	277		2.5	2.5	14.4
NJ232M	173	191	210	277		2.5	2.5	14.2
NUP232M	173		210	277		2.5	2.5	14.6

# Cylindrical Roller Bearings

**ZWZ**

d 160~170 mm



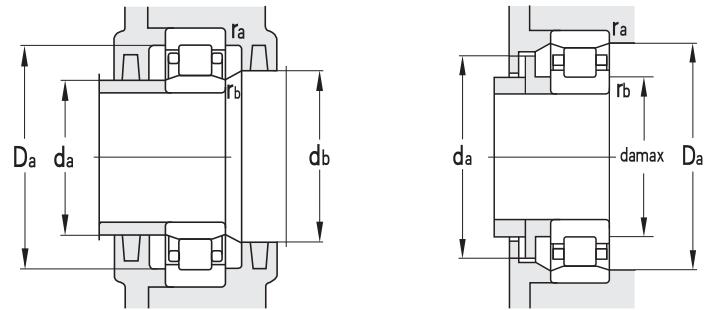
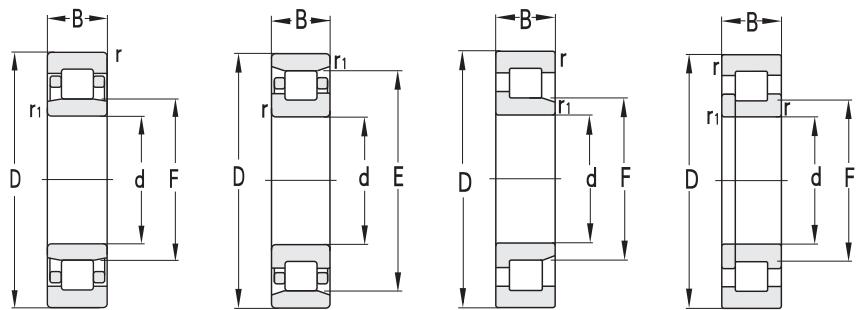
Principal dimensions	d	D	B	Basic load ratings			Limit speed ratings		Grease	Oil	
				rsmin	r1smin	F	E	Cr	Cor		
mm	KN						r/min				
160	290	48	3	3	3		259	517	695	1800	2200
	290	48	3	3	3	195		517	695	1800	2200
	290	48	3	3	3	195		517	695	1800	2200
	290	48	3	3	3	195		517	695	1800	2200
	290	48	3	3	3	195		517	695	1800	2200
	290	80	3	3	3	193		688	1000	1800	2200
	290	80	3	3	3	193		809	1190	1800	2200
	290	80	3	3	3	193		809	1190	1800	2200
	290	80	3	3	3	195		700	1050	1800	2200
	290	80	3	3	3	193		1030	1130	1800	2200
	290	80	3	3	3	193		1030	1130	1800	2200
	290	97.5	3	3	3	193		1030	1130	1800	2200
	290	97.5	3	3	3	193		1030	1130	1800	2200
	340	68	4	4			292	754	970	1500	1800
	340	68	4	4	208			754	970	1500	1800
	340	68	4	4	208			754	970	1500	1800
	340	68	4	4	208			754	970	1500	1800
	340	68	4	4	204			858	1050	1500	1800
	340	68	4	4	204			919	1150	1500	1800
	340	114	4	4	204			1260	1730	1350	1700
170	230	28	2	1.1	1.1		216	193	310	2400	2900
	260	42	2.1	2.1			237	299	400	2200	2800
	260	42	2.1	2.1	193			299	440	2200	2800
	260	42	2.1	2.1	193			299	440	2200	2800
	265	42	2.1	2.1			237	330	500	580	1100
	310	52	4	4	2.1		272	550	780	1800	2200
	310	52	4	4	208			550	780	1800	2200
	310	52	4	4	208			550	780	1800	2200
	310	52	4	4	208			550	780	1800	2200
	310	52	4	4	207			644	870	1800	2200
	310	86	4	4	205			1000	1480	1800	2200
	310	86	4	4	208			875	1400	1800	2200
	310	86	4	4	205			1000	1480	1800	2300

Designations	Abutment and fillet dimensions						Weight	
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm							Kg	
N232E	173	255		277	263	2.5	2.5	13.9
NU232E	173	191	198	277		2.5	2.5	14.0
NU232EQ1	173	191	198	277		2.5	2.5	14.3
NJ232E	173	191	210	277		2.5	2.5	14.3
NUP232E	173	210	277			2.5	2.5	14.5
NU2232	173	189	196	277		2.5	2.5	23.3
NU2232EM	173	189	196	277		2.5	2.5	24.2
NJ2232E	173	188	208	277		2.5	2.5	24.7
NJ2232M	173	189	196	277		2.5	2.5	23.9
NJ2232WB11Q1/YB2	173	188	208	277		2.5	2.5	24.2
NJ2232WB1Q1/YB2	173	188	208	277		2.5	2.5	26
NU2232WBQ1/YB2	173	189	196	277		2.5	2.5	24.8
NJ2232WBY	173	188	208	277		2.5	2.5	25.8
N332M	176	288		324	296	3	3	30.8
NU332M	176	204	211	324		3	3	30.9
NU332M/YA8	176	204	211	324		3	3	30.9
NJ332M	176	204	225	324		3	3	31.5
NU332EQ1/HA	176	200	207	324		3	3	31.3
NU332EQ1	176	200	207	324		3	3	27.8
NU2332EMA	176	201	209	324		3	3	53.9
N1934M	180		213	222	219	1.5	1	3.64
N1034M	181	233		249	241	2	2	8.02
NU1034M	181	190	196	249		2	2	8.23
NJ1034M	181	190	205	249		2	2	8.47
N1034X1M	186	234		254	241	2	2	7.97
N234M	186	266		294	278	3	3	18.2
NU234M	186	203	210	294		3	3	17.9
NU234M/YA8	186	203	210	294		3	3	17.4
NU234Q1	186	203	210	294		3	3	18.1
NJ234M	186	203	224	294		3	3	19.2
NU234EM	186	203	210	294		3	3	18.4
NU234EWBM	186	203	210	294		3	3	21.4
NU2234EM	186	201	208	294		3	3	29.0
NJ2234EQ1	187	203	211	293		3	3	30.5

# Cylindrical Roller Bearings

**ZWZ**

d 170~180 mm



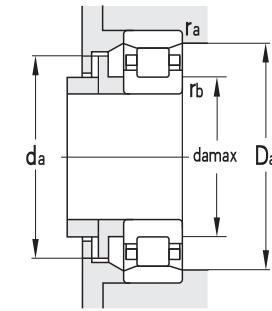
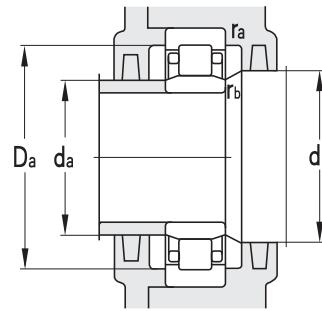
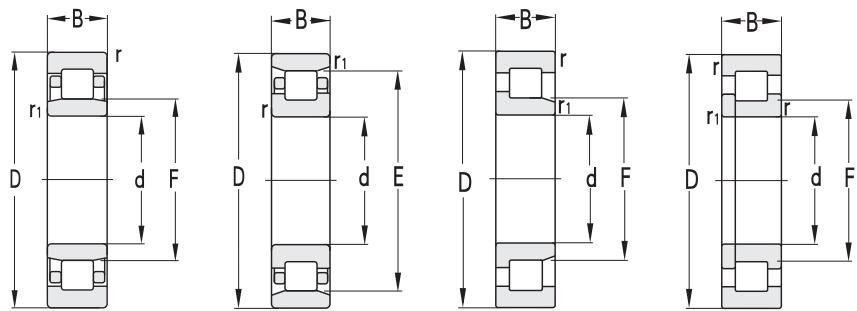
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings			
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm											
170	310	108	4	4	198	292	208	1070	1490	1500	1800
	340	114	4	4	208	310	905	1120	1610	1500	1800
	340	114	4	4	220	858	858	1110	1610	1500	1800
	360	72	4	4	220	858	1110	1110	1400	1700	1700
	360	72	4	4	220	1280	1280	1280	1850	1400	1700
	360	120	4	4	220	1280	1280	1280	1850	1400	1700
	360	120	4	4	220	1280	1280	1280	1850	1400	1700
	360	120	4	4	220	1280	1280	1280	1850	1400	1700
180	250	33	2	1.1	233	250	250	237	380	2200	2800
	280	31	2	2	205	255	255	270	420	2000	2400
	280	31	2	2	205	380	380	341	420	2000	2400
	280	33	2	2	205	380	380	565	472	2000	2400
	280	46	2.1	2.1	205	255	418	380	565	2000	2600
	280	46	2.1	2.1	205	255	380	380	565	2000	2600
	320	52	4	4	218	282	556	556	785	1700	2000
	320	52	4	4	218	282	556	556	785	1700	2000
	320	52	4	4	218	282	556	556	785	1700	2000
	320	52	4	4	218	282	556	556	785	1700	2000
	320	86	4	4	215	330	1050	1050	1580	1700	2000
	320	86	4	4	215	330	1100	1100	1580	1700	2000
	320	86	4	4	215	330	1050	1050	1580	1700	2000
	320	86	4	4	215	330	1100	1100	1580	1700	2000
	320	86	4	4	215	330	1050	1050	1580	1700	2000
	320	112	4	4	218	330	1120	1120	1950	1700	2000
	380	75	4	4	230	990	990	1260	1260	1500	1800
	380	75	4	4	230	990	990	1260	1260	1500	1800
	380	75	4	4	231	1170	1170	1360	1360	1500	2000
	380	75	4	4	231	1170	1360	1500	1500	1800	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm							Kg	
NU632M	176	195	201	304	295	3	3	40.9
N2332M	176	288	324	324	324	3	3	51.6
NU2332M	176	200	211	315	315	3	3	54.4
N334M	186	307	344	315	315	3	3	37.3
NU334M	186	214	223	344	344	3	3	37.7
NJ334M	186	214	243	344	344	3	3	38.4
NJ2334M	186	212	240	344	344	3	3	62.5
NU2334M	186	212	223	344	344	3	3	61.1
NU2334MA	186	212	223	344	344	3	3	61.5
NU2334M/C9	186	212	223	344	344	3	3	61.3
NF1936M	190	240	236	1.5	1.5	4.96		
N036M	191	246	269	254	2	8.59		
N036L	191	246	269	254	2	7.08		
N036EM	191	246	269	254	2	7.15		
N036X2	191	256	269	264	2	8.44		
N1036M	191	221	265	260	2	10.3		
NU1036M	191	202	208	269	2	10.4		
NJ1036M	191	202	208	269	2	10.7		
N236M	196	278	304	286	3	19.7		
NU236M	196	213	220	304	3	19.2		
NU236M/YA8	196	213	220	304	3	19.4		
NJ236M	196	213	234	304	3	19.3		
NUP236M	196	234	304	304	3	20.5		
NU2236M	196	211	218	304	3	31.4		
NU2236EM	196	211	218	304	3	30.3		
NJ2236M	196	211	232	304	3	31.9		
NJ2236EM	196	211	232	304	3	31.0		
NJ2236EQ1	196	211	232	304	3	31.7		
NUP2236M	196	232	304	304	3	32.1		
NU3236M/C3	196	211	218	304	3	41.6		
N336M	196	325	364	335	3	39.6		
NU336M	196	226	236	364	3	42.8		
NJ336M	196	226	236	364	3	43.6		
NJ336EM	196	226	254	364	3	42.7		
NU336EM	196	226	236	364	3	42.1		

# Cylindrical Roller Bearings

**ZWZ**

d 180~200 mm



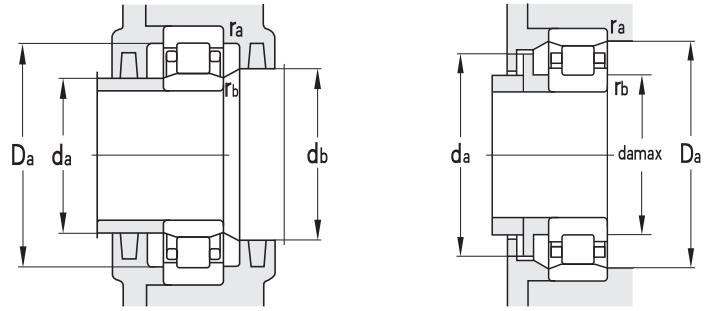
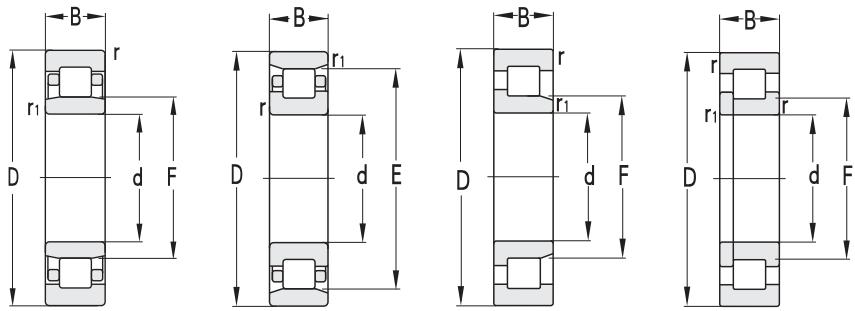
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings			
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm											
180	380	126	4	4	232			1360	1850	1300	1600
	380	126	4	4	232			1360	1850	1300	1600
190	260	42	2	1.1	208			347	685	2200	2800
	260	42	2	2	208			315	610	2200	2800
	290	46	2.1	2.1	215			413	640	2000	2600
	290	46	2.1	2.1	215			435	600	2000	2600
	340	55	4	4	231			622	885	1600	1900
	340	55	4	4	231			622	885	1600	1900
	340	55	4	4	231			622	885	1600	1900
	340	92	4	4	228			1140	1750	1600	1900
	340	120	4	4	231			1320	2340	1600	1900
	400	78	5	5	245			1040	1370	1200	1500
	400	78	5	5	245			1040	1370	1200	1500
	400	78	5	5	245			1040	1730	1200	1500
	400	132	5	5	240	345		1870	2450	1200	1500
200	310	34	2	2	277			336	545	2200	2800
	310	51	2.1	2.1	227			468	705	1900	2400
	310	51	2.1	2.1	227			468	705	1900	2400
	310	100	2.5	2.5	275.5	234.5		930	2110	1900	2400
	320	48	2.1	2.1	283			473	705	1900	2400
	320	88.9	3	3	232.689			776	1350	1700	2000
	360	58	4	4	316			688	995	1500	1800
	360	58	4	4	244			688	995	1500	1800
	360	58	4	4	244			688	995	1500	1800
	360	98	4	4	244			996	1600	1500	1800
	360	98	4	4	244			996	1600	1500	1800
	360	98	4	4	244			996	1600	1500	1800
	360	98	4	4	325			1280	1980	1500	1800
	360	98	4	4	241			1280	1980	1500	1800
	360	115	4	4	244			957	1520	1900	2400
	360	120.65	4	4	244			1280	2190	1900	2400
	420	80	5	5	260			1090	1400	1300	1600
	420	138	5	5	260			1650	2510	1200	1500
	420	138	5	5	260	364		1650	2510	1200	1500
	420	138	5	5	256			1970	2450	1200	1500

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								Kg
NJ2336M	196	227	255	364	3	3	72.0	
NU2336M	196	227	236	364	3	3	69.5	
NU2938Q1	196	206	210	252	1.5	1	6.98	
NJ2938	196	206	210	252	1.5	1	7.24	
NU1038M	201	212	218	279	2	2	10.9	
NJ1038Q1/HAP63	201	212	218	279	2	2	11.2	
NU238M	206	226	234	324	3	3	21.6	
NJ238M	206	226	248	324	3	3	22.0	
NUP238M	206	248	324	324	3	3	22.3	
NU2238M	206	223	232	324	3	3	38.6	
NU3238M/C3	206	223	232	324	3	3	51.2	
NJ338M	206	240	266	380	4	4	49.4	
NU338M	210	240	249	380	4	4	48.5	
N338M	210	340	380	350	4	4	50.2	
NU2338EMA	210	235	249	380	4	4	82.8	
N040M	211	274	299	280	2	2	10.1	
NU1040M	211	225	233	299	2	2	14.3	
NJ1040M	211	225	242	299	2	2	14.7	
NAOL4040X2	211	225	233	299	2	2	30.2	
N640M	211	280	299	286	2	2	14.7	
NU3040X3M/C3	211	225	235	309	3	3	28.7	
N240M	216	310	344	322	3	3	26.8	
NU240M	216	239	247	344	3	3	26.5	
NJ240M	216	239	262	344	3	3	27.1	
NJ2240M	216	236	260	344	3	3	45.5	
NUP2240M	216	260	344	344	3	3	46.3	
N2240EM	216	320	344	330	3	3	44.9	
NU2240EM	216	236	245	344	3	3	42.2	
NU1240X2WBM/HG2	211	225	233	299	2	2	42.9	
NU5240XPC3	211	225	233	299	2	2	57.6	
NU340M	220	253	264	400	4	4	56.7	
NJ2340M	220	241	251	400	4	4	99	
N2340M	220	260	360	400	368	4	94.5	
NJ2340M/YA4	220	241	251	400	4	4	98.4	

# Cylindrical Roller Bearings

**ZWZ**

d 200~240 mm



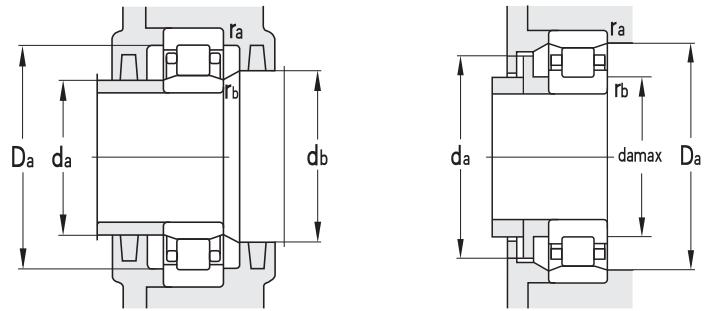
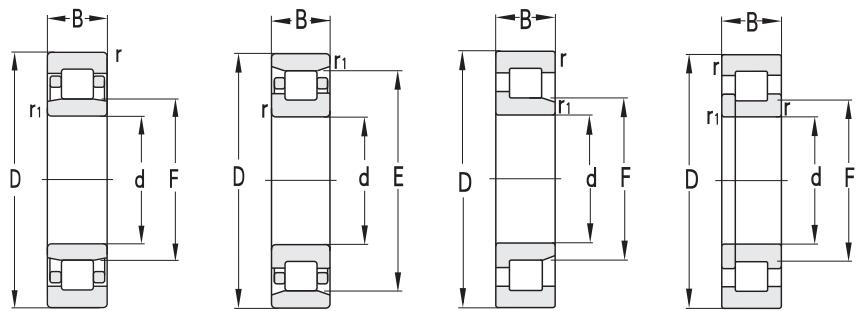
Principal dimensions					Basic load ratings			Limit speed ratings		
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm										
					KN		r/min			
200	420	165	5	5	260		2150	3540	1200	1500
	420	165	5	5	260		2150	3540	1200	1500
	420	165	5	5	260		2310	3400	1200	1500
203.23	310	82	3	3	229.006		880	1410	1000	1200
220	300	48	2.1	1.5	240		407	755	1900	2400
	300	48	2.1	2.1	240		407	750	1900	2400
	340	56	3	3	250		517	775	1800	2200
	340	56	3	3	250		534	810	1800	2200
	340	56	3	3	250		534	810	1800	2200
	340	56	3	3	250		530	810	1800	2200
	340	90	3	3	251.409		1060	1820	1800	2200
	350	98.4	3	3	253		1280	2090	1800	2200
	350	98.4	3	3	253		1280	2090	1800	2200
	400	65	4	4	350		836	1220	1500	1800
	400	65	4	4	270		836	1220	1500	1800
	400	65	4	4	270		836	1220	1500	1800
	400	108	4	4	270		1220	1990	1300	1600
	400	108	4	4	270		1220	1990	1300	1600
	400	108	4	4	265		1490	2280	1300	1600
	400	108	4	4	265		1490	2280	1300	1600
	400	108	4	4	350		1440	1990	1300	1600
	460	88	5	5	284		1280	1730	1000	1300
	460	145	5	5	284		2040	2780	1000	1300
	460	145	5	5	284		2170	3270	1000	1300
	460	145	5	5	284		2170	3270	1000	1300
	460	145	5	5	407		2300	3360	1000	1300
	460	145	5	5	275		2230	3250	950	1100
240	320	38	2.5	1.8	260		308	540	1900	2400
	360	56	3	3	270		512	775	1700	2000
	360	56	3	3	270		512	775	1700	2000
	360	56	3	3	270		545	855	1700	2000
	360	56	3	3	270		510	775	1700	2000
	390	108	4	4	278		1210	2060	1500	1800

Designations	Abutment and fillet dimensions						Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)
mm							
NU3340M	220	253	264	400	4	4	118
NUP3340	220	253	282	400	4	4	121
NU3340M/HCW20T	220	253	264	400	4	4	115
NU30/203X4Q1/HA	220	253	230	290	2	2	23.9
NU2944Q1	229	237	243	289	2	1	10.5
NJ2944M	229	237	243	289	2	1	10.8
NU1044Q1	233	246	254	327	2.5	2.5	19.4
NJ1044M	233	246	265	327	2.5	2.5	19.6
NU1044M	233	246	254	327	2.5	2.5	19.2
NPF1044M	233	246	254	327	2.5	2.5	20.2
NU3044Q1/HA	233	246	254	327	2.5	2.5	32
NU3044X3M/C9	233	248	257	332	2.5	2.5	38.1
NU3044X3M/C91YA6	233	248	257	332	2.5	2.5	38
N244M	236	342	384	358	3	3	36.7
NJ244M	236	263	290	384	3	3	35.4
NU244M	236	263	276	384	3	3	35.0
NU2244M	236	262	274	384	3	3	62.2
NJ2244M	236	262	290	384	3	3	63.3
NU2244EM/HC	237	255	264	383	3	3	62.8
NU2244EMA	237	255	264	383	3	3	63.8
N2244M	237	255	360	383	3	3	61.8
NU344M	240	277	288	440	4	4	73.4
NU2344M/C3	240	276	288	440	4	4	12
NU2344EM	240	276	288	440	4	4	114
NU2344M/C9	240	276	288	440	4	4	114
N2344EM	240	403	440	411	4	4	114
NU2344EMA	240	268	280	440	4	4	116
NU1948M	249	257	263	308	2	1.5	8.50
NU1048M	253	266	274	347	2.5	2.5	20.5
NJ1048M	253	266	274	347	2.5	2.5	21.1
NU1048Q1	253	266	274	347	2.5	2.5	21.2
NU1048MA	253	266	274	347	2.5	2.5	19.6
NU2148X3M	253	266	280	410	3	3	51.2

# Cylindrical Roller Bearings

**ZWZ**

d 240~280 mm



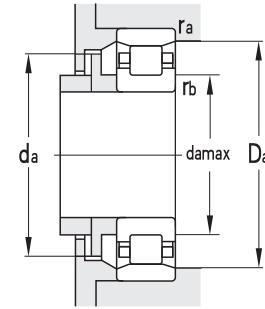
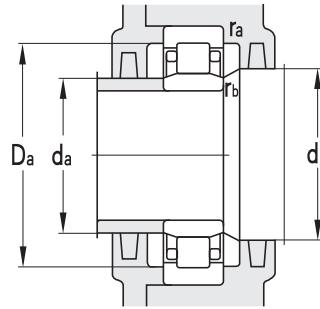
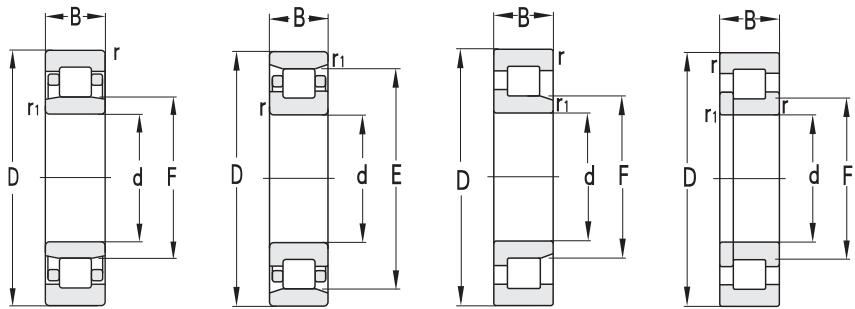
Principal dimensions							Basic load ratings			Limit speed ratings		
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil		
mm							KN	r/min				
240	390	107.95	3	3	272.26		1400	2230	1500	1800		
	440	72	4	4	295		1050	1540	1300	1600		
	440	72	4	4	295		1050	1540	1300	1600		
	440	120	4	4	295		1490	2450	1200	1500		
	440	146	4	4	290	430	2240	3820	1100	1400		
	500	95	5	5	290		1530	2120	1000	1300		
	500	95	5	5	310		1530	2120	1000	1300		
	500	95	5	5	306		1670	2190	1000	1300		
	500	155	5	5	310		2190	3360	950	1200		
250	308	50	6	2.3			655	1050	1800	2300		
260	360	46	2.1	2.1			337	445	785	1600	1850	
	400	65	4	4			347	688	1090	1500	1800	
	400	65	4	4	296		688	1090	1500	1800		
	400	65	4	4	296		688	1090	1500	1800		
	400	82	4	4	294		1080	1880	1300	1700		
	400	104	4	4	290.5		1350	2340	1150	1450		
	440	144	4	4	298.5		2050	3450	950	1250		
	480	80	5	5	320		1220	1800	1100	1400		
	480	80	5	5	320		1220	1800	1050	1350		
	480	80	5	5	320		1220	1800	1050	1350		
	480	80	5	5	320		1220	1800	1050	1350		
	480	130	5	5	320		1780	2910	1000	1300		
	480	130	5	5	320		1750	2910	1000	1300		
	480	130	5	5	320	420	1780	2910	950	1250		
	480	130	5	5	320		1780	2910	950	1250		
	540	102	6	6	336		1690	2290	850	1050		
	540	165	6	6	319		3150	4500	850	1050		
280	340	30	2	2	299		327	308	690	1800	2200	
	350	42	2	2	299		363	790	1800	2200		
	360	30	2	2	301		385	625	1700	1900		
	360	30	2	2	301		341	385	625	1700	1900	
	380	46	2.1	2.1	306		473	865	1700	1900		
	380	46	2.1	2.1	306		354	325	533	1700	1900	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NUF2148X3M/C9YA1	253	266	280	410	3	3	50.5	
NU248M	256	288	299	424	3	3	46.9	
NJ248M	256	288	317	424	3	3	49.6	
NU2248MA	256	284	299	423	3	3	84.8	
NU5248/P5	256	287	293	424	3	3	104	
N348M	260	426	480	434	4	4	96.3	
NU348M	260	302	314	480	4	4	96.3	
NU348EM	260	296	313	480	4	4	94.9	
NU2348MA	260	296	314	480	4	4	155	
N650EM/HAC9	268	343	368	351	5	2	21.4	
NF1952M	276	280	295	384	3	3	14.9	
NU1052M	276	291	300	384	3	3	30.2	
NUP1052M	276	313	384	384	3	3	37.2	
NJ1052M	276	291	300	384	3	3	36.3	
NU2052EM	276	291	300	384	3	3	40.1	
NU3052M	275	286	295	385	3	3	49.5	
NU3152M	277	295	302	423	3	3	98	
NU252M	280	313	324	460	4	4	67.1	
NJ252M	280	313	324	460	4	4	68.5	
NJ252MA	280	313	324	460	4	4	68.3	
NUP252M	280	313	324	460	4	4	70	
NU2252	280	309	324	460	4	4	106	
NU2252MA	280	309	324	460	4	4	107	
N2252M	280	416	427	460	4	4	105	
NJ2252M	280	309	324	460	4	4	108	
NU352M	286	330	341	514	5	5	120	
NU2352M	286	310	323	514	5	5	188	
N1856X3M/HG2	289	324	330	330	2	2	5.76	
NJ2856M	289	309	324	330	2	2	9.15	
NJ1856X3M/HG2	289	309	334	340	2	2	8.11	
N1856X3M/HGP6-1	289	309	340	330	2	2	8	
NU1956M	291	303	309	369	2	2	15.5	
NF1956M	291	303	309	340	2	2	16.9	

# Cylindrical Roller Bearings

**ZWZ**

d 280~320 mm



Principal dimensions					Basic load ratings			Limit speed ratings		
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm					KN			r/min		

280	420	65	4	4	316	384	700	1150	1400	1700
	420	65	4	4	316		704	1140	1400	1700
	420	65	4	4	316		704	1140	1400	1700
	420	82	4	4	314		1190	2170	1050	1300
	420	82	4	4	314		1110	1980	1050	1300
	440	135	3	3	318		1880	3400	1100	1400
	460	146	5	5	321		2250	3900	900	1150
	500	80	5	5	340		1100	1750	1150	1450
	500	80	5	5	340		1100	1750	1150	1450
	500	130	5	5	333		2090	3270	1100	1400
	500	130	5	5	333		2080	3270	1100	1400
	500	130	5	5	333		2080	3270	1100	1400
	500	165	1	6.5	333		2820	4900	950	1300
	580	108	6	6	362		1880	2660	850	1000
	580	175	6	6	362		2560	4250	900	1100

290	420	65	4	4	389	389	730	1200	1300	1600
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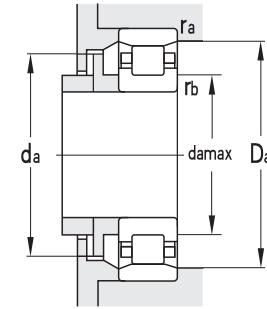
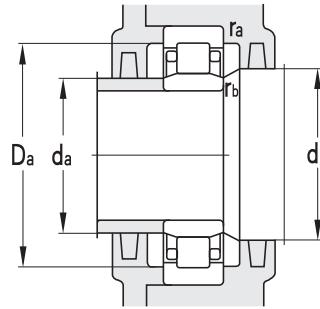
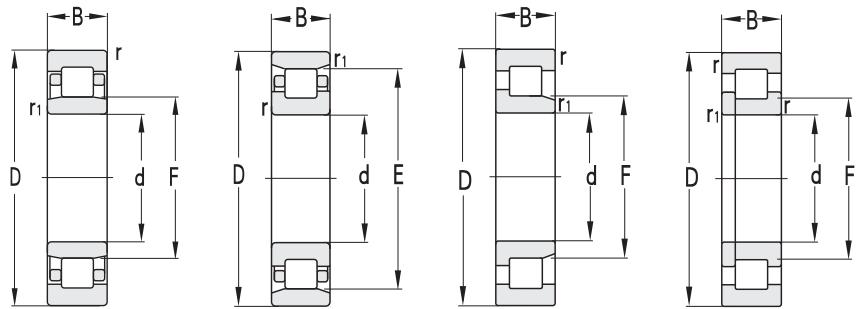
300	380	48	2.1	2.1	321	360	450	1000	1370	1650
	380	48	2.1	2.1	321		450	1000	1370	1650
	380	60	2.1	2.1	321		468	990	1200	1500
	460	57	4	4	344		803	1340	1400	1700
	460	74	4	4	340		935	1510	1200	1500
	460	74	4	4	340		935	1510	1200	1500
	460	74	4	4	340		935	1510	1200	1500
	460	95	4	4	341		1470	2800	980	1250
	460	95	4	4	341		1400	2510	980	1250
	460	118	4	4	340		1470	2700	1200	1500
	540	85	5	5	364		1510	2270	1000	1300
	540	140	5	5	364		2080	3450	1000	1200
	620	109	7.5	7.5	385		2310	3300	900	1100
	620	185	7.5	7.5	371		3860	5850	830	1000

Designations	Abutment and fillet dimensions						Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)
mm							
N1056M	296	380	411	388	3	3	31.5
NU1056M	296	311	320	404	3	3	30.9
NJ1056M	296	311	332	404	3	3	32.2
NU2056M	295	310	318	405	3	3	39.5
NU2056EMA	295	310	318	405	3	3	42
NB4056X3M	296	311	340	424	3	3	75.4
NU3156M	300	316	325	440	4	4	106
NJ256M	300	333	364	480	4	4	71.5
NU256M	300	333	344	480	4	4	70
NU2256E	300	333	344	480	4	4	116
NU2256EF3	300	333	344	480	4	4	116
NU2256EM	300	333	344	480	4	4	118
NU3256X2/C9YA1	300	333	344	480	4	4	142
NU356M	306	347	366	554	5	5	147
NU2356M	306	347	366	554	5	5	232
NFP10/290K	305	320	332	404	3	3	33.2
NJ2860M	310	318	332	370	1.5	1.5	15.5
NU2860M	310	318	324	370	1.5	1.5	14.5
N3860M/HG2	316	335	444	440	4	4	16.6
NJ1060X2M	316	335	358	444	3	3	36.5
NJ1060M	316	335	358	444	3	3	45.1
NU1060M	316	335	344	444	3	3	44.1
NU1060M/HA	316	335	344	444	3	3	44.1
NU2060M	317	336	345	443	3	3	60
NU2060MA	317	336	345	443	3	3	60
NU3060M	316	335	344	444	3	3	72.5
NU260M	320	358	368	520	4	4	86.9
NU2260M	320	352	368	520	4	4	146
NU360M	330	379	390	590	7	7	166
NU2360M	332	365	375	588	6	6	271
NU1864M	327	337	345	389	2	1.5	11.3
NU2864M	327	337	345	389	2	1.5	15
NU1964M	335	346	354	425	2.5	2.5	24.7

# Cylindrical Roller Bearings

**ZWZ**

d 320~380 mm



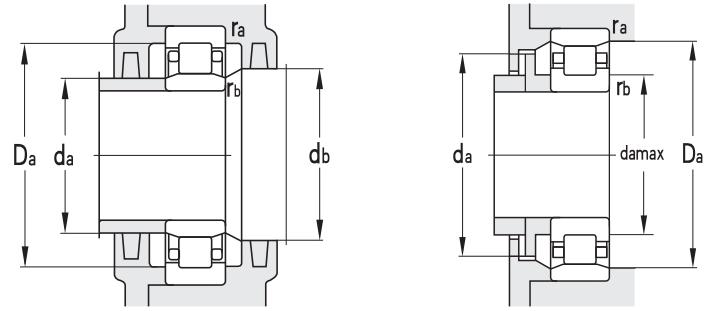
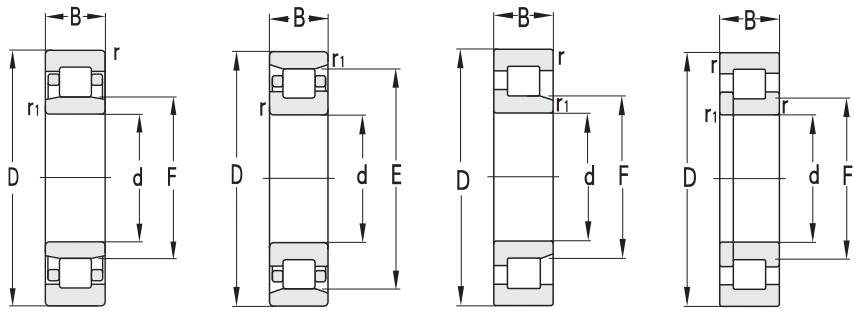
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings		Weight
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	
mm										
320	440	56	3	3	350	670	1150	1100	1400	
	480	74	4	4	360	957	1580	1100	1400	
	480	74	4	4	360	957	1580	1100	1400	
	480	74	4	4	360	957	1580	1100	1400	
	480	74	4	4	360	957	1580	1100	1400	
	480	95	4	4	360	1380	2650	970	1250	
	480	121	4	4	360	1540	2910	1100	1400	
	540	176	5	5	374	2780	5000	870	1050	
	580	92	5	5	390	1620	2450	960	1200	
	580	150	5	5	390	2480	4150	900	1100	
330	580	151	6	6	395	2750	4800	900	1100	
340	420	48	2.1	2.1	361	490	1150	1150	1450	
	440	56	3	3	365	690	1380	1050	1350	
	460	56	3	3	370	700	1400	1050	1350	
	460	72	3	3	373	785	1650	1050	1350	
	520	82	5	5	385	1160	1910	1000	1300	
	580	190	5	5	399	3300	5900	760	910	
	580	190	5	5	399	3300	5900	760	910	
	620	165	6	6	416	2600	4550	810	950	
	620	224	6	6	410	4600	8600	810	950	
360	480	72	3	3	388	1220	2300	1100	1300	
	540	82	5	5	405	1190	2000	980	1280	
	540	82	5	5	405	1080	2000	980	1280	
	540	82	5	5	405	1180	2000	980	1280	
	540	106	5	5	405	1890	3560	870	1050	
	540	134	5	5	405	2060	4050	800	1000	
	600	192	5	5	420	3520	6500	900	1000	
	650	170	6	6	437	3150	5400	800	950	
	750	224	7.5	7.5	455	5390	8650	700	850	
380	480	46	2.1	2.1	406	525	1050	950	1250	
	480	46	2.1	2.1	406	525	1050	950	1250	
	560	82	5	5	425	1220	2090	950	1200	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
FL- NU1964EMA	335	346	354	425	2.5	2.5	24.7	
NJ1064M	336	355	380	464	3	3	47.8	
NU1064M	336	355	364	464	3	3	48.2	
NU1064KM/C9	336	355	364	464	3	3	46.3	
NUP1064M	336	355	380	464	3	3	49.1	
NU2064M	335	357	364	465	3	3	63	
NU3064M	336	335	380	464	3	3	78.1	
NU3164M	367	369	387	490	4	4	172	
NU264M	340	383	394	560	4	4	112	
NU2264	340	377	394	560	4	4	181	
NU666/HCYA8	350	387	411	560	5	5	170	
NJ2868M	350	357	372	410	2	2.5	15.5	
NU1968X1M	348	355	366	427	2.5	2.5	22.3	
NU1968M	353	365	374	447	2.5	2.5	28.3	
NU2968M	353	369	377	447	2.5	2.5	36.2	
NU1068M	360	380	389	500	4	4	65.0	
NU3168E	360	388	403	560	4	4	211	
NU3168EF3	360	388	403	560	4	4	211	
NU2268M	366	401	421	594	5	5	225	
NU3268	366	401	421	594	5	5	307	
NJ2972E	380	400	380	464	4	4	38.1	
NU1072MA	378	400	410	522	4	4	66.2	
NU1072M	378	400	410	522	4	4	65.9	
NF1072M	378	400	410	522	4	4	67.7	
NU2072M	380	399	410	520	4	4	89.5	
NU3072M	381	400	410	520	4	4	112	
NU3172	373	417	417	587	423	4	219	
NU2272M	386	428	442	624	5	5	262	
NU2372	390	445	460	720	7	7	480	
NU1876M	390	401	410	470	2	2	23.5	
NUP1876M	390	401	410	470	2	2	24	
NU1076M	400	420	430	540	4	4	71.0	

# Cylindrical Roller Bearings

**ZWZ**

d 380~440 mm



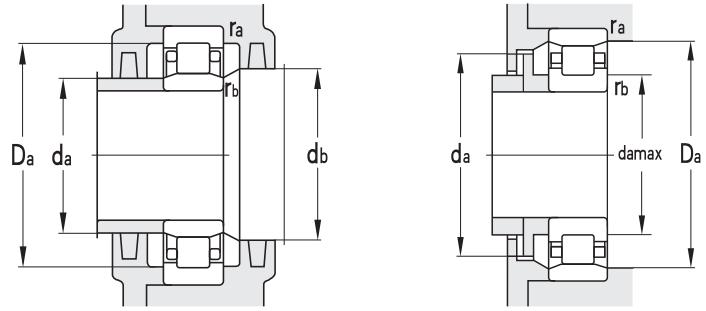
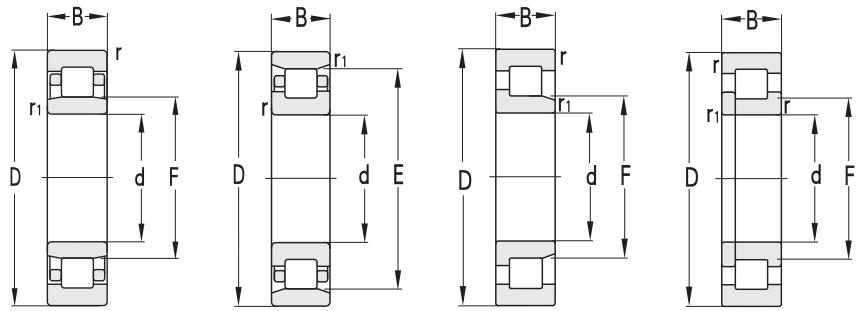
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm							KN	r/min		
380	560	106	5	5	425		1930	3750	800	950
	560	135	5	5	425		2250	4700	800	950
680	175	6	6	462		3050	5500	730	860	
680	175	6	6	462		2860	5400	730	860	
680	175	7.5	7.5	462		2860	5400	730	860	
400	500	46	2.1	2.1	423		565	1150	980	1250
	500	75	2.1	2.1	425		855	2010	980	1250
540	65	4	4	435		900	1750	900	1150	
540	82	4	4	435		1350	2850	900	1150	
540	82	4	4	435		1340	2780	900	1150	
540	82	4	4	438		1250	2510	900	1150	
540	82	4	4	438		1250	2510	900	1150	
600	90	5	5	450		1330	2210	900	1100	
600	90	5	5	450		1330	2210	900	1100	
600	90	5	5	450		1330	2210	900	1100	
600	90	5	5	450		1440	2470	900	1100	
600	118	5	5	449		2150	4800	750	900	
600	148	5	5	450		2330	4550	900	1100	
650	145	6	6	460		2920	5190	700	850	
650	200	6	6	460		3760	7170	700	850	
406	502	76	2	2		481	1130	2660	1000	1200
420	520	46	2.1	2.1	447		605	1270	900	1100
	520	75	2.1	2.1	447		900	2250	930	1150
560	65	4	4	449		1080	2010	930	1150	
560	65	4	4	449		1080	1950	930	1150	
560	82	4	4	458		1180	2600	930	1150	
560	82	4	4	458		1290	2800	930	1150	
620	90	5	5	470		1440	2490	900	1100	
620	118	5	5	469		2400	4750	770	950	
620	150	3	5	469		2850	5450	770	950	
700	224	6	6	485		4950	8950	650	780	
440	540	60	2.1	2.1	464		790	1900	870	1050

Designations	Abutment and fillet dimensions						Weight		
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)		
mm									
NU2076EM	398	422	430	542		4	4	93	
NU3076EM	398	417	430	542		4	4	116	
NU2276EM	406	445	457	654		5	5	276	
NU2276MA	406	445	457	654		5	5	289	
NU2276MA/YA36	406	445	457	654		5	5	289	
NU1880M	410	419	428	490		2	2	21.2	
NU3880Q1	410	419	428	490		2	2	33.4	
NU1980M	415	429	439	525		3	3	42	
NU2980EM	415	429	439	525		3	3	57.8	
FL-NJ2980/HCEC9	415	429	439	525		3	3	56.2	
NU2980M	415	434	442	525		3	3	55.2	
NF2980M	415	434	442	525		3	3	52.6	
NUP1080M	420		455	580		4	4	93.6	
NU1080M	420		446	580		4	4	92.5	
NU1080MA	420		446	580		4	4	93	
NJ1080	420		446	472	580		4	4	90.6
NU2080EM	418		446	454	582		4	4	122
NU3080M	420		446	455	580		4	4	153
NU2180M	420		450	460	590		4	4	197
NU3180M	420		450	460	590		4	4	274
NF6/406/C9W33	420			490	470	2	2	31.2	
NU1884	440		466	380	500		2	2	20.7
NJ3884M	427		441	462	510		2	2	33.3
NF1984F3	435		523		530		533		45.2
NJ1984MA	435		442	466			3		46
NU2984M	435		452	463	545		3	3	59.5
NJ2984	435		452	463	545		3	3	59.5
NU1084M/C3	440		466	475	600		4	4	98.0
NU2084EM	438		466	474	602		4	4	127
NF3084EM	438		466		602		586	4	162
NU3184EM	446		478	490	694		5	5	368
NU2888EM	450		459	469	530		2	2	34.5

# Cylindrical Roller Bearings

**ZWZ**

d 440~480 mm



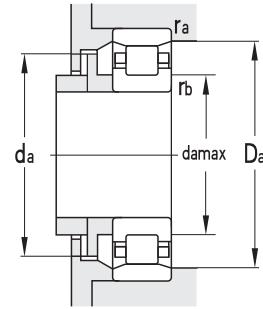
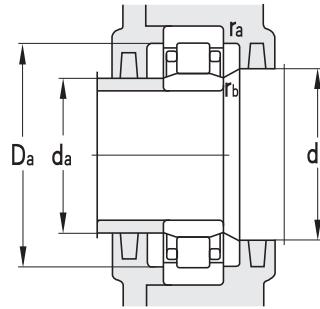
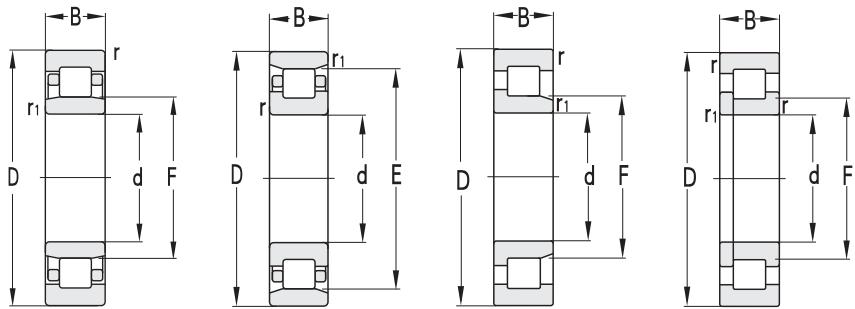
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings		Weight	
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor		
mm											
440	600	74	4	4	482	5		1010	1980	870	1050
	600	95	4	4	481	5		1670	3550	870	1050
	600	118	4	4	481	5		1940	4250	850	1000
	650	94	6	6	493			1570	2430	850	1000
	650	122	6	6	487			2450	5000	670	820
	720	122	6	6	508			2850	4300	800	950
	720	226	6	6				5230	9800	600	750
445	815	210	7.5	7.5	539			4800	7950	750	1100
452	680	100	6	6	516			1690	2630	600	750
460	580	56	3	3				795	1720	800	950
	580	56	3	3				840	1730	800	950
	580	72	3	3	489			1030	2350	860	1050
	580	72	3	3	490			1090	2480	860	1050
	620	95	4	4	502			1640	3500	800	950
	620	95	4	4	502			1670	1600	800	950
	620	95	4	4	502			1670	1600	800	950
	680	100	6	6	516			1690	2630	800	950
	680	128	6	6	513			2700	5450	650	800
	680	163	6	6	516			2970	6150	650	790
	680	163	6	6	499			3300	6340	650	790
	760	240	7.5	7.5	531			5450	10400	400	480
	760	240	7.5	7.5	531			5450	10400	400	480
	830	165	7.5	7.5	554			4200	6800	600	720
	830	212	7.5	7.5	554			4850	8000	580	670
	830	212	7.5	7.5	554			4850	8000	580	670
480	600	56	3	3	511	5		750	1620	840	950
	600	72	3	3	509	5		1050	2400	840	950
	650	78	5	5	525			1130	2200	780	920
	700	100	6	6	536			1600	2970	720	860
	700	100	6	6	536			1900	3500	720	860
	700	128	6	6	536			2600	5250	600	720
	790	248	7.5	7.5	547			5650	10700	500	600

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NU1988M	455	477	487	585		3	3	65
NJ2988EM	455	477	500	585		3	3	83.5
NUP3988EM	455		483	585		3	3	106
NU1088M	466	488	498	624		5	5	102
NU2088EM	463	483	492	627		5	5	146
N1188	466	488	690		670	5	5	207
NU3188	460	498	518	700		5	5	374
NU689M/C9	478	535	560	770		6	6	501
NU10/452M/YB2	470	510	580	660		5	5	116
N1892M	473	548		567	558	2.5	2.5	37.2
NF1892M	473	548		567	558	2.5	2.5	36.5
NJ2892EM	473	485	505	567		2.5	2.5	48.7
FL-NJ2892/HCEC9	473	485	505	567		2.5	2.5	46.1
NJ2992	486	511	550	610		3	3	83.4
NUP2992	480		524	600		3	3	85.0
NU2992	480		524	600		3	3	98.3
NU1092M	486	511	521	654		5	5	111
NU2092EM	483	509	518	657		5	5	166
NU3092M	483	496	508	657		5	5	211
NU3092EM	483	491	504	657		5	5	211
NU3192	490	526	536	730		6	6	467
NU3192MA	490	526	536	730		6	6	481
NU1292	492	542	559	798		6	6	405
NU2292M	492	542	559	798		6	6	515
NU2292MA	492	542	559	798		6	6	518
NU1896M	439	507	516	587		2.5	2.5	37.5
NJ2896EM	493	504	524	587		2.5	2.5	46.5
NU1996/HCYA4	498	517	530	632		4	4	74.3
NU1096M	503	531	538	677		5	5	128
NU1096MA	503	531	538	677		5	5	129
NU2096MA	503	529	538	677		5	5	176
NU3196EM	512	536	552	758		6	6	495

# Cylindrical Roller Bearings

**ZWZ**

d 480~600 mm



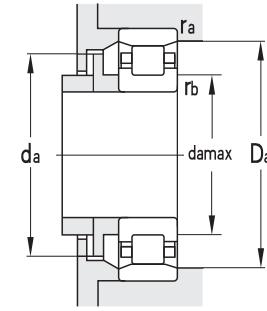
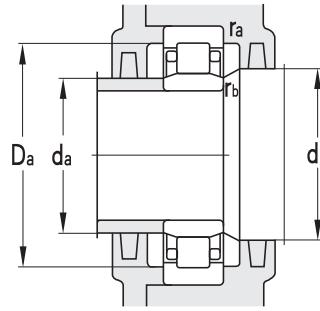
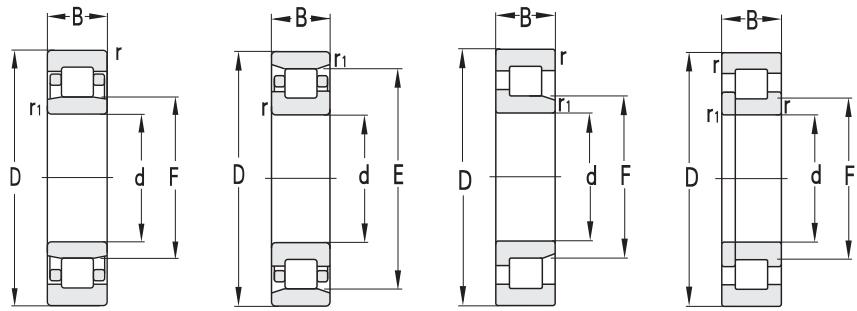
Principal dimensions							Basic load ratings			Limit speed ratings		
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil		
mm							KN	r/min				
480	790	248	7.5	7.5	556		5700	11000	500	600		
500	620	56	3	3	530	592	795	1700	780	940		
	620	72	3	3	544		1130	2670	780	940		
	670	78	5	5	543		1160	2350	720	880		
	670	100	5	5	543		1940	4300	750	900		
	670	100	5	5	543	633	1940	4300	750	900		
	670	128	5	5	543		2250	5150	670	840		
	720	100	6	6	556		1680	3050	720	880		
	720	128	6	6	553		2850	5900	620	720		
	720	167	6	6	556		3210	6970	620	720		
	830	264	7.5	7.5	581		6250	12200	480	580		
	920	185	7.5	7.5	603.1		5050	8450	540	650		
508	622.3	95.25	4	4	538		1360	3430	740	850		
530	650	72	3	3	573	622	1170	2890	900	1100		
	710	82	5	5	580		1500	2980	680	830		
	710	106	5	5	580		1990	4550	400	500		
	710	106	5	5	580		1990	4550	400	500		
	780	112	6	6	593		2200	4050	650	780		
	780	145	6	6	591		3650	7360	550	650		
	870	272	7.5	7.5	612	703	7250	14500	460	550		
560	680	56	3	3	591	651	810	1830	670	820		
	680	56	3	3	591		810	1830	670	820		
	680	72	3	3	608		1170	2950	670	820		
	750	85	5	5	607		1630	3200	650	780		
	750	112	5	5	607		2420	5450	6500	7800		
	750	112	5	5	625	703	2490	5600	6500	780		
	820	115	6	6	626		2250	4200	620	720		
	820	150	6	6	626		3650	7600	500	600		
	1030	206	9.5	9.5	668		6850	11000	460	550		
600	730	60	3	3	632		860	2000	650	780		
	730	78	3	3	632		1250	3350	620	730		

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NU3196M	512	545	561	767		6	6	508
NF18/500EM	513			607	598			38.5
NU28/500EM	513	526	534	607		2.5	2.5	48.5
NU19/500EM	518	537	549	652		4	4	80
NU29/500	522	537	549	648		3	3	101
NU29/500F3	522	537	549	648		3	3	102
N39/500EM	518	627	638	652		4		128
NJ10/500	523	550		697		5	5	136
NU20/500EM	523	549	558	697		5	5	175
NU30/500	523	530	545	697		5	5	232
NU31/500	532	550	580	798		6	6	602
NU12/500M	532	593	610	888		6	6	585
NUP6/508Q1/C9	520	526	534	607		3	3	65.6
NF28/530	544			645	625	2.5	2.5	52.2
NJ19/530EM	548	568	598	692		4		94.5
NUP29/530	555		605	585		4	4	125
NU29/530/YA1	555	585	605	585		4	4	125
NU10/530M	553	585	598	757		5	5	187
NU20/530EM	553	587	596	757		5	5	252
NU31/530EM	562	605	617	838		6	6	663
NJ18/560M	573	584	606	667		2.5	2.5	42.5
NJ18/560MA	573	584	606	667		2.5	2.5	44.2
NF28/560	573	645		665	657	2.5	2.5	53
NU19/560EM	578	600	613	732		4	4	108
NJ29/560	586	620	693	724		4	4	153
N29/560	586		693	724	713	4	4	138
NU10/560M	583	617	630	797		5	5	215
NU20/560EM	583	616	631	797		5	5	289
NU12/560MA	600	657	674	990		8	8	809
NU18/600EM	613	625	637	717		2.5	2.5	49.3
NU28/600EM	613	625	637	717		2.5	2.5	68.5

# Cylindrical Roller Bearings

**ZWZ**

d 600~670 mm



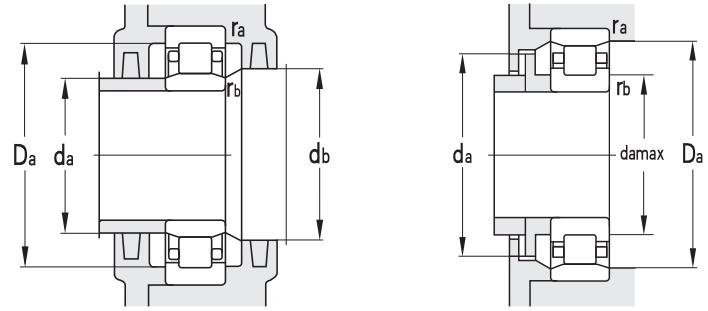
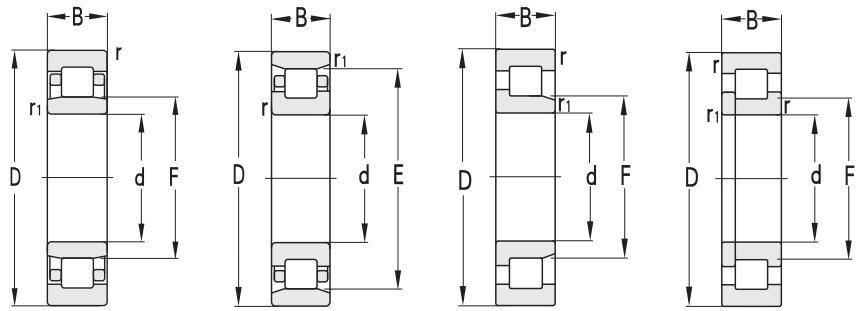
Principal dimensions	d	D	B	Basic load ratings				Limit speed ratings		Weight	
				r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor		
mm											
600	800	90	5	5	5	649	757	1900	3800	620	750
	800	90	5	5	5	649		1900	3800	620	750
	800	90	5	5	5	649		1900	3800	620	750
	800	118	5	5	5	649		2900	6550	620	750
	830	150	5	5	5	655		3410	7450	600	700
	870	118	6	6	6	667		2840	5250	590	680
	870	155	6	6	6	661		4180	8000	500	600
	870	200	6	6	6	661		5390	11000	500	600
620	780	102	4	4	740			1950	4800	600	750
	780	102	4	4	740			1950	4800	600	750
630	780	69	4	4	667	744		1050	2500	630	750
	780	88	4	4	667	744		1800	4500	630	750
	780	88	4	4	668	744		1800	4500	630	750
	780	112	4	4	745	745		2150	5750	550	650
	780	112	4	4	745	745		2150	5750	550	650
	850	100	6	6	688			1980	4000	600	700
	850	100	6	6	688			1980	4000	600	700
	850	100	6	6	688			2150	4250	600	700
	850	128	6	6	688			3050	6950	580	680
	850	128	6	6	688			3250	7250	580	680
	850	128	6	6	688			3250	7250	580	680
	920	128	7.5	7.5	702			3400	6250	450	530
	920	128	7.5	7.5	702			3400	6250	450	530
	920	170	7.5	7.5	699			4700	9500	480	560
	920	212	7.5	7.5	699			6450	14500	450	530
660.4	863.6	107.95	5.1	5.1	704			3000	6050	560	670
	812.8	107.95	4	4	697			2280	6000	560	670
666.75	838.2	114.3	3	6	796			2870	6850	560	680
670	820	69	4	4	708	786		1230	2800	550	650
	820	112	4	4	706			2560	7000	560	670
	820	112	4	4	2490			6700	560	670	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								Kg
NU19/600EM	618	642	645	782	4	4	128	
NUP19/600EM	618	675	782	4	4	135		
NF19/600EM	618	675	782	4	4	130		
NU29/600E	618	675	782	4	4	163		
NU6/600	619	647	703	806	4	4	237	
NU10/600	623	658	672	847	5	5	234	
NU20/600EM	623	652	667	847	5	5	320	
NU30/600E	623	655	666	847	5	5	412	
NFP6/620Q1	654	680	695	765	3	3	124	
N620/780	654	680	695	765	3	3	124	
NJ18/630EM	662	685	765	744	3	3	74.2	
N28/630M	645	737	765	744	3	3	95.6	
NU28/630M	645	660	674	765	3	3	96	
N38/630M	645	739	750	765	3	3	118	
NF38/630M	645	739	750	765	3	3	120	
NU19/630M	653	681	694	827	5	5	158	
NJ19/630	653	681	694	827	5	5	167	
NU19/630EM	653	676	688	827	5	5	160	
NU29/630	653	678	689	827	5	5	210	
NU29/630EM	653	678	689	827	5	5	214	
NJ29/630EM	653	678	689	827	5	5	222	
NU10/630EM	658	691	706	892	6	6	284	
NUP10/630EM	658	691	706	892	6	6	284	
NU20/630EM	658	690	705	892	6	6	395	
NU30/630	658	690	705	892	6	6	485	
NUP6/660.4Q1/C9	680	734	843	4	4	179		
NUP6/660.4Q1/C9-1	680	734	843	4	4	127		
NFP6/666X4Q1/C9	682	790	820	812	3	3	160	
NJ18/670	640	700	727	805	3	3	83.8	
NJ38/670Q1	640	700	727	805	3	3	133	
NFP38/670Q1/C9YAD	640	780	800	792	3	3	133	

# Cylindrical Roller Bearings

**ZWZ**

d 670~800 mm



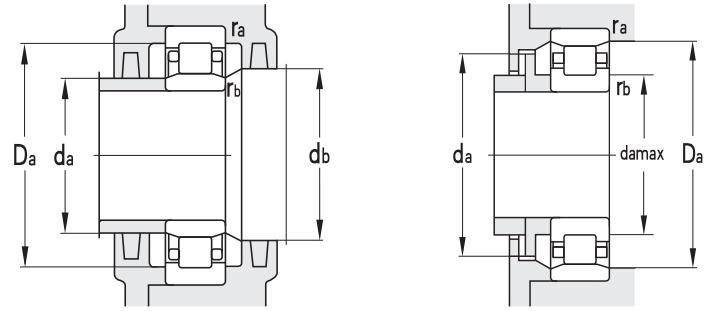
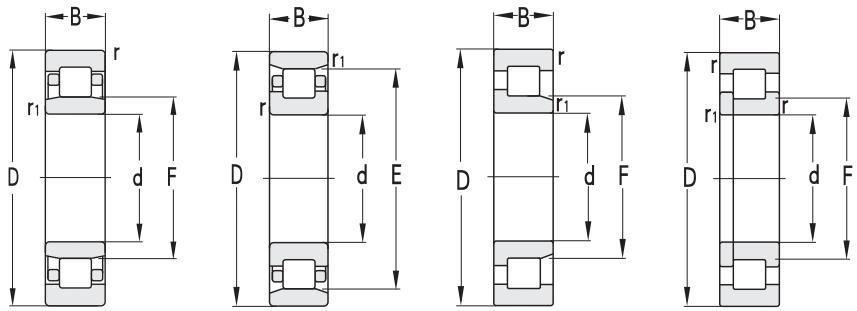
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm							KN	r/min		
670	900	103	6	6	731		2420	4900	530	630
	900	103	6	6	731		2420	4900	530	630
	980	136	7.5	7.5	747		3700	6800	430	500
	980	180	7.5	7.5	746	914	5400	11500	430	500
	980	230	7.5	7.5	744		6930	15000	430	500
	980	230	7.5	7.5	744		6500	14500	430	500
700	930	160	6	6	760		3520	8500	500	600
	930	160	6	6	760		3520	8500	500	600
710	870	95	4	4			831	1880	4950	480
	900	106	4	4			845	1980	5200	480
	950	106	6	6			884	2450	6000	480
	950	106	6	6			884	2450	6000	560
	950	106	6	6			2590	5500	480	560
	950	140	6	6	770		3650	8250	480	560
	1030	140	7.5	7.5	778		4550	8400	420	490
	1030	185	7.5	7.5	787		5800	12000	420	490
711.2	863.6	107.95	6.35	6.35	743		3300	6700	500	600
723.8	908.05	120.65	5	5			865	3350	8300	480
									550	
750	920	78	5	5	794		880	1450	3500	480
	920	78	5	5			880	1510	3480	480
	920	100	5	5			880	2160	5500	480
	920	100	5	5			880	2160	5500	590
	1000	100	6	6	815		3030	6500	460	550
	1000	112	6	6			2750	5750	470	550
	1090	150	7.5	7.5	830		4500	8500	350	415
	1090	195	7.5	7.5	832		6700	14500	350	415
800	980	82	5	5			936	1690	4000	430
	980	82	5	5				1700	4200	510
	1150	155	7.5	7.5	883			5400	10500	320
	1150	200	7.5	7.5	882			6900	14500	320
								380	380	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NUP19/670	693	730	755	877		5	5	193
NU19/670	693	730	755	877		5	5	193
NU10/670	698	736	753	952		6	6	344
NU20/670E	698	736	752	952		6	6	477
N30/670	908	952	952		919	3	3	594
NU30/670M	698	736	750	952		6	6	596
NU6/700	733	760	772	900		5	5	306
NUP6/700	733	760	772	900		5	5	316
N28/710EM	725	825		855	835	3	3	128
N28/710X3/W33	740	755		880	850	3	3	168
N19/710F3/CNL	740	875		910	890	5	5	227
NF19/710F3	740	875		910	890	5	5	229
NU19/710	740	755		900		5	5	210
NU29/710EM	733	760	772	927		5	5	294
NU10/710EM	738	769	783	1002		6	6	420
NU20/710EM	738	780	793	1002		6	6	535
NUP6/711.2M/C9	740	750	800	835		5	5	136
NFP6/723.8Q1/C9	752	765		883	850	4	4	197
NU18/750M	770	784	800	900		4	4	105
NF18/750F3	773	875		900	885	5	5	101
N28/750	773	875		900	885	5	5	145
N28/750F3	773	875		900	885	5	5	145
NU19/750X2/C9	733	750	770	977		5	5	220
NF19/750EM	773	938	977	953		5	5	264
NU10/750EM	778	823	838	1062		6	6	492
NU20/750EM	778	823	838	1062		6	6	634
NF18/800	818	930		950	942	5	5	133
NJ18/800EM	818	838	866	962		4	4	144
NU10/800EM	828	869	889	1122		6	6	565
NU20/800EM	828	868	888	1122		6	6	710

# Cylindrical Roller Bearings

**ZWZ**

d 800~1180 mm



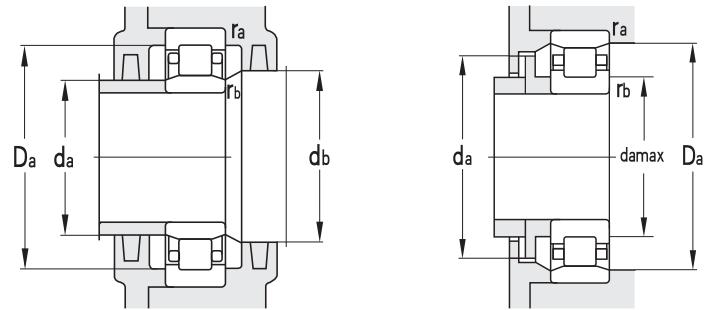
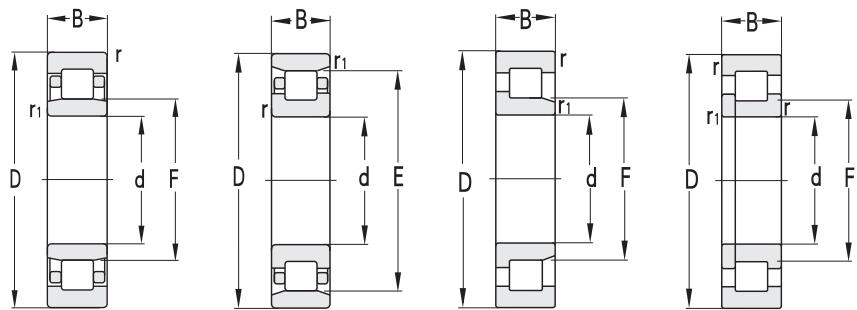
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	E	Cr	Cor	Grease	Oil
mm							KN	r/min		
800	1150	200	7.5	7.5	885		7910	14600	320	380
812.8	1016	139.7	6	6	865		4150	10500	420	500
820	990	72	5	5		943	1180	2960	450	530
850	1030	106	5	5	902		2050	5900	410	480
	1120	118	6	6	919		3050	6900	390	460
	1120	118	6	6	919		2930	7000	390	460
	1120	155	6	6		1059	4500	11300	390	460
900	1090	85	5	5	949		1900	4850	370	440
1090	112	5	5	5	949		2650	7150	370	440
1180	122	6	6	6	966.5		4050	8700	350	420
1180	165	6	6	6	969		5750	13500	350	420
950	1250	175	7.5	7.5	1024		5560	13000	340	400
	1250	175	7.5	7.5	1024		5670	13400	140	170
1000	1220	100	6	6	1053		2650	6550	350	420
1220	128	6	6	6	1053		3600	9500	350	420
1320	185	7.5	7.5	1082		6700	17000	290	350	
1060	1280	128	6	6		1225	3550	10500	310	370
1400	195	7.5	7.5	1146		7200	17000	290	350	
1400	250	7.5	7.5	1146		9000	23500	250	310	
1500	325	9.5	9.5			1390	12500	32500	230	290
1120	1360	106	6	6	1182		3350	8600	270	330
1360	106	6	6	1185		3250	8550	270	330	
1360	106	6	6	1185		3250	8550	270	330	
1180	1420	106	6	6	1242		2950	7750	250	320
1540	206	7.5	7.5	1258		8950	21500	180	220	
1540	272	7.5	7.5		1466	11000	28500	190	250	

Designations	Abutment and fillet dimensions							Weight
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NU20/800MA/HC	828	868	888	1122		6	6	725
NUP6/812X4	830	860	880	986		5	5	277
N6/820	840	937		970	944	4	4	128
NU28/80M	868	891	908	1012		4	4	192
NU19/850EM	873	909	926	1097		5	5	325
NJ19/850	873	909	926	1097		5	5	326
N29/850EM	873	1052		1097	1070	5	5	428
NU18/900M	918	942	956	1072		4	4	172
NU28/900M	918	944	956	1072		4	4	234
NU19/900EM	923	957	973	1157		5	5	378
NU29/900EM	923	958	975	1157		5	5	565
NU29/950	978	1013	1013	1222		6	6	596
NUP29/950	990	1069	1210			6	6	616
NU18/1000M	1023	1040	1060	1197		5	5	264
NJ28/1000EM	1023	1040	1082	1197		5	5	345
NU29/1000E	1028	1072	1089	1292		6	6	705
N28/1060M	1083	1218		1230		5	5	355
NU29/1060EM	1028	1133	1152	1372		6	6	875
NU39/1060EM	1028	1140	1153	1372		6	6	1060
N30/1060	1094	1382		1466	1402	8	8	1880
NJ18/1120EM	1143	1175	1210	1337		5	5	330
NJ18/1120F3/W20	1143	1175	1210	1337		5	5	327
NJ18/1120F3/W20YB2	1143	1175	1210	1337		5	5	329
NJ18/1180EM	1203	1228	1270	1397		5	6	354
NU29/1180EM	1208	1250	1266	1512	1474	6	6	1046
N39/1180M	1208	1458		1512	1474	6	6	1350

# Cylindrical Roller Bearings

**ZWZ**

d 1200~1900 mm



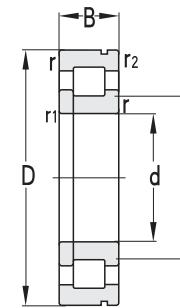
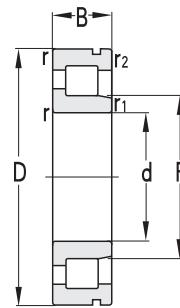
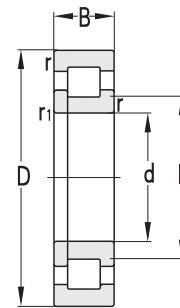
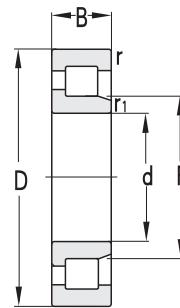
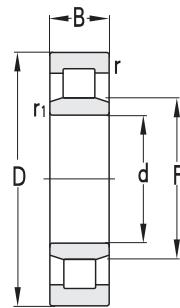
Principal dimensions						Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1smin</sub>	F	Cr	Cor	Grease	Oil
mm						KN		r/min	
1200	1520	185	7.5	7.5	1289	6220	17000	110	140
1520	185	7.5	7.5	7.5	1289	6220	17000	110	140
1250	1500	112	6	6	1316	3630	9550	300	380
1500	145	6	6	6	1316	4900	14000	300	380
1750	290	9.5	9.5	9.5	1635	12500	29500	165	190
1320	1600	122	6	6	1395	3650	9500	190	250
1720	175	7.5	7.5	7.5	1425	7920	19500	190	240
1720	175	7.5	7.5	7.5	1475	6700	16200		
1720	230	7.5	7.5	7.5	1420	10900	29000	180	230
1720	300	7.5	7.5	7.5	1640	12600	32500	175	210
1850	400	12	12	12	1737	21200	52800	150	185
1400	1700	175	7.5	7.5	1637	6300	1750	175	210
1500	1820	140	7.5	7.5	1585	6220	17300	195	250
1820	140	7.5	7.5	7.5	1735	6220	17300	195	250
1600	1950	200	7.5	7.5	1690	8340	24300	150	185
1700	2060	160	7.5	7.5	1784	6950	18500	125	155
1900	2300	175	9.5	9.5	2204	8150	23700	90	115

Designations	Abutment and fillet dimensions							Weight kg
	da(min)	da(max)	db(min)	Da(max)	Da(min)	ra(max)	rb(max)	
mm								
NU6/1200/C91	1240	1274	1304	1480		6	6	825
NU6/1200/C9	1240	1274	1304	1480		6	6	825
NU18/1250C9	1280	1306	1326	1470		5	5	386
NU18/1250/HCE	1280	1306	1326	1470		5	5	517
N20/1250M	1284	1625	1716	1650	8	8	2310	
NU18/1320M	1343	1382	1403	1577		5	5	525
NU19/1320	1348	1406	1428	1692		6	6	1110
NU19/1320D/HCRYAD	1348	1460	1478	1692				1080
NU29/1320E	1348	1405	1430	1692		6	6	1510
N39/1320M	1348	1630	1692	1655	6	6	1890	
N30/1320V	1362	1727	1803	1747	10	10	3540	
N28/1400EM	1428	1627		1672	1647	6	6	858
NU18/1500/HC	1528	1570	1748	1792		6	6	773
NF18/1500/HC	1528	1728	1792	1745	6	6	773	
NU28/1600F3	1655	1680	1700	1886		6	6	1272
NU18/1700EM	1728	1771	1795	2032		6	6	1156
N18/1900	1934	2194		2266	2219	8	8	1480

# Full Complement Cylindrical Roller Bearings

**ZWZ**

d 25~45 mm



Principal dimensions Basic load ratings Limit speed ratings

d	D	B	rmin	r1min	r2min	F	Cr	Cor	Grease	Oil
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mm									
KN                  r/min									

25	52	18	0.5	0.7	0.7	31	46.2	51.0	3500	6200
	52	18	1	1.1		31	41.3	43.5	3500	6200
	52	18	1	0.3	0.7	31	47.9	48	3500	6200
	52	18	1	0.5	0.7	30.998	38.5	35	3500	6200
	62	20	3	1.1		34	59.4	60.5	2800	5000
	62	24	3	1.1		34	69.3	74.0	2200	4500
	62	24	1.1	1.1		34.35	61.6	66.0	2200	4500

30	62	19	1	2		38.2	51.7	58.5	3200	6000
	72	19	2	2		40.4	80.0	60.5	1900	4000
	72	21	1.1	1.1		38.5	80.0	68.5	1900	4000
	72	30.162	1.5	1.0		60.409	275	445	1900	4000
	80	21	2.5	1.1		43.8	86.9	90.0	1900	4000

35	80	21	1.5	1.5	0.5	46.2	103	89.0	2400	4800
	80	21	1.5	1.1		46.2	103	89.0	2400	4800
	80	21	3	1.1		46.2	103	89.0	2400	4800
	80	21	1.5	1.1		45.806	103	106	1500	3200
	80	23	3.5	1.1		45.8	103	48.0	2400	4800
	82	23	1.1	0.3		64.5	79.0	112	1500	3200
	90	23	2	0.6		49.7	96.0	102	1500	3200
	90	23	2	0.6		49.7	96.0	102	1500	3200
	90	23	2.5	1		49	112	95.0	1500	3200
	90	23	5	1.5		48.5	112	83.5	1500	3200
	90	29	1.5	1.5	0.5	48	124	131	1500	3200

40	90	23	1.1	1.1	0.5	53.44	140	110	1800	3600
	90	23	3.5	1.5		53.44	140	110	1800	3600
	90	23	3.2	2		53.44	140	106	1800	3600
	90	23	3.5	1.5		52	140	95.5	1800	3600
	90	25	1.5	1.5		51	143	118	1200	2800
	90	33	3.2	2		53.44	147	166	1000	2600
	94	30	5	1.5		51.1	127	131	1000	2600

45	100	25	1.5	1.5		57.85	136	127	1400	3000
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Designations Weight

kg
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NUP2205NV/C9YAD	0.193
NU2205V/C9YA6	0.176
NUP2205NV/HAC9YA	0.193
NUP2205NV/HAC9Y	0.173
NJ305X2V/C3YA46	0.321
NJ2305V/C3YA46	0.378
NUP2305V	0.401
NCL2206X2V/YA6	0.272
NU306EV/C9YA6	0.399
NU306X2V/C3	0.431
NCL306X2V	0.647
NU306X3V	0.565
NJ307NV/C9	0.548
NUP307NV/C9	0.579
NJ307EV/C3	0.540
NJ307EV/YA4	0.540
NJ307EV/C9YAD	0.537
NJ607V	0.568
NFP2207X1V	0.681
NUP2207X1V/C9YB2	0.795
NJ2207X1V/C9YB2	0.780
NUP407X3V/C9YA6	0.75
NCF407X3V/C9YA6	0.763
NJ607NV	0.998

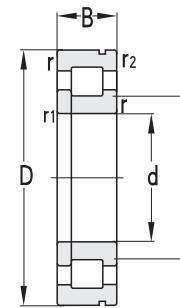
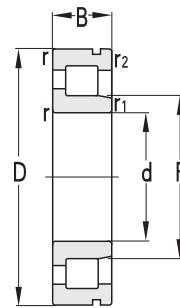
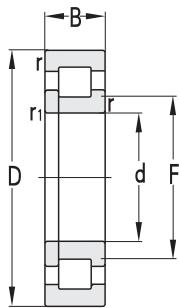
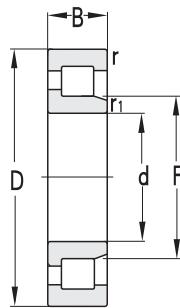
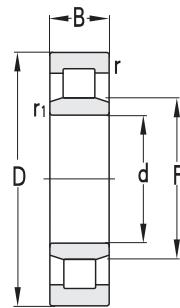
NUP308NV	0.499
NJ308V	0.719
NJ308V/C9YA6	0.719
NJ308V/C3YA5	0.724
NCF308X2V	0.755
NJ2308V/C9YA6	1.02
NJ608V/YA13	1.02

NJ309V	0.904
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# Full Complement Cylindrical Roller Bearings

**ZWZ**

d 45~260 mm



Principal dimensions				Basic load ratings				Limit speed ratings		
d	D	B	rmin	r1min	r2min	F	Cr	Cor	Grease	Oil
<b>mm</b>										
						KN		r/min		
45	100	25	1.5	2.2	0.5	57.3	118	126	1400	3000
	100	31	4.5	1.5	0.5	56	165	153	1200	2800
50	80	28	1.1	0.6		58.5	94.5	177	1200	2800
	110	27	2	2	0.5	66.72	160	156	1200	2800
	110	27	2	2		66.72	160	156	1200	2800
	110	27	2	2	0.5	66.72	160	156	1200	2800
	110	27	2	2	0.5	66.72	160	156	1200	2800
55	120	29	2	2	0.5	68.75	169	166	1100	2400
	120	29	2	2	0.5	68.75	169	166	1100	2400
56	160	60	2	2		77.15	300	360	1000	2200
60	130	62	1.5	1.5		81	230	385		
65	140	33	2.1	2.1	0.5	82.7	212	249	1000	2000
	140	33	2.1	2.1	0.5	82.7	212	249	1000	2000
	140	33	2.1	2.1	0.5	82.7	212	249	1000	2000
70	150	35	2.1	2.1	0.5	90.97	320	272	900	1900
	150	35	2.1	0.3	0.5	90.97	320	272	900	1900
85	120	22	1.1	1.1	1	83.1	98	170	1100	2400
114.3	152.4	51.05	2	1.5		127.05	198	545	900	1900
150	210	36	2	2		163.5	303	540	670	1400
220	300	48	2.1	1.5		282.4	550	985	4800	900
240	320	48	2.1	2.1		285	550	1070	450	850
260	320	28	2	1.1		127.5	270	550	2670	380
	400	104	4	4		153	1570		700	

## Designations

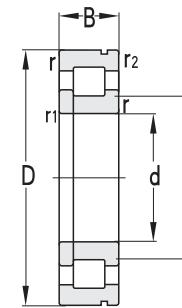
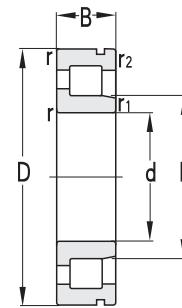
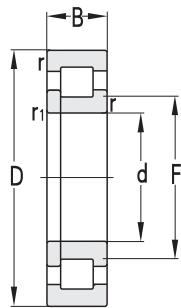
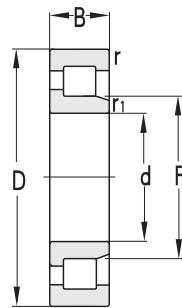
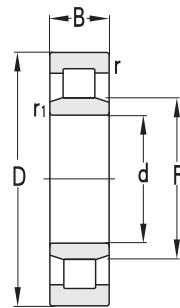
## Weight

	Kg
NUP309ENRV/C3YA6	1.02
NJ2309X2NRV/C3YA6	1.21
NU4010X2V/YAB	0.575
NUP310NV	1.28
NJ310V	1.25
NJ310V/HAC3YA6	1.25
NUP310NRV/HAC3YA6	1.32
NUP311NV	1.63
NUP311NRV	1.69
NUP6/56V	7.29
NUTR60130	4.74
NUP313NV	2.15
NUP313NRV/HAC3YA6	2.59
NUP313NRV/C3	2.59
NUP314NV/HA	2.96
NUP314NV/YA6	2.96
NCF2917V	0.718
NCL6/114.3V/W33X	2.81
NCF2930V	3.89
NCF2944V	9.63
NCF2948V	10.2
NCF1852V	4.52
NCF3052V	44.1

# Full Complement Cylindrical Roller Bearings

**ZWZ**

d 280~600 mm



Principal dimensions				Basic load ratings			Limit speed ratings			
d	D	B	rmin	r1min	r2min	F	Cr	Cor	Grease	Oil
mm										
						KN		r/min		
280	380	60	2.1	2.1		340	825	1690	380	700
300	420	72	3	3		390.5	1090	2155	340	630
	420	72	3	3		390.5	1240	2160	340	630
320	500	74	4	4		462	1420	2380	320	600
340	460	72	3	3		367	1170	2420	320	600
	520	133	5	5		482	2300	4300	270	520
360	480	72	3	3		501	1180	2700	300	560
380	480	46	2.1	1.5		520	650	1370	280	530
	480	56	2.1	1.5		534	840	1890	280	530
	520	82	4	4		484.5	1480	3130	240	480
400	540	82	4	4		511	1600	3400	220	460
420	520	56	1.5	1.5		502	925	2220	240	480
	560	82	4	4		542	1600	3650	240	480
440	540	60	2.1	2.1		560	1020	2550	220	450
	540	60	2.1	2.1		560	1020	2550	220	450
480	600	56	3	3		585	1060	2380	190	400
	600	76	3	3		572	1410	3430	190	400
500	670	100	5	5		670	2380	5300	170	360
530	650	56	3	3		720	1020	2320	180	380
	650	56	3	3		720	1020	2320	180	380
560	750	190	5	5		980	3030	6700	150	320
	820	195	6	6		980	5500	11500	150	320
600	800	118	5	5		953	3100	700	140	300

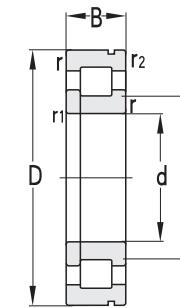
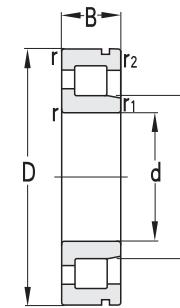
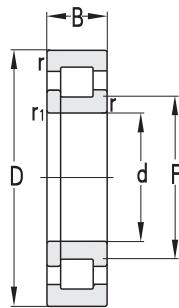
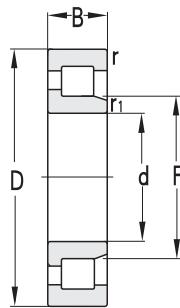
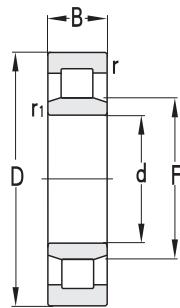
## Designations      Weight

	Kg
NCF2956V	19.8
NCF2960V/C3	31.0
NCF2960V/HC	31.0
NCF1064X1V	52.4
NCF2968V/C3	34.3
NCF3068V/HC	98.6
NCF2972V	36.5
NCF1876V	17.0
NCF1876VY	21.7
NCF2976V	52.9
NCF2980V	52.8
NCF1884VY	25.7
NCF2984V	57.1
FL- NCF2888V	28.9
FL- NCF2888V/HCE	28.9
NCF1896V	32.6
NCF1896VY	45.2
NCF29/500V	97.7
FL- NCF18/530V	33.9
FL- NCF18/530V/HCE	33.9
NCF29/560V	134
NCF30/560V/HC	336
NCF29/600V	163

# Full Complement Cylindrical Roller Bearings

**ZWZ**

d 630~670 mm



## Principal dimensions

d	D	B	rmin	r1min	r2min	F	Basic load ratings		Limit speed ratings	
							KN	r/min	Grease	Oil
<b>mm</b>										
630	850	128	6	6		980	3500	7560	130	280
670	820	69	4	4		1012	1320	3230	130	280
	820	69	4	4		1012	1320	3230	130	280
	900	136	6	6		1024	4000	9500	120	260

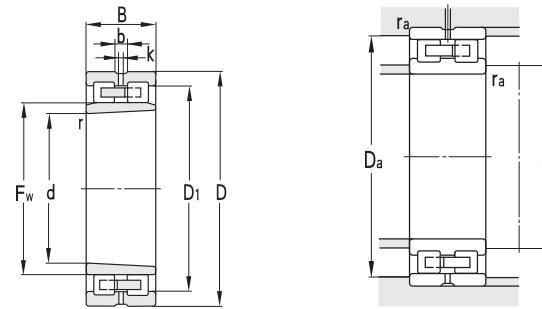
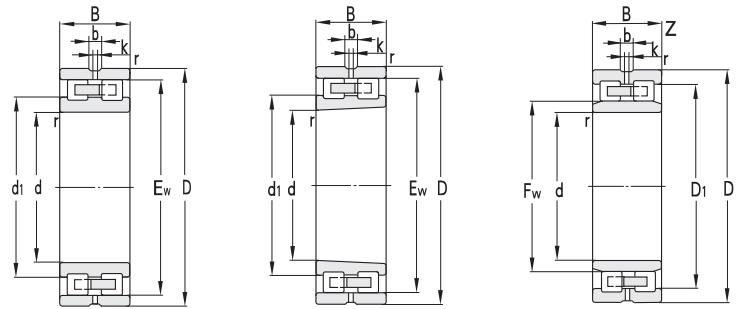
## Designations      Weight

	Kg
NCF29/630V	201
FL- NCF18/670V/HCE	72.2
FL- NCF18/670V	72.2
NCF29/670V	245

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 50~95 mm



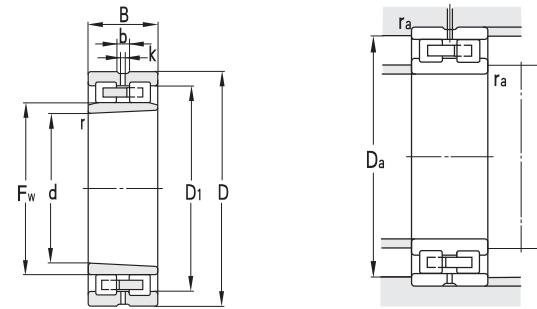
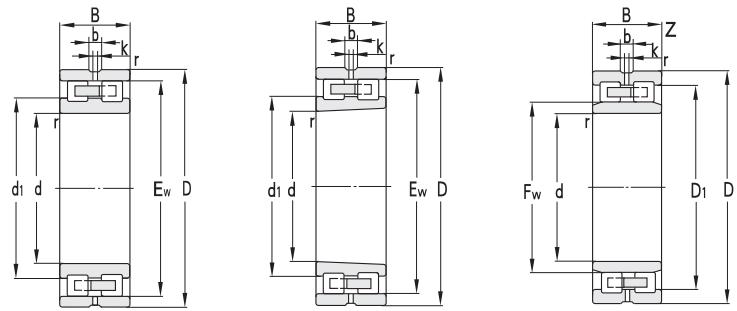
Principal dimensions	d	D	B	r	Basic load ratings		Limit speed ratings			
					Ew, Fw	KN	Cr	Cor	Grease	Oil
mm						KN			r/min	
50	80	23	1	72.5	60.0	85	10000	13000		
	80	23	1	72.5	60.0	84.5	10000	13000		
	130	63	1.5	50	270	320	10000	12000		
60	95	26	1.1	86.1	77.0	114	9000	10000		
	150	73	3.0	60	275	410	9000	10000		
65	160	73	3.0	65	308	460	8500	9500		
75	115	30	1.1	105	106	165	6700	8000		
	115	30	1.1	105	106	165	6700	8000		
80	125	34	1.1	113	130	207	4500	5600		
	125	34	1.1	113	130	207	4500	5600		
	125	34	1.1	113	130	207	6300	7500		
	125	34	1.1	113	130	207	6300	7500		
	125	34	1.1	113	128	207	6300	7500		
	125	34	1.1	113	128	207	6300	7500		
	125	34	1.1	113	128	207	6300	7500		
	150	90	2.0	115	420	640	4700	5800		
85	130	34	1.1	118	135	224	4300	5300		
	130	34	1.1	118	135	224	4300	5300		
90	140	37	1.5	127	147	260	4000	5000		
	140	37	1.5	127	147	260	5600	6700		
	140	37	1.5	127	147	260	5600	6700		
	140	37	1.5	127	147	260	5600	6700		
	140	37	1.5	127	147	260	5600	6700		
	140	37	1.5	127	147	260	5600	6700		
	140	37	1.5	127	147	260	5600	6700		
	140	37	1.5	127	147	260	5600	6700		
95	145	37	1.5	132	135	224	3800	4300		
	145	37	1.5	132	150	246	3800	4300		

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NN3010K/YA8	61.3				55	75	1	0.428
NN3010/YA8	61.3				55	75	1	0.431
NNTR50-2ZL		80			55	122	1	5.09
NN3012K	73.3				66	89	1	0.691
NNTR60-2ZL		97			66	132	1	7.86
NNTR65-2ZL		99.5			73	143	1	8.77
3182115	90.6				81.5	108.5	1	1.14
3182115A	90.6				81.5	108.5	1	1.07
NN3016K/C9	97				86.5	118.5	1	1.50
NN3016K	97				86.5	118.5	1	1.50
NN3016K/YA8	97				86.5	118.5	1	1.50
NN3016K/W33YA8	97		6	2.5	86.5	118.5	1	1.50
NN3016K/C9W33	97	6	2.5		86.6	118.6	1	1.5
NN3016K/C91W33	97	6	2.5		86.6	118.6	1	1.5
NN3016K/W33	97	6	2.5		86.6	118.6	1	1.5
NJ/NJP3216X3M/P54								7.40
NN3017K/YA8	102				91.5	123.5	1	1.63
NN3017K/C9	102				91.5	123.5	1	1.64
NN3018/YA8					98	132	1.5	1.98
NN3018K/YA8					98	132	1.5	1.95
NN3018K/C9					106.5	133.5	1	1.95
NN3018K/YA8W33			6.5	4	98	132	1.5	1.92
NN3018K/C91W33			6.5	4	98	132	1.5	1.92
NN3018K/C92W33			6.5	4	98	132	1.5	1.92
NN3018K/W33			6.5	4	98	132	1.5	1.92
NN3018K/SPC91W33			6.5	4	98	132	1.5	1.92
NN3019K	114.4				103	137	1.5	2.26
NN3019K/W33	114.4				103	137	1.5	2.24

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 100~110 mm



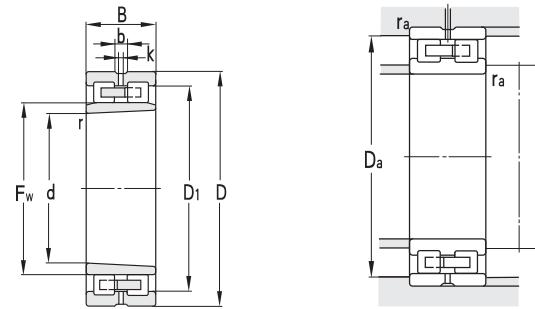
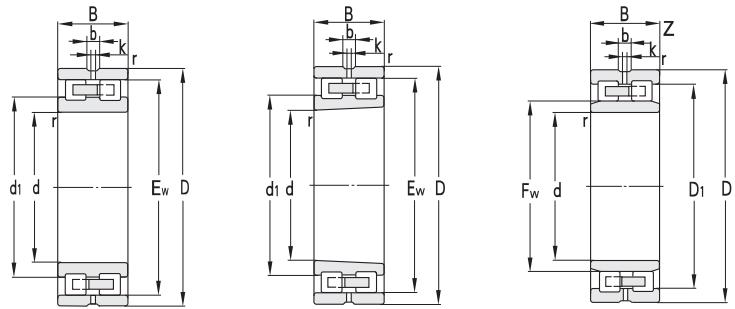
Principal dimensions	d	D	B	r	Basic load ratings		Limit speed ratings	
					Ew, Fw	Cr	Cor	Grease
mm					KN	r/min		
100	150	37	1.5	137	168	292	5300	6300
	150	37	1.5	137	168	292	5300	6300
	150	37	1.5	137	168	292	3600	4500
	150	37	1.5	137	168	292	3600	4500
	150	37	1.5	137	168	292	3600	4500
	150	37	1.5	137	168	292	3600	4500
	150	37	1.5	137	168	292	3600	4500
	150	37	1.5	137	168	292	3600	4500
	150	37	1.5	137	168	292	5300	6300
	150	37	1.5	137	168	292	5300	6300
	150	37	1.5	137	168	292	5300	6300
	150	37	1.5	137	168	292	5300	6300
	150	37	1.5	137	168	292	5300	6300
	150	50	1.5	115	168	292	3600	4500
	150	55	1.5	110	253	480	5300	6000
	150	65	1.5	110	253	480	5300	6000
	240	105	3.0	100	748	1210	4800	5300
	260	113	4.0	185	853	1350	4000	4800
105	160	41	2.0	146	192	350	4000	4800
	160	41	2.0	146	192	350	4000	4800
	160	41	2.0	146	192	350	4000	4800
110	170	45	2.0	155	220	405	5000	6000
	170	45	2.0	155	220	405	3200	4000
	170	45	2.0	155	220	405	3200	4000
	170	45	2.0	155	220	405	3200	4000
	170	45	2.0	155	220	405	3200	4000
	170	45	2.0	155	240	405	3200	4000
	170	45	2.0	155	242	405	3200	4000
	170	45	2.0	155	220	405	3200	4000
	170	45	2.0	155	220	405	3200	4000
	225	150	3.5	138	950	1460	3200	4000

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NN3020K/YA8	119.4				108	142	1.5	2.20
NN3020KTN1	119.4				108	142	1.5	2.09
NN3020	119.4				108	142	1.5	2.25
NN3020K/W33	119.4			6	108	142	1.5	2.17
NN3020K/C9YA8	119.4				108	142	1.5	2.18
NN3020K/YA8W33	119.4		6	2.5	108	142	1.5	2.17
NN3020K/C91W33	119.4		6	2.5	108	142	1.5	2.17
NN3020K/C91	119.4				108	142	1.5	2.20
NN3020K/C92W33	119.4		6	2.5	108	142	1.5	2.17
NN3020K/C1LW33	119.4		6	2.5	108	142	1.5	2.17
NN3020K/C9W33	120		6	4	108	142	1.5	2.17
NN3020K/P49W33YB2	119.4		6	2.5	108	142	1.5	2.20
NN3020K/P49YB2	119.4		6	2.5	108	142	1.5	2.20
NN3020KLM/P49W33YB2	119.4		6	2.5	108	142	1.5	2.08
NN3020K/UPC1W33	120		6	4	108	142	1.5	2.17
NNU4020/YA8	133				108	142	1.5	3.11
NNTR100- 2Z	123.5				108	142	1.5	3.37
NNTR100WB- 2Z	127.5				108	142	1.5	3.42
NNTR100	160.5				108	221	2	27.6
NNTR110- 2ZL	174				108	238	2	35.6
NN3021	125.2				116.5	154	1	2.94
NN3021K	125.2				116.5	154	1	2.93
NN3021K/C9	125.2				116.6	154	1	2.93
NN3022K	132.6				116.5	163	1	3.73
NN3022/YA8	132.6				116.5	163	1	3.74
NN3022KL/P49W33	132.6			12	4	116.5	163	1
NN3022K/P49W33	132.6			12	4	116.5	163	1
NN3022K/SPC91W33	132.6			12	4	116.5	163	1
NN3022K/P49YB2	132.6			12	4	116.5	163	1
NN3022K/W33	132.6			12	4	116.5	163	1
NN3022	132.6							3.71
NN3022KLM/P49YB2	132.6			12	4	116.5	163	1
NNU622Q1/HCYA7	186							3.54

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 120~140 mm



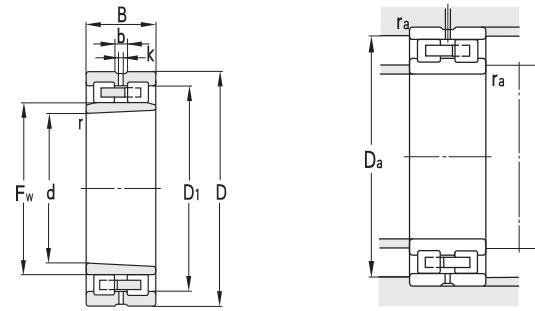
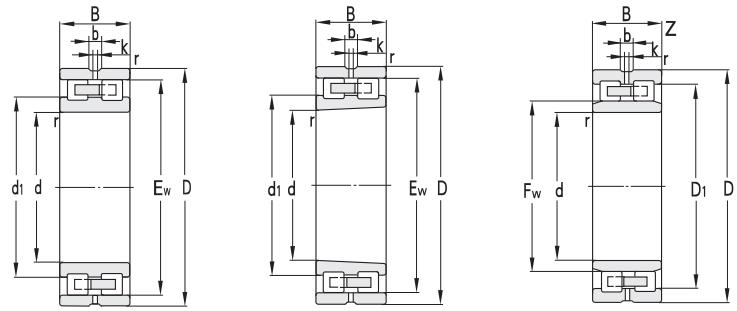
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	B	r	Ew, Fw	Cr	Cor	Grease	Oil
mm								
120	165	45	1.1	165	174	365	3000	38000
	180	46	2.0	165	243	445	4300	5000
	180	46	2.0	165	243	445	4300	5000
	180	46	2.0	165	243	445	3000	3800
	180	46	2.0	165	243	445	3000	3800
	180	46	2.0	165	243	445	3000	3800
	180	46	2.0	165	267	445	3000	3800
	180	46	2.0	165	267	445	3000	3800
	180	46	2.0	165	267	445	3000	3800
	180	46	2.0	165	267	445	3000	3800
	180	46	2.0	160	243	445	3000	3800
	290	133	2.0	143	968	1600	2400	3000
130	200	52	2.0	182	305	530	2800	3600
	200	52	2.0	182	305	530	2800	3600
	200	52	2.0	182	305	530	2800	3600
	200	52	2.0	182	305	530	2800	3600
	200	52	2.0	182	305	530	2800	3600
	200	52	2.0	182	305	530	2800	3600
	200	52	2.0	182	305	530	2800	3600
	200	52	2.0	182	305	530	2800	3600
	200	52	2.0	193.9	305	530	2800	3600
	200	52	2.0	193.9	305	530	2800	3600
	300	172.644	3.0	159.5	1360	2870	1900	2400
139.7	203.2	146.558	2.0	155.5	830	1900	1900	2400
140	190	50	1.5	156	199	405	2800	3400
	190	50	1.5	156	200	405	2800	3400
	210	53	2.0	160	320	575	2600	3400
	210	53	2.0	192	320	575	3800	4500
	210	53	2.0	192	320	575	2600	3400
	210	53	2.0	192	320	575	2600	3400
	210	53	2.0	192	320	575	2600	3400
	210	53	2.0	192	320	575	2600	3400
	210	53	2.0	192	320	575	2600	3400

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NN4924K/P49YB2	142.6		7.5	4	130	171	2	2.90
NN3024K	142.6		7.5	4	130	171	2	3.85
NN3024K/W33	142.6		7.5	4	130	171	2	3.65
NN3024K/C9	142.6		7.5	4	130	171	2	3.85
NN3024K/C1LW33	142.6		7.5	4	130	171	2	3.65
NN3024K/C91W33	142.6		7.5	4	130	171	2	3.65
NN3024K/C92W33	142.6		7.5	4	130	171	2	3.65
NN3024K/P492YB2	142.6		7.5	4	130	171	2	3.85
NN3024KLM/P492YB2	142.6		7.5	4	130	171	2	3.64
NN3024KTN1	142.6		7.5	4	130	171	2	3.64
NN3024	142.6		7.5	4	130	171	2	3.86
NNTR120-2Z	189				130	267	2	50.9
NN3026	156.4							5.54
NN3026K/C9W33	156.4				9.6	3		5.34
NN3026K/C91	156.4							5.34
NN3026K	156.4							5.34
NN3026K/C93	152.6							5.34
NN3026K/P494	152.6							5.34
NN3026K/P494W33	152.6							5.35
NN3026K/W33	152.6				9.6	5		5.35
NN3026K/C92W33	152.6				9.6	5		5.35
NN3026KTN1	152.6				9.6	5		5.22
NNFP3326X3	175				9	139	291	74.7
NNU6/139.7Q1/C9W33YA2	182		8	4	150	200	2	16.4
NNJ4928	172							4.19
NN4928K/P49YB2	172							4.11
NNU3028/C9W33	185.6		9.6	5	149	201	2	6.18
NN3028K	166.4							6.05
NN3028K/C9	166.4							6.05
NN3028KTN1	166.4							5.76
NN3028	166.4							6.05
NN3028K/C91W33	166.4				9.6	5	149	201
NN3028K/W33	166.4				9.6	5	149	201

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 140~170 mm



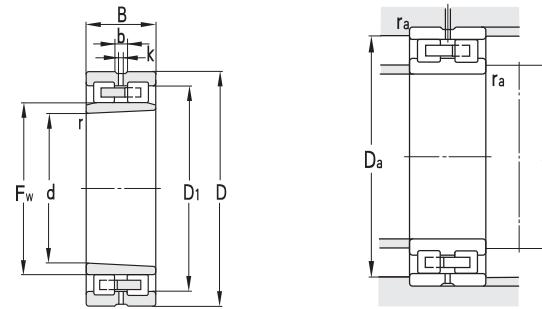
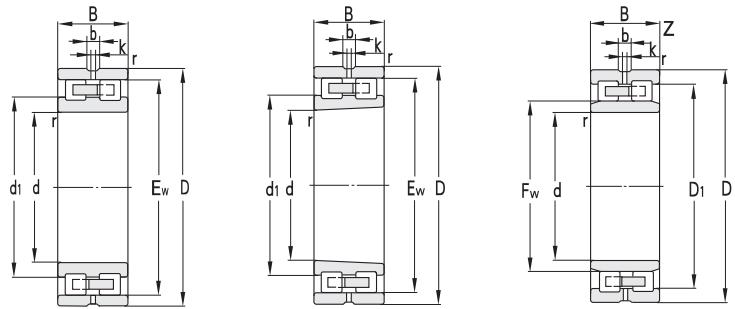
Principal dimensions	d	D	B	r	Basic load ratings		Limit speed ratings	
					Ew, Fw	Cr	Cor	Grease
mm						KN	r/min	
140	210	53	2.0	192	320	575	2600	3400
	250	136	3.0		930	1680	1900	2800
150	225	56	2.1	206	363	650	3400	4000
	225	56	2.1	206	363	650	3400	4000
	225	56	2.1	206	363	650	2400	3200
	225	56	2.1	206	363	650	2400	3200
	225	56	2.1	206	363	650	2400	3200
	225	56	2.1	206	363	650	2400	3200
	225	100	2.0		740	1450	2100	270
	225	56	2.1	206	363	650	2400	3200
	260	180	2.1		1160	2250	1900	2300
158.75	231.775	161.925	2.1	176.5	1020	2390	2200	3000
160	240	60	2.1	219	380	675	3200	3800
	240	60	2.1	219	380	675	3200	3800
	240	60	2.1	219	375	675	3200	3800
	240	60	2.1	219	380	335	3200	3800
	240	60	2.1	219	380	675	2200	3000
	240	60	2.1	219	380	675	2200	3000
	240	60	2.1	219	380	675	2200	3000
	240	60	2.1	219	380	675	2200	3000
	240	60	2.1	219	380	675	2200	3000
	240	60	2.1	219	380	675	2200	3000
	240	109	2.1	219	840	1960	1800	2500
	265	120	3.0	190	1060	1990	1800	2200
	270	170	3.0		1080	1830	1600	2000
	270	175	2.1		1160	2300	1600	2000
	270	176	3.0		1080	1830	1600	2000
170	260	67	2.1	236	470	860	2200	3000
	260	67	2.1	236	470	860	2200	3000
	260	67	2.1	236	470	860	2200	3000
	260	67	2.1	236	470	860	2200	3000
	306	278	2.1	276	1650	2690	1700	2200

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NN3028K/SPC1W33 NUHJ/NJ228EM	166.4		9.6	5	149	201	2	6.00 29.9
NN3030K NN3030/YA8 NN3030 NN3030/C9 NN3030/C9YA8 NN3030K/C91W33 NNCF5030V NN3030K/W33 NN6130X1	178.8 178.8 178.8 178.8 178.8 178.8 178.8 178.8 242		8.5 15.5 8.5 6.5	4.5 4.5 4.5 3.2	161 161 161 161 161 161 161 171	214 214 214 214 214 214 214 232	2 2 2 2 2 2 2 2	7.70 7.75 7.75 7.75 7.75 7.70 13.5 7.70 40.6
NNU6/158X4Q1/W33X		205.5	8.3	4	170	220	2	23.9
NN3032K NN3032K/P494 NN3032K/P494W33 NN3032KTN1 NN3032K/W33 NN3032K/SPC1W33 NN3032K/YB2 NN3032K/C9W33YB2 NN3032 NNCF5032V NNU4132X3/HCYA7W33X NNJ5132X2 NN6132X2 NNUP5132X2	190.2 190.2 190.2 190.2 190.2 190.2 190.2 190.2 190.2 190.2 242		8.5 8.5 8.5 8.5 8.5 11.5 12 11.5	4.5 4.5 4.5 4.5 4.5 3.2 12 3.2	171 171 171 171 171 171 171 171	229 229 229 229 229 232 232 232	2 2 2 2 2 2 2 2	8.39 8.39 8.38 7.86 8.38 8.38 8.39 8.38 8.38 16.7 29 34.0 41.6 33.9
NN3034K NN3034/YA8 NN3034/C9 NN3034K/W33	204 204 204 204		9.6	5	181 181 181 215	249 249 249 287	2 2 2 2	12.9 13.3 12.9 67.2
1- 2029								

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 180~220 mm



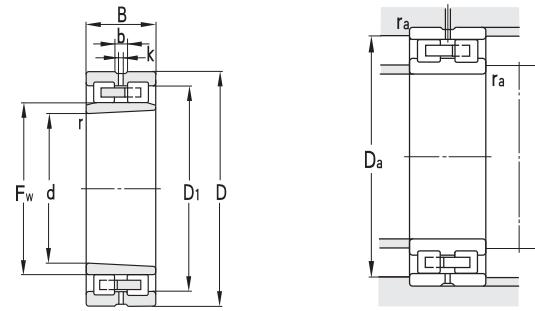
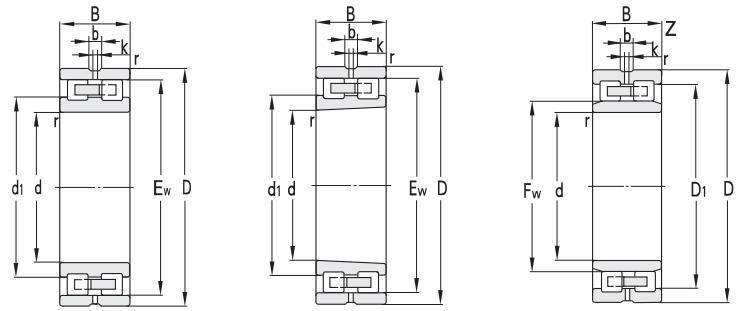
Principal dimensions	d	D	B	r	Basic load ratings		Limit speed ratings	
					Ew, Fw	Cr	Cor	Grease
mm					KN	r/min		
180	250	69	2.3	201	382	703	2000	2800
	250	69	2.3	201	450	950	2000	2800
	250	69	2.3	201	370	700	2000	2800
	260	88	2.0	198	578	1045	2000	2600
	280	74	2.1	255	605	1090	2800	3400
	280	74	2.1	255	605	1090	2800	3400
	280	74	2.1	255	605	1090	2000	2800
190	260	69	3.0	212	616	1250	1900	2600
	260	69	2.0	212	462	905	1900	2600
	290	75	2.1	265	622	1140	2600	3200
	290	75	2.1	265	622	1140	1900	2600
	290	75	2.1	265	622	1140	1900	2600
	290	180	2.1	219	1390	3200	1900	2600
200	280	48	2.1	210	455	895	1900	2400
	280	80	2.1	190	484	1040	1900	2400
	280	80	2.1	190	484	1040	1900	2400
	310	82	2.1	282	675	1340	2400	3000
	310	82	2.1	282	675	1340	1900	2400
	310	82	2.1	282	740	1340	1900	2400
	310	82	2.1	282	675	1340	1900	2400
	310	82	2.1	282	740	1340	1900	2400
	310	150	3.0	230	1480	3200	1900	2400
206.375	285.75	222.25	4.0	226	1460	4500	1800	2200
220	300	40	2.1	280	800	1620	1800	2200
	300	80	2.1	245	530	1200	1800	2200
	300	80	2.1	245	530	1200	1800	2200
	340	160	3.0	220	1750	3650	1800	2200
	340	90	3.0	310	875	1610	1800	2200
	340	90	3.0	310	875	1610	1800	2200
	340	90	3.0	310	795	1610	1800	2200
	340	90	3.0	310	875	1610	1800	2200
	340	90	3.0	310	875	1610	1800	2200

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NNU4936K	228				191	239	2	9.80
NN4936K/P49YAB	228				191	239	2	10.4
NNU4936K/W33	228				191	239	2	9.53
NND5936X3/C4YB4	234.8				191	250	2	14.8
NN3036K	218.2				191	269	2	16.9
NN3036K/W33	218.2		12.2	6	191	269	2	16.9
NN3036	218.2				191	269	2	16.9
NNU4938B-W33	257	9.5	5		201	249	2	11
NNU4938/C4YA4	236				201	249	2	11.0
NN3038K	228.2				201	279	2	17.9
NN3038K/W33	228.2	15	6		201	279	2	17.1
NN3038	228.2				201	279	2	18.0
NNU6038	236				201	279	2	43.6
NCF2940V	236.2	11.5	6		191	269	2	8.91
NNU4940/W33	236.2	8.5	6		191	269	2	15.3
NN4940K/P49YB2	236.2	8.5	6		191	269	2	14.6
NN3040K	242				211	299	2	22.0
NN3040	242				211	299	2	22.1
NN3040K/P494W33	242				211	299	2	21.8
NN3040K/C9	242				211	299	2	22
NN3040K/W33	242	12.2	5		211	299	2	21.8
NNCF5040V	242	23	5		211	299	2	40.7
NNU6/206X4M/C9	259	12.7	8		218	273	3.0	43.9
NNCD4944V	273	12.2	6		231	289	2	16.9
NNU4944/P53W33	273	12.2	6		231	289	2	16.6
NNU4944K/SPC1W33	273	12.2	6		231	289	2	16.6
FL-NNCF5044V/C3	15	4.5	233		327	2.5		53.1
NN3044K	265.2				233	327	2.5	30.1
NN3044K/W33	265.2	15	6		233	327	2.5	30.0
NN3044K/P49W33YB5	265.2	15	6		233	327	2.5	30.7
NN3044	265.2				233	327	2.5	31.0
NN3044/C1W33	265.2	15	6		233	327	2.5	30.9

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 220~300 mm



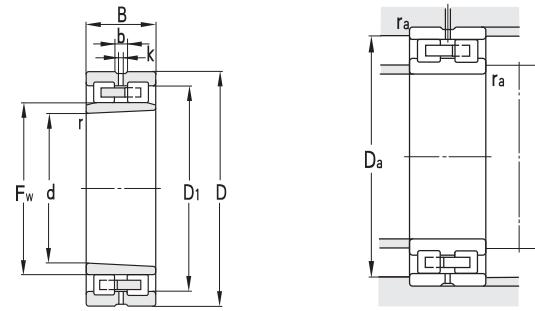
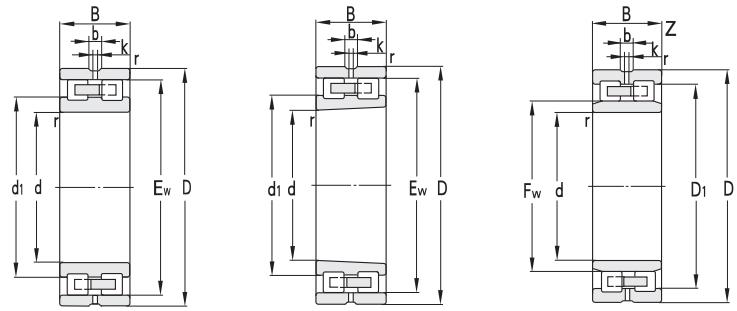
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	B	r	Ew, Fw	Cr	Cor	Grease	Oil
mm								
220	370	120	4.0	270	1070	1860	1200	1500
240	320	80	2.1	265	625	1470	1700	2000
	320	80	2.1	265	625	1470	1700	2000
	320	80	2.1	265	625	1470	1700	2000
	320	80	2.1	265	625	1470	1700	2000
	360	92	3.0	330	885	1690	2000	2600
	360	92	3.0	330	885	1690	1700	2000
	360	92	3.0	330	885	1690	1700	2000
	360	92	3.0	330	885	1690	1700	2000
260	360	80	2.1	292	666	1500	1600	1900
	360	100	2.1	292	760	2030	1400	1700
	360	100	2.1	292	760	2030	1400	1700
	360	100	2.1	292	835	2030	1400	1700
	360	100	2.1	292	760	2030	1400	1700
	360	100	2.1	292	840	2030	1400	1700
	360	115	2.1	292	990	2500	1400	1700
	400	104	4	364	1010	2120	1900	2600
	400	104	4.0	364	1110	2120	1900	2600
	400	104	4.0	364	1110	2120	1900	2600
	400	140	4	295	1570	3000	1150	1300
	440	180	4.0	306	2240	4500	1000	1500
280	380	100	2.1	309	870	2200	1300	1600
	380	100	2.1	309	960	2200	1300	1600
	380	100	2.1	309	960	2200	1300	1600
	380	100	2.1	309	870	2200	1300	1600
	420	106	4.0	384	1170	2290	1800	2200
	420	106	4.0	384	1170	2290	1400	1700
	420	106	4.0	384	1170	2290	1400	1700
	420	106	4.1	384	1170	2290	1400	1700
	460	180	5	326	2500	4700	900	1200
300	420	118	3.0	339	1050	2800	1200	1500
	420	118	3.0	339	1050	2800	1200	1500

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NNU3144	265.2		19	6	233	327	2.5	52.4
NNU4948/P63W33		295	12.2	6	251	309	2	17.8
NNU4948/P53W33	295	12.2	6	251	309	2	17.8	
NNU4948/C3W33	295	12.2	6	251	309	2	17.8	
NNU4948K/SPC1W33	295	12.2	6	251	309	2	17.7	
NN3048K	285.2		253	347	2.5	32.7		
NN3048	285.2		253	347	2.5	31.6		
NN3048/P51W33	285.2	15	6	253	347	2.5	32.6	
NN3048K/SPC1W33	285.2	15	6	253	347	2.5	32.6	
NNU4952X2/C9W33	325	9.5	5	273	347	2.5	28.2	
NNU4952/W33YA4	325	15	6	273	347	2.6	31.7	
NNU4952/W33	325	15	6	273	347	2.7	31.7	
NN4952K/W33	325	15	6	273	347	2.7	30.4	
NN4952K/W33	326	15	6	273	347	2.7	30.4	
NNU4952/W33	326	15	6	273	347	2.7	31.7	
NNU4952/W33YA4-1	326	15	6	273	347	2.7	31.7	
NNU4952X2/W33YAB	326	15	6	273	347	2.7	36.8	
NN3052K/C9W33YB5	312.8	15	6	276	347	3	49.2	
NN3052K/P51W33	312.8	15	6	276	384	3	49.2	
NN3052K	312.8	15	6	276	384	3	49.3	
NNU4052/W33		13.9	7.5	276	384	3	63.4	
NNU4152				276	424	3	111	
NNU4956K/P52W33	358	15	6	291	369	2	27.5	
NNU4956K/W33	387	15	6	291	369	2	27.5	
NN4956K/W33	347	15	6	291	369	2	27.8	
NNU4956		347		291	369	2	29	
NN3056K	332.8	347		296	404	3	49.7	
NN3056	332.8	347		296	404	3	52.3	
NN3056K/W33	332.8	15	6	296	404	3	49.7	
NN3056K/P52W33	332.8	300	440	4	118			
NNU4156								
NNU4960/C3W33	407	17.7	9	314	406	2.5	51.6	
NNU4960/C9				314	406	2.5	52.2	

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 300~420 mm



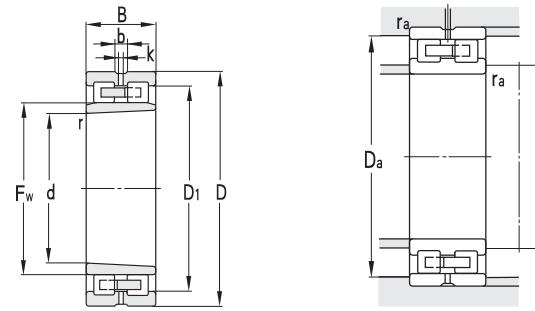
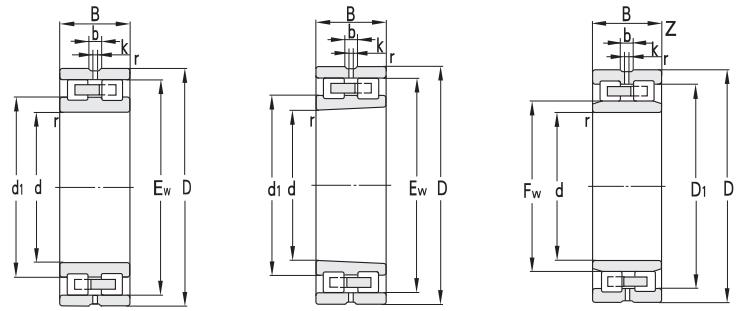
Principal dimensions	d	D	B	r	Basic load ratings		Limit speed ratings	
					Ew, Fw	KN	Cr	Cor
mm							r/min	
300	420	118	3	339	1150	2800	1200	1500
	430	150	4	339	1840	4150	1200	1500
	460	118	4.0	418	1290	2790	1200	1500
	460	118	4.0	418	1290	2790	1200	1500
	460	118	4.0	418	1420	2790	1200	1500
	460	118	4.0	418	1560	2790	1200	1500
	420	118	3.0	339	1150	2800	1200	1500
	500	200	5.0	312	2850	5500	900	1100
320	440	118	3.0	359	1090	3040	1100	1400
	480	121	4.0	438	1360	2910	1100	1400
	480	121	4.0	438	1360	2910	1100	1400
	480	145	3.7	364	1820	3870	1100	1300
340	520	180	5	385	2490	4800	860	1000
	520	133	5	473	1730	3780	900	1050
	520	180	5	436	2600	5500	900	1100
	520	243	5	410	4200	8850	900	1100
	580	243	5	402	4000	7550	780	940
360	480	118	3	510	1190	3500	950	1200
	540	134	5.0	493	1940	3900	900	1100
380	560	135	5.0	515	1800	4100	1300	1500
	620	243	5.0	442	4130	8350	700	850
400	540	140	4	446	1700	4500		
	560	140	4.0	466	1650	4750	850	1000
	600	148	5	549	2360	4750	1150	1300
	600	148	5	549	2360	4750	1150	1300
	620	200	5	469	3450	7500	750	900
	620	220	5	469	3250	7810	750	900
	620	150	5	569	2100	4500	1000	1250
	650	250	6	463	4700	9550	1000	1250
420	560	140	4	446	1810	4750	850	1000

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NN4960K/W33	379				314	406	2.5	52
NNU5960X3/W33YB4	385				314	406	2.5	158
NN3060K/YA8	360.4				316	444	3	76.2
NN3060/YA8	360.4				316	444	3	77.9
NN3060K/W33	360.4				314	444	3	75.5
NN3060K/P51W33YA8	360.4	379	17.7	9	316	444	3	75.8
NNU4960K/W33	360.4	379	17.7	9	314	406	2.5	49.3
NNU4160/HCW33	360.4				314	444	3	158
NNU4964/W33	399				334	426	2.5	54.9
NN3064/W33	377				336	464	3	76.3
NN3064K/P52W33	377				336	464	3	72.8
NNU4064X2/C9W33	424	18	8		336	464	3	93.3
NNU4068/W33X	460		12	6	360	500	4	136
NN3068K/W33	406		16.7	9	360	500	4	99.5
NNU4068/HCW33	406		17.3	9	360	500	4	136
NNCF5068V	406		18.5	9	360	500	4	178
NNU4168	510				360	560	4	267
NNU4972K/C9W33	423				360	500	4	58.5
NN3072K/P52W33	426				380	497	4	105
NN3076K/P52W33	448				400	517	4	110
NNU4176/C9	538				400	580	4	288
NNU4980K/W33	491				416	524	3	90.6
NNU4984K/P52W33	515				436	539	2	141
NN3080K	472				426	580	4	141
NN3080K/W33	472				426	580	4	328
NNU4084/W33	556		16.7	9	440	600	4	93.3
NNU4084X3/HCEW33X	536	12	6		440	600	4	204
NN3084K/W33	497		16.7	9	574	600	4	205
NNU4180					426	624	5	135
NNU4984K/W33	556	12	9		440	600	4	93.3

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 420~460 mm



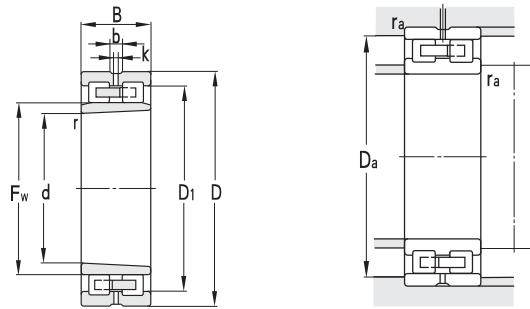
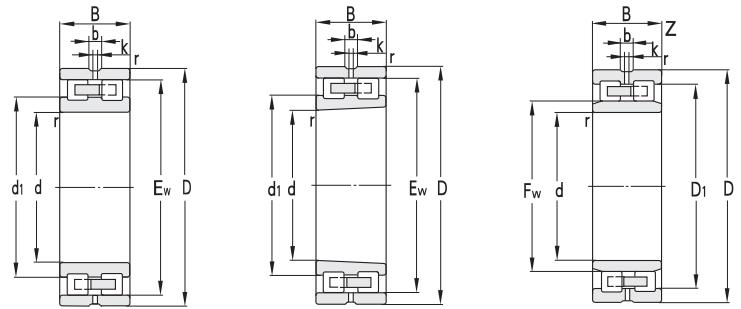
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	B	r	Ew, Fw	Cr	Cor	Grease	Oil
mm								
				KN		r/min		
420	620	200	5	380	3250	7810	750	900
	620	200	3	380	3450	7500	750	900
440	540	100	2.1	471	1000	3000	840	950
	540	100	2.1	471	1000	3000	840	950
	620	225	5		3860	9670	750	850
	640	230	6.0	482	4790	10400	700	850
	650	157	6		2540	5250	1000	1200
	650	212	6	487	3850	8250	700	850
	650	212	6	487	3850	8250	700	850
	720	280	6	511	5650	11500	600	700
	720	280	6	511	5650	11500	600	700
	580	118	3	497	1150	3250	840	950
	580	118	3	497	1150	3250	840	950
	620	160	4	510	2000	5400	800	900
	620	160	4	510	2000	5400	800	900
	680	163	6.0	624	2600	6200	1000	1200
	680	163	6	624	2500	5500	950	1150
	680	218	6	513	4250	9300	650	780
	680	218	6	513	4250	9300	650	780
	760	300	7.5	537	6350	13000	550	650
	760	300	7.5	537	6350	13000	550	650
	650	170	5	534	2300	6150	720	880
	650	170	5	534	2300	6150	720	880
	700	165	6	644	2500	5800	930	1000
	700	165	6	644	2500	5800	930	1000
	700	218	6	533	4200	9600	620	720
	700	218	6	533	4200	9600	620	720
	790	308	7.5	557	7000	14400	500	600
	790	308	7.5	557	7000	14400	500	600
457.2	660.4	203.2	6	510	3550	8300	670	800
460	620	160	4	510	2100	5900	800	950

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg	
	d1	D1	b	k	da(min)	Da(max)	ra(max)		
NNU4084X3/HCW33	556	16.7	9	440	600	4	205		
NNU4084/W33TYA6	556	16.7	9	440	600	4	204		
NNU4888K/W33	505	16.7	9	448	529	2	49		
NNU4888/W33	505	16.7	9	448	529	2	49		
NNP4088X3/HCW33X-1	602	16.7	7.5	466	614	5	221		
NNP4088X3/W33	602	16.7	7.5	466	614	5	256		
NN3088K/W33	582	76.7	12	466	624	5	172		
NNU4088/W33	582	22.3	12	466	624	5	214		
NNU4088K/W33	582	22.3	12	466	624	5	214		
NNU4188K30M/W33	638	22.3	12	466	694	5	452		
NNU4188/W33	638	22.3	12	466	694	5	452		
NNU4892K/W33	537	16.7	9	474	566	2.5	75		
NNU4892/W33	537	16.7	9	474	566	2.5	75		
NNU4992/W33	537	16.7	9	476	604	3	132		
NNU4992K/W33	565	16.7	9	476	604	3	128		
NN3092K/P52W33	565	20.5	12	486	627	5	198		
NN3092K/W33	544	22.3	12	627	654	5	185		
NNU4092/W33	544	614	22.3	12	486	654	5	238	
NNU4092K/W33	614	22.3	12	486	654	5	235		
NNU4192K30	672	493	727	6	533	6	533		
NNU4192	672	493	727	6	535	6	535		
NNU4996/W33	592	22.3	12	500	630	4	150		
NNU4996K/W33	592	22.3	12	500	630	4	148		
NN3096/W33	564	22.3	12	648	674	5	198		
NN3096K/W33	564	22.3	12	648	674	5	192		
NNU4096/W33	634	22.3	12	506	674	5	272		
NNU4096/W33	634	22.3	12	506	674	5	265		
NNU4196/W33	701	22.3	12	513	757	6	591		
NNU4196K/W33	701	22.3	12	513	757	6	585		
NNU6/457.2WB/HCC9W33X 585	22.3	12	648	674	5	244			
NNU4992/W33								144	

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 460~560 mm



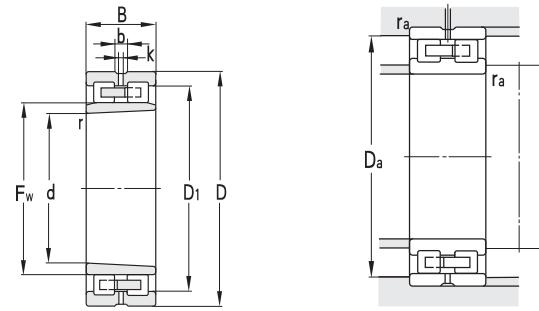
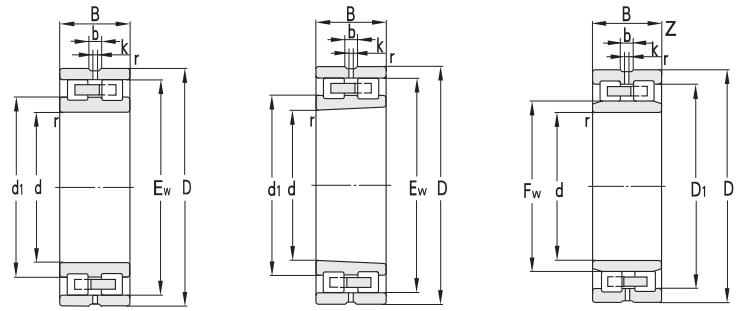
Principal dimensions	d	D	B	r	Basic load ratings		Limit speed ratings	
					Ew, Fw	Cr	Cor	Grease
mm					KN	r/min		
460	680	163	6	501	2600	6200	1000	1200
	680	163	6	501	2850	6200	1000	1200
	680	163	6	501	2600	6200	1000	1200
	680	218	6	501	3930	8860	1000	1200
480	720	200	3	600	4000	8650	950	1100
500	670	160	5.0	554	2450	6800	750	1000
	670	170	5	554	2330	6100	750	1000
	670	170	5	554	2330	6100	750	1000
	670	450	5	515	3300	8700		
	720	167	6	664	2650	5800	950	1100
	720	167	6	664	2650	5800	950	1100
	720	218	6	553	4450	10500	620	740
	720	218	6	553	4450	10500	620	740
	730	305	6.0	676	6200	15100	600	700
	830	325	7.5	582	7400	14500	580	700
	830	325	7.5	582	7400	14500	580	700
530	710	106	5.0	610	2220	5900	850	1000
	710	180	5.0	588	2930	7450	700	950
	710	180	5.0	588	2930	7450	700	950
	780	185	6	715	3250	7250	880	980
	780	185	6	715	3250	7250	880	980
	780	225	5	688	4400	10200	1000	1100
	780	250	6	591	5400	12100	550	650
	780	250	6	591	5400	12100	550	650
	870	335	7.5	618	7750	15500	460	550
	870	335	7.5	618	7750	15500	460	550
560	750	190	5.0	623	3210	8950	630	750
	750	190	5.0	623	3210	8950	630	750
	750	190	5.0	623	3210	8950	630	750
	820	195	6.0	755	3720	8170	600	850
	820	195	6.0	755	3720	8150	600	850
	820	258	6.0	732	5900	14000	530	630

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NN3092/SPYB5	614	9.5	12	486	654	5	200	
NN3092K/W33	614	9.5	12	486	654	5	198	
NNU3092/W33	614	9.5	12	486	654	5	208	
NNU4092/W33	614	11.5	12	486	654	5	281	
NNU3096X3/W33TYA6	612	11.5	12	520	650	4	285	
NNU49/500X2F1/YA34	612			520	650	4	174	
NNU49/500F1/W33X	612	22.3	12	520	650	4	178	
NNU49/500K/W33X	612	22.3	12	520	650	4	178	
ND69/500X2D/DR-SY	612	22.3	12	520	650	4	402	
NN30/500/W33	584	22.3	12	668	694	5	210	
NN30/500/W33	584	22.3	12	668	694	5	205	
NNU40/500/W33	654	22.3	12	526	694	5	285	
NNU40/500K/W33	654	22.3	12	526	694	5	282	
NNP6/500/HCP63W33YB5	556	658	22.3	12	526	704	5	435
NNU41/500/W33	734	22.3	12	533	797	6	705	
NNU41/500/W33	734	22.3	12	533	797	6	499	
NN39/530K/W33	649	15.5	6	550	690	4	151	
NNU49/530/HCW33	649	17.7	6	550	690	4	203	
NNU49/530K/W33	649	17.7	6	550	690	4	203	
NN30/530/W33	625	22.3	12	720	754	5	262	
NN30/530K/W33	625	22.3	12	720	754	5	258	
NNU6/530/HCW33	625	25.3	12	720	754	5	366	
NNU40/530/W33	706	22.3	12	556	754	5	415	
NNU40/530K/W33	706	22.3	12	556	754	5	410	
NNU41/530K30/W33	770	22.3	12	563	837	6	788	
NNU41/530/W33	770	22.3	12	563	837	6	788	
NNU49/560/W33	689	22.3	12	580	730	4	245	
NNU49/560K/W33	689	22.3	12	580	730	4	235	
NNU49/560K/W33X	689	22.3	12	580	730	4	235	
NN30/560K	658.4			590	790	6	337	
NN30/560K/P5W33	658.4	22.3	12	590	790	6	336	
NNU40/560/W33	658.4	22.3	12	590	790	6	468	

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 560~710 mm



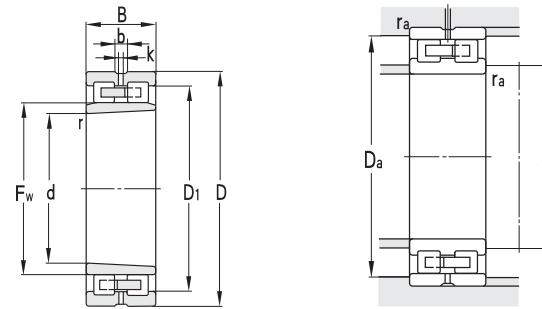
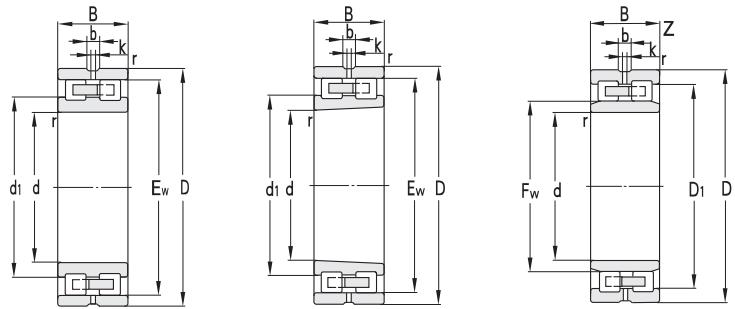
Principal dimensions	d	D	B	r	Basic load ratings		Limit speed ratings	
					Ew, Fw	Cr	Cor	Grease
mm					KN	r/min		
560	750	190	5.0	693	2690	7900	630	750
	750	190	5.0	693	2690	7900	630	750
	750	190	5.0	693	3200	8950	630	750
	820	258	6.0	626	5900	14000	530	630
	920	355	7.5	737	8550	18200	500	600
	920	355	7.5	737	8550	18200	500	600
600	800	200	5.0	666	3700	11400	560	670
	820	200	6	631	9750	35000	560	670
	870	200	6.0	805	4460	9850	600	800
	870	200	6.0	805	4460	9850	600	800
	870	272	6	764	7690	15900		
	980	375	7.5	699	9800	21000	380	450
	980	375	7.5	699	9800	21000	380	450
	980	375	7.5	699	9800	21000	380	450
630	780	150	4.0	738	2270	6900	500	600
	850	218	6	742	3360	11000	530	630
	920	212	7.5	850	5050	11300	700	800
	920	212	7.5	850	4350	10600	550	750
	920	212	7.5	850	4350	10600	550	750
670	900	230	6.0	738	4900	12500	500	600
	900	230	6.0	738	4750	13300	500	600
	980	230	7.5	760	4980	11300	670	750
	980	308	7.5	260	8470	20000	480	560
	980	230	7.5	230	4980	11300		
690	980	365	7.5	759	9950	26100	560	670
	980	365	6	759	9950	26100	560	670
710	950	243	6.0	770	5730	15200	450	530
	950	240	6.0	768	5250	15000	450	530
	950	243	6.0	782	5730	16500	450	530
	1030	236	7.5	951	5500	12500	580	650
	1030	315	7.5	784	9000	21500	380	450
	1150	438	9.5	820	12800	28000	310	370

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg	
	d1	D1	b	k	da(min)	Da(max)	ra(max)		
NN49/560K/P51W33	632		23.5	12	580	730	4	233	
NN49/560K/W33	632		23.5	12	580	730	4	233	
NNU49/560K/W33	632		23.5	12	580	730	4	235	
NNU40/560/P63W33YB5	732		22.3	12	590	790	6	468	
NNU41/560/W33	632		23.5	12	580	730	4	944	
NNU41/560/HCRW33	632		23.5	12	580	730	4	944	
NNU49/600/P63W33YB5	737		22.3	12	620	780	4	282	
NNU49/600/W33X	737		22.3	12	620	780	4	282	
NN30/600KF1/YA8	701		15	8	630	840	6	384	
NN30/600F1/YA8	701		15	8	630	840	6	403	
FL-240/600/W33								550	
NNU41/600/HCW33	864		22.3	12	634	946	6	1123	
NNU41/600/W33	864		22.3	12	634	946	6	1123	
NNU41/600/HCRW33	864		22.3	12	634	946	6	1123	
NN48/630K/P51W33	686		20.5	8	650	760	4	161	
NNU49/630K/C9W33	686		20.5	8	650	760	4	372	
NN30/630/P4W33YB5	686		20.5	8	650	760	4	462	
NN30/630KF1/YA8	738		15	8	660	890	6	438	
NN30/630F1/YA8	738		15	8	660	890	6	460	
NNU49/670/C3		822				696	870	5	424
NNU49/670/W33		872				704	907	6	424
NNU49/670		872				704	907	6	594
NN40/670K/P4W33YB5		872				704	907	6	773
FL-NNU30/670/W33X		872				704	907	6	594
NNU6/690/HCEC9W33YB2	881		30	15	724	940	6	912	
NNU6/690/HCC9W33YB2	881		30	15	724	940	6	912	
NNP49/710/C9YA57	890					736	896	5	493
NNU49/710/HCW33	890		30	15	736	896	5	492	
NNP49/710/C9YA7	878					736	896	5	512
NN30/710/W33	831		22.3	12	744	957	6	595	
NNU40/710/W33	937		22.3	12	744	996	6	858	
NNU41/710/W33	1024		22.3	12	750	1110	8	1800	

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 710~950 mm



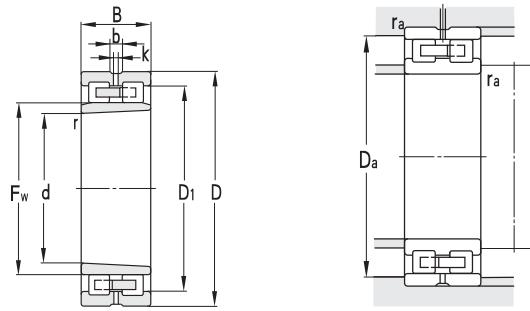
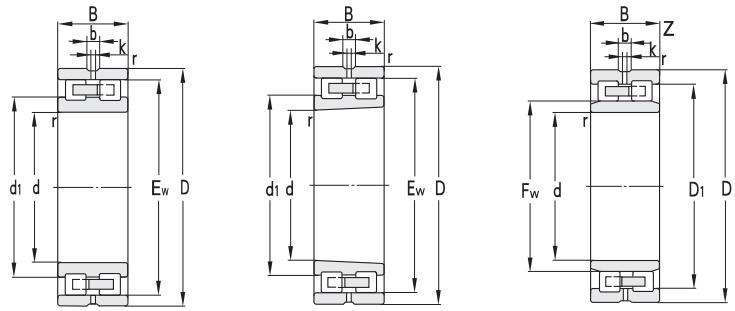
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	B	r	Ew, Fw	Cr	Cor	Grease	Oil
mm								
710	870	180	4	823	2600	8500	480	550
750	920	170	5	879	3550	10000	460	530
	1000	250	8	831	5050	16000	420	480
	1000	250	6	831	5400	15800	420	480
	1090	250	7.5	1013	6800	15000	550	600
	1090	250	7.5	1007	7050	16000	550	620
	1090	335	7.5	830	10000	23500	350	420
	1220	475	9.5	871	16000	35600	280	350
800	1060	258	6	884	5800	16500	360	440
	1060	258	6	884	5700	16900	380	450
	1150	258	7.5	1065	7500	17500	510	580
	1150	258	7.5	1065	7500	17500	510	580
	1150	345	7.5	885	10500	26500	330	380
	1280	475	9.5	921	15500	36000	270	325
850	1120	272	6	939	5650	17500	350	420
	1220	272	7.5	1130	7800	18000	470	520
	1220	272	7.5	1130	7800	18000	470	520
	1220	365	7.5	940	11000	28000	290	350
	1360	500	12	976	19000	44500	230	285
900	1180	280	6	986	6300	19000	330	380
	1280	280	7.5	1185	7920	19000	310	370
	1280	375	7.5	990	12500	31000	275	330
	1420	515	12	1032	20500	47000	210	270
	1420	515	12	1032	20500	47000	210	270
950	1250	300	7.5	1046	7050	22300	410	460
	1360	300	7.5	1255	8750	22500	390	440
	1360	300	7.5	1255	8750	22500	390	440
	1360	300	7.5	1255	9200	22400	390	440
	1360	412	7.5	1050	13500	35000	250	315
	1500	545	12	1092	24500	56500	195	250

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NN48/710X2K	771.8							
NN48/750K30/W33	811		22.3	12	770	887	4	235
NNU49/750/W33X		918			776	974	5	570
NNU49/750		918			776	974	5	535
NN30/750/W33	877		22.3	12	784	1011	6	700
NN30/750/P63W33YB5		22.3	12			6	767	
NNU40/750/W33	991	22.3	12	784	1000	6	924	
NNU41/750/W33	1083	22.3	12	790	1180	8	2240	
NNU49/800/W33X		974	22.3	12	826	1034	5	614
NNU49/800K/W33		974	22.3	12	826	1034	5	639
NN30/800K/W33	929		22.3	12	833	1071	6	750
NN30/800/W33	929		22.3	12	833	1071	6	785
NNU40/800/W33		1046	22.3	12	833	1117	6	1150
NNU41/800/W33		1141	22.3	12	840	1240	8	2380
NNU49/850/W33X		1029	22.3	12	876	1094	5	715
NN30/850/W33	986		22.3	12	883	1187	6	935
NN30/850K/W33	986		22.3	12	883	1187	6	930
NNU40/850/W33		1110	22.3	12	883	1187	6	1350
NNU41/850/W33		1213	22.3	12	897	1334	10	2890
NNU49/900/W33X		1082	22.3	12	926	1154	5	843
NN30/900/W33		1185	22.3	12	933	1191	6	1050
NNU40/900/W33	990		22.3	12	933	1257	6	1510
NNU41/900/W33	1032		22.3	12	947	1394	10	3160
NNU41/900K/W33	1032		22.3	12	947	1394	10	3160
NNU49/950/W33X		1149	22.3	12	983	1217	6	958
NN30/950/W33	1103		22.3	12	983	1263	6	1300
NN30/950K/W33	1103		22.3	12	983	1263	6	1300
NN30/950K/C9W33	1103		22.3	12	983	1263	6	1374
NNU40/950/W33		1237	22.3	12	983	1327	6	1890
NNU41/950/W33		1338	22.3	12	997	1474	10	3850

# Double-row Cylindrical Roller Bearings

**ZWZ**

d 1000~1500 mm



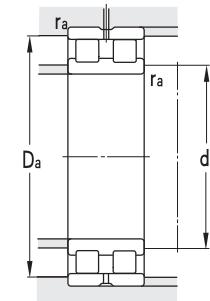
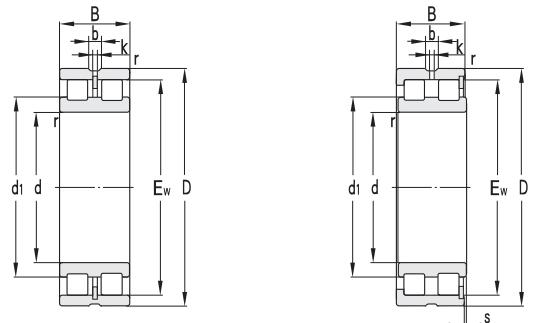
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	B	r	Ew, Fw	Cr	Cor	Grease	Oil
mm								
mm				KN		r/min		
1000	1320	315	7.5	1238	8500	26000	380	440
	1320	315	7.5	1103	8500	26000	380	440
1420	308	7.5	1316	10000	24600	370	420	
1420	412	7.5	1101	15000	38000	230	290	
1580	580	12	1154	27200	62500	190	250	
1060	1400	335	7.5	1160	10000	30600	350	380
	1400	335	7.5	1160	10000	30600	350	380
1500	325	9.5	1391	10500	37500	350	380	
1500	325	9.5	1391	10500	37500	350	380	
1660	600	15	1214	29000	69400	175	210	
1660	600	15	1214	29000	69400	175	210	
1120	1460	335	7.5	1220	10000	31500	330	370
1460	335	7.5	1220	10000	31500	330	370	
1750	630	15	1279	33500	76600	165	190	
1750	630	15	1279	33500	76600	165	190	
1180	1540	355	7.5	1285	11500	35500	310	350
1540	355	7.5	1285	11500	35500	310	350	
1850	670	15	1350	35500	83500	150	185	
1850	670	15	1350	35500	83500	150	185	
1250	1950	710	15	1426	41500	98500	120	160
	1950	710	15	1426	41500	98500	120	160
1320	1720	400	7.5	1620	13200	42500	260	300
	1720	400	7.5	1620	13200	42500	260	300
1720	400	7.5	1442	13500	42500	260	300	
1720	400	7.5	1442	13500	42500	260	300	
2060	750	15	1507	45600	106000	130	150	
2060	750	15	1507	45600	106000	130	150	
1400	2180	775	19	1598	49500	117000	90	120
	2180	775	19	1598	49500	117000	90	120
1500	2300	800	19	1709	52500	132000	85	110

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight Kg
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NN49/1000	1124		22.3	12	1249	1287	6	1210
NNU49/1000/W33X	1212	22.3	12	1033	1287	6	1250	
NN30/1000/W33	1156	22.3	12	1324	1387	6	1385	
NN40/1000/W33	1296	22.3	12	1033	1387	6	1985	
NNU41/1000K30/W33	1408	22.3	12	1047	1474	10	4250	
NNU49/1060/W33	1288	22.3	12	1093	1367	6	1360	
NNU49/1060K/W33	1288	22.3	12	1093	1367	6	1360	
NN30/1060/W33	1223	22.3	12	1100	1399	8	1650	
NN30/1060K/W33	1223	22.3	12	1100	1399	8	1650	
NNU41/1060/W33	1485	22.3	12	1116	1627	12	5075	
NNU41/1060K/W33	1485	22.3	12	1116	1627	12	5075	
NNU49/1120/W33	1348	22.3	12	1153	1427	6	1440	
NNU49/1120K/W33	1348	22.3	12	1153	1427	6	1440	
NNU41/1120/W33	1567	22.3	12	1176	1717	12	5570	
NNU41/1120K30/W33	1567	22.3	12	1176	1717	12	5570	
NNU49/1180/W33	1421	22.3	12	1213	1507	6	1660	
NNU49/1180K30/W33	1421	22.3	12	1213	1507	6	1660	
NNU41/1180/W33	1655	22.3	12	1227	1817	6	7200	
NNU41/1180K/W33	1655	22.3	12	1227	1817	6	7200	
NNU41/1250/W33	1748	22.3	12	1297	1917	12	8000	
NNU41/1250K30/W33	1748	22.3	12	1297	1917	12	8000	
NN49/1320/W33	1468	22.3	12	1353	1640	6	3040	
NN49/1320K/W33	1468	22.3	12	1353	1640	6	3040	
NNU49/1320/W33	1592	22.3	12	1353	1687	6	3100	
NNU49/1320K/W33	1592	22.3	12	1353	1687	6	3100	
NNU41/1320/W33	1846	22.3	12	1367	2027	6	9450	
NNU41/1320K/W33	1846	22.3	12	1367	2027	6	9450	
NNU41/1400/W33	1954	22.3	12	1470	2140	8	10700	
NNU41/1400K30/W33	1954	22.3	12	1470	2140	8	10700	
NNU41/1500/W33	2065	22.3	12	1570	2260	8	12300	

# Double Row Full Complement Cylindrical Roller Bearings

**ZWZ**

d 40~160 mm



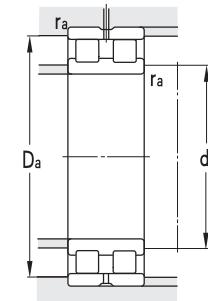
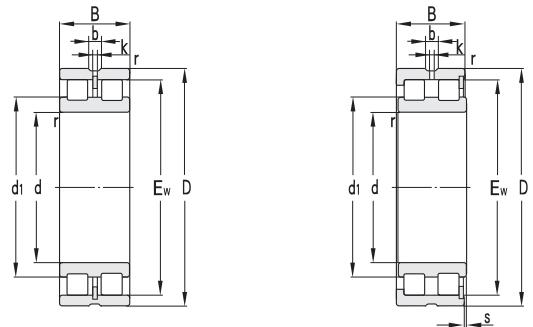
Principal dimensions				Basic load ratings		Limit speed ratings			
d	D	B	r	Ew, Fw	Cr	Cor	Grease	Oil	
				KN		r/min			
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
40	68	38	0.6	60.8	86.0	129	2000		
	68	38	0.6	60.8	86.0	129	2000		
	68	38	1.0	60.8	86.0	129	2000		
56	160	60	1.5		275	380			
	160	63	5		275	380			
65	150	52	2.0		235	375			
70	110	54	0.6	100	190	325	1200		
80	190	75	1.5		240	390			
	190	75	1.5		240	390			
85	130	60	1.1	121.4	308	510	1100	2400	
89	125	58	1.1	97.22	191	375	1100	2400	
90	125	58	1.1	97.22	191	375	1000	2200	
	140	67	1.5	130	385	660	900	1900	
100	150	67	1.0	138	320	590	850		
110	170	80	2.0	154.5	400	805	750	1900	
	170	80	1.5	154	380	790	750		
	260	110	1	132	1010	1500	700	1500	
120	180	80	0.6	164	445	885	700		
130	200	94	1.0	185.2	540	1000	680		
140	210	95	2.0	195.5	700	1380	650		
160	220	60	2.0	405	935				
	240	109	0.6	222.6	835	1680	630	1300	
	240	109	1.1	222.6	835	1680	630		

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
	mm			mm	mm	mm	mm	Kg
NNF5008V	50.3				44	63	0.6	0.553
NNF5008- 2LSV	50.3				44	63	0.6	0.553
NNCF5008V	50.3	57.3	7	3	44	63	1.0	0.553
NUTR56160	62				60	145	1.2	7.87
NUTR56160/YA7	62				60	145	1.2	7.76
NUTR65150	72				70	138	1.0	5.26
NNF5014- 2LSNV	85				75	105	0.6	1.85
NUTR616- 2RS/C9	91				87	183	1.0	13.2
NUTR616- 2RS/C9YAD	91				87	183	1.0	18
NNCF5017V/W33	99.5		4	2	91.5	123.5	1.0	2.73
NUCL6/89V/YA3DF		111.6			96.5	118.5	1.0	1.87
NUCL3918X2V/YA3DF		111.6			106.5	114	1.0	1.81
NNCF5018V	106.5				106.5	133.5	1.0	3.68
NNF5020- 2RSV	118				106	145	1.0	3.99
NNCF5022V		130			116.5	164	1.0	6.49
NNF5022- 2LSV		131			117	165	1.5	6.93
NNFPL2422X3V/HAP59		184			116.5	238	1	34
NNF5024- 2LSNV	141				127	175	0.6	7.41
NNF5026- 2LSNRV	158				137	195	1.0	11.1
NNCF5028V	164.5	188.9			147	205	2.0	11.3
NNF4932V		191			167	235	1.0	7.08
NNF5032- 2LSNRV		191			167	235	0.6	18.8
NNF5032- 2LSNRV/YB2		191			167	235	1.0	18.4

# Double Row Full Complement Cylindrical Roller Bearings

**ZWZ**

d 170~600 mm



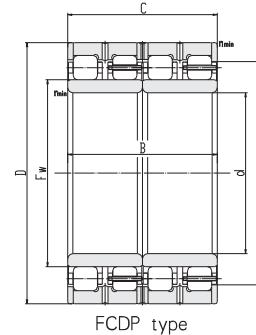
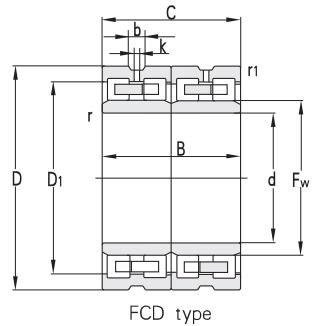
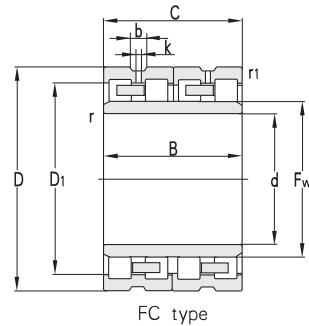
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	B	r	Ew, Fw	Cr	Cor	Grease	Oil
mm								
mm				KN		r/min		
170	260	122	2.1	239	1010	1060	2120	
	260	122	2.1	239	1010	1060	2120	
	260	122	0.6	239	1010	1990	580	
	260	122	0.6	239	1010	1990	580	
180	250	69	2		580	1310		
	280	74	2.1		790	1420	450	
	280	135	0.6	254	1140	2380	560	1100
	280	135	2.1	254	1140	2380	560	
200	280	48	2.1		455	895		
220	330	80	2.1	276.8	695	1620	500	950
240	320	80	2.1	299.8	765	1880	450	850
	360	159	1		1580	3850	340	
260	400	190	4		2750	5500		
	400	189	1.1		2180	4800		
300	420	118	3.0	390.2	1460	3300	340	630
380	540	260	4.0	508	4000	8000	120	260
400	600	272	5.0		5700	11700		
420	520	100	2.1	493	2090	4200	220	450
460	580	118	3.0	544	2870	5500	220	450
480	600	118	3.0	567	3100	5750	200	430
560	820	400	6.0	771	8300	19600	150	300
600	870	272	6.0		6970	17000		

Designations	Other dimensions mm				Contact surface and chamfer dimensions mm			Weight
	d1	D1	b	k	da(min)	Da(max)	ra(max)	
NNCF5034V					177	255	0.6	21.4
FL- NNCF5034V/C3					177	255	0.6	21.4
NNF5034- 2RSV					177	255	0.6	23.5
NNF5034- 2RSNV					177	255	0.6	23.5
NNCL4936V					191	269	2.0	10.4
NCF3036V					191	269	2.0	16.9
NNF5036- 2LSNRV					191	269	0.6	33.3
NNF5036- 2LSV					191	269	2.0	32.5
NCF2940V					191	269	2.0	8.91
NNCF4944V/C3					231	319	2.0	16.8
NNC4948V/C3					251	309	2.0	18.3
NNF5048- 2LSNRV					251	346	2.0	60.7
NNCF5052V					272	383	2.0	83.9
NNF5052- 2LSNRV					272	383	2.0	92.4
NNCF4960V/C3					314	406	2.5	49.3
NNCL5076X3V/HCC9T					396	524	3.0	154
NNCL5080V/HC					411	588	3.0	266
NNCL4884V/C9W33X	10		10	8	428	509	2.0	48.4
NNCS4892V/W33	20.5		20.5	12	474	560	2.5	75.5
NNCS4896V/W33	20.5		20.5	12	500	588	2.5	78.4
NNCL50/560X2V/HCC9T					590	790	5.0	578
NNCL40/600V/HC					612	853	3.0	509

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 90~150 mm



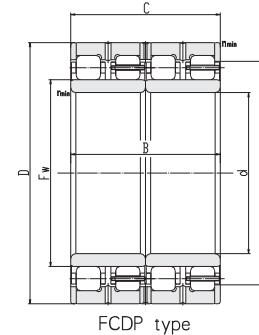
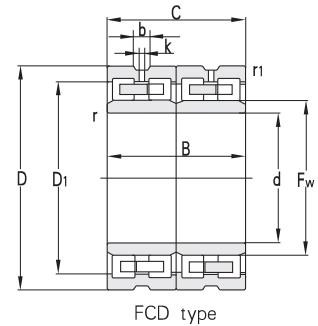
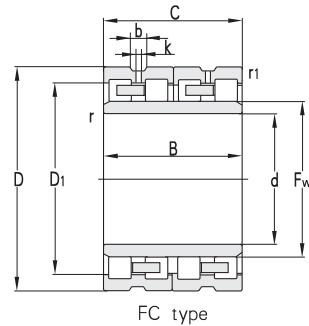
Principal dimensions							Basic load ratings		
d	D	B	C	rmin	r1min	Fw	Cr	Cor	
<b>mm</b>							<b>KN</b>		
90	140	70	70	1.5	1.1	105	253	425	
	140	70	70	1.1	1.5	105	275	425	
100	140	70	70	1.5	1.1	111	209	435	
	140	70	70	1.5	1.1	111	228	435	
	140	70	70	1.1	1.5	111	209	435	
	140	104	104	1.5	1.1	111	330	775	
	140	104	104	1.1	1.5	111	396	870	
	140	104	104	1.5	1.1	111	360	870	
	150	106	106	1.1	1.5	113	425	890	
110	170	120	120	2	2	127	583	1110	
	170	120	120	2	2	127	534	1110	
120	180	105	105	2	2	135	413	770	
	180	105	105	2	2	135	561	1100	
130	200	125	125	2	2	149	583	1200	
	200	125	125	2	2	149	638	1200	
140	210	125	125	2	2	158	594	1160	
	210	125	125	2	2	158	594	1050	
	210	155	155	2	2	166	693	1610	
145	210	155	155	1.1	1.1	166	752	1610	
	210	155	155	2	2	166	752	1610	
	210	155	155	2	2	166	754	1800	
	225	156	78	2	2	169	913	1800	
	225	156	78	2	2	169	913	1800	
150	225	120	120	2	2	169	710	1450	
	225	120	120	2	2	169	710	1450	
	225	120	60	2	2	169	809	1620	
	225	120	120	2	2	169	781	1450	
	230	156	156	2	2	174	852	1790	
	230	156	156	2	2	174	1010	2090	

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
<b>mm</b>				<b>Kg</b>
FC182870	123	6.5	4	3.78
FC182870A	122.6	6.5	4	3.78
FC202870/YA3	125.4			3.10
NNQD6920X2/YB3	125.9			3.08
FC202870A/YA3	125.4			3.62
FC2028104	125.4	8	4	4.99
FC2028104A	125.4	8	4	4.99
FCD2028104	125.4	8	4	4.99
FC2030106	132	8	4	6.67
FC2234120A	149	6.5	4	10.1
FC2234120	149	6.5	4	10.1
FC2436105	160	6.5	4	9.13
FC2436105A	159	6.5	4	9.13
FC2640125	174	6.5	4	14.6
FC2640125A	174	6.5	4	14.6
FC2842125	188	9.5	5	14.7
FC2842125A	186.8	9.5	5	14.7
FC2842155K/C9YA3	190.9			18.1
FC2942155	190.9			18.3
FC2942155/YA3	190.9			18.3
FC2942155A/YA3	190			18
FC2945156/C3	197.8	9.5	5	23.6
FC2945156/YA3	197.8	9.5	5	23.6
FC3045120	200	9	4	16.7
FCD3045120	199.4	9	4	16.6
FC3045120ZW/C9	202.4	9	4	17.9
FC3045120A	199.4	9	4	16.7
FC3046156	204	9.5	5	23.6
FC3046156A	202.8	9.5	5	23.6

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 160~180 mm



## Principal dimensions

Basic load ratings						
d	D	B	C	rmin	r1min	Fw

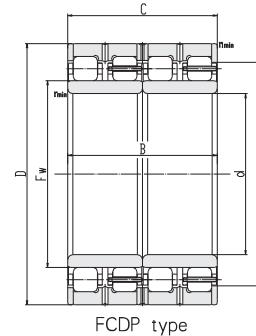
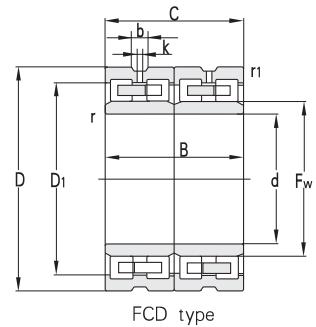
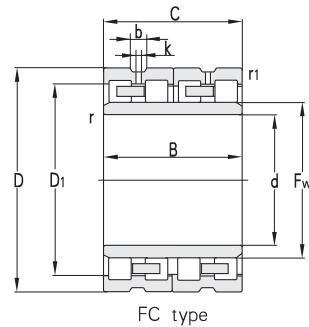
mm							KN	
d	D	B	C	rmin	r1min	Fw	Cr	Cor
160	230	130	130	1.5	1.5	180	742	1705
	230	130	130	1.5	1.5	180	770	1620
	230	168	168	2.1	2.1	180	852	2170
	230	168	168	2.1	2.1	180	897	2200
	240	124	124	2.1	2.1	183	810	1530
	240	124	124	2.1	2.1	183	810	1530
	240	124	124	2.1	2.1	183	810	1530
	240	124	124	2.1	2.1	183	810	1530
	240	124	124	2.1	2.1	183	810	1530
	240	168	168	2.1	2.1	183	1060	2350
	240	168	168	2.1	2.1	183	1240	2560
	240	168	168	2.1	2.1	183	1060	2350
165.1	225.425	168.275	168.275	1.5	1.5	181	950	1950
170	230	160	160	2	2	185.5	1210	2360
	230	160	160	2	2	185.5	1100	2360
	230	180	180	2	2	186	1010	2720
	240	130	130	2.1	2.1	189	730	1720
	250	170	170	2.1	2.1	192	1280	2500
	250	170	170	2.1	2.1	192	1280	2590
	250	170	170	2.1	2.1	192	1380	2550
	260	120	120	2.1	2.1	195	867	1790
	260	120	120	2.1	2.1	195	867	1790
	260	150	150	2.1	2.1	195	1000	2240
	260	150	150	2.1	2.1	195	1180	2240
180	250	133	133	2	2	234	1050	1870
	250	156	156	2.1	2.1	200	1210	1770
	250	156	78	2	2	200	1210	2315
	256	156	156	2	2	198	1220	1950
	260	124	124	2.1	2.1	202	809	1730
	260	168	168	2.1	2.1	202	1180	2790
	260	168	168	2.1	2.1	202	1180	2790
	260	168	168	2.1	2.1	202	1530	2790
	260	168	84	2.1	2.1	202	1180	2790

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
FC3246130	210			16.9
FC3246130A/YA3	210			17.3
FC3246168/YA3	206.6			22.1
FC3246168A/YA3	205.6			22.3
FC3248124/C9	216	9	4	20.3
FC3248124	216	9	4	20.3
FC3248124A	215	9	4	20.3
FC3248124A/YA31	215	9	4	20.2
FC3248124/YA31	215	9	4	20.2
FC3248168	216	10	5	26.4
NNQD6032X2/C4	215	10	5	28.1
FC3248168A	215	10	5	26.4
FCD3345168X4/YA3	205			19.7
FCD3446160	211.5	7.5	3	20.0
FCD3446160A/YA4	211.5	7.5	3	20.0
FC3446180/YA4	210	8	3	21.7
FC3448130	216	9	4	18.7
FC3450170	225	12	6	28.5
FC3450170Q1/HG2YA4	225	9.5	5	28.9
FC3450170A	224	12	6	28.8
FC3452120	228	9.5	5	24.6
FC3452120A	227	9.5	5	24.6
FC3452150	227	9.5	5	29.7
FC3452150/HC	227	9.5	5	29.7
NNQ6936X2V/YA7	234	12	6	18.2
FC3650156/C4YA4	226	9.5	6.5	22.7
FC3650156/YA34	226.8			23.9
FC3650156/YA3	226.8			23.7
FC3652124	234.8	9.5	5	21.7
FC3652168	234.8	12	6	30.2
FC3652168/YA3	234.8	12	6	30.1
FC3652168Q1/HG2YA4	234.8	9.5	5	30.6
FC3652168/YC4YAD	232.4			30.1

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 180~199.86 mm



## Principal dimensions

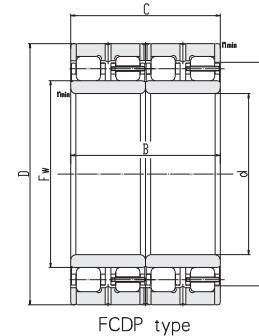
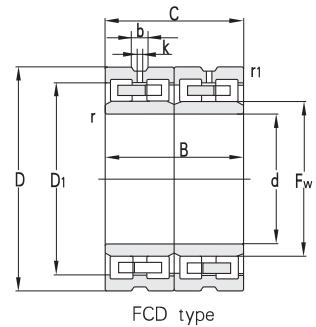
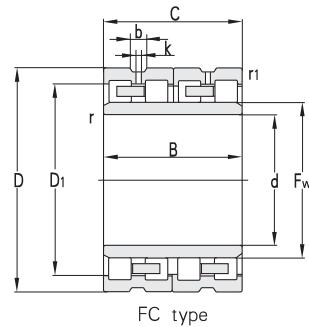
d	D	B	C	rmin	r1min	Basic load ratings							
						Fw	Cr	Cor					
mm													
KN													
180	260	168	168	2.1	2.1	202	1180	2790					
	260	168	168	2.1	2.1	202	1180	2790					
	260	168	168	2.1	2.1	202	1180	2790					
	260	180	180	2.1	2.1	202	1250	3000					
	260	180	180	2.1	2.1	202	1250	3000					
	260	168	168	2.1	2.1	202	1100	2660					
190	260	168	168	2.1	2.1	212	1340	2570					
	260	168	168	2.1	2.1	212	1450	2600					
	260	168	168	2.1	2.1	212	1450	2600					
	270	168	168	2.1	2.1	212	1420	2430					
	270	168	168	2.1	2.1	212	1420	2430					
	270	168	168	2.1	2.1	212	1420	2430					
	270	168	168	2.1	2.1	212	1420	2430					
	270	168	168	2.1	2.1	212	1420	2430					
	270	168	168	2.1	2.1	212	1420	2430					
	270	170	170	2.1	2.1	212	1430	2430					
	270	170	170	2.1	2.1	212	1430	2650					
	270	200	200	2.1	2.1	212	1520	3180					
	270	200	200	2.1	2.1	212	1580	3275					
200	270	170	170	2.1	2.1	222	1120	2270					
	270	170	170	2.1	2.1	222	1120	2270					
	270	170	170	2.1	2.1	222	1120	2740					
	270	170	170	2.1	2.1	222	1120	2740					
	280	188	188	2.1	2.1	222	1430	2580					
	280	188	188	2.1	2.1	222	1560	3000					
	280	200	200	2.1	2.1	224	1340	3400					
	290	192	192	2.1	2.1	226	1460	3250					
	290	192	192	2.1	2.1	226	1360	3695					
	290	192	192	2.1	2.1	226	1490	3300					
	290	192	192	2.1	2.1	226	1460	3695					
	290	192	192	2.1	2.1	226	1460	3350					
199.86	280	170	170	2.1	2.1	222	1110	3000					

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
mm				
FC3652168A	234	12	6	30. 2
FC3652168A/YA3	234	12	6	30. 1
FC3652168/YA31	237. 6	9. 5	5	30. 1
FC3652180F3	234. 8	12	6	31. 3
FC3652180	234. 8	12	6	31. 5
FC3652168/YA4	232. 4	12	6	29. 3
672838*	238. 6	9. 5	5	22. 6
FC3852168A	237. 6	9. 5	5	23. 1
FC3852168/YA3	237. 6	9. 5	5	23. 1
FC3854168	245. 2	9. 5	5	30. 2
FC3854168/YA3	245. 2	9. 5	5	29. 9
FC3854168Q1/HG2C9YA4	245. 2	9. 5	5	30. 8
FC3854168A	244	9. 5	5	31. 9
FC3854168A/YA3	244	9. 5	5	31
FC3854168AQ1/HG2C9YA4	244	9. 5	5	30. 8
FC3854170/YA3	245. 2	9. 5	5	30. 2
FC3854170A/YA3	244	9. 5	5	31. 8
FC3854200	245. 2	15	7	35. 0
FC3854200A	244	15	7	35
FC4054170Q1/YA3	246. 5	9. 5	5	28. 7
FC4054170Q1/HG2C4Y	246. 5	9. 5	5	28. 7
FC4054170A/C4YA3	247. 6	9. 5	5	28. 7
FC4054170/HCC4YA3	247. 6	9. 5	5	28. 7
FC4056188	255	9. 5	5	35. 7
FC4056188A	254	9. 5	5	35. 9
FC4056200/YA34	257	15	7	38. 8
FC4058192	262	15	6	40. 9
FC4058192A/YA3	262	15	6	41. 2
FC4058192/YA4	261	15	6	40. 9
FC4058192A	261	15	6	40. 9
FC4058192A/YA4	261	15	6	41. 3
FC4056170X4/YA3	254			33. 3

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 210~240 mm



## Principal dimensions

d	D	B	C	rmin	r1min	Fw	Cr	Cor
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mm KN

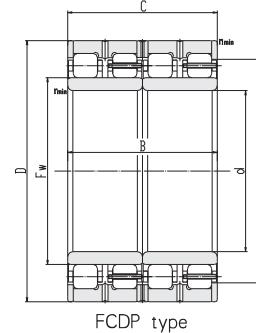
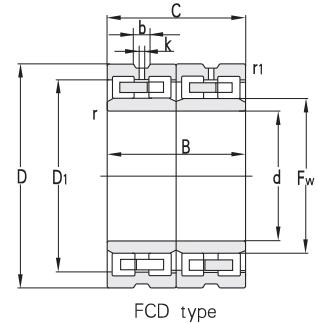
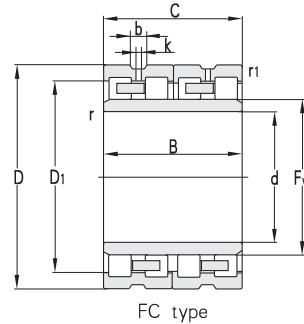
210	300	210	210	2.1	2.1	234	1560	3950
	300	210	210	2.1	2.1	234	1560	3950
	300	210	210	2.1	2.1	234	1780	4140
	300	210	210	2.1	2.1	234	1780	4140
	300	170	170	2.1	2.1	234	1320	3150
	300	260	260	2.1	2.1	1270	2670	
220	300	96	96	2.5	2.5	1360	3700	
	300	192	192	2.5	2.5	242	1280	3390
	310	192	192	2.1	2.1	246	1600	1910
	310	192	192	2.1	2.1	246	1600	1910
	310	192	192	2.1	2.1	246	1600	3600
	310	192	192	2.1	2.1	246	1600	3600
	310	225	225	0.6	2.1	244	1850	4050
	320	210	210	2.1	2.1	248	1900	3800
	320	210	210	2.1	2.1	248	1900	4000
	320	210	210	2.1	2.1	248	1900	4000
	340	200	200	4	4	250	1950	3550
	340	192	192	2.1	2.1	260	1620	3390
224.88	310	225	225	2.1	2.1	244.7	1260	3030
230	330	206	206	2.1	2.1	260	1780	3800
	330	206	103	2.1	2.1	258	1880	4350
	330	206	206	2.1	2.1	260	1880	4350
	330	206	206	2.5	2.5	257	1880	3900
	330	206	206	2.1	2.1	260	1880	4350
	340	260	260	2.1	2.1	261	2120	5350
	340	260	260	2.1	2.1	261	2120	5350
	365	250	250	2.1	2.1	272	2400	5400
240	330	220	220	2.1	2.1	264	1780	4850
	330	220	220	2.1	2.1	264	1780	4850
	330	220	220	2.1	2.1	264	1960	5335
	330	220	220	2.1	2.1	264	1960	5335
	330	220	220	2.1	2.1	264	1960	5335

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
mm			Kg	
FC4260210	271	9.5	5	48.3
FC4260210/C9YA4	271	9.5	5	48.3
FC4260210A	269	9.5	5	48.3
FC4260210A/C9YA4	269	9.5	5	48.3
FC4260170	269	9.5	5	39.1
FC4260260/HC	303.3	15	5	58.9
FC4460192ZW	303.3	15	5	43.4
FC4460192/YA4- 1	272	9.5	5	39.8
FC4462192/YA3	282.5	15	6	45.8
FC4462192	282.5	15	6	45.8
FC4462192A	281.2	15	6	46.2
FC4462192A/YA3	281.2	15	6	46.1
FC4462225	280			53.9
FC4464210/YA3	287			56.5
FC4464210A/YA3	286.4	9.5	5	58.2
FCD4464210	286.4	9.5	5	57.1
FC4468200/YB2	308.3	15	6	63.4
FCD4468192	303	9.5	5	64.0
FCD4562225X4/YA3	278			50.4
FC4666206/YA3	296	9.5	5	56.5
FC4666206/C4YAD	293			59.1
FC4666206A/YA3	295	9.5	5	57.8
FC4666206/YA4	295.6	9.5	5	58.3
FC4666206/YA34	295	9.5	5	57.8
FC4668260/HCYA3	303	9.5	5	82.1
FC4668260/HCYA3- SY	303	9.5	5	82.1
FCD4673250	317	12	6	102
FC4866220/YA3	301	9.5	5	56.5
FC4866220	301			56.7
FC4866220A	299			57.1
FC4866220A/HG2	299			57.1
FC4866220A/YA3	299			56.8

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 240~270 mm



## Principal dimensions

Basic load ratings							
d	D	B	C	rmin	r1min	Fw	Cr

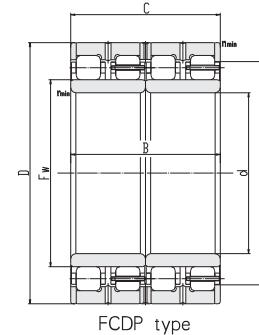
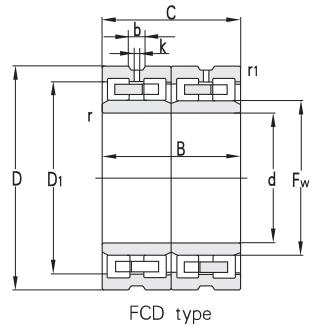
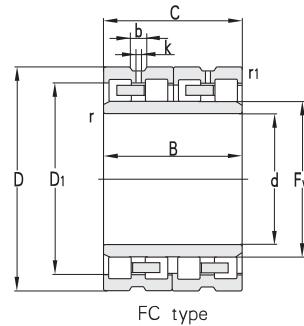
mm								KN	
d	D	B	C	rmin	r1min	Fw	Cr	Cor	
240	340	192	192	2.1	2.1	265	1440	3380	
	340	192	192	2.1	2.1	265	1540	3650	
	340	192	192	2.1	2.1	266	1560	3850	
	360	200	200	2.1	2.1	272	1870	4410	
	360	220	220	2.5	2.5	272	1870	4410	
	360	220	220	2.1	2.1	272	2430	4410	
	360	220	220	2.1	2.1	272	1930	4600	
	360	220	220	2.1	2.1	272	2530	4850	
250	340	230	230	3.5	3.5	264	1750	4700	
	350	220	220	3	3	278	1740	4980	
	350	220	220	3	3	278	1840	4980	
	360	220	220	3	3	282	1650	4250	
	360	220	220	3	3	282	1710	4670	
260	360	200	200	3	3	288	2000	4650	
	360	200	200	3	3	288	2000	4650	
	370	100	100	3	3	290	1710	4100	
	370	200	200	3	3	292	2050	4250	
	370	200	200	3	3	292	2150	4250	
	370	220	220	3	3	292	2100	4900	
	370	220	220	3	3	292	2100	4900	
	370	220	220	3	3	292	2150	4900	
	370	220	220	3	3	292	1950	4900	
	370	220	220	3	3	292	2100	4800	
	370	220	220	3	3	292	2100	4900	
	380	220	220	3	3	290	2150	4750	
	380	280	280	3	3	294	2640	6050	
	380	280	280	3	3	294	2640	6050	
	400	145	145	4	4	296	1800	1720	
270	380	230	230	3	3	298	1890	4800	
	380	230	230	3	3	298	1970	4800	
	380	230	230	3	3	298	1970	4800	
	380	275	275	3	3	303	2400	6300	
	390	236	236	3	3	312	2310	5950	

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
FC4868192A1	308	9.5	5	52.8
FC4868192A	305	9.5	5	54.7
FC4868192/YA4	305.5	9.5	5	55.5
FC4872220	318	12	6	78.0
FC4872220A/C4YA3	320			78.0
FC4872220Q1/HG2YA4	320	9.5	5	78.4
FC4872220A	316.8	12	6	79.1
FC4872220AQ1/HG2YA4	316.8	12	6	79.1
FC5068230/YA34	314	9.5	5	60.9
FC5070220/YA3	316	9.5	5	65.5
FC5070220A/YA3	316.4	9.5	5	67.5
FC5072220/YA3	320	9.5	5	76.9
FC5072220A/YA3	320	9.5	5	76.8
FC5272220/YA3B2	328	9.5	5	63.0
FC5272220A/YA3B2	326	9.5	5	63
FCD5274200/C4YAB	332			73
FC5274200	335.2	15	6	73.0
FC5274200A	333.6	15	6	73.8
FC5274220/YA3	335.5	9.5	5	79.2
FC5274220	335.5	9.5	5	80.0
FC5274220A	333.6	9.5	5	80.4
FC5274220A/YA34- 1	333.6	9.5	5	79.6
FC5274220A/YA4	330	9.5	5	78.7
FC5274220/YA34	335.5	9.5	5	79.6
FC5276220/C4YA4	332			87.9
FC5276280/HCYA3	335.6	9.5	5	111
FC5276280/HCYA3- SY	335.6	9.5	5	111
FCD5280290/P63YA3	352	9.5	5	136
FC5476230/YA3	346	9.5	5	80.2
FC5476230A	342.8	9.5	5	82.1
FC5476230A/YA3	342.8	9.5	5	81.9
FC5476275	346	9.5	5	98.6
FC5478236	352	9.5	5	97.8

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 270~320 mm



## Principal dimensions

		Basic load ratings						
d	D	B	C	rmin	r1min	Fw	Cr	Cor

mm KN

270	390	236	236	3	3	312	2310	5950
280	390	220	220	3	3	312	2130	5150
	390	220	220	3	3	312	2130	5200
	390	220	220	3	3	312	2680	5000
	390	220	220	3	3	312	2130	5200
	390	220	220	3	3	312	2150	5200
	390	220	220	3	3	312	2100	5200
	390	220	220	3	3	312	1900	5200
	390	275	275	1.5	1.1	308	2360	6650
	390	275	275	3	3	308	2540	6750
	390	275	275	3	3	308	2360	6650
	390	240	240	3	3	312	2570	5850
	390	240	240	3	3	312	2570	5850
	390	240	240	3	3	312	2570	5850
	390	220	220	3	3	312	2300	5100
	390	220	220	3	3	312	2300	5100
	390	275	275	3	3	308	2360	6650
	390	275	275	3	3	312	2300	6860
	400	244	244	7.5	4	312	2300	6000
	410	300	300	4	4	313	3120	7720
	420	280	280	4	4	318	3500	7000
290	410	240	120	4	4	320	2340	5900
300	420	240	240	4	4	332	3450	6300
	420	240	240	4	4	332	3450	6300
	420	240	240	4	4	332	3450	6300
	420	240	240	4	4	332	3450	6300
	420	300	300	3	3	332	2270	6800
	420	300	300	3	3	332	3550	6800
	420	300	300	3	3	332	3550	6800
	420	300	300	3	3	332	3550	6800
	460	350	350	4	5	340	4100	10500
320	450	240	240	4	4	355	2760	6720

## Abutment and fillet dimensions

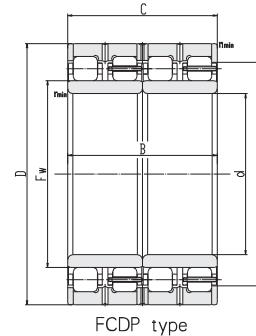
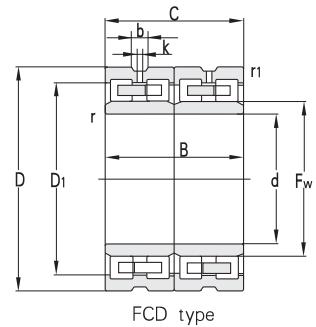
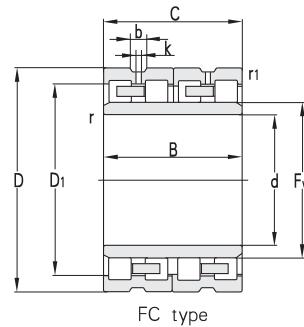
Designations	D1 (min)	b (max)	k (max)	Weight
--------------	----------	---------	---------	--------

Designations	mm	mm	mm	Kg
FC5478236A	350.4	9.5	5	98.3
FC5678220	355.5	12	6	86.5
FC5678220A	350.4	12	6	89
FC5678220/YA3	355.5	12	6	86.6
FC5678220A/YA3	350.4	12	6	88.6
FC5678220/HCYAB	355.5	12	6	89.1
FC5678220/YA34	350.4	12	6	88.6
FC5678220/YAD	355.5	12	6	88.6
FCDP5678275	354.2	9.5	5	102
FC5678275/YA34	354.2	9.5	5	99.3
FC5678275/C3YA34	352.8	9.5	5	102
FC5678240	354.5	12	6	90.4
FC5678240/HCYA34	354.5	12	6	90.4
FC5678240/YA34	354.5	12	6	90.4
FC5678220/HCYAD	352.3			83
FC5678220F1/HCC4YAD	352.3			83
FC5678275/YA34-1	348	9.5	5	105
FC5678275/YA4	351	9.5	5	106
FCD5680244F3/YAD	357	15	8	102
572856W*	367			132
FC5684280	373	12	6	139
FC5882240/C4YA3	368	15	8	102
FC6084240	382	15	8	111
FC6084240YA3	382	15	8	111
FC6084240A	380	15	8	111
FC6084240A/YA3	380	15	8	111
FCD6084300	382	12	8	129
FCD6084300/YA34	382	12	6	129
FCD6084300/YA3	382	12	6	129
FCD6084300/HC	382	12	6	129
FCD6092350ZWF3/HCYAD	399	20	10	226
FC6490240/YA3	412	12	6	119

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 320~360 mm



## Principal dimensions

d	D	B	C	rmin	r1min	Basic load ratings		
						Fw	Cr	Cor
mm								
						KN		
320	450	240	240	4	4	355	2970	6720
	450	240	240	4	4	355	2760	6720
	460	240	240	3	3	364	3370	7550
	460	240	240	3	3	355	2650	6750
	460	240	240	3	3	355	2650	6750
	460	300	300	4	4	355	3200	8650
	460	340	340	4	4	357	3700	10000
	480	290	290	4	4		3300	8130
	480	306	306	4	4	364	3950	8250
	480	350	350	4	4	364	5150	10500
330	460	340	340	4	4	365	3550	9950
	460	340	340	4	4	365	3550	9950
	460	340	340	4	4	365	4200	9950
340	450	250	250	4	4	371	2420	7500
	450	250	250	4	4	371	2420	7250
	450	250	250	4	4	371	2420	7500
	450	250	250	4	4	371	2420	7250
	450	250	250	4	4	371	2420	7250
	450	250	250	4	4	371	2430	6800
	450	250	250	4	4	370	2430	6800
	450	250	250	4	4	370	2430	6800
	450	250	250	4	4	369	2430	6820
	450	250	250	4	4	369	2430	6820
	480	350	350	4	4	378	3750	10600
	480	350	350	4	4	378	3750	10600
350	500	380	380	6	3	388	4030	10200
	500	410	410	3	11.5*20*	388	5800	13500
	520	300	300	5	8*20*	401	4200	9000
360	500	250	250	3	3	394	3600	7730
	500	250	250	3	3	394	3300	8000
	510	370	370	4	4	397	4950	11400
	510	370	370	4	4	399.5	4950	11300

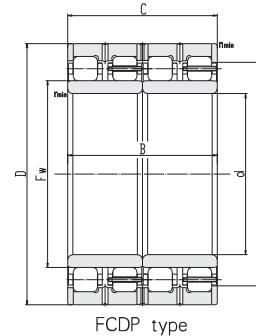
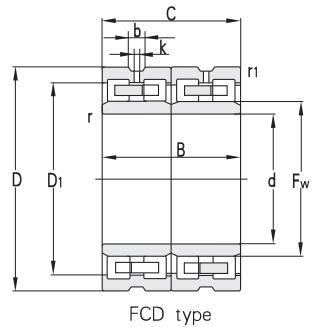
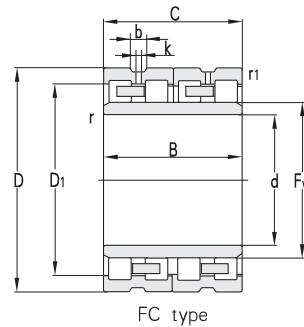
## Abutment and fillet dimensions

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
mm				
FC6490240/C4YA3	409.4	12	6	120
FC6490240/YA34	412	12	6	120
FCD6492240ZW/HCC4YA3	417			141
FCD6492240/HCC9		12	6	131
FCD6492240/HCC9YA3		12	6	131
FCD6492300/HCYA3		12	6	169
FCD6492340/YA3	413	12	6	189
FCD6496290F3/HG2YA3				186
FCD6496306/HCYA3	427	12	6	197
FCD6496350F3/HCYA34	427	12	6	230
FCD6692340	416.2	12	6	210
FC6692340-ZH	416.2	12	6	211
FCD6692340/HCYA4	416.2	12	6	210
FCD6890250	410.6	12	6	109
FCD6890250/C3YA4	406.2	12	6	115
FCD6890250/C9YA4-1	410.6	12	6	109
FCD6890250/C4YA34	410.6	12	6	109
FCD6890250/HCYA34	410.6	12	6	109
FC6890250/HG2	416			107
FC6890250/YAB	406.8	12	8	111
FC6890250/YAB-1	406.8	12	8	111
FC6890250/YAD	415	12	6	105
FC6890250/YAD-1	415	12	6	105
FCD6896350	430.8	12	6	202
FCD6896350/HC	430.8	12	6	202
FCDSP70100380/HC	450	12	6	225
FCDP70100410	455	16.7	9	280
FC70104300	468			213
FC72100250ZW/HCYA3	456			156
FCD72100250F3/HC	456			124
FCD72102370	460	12	6	220
FCD72102370/YA4	462	12	6	241

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 360~420 mm



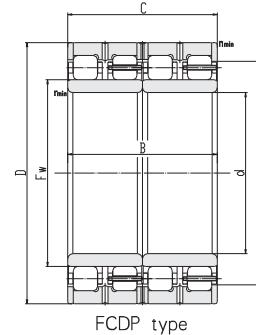
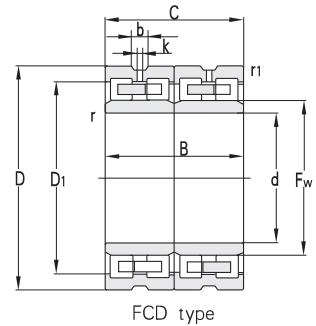
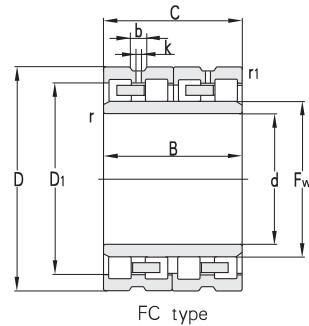
Principal dimensions							Basic load ratings		
d	D	B	C	rmin	r1min	Fw	Cr	Cor	
<b>mm</b>							<b>KN</b>		
360	500	300	300	3	3	410	4100	11000	
365	540	300	300	2	2	421	5000	11000	
370	520	380	380	1.5	1.5	409	5230	12000	
	520	380	380	1.5	1.5	409	5050	12000	
375	600	440	440	2	2	470	5350	15600	
380	540	260	260	4	4	428	3350	8550	
	540	300	300	2	8.5*20*	421	4650	10100	
	540	304	304	4	4	422	4650	10100	
	540	340	340	4	4	422	5250	11900	
	540	400	400	4	4	422	5050	14200	
	540	400	400	4	4	422	5050	14200	
	560	300	300	2	13.5*20*	424	4950	9650	
	560	325	325	5	5	425	4840	10000	
390	540	320	320	2	10*20*	431	3800	10100	
	540	320	320	2	10*20*	431	5200	12000	
	550	400	400	4	4	432.3	4850	13400	
	550	400	400	1.5	13*25*	432.4	4850	13400	
400	550	300	300	5	5	442	4460	5050	
	550	300	300	5	5	442	4640	5450	
	560	300	300	4	4	442	4550	10000	
	560	410	410	2	12*20*	5200	15200		
	560	410	410	2	13.5*20*	445	6250	15600	
	590	440	440	5	5	450	7250	16500	
410	560	400	400	2	11*20*	450	6400	15800	
	600	440	440	5	5	460	6450	18300	
	600	440	440	5	5	460	6450	18300	
	600	440	440	5	5	460	6450	18300	
420	580	260	260	4	4	468	4350	9600	
	580	320	320	4	4	463	4680	10800	

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
				<b>Kg</b>
FCD72100300/HCYA3	490	12	6	179
FC73108300	490	12	6	225
FCDP74104380	474	12	6	296
FCDP74104380/HC	474	12	6	296
FCDP75120440/P63	535	15	6	527
FCD76108260	495			198
FCD76108300	490	12	6	220
FC76108304	488	12	6	227
FC76108340	488	12	6	256
FCD76108400/YA3	488	12	6	297
FCD76108400/YA34	488	12	6	297
FCD76112300	488	13.9	7.5	261
FCD76112325	506			263
FCDP78108320/YA3	500	13.9	7.5	228
FCD78108320	500	13.9	7.5	228
FC78110400K/HCYA4	496.5	12	6	330
FCD78110400/HCYAD	496.5	12	6	330
FC80110300	502	12	6	223
FC80110300A	499.6	12	6	225
FC80112300	513			242
FCDP80112410/HG2C4YA34	509	13.9	7.5	324
FCD80112410	509	13.9	7.5	310
FCD80114440	530			410
FCDP82112400	515	16.7	9	287
FCDP82120440/HCYA34	533	20	10	445
FCDP82120440-ZH	533	20	10	445
FCDP82120440/HCYA34	533	20	10	445
FCD84116260	536			205
FCD84116320	525			249

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 420~480 mm



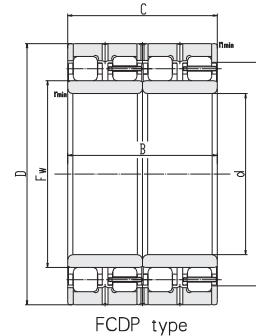
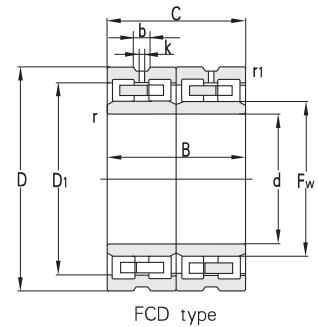
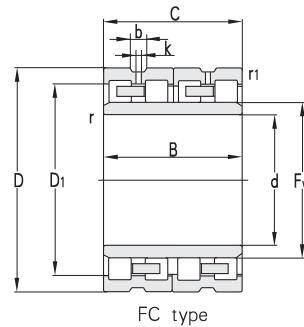
Principal dimensions								Basic load ratings		
d	D	B	C	rmin	r1min	Fw	Cr	Cor		
								KN		
mm										
420	600	440	440	5	5	470	5550	16300		
	600	440	440	5	5	470	5550	16300		
	600	440	440	5	5	470	5900	18300		
	600	440	440	5	5	470	7100	19500		
440	620	450	450	2	12*20*	6700	21100			
	620	450	450	5	5	487	7420	15800		
	620	450	450	5	5	487	7420	15800		
	620	450	450	5	5	487	6700	21100		
	620	450	450	5	5	487	6700	21100		
	620	450	450	5	5	487	6700	21100		
	660	340	340	6	6	492	6380	13500		
	650	355	355	3	3	509.5	6250	14600		
	650	355	355	4	12.5*20*	494	6700	14700		
	660	340	340	6	6	492	5100	13500		
450	590	300	300	4	14.5*45*	490	3900	12200		
460	650	355	355	3	12*20*	509.5	6250	14500		
	650	424	424	3	12*20*	510	7800	18200		
	650	470	470	3	12*20*	509	8750	22400		
	650	470	470	3	12*20*	509	8750	21500		
	680	400	400	6	6	518	8050	17400		
	700	310	310	6	6	550	5550	13900		
462	615.95	386	386	4	2	585	3470	8350		
475	600	368	368	3	3	504	5500	14700		
	600	392	392	3	3	504	5500	14700		
480	650	450	450	6	6	525	7840	15400		
	650	450	450	6	6	525	5350	1580		
	680	500	500	6	6	532	7980	23400		
	680	420	420	3	12*20*	528	8400	19400		
	680	500	500	6	6	532	7980	23400		
	680	500	500	6	6	532	7100	22900		

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
mm				
				Kg
FCD84120440/HC	535	18	8	414
FCD84120440/HCP6YAB	535	18	8	414
FCDP82120440/HDYA34	535	18	8	445
FCDP84120440/HCYA34	535	18	8	416
FCDP88124450/HG2C4YA34				436
FCDP88124450	563	15	8	452
FCDP88124450/YA6	563	15	8	452
FCDP88124450/HC	563	15	8	436
FCDP88124450/HCYA36	563	15	8	436
FCDP88124450/HCEYA6	563	15	8	436
FC88132340ZW/HCC4YA3	582			425
FC88130355	585	11.1	6	400
FC88130355A	584	11.1	6	421
FCD88132340ZW/HCC4YA3	582			425
FC90114300	528	12	6	240
FCD92130355	584	11.1	6	375
FCD92130424	594	16.7	9	452
FCD92130470	584	11.1	6	512
FCDP92130470/HCYAD	616	16.7	9	516
FC92136400	618	24	8	630
NNQP692KZW/P4YB5	623	26	9	422
CCT6/462	570			338
FCDP95120368HC/YA3	563	16.7	9	237
FCDP95120392/YA3	577	16.7	9	242
FCD96130450	593	15	8	419
FCDP96130450/HC	593	15	9	430
FCDP96136500/P54	632	15	8	599
FCD96136420	616	16.7	9	510
FCDP96136500/HCP64	632	15	9	599
FCD96136500/P64YA3	632	15	9	588

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 500~560 mm



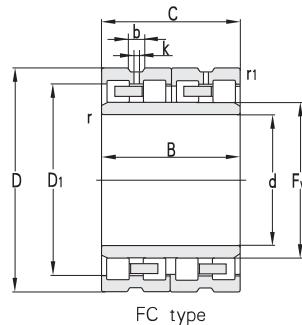
Principal dimensions							Basic load ratings		
d	D	B	C	rmin	r1min	Fw	Cr	Cor	
<b>mm</b>							<b>KN</b>		
500	650	260	260	5	5	542	4000	10000	
	670	450	450	6	6	540	7840	20100	
	670	450	450	6	6	540	8640	23700	
	670	450	450	3	12.5*20*	540	8400	22700	
	670	450	450	5	5	540	8000	21500	
	670	485	450	5	12.5*20*	540	8400	22700	
	680	450	450	2	5	550	8200	22000	
	710	480	480	5	18*20*	558	8780	21500	
	720	400	400	3	6	558	7850	17500	
	720	400	400	5	5	558	8500	18300	
	720	530	530	5	13*20*	568	10500	28500	
	720	530	530	6	6	568	8500	28100	
	738	500	500	6	18*20*	556	10500	23000	
510	680	500	500	5	7.5*20*	560	8950	26200	
	730	520	520	6	17.5*20*	569	9480	21500	
	760	550	550	3	16*20*	570	12000	26500	
530	710	260	260	6	6	558	9450	26500	
	760	520	520	5	12*20*	587	11500	28500	
	780	570	570	3	14*20*	601	12700	32500	
	780	570	570	6	6	603	13000	32000	
	780	500	500	6	6	591	9300	20500	
550	740	510	510	2	15*20*	600	10000	27500	
	800	520	520	6	10*20*	612	11500	26000	
	800	560	560	6	18.5*20*	610	12000	28000	
	800	560	560	6	6	610	13100	31900	
	800	520	520	6	6	612	10300	28500	
	800	520	520	6	6	612	12200	28500	
560	820	315	279	3	6	625	13500	36000	
	820	600	600	3	20*20*	625	14200	34000	
	820	630	630	3	3	625	14400	36000	
	800	600	600	7.5	7.5	620	13000	33500	

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
mm				Kg
FCD100130260	600			220
FC100134450/P69	615	15	7	446
FCD100134450/P69HCYA3	617	15	8	460
FCDP100134450/HCC9YAD	617	15	8	453
FCD100132450	612	16.7	9	455
FCDP100134450/HCEC9YAD	614	18	10	463
FCD100136450	622	13.9	7.5	485
FCDP100142480/YA6	642	13.9	7.5	604
FC1001444400	656	22.3	12	526
FCD1001444400ZW/HCYA3	656	22.3	12	469
FCD100144530/YA6	651	16.7	9	729
FCDP100144530/HCEYA34	651	16.7	9	750
FCD100148500X1	671	22.3	12	732
FCDP102136500	627			525
FCD102146520	665			744
FCDP102152550	688	16.7	9	947
FCDP106142520/HC	656	12	6	603
FCDP106152520	683	16.7	9	773
FCD106156570	697	22.3	12	954
FCDP106156570/HCEYAD	690	22.3	12	964
FCD106156500	690			810
FCDP110148510/YA6	680	22.3	12	612
FCD110160520/YA6	721			890
FCD110160550/YA6	725			928
FCDP110160560/HC	725			961
FCDP110160520	721			890
FCDP110160520/HC	721			890
FCDP112164630/HCC4YA3	755	18	10	1164
FCDP112164600	743	16.7	9	1075
FCDP112164630	743	16.7	9	1170
FCDP112160600	722	16.7	9	1010

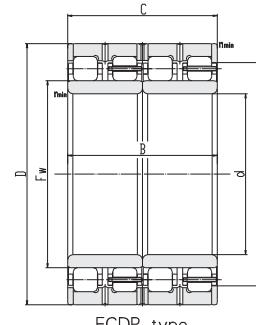
# Four-row Cylindrical Roller Bearings

ZWZ

d 570~690 mm



The diagram illustrates a cross-section of a deep groove ball bearing assembly. The outer ring has an outer diameter  $D$  and a shoulder diameter  $D_1$ . The inner ring has an inner diameter  $r$  and a shoulder diameter  $r_1$ . The bearing width is  $B$ . The distance between the inner ring shoulder and the outer ring shoulder is  $b$ . The axial clearance or预紧力 (preload) is  $F_w$ . The distance from the center of the bearing to the center of the shoulder is  $k$ . The overall width of the bearing is  $C$ .



## Principal dimensions

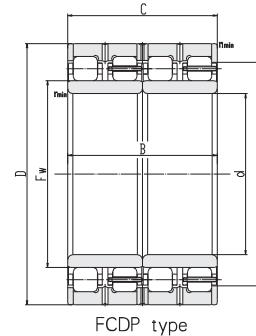
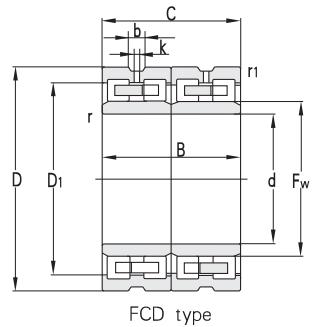
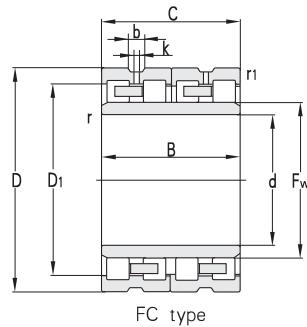
d	D	B	C	rmin	r1min	Fw	Cr	Cor
						KN		
mm								
570	750	530	530	6	6	622	9000	26600
	800	514	514	6	6	626	11000	29000
	815	594	594	6	6	628	13000	35200
580	780	520	486	2	12*20*	634	9900	27000
	780	521	486	2	12*20*	634	9900	27000
	780	558	486	2	12*20*	634	9900	27000
590	820	590	590	6	6	649	12800	35100
600	820	575	575	3	6	660	12300	35000
	820	575	575	3	6	660	9750	35000
	870	640	640	6	6	669	13200	38500
	870	540	540	4	22*20*	672	13000	31500
630	800	360	360	5	5	675	6850	19500
	850	436	436	6	6	690	7450	23500
	920	515	515	7.5	7.5	700	13700	17160
640	880	600	600	6	6	700	13500	40000
650	900	650	650	7.5	20*20*	704	14000	42000
	920	670	670	4	17*20*	723	14300	44500
	920	690	690	7.5	7.5	723	14500	45000
660	820	440	440	4	7.5	702	7450	22700
	880	450	450	6	6	727	7500	23500
	1075	650	650	7.5	7.5	775	21100	45500
680	980	640	640	20*20*	4		17700	46000
	1020	680	680	6	6	775	20000	49500
690	980	715	715	20*20*	4	767.5	18800	51500
	980	750	750	7.5	11.4*20*	766	18800	51500
	980	715	715	20*20*	4	767.5	18800	51500
	980	750	750	7.5	7.5	760	16100	51500

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
	mm			Kg
FC114150530/HCYA3	690		8	625
FCDP114160514/HCC9YAD	746	22	14	835
FCDP114163594	740	22	14	1010
FCDP116156486/WB	717	16.7	9	696
FCDP116156486/WB- 1	717	16.7	9	700
FCDP116156486/WB- 2	717	16.7	9	713
FCDP118164590	748	16.7	9	990
FCDP120164575/HCYA6- 1	768	18	9	945
FCDP120164575/HCRYA6	768	18	9	945
FCDP120174640/HCYA34	809	18	10	1347
FCDP120174540	780	16.7	9	1100
FCD126160360	742			560
FCD126170436	770			720
FCD12618415/HC	825	25	12	1182
FCDP128176600	743	25	12	1120
FCDP130180650/HC	819.4	30	12	1275
FCDP130184670/HCYA3	829	18	10	1460
FCDP130184690	829	18	10	1490
FCD132164440	766			532
FCD132176450	806			782
FCDP132215650/HCYAD	936	18	12	2407
FCDP136196640/HCC4YAD	880	45	12	1680
FCDP136204680	929	22	12	2050
FCDP138196715/HCP69YAD	907.5	22	12	1805
FCDP138196750/HCC9YAD	880	45	13	1920
FCDP138196715/HCP69YAD- 1	907.5	22	12	1805
FCDP138196750/HCEC9YAD	907.5	45	13	1920

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 700~820 mm



## Principal dimensions

d	D	B	C	rmin	r1min	Fw	Cr	Cor
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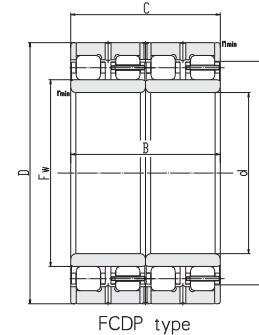
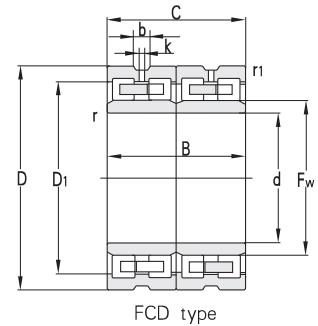
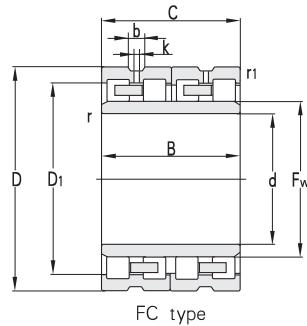
mm									KN		
700	930	620	620	3	18*20*	763	15000	42800			
	930	620	620	3	18*20*	760	15100	44000			
	980	700	700	6	6	774	17500	48500			
	1000	710	710	4	4	770	19000	47500			
705	1000	715	715	7.5	7.5	770	16700	54200			
710	1000	715	715	7.5	7.5	780	16700	54200			
	1020	710	710	4	4	785	19500	49700			
725	1000	700	700	6	6	796	18000	49500			
730	960	620	620	3	20*20*	790	15400	45000			
	1030	750	750	6	21*20*	809	20500	58500			
750	1000	670	670	3	20*20*	813	17000	48500			
	1000	670	670	3	20*20*	813	17000	48500			
	1080	665	650	7.5	7.5	833	19500	48000			
	1090	750	750	7.5	22*20*	832	21500	51500			
	1133	670	670	6	6	848	21000	50500			
760	1080	790	790	7.5	7.5	846	23500	65000			
	1079.6	787.4	787.4	5	22*20*	846	26600	64000			
	1015	700	700	7.5	7.5	832	18500	55000			
	1030	750	750	7.5	7.5	828	21000	61200			
	1079.5	787	787	7.5	7.5	846	26600	64000			
	1080	805	790	6	6	846	23500	65000			
780	1070	780	780	6	25*20*	853	22000	60000			
790	1015.9	610	610	6	6	850	17500	50000			
800	1080	700	700	3	3	878	18800	48500			
	1080	700	700	5	5	878	19030	59500			
	1080	750	750	6	6	880	20000	60000			
820	1130	800	800	4	23*20*	903	19700	67000			

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
mm				
				Kg
FCDP140186620	859	22.3	12	1170
FCDP140186620/HCEC9YAD	859	22.3	12	1230
FCDP140196700	900	22.3	12	1680
FCDP140200710	916	22.3	12	1820
FCDP141200715/HCYA4	920	22.3	12	1875
FCDP142200715/HCYA4	920	22.3	12	1843
FCDP142204710	932	22.3	12	1940
FCDP145200700	920	22.3	12	1750
FCDP146192620	886	22.3	12	1218
FCDP146206750	929	22.3	12	2035
FCDP150200670/HCC9	921	22.3	12	1522
FCDP150200670/HCC91	921	22.3	12	1522
FCDP150216650/WB	989	22.3	12	2020
FCDP150218750	993	22.3	12	2410
FCDP150226670X1	1023	22.3	12	2450
FCDP152216790	974	22.3	12	2420
FCDP152215787X4/HC	982	23.5	12	2373
FCDP152203700	973	22.3	12	1600
FCDP152206750	988	22.3	12	1870
FCDP152215787X4/HC-1	982	23.5	12	2373
FCDP152216790X1	974	22.3	12	2450
FCDP156214780	988	22.3	12	2280
FCDP158203610X1	960	22.3	12	1280
FCDP160216700/HC	982	23.5	12	1850
FCDP160216700/HCP64YAD	1018	30	12	1918
FCDP160216750	1020	23.5	12	2030
FCDP164226800/HC	1026	23.5	12	2534

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 820~950 mm



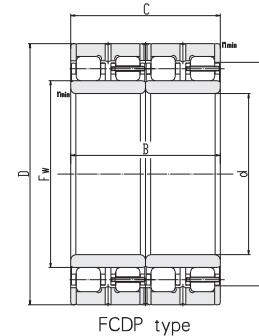
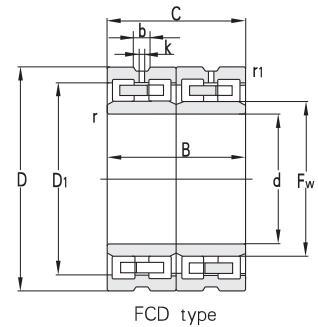
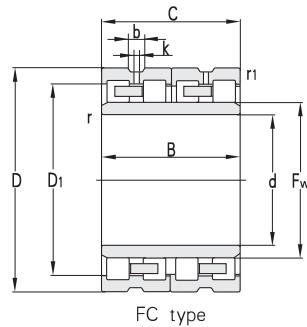
Principal dimensions							Basic load ratings		
d	D	B	C	rmin	r1min	Fw	Cr	Cor	
<b>mm</b>							<b>KN</b>		
820	1130	800	800	4	23*20*	903	19700	67000	
	1130	800	800	4	23*20*	903	19700	67000	
	1130	800	800	4	4	903	19700	67000	
	1160	840	840	7.5	7.5	910	21600	68500	
830	1080	710	710	7.5	25*20*	896	14500	60500	
840	1160	840	840	7.5	7.5	920	24700	70800	
850	1150	840	840	4	23*20*	928	25400	76500	
	1180	650	650	7.5	7.5	945	19000	50500	
	1180	850	850	4	20*20*	940	26100	74000	
	1180	875	850	7.5	7.5	940	26100	74000	
860	1140	750	750	7.5	7.5	938	20500	61000	
	1160	735	710	6	6	940	21000	60000	
880	1140	80	800	6	6	946	24000	76000	
900	1220	840	840	4	24*20*	989	26300	80000	
	1230	895	870	7.5	7.5	990	26400	80000	
	1280	780	780	7.5	23*20*	998	28500	80500	
	1280	930	930	4	25*20*	1000	32500	93500	
	1280	1050	840	7.5	7.5	1000	28900	80500	
920	1280	815	800	1010	7.5	7.5	28700	80000	
	1280	865	850	1015	7.5	7.5	27600	77500	
	1300	975	950	1019	7.5	7.5	32500	92500	
950	1300	850	850	7.5	7.5	1044	32200	85000	
	1300	850	850	10	10	1044	28600	80500	
	1300	850	850	10	10	1044	21500	64000	
	1300	850	850	7.5	7.5	1044	33300	90500	
	1360	975	975	6	26*20*	1075	34000	100000	
	1360	1000	1000	5	22*20*	1075	37500	105000	

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
<b>mm</b>				<b>Kg</b>
FCDP164226800/HCYA3	1026	23.5	12	2534
FCDP164226800/HCP6YA3-SY	1026	23.5	12	2534
FCDP164226800/HCYA34	1026	23.5	12	2534
FCDP164232840	1045	23.5	12	2750
FCDP166216710/HCC9YA3	995	23.5	12	1838
FCDP168232840	1016	22.3	12	2730
FCDP170230840/HC	1056	22.3	12	2560
FCDP170236650	1088	22.3	12	2100
FCDP170236850/HC	1084	22.3	12	2920
FCDP170236850/WB	1084	22.3	12	2950
FCDP172228750	1060	22.3	12	2100
FCDP172232710/WB	1070	22.3	12	2150
FCDP176228800	1040	22.3	12	2210
FCDP180244840/HC	1117	22.3	12	3050
FCDP180246870/WB	1123	22.3	12	3150
FCDP180256780	1175	22.3	12	3250
FCDP180256930/HC	1152	22.3	12	4050
FCDP180256840/WB	1152	22.3	12	3890
FCDP184256800/WB	1238	22.3	12	3280
FCDP184256850/WB	1238	22.3	12	3450
FCDP184268950/WB	1256	22.3	12	4180
FCDP190260850/C9HYA3	1182	30	14	3390
FCDP190260850/HCC9	1182	30	16	3390
FCDP190260850/HCP69YAD	1186.8	32	12	3360
FCDP190260850E/C9HYA3	1234	30	14	3550
FCDP190272975	1227	22.3	12	4895
FCDP1902721000	1229	22.3	12	5013

# Four-row Cylindrical Roller Bearings

**ZWZ**

d 950~1480 mm



Principal dimensions							Basic load ratings		
d	D	B	C	rmin	r1min	Fw	Cr	Cor	
<b>mm</b>							<b>KN</b>		
950	1360	1000	1000	5	5	1075	37500	105000	
970	1145	705	685	6	6	940	20500	63000	
980	1310	880	880	14*45*	20*20*	1061.7	28500	86500	
1000	1360	800	800	4	23*20*	1101	27000	82800	
1030	1380	850	850	7.5	7.5	1124	29000	90500	
1040	1440	1000	1000	7.5	27*20*	1133	37900	93500	
1200	1590	1050	1050	6	30*20*	1305	41800	13500	
1270	1602	850	850	7.5	7.5	1354	42000	13600	
1300	1655	890	880	7.5	7.5	1391	37300	122000	
1350	1765	1360	1360	7.5	42*20*	1457	40000	122000	
1400	1780	1200	1200	9.5	40*20*	1493	52300	163000	
1900	1360	1360	12	40*20*	1521	61500	182000		
1480	1849.74	1100	1100	7.5	7.5	1574	52500	164000	

Designations	Abutment and fillet dimensions			Weight
	D1 (min)	b (max)	k (max)	
<b>mm</b>				
FCDP1902721000/K30	1229	22.3	12	4820
FCDP174229685/WB	1044	22.3	12	1990
FCDP196262880	1198	30	16	3300
FCDP200272800	1237	22.3	12	3560
FCDP206276850	1258	22.3	12	3650
FCDP2082881000	1335	22.3	12	5090
FCDP2403181050	1465	24	15	5980
FCDP254320850X1	1568	22.3	12	6000
FCDP260331880HC/WB	1552	22.3	12	4800
FCDP2703531360	1620	22.3	12	9110
FCDP2703561200	1671	22.3	12	7380
FCDP2703801360	1670	22.3	12	11300
FCDP296370110X1	1700	22.3	12	7450

## Product Characteristics

The inner and outer rings of tapered roller bearings have tapered raceway. The tapered rollers are mounted between raceways. If extending the tapered surfaces, the sliding surfaces of the cup, the inner ring and the rolling elements will converge towards the same single point on the bearing axes. Tapered roller bearings can bear combined radial and load axial. The axial load capacity of the bearing varies with contact angle. The greater the contact angle is, the bigger the axial load capacity is. Tapered roller bearings belong to separable bearings. The rollers, the inner ring and the cage consist of cones, which can be mounted separately from cup.

These bearings can limit the axial displacement of either shaft or housing in one direction. When only radial load, the auxiliary axial force can be formed. It is suggested that two of the bearings be put in face-to-face or back-to-back arrangements in application and the cup and cones should be mounted relatively to their end surfaces.

These bearings are mainly used on automobile wheels (both former and rear), variable speed devices, differential mechanisms, pinion shafts, machine tool spindles, construction machines, large size agricultural machines, gear deceleration devices for railway vehicles, and the small deceleration devices for mill roll necks.

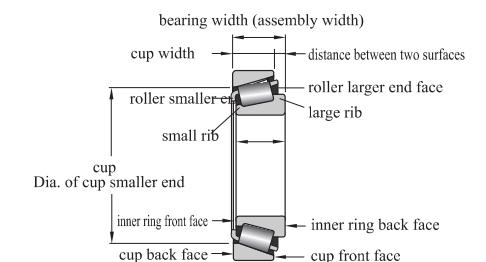
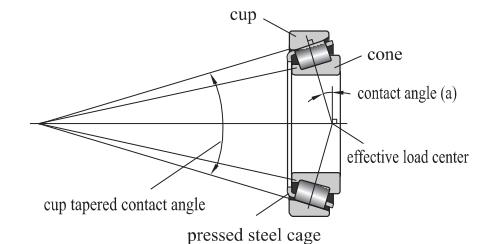
## Types of bearings

ZWZ manufactures both metric and inch-sized single row, double row and four-row tapered roller bearings.

- Single - row tapered roller bearings

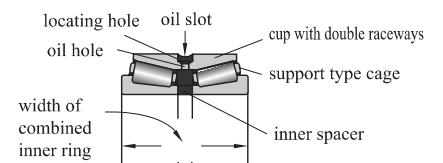
These bearings can only limit the axial displacement of either the shaft or the housing in one direction, and can carry axial load in one direction. When with only radial load, the axial force formed inside the bearing must be offset. It is suggested that two of the bearings

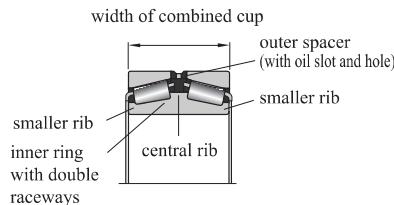
to be put in face-to-face or back-to-back arrangements in application.



- Double-row tapered roller bearings

These bearings can carry axial load in two direction when they carry radial load. The axial displacement in two direction of the shaft and housing are limited within the bearings radial clearance range.





## ● Four-row tapered roller bearings

The functions and features of these bearings are basically the same as those of the double-row design. However, they can carry heavier load than the double-row tapered roller bearings, but with slightly slower rotation speed. These bearings are mainly applied to heavy machinery such as rolling mills.

## ● Multi-sealed double-row or four-row tapered roller bearings

ZWZ manufactures double-row and four-row tapered roller bearings with longer life, multiple seals. Their seal performance are improved by amending traditional design method of full seal bearings, adopting new type seal structure. Comparing to open type bearings, the life of multiple seals double-row or four-row tapered bearings can be increased by 20 to 40%, and the lubricating consumption is decreased by 80%.

Multi-sealed double-row or four-row tapered roller bearings are denoted with the suffix XRS.

## Dimension scope

The basic dimensions of ZWZ tapered roller bearing are listed in the bearing dimensions data sheet.

### Single row tapered roller bearings

Bore diameter dimension range: 20 mm to 1270mm  
Outside diameter dimension range: 40mm to 1465mm  
Width dimension range: 15mm to 240mm

### Double row tapered roller bearings

Bore diameter dimension range: 38 mm to 1560mm  
Outside diameter dimension range: 70mm to 1800mm  
Width dimension range: 50mm to 460mm

### Four row tapered roller bearings

Bore diameter dimension range: 130 mm to 1600mm  
Outside diameter dimension range: 200mm to 2000mm  
Width dimension range: 150mm to 1150mm

## Tolerance

ZWZ manufactures tapered roller bearings with P0, PX, P6, P5, P4, and P2 precision grade. All the tolerance values conform to GB307.1 standard. The tolerances are listed in the preface tables.

ZWZ manufactures inch-sized tapered roller bearings with normal tolerance class, also manufactures inch -sized tapered roller bearings with CL2, CL3, CL10 and CL00 tolerances

## Radial clearance

ZWZ single-row tapered roller bearings have clearance only after they are mounted, and the clearance can be determined only when another bearing is located next to it in the opposite direction after adjusting. The radial clearance of double two and four-row tapered roller bearing are listed in the preface tables.

### Cage

Normally, tapered roller bearings use pressed basket shaped cages of steel sheet but for bearings with greater dimensions, machined solid support shaped cages are also used.

1. When the bearings outside Dia. is smaller than or equal to 650mm, steel sheet pressed cage are used, the suffix of code does not denote the structure of cage.

2. When outside Dia. is bigger than 650mm, steel solid support shaped cage are used, the suffix of code does not denote the structure of cage.

## Angle deviation allowance

Usually for tapered roller bearings, there should be no misalignment between the shaft and the housing bore. When there is misalignment, the slope angle should not be greater than 2'.

### Single-row tapered roller bearings

#### Equivalent dynamic load

Usually for tapered roller bearings, there should be no misalignment between the shaft and the housing bore. When there is misalignment, the slope angle should not be greater than 2'.

When  $Fa/Fr \leq e$   $P=Fr$  [KN]

When  $Fa/Fr > e$   $P=0.4Fr + YFa$  [KN]

Single row tapered roller bearings can be used in pairs (their basic dimensions may be different), and when calculating the equivalent dynamic load, the additional axial force caused by the radial load must be calculated and taken into consideration. The additional force S of single-row tapered roller bearings can be approximately calculated according to the following formula:

$$S = Fr/2Y$$

### Equivalent static load

#### Single row tapered roller bearings

$$P0=0.5Fr + Y0Fa \quad [KN]$$

$$P0 < Fr \quad P0=Fr$$

### Double-row and four-row tapered roller bearings

#### Equivalent dynamic load

$$P=0Fr + Y1Fa \quad [KN]$$

When  $Fa/Fr \leq e$

$$P=0.67Fr + Y2Fa \quad [KN]$$

When  $Fa/Fr > e$

#### Equivalent static load

$$P0=Fr + Y0Fa \quad [KN]$$

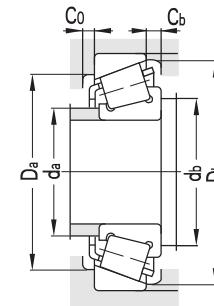
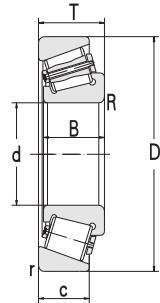
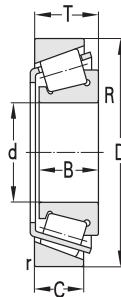
Fr and Fa indicate total load acted on single row, double-row and four-row tapered roller bearings.

The factors e, Y, Y1, Y2, Y0 are listed in the bearing dimension tables.

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 20~30 mm



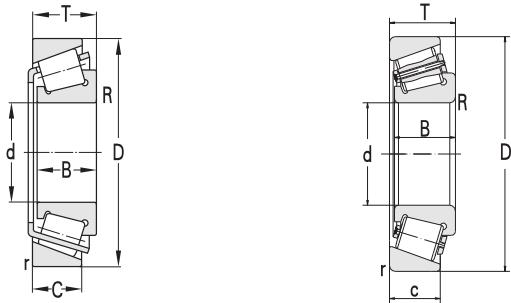
Principal dimensions								Basic load ratings		Limit speed ratings			
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	C <sub>r</sub>	C <sub>or</sub>	Grease	Oil	
mm													
									KN	r/min			
20	47	15	14	12	1	1	1	1	30.5	29.7	8000	11000	
	47	15.25	14	12	1	1	1	1	26.8	26.9	8000	11000	
	47	15.25	14	12	1	1	1	1	30	31	8000	11000	
	47	19.25	18	15	1	1	1	1	27.5	31	7500	10000	
	52	16.25	15	13	1.5	1.5	1.5	1.5	32.5	22	8000	11000	
	52	22.25	21	18	1.5	1.5	1.5	1.5	42	35	7500	10000	
25	47	17	17	14	0.6	0.6	0.6	0.6	32.5	42.5	7500	9500	
	52	16.25	15	13	1	1	1	1	32	34	7500	9500	
	52	16.25	15	13	1	1	1	1	36	40	7500	9500	
	52	19.25	18	16	1	1	1	1	40.5	46	7000	9500	
	52	22	22	18	1	1	1	1	51.5	56	7500	9500	
	52	23.75	22.5	13	5.5	5.5	1	1	32	35	7500	9500	
	62	18.25	17	13	1.5	1.5	1.5	1.5	45	48	7500	9500	
	62	18.25	17	13	1.5	1.5	1.5	1.5	48	47	9000	13000	
	62	18.25	17	15	1.5	1.5	1.5	1.5	48	46.5	9000	13000	
	62	25.25	24	20	1.5	1.5	1.5	1.5	63	66	6000	7100	
28	52	16	16	12	3.4	3.6	1	1	35.5	39.2	7100	8900	
	52	16	16	12	1	1	1	1	35.5	39.2	7100	8900	
30	55	17	17	13	1	1	1	1	36	47	6700	9000	
	62	17.25	16	14	1	1	1	1	41	44	6300	8500	
	62	21.25	20	17	1	1	1	1	55	65	6300	8500	
	62	21.25	20	17	1	1	1	1	55	65	6300	8500	
	62	25	25	19.5	1	1	1	1	70.5	75	5600	7500	
	72	20.75	19	14	1.5	1.5	1.5	1.5	46.5	51	5600	7500	
	72	20.75	19	14	1.5	1.5	1.5	1.5	46.5	51	5600	7500	
	72	20.75	19	16	1.5	1.5	1.5	1.5	61.5	63	5600	7500	
	72	20.75	19	16	1.5	1.5	1.5	1.5	61.5	62.5	5600	7500	
	72	20.75	19	16	1.5	1.5	1.5	1.5	51	56	5600	7500	
	72	20.75	19	16	1.5	1.5	1.5	1.5	54.5	59.5	5000	6700	
	72	20.75	20	14	1.5	1.5	1.5	1.5	54.5	59.5	5000	6700	
	72	24	23	16.5	1.5	1.5	1.5	1.5	59	61	5000	6700	
	72	24.35	23	18	1.5	1.5	1.5	1.5	66	80	5000	6700	
	72	28.75	27	23	1.5	1.5	1.5	1.5	77	84	5300	7000	

Designations	Abutment and fillet dimensions						Calculation Factor					Weight
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a	
mm												
30204X2/P6XYB5	28	24	40	43	44	2.5	3	0.35	1.7	0.96	11	0.123
30204	27	26	40	41	43	2.5	3.3	0.35	1.7	0.96	11	0.121
30204/YA8	28	24	40	43	45	2.5	3.3	0.35	1.7	0.96	11	0.124
32204	26	24	38	43	44	2	4.3	0.33	1.8	1	12	0.158
30304	28	28	44	45	48	3	3.3	0.3	2	1.1	11	0.167
32304	26	27	43	45	48	3	4.5	0.3	2	1.1	13	0.238
33005	31	28	40	44	45	2	3	0.29	2.1	1.14	11	0.129
30205	31	31	44	46	49	2	3.3	0.37	1.6	0.88	12	0.160
30205/YA8	32	29	43	48	49	2	3.3	0.37	1.6	0.88	12	0.166
32205	31	31	44	48	50	2	3.3	0.36	1.7	0.92	13	0.199
33205	30	29	42	48	50	2	4	0.35	1.7	0.94	14	0.216
30205X2	32	26	43	48	49	2	11	0.37	1.6	0.88	12	0.200
31305A	35	33	50	55	58	2	5.3	0.55	1.1	0.61	16	0.268
30305	35	32	54	55	58	3	5.3	0.3	2	1.1	12	0.250
30305X2	35	33	53	55	58	2	3.3	0.3	2	1.1	13	0.267
32305	32	32	52	55	58	2	5.3	0.3	2	1.1	15	0.422
320/28/YB2	33	29	44	48	51	2	4	0.43	1.4	0.77	13	0.145
320/28	33	32	44	48	51	2	4	0.43	1.4	0.77	13	0.145
32006/P6XYB5	35	36	48	49	52	3	4	0.43	1.4	0.8	13	0.171
30206	37	36	53	56	58	3	4.5	0.37	1.6	0.88	14	0.230
32206	36	36	52	56	58	2	4.3	0.37	1.6	0.88	15	0.356
32206/YA8	36	36	52	56	58	2	4.3	0.37	1.6	0.88	15	0.366
33206	37	34	51	58	60	2	5.5	0.34	1.8	0.97	16	0.343
31306B/HAP5	41	38	59	65	68	2	6.8	0.55	1.1	0.6	18	0.370
31306B/P6X	41	38	59	65	68	2	6.8	0.55	1.1	0.6	18	0.370
30306	40	37	62	65	66	4	6	0.31	1.9	1.05	15	0.390
30306/HA	40	37	62	65	66	4	6	0.31	1.9	1.05	15	0.397
30306/HAP6X	40	37	62	65	66	4	6	0.31	1.9	1.05	15	0.397
31306WB1	38	38	55	65	67	2	6.8	0.83	0.7	0.4	34	0.489
31306X2A/HAP5-1	39	38	56	65	67	2	7.5	0.62	1	0.53	21	0.455
31306X2A	43	38	58	65	69	2	6.4	0.55	1.1	0.6	20	0.489
32306	38	37	59	65	66	2	6	0.31	1.9	1.05	18	0.554

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 32~40 mm



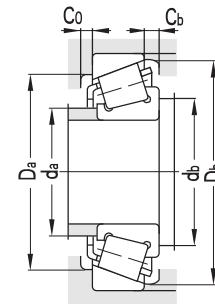
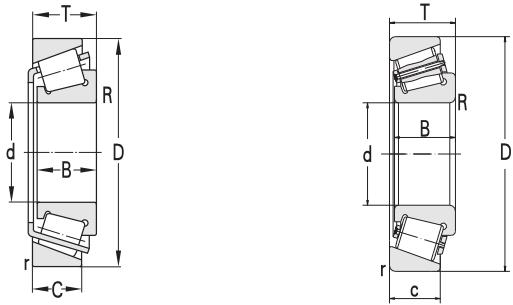
Principal dimensions								Basic load ratings		Limit speed ratings		Calculation Factor															
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Cr	Cor	Grease	Oil	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a	Weight			
mm								KN		r/min		mm								Kg							
32	75 65	29.75 27.5	28 26	23 15	1.5	1.5	1.5	1	75.5 43.5	54.3 46.5	5000 5500	6700 7000	41	40	58	68	71	3	6.8	0.55	1.1	0.6	23	0.647			
35	62	18	18	14	1	1	1	1	42	52	6000	8000	32007	40	41	54	56	59	4	4	0.45	1.3	0.73	15	0.384		
	65	18	18	14	3.5	3.5	1.2	1.2	35	41	5000	7000	30607	42	47	55	65	62	2	4	0.38	1.6	0.88	14	0.229		
	65	18	18	14	3.5	3.5	1.5	1.5	38.5	42	5000	7000	30607-1	39	36	52	58	58	2	4	0.33	1.8	0.99	13	0.251		
	72	18.25	17	15	1.5	1.5	1.5	1.5	50.5	55	5300	7000	30207	44	42	62	65	67	3	3.3	0.37	1.6	0.88	15	0.318		
	72	24.25	23	19	1.5	1.5	1.5	1.5	66	80	5300	7000	32207E/YA8	42	42	61	65	68	3	5.3	0.37	1.6	0.88	17	0.465		
	72	24.25	23	19	1.5	1.5	1.5	1.5	66	80	5300	7000	32207	42	42	61	65	68	2	5.3	0.37	1.6	0.88	17	0.452		
	72	28	28	22	1.5	1.5	1.5	1.5	87.5	106	4800	6300	33207	42	42	59	65	69	2	6	0.35	1.7	0.93	18	0.519		
	80	22.75	21	15	2	2	1.5	1.5	68	76	4500	6000	31307	45	44	62	71	76	3	7.5	0.83	0.7	0.4	25	0.515		
	80	22.75	21	18	2	2	1.5	1.5	68.5	65	5000	6700	30307	47	44	68	73	75	3	5.5	0.31	1.9	1.05	16	0.515		
	80	32.75	31	25	0.3	0.3	1.5	1.5	95	110	4800	6300	32307A/HAP5	45	36	61	73	75	3	7.8	0.47	1.3	0.7	23	0.768		
	80	32.75	31	25	2	2	1.5	1.5	90.5	94	4800	6300	32307	43	44	66	71	74	4	8.5	0.31	1.9	1.05	20	0.755		
	80	32.75	31	25	2	2	1.5	1.5	90	110	4800	6300	32307/HAP6X	43	44	66	71	74	4	8.5	0.31	1.9	1.05	20	0.755		
	80	18.25	17	15	1.5	1.5	1.5	1.5	54.5	60	5600	7500	30207X1	47	44	68	73	75	3	5.5	0.37	1.6	0.88	17	0.43		
	89	38	38	27.5	1	1	1.5	1.5	111	148	4800	6300	32307X3A/HAP5	47	39	64	82	85	3	11	0.62	1	0.53	29	1.22		
39.7	90	25.4	22	21	0.8	0.8	0.8	0.8	78.5	94.5	4000	5300	306/39X4	48	49	71	81	87	4	9.5	0.4	1.5	0.83	25	0.769		
40	68	19	19	14.5	1	1	1	1	58.5	79.5	5300	7000	32008/P6X	47	44	59	64	66	3	4.5	0.38	1.6	0.87	15	0.297		
	68	19	19	14.5	1	1	1	1	58.5	79.5	5300	7000	32008	47	44	59	64	66	3	4.5	0.38	1.6	0.87	15	0.297		
	72	19	19	16	1	1	1	1	58.5	79.5	5300	7000	32008X1WC	47	44	59	68	66	2	3	0.38	1.6	0.87	16	0.315		
	73	21	21	15.5	1	1	1	1	59	74.5	5300	7000	32008X3	47	50	59	64	67	2	3	0.43	1.4	0.76	26	0.362		
	75	26	26	20.5	1.5	1.5	1.5	1.5	81	104	5000	6700	33108	65	47	65	68	71	4	5.5	0.35	1.7	0.9	18	0.499		
	80	19.75	18	16	1.5	1.5	1.5	1.5	66	73	4800	6300	30208	49	47	69	73	75	3	3.8	0.37	1.6	0.88	17	0.430		
	80	24.75	23	19	1.5	1.5	1.5	1.5	79	93	4800	6300	32208	48	47	68	73	76	3	5.8	0.37	1.6	0.88	18	0.561		
	80	30	29	23	2	2	2	2	103	120	4300	5600	33208X2A	49	49	65	72	77	3	7	0.43	1.4	0.77	21	0.669		
	80	32	32	25	1.5	1.5	1.5	1.5	113	126	4300	5600	33208	47	48	65	73	77	2	7	0.36	1.7	0.92	21	0.701		
	90	25.25	23	17	2	2	1.5	1.5	71.5	77	4000	5300	31308	48	49	71	81	87	4	9.5	0.83	0.7	0.4	29	0.731		
	90	25.25	23	20	2	2	1.5	1.5	95.5	102	4500	6000	30308	52	49	77	81	84	3	5.5	0.35	1.7	0.96	19	0.734		
	90	25.25	23	20	3	3	1.5	1.5	95.5	102	4500	6000	30308R/YA6	54	52	75	83	83	3	5.3	0.35	1.7	0.96	19	0.783		
	90	35.25	33	27	1.8	1.8	1.8	1.8	102	119	4000	5300	32308/YA8	49	49	73	81	83	4	8.5	0.35	1.7	0.96	22	1.020		
	90	35.25	33	27	2	2	1.5	1.5	117	140	4000	5300	32308	49	49	73	81	83	4	8.5	0.35	1.7	0.96	22	1.080		
	90	35.25	33	27	2	2	1.5	1.5	114	148	4000	5300	32308B	50	49	67	83	85	3	8.3	0.55	1.1	0.6	27	1.06		

Designations	Abutment and fillet dimensions								Calculation Factor																													
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a																											
T5FD032 302/32X2/YA6	41	40	58	68	71	3	6.8	0.55	1.1	0.6	23	0.647																										
32007	40	41	54	56	59	4	4	0.45	1.3	0.73	15	0.384	30607	42	47	55	65	62	2	4	0.38	1.6	0.88	14	0.229	30607-1	39	36	52	58	58	2	4	0.33	1.8	0.99	13	0.251
30207	44	42	62	65	67	3	3.3	0.37	1.6	0.88	15	0.318	32207E/YA8	42	42	61	65	68	3	5.3	0.37	1.6	0.88	17	0.465	32207	42	42	61	65	68	2	5.3	0.37	1.6	0.88	17	0.452
32207	42	42	61	65	68	2	6	0.35	1.7	0.93	18	0.519	33207	42	42	59	65	69	2	6	0.35	1.7	0.93	18	0.519	31307	45	44	62	71	76	3	7.5	0.83	0.7	0.4	25	0.515
30307	47	44	68	73	75	3	5.5	0.31	1.9	1.05	16	0.515	32307A/HAP5	45	36	61	73	75	3	7.8	0.47	1.3	0.7	23	0.768	32307	43	44	66	71	74	4	8.5	0.31	1.9	1.05	20	0.755
32307	43	44	66	71	74	4	8.5	0.31	1.9	1.05	20	0.755	32307/HAP6X	43	44	66	71	74	4	8.5	0.31	1.9	1.05	20	0.755	30207X1	47	44	68	73	75	3	5.5	0.37	1.6	0.88	17	0.43
32307X3A/HAP5	47	39	64	82	85	3	11	0.62	1	0.53	29	1.22	32308B	47	48	65	73	77	2	7	0.36	1.7	0.92	21	0.701	33208	47	48	65	73	77	2	7	0.36	1.7	0.92	21	0.701
31308	48	49	71	81	87	4	9.5	0.83	0.7	0.4	29	0.731	30308	52	49	77	81	84	3	5.5	0.35	1.7	0.96	19	0.734	30308R/YA6	54	52	75	83	83	3	5.3	0.35	1.7	0.96	19	0.783
32308/YA8	49	49	73	81	83	4	8.5	0.35	1.7	0.96	19	0.783	32308	49	49	73	81	83	4	8.5	0.35	1.7	0.96	22	1.020	32308B	50	49	67	83	85	3	8.3	0.55	1.1	0.6	27	1.06

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 42~50 mm



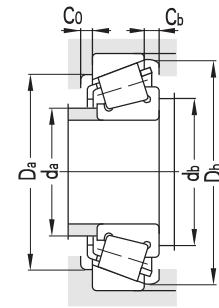
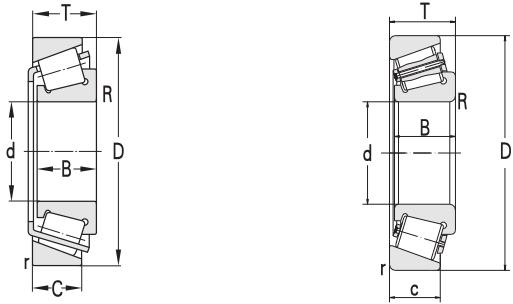
Principal dimensions								Basic load ratings		Limit speed ratings			
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	C <sub>r</sub>	C <sub>or</sub>	Grease	Oil	
mm								KN		r/min			
42	100	38.25	36	30	2	2	1.5	1.5	153	174	3600	4800	
45	75	20	20	15.5	1	1	1	1	57.5	80	4800	6300	
	75	20	20	15.5	1	1	1	1	57.5	80	4800	6300	
76	24	27.5	19.8	2	2	2	2	2	76	101	4700	6250	
76	23.8	27.5	19.8	0.7	0.7	0.1	0.1	0.1	76	101	4700	6250	
80	26	26	20.5	1.5	1.5	1.5	1.5	1.5	87	118	4500	6000	
85	20.75	19	16	1.5	1.5	1.5	1.5	1.5	70.5	83	4500	6000	
85	24.75	23	19	1.5	1.5	1.5	1.5	1.5	84.5	105	4500	6000	
85	24.75	23.5	20	1.5	1.5	1.5	1.5	1.5	59.5	72	4500	6000	
85	32	32	25	1.5	1.5	1.5	1.5	1.5	115	150	4000	5300	
100	27.25	25	18	2	2	1.5	1.5	1.5	86	93	3600	4800	
100	27.25	25	18	2.5	2.5	2.5	2.5	2.5	102	117	3600	4800	
100	27.25	25	22	2	2	1.5	1.5	1.5	103	107	4000	5300	
100	31.8	29	20.5	2	2	1.5	1.5	1.5	98	108	3600	4800	
100	32	29	20.5	2	2	1.5	1.5	1.5	148	163	3400	4500	
100	32	29	20.5	2	2	1.5	1.5	1.5	99	107	4000	5300	
100	38.25	36	30	2	2	1.5	1.5	1.5	153	174	3600	4800	
47	100	43	43	37	1.8	1.8	1.8	1.8	151	190	3400	4500	
50	80	20	20	15.5	1	1	1	1	60	86.5	4500	6000	
	80	22	20	17.5	4	4	1.5	1.5	60	86	4500	6000	
80	24	24	19	1	1	1	1	1	77	111	4500	6000	
82	21.5	21.5	17	3	3	0.5	0.5	0.5	68.5	73	3200	4300	
83	20.5	20.5	15.5	4	4	1	1	1	66	91	4500	6000	
90	21.75	20	17	1.5	1.5	1.5	1.5	1.5	72.5	74	4300	5600	
90	24.75	23	19	1.5	1.5	1.5	1.5	1.5	88	110	4000	5600	
90	25	23	19	1.3	1.3	1.3	1.3	1.3	62	77	4300	5600	
90	32	32	24.5	1.5	1.5	1.5	1.5	1.5	119	160	3800	5000	
100	36	35	30	2.5	2.5	2.5	2.5	2.5	134	196	3700	4900	
110	29.25	27	23	2.5	2.5	2.5	2.5	2.5	132	150	3600	4800	
110	29.25	27	19	2.5	2.5	2	2	2	110	124	3200	4300	
110	29.25	27	19	3	3	3	3	3	118	135	3200	4300	
110	42.25	40	33	2.3	2.3	2.3	2.3	2.3	173	214	3600	4800	
110	42.25	40	33	2.5	2.5	2	2	2	173	214	3600	4800	

Designations	Abutment and fillet dimensions							Calculation Factor						
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a			Weight
mm													Kg	
323/42R	58	51	81	93	93	3	8.3	0.35	1.7	0.96	25	1.55		
32009	52	49	65	71	73	3	6	0.39	1.5	0.84	17	0.343		
32009/HA	52	49	65	71	73	3	6	0.39	1.5	0.84	17	0.343		
306/42	52	49	65	71	73	3	6	0.28	2.2	1.19	29	0.479		
306/42	52	49	65	71	73	3	6	0.28	2.2	1.19	29	0.479		
33109R	52	52	69	73	77	4	5.5	0.37	1.6	0.9	19	0.538		
30209	53	52	74	78	80	3	5	0.4	1.5	0.81	18	0.464		
32209	53	52	73	78	81	3	5.8	0.4	1.5	0.81	20	0.576		
32209X2A	53	53	69	78	78	3	4.8	0.4	1.5	0.83	19	0.621		
33209	52	53	70	78	82	3	7	0.39	1.6	0.86	22	0.789		
31309	54	54	79	91	96	4	9.5	0.83	0.7	0.4	32	0.977		
31309/YB4	54	54	79	91	96	4	9.5	0.83	0.7	0.4	32	0.977		
30309	59	54	86	91	94	4	8.5	0.35	1.7	0.96	21	0.987		
32309X2A	56	54	77	93	95	4	11	0.72	0.8	0.46	30	1.14		
31309X2	55	54	75	93	95	3	12	0.81	0.7	0.41	33	1.16		
30309X2B	56	54	77	93	95	4	12	0.72	0.8	0.46	30	1.08		
32309	56	54	82	91	93	4	8.5	0.35	1.7	0.96	25	1.44		

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 50.8~60 mm



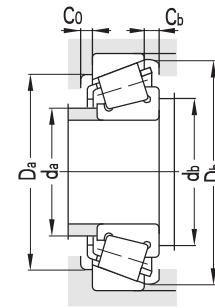
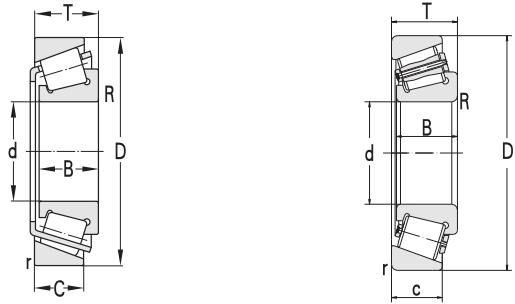
Principal dimensions										Basic load ratings		Limit speed ratings			
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Cr	Cor	Grease	Oil			
mm										KN	r/min				
50.8	100	35	35	27	1.5	1.5	1.5	1.5	141	193	3200	4300			
	100	35	35	29	2	2	2	2	131	171	3200	4300			
55	90	23	23	17.5	1.5	1.5	1.5	1.5	77	111	4000	5300			
	90	27	27	21	1.5	1.5	1.5	1.5	101	147	4000	5300			
	95	30	30	23	1.5	1.5	1.5	1.5	100	163	3800	5000			
	95	30	30	23	1.5	1.5	1.5	1.5	100	163	3800	5000			
	95	30	30	23	1.5	1.5	1.5	1.5	100	163	3800	5000			
	100	22.75	21	18	2	2	2	2	1.5	93	110	3800	5000		
	100	22.75	21	18	2	2	2	2	1.5	1.5	89.5	105	4000	5300	
	100	26.75	25	21	2	2	2	2	1.5	1.5	108	133	3800	5000	
	100	26.75	25	21	6	0.2	1.5	1.5	108	133	3800	5000			
	100	26.75	25	21	2	2	1.5	1.5	98	133	3800	5000			
	100	32	31	24.5	2	2	2	2	2	142	174	3400	4500		
	100	35	35	27	2	2	2	2	1.5	1.5	143	196	3400	4500	
	100	35	35	27	2	2	1.5	1.5	143	196	3400	4500			
	120	31.5	29	25	2.5	2.5	2	2	153	178	3200	4300			
	120	31.5	29	25	2.5	2.5	2	2	153	178	3200	4300			
	120	31.5	29	25	2.5	2.5	2	2	153	178	3200	4300			
	120	31.5	29	25	2.5	2.5	2	2	153	178	3200	4300			
	120	31.5	29	21	2.5	2.5	2	2	155	166	2800	3800			
	120	31.5	29	21	2.5	2.5	2	2	135	139	2800	3800			
	120	31.5	29	21	2.5	2.5	2	2	138	162	2800	3800			
	120	45.5	43	35	2.5	2.5	2	2	218	280	3000	4000			
	120	45.5	43	35	7	7	2	2	218	280	3000	4000			
	120	45.5	43	35	2.5	2.5	2	2	200	283	3000	4000			
	125	37	36	25	3	3	2	2	148	172	2800	3800			
60	85	17	16	14	1	1	1	1	42.5	67.5	3900	5100			
	95	23	23	17.5	1.5	1.5	1.5	1.5	78.5	112	3800	5000			
	95	27	27	21	1.5	1.5	1.5	1.5	100	158	2800	5000			
	100	30	30	23	1.5	1.5	1.5	1.5	116	171	3600	4800			
	110	23.75	22	19	2	2	1.5	1.5	104	124	3400	4500			
	110	29.75	28	24	2	2	1.5	1.5	133	170	3400	4500			
	110	29.75	28	24	2	2	1.5	1.5	133	170	3400	4500			
	115	40	39	33	4	4	3	3	200	270	3000	4000			
	130	33.5	31	26	3	3	2.5	2.5	163	185	3000	4000			

Designations	Abutment and fillet dimensions							Calculation Factor				
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a	Weight
339/50.8	64	58	83	93	97	4.5	8	0.4	1.5	0.83	25	1.267
306/50.8	63	59	83	92	94	3	6	0.3	2	1.1	23	1.27
32011	64	63	79	83	88	4.5	5.5	0.41	1.5	0.81	20	0.564
33011	62	65	78	83	87	4.5	5.5	0.31	1.92	1.06	19	0.839
33111/P6XYB	21	63	47	88	57	3	7	0.37	1.6	0.88	18	0.881
33111/HA	64	63	81	88	92	3	7	0.37	1.6	0.88	22	0.881
33111/P6XYZB	64	63	81	88	92	3	7	0.37	1.6	0.88	22	0.881
30211	64	64	88	91	95	4	5	0.4	1.5	0.81	21	0.713
30211/YA	65	64	87	93	95	3	4.8	0.4	1.5	0.81	21	0.689
32211	62	64	87	91	95	4	5.7	0.4	1.5	0.81	22	0.878
32211/YA6	65	74	85	93	95	3	5.8	0.4	1.5	0.81	22	0.875
32211/HAP6X	62	64	87	91	95	4	5.7	0.4	1.5	0.81	22	0.878
33211X2A	64	64	85	92	97	4.5	7.5	0.4	1.5	0.81	24	1.01
33211	63	64	85	93	96	6	8	0.4	1.5	0.8	25	1.17
33211/HAP6X	63	64	85	93	96	6	8	0.4	1.5	0.8	25	1.17
30311	70	65	104	110	112	4	6.5	0.35	1.7	0.96	25	1.65
30311R	70	65	104	110	112	4	6.5	0.35	1.7	0.96	25	1.71
30311X3R	70	65	104	110	112	4	6.5	0.35	1.7	0.96	25	1.84
31311	68	65	92	112	112	3	11	0.83	0.7	0.4	38	1.78
31311/YA8	68	65	92	112	112	3	11	0.83	0.7	0.4	38	1.71
31311/YB4	68	65	92	112	112	3	11	0.83	0.7	0.4	38	1.71
32311	66	65	99	110	111	5	11	0.35	1.7	0.96	29	2.43
32311/YA6	66	65	99	110	111	5	11	0.35	1.7	0.96	29	2.43
32311A	66	65	99	110	111	5	11	0.55	1.1	0.6	230	2.51
30611B	69	67	95	117	117	3	12	0.73	0.8	0.45	38	2.10
32912X2A	65	68	76	81	79	4	3	0.38	1.6	0.87	17	0.277
32012	68	68	83	88	92	5	5.5	0.4	1.4	0.77	21	0.597
33012	67	67	85	88	90	5	6	0.33	1.8	1	20	0.691
33112	68	68	85	93	97	3.5	7	0.4	1.5	0.83	23	0.895
30212	69	69	96	101	103	4	5	0.4	1.5	0.81	23	0.923
32212	69	68	95	101	104	4	5.8	0.4	1.5	0.81	25	1.26
32212/HAP6X	69	68	95	101	104	4	5.8	0.4	1.5	0.81	25	1.26
33212X3	71	74	96	104	110	5	7	0.33	1.8	0.99	28	1.86
30312	76	72	112	118	121	3.5	7.5	0.35	1.7	0.96	26	1.96

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 60~65 mm



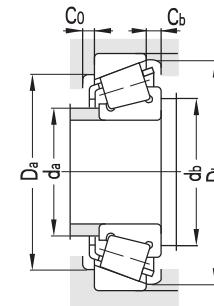
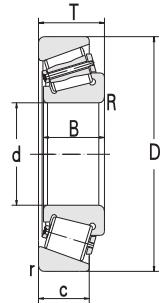
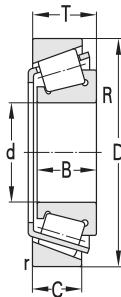
Principal dimensions	d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Basic load ratings		Limit speed ratings		Grease	Oil
										Cr	Cor	r/min	r/min		
mm															
60	130	33.5	31	22	3	3	2.5	2.5	138	155	2600	3600			
	130	33.5	31	22	3	3	2.5	2.5	152	176	2600	3600			
	130	48.5	46	37	3	3	2.5	2.5	229	289	2600	3600			
	140	42	41	28	3	3	2.5	2.5	187	225	2600	3600			
65	100	23	23	17.5	1.5	1.5	1.5	1.5	82.5	128	3400	4500			
	100	23.3	22	19	1.5	1.5	1.5	1.5	81	116	3400	4500			
	100	27	27	21	1.5	1.5	1.5	1.5	108	158	3400	4500			
	110	30.35	30	24	3	4	1.8	1.8	109	155	3200	4300			
	110	30.35	30	24	3	4	1.8	1.8	112	163	3000	4000			
	110	30.35	30	24	3	3	2	2	140	203	3200	4300			
	110	30.5	30	24	3	4	1.8	1.8	79	166	3200	4300			
	110	34	34	26.5	1.5	1.5	1.5	1.5	157	220	3200	4300			
	110	34	34	26.5	1.5	1.5	1.5	1.5	157	220	3200	4300			
	110	38	38	29	2	2	1.5	1.5	168	235	3000	4000			
	120	24.75	23	20	2	2	1.5	1.5	122	147	3000	4000			
	120	32.75	31	27	2	2	1.5	1.5	151	192	3000	4000			
	120	32.75	31	27	1	1	0.4	0.4	180	242	3000	4000			
	120	33	31	27	1.8	1.8	1.8	1.8	130	163	3000	4000			
	120	41	41	32	2	2	1.5	1.5	183	280	2800	3800			
	120	41	41	32	2	2	1.5	1.5	183	280	2800	3800			
	120	41	41	32	2	2	1.5	1.5	183	280	2800	3800			
	130	45	43	35	7	7	2	2	223	298	2800	3800			
	130	51	48	39	2.5	2.5	2.5	2.5	235	320	2400	3400			
	130	51	48	39	3	3	2.5	2.5	245	335	2400	3400			
	140	36	33	23	3	3	2.5	2.5	171	198	2800	3800			
	140	36	33	23	3.8	5	2.5	2.5	171	198	2800	3800			
	140	36	33	23	3	3	2.5	2.5	180	213	2800	3800			
	140	36	33	28	3	3	2.5	2.5	188	216	2600	3600			
	140	36	33	28	3	3	6	6	188	216	2600	3600			
	140	36	33	28	6	6	2.5	2.5	188	216	2600	3600			
	140	36	33	28	6	6	2.5	2.5	188	216	2600	3600			
	140	40	39	26	3.5	3.5	2	2	220	240	2600	3600			
	140	51	48	39	3	3	2.5	2.5	264	335	2400	3400			
	140	51	48	39	3	3	2.5	2.5	253	350	2400	3400			
	150	53.5	54	44.5	2.3	2.3	2.3	2.3	296	390	2400	3400			

Designations	Abutment and fillet dimensions							Calculation Factor					Weight
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a		
mm													Kg
31312	69	72	103	118	124	5	12	0.83	0.7	0.4	41	1.92	
31312/YB4	69	72	103	118	124	5	12	0.83	0.7	0.4	41	1.92	
32312	72	72	107	118	122	6	12	0.35	1.7	0.96	31	2.90	
31312X3	78	72	106	131	130	5	14	0.73	0.8	0.45	42	3.42	
32013	72	72	90	93	97	4	5.5	0.46	1.3	0.7	22	0.612	
32013X2	72	72	90	93	97	4	5.5	0.35	1.7	0.94	20	0.629	
33013	72	73	87	93	97	3.5	6	0.3	1.7	0.95	21	0.732	
7813	76	79	94	105	106	3.5	6.4	0.4	1.5	0.82	25	1.10	
7813Y	76	77	94	110	106	3.5	6.4	0.4	1.5	0.82	25	1.10	
33113X2- 1	75	77	94	102	106	5	6.5	0.4	1.5	0.82	25	1.13	
33113X2	75	77	93	110	105	3.5	6.2	0.39	1.6	0.85	25	1.17	
33113	76	73	94	103	107	3.5	7.5	0.39	1.6	0.85	26	1.30	
33113/YB2	76	73	94	103	107	3.5	7.5	0.39	1.6	0.85	26	1.30	
33212	69	68	93	105	106	6	9	0.4	1.5	0.8	27	1.51	
30213	77	74	106	111	114	4	5	0.4	1.5	0.81	24	1.14	
32213	75	74	104	111	115	4	5.8	0.4	1.5	0.81	28	1.58	
32213/YA6	77	69	102	120	115	5	5.8	0.4	1.5	0.81	28	1.58	
32213A/YA6	75	74	104	111	115	3.5	6	0.37	1.6	0.89	26	1.50	
33213	76	74	100	113	116	3.5	9	0.39	1.5	0.85	30	2.02	
33213/YB2	76	74	100	113	116	3.5	9	0.39	1.5	0.85	30	2.02	
33213/HA	76	74	100	113	116	3.5	9	0.39	1.5	0.85	30	2.02	
30613	80	66	108	122	122	3.5	10	0.33	1.8	0.99	30	2.64	
32313X1	79	75	107	121	122	5	12	0.33	1.8	0.99	32	3.01	
32313X1A	80	77	107	121	124	5	12	0.35	1.7	0.93	33	2.93	
31313	75	77	111	128	134	5	13	0.83	0.7	0.4	44	2.46	
31313/YA6	75	77	111	128	134	5	13	0.83	0.7	0.4	44	2.45	
31313/YB4	75	77	111	128	134	5	13	0.83	0.7	0.4	44	2.46	
30313	83	72	120	131	131	3.5	8	0.35	1.7	0.96	28	2.49	
30313/YA6- 1	86	77	120	122	131	5	8	0.35	1.7	0.96	28	2.49	
30313/YA6	86	84	120	131	131	5	8	0.35	1.7	0.96	28	2.49	
30313/YA6- 2	86	84	120	131	131	5	8	0.35	1.7	0.96	28	2.49	
27713E	80	77	109	132	133	3.5	14	0.73	0.8	0.45	42	2.77	
32313	79	77	117	128	131	6	12	0.35	1.7	0.96	33	3.68	
T5GD065	80	77	106	131	132	5	12	0.55	1.1	0.6	41	4.36	
30613- 1	86	75	117	150	137	3.5	9	0.36	1.7	0.9	37	4.43	

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 70~75 mm



Principal dimensions								Basic load ratings		Limit speed ratings		
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	C <sub>r</sub>	C <sub>o</sub>	Grease	Oil
mm								KN		r/min		

70	100	20	20	16	1	1	1	1	70.5	114	3000	4000
	100	20	19	16	1	1	1.5	1	60.5	97	3000	4000
	110	25	25	19	1.5	1.5	1.5	1.5	106	163	3000	4000
	120	33	33	27	2	2	2	2	158	220	3000	4000
	120	37	37	29	2	2	1.5	1.5	164	258	3000	4000
	120	45	42	37	2.5	2.5	2.5	2.5	138	198	3000	4000
	120	45	42	37	2.5	2.5	2.5	2.5	138	198	3000	4000
	125	26.25	24	21	2	2	1.5	1.5	119	142	2000	3000
	125	33.25	31	27	2	2	1.5	1.5	170	227	3000	4000
	125	33.25	31	27	2.5	2.5	2.5	2.5	201	248	2800	3800
	130	57	56	35	10.5	11	1.5	1.5	250	345	2800	3800
	150	38	35	25	3	3	2.5	2.5	192	226	3000	4000
	150	38	35	25	3	3	2.5	2.5	192	226	2400	3400
	150	38	35	30	3	3	2.5	2.5	223	262	2400	3400
	150	38	35	30	8.5	8.5	2.5	2.5	226	267	2400	3400
	150	54	51	42	3	3	2.5	2.5	268	395	2400	3400
	150	54	51	42	3	3	2.5	2.5	305	390	2400	3400
	150	54	51	42	6	6	2.5	2.5	305	395	2200	3200
	165	57	57	40	6	6	2.5	2.5	315	400	2200	3200
					3	3	3	3	315	410	2200	3200

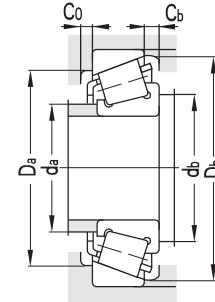
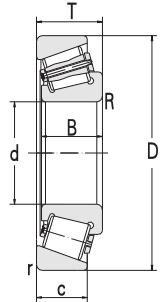
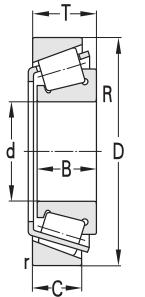
75	115	25	25	19	1.5	1.5	1.5	1.5	104	160	3000	4000
	115	31	31	25.5	1.5	1.5	1.5	1.5	130	213	3000	4000
	125	37	37	29	2	2	1.5	1.5	174	275	2800	3800
	130	27.25	25	22	2	2	1.5	1.5	139	175	2800	3800
	130	33.25	31	27	2	2	1.5	1.5	173	231	2600	3600
	130	33.25	31	27	3	3	2.5	2.5	185	253	2600	3600
	130	33.5	31	27	1.8	1.8	1.8	1.8	139	184	2600	3600
	130	41	41	31	2	2	1.5	1.5	199	282	2600	3600
	135	44	45	35	3	3	2.5	2.5	200	292	2600	3600
	135	44.5	45	35	2.3	2.3	2.3	2.3	193	277	2600	3600
	135	44.5	45	36.5	2.5	2.5	2.5	2.5	232	340	2600	3600
	150	30.5	29	20	3	3	2.5	2.5	165	202	2200	3200
	160	40	37	31	3	3	2.5	2.5	259	285	2200	3200
	160	40	37	26	3	3	2.5	2.5	229	276	2200	3200
	160	58	55	45	3	3	2.5	2.5	345	455	2000	3000

Designations	Abutment and fillet dimensions						Calculation Factor					
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a	Weight
mm												Kg
32914	76	76	90	96	96	5	4	0.32	1.9	1.05	18	0.475
32914X2A	77	74	90	96	96	5	4	0.36	1.7	0.92	19	0.477
32014	93	78	112	103	125	5	6	0.43	1.4	0.76	26	0.972
33114X2A/YA6	81	79	104	112	113	5	6	0.28	2.2	1.19	23	1.51
33114	82	79	102	113	116	3.5	8	0.38	1.6	0.87	28	1.72
30614R	79	80	99	111	115	3.5	8	0.39	1.5	0.84	32	1.94
30614	79	80	99	111	115	3.5	8	0.39	1.5	0.84	32	1.89
30214	81	69	110	116	118	4	5.3	0.42	1.4	0.79	26	1.29
32214	79	79	106	118	120	4	6.3	0.42	1.4	0.79	29	1.66
32214/YA6	81	80	106	116	120	5	6.3	0.42	1.4	0.79	29	1.66
30214X3/YA6	82	71	109	123	124	5	22	0.33	1.8	0.99	30	2.92
31314	78	82	118	138	140	5	13	0.83	0.7	0.4	47	2.87
31314	78	82	118	138	140	5	13	0.83	0.7	0.4	47	2.87
30314	89	82	130	138	141	5	8	0.35	1.7	0.96	30	3.08
30314/YA6	92	71	128	141	140	5	8	0.35	1.7	0.96	30	3.08
T5GD070	89	82	115	141	140	5	12	0.55	1.1	0.6	44	4.54
32314	84	82	125	138	141	6	12	0.35	1.7	0.96	36	4.38
32314/YA6	88	89	123	141	140	5	12	0.35	1.7	0.96	36	4.38
32314/YA6-1	88	89	123	141	140	5	12	0.35	1.7	0.96	36	4.33
30614-1	85	80	121	155	156	4	6.3	0.7	0.86	0.47	52	6.09
32015	84	83	100	108	112	6	6	0.46	1.3	0.72	25	0.922
33015	84	82	104	108	110	6	5.5	0.3	2	1.1	23	1.10
33115	87	84	107	118	121	4.5	8	0.4	1.5	0.83	29	1.80
30215	85	84	115	121	125	4.5	5.3	0.44	1.4	0.76	28	1.40
32215	84	84	115	126	126	4.5	6.3	0.44	1.4	0.76	30	1.76
32215/YA6	86	87	111	121	125	6	6.3	0.44	1.4	0.76	30	1.76
32215A/YA6	87	83	110	125	123	4.5	6.5	0.41	1.5	0.81	29	1.74
33215	87	84	109	123	126	4.5	10	0.43	1.4	0.77	32	2.27
33215X2A-1	87	87	110	126	128	4.5	9	0.4	1.5	0.82	33	2.66
33215X2A	87	85	110	135	128	4.5	9.5	0.4	1.5	0.82	33	2.58
30615	90	76	115	126	128	6	8	0.28	2.2	1.19	29	2.79
31315X3	93	85	126	146	142	5	13	0.64	0.94	0.52	38	2.24
30315	95	87	139	148	150	4.5	9	0.35	1.7	0.96	32	3.71
31315	86	87	127	148	153	6	14	0.83	0.7	0.4	50	3.40
32315	94	87	131	151	150	4.5	13	0.35	1.7	0.96	38	5.35

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 75~90 mm



Principal dimensions								Basic load ratings		Limit speed ratings			
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Cr	Cor	Grease	Oil	
mm													
									KN		r/min		

75	160	40	37	26	3	3	2.5	2.5	226	270	2300	3500
	180	63.65	60	45	3	3	2.5	2.5	375	490	2000	3000
	180	63.5	60	45	4	4	3	3	370	480	2000	3000

80	110	20	19	16	1	1	1	1	63	105	2700	3700
	110	20	20	16	1	1	1	1	71	119	2700	3700
	125	29	29	22	1.5	1.5	1.5	1.5	139	219	2600	3600
	125	36	36	29.5	1.5	1.5	1.5	1.5	172	281	2600	3600
	130	32	31	25	3.5	3.5	2	2	151	218	2400	3400
	130	37	37	29	2	2	1.5	1.5	179	280	2600	3600
	140	28.25	26	22	2.5	2.5	2	2	146	178	2400	3400
	140	35.25	33	28	2.5	2.5	2	2	198	263	2400	3400
	140	35.25	33	28	5.5	5.5	2	2	198	263	2400	3400
	140	35.5	33	28	2.3	2.3	2.3	2.3	162	216	2400	3400
	140	45	45	36.5	3	3	2.5	2.5	237	350	2600	3600
	140	46	46	35	2.5	2.5	2	2	264	390	2200	3200
	170	42.5	39	27	3	3	2.5	2.5	223	260	2200	3200
	170	42.5	39	33	3	3	2.5	2.5	273	320	2000	3000
	170	61.5	58	48	3	3	2.5	2.5	390	510	1900	2800
	180	63.65	60	45	3	3	2.5	2.5	370	550	1800	2800

85	130	29	29	22	1.5	1.5	1.5	1.5	138	220	2400	3400
	130	36	36	29.5	1.5	1.5	1.5	1.5	195	330	2600	3600
	140	41	41	32	2.5	2.5	2	2	215	350	2400	3400
	150	30.5	28	24	2.5	2.5	2	2	167	204	2400	3400
	150	38.5	36	30	2.5	2.5	2	2	230	315	2200	3200
	150	49	49	37	2.5	2.5	2	2	286	236	2000	3000
	180	44.5	41	28	4	4	3	3	254	300	2000	3000
	180	44.5	41	34	4	4	3	3	299	355	1900	2800
	180	63.5	60	49	4	4	3	3	425	560	1800	2600

90	140	32	32	24	2	2	1.5	1.5	165	255	2200	3200
	140	32.4	30	26	2	2	1.5	1.5	150	196	2200	3200
	140	39	39	32.5	2	2	1.5	1.5	226	370	2200	3200
	145	35	32	27	6.5	6.5	2	2	168	272	2200	3200
	150	38.5	36	30	2.5	2.5	2	2	209	310	2000	3000

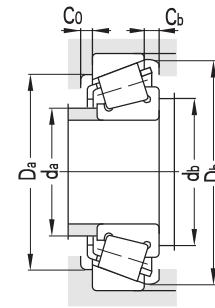
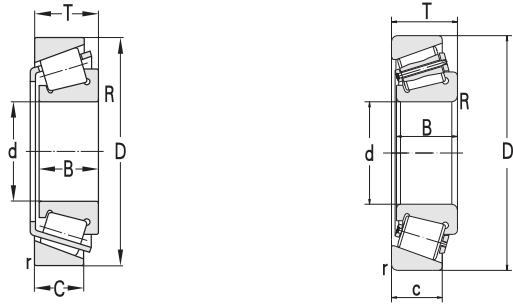
Designations	Abutment and fillet dimensions						Calculation Factor					
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a	Weight
mm												
31315/YB4	94	88	131	151	150	4.5	13	0.83	0.7	0.4	41	3.4
32315X3	98	87	132	171	168	6	18.7	0.7	0.86	0.47	57	7.90
32315X3-1	98	87	132	171	168	6	18.7	0.7	0.86	0.47	55	7.89
32916X2A	86	88	100	106	106	5	6	0.32	1.83	1	20	0.500
32916	86	88	100	106	106	5	6	0.35	1.7	0.96	38	0.548
32016	90	88	109	118	121	6	7	0.42	1.4	0.78	27	1.26
33016	90	87	112	117	119	6	6.5	0.28	2.1	1.1	26	1.62
33116X2A	91	81	113	122	125	4.5	7	0.38	1.6	0.88	27	1.60
33116	91	81	111	123	127	4.5	8	0.42	1.4	0.79	31	2.79
30216	90	90	124	130	133	4.5	6.3	0.42	1.4	0.79	29	1.56
32216	89	90	122	130	135	5	7.3	0.42	1.4	0.79	32	2.19
32216/YA6-1	91	81	120	132	134	6	7.3	0.42	1.4	0.79	32	2.19
32216/A/YA6	94	90	119	140	132	4.5	7.5	0.4	1.5	0.82	31	2.13
33216X2	94	92	120	131	133	4.5	8.5	0.28	2.2	1.19	30	2.77
33216	90	90	117	132	136	4.5	11	0.43	1.4	0.78	35	2.89
31316	92	91	134	158	161	6	16	0.83	0.7	0.4	53	3.65
30316	102	92	146	158	160	5	9.5	0.35	1.7	0.96	34	4.32
32316	97	92	142	158	160	4.5	14	0.35	1.7	0.96	41	6.43
32316X3	97	92	142	158	160	4.5	14	0.76	0.86	0.47	57	7.91

32017	94	93	114	123	126	7	7	0.44	1.4	0.75	28	1.33
33017	94	92	118	122	125	6	6.5	0.3	2	1.1	26	1.70
33117	98	95	119	132	136	4.5	9	0.41	1.5	0.81	33	2.43
30217	96	95	132	140	142	5	6.5	0.42	1.4	0.79	31	2.05
32217	95	95	130	140	143	5	8.5	0.42	1.4	0.79	34	2.70
33217	96	95	125	142	145	4.5	12	0.42	1.4	0.79	37	3.64
31317	96	99	143	166	171	6	17	0.83	0.7	0.4	56	4.92
30317	107	99	156	166	168	6	11	0.35	1.7	0.96	35	5.39
32317	102	99	150	166	168	4.5	15	0.35	1.7	0.96	42	7.37
32018	100	99	122	133	135	7	8	0.42	1.4	0.78	30	1.77
32018X2A	100	99	125	131	134	6	8	0.34	1.8	0.97	23	1.71
33018	100	99	127	132	135	7	6.5	0.27	2.2	1.3	27	2.24
32018X3/YA6	100	99	129	133	135	7	6.5	0.42	1.4	0.78	30	2.08
33118X2(TRA181504)	103	10	130	142	145	4.5	8.5	0.42	1.4	0.79	34	2.57

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 90~100 mm



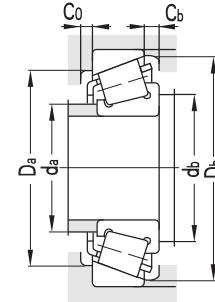
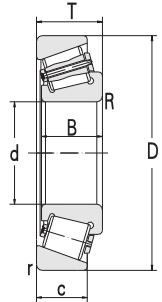
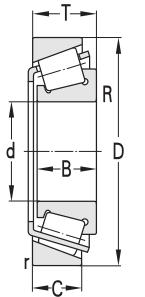
Principal dimensions	d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Basic load ratings		Limit speed ratings		Grease	Oil
										Cr	Cor	KN	r/min		
mm															
90	150	45	45	35	2.5	2.5	2	2	242	390	2000	3000			
	150	45	45	35	2.5	2.5	2	2	242	390	2000	3000			
	150	45	45	35	2.5	2.5	2	2	242	390	2000	3000			
	160	32.5	30	26	2.5	2.5	2	2	222	291	2000	3000			
	160	32.5	30	26	2.5	2.5	3	3	222	291	2000	3000			
	160	42.5	40	34	2.5	2.5	2	2	274	280	2000	3000			
	160	42.5	40	34	2.3	2.3	2.3	2.3	217	293	2000	3000			
	160	42.5	40	34	2.3	2.3	2.3	2.3	217	293	2000	3000			
	160	43	40	34	2.3	2.3	2.3	2.3	217	293	2000	3000			
	160	50	46	39	3	3	3	3	235	320	2000	3000			
	160	55	55	42	2.5	2.5	2	2	330	495	2000	3000			
	170	62	59.5	49	2.5	2.5	2.5	2.5	360	520	2000	3000			
	190	46.5	43	30	4	4	3	3	283	340	2000	3000			
	190	46.5	43	36	4	4	3	3	335	410	1800	2600			
	190	67.5	64	53	4	4	3	3	485	650	1700	2400			
95	130	23	22	18	1.5	1.5	1.5	1.5	79.5	135	2300	3300			
	145	32	32	24	2	2	1.5	1.5	182	292	2200	3200			
	145	32.4	30	26	2	2	1.5	1.5	161	248	2200	3200			
	145	39	39	32.5	2	2	1.5	1.5	210	345	2200	3200			
	160	47	47	38	3	3	3	3	286	460	2200	3200			
	160	47	47	38	3	3	2.5	2.5	325	435	2200	3200			
	170	34.5	32	27	3	3	2.5	2.5	233	300	1900	2800			
	170	45.5	43	37	3	3	2.5	2.5	298	415	1900	2800			
	170	45.5	43	37	3	3	2.5	2.5	300	415	1900	2800			
	170	47	47	37	3	3	3	3	300	460	1900	2800			
	170	58	58	44	3	3	2.5	2.5	405	560	1900	2800			
	200	49.5	45	32	4	4	3	3	305	370	1900	2800			
	200	49.5	45	38	4	4	3	3	365	445	1800	2600			
	200	71.5	67	55	4	4	3	3	520	705	1700	2400			
100	140	25	25	20	1.5	1.5	1.5	1.5	102	167	2000	3000			
	150	32	32	24	2	2	1.5	1.5	190	281	1600	2200			
	150	39	39	32.5	2	2	1.5	1.5	253	390	2000	3000			
	180	37	34	29	3	3	2.5	2.5	262	340	1900	2800			
	180	49	46	39	3	3	2.5	2.5	345	490	1800	2600			

Designations	Abutment and fillet dimensions							Calculation Factor					Weight
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a		
mm													Kg
33118	104	100	127	142	145	4.5	10	0.4	1.5	0.83	35	3.22	
33118/YB2	104	100	127	142	145	4.5	10	0.4	1.5	0.83	35	3.22	
33118/HA	102	100	128	142	145	4.5	10	0.4	1.5	0.83	35	3.15	
30218	102	100	140	150	151	5	6.5	0.42	1.4	0.79	33	2.73	
30218/YA6	102	100	140	150	151	5	6.5	0.42	1.4	0.79	33	2.73	
32218	101	100	138	150	152	5	8.5	0.42	1.4	0.79	37	3.61	
32218R/YA6	106	100	135	160	151	4.5	9	0.39	1.6	0.85	35	3.47	
32218/YA6	106	100	135	160	151	4.5	9	0.39	1.6	0.85	35	3.36	
32218/YA6	106	100	135	160	151	4.5	9	0.39	1.6	0.85	35	3.36	
33218X2A	103	102	133	149	149	4.5	11	0.34	1.8	0.97	35	3.82	
33218	95	99	115	160	126	7	13	0.29	2.1	1.13	33	4.77	
30618	107	100	139	161	161	4.5	13	0.36	1.7	0.92	42	6.04	
31318	102	104	151	176	181	6	17	0.83	0.7	0.4	59	5.53	
30318	113	104	165	176	178	6	11	0.35	1.7	0.96	37	5.76	
32318	107	104	157	176	178	8	15	0.35	1.7	0.96	45	8.97	
32919X2A	102	103	117	124	126	5	7	0.38	1.59	0.87	25	0.786	
32019	105	104	130	138	139	6	8	0.44	1.35	0.8	31	1.87	
32019X2A	105	104	130	136	140	6	8	0.36	1.7	0.93	33	1.80	
33019	105	104	128	138	140	4.5	6.5	0.28	2.2	1.19	29	2.32	
30619	108	107	137	149	153	4.5	9	0.34	1.8	0.97	35	3.79	
7819E	67	107	96	151	110	4.5	9	0.28	2.2	1.19	28	3.73	
30219	108	107	149	158	160	5	7.5	0.42	1.4	0.79	35	3.27	
32219	106	107	145	158	163	5	8.5	0.42	1.4	0.79	40	4.34	
32219N1-WTL	106	107	145	158	163	5	8.5	0.42	1.4	0.79	40	4.18	
33020X3A/HA	116	107	146	159	160	7	10	0.29	2.1	1.15	33	4.26	
33219	109	107	141	161	164	7	14	0.41	1.5	0.81	43	5.54	
31319	107	109	157	186	189	6	18	0.83	0.7	0.4	62	6.84	
30319	118	109	172	186	185	6	12	0.35	1.7	0.96	39	6.91	
32319	114	109	166	186	187	8	17	0.35	1.7	0.96	47	10.0	
20007920	110	108	128	133	136	7	5	0.33	1.8	1	24	1.13	
32020	110	109	131	143	145	4.5	8	0.46	1.3	0.72	33	1.87	
33020	109	109	132	143	144	4.5	6.5	0.29	2.1	1.15	29	2.36	
30220	114	112	157	168	169	5	8	0.42	1.4	0.79	37	3.56	
32220	113	112	154	168	172	5	10	0.42	1.4	0.79	42	5.31	

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 100~120 mm



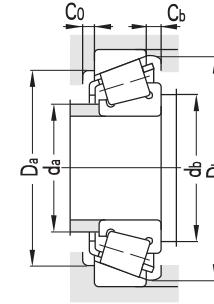
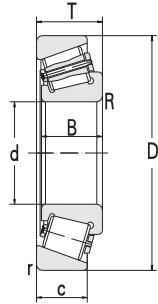
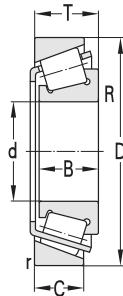
Principal dimensions	d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Basic load ratings		Limit speed ratings		Grease	Oil
										Cr	Cor	KN	r/min		
mm															
100	180	63	63	48	3	3	2.5	2.5	430	655	1700	2400			
215	51.5	47	39	4	4	3	3	3	405	495	1700	2400			
215	77.5	73	60	4	4	3	3	610	840	1600	2200				
105	160	35	35	26	2.5	2.5	2	2	199	320	1900	2800			
160	35.4	33	28	2.5	2.5	2.5	2	2	171	256	1800	2600			
160	43	43	34	5	2.5	2.5	2	2	266	405	1900	2800			
160	43	43	34	5	5	2	2	2	266	405	1900	2800			
160	43	43	34	8	8	2	2	2	266	405	1900	2800			
170	38	38	29	2.5	2.5	2	2	2	246	405	1700	2200			
190	39	36	30	3	3	2.5	2.5	2.5	292	365	1800	2600			
190	53	50	43	3	3	2.5	2.5	2.5	385	555	1800	2600			
215	78	73	60	3	3	3	3	3	550	755	1900	2800			
225	53.5	49	41	4	4	3	3	3	430	530	1600	2200			
225	81.5	77	63	4	4	3	3	3	660	915	1500	2000			
106	160	35	35	26	6.4	6.4	2	2	206	340	1900	2800			
110	150	25.4	24	20	1.5	1.5	1.5	1.5	88	138	2000	3000			
170	38	38	29	2.5	2.5	2.5	2	2	231	365	1800	2600			
170	38	38	29	2.5	2.5	2.5	2	2	216	390	1800	2600			
170	38.4	36	31	2.5	2.5	2.5	2	2	198	297	1800	2600			
170	47	47	37	2.5	2.5	2.5	2	2	300	465	1800	2600			
180	56	56	43	2.5	2.5	2.5	2	2	350	595	1800	2600			
190	49	49	39	3	3	3	3	3	360	560	1800	2600			
200	41	38	32	3	3	2.5	2.5	2.5	320	430	1700	2400			
200	56	53	46	3	3	2.5	2.5	2.5	465	695	1700	2400			
200	56	53	46	3	3	2.5	2.5	2.5	415	600	1400	1900			
240	54.5	50	42	4	4	3	3	3	470	580	1600	2200			
240	63	57	38	4	4	3	3	3	470	595	1600	2200			
240	84.5	80	65	4	4	3	3	3	735	1030	1400	1900			
115	190	49	49	35	2.5	2.5	2.5	2.5	282	440	1600	2200			
120	165	29	29	23	1.5	1.5	2.5	2.5	189	320	1600	2200			
180	38	38	29	29	2.5	2.5	2	2	237	395	1700	2400			

Designations	Abutment and fillet dimensions							Calculation Factor					Weight
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a		
mm													Kg
33220	112	112	151	168	172	10	15	0.4	1.5	0.8	43	6.58	
30320	127	114	184	201	199	6	13	0.35	1.7	0.96	41	8.09	
32320	122	114	177	201	201	8	18	0.35	1.7	0.96	51	13.2	
32021	116	116	143	150	154	6	9	0.44	1.35	0.8	34	2.38	
20007121	116	115	143	150	154	6	9	0.36	1.7	0.93	31	2.50	
33021	117	115	141	152	154	4.5	9	0.28	2.1	1.17	31	2.98	
33021/YA6	117	121	141	152	154	7	9	0.28	2.1	1.17	31	2.98	
33021/YA6- 1	117	125	141	152	154	7	9	0.28	2.1	1.17	31	2.98	
32021X3	125	122	148	162	164	4.5	9	0.43	1.4	0.77	37	3.36	
30221	125	117	162	181	177	6	9	0.42	1.4	0.79	39	4.47	
32221	118	117	161	178	182	5	10	0.42	1.4	0.79	45	6.34	
32321X3	129	117	175	204	198	4.5	18	0.31	1.9	1.05	49	12.3	
30321	133	119	193	211	208	7	13	0.35	1.7	0.96	43	9.38	
32321	128	119	185	211	210	8	19	0.35	1.7	0.96	54	15.0	
320/106/P6XYA6	116	116	143	150	154	6	9	0.44	1.35	0.8	34	2.35	
32922X2A	120	118	138	143	145	7	5.4	0.28	2.1	1.17	23	1.18	
32022	123	120	148	162	164	4.5	9	0.43	1.4	0.77	37	3.08	
32022/YA8	123	120	148	162	164	4.5	9	0.43	1.4	0.77	37	3.11	
32022X2A	122	120	152	160	163	7	9	0.35	1.7	0.95	33	3.10	
33022	123	120	148	162	162	4.5	10	0.29	2.1	1.15	33	3.75	
33122	125	120	151	172	175	4.5	13	0.42	1.4	0.79	44	5.56	
33022X3A/H4	125	120	151	172	175	7	13	0.42	1.4	0.79	44	5.87	
30222	132	122	171	191	187	6	9	0.42	1.4	0.79	41	5.27	
32222	124	122	170	188	192	6	10	0.42	1.4	0.79	48	7.62	
32222/YA8	129	122	167	191	190	4.5	10	0.42	1.4	0.79	48	7.58	
30322	142	124	206	226	222	8	13	0.35	1.7	0.96	45	11.1	
31322	129	124	188	226	226	7	25	0.83	0.7	0.4	75	12.5	
32322	137	124	198	226	224	9	20	0.35	1.7	0.96	56	18.0	
30623	131	120	160	181	180	4.5	14	0.44	1.4	0.74	42	5.13	
32924	131	118	150	158	161	4.5	6	0.35	1.7	0.95	29	1.79	
32024	132	120	157	172	175	4.5	9	0.46	1.3	0.72	40	3.31	

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 120~150 mm



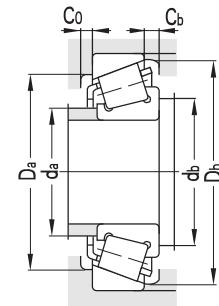
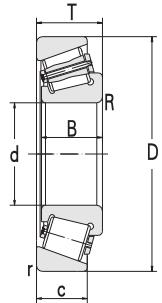
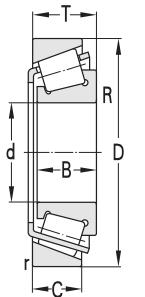
Principal dimensions								Basic load ratings		Limit speed ratings		
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Cr	Cor	Grease	Oil
mm								KN		r/min		
120	180	38.4	36	31	2.5	2.5	2	2	230	325	1700	2400
	180	48	48	38	2.5	2.5	2	2	295	530	1800	2600
215	43.5	40	34	3	3	2.5	2.5	2.5	330	445	1600	2200
215	61.5	58	50	3	3	4	2.5	2.5	480	720	1600	2200
260	59.5	55	46	4	4	3	3	3	565	710	1500	2000
260	68	62	42	4	4	3	3	3	540	690	1500	2000
260	90.5	86	69	4	4	3	3	3	845	1190	1300	1800
130	180	32.5	30	26	2	2	1.5	1.5	150	249	1700	2400
	200	45	45	34	2.5	2.5	2	2	340	580	1600	2200
200	45.5	42	36	2.5	2.5	2	2	2	271	420	1500	2000
230	43.75	40	34	4	4	3	3	3	360	480	1500	2000
230	67.75	64	54	4	4	3	3	4	555	845	1500	2000
230	67.75	66	54	4	4	3	3	3	570	810	1500	2000
280	63.75	58	49	5	5	4	5	5	645	815	1300	1800
280	72	66	44	5	5	4	4	4	620	805	1300	1800
280	99.5	93	78	3.7	3.7	3.7	3.7	3.7	870	1250	1100	1600
140	190	32.5	30	26	2	2	1.5	1.5	154	257	1600	2200
	190	32	25	2	2	1.5	1.5	1.5	206	390	1600	2200
210	45	45	34	2.5	2.5	2	2	330	560	1600	2200	
210	45	45	34	2.5	2.5	2	2	330	560	1800	2400	
210	45.5	42	36	2.5	2.5	2	2	2	276	440	1600	2200
230	58	57	45	3	3	3	3	3	400	660	1600	2200
230	58	57	45	3	3	3	3	3	400	660	1600	2200
250	45.75	42	36	4	4	3	3	3	405	540	1400	1900
250	71.75	68	58	4	4	3	3	3	650	1000	1400	1900
300	67.75	62	53	5	5	4	4	4	740	945	1200	1700
300	107.75	102	85	5	5	4	4	4	1090	1630	1200	1700
300	77	70	47	5	5	4	4	4	695	900	1200	1700
300	90	82	60	3.7	3.7	3.7	3.7	3.7	660	915	1200	1700
150	210	38	38	30	2.5	2.5	2	2	270	465	1500	2000
	210	38.5	36	31	2.5	2.5	2	2	220	385	1500	2000
225	48	48	36	3	3	2.5	2.5	2.5	365	635	950	1400
	48.5	45	38	3	3	2.5	2.5	2.5	280	454	950	1400

Designations	Abutment and fillet dimensions							Calculation Factor				
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a	Weight
mm												Kg
32024X2A	131	130	161	170	173	7	9	0.37	1.6	0.89	29	3.66
33024	132	131	160	170	171	6	10	0.3	2	1.1	36	4.07
30224	139	132	187	203	203	6	9.5	0.44	1.4	0.76	45	6.32
32224	134	132	181	203	206	7	12	0.44	1.4	0.76	52	9.60
30324	153	134	221	246	238	8	14	0.35	1.7	0.96	49	14.2
31324	140	134	203	246	246	9	26	0.83	0.7	0.4	82	15.6
32324	147	134	213	246	240	9	22	0.35	1.7	0.96	60	22.4
32926X2A	142	139	164	173	174	9	6.5	0.27	2.2	1.22	28	2.31
32026	144	142	178	190	192	7	11	0.43	1.4	0.8	42	5.06
32026X2A	144	140	178	190	192	8	11	0.35	1.7	0.95	39	4.66
30226	150	144	203	216	219	7	10	0.44	1.4	0.76	47	7.02
32226	143	144	193	216	221	7	14	0.44	1.4	0.76	56	11.8
7526EY	154	144	196	219	214	4.5	14	0.26	2.3	1.25	45	11.9
30326	165	145	239	262	258	8	15	0.35	1.7	0.96	53	17.4
31326	150	147	218	262	263	9	28	0.83	0.7	0.4	87	18.9
32326/YA6	168	144	227	280	258	4.5	22	0.32	1.9	1.04	65	26.4
32928X2A	142	149	164	183	174	9	6.5	0.27	2.2	0.22	28	2.43
32928	150	150	177	182	184	6	7	0.35	1.7	0.9	33	2.55
32028	154	150	183	202	204	4.5	11	0.46	1.3	0.72	46	5.84
FL-32028	154	150	183	202	204	4.5	11	0.46	1.3	0.72	46	5.84
32028X2A	153	150	187	201	202	8	11	0.37	1.6	0.89	42	4.94
30628R	182	152	217	219	242	4.5	13	0.44	1.4	0.74	56	9.20
30628	182	152	217	219	242	4.5	13	0.44	1.4	0.74	56	8.97
30228	162	154	219	236	234	9	11	0.44	1.4	0.76	50	8.80
32228	156	154	210	236	240	8	14	0.44	1.4	0.76	61	14.7
30328	176	155	255	282	275	9	15	0.35	1.7	0.96	56	21.2
32328	177	156	239	287	276	9	22.8	0.37	1.6	0.9	74	35.8
31328	162	157	235	282	283	9	30	0.83	0.7	0.4	93	23.4
31328X2A	176	154	228	300	276	4.5	30	0.73	0.8	0.45	91	29.0
32930	161	160	190	202	202	9	7.5	0.33	1.83	1	36	3.83
32930X2A	165	160	191	202	201	9	7.5	0.27	2.2	1.21	33	4.56
32030	161	160	197	216	217	9	13	0.46	1.3	0.72	49	6.40
32030X2	164	162	200	213	216	8	13	0.39	1.5	0.85	46	6.84

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 150~180 mm



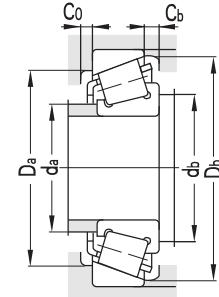
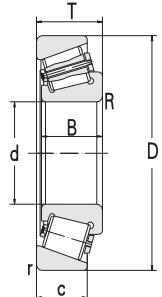
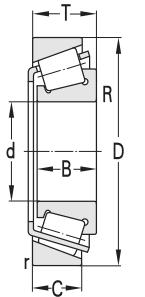
Principal dimensions								Basic load ratings		Limit speed ratings		
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Cr	Cor	Grease	Oil
mm								KN		r/min		
150	270	49	45	38	4	4	3	3	450	605	1300	1800
	270	77	73	60	4	4	3	3	735	1140	1200	1700
320	72	65	55	5	5	4	4	4	815	1050	1100	1600
320	82	75	50	5	5	4	4	4	810	1060	950	1400
320	114	108	90	5	5	4	4	4	1280	1880	950	1400
160	220	38.5	36	31	2.5	2.5	2	2	232	400	1500	2000
	240	51	51	38	3	3	2.5	2.5	415	730	1100	1600
240	51.5	48	41	3	3	4	3	3	375	630	1100	1600
290	52	48	40	4	4	3	3	3	510	695	1100	1600
290	84	80	67	4	4	3	3	3	925	1490	1100	1600
340	75	68	58	5	5	4	4	4	915	1180	1000	1500
340	88	79	54	3.7	3.7	3.7	3.7	3.7	825	1080	1000	1500
340	121	114	95	5	5	4	4	4	1540	2230	1000	1500
375	86.55	79.4	50.3	5	5	5	5	5	870	1050	1000	1500
375	86.55	79.4	60.3	5	5	5	5	5	870	1050	1000	1500
170	230	38	38	30	2.5	2.5	2	2	280	560	1400	1900
	230	38.5	36	31	2.5	2.5	2	2	235	415	1400	1900
220	27	25	19.5	3	3	3	3	3	166	328	1600	2150
260	57	57	43	3	3	2.5	2.5	2.5	520	870	1200	1700
260	57	57	43	1.5	1.5	1.5	1.5	1.5	520	870	1600	2100
260	57.5	54	46	3	3	2.5	2.5	2.5	430	750	1400	1900
310	57	52	43	5	5	4	4	4	605	845	1000	1500
310	91	86	71	5	5	4	4	4	1010	1630	1000	1500
360	128	120	100	3.7	3.7	3.7	3.7	3.7	1430	2120	950	1400
180	240	32	30	23	3	3	3	3	245	250	1200	1700
	250	45	45	34	2.5	2.5	2	2	345	725	1600	2500
280	64	64	48	3	3	2.5	2.5	2.5	610	1070	950	1400
280	64.5	60	52	3	3	2.5	2.5	2.5	520	860	950	1400
290	65	63.5	48	2.3	2.3	2.3	2.3	2.3	580	1010	950	1400
320	57	52	43	5	5	4	4	4	590	820	1000	1500
320	91	86	71	5	5	4	4	4	1020	1670	950	1400
380	98	88	60	5	5	4	4	4	1050	1500	900	1300

Designations	Abutment and fillet dimensions						Calculation Factor					
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a	Weight
mm												Kg
30230	174	164	234	256	252	9	11	0.44	1.4	0.76	53	11.2
32230	168	164	223	256	256	4.5	17	0.44	1.4	0.76	64	18.4
30330	190	165	273	302	294	4.5	17	0.35	1.7	0.96	60	25.5
31330	181	170	251	303	300	9	32	0.83	0.72	0.4	96	27.5
32330	190	166	261	307	299	4.5	24	0.35	1.7	0.96	77	42.2
32932X2A	175	170	203	212	213	9	7.5	0.27	2.2	1.23	34	3.79
32032	174	173	211	231	232	8	13	0.46	1.3	0.72	53	7.69
32032X2A- 1	175	172	213	228	231	8	13	0.37	1.6	0.89	47	7.67
30232	189	174	252	276	271	9	12	0.44	1.4	0.76	57	13.4
32232	180	174	242	276	276	10	17	0.44	1.4	0.76	70	23.3
30332	201	180	290	323	310	9	17	0.35	1.7	0.9	61	29.5
31332	199	161	265	340	315	4.5	34	0.76	0.8	0.43	100	29.9
32332	199	176	274	327	314	4.5	26	0.35	1.7	0.96	81	51.7
30632	214	176	295	375	337	4.5	37	0.7	0.9	0.47	98	40.7
30632X2	214	161	295	360	337	9	26.3	0.7	0.86	0.47	103	41.8
32934	183	182	213	220	222	7	8	0.37	1.6	0.9	42	4.51
32934X2A	185	180	213	222	224	9	7.5	0.28	2.1	1.17	36	3.864
32934X3	175	171	203	211	212	9	7.5	0.47	1.3	0.72	53	2.33
32034	188	184	230	246	249	10	14	0.44	1.35	0.8	56	10.6
32034/P4YA6	188	184	230	246	249	10	14	0.44	1.35	0.8	56	10.6
32034X2A	187	182	230	248	249	10	14	0.31	1.9	1.07	47	10.1
30234	203	190	268	293	288	8	14	0.43	1.4	0.8	58	17.0
32234	196	190	259	293	294	10	20	0.43	1.4	0.8	75	30.0
32334/YA6	213	184	288	360	332	4.5	28	0.36	1.7	0.92	87	63.5
T4DB 180	191	192	224	226	233	6	9	0.48	1.25	0.7	48	3.55
32936	194	192	225	240	241	8	11	0.48	1.25	0.7	53	6.7
32036	199	192	247	268	267	9	16	0.42	1.4	0.8	75	13.9
32036X2A	199	192	247	268	267	9	16	0.28	2.2	1.19	53	13.0
32036X3A	207	196	247	290	274	4.5	17	0.44	1.4	0.75	62	15.6
30236	209	198	278	302	300	4.5	14	0.45	1.3	0.73	64	17.8
32236	208	196	264	307	304	10	20	0.45	1.3	0.73	78	32.3
31336	217	220	289	368	355	12	21	0.55	0.73	0.8	120	46.4

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 190~254 mm



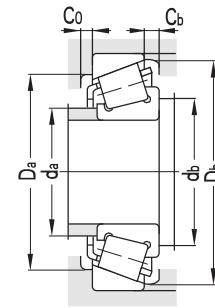
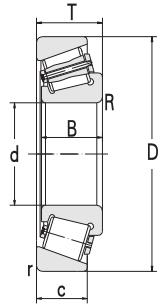
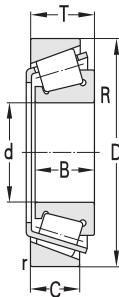
Principal dimensions								Basic load ratings		Limit speed ratings			
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Cr	Cor	Grease	Oil	
mm													
									KN		r/min		
190	260	45	45	34	2.5	2.5	2	2	335	745	1100	1600	
	260	45.5	42	36	2.5	2.5	2	2	350	670	1100	1600	
290	51	46	40	3	3	2.5	2.5	2.5	380	610	950	1400	
290	64.5	60	52	3	3	2.5	2.5	2.5	520	882	1000	1500	
290	64.5	60	52	3	3	2.5	2.5	2.5	630	905	1000	1500	
340	60	55	46	5	5	4	4	4	740	1040	950	1400	
340	97	92	75	5	5	4	4	4	1100	1080	950	1300	
200	270	37	34	27	3	3	3	3	325	580	1000	1500	
	280	51	51	39	3	3	2.5	2.5	455	935	1000	1500	
280	51.5	48	41	3	3	2.5	2.5	2.5	380	742	1000	1500	
310	70.5	66	56	3	3	2.5	2.5	2.5	575	1040	950	1400	
360	64	58	48	5	5	4	4	4	780	1100	900	1300	
360	104	98	82	5	5	4	4	4	1350	2144	900	1300	
210	285	41	40	33	4	4	3	3	360	710	1000	1500	
220	285	41	40	33	4	4	3	3	385	800	950	1500	
300	51.5	48	41	3	3	2.5	2.5	2.5	390	835	900	1400	
340	76.5	72	62	4	4	3	3	3	780	1330	950	1400	
400	72	65	54	5	5	4	4	4	975	1370	900	1300	
400	73	65	54	3.7	3.7	3.7	3.7	3.7	855	1180	900	1300	
400	114	108	90	5	5	4	4	4	1650	2770	900	1300	
240	320	42	39	30	3	3	3	3	420	800	850	1200	
	320	51	51	39	3	3	2.5	2.5	500	1050	850	1200	
320	51	48	41	3	3	2.5	2.5	2.5	390	790	900	1300	
320	51	48	41	3	3	2.5	2.5	2.5	360	790	900	1300	
360	76.5	72	62	4	4	3	3	3	770	1400	850	1200	
360	76	76	57	4	4	3	3	3	845	1410	850	1200	
360	76	76	57	4	4	3	3	3	845	1410	850	1200	
440	127	120	100	5	5	4	4	4	1900	3300	700	950	
440	127	120	100	5	5	4	4	4	1900	3300	700	950	
254	422.27	86.1	79.8	66.7	4.7	4.7	2.5	2.5	1110	1760	850	1200	

Designations	Abutment and fillet dimensions							Calculation Factor					Weight
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a		
mm													Kg
32938	205	202	235	252	251	10	9.5	0.48	1.25	0.7	55	6.94	
32938X2A	205	202	235	252	251	10	9.5	0.38	1.6	0.86	49	6.52	
32038X2A- 1	215	202	256	281	272	4.5	11	0.38	1.6	0.87	53	10.5	
32038X2A	209	202	257	278	279	10	13	0.37	1.6	0.89	58	15.28	
32038X2A/P4	209	202	257	278	279	10	13	0.37	1.6	0.89	58	15.3	
30238	229	206	294	327	317	4.5	14	0.44	1.4	0.76	67	20.6	
32238	214	208	286	322	326	10	22	0.44	1.4	0.76	81	36.1	
T4DB 200	214	214	251	255	262	6	10	0.48	1.25	0.7	53	5.50	
32940	218	215	252	271	270	4.5	11	0.39	1.5	0.84	54	9.56	
32940X2A	220	212	251	271	270	4.5	11	0.39	1.5	0.84	54	8.86	
32040X2A	221	212	273	298	297	11	17	0.39	1.5	0.84	65	18.2	
30240	236	218	315	342	338	9	16	0.44	1.4	0.76	70	25.4	
32240	222	218	302	342	342	11	22	0.41	1.5	0.81	84	42.6	
30642N1- WTL	218	215	252	271	270	4.5	11	0.32	1.9	1.04	52	7.28	
T2DC 220	233	236	270	270	277	7	8	0.31	1.9	1.1	45	6.50	
32944X2A	310	232	342	291	361	10	11	0.39	1.5	0.84	66	10.1	
32044X2A	243	234	300	326	326	12	19	0.35	1.7	0.95	67	23.3	
30244	256	220	334	382	382	10	18	0.42	1.4	0.79	77	36.8	
30244A/YA6	256	220	334	382	382	10	19	0.37	1.6	0.88	71	37.6	
32244	256	220	334	382	382	10	24	0.44	1.4	0.76	96	62.7	
T4EB 240	256	254	299	305	310	7	12	0.46	1.3	0.7	60	8.50	
32948	255	254	294	308	311	9	12	0.46	1.3	0.7	64	11.5	
32948X2A	259	252	331	387	309	10	11	0.32	1.9	1.04	52	10.8	
32948X2A/P4	259	252	331	387	309	10	11	0.32	1.9	1.04	52	11.1	
32048X2A	261	254	318	346	346	12	19	0.31	1.9	1.05	65	23.8	
2007148S	261	254	318	346	346	12	19	0.31	1.9	1.05	63	24.9	
2007148SY	261	254	318	346	346	12	19	0.31	1.9	1.05	63	24.7	
32248	276	262	365	420	415	14	27	0.43	1.4	0.8	105	82.5	
32248/HC	276	262	365	420	415	14	27	0.43	1.4	0.8	105	82.5	
306/254	297	270	370	413	399	13	19	0.36	1.7	0.9	80	45.4	

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 255~400 mm



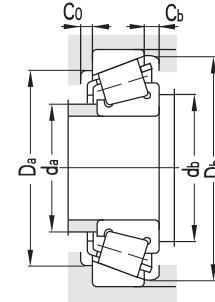
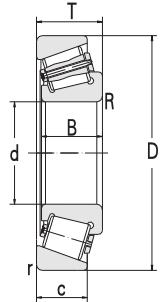
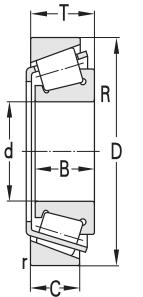
Principal dimensions								Basic load ratings		Limit speed ratings			
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Cr	Cor	Grease	Oil	
mm								KN		r/min			
255	560	123.05	104.8	70	6	6	6	1920	2690	560	750		
260	360	64.5	60	52	3	3	2.5	25	595	1250	800	1100	
	400	87.7	82	71	5	5	4	4	1050	1960	800	1100	
	480	137	130	105	6	6	5	5	2160	3650	670	900	
	480	133.5	141	102.5	6	6	5	5	2280	3750	670	900	
	540	109	102	80	6	6	6	6	2050	2950	670	900	
	540	114	102	85	6	6	6	6	2015	2730	670	900	
274.574406.41376.2								76.2	60.325	8.5	8.5	4.3	4.3
280	380	64.5	60	52	3	3	2.5	2.5	600	1250	800	1100	
	380	63.5	63.5	48	3	3	2.5	2.5	720	1500	800	1100	
	420	87.7	82	71	5	5	4	4	1000	1840	750	1000	
300	420	74.5	72	62	4	4	3	3	710	1810	700	950	
	440	73	70	55	4	4	3	3	860	1460	700	950	
	460	100	100	74	5	5	4	4	1460	2740	670	900	
	460	100.7	95	77	5	5	4	4	1310	2400	700	950	
	540	149	140	115	6	6	5	5	2680	4700	600	800	
320	440	76	76	57	4	4	3	3	1000	2300	650	900	
	480	100	100	74	5	5	4	4	1540	2940	630	850	
	480	95	95	70	5	5	4	4	1480	2860	630	850	
	620	141	125	107	7.5	7.5	7.5	7.5	2780	4600	520	680	
340	460	76	76	57	4	4	3	3	1000	2350	500	830	
	520	86	82	64	5	5	4	4	1200	2050	500	630	
360	480	76	76	57	4	4	4	4	970	2220	500	630	
	530	80	66	59	5	5	5	5	1030	1900	500	630	
	540	86	82	63.5	5	5	4	4	1270	2200	480	600	
	680	165	150	125	7.5	7.5	7.5	7.5	3620	6250	480	600	
400	500	60	57	47	4	4	3	3	460	950	400	500	
	540	87	82	71	5	5	4	4	1280	2880	380	480	

Designations	Abutment and fillet dimensions							Calculation Factor					Weight
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a		
mm												Kg	
30651	329	274	435	542	510	13	53.1	0.87	0.7	0.38	171	127	
32952X2A	286	272	325	351	344	13	13	0.3	2	1.09	60	19.2	
32052X2A	287	278	352	383	383	14	22	0.3	2	1.11	71	37.8	
32252	305	279	394	465	451	13	32	0.43	1.4	0.77	113	105	
32252X2/HC	302	285	397	465	453	12	30	0.43	1.4	0.77	111	101	
30352X2	325	286	463	514	493	18	29	0.35	1.7	0.9	93	108	
30352	332	279	449	522	481	10	29	0.32	1.9	1.04	92	113	
306/274X4-1	305	292	344	371	364	13	13	0.37	1.6	0.89	83	31.8	
32956X2A	305	292	344	371	364	13	13	0.32	1.9	1.03	64	21.3	
32956	305	292	344	371	364	13	13	0.43	1.4	0.77	100	20	
32056X2A	305	298	370	402	402	14	22	0.37	1.6	0.89	83	39.6	
32960	330	314	379	409	400	13	15	0.28	2.1	1.17	67	30.2	
32960X3B/P5	335	314	398	429	423	13	18	0.44	1.4	0.75	87	34.2	
32060	330	322	404	440	439	15	26	0.43	1.4	0.8	97	56.6	
32060X2A	329	318	404	442	439	15	26	0.36	1.7	0.9	89	57.0	
30660	343	326	453	518	511	17	34	0.43	1.4	0.8	126	142	
32964	343	337	402	424	426	13	19	0.43	1.4	0.8	84	34.5	
32064	354	336	419	467	463	13	26	0.46	1.3	0.72	104	62.7	
32064X2	354	336	419	467	463	13	26	0.46	1.3	0.72	104	57.7	
30664	380	354	501	586	577	16	34	0.6	1	0.6	154	183	
32968	361	357	421	444	446	14	19	0.44	1.35	0.8	90	36.5	
31068X2	378	367	462	507	483	13	20	0.29	2.09	1.15	78	73.9	
32972	388	374	433	467	468	13	19	0.46	1.3	0.72	97	38.5	
30672/P5	410	376	476	515	502	13	21	0.4	1.5	0.82	95	53.2	
31072X2	401	390	482	526	509	13	21	0.37	1.61	0.89	97	73.1	
30672	416	394	551	646	640	22	40	0.6	1	0.6	172	262	
30680	368	414	406	489	430	13	13	0.38	1.6	0.86	77	25.1	
32980	450	436	500	550	530	8	8	0.4	1.4	0.8	185	54.1	

# Single-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 400~1270 mm



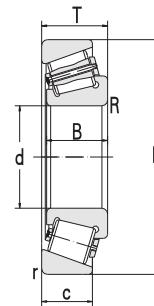
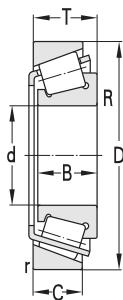
Principal dimensions										Basic load ratings		Limit speed ratings	
d	D	T	B	C	R <sub>radial</sub>	R <sub>axial</sub>	r <sub>radial</sub>	r <sub>axial</sub>	Cr	Cor	Grease	Oil	
mm										KN	r/min		
400	540	70	70	53	5	5	4	4	1040	2320	350	450	
	750	130	115	77	6	6	6	6	2660	4180	320	430	
420	620	95	90	67	5	5	5	5	1560	2930	380	480	
	620	95	90	67	5	5	5	5	1560	2940	380	480	
460	860	210	190	160	7.5	7.5	7.5	7.5	5590	10100	350	470	
480	950	240	225	174	9.5	9.5	9.5	9.5	6980	12500	310	420	
500	720	110	100	82	6	6	6	6	2090	4100	360	450	
530	670	100	95	82	6	6	6	6	1590	4500	340	450	
	710	88	82	62	5	5	5	5	1560	3150	340	450	
560	1080	265	235	208	9.5	9.5	9.5	9.5	8910	15700	180	270	
630	850	132	132	95	6	6	6	6	3080	7150	360	450	
	920	135	128	94	7.5	7.5	7.5	7.5	3520	7450	320	430	
	920	134	128	94	7.5	7.5	7.5	7.5	3410	7100	320	430	
680	1000	190	188	140	6	6	6	6	5580	12500	250	350	
710	950	114	106	80	6	6	6	6	2860	6900	260	360	
760	890	78	75	59	4.7	4.7	4.7	4.7	1360	3520	130	170	
850	1030	90	88	64	6	6	6	6	2200	5900	200	300	
900	1180	122	122	87	6	6	6	6	3850	9000	180	260	
	1280	190	170	135	7.5	7.5	7.5	7.5	6430	14600	95	130	
1000	1420	210	195	150	7.5	7.5	7.5	7.5	8100	18000	160	230	
1270	1465	73	69	51	6	6	6	6	2100	6920	120	170	
	1465	100	100	75	6	6	6	6	3120	10500	120	170	

Designations	Abutment and fillet dimensions						Calculation Factor					
	da(max)	db(min)	Da(min)	Da(max)	Db(min)	Ca(min)	Cb(min)	e	Y	Yo	a	Weight
mm												Kg
31980X2 30680-1	450	436	500	550	530	8	8	0.42	1.5	0.9	100	44
	480	470	617	730	688	15	15	0.7	0.86	0.47	189	222
31084X2 31084X2/P5	470	436	552	605	586	13	28	0.41	1.5	0.8	111	88.3
	470	436	552	605	586	13	28	0.41	1.5	0.8	111	88.3
30692	530	494	690	826	804	10	50	0.57	1.05	0.6	218	512
30696	570	524	761	906	877	32	66	0.54	1.1	0.6	230	761
T2GB500	556	519	652	702	682	13	28	0.32	1.9	1.02	113	128
318/530X3 319/530X2	560	549	609	652	654	13	18	0.44	1.35	0.74	134	81.6
	573	546	655	695	683	13	26	0.39	1.5	0.84	118	81.5
306/560	660	604	887	1036	995	27	50	0.43	1.4	0.8	241	1063
329/630 T3GB630 306/630	675	649	766	832	821	13	37	0.46	1.3	0.72	168	200
	704	631	819	902	867	13	41	0.43	1.4	0.78	166	289
	704	631	819	902	867	13	40	0.43	1.4	0.78	166	286
306/680	742	706	884	974	953	27	50	0.43	1.4	0.8	200	486
319/710	774	729	864	932	909	13	34	0.46	1.3	0.72	175	210
306/760/HC	785	776	393	870	870	13	22	0.32	1.9	1.04	71	78.3
318/850X2	892	869	968	1012	1004	13	26	0.44	1.4	0.75	176	140
T3CB900 306/900/HC	970	919	1092	1162	1139	13	35	0.4	1.5	0.82	193	325
	990	920	1142	1230	1265	13	55	0.44	1.4	0.74	242	71.8
306/1000	1090	1070	1265	1390	1358	16	20	0.46	1.3	0.72	278	966
306/1270 306/1270-1	1310	1296	1390	1439	1408	17	22	0.48	1.25	0.7	154	71.8
	1315	1296	1400	1439	1434	19	25	0.48	1.25	0.7	265	266

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 17.462~29 mm



Principal dimensions													
d	D		T		B		C		rmin		Rmin		
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
17.462	0.6875	39.878	1.57	13.843	0.545	14.605	0.575	10.668	0.42	1.3	1.3		
19.05	0.75	45.237	1.781	15.494	0.61	16.637	0.655	12.065	0.475	1.2	1.2		
		49.225	1.938	18.034	0.71	19.05	0.75	14.288	0.5625	1.3	1.3		
		49.225	1.938	21.209	0.835	19.05	0.75	17.462	0.6875	1.5	1.3		
		49.225	1.938	23.02	0.9063	21.539	0.848	17.462	0.6875	3.5	1.5		
20.625	0.812	49.225	1.938	23.02	0.9063	21.539	0.848	17.462	0.6875	1.5	1.5		
21.43	0.8437	50.005	1.9687	17.526	0.69	18.288	0.72	13.97	0.55	1.3	1.3		
		50.005	1.9687	17.526	0.69	18.288	0.72	13.97	0.55	1.3	1.3		
21.979	0.8653	45.237	1.781	15.494	0.61	16.637	0.655	12.065	0.475	1.3	1.3		
		45.974	1.81	15.494	0.61	16.637	0.655	12.065	0.475	1.3	1.3		
22.225		50.8	2	15.011	0.591	14.26	0.5614	12.7	0.5	1.5	1.5		
25.4	1	50.292	1.98	14.224	0.56	14.732	0.58	10.668	0.42	1.3	1.3		
		50.8	2	15.011	0.591	14.26	0.5614	12.7	0.5	1.5	1.5		
		57.15	2.25	19.431	0.765	19.431	0.765	14.732	0.58	1.5	1.5		
26*		57.15	2.25	17.462	0.6875	17.462	0.6875	13.495	0.5313	1.5	3.5		
26.988	1.0625	50.292	1.98	14.224	0.56	14.732	0.58	10.668	0.42	1.3	3.6		
		63.5	2.5	20.638	0.8125	20.638	0.8125	15.875	0.625	1.5	0.8		
28*		57.15	2.25	17.462	0.6875	17.462	0.6875	13.495	0.5313	1.5	3.5		
28.575	1.125	60.325	2.375	19.845	0.7813	19.355	0.762	15.875	0.625	1.3	3.5		
		64.292	2.5312	21.433	0.8438	21.433	0.8438	16.67	0.6563	1.5	1.5		
		66.421	2.615	23.812	0.9375	25.433	1.0013	19.05	0.75	1.3	1.3		
		68.262	2.6875	22.225	0.875	22.225	0.875	17.462	0.6875	1.5	0.8		
		73.025	2.875	22.225	0.875	22.225	0.875	17.462	0.6875	3.3	0.8		
29		1.1417	50.292	1.98	14.224	0.56	14.732	0.58	10.668	0.42	1.2	3.6	

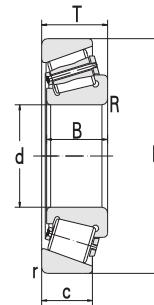
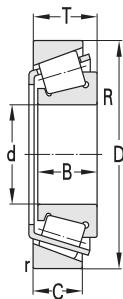
Basic load ratings	Limit speed ratings		Designations		Calculation Factor				Weight
	Cr	Cor	Grease	Oil	e	Y	Yo	a	
KN	r/min								Kg
25.6	28	9000	13000	KLM11749/KLM11710	0.29	2.1	1.15	9	0.0758
31.5	28.9	8500	12000	KLM11949/KLM11910	0.3	2	1.1	10	0.123
37.5	37	8500	12000	K09067/K09195	0.27	2.26	1.24	11	0.176
37.5	37	8500	12000	K09067/K09196	0.27	2.26	1.24	15	0.195
37.5	37	8500	12000	K09074/K09194	0.27	2.26	1.24	16	0.201
37.5	37	8000	11000	K09081/K09196	0.27	2.26	1.24	12	0.197
45	43.5	8000	11000	KM12649/KM12610	0.28	2.16	1.19	11	0.169
45	43.5	8000	11000	K2M12649/K2M12610	0.28	2.16	1.19	11	0.169
35.5	40	8000	10000	KLM12749/KLM12710	0.31	1.96	1.08	13	0.116
29.5	34	8000	10000	KLM12749/KLM12711	0.31	1.96	1.08	13	0.118
30.5	33	8000	10000	K07087X/K07210X	0.4	1.49	0.82	12	0.104
29.5	34	7500	10000	L44643/L44610	0.37	1.6	0.88	11	0.128
30.5	33	7500	10000	K07100S/K07210X	0.4	1.5	0.82	12	0.0908
42	49	7500	10000	KM84548/KM84510	0.55	1.1	0.6	16	0.237
38	43.5	7500	10000	K15579X/K15520	0.35	1.73	0.95	19	0.207
29.5	34	7500	10000	L44649/L44610	0.37	1.6	0.88	11	0.126
46	53	7500	9000	K15106/K15250X	0.35	1.71	0.94	15	0.316
38	43.5	7000	9000	KJ15585/K15520	0.35	1.73	0.95	12	0.207
39	42.5	7000	9000	K1988/K1931	0.33	1.82	1	13	0.244
48.5	67.5	7000	9000	KM86647/KM86610	0.55	1.1	0.6	18	0.351
68.5	77	7000	9000	K2689/K2631	0.26	2.28	1.25	14	0.420
53.5	65	7000	9000	K02474/K02420	0.42	1.4	0.79	17	0.410
55	65.5	7000	9000	K02872/K02820	0.45	1.32	0.73	19	0.825
29.5	34	7000	9000	L45449/L45410	0.37	1.62	0.89	11	0.118

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 30~38.1 mm



Principal dimensions																
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	mm	in	mm	in	mm	in
30	1.811	72.085	2.838	22.385	0.8813	19.202	0.756	18.415	0.725	2.3	0.8					
30.1621.1875	62	2.4409	16.002	0.63	16.566	0.6522	14.288	0.5625	1.5	1.5						
	68.262	2.6875	22.225	0.875	22.225	0.875	17.462	0.6875	2.3	0.8						
31.75	1.25	59.131	2.328	15.875	0.625	16.764	0.66	11.811	0.465	1.3	3.6					
		62	2.4409	18.161	0.715	19.05	0.75	14.288	0.5625	1.3	4.8					
		69.85	2.75	23.812	0.9375	25.357	0.9983	19.05	0.75	1.3	0.8					
33.3381.3125	68.262	2.6875	22.225	0.875	22.225	0.875	17.462	0.6875	1.5	0.8						
	76.2	3	23.812	0.9375	25.654	1.01	19.05	0.75	1.5	3.3						
	76.2	3	29.37	1.1563	28.575	1.125	23.02	0.9063	3.3	0.8						
34.9251.375	65.088	2.5625	18.034	0.71	18.288	0.72	13.97	0.55	1.3	3.6						
	65.088	2.5625	21.082	0.83	18.288	0.72	17.018	0.67	1.5	0.8						
	69.012	2.717	19.845	0.7813	19.583	0.771	15.875	0.625	3.3	3.5						
	69.012	2.717	19.845	0.7813	19.583	0.771	15.875	0.625	3.5	0.8						
	72.233	2.8438	25.4	1	25.4	1	19.842	0.7812	2.3	2.3						
	73.025	2.875	23.812	0.9375	24.608	0.9688	19.05	0.75	0.8	1.5						
	76.2	3	29.37	1.1563	28.575	1.125	23.02	0.9063	3.3	3.5						
	76.2	3	29.37	1.1563	28.575	1.125	23.812	0.9375	3.3	1.5						
	79.375	3.125	29.37	1.1563	29.771	1.1721	23.812	0.9375	3.3	3.5						
	95.25	3.75	11.115	0.4376	29.9	1.1772	22.225	0.875	0.8	2.3						
35*	59.131	2.328	15.875	0.625	16.764	0.66	11.938	0.47	1.3	3.5						
	59.974	2.3612	15.875	0.625	16.764	0.66	11.938	0.47	1.3	3.5						
	62*	16.7	17				13.6		1.5	SP						
	62*	16.7	17				13.6		1.5	SP						
36.4871.4365	76.2	3	23.812	0.9375	25.645	1.0096	19.05	0.75	3.3	1.5						
36.512	76.2	3	29.37	1.1563	28.575	1.125	23.02	0.9063	3.3	0.8						
	72.238	2.844	20.638	0.8125	20.638	0.8125	18.575	0.7313	1.3	3.5						
38.1	1.5	65.088	2.5625	18.034	0.71	18.288	0.72	13.97	0.55	1.3	2.3					
		65.088	2.5625	18.034	0.71	18.288	0.72	13.97	0.55	1.1	2.3					

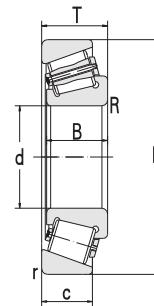
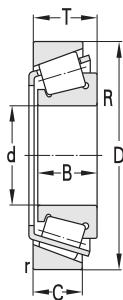
Basic load ratings	Limit speed ratings	Designations	Calculation Factor				Weight			
			Cr	Cor	Grease	Oil	e	Y	Yo	a
KN	r/min									Kg
46	55.5	7000	8500	K14118/K14283	0.38	1.57	0.86	17	0.202	
40	43.5	7000	8500	K17119/K17244B	0.38	1.57	0.86	14	0.228	
58.5	75	5600	7500	KM88043/KM88012	0.55	1.1	0.6	19	0.412	
44	50	6300	8500	KLM67048/KLM67010	0.41	1.46	0.8	13	0.175	
56.5	62	6300	8500	K15123/K15245	0.35	1.71	0.94	13	0.242	
71.5	85.5	6300	8500	K2580/K2523	0.27	2.2	1.2	15	0.451	
56	70.4	6300	7500	KM88048/KM88010	0.55	1.1	0.6	19	0.382	
90	110	5600	7500	K2790/K2720	0.3	1.98	1.09	16	0.559	
82	110	5600	7500	KHM89443/KHM89410	0.55	1.1	0.6	24	0.774	
49	60	5600	7500	KLM48548/KLM48510	0.38	1.59	0.88	14	0.260	
49	60	5600	7500	KLM48548A/KLM48511A	0.38	1.59	0.88	14	0.291	
46	55.5	5600	7500	K14138A/K14274	0.38	1.57	0.86	14	0.320	
46	55.5	5600	7500	K14138A/K14276B	0.38	1.57	0.86	15	0.333	
70.5	80.5	5000	7100	KHM88649/KHM88610	0.55	1.1	0.6	21	0.480	
71.5	85	5600	7500	K25877/K25821	0.29	2.07	1.14	14	0.475	
82	110	5600	7500	KHM89446/KHM89410	0.55	1.1	0.6	24	0.670	
81.5	98	5600	7500	K315945H/K31520SH	0.4	1.49	0.82	21	2.13	
87.5	106	5600	7500	K3478/K3420	0.37	1.64	0.9	20	0.695	
108	129	5600	7500	K449/K432B	0.28	2.11	1.16	19	1.16	
34	36	5600	7000	KL68149/KL68110	0.42	1.44	0.79	13	0.166	
34.5	24.5	5600	7000	KL68149/KL68111	0.42	1.44	0.79	13	0.166	
41.5	53.5	5600	7500	KLM78349SH/KLM78310ASH	0.44	1.35	0.74	14	0.206	
41.5	53.5	5600	7500	KLM78349/KLM78310A	0.44	1.4	0.74	14	0.206	
90	110	5000	6700	K2780/K2720	0.3	2	1.1	16	0.526	
85	116	4800	6300	KHM89448/KHM89410	0.55	1.1	0.6	23	0.650	
45	61	4800	6300	K16143/K16284	0.4	1.49	0.82	17	0.362	
44	57	5000	7000	KLM29749/KLM29710	0.33	1.8	0.99	12	0.237	
48	63.5	5000	7000	KLM29749/KLM29710-DZ	0.33	1.8	0.99	12	0.241	

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 38.1~42.875 mm



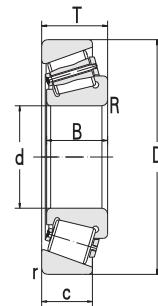
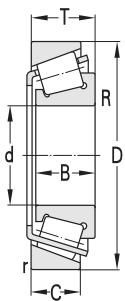
Principal dimensions																																		
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	mm	in	mm	in	mm	in																		
38.1	69.012	2.717	26.195	1.0313	26.195	1.0313	15.083	0.5938	0.8	1.5	72.238	2.844	20.638	0.8125	20.638	0.8125																		
	72.238	2.844	20.638	0.8125	20.638	0.8125	15.875	0.625	1.3	3.5	76.2	3	23.812	0.9375	25.654	1.01	19.05	0.75	3.3	3.5														
	76.2	3	23.812	0.9375	25.654	1.01	19.05	0.75	3.3	3.5	79.375	3.125	29.37	1.1563	29.771	1.1721	23.812	0.9375	3.3	3.5														
	79.375	3.125	29.37	1.1563	29.771	1.1721	23.812	0.9375	3.3	3.5	82.55	3.25	29.37	1.1563	28.575	1.125	23.02	0.9063	3.3	2.3														
	82.55	3.25	29.37	1.1563	28.575	1.125	23.02	0.9063	3.3	2.3	88.5	3.4843	26.988	1.0625	29.083	1.145	22.225	0.875	1.5	3.5														
39*	72.014	2.8352	21.4	0.8425	20.638	0.8125	16.637	0.655	0.4	3.5	39.688	1.5625	73.025	2.875	23.812	0.9375	25.654	1.01	19.05	0.75	0.8	3.5												
	73.025	2.875	25.654	1.01	22.098	0.87	21.336	0.84	2.3	0.8	73.025	2.875	23.812	0.9375	25.654	1.01	19.05	0.75	0.8	3.5														
	76.2	3	23.812	0.9375	25.654	1.01	19.05	0.75	0.8	3.5	76.2	3	23.812	0.9375	25.645	1.0096	19.05	0.75	0.8	3.5														
40.988	1.6137	68*	2.6772	17.5	0.689	18	0.7087	13.5	0.5315	0.8	3.6	41*	68*	2.6772	17.5	0.689	18	7.087	13.5	0.5315	1.5	3.6												
	73.431	2.891	19.558	0.77	19.812	0.78	14.732	0.58	0.76	3.56	41.275	1.625	73.431	2.891	21.43	0.8437	19.812	0.78	16.604	0.6537	0.8	3.5												
	73.431	2.891	21.43	0.8437	19.812	0.78	16.604	0.6537	0.8	3.5	76.2	3	18.009	0.709	17.384	0.6844	14.288	0.5625	1.5	1.5	50.5	61.5	4500	6000	K11162/K11300	0.49	1.2	0.68	17	0.343				
	76.2	3	22.225	0.875	23.02	0.9063	17.462	0.6875	0.8	3.5	76.2	3	22.225	0.875	23.02	0.9063	17.462	0.6875	0.8	3.5	71	83.5	4500	6000	K24780/K24720	0.4	1.5	0.84	17	0.429				
	80.167	3.1562	29.37	1.1563	30.391	1.1965	23.812	0.9375	3.3	0.8	80.167	3.1562	29.37	1.1563	30.391	1.1965	23.812	0.9375	3.3	0.8	97	114	4500	6000	K3384/K3320	0.27	2.2	1.21	17	0.630				
	82.55	3.25	26.543	1.045	25.654	1.01	20.193	0.795	3.3	3.5	82.55	3.25	26.543	1.045	25.654	1.01	20.193	0.795	3.3	3.5	97	114	4500	6000	K3379/K3320	0.27	2.2	1.21	17	0.630				
	82.55	3.25	26.543	1.045	25.654	1.01	20.193	0.795	3.3	3.5	84	105	4500	6000	KM802048/KM802011	0.55	1.1	0.6	23	0.623														
	84.138	3.3125	30.162	1.1875	30.886	1.216	23.812	0.9375	3.3	1.5	84	105	4500	6000	KM802048SH/KM802011SH0	0.54	1.1	0.6	22	0.623														
	85.725	3.375	30.162	1.1875	30.162	1.1875	23.812	0.9375	SP	3.5	85.725	3.375	30.162	1.1875	30.162	1.1875	23.812	0.9375	SP	105	143	4500	6000	K3585/K3520	0.53	1.14	0.62	25	0.792					
	87.312	3.4375	30.162	1.1875	30.866	0.9375	23.812	1.2452	1.5	3.3	87.312	3.4375	30.162	1.1875	30.866	0.9375	23.812	1.2452	1.5	3.3	101	130	4500	6000	K3877/K3826B	0.4	1.49	0.82	22	0.862				
	88.5	3.4843	26.988	1.0625	29.083	1.145	22.225	0.875	1.5	3.5	88.5	3.4843	26.988	1.0625	29.083	1.145	22.225	0.875	1.5	3.5	129	175	4500	6000	K3585/K3525	0.53	1.14	0.62	24	0.861				
	88.9	3.5	30.162	1.1875	29.37	1.1563	23.02	0.9063	3.3	3.5	88.9	3.5	30.162	1.1875	29.37	1.1563	23.02	0.9063	3.3	3.5	146	194	4300	5600	K59162/K59412	0.4	1.49	0.82	26	1.69				
	104.775	4.125	36.512	1.4375	36.512	1.4375	28.575	1.125	3.3	1.5	42.862	1.6875	82.55	3.25	26.195	1.0313	26.988	1.0625	20.638	0.8125	3.3	3.5	84.5	119	4500	6000	K22780/K22720	0.4	1.49	0.82	20	0.687		
	42.875	1.688	80	3.1496	21	0.8268	22.403	0.882	17.826	0.7018	2	3.5	42.875	1.688	80	3.1496	21	0.8268	22.403	0.882	17.826	0.7018	2	3.5	69	76	4500	6000	K342S/K332US	0.27	2.2	1.21	15	0.432

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 42.875~47.625 mm



Principal dimensions																
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	mm	in	mm	in	mm	in
42.875	82.931	3.265	26.988	1.0625	25.4	1	22.225	0.875	2.3	3.5						
43*	80*		21.001	0.8268	22.403	0.882	17.826	0.7018	0.8	3.5						
44.45	1.75	82.931	3.265	23.812	0.9375	25.4	1	19.05	0.75	0.8	3.5					
90.119	3.548	23	0.9055	21.692	0.854	21.808	0.8586	2.3	3.5							
93.264	3.6718	30.162	1.1875	30.302	1.193	23.812	0.9375	3.3	3.5							
93.264	3.6718	30.162	1.1875	30.302	1.193	23.812	0.9375	3.3	3.5							
95.25	3.75	30.958	1.2188	28.575	1.125	22.225	0.875	0.8	3.5							
101.6	4	34.925	1.375	36.068	1.42	26.988	1.0625	3.3	3.5							
104.775	4.125	36.512	1.4375	36.512	1.4375	28.575	1.125	3.3	3.5							
44.988	1.7712	104.986	4.1333	32.512	1.28	31.75	1.25	23.368	0.92	2.5	2.5					
45.23	1.7807	79.985	3.149	19.842	0.7812	20.638	0.8125	15.08	0.5937	2	1.3					
45.237	1.781	87.312	3.437	30.162	1.1875	30.886	1.216	23.812	0.9375	3.3	3.5					
45.242	1.7812	73.431	2.891	19.558	0.77	19.812	0.78	15.748	0.62	0.8	3.5					
		77.788	3.0625	21.43	0.8437	19.842	0.7812	16.667	0.6562	0.8	3.5					
45.618	1.796	82.931	3.265	23.812	0.7375	25.4	1	19.05	0.75	0.8	3.5					
		82.931	3.265	26.988	1.0625	25.4	1	22.225	0.875	2.3	3.5					
		82.931	3.265	23.812	0.9375	25.4	1	19.05	0.75	0.8	3.5					
		83.058	3.27	23.876	0.94	25.4	1	19.114	0.7525	2	3.5					
		83.058	3.27	23.876	0.94	25.4	1	19.114	0.7525	2	3.5					
43*	75*		18		18		14		1.6	2.3						
46.038	1.8125	79.375	3.125	17.462	0.6875	17.462	0.6875	13.495	0.5313	1.5	2.8					
		85	3.3465	20.638	0.8125	21.692	0.854	17.462	0.6875	1.5	2.3					
		85	3.3465	20.638	0.8125	21.692	0.854	17.462	0.6875	1.3	2.3					
47.625	1.875	93.264	3.6718	30.162	1.1875	30.302	1.193	23.812	0.9375	3.3	3.5					
		95.25	3.75	30.162	1.1875	29.37	1.1563	23.02	0.9063	3.3	3.5					

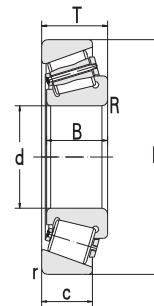
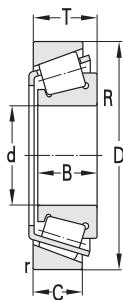
Basic load ratings	Limit speed ratings	Designations		Calculation Factor				Weight		
				Cr	Cor	Grease	Oil			
KN	r/min								Kg	
78	101	4500	6000	K25577/K25523		0.33	1.79	0.99	19	0.646
69	76	4500	6000	K342X/K332B		0.27	2.2	1.21	15	0.440
77	100	4500	6000	K25580/K25520		0.33	1.79	0.99	18	0.573
71.5	85	4500	6000	K355X/K352		0.31	1.96	1.08	18	0.668
103	140	4500	6000	K3782SH/K3720SH		0.34	1.77	0.98	22	1.04
103	140	4500	6000	K3782/K3720		0.34	1.77	0.98	22	1.04
111	133	4500	6000	KHM903249/KHM903210		0.74	0.81	0.45	32	1.00
136	168	4500	6000	K527/K522		0.29	2.1	1.16	22	1.36
146	194	4300	5600	K59175/K59412		0.4	1.49	0.82	26	1.63
127	164	4500	6000	KHM905843/KHM905810		0.78	0.77	0.42	34	1.41
58	76	4500	6000	K17887/K17831		0.37	1.64	0.9	16	0.406
114	120	4500	6000	K3586/K3525-1		0.31	1.97	1.08	20	0.758
51.5	70	4500	6000	KLM102949/KLM102910		0.31	1.97	1.08	14	0.318
51	71	4800	6300	KLM603049/KLM603012		0.43	1.4	0.77	19	0.358
77	100	4500	6000	K25590/K25520		0.33	1.79	0.99	18	0.556
77	100	4500	6000	K25590/K25523		0.33	1.79	0.99	18	0.589
77	100	4500	5000	K25590SH/K25520SH		0.33	1.79	0.99	18	0.556
70	100	4500	5000	K25590SH/K25522SH		0.33	1.79	0.99	21	0.556
77	100	4500	5000	K25590/K25522		0.33	1.79	0.99	18	0.556
57	79.5	4800	6300	KLM503349/KLM503310-DZ		0.4	1.49	0.82	16	0.305
48	60	4500	6000	K18690/K18620		0.37	1.6	0.88	16	0.325
73	83	4500	6000	K359S/K354X		0.31	1.9	1.1	16	0.770
73	83	4500	6000	K359S/K354A		0.31	1.9	1.1	16	0.770
103	140	3800	5300	K3779/K3720		0.34	1.77	0.98	21	0.921
107	144	3800	5300	KHM804846/KHM804810		0.55	1.1	0.6	26	0.987

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 50~54.488 mm



## Principal dimensions

d	D	T	B	C	rmin	Rmin
mm	in	mm	in	mm	in	mm
50*	82*	21.976		21.501	0.8465	17
	84*	22		22	17.5	
	90*	28		28	1.1024	23
93.264	3.6718	30.162	0.1875	30.302	1.193	23.812
	105*	37		36	29	0.9375
					3	3.5
50.8 2	82	3.2283	21.967	0.8648	22.225	0.875
	82.55	3.25	21.59	0.85	22.225	0.875
	85	3.3465	17.462	0.6875	17.462	0.6875
	88.9	3.5	20.638	0.8125	22.225	0.875
	90	3.5433	25	0.9843	22.225	0.875
	92.075	3.625	24.608	0.9688	25.4	1
	93.264	3.6718	30.162	1.1875	30.162	1.1875
	93.264	3.6718	30.162	1.1875	30.162	1.1875
	101.6	31.75	1.25	31.75	1.25	25.4
	104.775	4.125	36.512	1.4375	36.512	1.4375
	104.775	4.125	36.512	1.4375	36.512	1.4375
	104.775	4.125	30.162	1.1875	30.958	1.2188
	104.775	4.125	30.162	1.1875	30.958	1.2188
	107.95	4.25	27.783	1.0938	29.317	1.1542
	107.95	4.25	27.783	1.0938	29.317	1.1542
	123.825	4.875	36.512	1.4375	32.791	1.291
					25.4	1
					3.3	3.5
51.75 2.0374	104.775	4.125	30.162	1.1875	29.317	1.1542
					24.605	0.9687
					3.3	2.3
52.388 2.0625	92.075	3.625	24.608	0.9688	25.4	1
	92.075	3.625	24.608	0.9688	25.4	1
	95.25	3.75	27.783	1.0938	28.575	1.125
					22.225	0.875
					2.3	3.5
53.975 2.125	95.25	3.75	27.783	1.0938	28.575	1.125
	100	3.937	21	0.8268	21.946	0.864
	107.95	4.25	36.512	1.4375	36.957	1.455
	123.825	4.875	36.512	1.4375	32.791	1.291
	130.175	5.125	36.512	1.4375	33.338	1.3425
					23.812	0.9375
					3.3	3.5

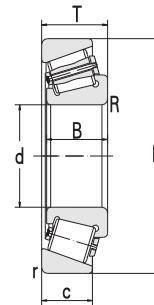
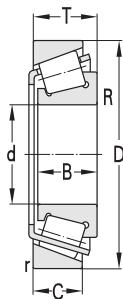
Basic load ratings Cr	Cor	Limit speed ratings		Designations	Calculation Factor				Weight
		Grease	Oil		e	Y	Yo	a	
KN		r/min							
61.5	84	4000	5000	KJM104948/KJLM104910	0.31	1.97	1.08	16	0.425
64	91	4000	5000	KJLM704649/KJLM704610	0.44	1.37	0.75	20	0.470
121	140	4000	5000	JM205149/JM205110	0.33	1.83	1.01	20	0.758
113	136	4000	5000	K50KW01/K3720	0.34	1.77	0.98	23	0.928
140	192	4000	5000	KJHM807045/KJHM807012	0.49	1.23	0.68	29	1.39
68.5	84	4500	6000	KLM104949/KLM104910	0.3	2	1.1	16	0.422
68.5	84	4500	6000	KLM104949/KLM104911	0.31	1.97	1.08	16	0.417
50.5	66.5	4000	5000	K18790/K18720	0.41	1.48	0.81	63	0.378
75.5	89	4000	5000	K368A/K362A	0.32	1.88	1.03	17	0.520
75.5	89	4000	5000	K368A/K362X	0.32	1.88	1.03	17	0.601
86.5	119	4000	5000	K28580/K28521	0.38	1.59	0.88	18	0.701
124	158	4000	5000	K3775/K3730	0.34	1.77	0.98	22	0.870
124	158	4000	4500	K3780/K3720	0.34	1.77	0.98	22	0.870
120	151	4000	4500	K49585/K49522	0.4	1.5	0.82	23	
140	192	3500	4500	KHM807046/KHM807010	0.49	1.23	0.68	29	1.48
146	194	3500	4500	K59200/K59412	0.4	1.49	0.82	26	1.49
127	166	3500	4500	K45285ASH/K45220SH	0.33	1.8	0.99	26	1.23
127	166	3500	4500	K45284/K45220	0.33	1.8	0.99	26	1.23
110	143	3500	4500	K455/K453A	0.34	1.79	0.98	21	1.24
110	143	3500	4500	K455/K453	0.34	1.79	0.98	21	1.30
142	189	2800	4000	K72200C/K72487	0.74	0.81	0.45	38	2.13
100	145	3500	4500	K462/K453X	0.34	1.79	0.98	25	1.05
86.5	119	3500	4000	K28584/K28521	0.38	1.59	0.88	18	0.678
86.5	119	3500	4000	K28584A6/K28521	0.38	1.59	0.88	18	0.678
109	140	3000	4000	K33891/K33821	0.33	1.82	1	20	0.811
109	140	3000	4000	K33895/K33822	0.33	1.82	1	20	0.819
82.5	103	3000	4000	K389A/K383A	0.35	1.69	0.93	19	0.692
153	190	3000	4000	K539/K532XA6	0.3	2.02	1.11	23	1.47
142	189	2800	4000	K72212C/K72487	0.74	0.81	0.45	38	2.12
176	210	3000	4000	KHM911242/KHM911210	0.81	0.74	0.41	41	2.24
140	192	3000	4000	KHM807048/KHM807010	0.49	1.23	0.68	29	1.39

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 55~63.5 mm



Principal dimensions

d	D	T	B	C	rmin	Rmin					
mm	in	mm	in	mm	in	mm					
55*		90*	23	23	18.5	0.5	1.5				
		95*	29	29	23.5	2.5	1.5				
		110*	39	39	32	2.5	3				
55.562	2.1875	97.63	3.837	24.608	0.9688	24.608	0.9688	19.446	0.7656	0.8	3.5
57.15	2.25	96.838	3.8125	21	0.8268	21.946	0.864	15.875	0.625	0.8	3.5
		100	3.937	21	0.8268	21.946	0.864	17.826	0.7018	2	0.8
		112.712	4.4375	30.162	1.1875	30.048	1.183	23.812	0.9375	3.3	3.5
		112.712	4.4375	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	8
		140.03	5.513	36.512	1.4375	33.236	1.3085	23.52	0.926	2.3	3.5
60*		112.712	4.4375	30.162	1.1875	30.048	1.183	23.812	0.9375	3.3	3.5
		135*	33.45	1.3169	30.95	1.2185	22	0.8661	3.5	3.5	
		146.05	5.75	41.275	1.625	39.688	1.5625	25.4	1	3.3	3.5
60.325	2.375	100	3.937	25.4	1	25.4	1	19.845	0.7813	3.3	3.5
		101.6	4	25.4	1	25.4	1	19.845	0.7813	3.3	3.5
		122.238	4.8125	38.1	1.5	38.354	1.51	29.718	1.17	3.3	8
		123.825	4.875	38.1	1.5	36.678	1.444	30.162	1.1875	3.3	2.3
		127	5	44.45	1.75	44.45	1.75	34.925	1.375	3.3	3.5
61.912	2.4375	112.712	4.4375	26.967	1.0617	21.996	0.866	23.812	0.9375	3.3	0.8
		127	5	36.512	1.4375	36.512	1.4375	26.988	1.0625	3.3	3.5
		136.525	5.375	46.038	1.8125	46.038	1.8125	36.512	1.4375	3.3	3.5
63.5	2.5	94.458	3.7188	19.05	0.75	19.05	0.75	15.083	0.5938	1.5	1.5
		104.775	4.125	21.433	0.8438	22	0.8661	15.875	0.625	2.0	2.0
		107.95	4.25	25.4	1	25.4	1	19.05	0.75	3.3	1.5
		107.95	4.25	25.4	1	25.4	1	19.05	0.75	0.8	1.5
		107.95	4.25	25.4	1	25.4	1	19.05	0.75	0.8	3.5
		110	4.3307	22	0.8661	21.996	0.866	18.824	0.7411	1.3	3.5
		110	4.3307	25.4	1	25.4	1	19.05	0.75	1.3	3.5
		112.712	4.4375	30.162	1.1875	30.048	1.183	23.812	0.9375	3.3	3.5
		112.712	4.4375	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	3.5
		112.712	4.4375	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	3.5

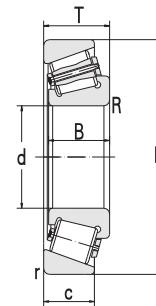
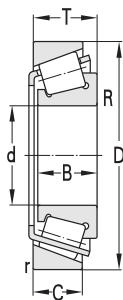
Basic load ratings	Limit speed ratings	Designations	Calculation Factor				Weight		
			Cr	Cor	Grease	Oil			
KN		r/min					Kg		
78	113	3000	4000	KJLM506849/KJLM506810	0.4	1.5	0.82	20	0.568
77	152	3000	4000	KJM207049/KJM207010	0.33	1.8	0.99	21	0.831
164	203	3000	4000	KJH307749/KJH307710	0.35	1.69	0.93	26	1.69
89.5	129	3000	4000	K28680/K28622	0.4	1.49	0.82	21	0.760
82.5	103	3000	4000	K387A/K382A	0.35	1.7	0.9	21	0.581
82.5	103	3000	4000	K387S/K383A	0.35	1.69	0.93	19	0.653
139	198	3000	4000	K3979/K3920	0.35	1.7	0.93	24	1.46
141	201	3000	4000	K39581/K39520	0.35	1.7	0.93	24	1.42
155	185	3000	4000	K78225C/K78551	0.87	0.69	0.38	45	2.53
115	170	3000	4000	K3977/K3920	0.4	1.49	0.82	25	1.30
151	175	3000	4000	KHM911244B/KHM911216B	0.82	0.73	0.4	41	2.06
206	240	3000	4000	KH913840/KH913810	0.78	0.77	0.42	45	3.28
95	75.5	3000	4000	K28985/K28921	0.43	1.41	0.77	24	0.812
95	75.7	3000	4000	K28985/K28920	0.43	1.41	0.77	24	0.851
233	154	3000	4000	KHM212044/KHM212011	0.34	1.78	0.98	31	2.08
162	223	3000	4000	K558/K552A	0.35	1.73	0.95	31	2.09
211	274	3000	4000	K65237/K65500	0.49	1.2	0.68	35	2.65
91	105	3000	4000	K392/K3920	0.4	1.49	0.82	27	1.06
166	234	2600	3400	KHM813843/KHM813810	0.5	1.2	0.66	37	2.16
249	405	2600	3400	KH715334/KH715311	0.47	1.3	0.7	37	3.41
62	105	3000	4000	KL610549/KL610510	0.42	1.4	0.78	20	0.453
92.5	119	3000	4000	K39250/K39412	0.39	1.6	0.86	20	0.711
92.5	141	3000	4000	K29586/K29520	0.46	1.31	0.72	18	0.914
92.5	141	3000	4000	K29586/K29522	0.46	1.31	0.72	24	0.914
92.5	141	3000	4000	K29585/K29522	0.46	1.31	0.72	24	0.914
90	117	3000	4000	K395/K394A	0.4	1.5	0.82	21	0.853
92.5	141	3000	4000	K29585/K29521	0.46	1.31	0.72	24	0.965
116	170	2900	3900	K3982/K3920	0.4	1.49	0.82	24	1.22
154	201	2900	3900	K39585/K39520	0.35	1.7	0.93	24	1.27
154	201	2900	3900	K39585/K39520/HE1	0.35	1.7	0.93	24	1.27

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 63.5~69.85 mm



Principal dimensions																
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	mm	in	mm	in	mm	in
63.5	122.238	4.8125	38.1	1.5	38.354	1.51	29.718	1.17	3.3	7						
	123.825	4.875	38.1	1.5	36.678	1.444	30.162	1.1875	3.3	3.5						
	127.5	36.512	1.4375	36.512	1.4375	26.988	1.0625	3.3	3.5							
	136.525	5.375	41.275	1.625	41.275	1.625	31.75	1.25	3.3	3.5						
	136.525	5.375	41.275	1.625	41.275	1.625	31.75	1.25	3.3	3.5						

65*	110*	28	28	22.5		2.5	3										
	120*	39	38.5	1.5157	32	2.5	3										
65.088	2.5625	135.755	5.3447	53.975	2.125	56.007	2.205	44.45	1.75	3.3	3.5						
66.675	2.625	107.95	4.25	25.4	1	25.4	1	19.05	0.75	0.8	3.5						
		107.95	4.25	25.4	1	25.4	1	19.05	0.75	0.8	3.5						
		110	4.3307	22	0.8661	21.996	0.866	18.824	0.7411	1.3	0.8						
		110	4.3307	22	0.8661	21.996	0.866	18.824	0.7411	1.3	3.5						
		112.712	4.4375	30.162	1.1875	30.048	1.183	23.812	0.9375	3.3	3.5						
		112.712	4.4375	30.162	1.1875	30.048	1.183	23.812	0.9375	3.3	5.5						
		112.712	4.4375	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	3.5						
		112.712	4.4375	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	3.5						
		112.712	4.4375	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	3.5						
		117.475	4.625	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	3.5						
		122.238	4.8125	38.1	1.5	38.354	1.51	29.718	1.17	3.3	3.6						
		122.238	4.8125	38.1	1.5	38.354	1.51	29.718	1.17	1.5	3.5						
		122.238	4.8125	38.1	1.5	38.354	1.51	29.718	1.17	SP	SP						
		136.525	5.375	41.275	1.625	41.275	1.625	31.75	1.25	3.3	3.5						
		136.525	5.375	41.275	1.625	41.275	1.625	31.75	1.25	3.3	3.5						
		136.525	5.375	46.038	1.8125	46.038	1.8125	36.512	1.4375	3.3	3.5						

68.262	2.6875	136.525	5.375	41.275	1.625	41.275	1.625	31.75	1.25	3.3	3.5						
		136.525	5.375	46.038	1.8125	46.038	1.8125	36.512	1.4375	3.3	3.5						
		161.925	6.375	49.212	1.9375	46.038	1.8125	31.75	1.25	3.3	3.5						
69.85	2.75	112.712	4.4375	25.4	1	25.4	1	19.05	0.75	3.3	1.5						
		120	4.7244	29.795	1.173	29.007	1.142	24.237	0.9542	2	3.5						
		120	4.7244	32.545	1.2813	32.545	1.2813	26.195	1.0313	3.3	3.5						
		130.175	5.125	41.275	1.625	41.275	1.625	31.75	1.25	3.3	3.5						
		146.05	5.75	41.275	1.625	39.688	1.5625	25.4	1	3.3	3.5						

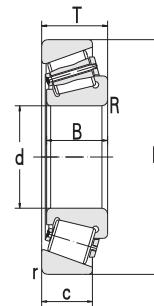
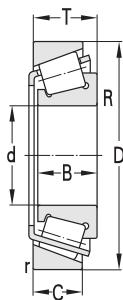
Basic load ratings	Limit speed ratings	Designations	Calculation Factor				Weight			
			Cr	Cor	Grease	Oil	e	Y	Yo	a
190	250	2900	3900	KHM212047/KHM212011	0.34	1.78	0.98	24	1.90	
162	223	2900	3900	K559/K552A	0.35	1.73	0.95	29	1.99	
166	234	2900	3900	KHM13842/KHM813810	0.5	1.2	0.66	32	2.12	
264	340	2800	3800	KH414235/KH414210	0.36	1.66	0.91	30	3.03	
264	340	2800	3800	KH414235A6/KH414210B2	0.36	1.66	0.91	30	2.96	
131	181	2800	3800	KJM511946/KJM511910	0.4	1.49	0.82	24	1.06	
187	250	2800	3800	KJM211749/KJM211710	0.34	1.78	0.98	27	0.86	
265	355	2600	3400	K6379/K6320	0.32	1.88	1.02	36	3.63	
92.5	141	2800	3800	K29590/K29522	0.46	1.31	0.72	18	0.853	
92.5	141	2800	3800	K29590A6/K29522	0.46	1.31	0.72	24	0.853	
90	117	2800	3800	K395A/K394A	0.4	1.49	0.82	21	0.797	
90	117	2800	3800	K395S/K394A	0.4	1.49	0.82	21	0.397	
116	170	2800	3800	K3984/K3920	0.4	1.49	0.82	24	1.17	
116	170	2800	3800	K3994/K3920	0.4	1.49	0.82	24	1.17	
141	201	2800	3800	K39590/K39520	0.35	1.7	0.93	24	1.23	
141	201	2800	3800	K39590SH/K39520SH	0.35	1.7	0.93	24	1.23	
123	180	2800	3800	K33262/K33462	0.44	1.38	0.76	28	1.37	
154	2800	3800	KHM212049/KHM212011	0.34	1.78	0.98	24	1.90		
154	2800	3800	KHM212049/KHM212010	0.34	1.78	0.98	27	1.90		
233	154	2600	3400	KHM21049A/KHM21010A6	0.34	1.78	0.98	27	0.98	
233	271	2600	3400	K641/K632	0.36	1.66	0.91	30	2.74	
249	405	2600	3400	KH715341/KH715311	0.47	1.3	0.7	37	3.24	
199	271	2600	3400	K642/K632	0.36	1.66	0.91	30	2.69	
238	380	2600	3400	KH715343/KH715311	0.47	1.3	0.7	37	3.18	
248	490	2800	3800	K9278/K9220	0.71	0.85	0.47	56	4.58	
98	156	2600	3600	K29675/K29620	0.49	1.23	0.68	26	0.952	
135	188	2800	3800	K482/K472	0.38	1.56	0.86	26	1.32	
157	229	3000	4000	K47487/K47420	0.35	1.7	0.9	25	1.50	
199	271	2600	3600	K643/K633	0.36	1.66	0.91	29	2.30	
206	240	2600	3600	KH913849/KH913810	0.78	0.77	0.42	45	2.97	

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 70~82.555 mm



Principal dimensions																
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	mm	in	mm	in	mm	in
70*	110*	26	25	20.5	2.5	1										
71.438	2.8125	117.475	4.625	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	3.5					
136.525	5.375	41.275	1.625	41.275	1.625	31.75	1.25	3.3	3.5							
136.525	5.375	41.275	1.625	41.275	1.625	31.75	1.25	3.3	6.4							
73.025	2.875	112.712	4.4375	25.4	1	25.4	1	19.05	0.75	3.3	3.5					
117.475	4.625	30.162	1.1875	30.162	1.1875	23.812	0.9375	3.3	3.5							
150.089	5.909	44.45	1.75	46.672	1.8375	36.512	1.4375	3.3	3.5							
75*	115*	25	25	19	2.5	3										
120*	31		29.5	25												
75.987	2.9916	131.976	5.1959	39	1.5354	39	1.5354	32	1.2598	3.5	7					
76.2	3	125.412	4.9375	25.4	1	25.4	1	19.845	0.7813	1.5	3.5					
127	5	30.162	1.1875	31	1.2205	22.225	0.875	3.3	3.5							
127	5	30.162	1.1875	31	1.2205	22.225	0.875	3.3	6.4							
135.733	5.3438	44.45	1.75	46.1	1.815	34.925	1.375	3.3	3.5							
136.525	5.375	30.162	1.1875	29.769	1.1716	22.225	0.875	3.175	3.5							
139.992	5.5115	36.512	1.4375	36.098	1.4212	28.575	1.125	3.302	3.5							
150.089	5.909	44.45	1.75	46.672	1.8375	36.512	1.4375	3.3	3.5							
161.925	6.375	47.625	1.875	48.26	1.9	38.1	1.5	3.3	3.5							
161.925	6.375	53.975	2.125	55.1	2.1693	42.862	1.6875	3.3	3.5							
171.45	6.75	49.212	1.9375	46.038	1.8125	31.75	1.25	3.3	3.5							
180.975	7.125	53.975	2.125	53.183	2.0938	35.72	1.4063	3.3	3.5							
77.788	3.0625	135.733	5.3438	44.45	1.75	46.1	1.815	34.925	1.375	3.3	3.5					
80*	130*	35		34		28.5		2.5	3							
80.962	3.1875	136.525	5.375	30.162	1.1875	29.769	1.172	22.225	0.875	3.175	3.503					
82.55	3.25	125.412	4.9375	25.4	1	25.4	1	19.845	0.7813	1.5	3.5					
133.35	5.25	33.338	1.3125	33.338	1.3125	26.195	1.0313	3.3	6.8							
133.35	5.25	33.338	1.3125	33.338	1.3125	26.195	1.0313	3.3	3.5							

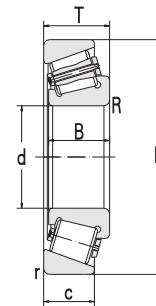
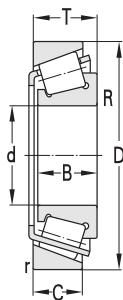
Basic load ratings	Limit speed ratings	Designations		Calculation Factor				Weight	
				Cr	Cor	Grease	Oil		
KN	r/min	Kg							
102	156	3000	4000	KJLM813049/KJLM813010	0.49	1.23	0.68	26	0.894
118	180	2600	3600	K33281/K33462	0.44	1.38	0.76	28	1.24
242	300	2600	3600	KH414249/KH414210	0.36	1.66	0.92	31	2.59
199	271	2600	3600	K645/K632	0.36	1.66	0.91	33	2.55
98	156	2600	3600	K29685/K29620	0.49	1.23	0.68	25	0.878
118	180	2600	3600	K33287/K33462	0.44	1.38	0.76	28	1.21
264	365	2400	3400	K744/K742	0.33	1.84	1.01	31	3.74
105	152	2600	3600	KJLM714149/KJLM714110	0.46	1.3	0.72	25	8.58
128	204	2600	3600	KJM714249/KJM714210	0.44	1.35	0.74	28	1.28
203	305	2600	3600	KHM215249/KHM215210	0.33	1.84	1.01	28	2.14
91	160	2600	3600	K27684/K27620	0.45	1.32	0.73	29	1.25
184	220	2600	3600	K42687/K42620	0.42	1.43	0.79	27	1.44
184	220	2600	3600	K42688/K42620	0.42	1.43	0.79	27	1.44
215	340	2600	3600	K5760/K5735	0.41	1.5	0.81	33	2.73
134	198	2400	3400	K495A/K493	0.44	1.35	0.74	29	1.82
187	290	2400	3400	K575/K572	0.4	1.49	0.82	32	2.44
264	340	2400	3400	K748S/K742	0.33	1.84	1.01	33	3.62
273	390	2400	3400	K755/K752	0.34	1.76	0.97	40	4.85
315	475	2400	3400	K6576/K6535	0.4	1.49	0.82	41	5.46
267	325	2000	2800	K9380/K9321	0.76	0.79	0.43	54	5.20
207	210	2000	2800	KH917840/KH917810	0.73	0.82	0.45	63	6.56
215	340	2600	3600	K5795/K5735	0.41	1.5	0.81	33	2.73
175	280	2400	3400	KJM515649/KJM515610	0.41	1.48	0.81	30	1.82
134	198	2400	3400	K496/K493	0.44	1.35	0.74	29	1.75
140	151	2400	3400	27687/27620	0.45	1.32	0.73	27	1.10
142	218	2400	3400	K47687/K47620	0.4	1.48	0.82	28	1.74
142	218	2400	3400	K47686/K47620	0.4	1.48	0.82	28	1.80

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 82.55~90 mm



## Principal dimensions

d	D		T		B		C		rmin	Rmin	
	mm	in	mm	in	mm	in	mm	in	mm	in	
82.55	133.35	5.25	39.688	1.5625	39.688	1.5625	32.545	1.2813	3.3	3.5	
	139.7	5.5	36.512	1.4375	36.098	1.4212	28.575	1.125	3.3	3.556	
	139.992	5.5115	36.512	1.4375	36.098	1.4212	28.575	1.125	3.302	3.556	
	146.05	5.75	41.275	1.625	41.275	1.625	31.75	1.25	3.505	0.254	
	150	5.9055	44.45	1.75	46.672	1.8375	36.512	1.4375	3.3	3.5	
83.345	3.2813	125.412	4.9375	25.4	1	25.4	1	19.845	0.7813	1.5	3.5
84.138	3.3125	133.35	5.25	30.162	1.1875	29.769	1.172	22.225	0.875	3.3	3.5
84.976	3.3455	125.412	4.9375	25.4	1	25.4	1	19.845	0.7813	1.5	5
85*	130*	30		29		24			2.5	3	
85.026	3.3475	150.089	5.909	44.45	1.75	46.672	1.8375	36.512	1.4375	3.3	3.5
	150.089	5.909	44.45	1.75	46.672	1.8375	36.512	1.4375	3.3	5	
85.725	3.375	136.525	5.375	30.163	1.1875	29.769	1.172	22.225	0.875	3.175	3.556
	133.35	5.25	30.162	1.1875	29.769	1.172	22.225	0.875	3.3	3.556	
	142.138	5.596	42.862	1.6875	42.862	1.6875	34.133	1.3438		4.8	
	146.05	5.75	41.275	1.625	41.275	1.625	31.75	1.25	3.175	6.4	
	152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.175	3.5	
88.9	3.5	118.618	4.67	39.688	1.5625	39.688	1.5625	30.162	1.1875	3.556	6.35
	152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.175	6.4	
	152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.3	3.5	
	152.4	6	39.688	1.5625	39.688	1.5625	30.162	1.1875	SP	SP	
	161.925	6.375	53.975	2.125	55.1	2.1693	42.862	1.6875	3.3	3.5	
	168.275	6.625	41.275	1.625	41.275	1.625	30.162	1.1875	3.3	3.5	
	190.5	7.5	57.15	2.25	57.531	2.265	44.45	1.75	3.3	8	
	190.5	7.5	57.15	2.25	57.531	2.265	46.038	1.8125	3.3	8	
90*	145*	35		34		27		2.5	6		
	147*	40		40		32.5		3.5	7		
	147*	40		40		32.5		5.8	3.5		
	147*	40		40		32.5		SP	SP		

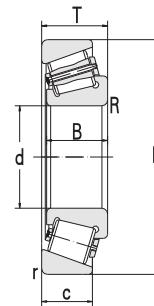
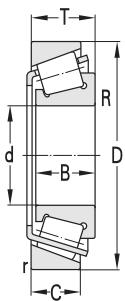
Basic load ratings	Limit speed ratings				Designations	Calculation Factor				Weight
	Cr	Cor	Grease	Oil		e	Y	Yo	a	
KN	r/min									Kg
186	310	2400	3400	KHM516449/KHM516410	0.4	1.48	0.82	32	2.12	
187	290	2400	3400	K580/K572X	0.4	1.48	0.82	31	2.21	
217	275	2400	3400	K580/K572	0.4	1.49	0.82	31	2.21	
265	360	2400	3400	K663/K653	0.41	1.47	0.81	36	2.87	
264	365	2400	3400	K749A/K742A	0.33	1.84	1.01	38	3.33	
100	160	2400	3400	K27690/K27620	0.42	1.44	0.79	26	1.08	
134	198	2400	3400	K498/K492A	0.44	1.35	0.74	29	1.47	
100	160	2400	3400	K27695/K27620	0.45	1.32	0.73	31	1.01	
138	216	2400	3400	KJM716649/KJM716610	0.44	1.35	0.74	30	1.39	
264	365	2400	3400	K749/K742	0.33	1.84	1.01	31	3.22	
264	365	2400	3400	K749S/K742	0.33	1.84	1.01	33	3.20	
134	198	2400	3400	K497/K493	0.44	1.35	0.74	29	1.60	
134	198	2200	3200	K497/K492A	0.44	1.35	0.74	23	1.47	
220	345	2200	3200	KHM617049/KHM617010	0.43	1.4	0.76	35	2.63	
217	315	2200	3200	K665A/K653	0.41	1.47	0.81	33	2.74	
315	167	2000	3400	K596/K592A	0.44	1.36	0.75	39	2.92	
286	350	2000	3000	KHM518445/KHM518410	0.4	1.49	0.82	33	2.86	
184	286	1800	2700	K593A/K592A	0.44	1.36	0.75	39	2.80	
207	169	1800	2700	K593/K592A	0.44	1.36	0.75	39	2.63	
255	370	1800	2700	KHM518445A6/KHM518410A6	0.4	1.49	0.82	34	2.86	
315	475	2400	3400	K6580/K6535	0.4	1.49	0.82	41	4.73	
205	350	1800	2700	K679/K672	0.47	1.28	0.7	38	4.03	
380	555	1900	2600	K855/K854	0.33	1.8	0.99	42	7.69	
445	610	1700	2400	KHH221434/KHH221410	0.33	1.79	0.99	24	7.87	
189	315	2200	3200	KJM718149A/KJM718110	0.44	1.36	0.75	33	2.17	
216	345	2200	3200	KHM218248/KHM218210	0.33	1.8	0.99	31	2.51	
253	370	2200	3200	KHM218248SH/KHM218210SH	0.33	1.8	0.99	31	2.58	
215	345	2200	3200	KHM218248A6/KHM218210A6	0.33	1.8	0.99	31	2.51	

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 92.075~107.95 mm



Principal dimensions											
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	
92.075	3.625	150	9.9055	35.992	1.417	36.322	1.43	27	1.063	3	6.35
		152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.302	6.35
		152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.3	3.5
		180.975	7.125	47.625	1.875	48.006	1.89	38.1	1.5	3.3	3.5
95*		150*		35		34		27		2.5	3
95.25	3.75	147.638	5.8125	35.717	1.4062	36.322	1.43	26.192	1.0312	0.8	5
		152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.302	5.08
		152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.302	5.08
		152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.3	3.5
		152.4	6	39.688	1.5625	36.322	1.43	30.162	1.1875	3.3	8
		168.275	6.625	41.275	1.625	41.275	1.625	30.162	1.1875	3.3	3.5
96.838	3.8125	148.43	5.8437	28.575	1.125	28.971	1.1406	21.433	0.8438	3	3.5
		188.912	7.4375	50.8	2	46.038	1.8125	31.75	1.25	3.3	3.5
99.975	3.936	212.725	8.375	66.675	2.625	66.675	2.625	53.975	2.125	3.3	3.5
100*		145*		24		22.5		17.5		5	3
		155*		36		35		28		2.5	3
		157*		42		42		34		SP	SP
101.6	4	157.162	6.1875	36.512	1.4375	36.116	1.4219	26.195	1.0313	3.3	3.5
		168.275	6.625	41.275	1.625	41.275	1.625	30.162	1.1875	3.3	3.5
		190.5	7.5	57.15	2.25	57.531	2.265	44.45	1.75	3.3	8
		190.5	7.5	57.15	2.25	57.531	2.265	46.038	1.8125	3.3	8
		212.725	8.375	66.675	2.625	66.675	2.625	53.975	2.125	3.3	7
		212.725	8.375	66.675	2.625	66.675	2.625	53.975	2.125	3.3	7
		250.825	9.875	76.2	3	73.025	2.875	50.8	2	6.4	6.4
104.775	4.125	180.975	7.125	47.625	1.875	48.006	1.89	38.1	1.5	3.3	7
		180.975	7.125	47.625	1.875	48.006	1.89	38.1	1.5	3.3	3.5
		180.975	7.125	47.625	1.875	48.006	1.89	38.1	1.5	3.3	6.4
107.95	4.25	146.05	5.75	21.433	0.8438	21.433	0.8438	16.67	0.6563	1.5	1.5

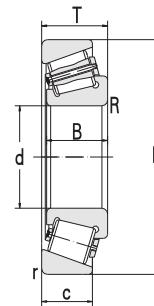
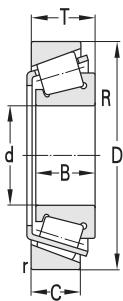
Basic load ratings	Limit speed ratings	Designations		Calculation Factor				Weight	
				Cr	Cor	Grease	Oil		
KN	r/min								
184	286	1900	2800	598A/593X	0.44	1.36	0.75	34	2.37
232	315	1900	2800	598A/592A	0.44	1.36	0.75	34	2.67
232	315	1900	2800	K598/K592A	0.44	1.36	0.75	34	2.66
288	435	1900	2800	K778/K772	0.39	1.56	0.86	44	5.55
187	290	1900	2800	KJM719149/KJM719113	0.44	1.4	0.75	33	2.23
228	310	1900	2800	594A/592XE	0.44	1.39	0.75	34	2.13
228	310	1900	2800	594A/592A	0.44	1.36	0.75	34	2.54
228	310	1900	2800	K594A/K592A	0.44	1.36	0.75	34	2.54
207	169	1900	2800	K594/K592A	0.44	1.36	0.75	34	2.54
207	169	1900	2800	K594R/K592A	0.44	1.36	0.75	34	2.52
221	350	1900	2800	K683/K672	0.48	1.25	0.7	38	3.75
146	230	1900	2800	K42381/K42584	0.49	1.22	0.67	32	1.68
270	345	1900	2800	K90381/K90744	0.87	0.69	0.38	62	5.63
600	830	1900	2800	KHH224334/KHH224310	0.33	1.84	1.01	54	11.2
116	171	1900	2800	KJP10049A/KJP10010	0.47	1.27	0.7	30	1.13
231	260	1900	2800	KJM720249/KJM720210	0.47	1.27	0.7	36	2.34
253	400	1900	2800	KHM220149A6/KHM220110A6	0.33	1.8	0.99	33	2.89
193	315	2000	2800	K52400/K52618	0.47	1.3	0.69	36	2.48
205	350	2000	2800	K687/K672	0.47	1.28	0.7	38	3.43
380	555	1900	2600	K861/K854	0.33	1.8	0.99	42	6.80
445	610	1800	2600	KHH221449/KHH221410	0.33	1.79	0.99	24	7.87
655	900	1800	2600	KHH224335/KHH224310	0.33	1.84	1.01	48	11.1
450	675	1800	2600	K941/K932	0.33	1.84	1.01	48	11.0
550	695	1400	1900	KHH923649/KHH923610	0.71	0.85	0.47	85	17.6
288	435	2000	2600	K787/K772	0.39	1.6	0.86	39	4.78
288	435	2000	2600	K782/K772	0.39	1.56	0.86	39	4.81
288	435	2000	2600	K786/K772	0.39	1.56	0.86	39	4.79
106	180	1900	2800	KL521949/KL521910	0.39	1.54	0.85	26	0.993

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 107.95~133.35 mm



Principal dimensions										
d	D		T		B		C		rmin	Rmin
	mm	in	mm	in	mm	in	mm	in	mm	mm
107.95	158.75	6.25	23.02	0.9063	21.438	0.844	15.875	0.625	3.3	3.5
	165.1	6.5	36.512	1.4375	36.512	1.4375	26.988	1.0625	3.3	3.5
109.538	4.3125	158.75	6.25	23.02	0.9063	21.438	0.844	15.875	0.625	3.3
110*	165*	35	35		26.5			2.5	3	
	180*	47	46		38			2.5	3	
	165*	35	35		26.5			3	2.5	
	180*	47	46		38			2.5	3	
114.3	4.5	177.8	7	41.275	1.625	41.275	1.625	30.162	1.1875	3.3
	190.5	7.5	47.625	1.875	49.212	1.9375	34.925	1.375	3.3	3.5
	212.725	8.375	66.675	2.625	66.675	2.625	53.957	2.1243	3.3	7
	228.6	9	53.975	2.125	49.428	1.946	38.1	1.5	3.3	3.5
114.976	4.5266	180.975	7.125	41.275	1.625	41.275	1.625	30.162	1.1875	3.3
117.8	4.6378	247.65	9.75	47.625	1.875	47.625	1.875	38.1	1.5	3.3
120*	170*	27		25		19.5		3	3	
120.65	4.75	206.375	8.125	47.625	1.875	47.625	1.875	34.925	1.375	3.3
	273.05	10.75	82.55	3.25	82.55	3.25	53.975	2.125	6.4	6.4
	182.562	7.1875	39.688	1.5625	38.1	1.5	33.338	1.3125	3.3	3.5
127	5	182.562	7.1875	39.688	1.5625	38.1	1.5	33.338	1.3125	3.3
	182.562	7.1875	39.688	1.5625	38.1	1.5	33.338	1.3125	3.3	3.5
	234.95	9.25	63.5	2.5	63.5	2.5	49.212	1.9375	3.3	6.4
	228.6	9	53.975	2.125	49.428	1.946	38.1	1.5	3.3	3.5
128.588	5.0625	206.375	8.125	47.625	1.875	47.625	1.875	34.925	1.375	3.3
130.175	5.125	196.85	7.75	46.038	1.8125	46.038	1.8125	38.1	1.5	3.3
133.35	5.25	196.85	7.75	46.038	1.8125	46.038	1.8125	38.1	1.5	3.5
	234.95	9.25	63.5	2.5	63.5	2.5	49.212	1.9375	3.3	9.7

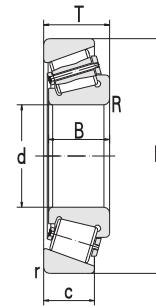
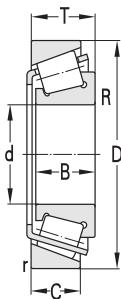
Basic load ratings	Limit speed ratings		Designations		Calculation Factor				Weight
	Cr	Cor	Grease	Oil	e	Y	Yo	a	
KN	r/min							Kg	
107	174	1900	2800	K37425/K37625	0.61	0.99	0.54	39	1.36
198	330	1900	2800	K56425/K56650	0.5	1.2	0.7	38	2.67
107	174	1900	2800	K37431A/K37625	0.61	0.99	0.54	39	1.32
195	320	1900	2800	KJM822049/KJM822010	0.5	1.21	0.66	39	2.63
320	510	1900	2800	JHM522649/JHM522610	0.41	1.48	0.81	40	4.56
211	360	1900	2800	KM822049/KM822010	0.5	1.2	0.66	38	2.63
320	510	1900	2800	KJHM522649/KJHM522610	0.41	1.48	0.81	40	4.56
250	400	1900	2800	K64450/K64700	0.52	1.23	0.64	43	3.50
305	480	1900	2800	K71450/K71750	0.41	1.48	0.81	41	5.26
450	675	1700	2400	K938/K932	0.33	1.8	1	47	9.95
400	590	1700	2400	KHM926740/KHM926710	0.74	0.81	0.45	69	9.78
250	400	1900	2800	K64452A/K64713	0.52	1.15	0.63	43	
420	520	1600	2300	K67791/K67720	0.44	1.36	0.75	52	6.82
155	243	1900	2800	KJP12049/KJP12010	0.47	1.3	0.69	35	1.75
330	550	1600	2200	K795/K792	0.46	1.3	0.72	46	6.28
815	940	1700	2400	HH926749/HH926710	0.63	0.95	0.52	76	22.1
228	430	1700	2400	K48282/K48220	0.3	2	1.1	34	3.56
228	430	1700	2400	K48290/K48220	0.3	2	1.1	34	3.20
240	430	1700	2400	48290/48220	0.3	2	1.1	34	3.20
515	810	1700	2400	K95500/K95925	0.37	1.62	0.89	51	11.6
400	590	1700	2400	KHM926747/KHM926710	0.74	0.81	0.45	68	8.88
330	550	1600	2200	K799/K792	0.46	1.3	0.72	46	5.70
330	590	1600	2200	67389/67322	0.34	1.74	0.96	40	4.96
380	420	1600	2200	K67390/K67322	0.34	1.74	0.96	40	4.71
515	810	1500	2000	95525/95925	0.37	1.62	0.89	51	11.1

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 139.7~179.934 mm



Principal dimensions											
d	D		T		B		C		rmin	Rmin	
	mm	in	mm	in	mm	in	mm	in	mm		
139.7	5.5	228.6	9	57.15	2.25	57.15	2.25	44.45	1.75	3.3	3.5
		236.538	9.3125	57.15	2.25	56.642	2.23	44.45	1.75	3.3	3.5
		254	10	66.675	2.625	66.675	2.625	47.625	1.875	3.3	7
146.05	5.75	193.675	7.625	28.575	1.125	28.575	1.125	23.02	0.9063	1.5	1.5
		304.8	12	88.9	3.5	82.55	3.25	57.15	2.25	6.4	6.4
152.4	6	222.25	8.75	46.83	1.8437	46.83	1.8437	34.925	1.375	1.5	3.5
		254	10	66.675	2.625	66.675	2.625	47.625	1.875	3.3	7
		268.288	10.563	74.612	2.9375	74.612	2.9375	57.15	2.25	6.4	6.4
		268.288	10.563	74.612	2.9375	74.612	2.9375	57.15	2.25	6.4	6.4
		307.975	12.125	88.9	3.5	93.662	3.6875	66.675	2.625	6.8	9.7
158.75	6.25	225.425	8.875	41.275	1.625	39.688	1.5625	33.338	1.3125	3.3	3.5
165.1	6.5	225.425	8.875	41.275	1.625	39.688	1.5625	33.338	1.3125	3.3	3.5
		247.65	9.75	47.625	1.875	47.625	1.875	38.1	1.5	3.3	3.5
		288.925	11.375	63.5	2.5	63.5	2.5	47.625	1.875	7	3.3
		336.55	13.25	92.075	3.625	95.25	3.75	69.85	2.75	6.4	3.3
170*		230*		39		38		31		2.5	3
		240*		46		44.5		37		2.5	3
		240*		46		44.5		37		2.5	3
174.625	6.875	288.925	11.375	63.5	2.5	63.5	2.5	47.625	1.875	3.3	7
		288.925	11.375	63.5	2.5	63.5	2.5	47.625	1.875	3.3	7
177.8	7	247.65	9.75	47.625	1.875	47.625	1.875	38.1	1.5	3.3	3.5
		260.35	10.25	53.975	2.125	53.975	2.125	41.275	1.625	3.3	3.5
		260.35	10.25	53.975	2.125	53.975	2.125	41.275	1.625	3.3	3.5
		288.925	11.375	63.5	2.5	63.5	2.5	47.625	1.875	3.3	7
		319.964	12.597	88.9	3.5	85.725	3.375	65.088	2.5625	4.8	3.5
		428.628	16.8751	106.362	4.1875	95.250	3.75	61.912	2.4375	6.4	6.4
178.595	7.0313	265.112	10.4375	51.595	2.0313	57.150	2.25	38.895	1.5313	3.3	3.3
179.934	7.084	265.112	10.4375	51.595	2.0313	57.150	2.25	38.895	1.5313	3.3	3.3

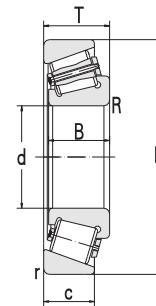
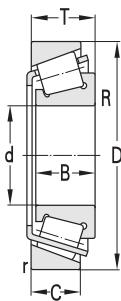
Basic load ratings	Limit speed ratings				Designations	Calculation Factor				Weight	
	Cr	Cor	Grease	Oil		e	Y	Yo	a		
KN	r/min									Kg	
370	680	1400	1900	K898/K892	0.42	1.43	0.79	50	8.85		
510	810	1400	1900	KHM231132/KHM231110	0.31	1.9	1.1	45	10.1		
715	1100	1400	1900	K99550/K99100	0.41	1.47	0.81	54	14.0		
186	370	1600	2200	K36690/K36620B	0.37	1.6	0.9	34	2.22		
835	1140	1100	1600	KHH932145/KHH932110	0.73	0.82	0.45	105	28.3		
263	540	1100	1600	KM231649/KM231610	0.33	1.8	0.99	28	5.76		
595	930	1100	1600	K99600/K99100	0.41	1.5	0.81	55	12.5		
670	1070	1200	1700	KEE107060/K107105	0.39	1.55	0.85	58	16.8		
670	1070	1200	1700	EE107060/107105	0.39	1.55	0.85	58	16.8		
1190	1350	1100	1600	KHH234048/KHH234010	0.33	1.84	1.01	63	30.9		
261	440	1100	1600	K46780/K46720	0.38	1.57	0.86	44	5.24		
261	565	1100	1600	K46790/K46720	0.38	1.57	0.86	44	4.64		
415	520	1000	1400	K67780/K67720	0.44	1.36	0.75	52	8.16		
625	670	1100	1600	KHM237535/KHM237510	0.32	1.88	1.04	52	16.8		
1320	1500	900	1300	KHH437549/KHH437510	0.37	1.6	0.88	72	37.4		
289	550	1100	1600	KJHM534149/KJHM534110	0.38	1.57	0.86	44	4.45		
355	675	1000	1400	JM734449/JM734410	0.44	1.37	0.75	49	6.28		
355	675	1000	1400	KJM734449/KJM734410	0.44	1.37	0.75	52	6.28		
815	850	1000	1400	KHM237542/KHM237510	0.33	1.84	1.01	54	16.9		
815	850	1000	1400	KHM237545/KHM237510	0.33	1.84	1.01	54	16.9		
415	520	1000	1400	K67790/K67720	0.44	1.36	0.75	52	7.12		
430	840	1000	1400	M236849/M236810	0.33	1.8	0.99	47	9.08		
430	840	1000	1400	KM236849/KM236810	0.33	1.8	0.99	47	9.08		
815	850	900	1300	KHM237545/KHM237510	0.33	1.84	1.01	54	16.7		
930	1420	1000	1400	KH239640/KH239610	0.32	1.88	1.04	65	28.2		
1320	1840	900	1000	KEE350701/K351687	0.76	0.82	0.43	121	68.1		
485	870	1000	1400	M336948/M336912	0.33	1.8	1	47	9.75		
485	870	1000	1400	M336949/M336912	0.33	1.8	1	47	9.55		

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 180~216.713 mm



Principal dimensions									
d	D	T	B	C	rmin	Rmin			
mm	in	mm	in	mm	in	mm	in	mm	in
180*	250*	47	45	37		3	2.5		
184.15	7.25	266.7	10.5	47.625	1.875	46.833	1.8438	38.1	1.5
		280	11.0236	46.525	1.8317	46.833	1.8438	36	1.4173
187.325	7.375	269.875	10.625	55.562	2.1875	55.562	2.1875	42.862	1.6875
		282.575	11.125	50.8	2	47.625	1.875	36.512	1.4375
190.475	7.499	279.400	11	52.388	2.0625	57.150	2.25	41.275	1.625
190.5	7.5	266.7	10.5	47.625	1.875	46.833	1.8438	38.1	1.5
		365.049	14.372	92.075	3.625	88.897	3.4999	63.5	2.5
191.237	7.529	279.4	11	52.388	2.0625	58.738	2.3125	41.275	1.625
196.85	7.75	241.3	9.5	23.812	0.9375	23.017	0.9062	17.462	0.6875
		257.175	10.125	39.688	1.5625	39.688	1.5625	30.162	1.1875
		317.5	12.5	63.5	2.5	63.5	2.5	46.038	1.8125
200*	300*	65	62	51		2.5	3.5		
200.025	7.875	276.225	10.875	42.862	1.6875	46.038	1.8125	34.133	1.3438
203.987	8.031	276.225	10.875	42.862	1.6875	46.038	1.8125	34.133	1.3438
206.375	8.125	282.575	11.125	46.038	1.8125	46.038	1.8125	36.512	1.4375
		336.55	13.25	98.425	3.875	100.0123	9.375	77.788	3.0625
209.55	8.25	317.5	12.5	63.5	2.5	63.5	2.5	46.038	1.8125
		317.5	12.5	63.5	2.5	63.5	2.5	46.038	1.8125
215.900	8.5	285.750	11.25	46.038	1.8125	46.038	1.8125	34.924	1.375
216.408	8.52	285.750	11.25	46.038	1.8125	46.038	1.8125	34.924	1.375
216.713	8.532	285.750	11.25	46.038	1.8125	46.038	1.8125	34.924	1.375

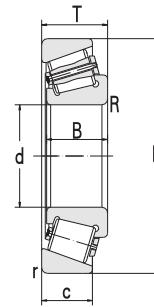
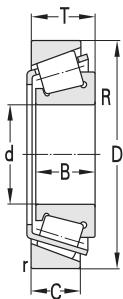
Basic load ratings	Limit speed ratings	Designations		Calculation Factor				Weight		
				Cr	Cor	Grease	Oil			
KN	r/min								Kg	
400	780	900	1000	JM736149	JM736110	0.48	1.25	0.69	56	6.80
485	520	900	1000	K67883CL4	K67820CL4	0.33	1.81	1	46	8.34
360	760	900	1000	K67883	K67830	0.48	1.26	0.69	58	10.1
425	860	900	1000	KM238849	KM238810	0.33	1.81	1	49	9.63
395	690	900	1000	87737	87111	0.43	1.4	0.8	55	9.95
515	985	900	1000	M239449	M239410	0.35	1.7	0.9	49	9.80
345	725	1100	1500	K67885	K67820	0.48	1.3	0.69	58	8.04
990	1460	900	1000	KEE420751	K421437	0.4	1.6	0.83	79	39.3
515	985	900	1000	M239448A	M239410	0.35	1.7	0.9	49	9.55
160	330	1200	1700	KLL639249	KLL639210	0.43	1.4	0.8	41	2.10
275	635	1100	1600	KLM739749	KLM739710	0.44	1.35	0.8	50	5.20
605	1130	850	1200	K93775	K93125	0.52	1.15	0.63	73	18.8
615	1240	850	1200	JHM840449	JHM840410	0.52	1.15	0.63	72	15.5
445	780	1000	1500	LM241147	LM241100	0.31	1.9	1.1	45	7.75
445	780	1000	1500	LM241148	LM241100	0.31	1.9	1.1	45	7.35
375	840	1000	1500	67985	67920	0.5	1.2	0.7	62	8.70
965	1400	850	1200	KH242649	KH242610	0.34	1.78	0.98	52	33.0
605	1130	850	1200	93825	93125	0.52	1.15	0.63	73	16.6
605	1130	850	1200	K93825	K93125	0.52	1.15	0.63	73	16.6
375	840	1000	1500	LM742749	LM742710	0.48	1.25	0.7	60	8.00
375	840	1000	1500	LM742747	LM742710	0.48	1.25	0.7	60	7.95
375	840	1000	1500	LM742747A	LM742710	0.48	1.25	0.7	60	7.95

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 220.662~266.7 mm



Principal dimensions																
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	mm	in	mm	in	mm	in
220.662	8.6875	314.325	12.375	61.912	2.4375	61.912	2.4375	49.212	1.9375	3.3	6.4					
228.6	9	358.775	14.125	71.438	2.8125	71.438	2.8125	53.975	2.125	3.3	3.5					
		488.95	19.25	123.825	4.875	111.125	4.375	73.025	2.875	6.4	6.4					
230.188	9.0625	317.5	12.5	47.625	1.875	52.388	2.0625	36.512	1.4375	3.3	3.3					
231.775	9.125	300.038	11.8125	33.338	1.3125	31.750	1.25	23.812	0.9375	3.3	3.3					
		317.5	12.5	47.625	1.875	52.388	2.0625	36.512	1.4375	3.3	3.3					
		336.55	13.25	65.088	2.5625	65.088	2.5625	50.8	2	3.3	6.4					
234.95	9.25	384.175	15.125	112.712	4.4375	112.712	4.4375	90.488	3.5625	6.4	6.4					
237.33	9.3437	336.55	13.25	65.088	2.5625	65.088	2.5625	50.8	2	3.3	6.4					
241.3	9.5	444.5	17.5	101.6	4	100.012	3.9375	76.2	3	4.8	6.4					
		508	20	117.475	4.625	95.25	3.75	73.025	2.875	6.4	6.4					
247.65	9.75	346.075	13.625	63.5	2.5	63.5	2.5	50.8	2	6.4	6.4					
		406.4	16	115.8884	5.625	117.475	4.625	93.662	3.6875	6.4	6.4					
254*	10	324.975*	12.7943	39		41.5		28		3.3	1.5					
		324.975*	12.7943	39		41.5		28		3.3	1.5					
		533.4	21	133.35	5.25	120.65	4.75	77.788	3.0625	6.4	6.4					
255.6	10.063	342.9	13.5	57.15	2.25	63.5	2.5	44.45	1.75	3.3	1.5					
257.175	10.125	342.9	13.5	57.15	2.25	57.15	2.25	44.45	1.75	3.3	6.4					
		358.775	14.125	71.438	2.8125	76.2	3	53.975	2.125	3.3	1.5					
260.35	10.25	422.275	16.625	86.121	3.3906	79.771	3.1406	66.675	2.625	3.3	6.8					
263.525	10.375	325.438	12.8125	28.575	1.125	28.575	1.125	25.400	1	1.5	1.5					
266.7	10.5	355.6	14	57.15	2.25	57.15	2.25	44.45	1.75	3.3	3.5					
		393.7	15.5	73.817	5.125	69.85	2.75	50.005	1.9687	6.4	6.4					

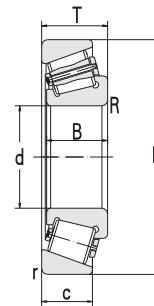
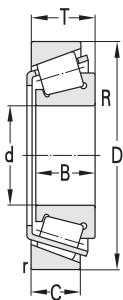
Basic load ratings	Limit speed ratings			Designations	Calculation Factor				Weight	
	Cr	Cor	Grease		e	Y	Yo	a		
KN	r/min									Kg
620	1220	1000	1500	KM244249/KM244210	0.33	1.88	0.99	58	14.9	
750	1500	950	1300	KM249732/KM249710-	0.33	1.8	0.99	65	27.2	
1820	2490	750	1000	HH49549/HH49510	0.94	0.64	0.35	174	101	
520	985	900	1200	LM245846/LM245810	0.31	1.9	1.1	49	10.6	
212	420	950	1300	544091/544118A	0.4	1.5	0.8	49	5.40	
520	985	900	1200	LM245848/LM245810	0.31	1.9	1.1	49	10.6	
640	1360	850	1200	KM246942/KM246910	0.33	1.8	0.99	61	18.5	
1360	2540	750	1000	KH247549/KH247510	0.33	1.88	0.99	84	50.0	
640	1360	850	1200	KM246949/KM246910	0.33	1.8	0.99	61	17.5	
1340	2000	750	1000	KEE923095/K923175	0.34	1.78	0.98	83	65.9	
1340	2060	670	900	KEE390095/K390200	0.94	0.64	0.35	132	96.4	
670	1310	850	1200	KM348449/KM348410	0.34	1.75	0.96	61	17.4	
1690	3200	750	1000	HH249949/HH249910	0.33	1.8	0.99	87	58.0	
345	800	850	1200	1- 7009	0.56	1.07	0.59	71	8.06	
365	800	850	1200	L848849SH/L848810SH	0.56	1.07	0.59	71	8.06	
365	800	850	1200	HH953749/HH953710	0.94	0.64	0.35	179	129	
665	1330	850	1200	M349547SH/M349510SH	0.35	1.73	0.95	59	14.4	
725	880	850	1200	KM349549/KM349510	0.35	1.73	0.95	80	14.0	
750	1520	850	1200	M249747SH/M249710SH	0.33	1.8	0.99	64	21.7	
1100	1800	900	1300	HM252348/HM252310	0.33	1.8	0.99	78	42.8	
1280	1790	1000	1500	38880/38820	0.37	1.6	0.9	49	54.2	
715	800	850	1200	KLM451349/KLM451310	0.36	1.67	0.92	62	15.1	
770	1460	750	1000	KEE275105/K275155	0.4	1.49	0.82	75	27.8	

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 266.7~403.225 mm



Principal dimensions																
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	mm	in	mm	in	mm	in
266.7	444.5	17.5	120.65	4.75	117.475	4.625	88.9	3.5	6.4	6.4						
273.05	10.75	393.7	15.5	73.817	5.125	69.85	2.75	50.005	1.9687	6.4	6.4					
288.925	11.375	406.4	16	77.788	3.0625	77.788	3.0625	60.325	2.375	3.3	6.4					
292.100	11.5	374.650	14.75	47.625	1.875	47.625	1.875	34.925	1.375	3.3	3.5					
304.8	12	393.7	15.5	50.8	2	50.8	2	38.1	1.5	3.3	6.4					
		406.4	16	63.5	2.5	63.5	2.5	47.625	1.875	3.3	6.4					
317.5	12.5	447.675	17.625	85.725	3.375	85.725	3.375	68.262	2.6875	3.3	3.5					
330.2	13	415.925	16.375	47.625	1.875	47.625	1.875	34.925	1.375	3.3	3.5					
		482.600	19	85.725	3.375	80.167	3.1562	60.325	2.375	3.5	6.4					
333.375	13.125	469.900	18.5	90.488	3.5625	90.488	3.5625	71.438	2.8125	3.3	6.4					
343.154	13.51	450.850	17.75	66.675	2.625	66.675	2.625	52.388	2.0625	3.5	8.5					
346.075	13.625	488.950	19.25	95.250	3.75	95.250	3.75	74.612	2.9375	3.3	6.4					
355.6	14	482.6	19	60.320	2.3748	55.560	2.1874	38.1	1.5	7	7					
371.5	14.626	622.3	24.5	147.638	5.8125	131.762	5.1875	82.55	3.25	12.7	14.3					
377.825	14.875	522.288	20.5625	85.725	3.375	84.138	3.3125	61.912	2.4375	3.3	6.4					
380.1	14.9646	480	18.8976	50	1.9685	48.08	1.8929	35.08	1.3811	4	6					
381	15	479.425	18.875	49.212	1.9375	47.625	1.875	34.925	1.375	3.3	6.4					
		522.288	20.5625	85.725	3.375	84.138	3.3125	61.912	2.4375	3.3	6.4					
384.175	15.125	546.100	21.5	104.775	4.125	104.775	4.125	82.550	3.25	6.4	6.4					
403.225	15.875	460.375	18.125	28.575	1.125	28.575	1.125	20.638	0.8125	3.3	3.5					

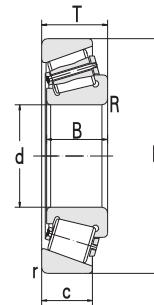
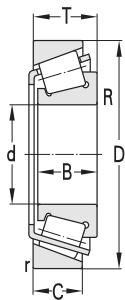
Basic load ratings	Limit speed ratings			Designations	Calculation Factor				Weight	
	Cr	Cor	Grease		e	Y	Yo	a		
KN	r/min									Kg
1610	3050	670	900	KH852849/KH852810	0.58	1.04	0.57	121	73.1	
770	1460	750	1000	KEE275108/K275155	0.4	1.49	0.82	75	26.3	
1250	1900	670	900	M255449/M255410	0.34	1.78	0.98	72	30.5	
1080	1590	780	1050	L555249/L555210	0.4	1.5	0.8	65	12.2	
580	1210	670	900	KL357049/KL357010	0.36	1.68	0.92	64	14.6	
2200	2800	670	900	LM757049/LM757010	0.44	1.38	0.76	79	21.2	
960	2330	670	900	HM259048/HM259010	0.33	1.8	0.99	80	41.3	
475	1140	670	900	KL860049/KL860010	0.5	1.2	0.7	83	14.3	
1200	2480	600	830	EE526130/526190	0.4	1.5	0.8	90	49.2	
1320	2820	600	830	HM261049/HM261010	0.33	1.8	1	85	47.6	
930	2180	650	850	LM361649A/LM361610	0.35	1.7	0.9	75	28.3	
845	1180	600	830	HM262749/HM262710	0.33	1.8	1	88	55.8	
565	1180	600	830	306/355.6-1	0.48	1.27	0.7	92	26.6	
2300	3600	420	580	H961649/H961610	0.94	0.64	0.35	210	180	
1170	2580	670	900	KLM565946/KLM565910	0.38	1.56	0.86	93	51.9	
590	1490	560	750	306/380.1	0.5	1.2	0.7	93	20.8	
590	1490	560	750	L865547/L865512	0.5	1.2	0.7	92	20.4	
1170	2580	650	870	KLM565949/KLM565910	0.38	1.56	0.86	93	51.2	
1850	4150	530	700	HM266449/HM266410	0.33	1.8	1	96	77.6	
240	760	560	750	LL566848/LL566810	0.4	1.5	0.8	70	6.73	

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 406.4~660.4 mm



Principal dimensions										
d	D	T	B	C	rmin	Rmin	mm	in	mm	in
406.4 16	546.1 21.5 76.2 3 61.12 2.4063 55.562 2.1875 6.4 6.4	549.275 21.625 85.725 3.375 84.138 3.3125 61.962 2.4394 3.3 6.4	574.625 22.623 76.2 3 67.866 2.6719 50.8 2 3.3 6.8	762 30 180.975 7.125 161.925 6.375 107.950 4.25 12.7 12.7						
415.925 16.375	590.55 23.25 114.3 4.5 114.3 4.5 88.9 3.5 6.4 6.4									
430.212 16.9375	603.250 23.75 76.2 3 73.025 2.875 50.8 2 6.4 6.4									
447.625 17.623	635 25 120.650 4.75 120.650 4.75 95.250 3.75 6.4 6.4									
457.2 18	573.088 22.5625 74.612 2.9375 74.612 2.9375 57.150 2.25 6.4 6.4	603.250 23.75 85.725 3.375 84.138 3.3125 60.325 2.375 3.3 6.4	615.950 24.25 85.725 3.375 85.725 3.375 66.675 2.625 6.4 6.4	660.400 26 91.280 3.5937 85.725 3.375 62.705 2.4687 6.4 10.5						
482.6 19	634.873 24.995 80.962 3.1875 80.962 3.1875 63.5 2.5 3.3 6.4									
488.95 19.25	634.873 24.995 84.138 3.3125 84.138 3.3125 61.912 2.4375 3.3 6.4									
498.475 19.625	634.873 24.995 80.962 3.1875 80.962 3.1875 63.5 2.5 3.3 6.4									
520.7 20.5	736.6 29 88.9 3.5 81.758 3.2188 53.975 2.125 3.3 6.4									
536.575 21.125	761.873 29.995 146.05 5.75 146.05 5.75 114.3 4.5 6.4 6.4	820 32.2835 152 5.9843 146 5.748 112 4.4094 5 6								
539.750 21.25	635 25 50.8 2 50.8 2 38.1 1.5 6.4 6.4									
607.72 23.926	787.4 31 93.662 3.6875 93.662 3.6875 69.85 2.75 6.4 6.4									
609.6 24	787.4 31 93.662 3.6875 93.662 3.6875 69.85 2.75 6.4 6.4									
635 25	736.6 29 57.15 2.25 53.975 2.125 41.275 1.625 3.3 3.3									
660.4 26	812.8 32 95.25 3.75 95.25 3.75 73.025 2.875 6.4 6.4									

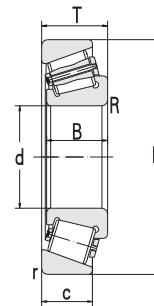
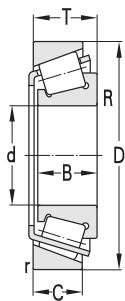
Basic load ratings	Limit speed ratings	Designations		Calculation Factor				Weight	
		Cr	Cor	Grease	Oil	e	Y	Yo	a
KN	r/min								Kg
840	1830	630	850	KEE234160/K234215	0.48	1.26	0.69	107	41.8
1350	3000	600	800	LM567949/LM567910	0.4	1.5	0.8	100	54.0
920	2030	500	650	EE285160/EE285226	0.5	1.2	0.7	114	54.2
3650	6050	350	480	H969249/H969210	0.94	0.64	0.35	250	322
1810	4030	480	650	M268749/M268710	0.33	1.8	0.99	104	96.6
1050	2300	480	650	EE241693/242375	0.52	1.15	0.6	122	58.6
2300	5450	430	560	M270749/M270710	0.33	1.8	1	111	121
1100	2980	480	630	L570649/L570610	0.4	1.5	0.8	101	43.8
1420	3390	450	600	LM770949/LM770910	0.46	1.3	0.7	115	62.0
1450	3750	420	580	LM272235/LM272210	0.33	1.8	1	98	73.2
1750	3600	420	580	EE737181/737260	0.37	1.6	0.9	107	91.5
1430	3600	420	580	EE243190/243250	0.35	1.7	0.9	98	60.8
1420	3600	420	580	LM772748/LM772710	0.48	1.25	0.7	124	64.5
1340	2950	420	580	EE243196/243250/HE	0.35	1.7	0.9	98	58.3
1630	3350	380	500	EE982051/982900	0.48	1.25	0.7	134	101
3300	7950	360	480	M276449/M276410	0.33	1.8	1	134	202
3850	7750	340	450	306/536X4	0.43	1.4	0.8	161	273
780	2150	400	530	LL575349/LL575310	0.4	1.5	0.8	102	27.2
2200	2800	340	450	EE649239/649310	0.38	1.58	0.87	124	108
2120	5250	340	450	EE649240/649310	0.38	1.58	0.87	124	108
855	2640	350	470	80780/80720	0.44	1.35	0.8	124	37.3
1920	5550	310	420	L281147/L281110	0.33	1.8	1	123	106

Note: \* indicates the maximum value of ID or OD.

# Single-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 660.4~1016 mm



Principal dimensions																
d	D	T	B	C	rmin	Rmin	mm	in	mm	in	mm	in	mm	in	mm	in
660.4		939.8 37	136.525 5.375	127.08 5.0031	98.5 113.665	3.878 4.475	6.4	6.4	1000 39.3701	152.4 6	142.24 5.6	111.125 4.375	6.4	6.4	6.4	6.4
679.45	26.75	901.7 35.5	142.875 5.625	142.875 5.625	111.125 4.375	6.4	9.7									
682.625	26.875	965.2 38	185.738 7.3125	185.810 7.3154	142.950 5.628	6.4	6.4	1080 42.5197	200	7.874 195	7.6772 142	5.5906 12	12	12	169	419
685.8	27	876.3 34.5	93.662 3.6875	92.075 3.625	69.85 2.75	6.4	6.4	876.3 34.5	93.662 3.6875	92.075 3.625	69.85 2.75	6.4	6.4	148	399	
711.2	28	939.8 37	120.65 4.75	115.38 4.5425	73.33 2.887	6.4	6.4								254	207
723.9	28.5	914.4 36	84.137 3.3125	80.962 3.1875	60.325 2.375	6.4	5.5								137	116
749.3	29.5	990.6 39	159.5 6.2795	160.388 6.3145	123 4.8425	6.4	6.4								165	331
759.925	29.9183	889 35	69.85 2.75	69.85 2.75	50.8 2	3.3	3.3								132	67.2
760*	29.9213	889 35	88.9 3.5	88.9 3.5	72 2.8346	4	4								127	93.5
762	30	889 35	88.9 3.5	88.9 3.5	72 2.8346	4	4								127	91.9
774.7	30.5	965.2 38	93.662 3.6875	80.962 3.1875	66.675 2.625	3.3	6.4								158	130
801.688	31.5625	914.4 36	58.738 2.3125	58.738 2.3125	41.275 1.625	3.3	3.5								137	53.6
838.2	33	1041.4 41	93.662 3.6875	88.9 3.5	66.675 2.625	6.4	6.4								177	161
857.25	33.75	1092.2 43	120.65 4.75	111.125 4.375	76.2 3	6.4	19								228	244
928*		1060*	92	90	76	3.3	3.3								152	117
930*		1060*	92	90	76	3.3	3.3								152	115
977.9	38.5	1130.3 44.5	66.675 2.625	63.5 2.5	47.625 1.875	6.4	6.4								184	101
1016	40	1270 50	101.6 4	101.6 4	66.675 2.625	9.7	9.7								229	276

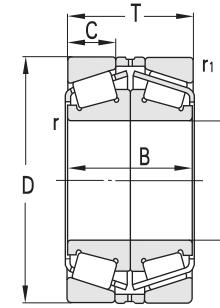
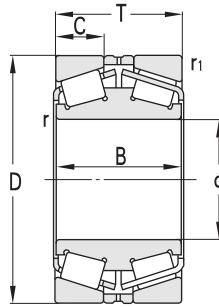
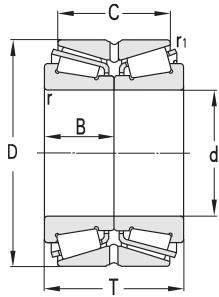
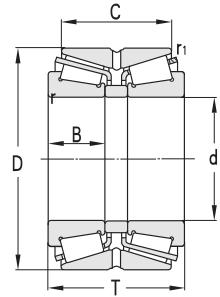
Basic load ratings	Limit speed ratings	Designations		Calculation Factor				Weight	
				Cr	Cor	Grease	Oil		
KN	r/min	Kg							
3700	8100	260	360	306/660.4	0.4	1.5	0.8	167	288
4300	9450	240	340	306/660.4-1	0.43	1.4	0.8	183	411
3550	8900	260	360	LM281849/LM281810	0.33	1.8	1	149	243
5050	12480	240	340	306/682 X4-2	0.33	1.8	1	169	419
6650	13100	200	300	306/682 X4-3	0.43	1.4	0.8	209	641
2100	4950	280	380	EE655270/655345	0.43	1.4	0.8	148	399
2600	6150	220	320	306/711.2	0.75	0.8	0.45	254	207
2000	4850	260	360	EE755285/755360	0.37	1.6	0.9	137	116
4500	11800	220	320	LM283649/LM283610	0.33	1.8	1	165	331
1210	3750	260	360	LL483448/LL483418	0.37	1.6	0.9	132	67.2
2200	3200	260	360	L183448/L183410	0.32	1.88	1.04	127	93.5
2200	3200	260	360	L183449/L183410	0.32	1.88	1.04	127	91.9
1920	4850	220	320	EE752305/752380	0.4	1.5	0.8	158	130
1050	3500	240	340	LL584449/LL584410	0.4	1.5	0.8	137	53.6
1850	4750	200	300	EE763330/763410	0.44	1.35	0.8	177	161
2790	7300	190	280	EE157337/157430	0.57	1.05	0.6	228	244
2120	7450	190	280	JL286948H/JL286910	0.33	1.8	1	152	117
2120	7450	190	280	JL286949H/JL286910	0.33	1.8	1	152	115
1430	4300	170	240	LL687949/LL687910	0.44	1.35	0.8	184	101
2700	7450	160	230	EE168400/168500	0.5	1.2	0.7	229	276

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 40~85 mm



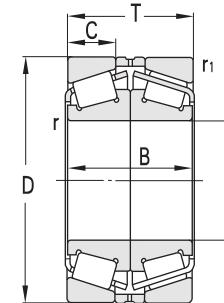
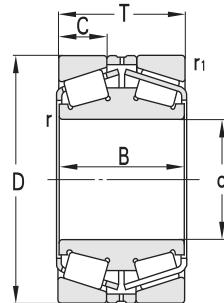
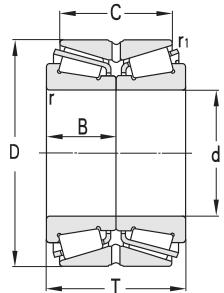
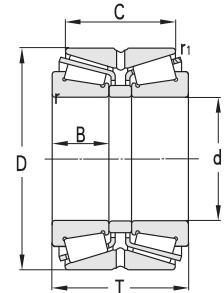
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
40	70	70	19	64	1	0.3		93.5	152	3600	4800
73	55	27.5	55	4.2	0.8			90	162	3600	4800
80	45	22.5	44	2.5	1.5*15*			127	175	3600	4800
45	88	55	27.5	55	5.5	0.4		157	213	3500	4600
50	90	49	20	39	1.8	0.5		111	140	3400	4500
90	55	23	43.5	1.5	0.6			320	220	3400	4500
55	90	52	26	41	1.5	0.6		160	245	3300	4400
90	54	27	21	0.5	1.5			174	292	3300	4400
90	60	30	60	3.5	0.3			143	279	3300	4400
100	52	21	42	2	0.5			165	230	3300	4400
100	56	25	42.5	2.5	0.5			186	268	3300	4400
65	168	110	58.7	110	3	2.5		209	320	3000	4000
68.6	115	62.5	29	22.5	1.5	0.3		206	400	3200	4200
69.86	126	64	27.5	54	2.5	0.4		170	281	3000	4150
70	125	74	31	61.5	2	0.6		310	495	2400	3200
125	75	31	62	2	0.6			310	495	2400	3200
126	71.5	27.5	58.3	1.5	0.3			170	281	2400	3200
75	115	58	25	46	1.5	0.6		178	325	2400	3200
130	74.5	31	62	1.8	0.3			300	480	2300	3000
76	125.4	62.5	29	65.3	1.5	0.3		203	400	2300	3000
125.4	56.63	29	59.43	1.5	0.3			203	400	2300	3000
80	110	20	20	16							
125	66	29	52	1.5	0.6			238	430	2200	3000
140	56.75	52	22	0.7	2			251	356	2100	2800
140	80	33	65	2.3	0.7			340	530	2100	2800
85	150	82	36	65	2.5	0.6		320	590	2000	2700

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
350608/YWG	0.38	1.78	2.65	1.74	0.985
352208X1D1TN1- 2RS	0.4	1.69	2.52	1.65	1.04
352208X2D1TN1	0.37	1.82	2.71	1.78	1.04
352209X1D1TN1- 2RS	0.4	1.69	2.52	1.65	1.49
350210X2	0.42	1.61	2.39	1.57	1.24
352210	0.42	1.61	2.39	1.57	1.39
352011X2D1	0.41	1.66	2.47	1.62	1.23
33011/DF	0.31	2.16	3.22	2.12	1.73
352011X2D1TN1- 2RS	0.39	1.72	2.56	1.68	1.59
350211X2/C9	0.4	1.67	2.48	1.63	1.60
352211X2/YA6	0.4	1.67	2.48	1.63	1.87
1- 7034	0.33	2.04	3.03	1.99	9.26
306/68.6/C9DBYA1	0.3	2.25	3.43	2.2	2.99
350614X4DR	0.58	1.18	1.76	1.16	2.59
352214	0.42	1.61	2.39	1.57	3.66
352214X2	0.42	1.61	2.39	1.57	3.66
350614X4DR- 1	0.58	1.18	1.76	1.16	2.93
352015	0.46	1.47	2.19	1.44	2.04
352215X2	0.44	1.55	2.31	1.52	3.81
3506/76DR	0.3	2.25	3.43	2.2	2.93
3506/76X2DR	0.3	2.25	3.43	2.2	2.72
352016	0.42	1.61	2.39	1.57	2.76
187216	0.42	1.61	2.39	1.57	3.28
352216X2	0.4	1.68	2.5	1.64	4.97
352217X2- 1	0.42	1.61	2.39	1.57	5.52

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 85~120 mm



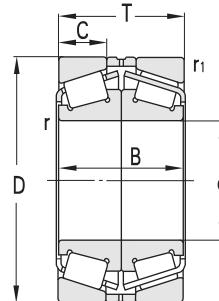
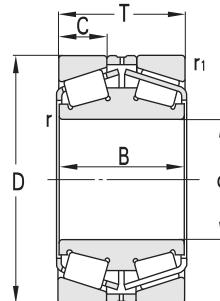
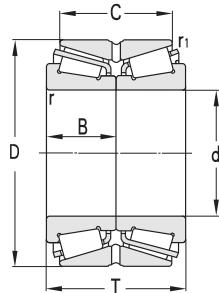
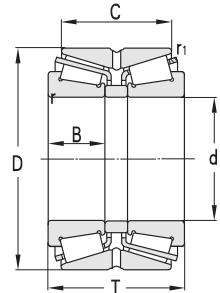
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
								KN		r/min	
85	150	84	36	66	2.5	0.5	360	630	2000	2700	
	150	130.5	39.5	100	2	1	286	500	2000	2700	
	180	99	41	66	4	1	560	680	1900	2600	
90	155	85	37.547	63.5	3.5	0.5	330	590	2000	2700	
	160	94	40	78	2.5	0.6	440	525	1900	2500	
	160	96	40.8	78	2.5	0.6	440	525	1900	2500	
	190	103	43	70	4	1	530	760	1700	2200	
100	150	66	66	27	2*30*	1.5	294	560	1800	2300	
	180	83	34	67	3	1	445	690	1700	2200	
	180	111	46	92	3	0.8	670	840	1700	2200	
	190	125	62.5	100	3	1.3	630	1050	1500	2000	
105	170	38	38	29	2.5	2	246	405	1700	2200	
	190	117	50	96	3	0.8	675	1150	1600	2100	
	190	118	50	96	3	0.8	670	1210	1600	2100	
110	180	95	42	76	2	0.6	495	900	1200	1600	
	180	76	42	95	2	0.6	495	900	1200	1600	
	195	126	57.658	131.35	1.5	**	570	1170	1200	1600	
	200	90	38	72	3	0.8	550	850	1500	2000	
	200	124	53	102	3	0.6	680	1150	1500	2000	
119.062	195.262	136.525	57.15	142.875	1.5	**	570	1170	1100	1500	
115	230	116	49.5	84	3	2.5	685	1100	1300	1700	
120	180	88	38	70	2.5	0.6	405	785	1500	2000	
	200	110	48	90	2	0.6	605	1060	1500	2000	
	215	87	80	34	0.8	2.5	570	890	1400	1900	
	215	132	58	106	2.5	0.9	770	1390	1400	1900	
	215	132	58	106	3	1	770	1390	1400	1900	
	215	132	58	109	3	1	770	1390	1400	1900	
	280	185	83.5	155	5	1.5	1410	2250	1100	1500	

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
352217X2	0.42	1.61	2.39	1.57	5.59
197717	0.26	2.55	3.8	2.5	7.92
351317	0.83	0.82	1.22	0.8	11.1
350618/YA10	0.44	1.55	2.31	1.52	6.12
352218X2	0.42	1.61	2.39	1.57	7.80
352218X2- 1	0.42	1.61	2.39	1.57	7.83
351318	0.83	0.82	1.22	0.8	12.3
370620/YAD	0.32	2.04	3.03	1.99	4.04
352220X2	0.42	1.61	2.39	1.57	6.51
352220X2- 1	0.42	1.61	2.39	1.57	11.6
350620D1	0.36	1.85	2.76	1.81	14.9
32021X3					
352221X2	0.42	1.61	2.39	1.57	13.7
352221X2- 1	0.42	1.61	2.39	1.57	13.8
352122	0.32	2.09	3.11	2.04	9.10
352122/YAG	0.32	2.09	3.11	2.04	9.06
352222X3- 2RS	0.26	2.55	3.8	2.5	19.3
352222X2- 1	0.45	1.51	2.25	1.48	11.1
352222X2	0.42	1.61	2.39	1.57	16.5
3506/119X4- 2RS	0.26	2.55	3.8	2.5	18.6
350623	0.72	0.94	1.4	0.9	20.2
352024	0.46	1.47	2.19	1.44	7.31
352124	0.3	2.25	3.43	2.2	12.6
30224/DF	0.44	1.55	2.31	1.52	13.4
352224X2D	0.41	1.64	2.44	1.6	19.6
352224X2	0.41	1.64	2.44	1.6	19.1
352224	0.41	1.64	2.44	1.6	19.2
350624- 1	0.39	1.74	2.59	1.7	54.5

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 130~160 mm



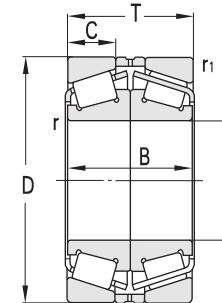
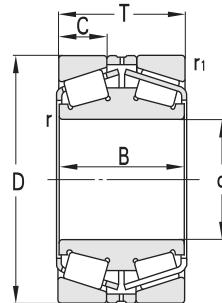
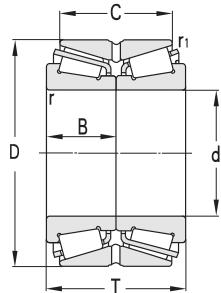
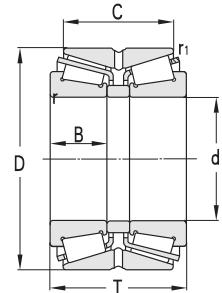
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
								KN		r/min	
130	180	70	30	56	2	0.5	280	565	1400	1900	
	200	95	42	75	2.5	0.7	485	870	1300	1800	
	210	64	29	57	2.5	0.6	355	575	1300	1700	
	210	110	48	90	2	0.6	605	1070	1300	1700	
	214	115.6	48	98	2.3	0.7	605	1070	1300	1700	
	230	149	64	120	4	0.8	980	1760	1300	1700	
	230	149	69	120	4	0.8	870	1660	1200	1650	
	230	149	66.5	120	4	0.8	925	1700	1300	1700	
	235	145	72.5	115	2.3	1.3	885	1560	1300	1700	
	280	144	132	44	1.3	4	1100	1680	1100	1500	
140	210	95	42	75	2.5	0.6	500	950	1200	1700	
	225	115	50	90	2.5	1	640	1180	1200	1700	
	240	132	57	106	4	1.5	825	1660	1200	1700	
	250	157	68	128	4	1	1140	2080	1200	1600	
	300	154	70	47	1.3	4	1210	1842	900	1300	
150	210	76	38	30	0.5	2	455	920	1200	1500	
	210	80	36	62	2.5	0.7	385	795	1200	1500	
	210	80	36	62	2.5	0.7	385	795	1200	1500	
	225	112	45	88	3	1	1100	1690	1200	1500	
	225	79	36	62	2.5	0.7	385	795	1200	1500	
	250	138	60	112	2.5	1	865	1560	1100	1500	
	250	80	34	71	3	1	510	860	1200	1500	
	270	109	45	87	4	1	710	678	1100	1500	
	270	169	73	138	4	1	1270	2330	1100	1500	
159	270	150	70	120	2.5	1	960	1720	1100	1500	
160	220	82	36	65	2.5	0.7	415	860	1100	1500	
	160	240	112	51	86	3	715	1450	110	1500	
	240	114	51	84	3	0.6	715	1450	1100	1500	
	240	115	48	90	3	0.9	745	1330	1100	1400	
	270	140	65	120	2.5	1	970	1930	1000	1400	
	270	140	65	120	2.5	1	970	1930	1000	1400	
	270	140	70	110	2.5	0.9	1720	2610	1000	1400	

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
352926X2	0.27	2.49	3.71	2.43	4.87
352026X2	0.35	1.94	2.88	1.89	9.72
1-7006	0.32	2.08	3.1	2.04	8.06
352126	0.32	2.13	3.17	2.08	13.9
352126X2/C9	0.32	2.13	3.17	2.08	15.7
352226X2	0.44	1.55	2.31	1.52	27.4
352226X2- RS/HCRC9	0.43	1.55	2.31	1.52	26.1
97526/EY	0.26	2.55	3.8	2.5	25.6
350626D1	0.39	1.74	2.59	1.7	24.7
31326/DF	0.55	0.82	1.22	0.8	40.9
352028X2	0.35	1.94	2.88	1.89	8.36
352128	0.34	2	2.98	1.96	15.5
352228X3	0.44	1.54	2.29	1.5	24.7
352228X2	0.44	1.55	2.31	1.52	31.7
31328/DF	0.83	0.818	1.22	0.8	50.3
32930/DF	0.33	2.06	3.06	2.01	7.99
352930X2D	0.27	2.48	2.69	2.42	9.12
352930X2	0.27	2.48	3.69	2.42	9.32
350630	0.39	1.73	2.58	1.69	14.1
352930X3	0.27	2.48	3.69	2.42	11.8
352130	0.25	2.74	4.08	2.68	25.8
352130X2	0.4	1.7	2.53	1.66	15
350630-1	0.44	1.55	2.31	1.52	24.5
352230X2	0.44	1.55	2.31	1.52	39.4
3521/159X2/C3	0.36	1.86	2.76	1.81	28.4
352932X2	0.27	2.51	3.74	2.45	8.15
32032T112/DBC345	0.46	1.47	2.19	1.44	16.0
352032X2-1	0.46	1.47	2.19	1.44	16.7
352032X2	0.35	1.94	2.88	1.89	16.5
352132X2/HA	0.32	2.12	3.15	2.07	31.8
352132X2/HAC9	0.32	2.12	3.15	2.07	31.8
350632D1	0.36	1.86	2.76	1.81	26.7

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 160~190 mm



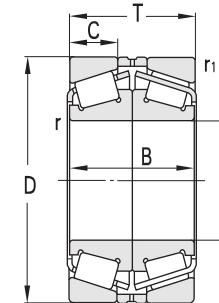
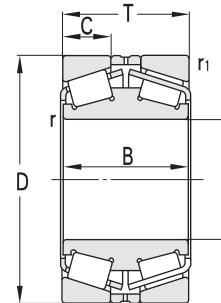
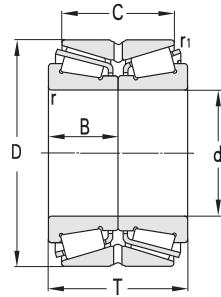
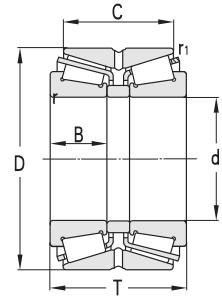
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings		
								Cr	Cor	Grease	Oil	
mm												
								KN		r/min		
160	270	150	70	120	2.5	1	965	1720	1000	1400		
	270	150	70	120	2.5	1	965	1720	1000	1400		
290	178	80	67	4	1	1580	2970	920	1200			
290	180	80	140	3	1.1	1320	2420	920	1200			
290	210	80	67	4	1	1580	2970	920	1200			
165	290	150	70	125	3	1.3	1210	2300	920	1200		
170	230	82	36	65	2.5	0.7	420	890	1000	1400		
	230	65	65	27	0.7	2	450	945	1000	1400		
230	76	38	30	0.6	2	485	1120	1000	1400			
260	120	54	95	3	0.9	755	1550	1000	1300			
260	120	54	95	3	0.9	755	1550	1000	1300			
280	150	66	120	2.5	1	1070	2000	950	1300			
180	250	95	42	74	2.5	0.7	505	1060	1000	1300		
	250	95	47.5	74	2.5	0.7	520	1300	1000	1300		
259.5	70	35	70	2.5	1	440	850	1000	1300			
270	109.5	47	84.138	2.5	0.6	770	1560	940	1300			
280	150	63.5	52	3	1	940	1810	940	1300			
280	134	60	108	3	0.9	940	1810	940	1300			
285	108	54	79.4	2.5	2.3	730	1190	940	1300			
300	164	72	134	3	1	1200	2350	890	1200			
320	192	86	152	5	1.1	1530	2750	890	1200			
320	190	86	145	3.7	1.3	1530	2750	890	1200			
340	180	83	140	5	1.1	1700	2860	840	1100			
190	260	95	42	75	2.5	0.7	605	1450	940	1300		
	260	95	42	75	2.5	0.6	605	1450	940	1300		
260	102	45	36	2.5	0.7	605	1450	940	1300			
290	134	60	104	3	0.9	930	1860	890	1200			
290	146	64	48	3	1	1100	2250	890	1200			
320	170	76	130	3	1	1320	2400	840	1100			
320	172	77	134	3	1	1520	2700	840	1100			
	320	172	77	134	3	1	1520	2700	840	1100		

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
352132X2	0.36	1.86	2.76	1.81	28.3
352132X2/YB4	0.36	1.86	2.76	1.81	28.3
32232/DBC3	0.44	1.55	2.31	1.52	48.6
352232X2/YA6	0.4	1.7	2.53	1.66	46.2
32232/DBC3YA10	0.44	1.55	2.31	1.52	53.5
350633/HCC9	0.31	2.2	3.27	2.15	41.1
352934X2	0.28	2.39	3.56	2.34	8.11
370634	0.29	2.36	3.51	2.31	6.79
32934/P59DF	0.38	1.76	2.62	1.72	9.31
352034X2	0.31	2.18	3.24	2.13	20.4
352034X2D	0.31	2.18	3.24	2.13	20.0
352134	0.38	1.78	2.65	1.74	35.6
352936X2	0.37	1.84	2.74	1.8	13.0
352936X2BD1	0.48	1.41	2.09	1.37	13.8
350636D1-1	0.72	0.94	1.4	0.92	11.3
352936X3	0.37	1.8	2.69	1.76	19.2
32036X2AT150/DBC150	0.28	2.43	3.61	2.37	29.4
352036X2	0.28	2.43	3.61	2.37	28.5
350636D1	0.35	1.95	2.9	1.91	23.2
352136	0.26	2.46	3.93	2.58	39.9
352236/YA6	0.36	1.85	2.76	1.81	60.0
352236X2/YA6	0.36	1.85	2.76	1.81	52.4
350636	0.35	1.96	2.91	1.91	71.9
352938X2	0.38	1.76	2.62	1.72	13.3
32538X2/DB	0.38	1.76	2.62	1.72	14.4
32938X2/DB	0.38	1.76	2.62	1.72	14.4
352038X2	0.37	1.83	2.72	1.79	28.8
32038T146/DBC220	0.44	1.53	2.27	1.49	31.6
352138X2	0.31	2.15	3.2	2.1	52.0
352138X2-1/HCE	0.31	2.15	3.2	2.1	53.2
352138X2-1/HC	0.31	2.15	3.2	2.1	53.2

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 200~240 mm



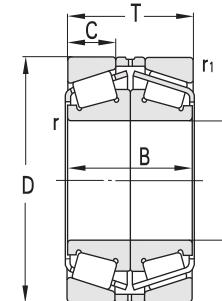
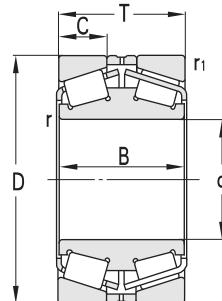
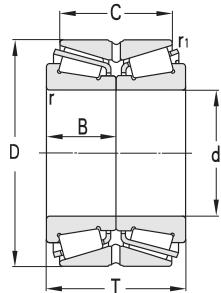
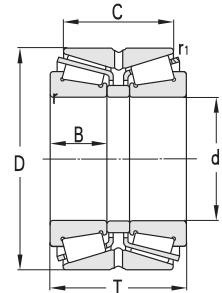
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
								KN		r/min	
200	280	110	48	85	3	0.9	670	1530	900	1200	
	280	116	51.5	85	3	1	670	1530	900	1200	
	280	117	55	97	3	0.6	670	1530	900	1200	
	280	110	48.5	85	3	1	670	1530	900	1200	
	310	140	70	53	0.8	2.5	1270	2620	840	1100	
	310	154	70	120	3	1	1260	2620	840	1100	
	310	151	66	118	3	1	995	2080	840	1100	
	310	151	66	120	3	1	995	2080	840	1100	
	310	151	66	123	3	1	995	2080	840	1100	
	310	155	66	56	3	0.8	995	2080	840	1100	
	320	110	48.5	85	3	1	890	1560	820	1100	
	340	184	82	150	3	1	1810	3400	800	1100	
	360	218	174	98	5	1.1	2350	4350	800	1100	
	360	218	174	98	5	1.1	2350	4350	800	1100	
205	320	150	75	110	3.7	1.3	805	1610	940	1100	
220	300	110	48	88	3	0.8	705	1720	810	1100	
	340	164	72	130	4	1.1	1370	2730	760	1000	
	340	165	72	130	4	1.5	1530	2980	760	1000	
	370	195	88	150	4	1.3	1680	3200	760	1000	
	370	120	50	107	5	1.5	1130	1910	760	1000	
225	360	146.5	73.25	111	3	1.1	1280	2290	760	1000	
228.6	488.92	345	150	220	5	1.5	3320	5890	710	900	
230	355	145	72.5	110	6	2.3	1180	2310	760	1000	
240	320	105	48	82	3	0.9	665	1590	760	1000	
	320	109	48	90	3	1	675	1550	760	1000	
	320	110	48	87	3	0.9	665	1590	760	1000	
	320	110	48	87	3	1	665	1590	760	1000	
	360	152	76	57	1	3	1820	3300	690	920	
	360	165	72	130	4	1.1	1460	2890	690	920	
	360	171	72	62	4	1.1	1350	2900	690	920	

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
352940X2	0.39	1.72	2.56	1.68	18.1
352940X2-1	0.39	1.72	2.56	1.68	18.9
352940X2-2	0.39	1.72	2.56	1.68	20.7
352940X2-3	0.39	1.72	2.56	1.68	18.2
32040/DF	0.43	1.57	2.34	1.53	40.2
352040	0.43	1.57	2.34	1.53	41.9
352040X2-1	0.39	1.72	2.56	1.68	38.9
352040X2	0.39	1.72	2.56	1.68	38.3
352040X2-2	0.39	1.72	2.56	1.68	38.6
32040X2/DB	0.39	1.72	2.56	1.68	38.9
352940X3/YA10	0.42	1.6	2.38	1.57	30.3
352140	0.25	2.74	4.08	2.68	63.8
352240/YA10	0.41	1.66	2.47	1.62	93.3
332240/HCYA10	0.41	1.66	2.47	1.62	93.3
351041X2D1	0.39	1.72	2.56	1.68	40.2
352944X2	0.31	2.18	3.24	2.13	21.2
352044X2	0.35	1.95	2.9	1.91	47.7
352044X2-1	0.35	1.95	2.9	1.91	47.9
352144	0.37	1.83	2.72	1.79	76.3
350644	0.37	1.83	2.72	1.79	46.9
350645D1	0.36	1.87	2.79	1.83	48.2
3506/228X4	0.87	0.78	1.16	0.76	286
350646D1	0.36	1.87	2.79	1.83	
352948X2	0.32	2.12	3.15	2.07	22.3
352948X2-2	0.32	2.12	3.15	2.07	23.5
352948X2-1/YA1W	0.32	2.12	3.15	2.07	23.0
352948X2-1	0.32	2.12	3.15	2.07	23.2
32048/DF	0.46	1.47	2.19	1.44	54.0
352048X2	0.31	2.15	3.2	2.1	52.8
32048X2AT171/DBC275	0.31	2.15	3.2	2.1	52.7

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 240~300 mm



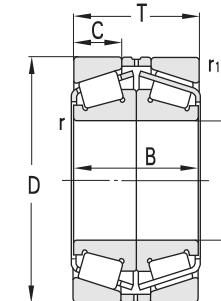
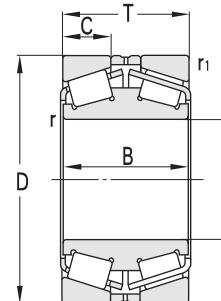
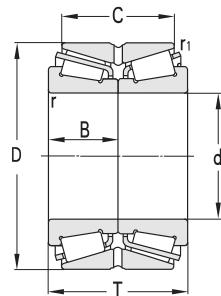
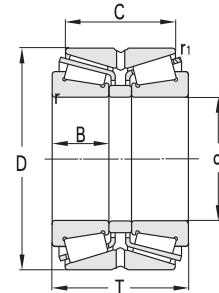
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
								KN	r/min		
240	400	210	95	163	3.7	1.3	2060	4050	630	840	
400	128	59	114	5	1.5	1.5	1240	2270	720	1000	
480	220	200		2.5		5	3340	5400	580	770	
259.5	481	250	250	98	2.5	5	3630	7100	580	770	
260	360	134	60	108	3	0.9	1010	2500	670	900	
	360	133	60	109	3	1.1	1010	2500	670	900	
	360	92	40	62	3	1	630	1370	700	950	
	360	141	63.5	110	3	1	1120	2550	670	900	
	360	134	60.5	108	3	1	1040	2550	670	900	
	400	150	75	110	4.7	1.1	1410	2630	630	840	
	400	155	72	108	9.5	1.6	1400	2630	630	840	
	400	174	87	65	1.3	4	1900	4100	630	840	
	400	186	82	146	5	1.3	1750	3750	630	840	
	420	170	170	70	5	5	1970	4050	630	840	
	420	170	170	70	5	5	1970	4050	630	840	
	430	180	90	130	7.5	2.3	1560	2990	630	840	
	440	144	128	5	1.5	1.5	1820	3400	560	750	
	440	225	100	180	4	2.3	2410	4750	580	770	
	480	284	220	5	1.5	1.5	3990	7300	520	680	
280	380	129	120	52	0.9	2.5	1100	2770	620	820	
	380	134	60	108	3	0.9	1030	2650	620	820	
	380	134	60	108	3	1	1030	2650	620	820	
	389.5	92	92	30	4	4	870	1880	600	800	
	420	186	82	146	5	1.3	1890	4000	580	770	
	420	188	83	154	5	1.3	1890	4000	580	770	
	420	189	83.5	154	5	1.3	1960	4200	580	770	
	460	146	65	130	6	2	1810	3300	580	770	
	470	250	180		6.4	1.5	3430	6300	500	650	
300	420	160	72	128	4	1.1	1670	3614	580	770	
	420	159	71.5	128	4	1.1	1820	3610	580	770	
	420	159	71.5	128	4	1.1	1820	3610	580	770	
	420	152	152	53	3	3	1630	3300	580	770	

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
352148	0.31	2.18	3.24	2.13	98.1
350648	0.43	1.55	2.31	1.52	60
370648	0.72	0.94	1.4	0.9	184
3706/259.5	0.45	1.5	2.23	1.47	214
352952X2	0.3	2.23	3.32	2.18	39.7
352952X2-1	0.3	2.23	3.32	2.18	39.8
352952X2-3	0.7	0.96	1.44	0.94	25.5
352952	0.41	1.66	2.47	1.62	39.0
352952X2-3/YB2	0.29	2.23	3.32	2.18	38.3
352052X2-1	0.35	1.95	2.99	1.91	60.3
352052X2-3	0.35	1.95	2.99	1.91	62.2
32052/DF	0.43	1.55	2.31	1.52	82.6
352052X2	0.29	2.31	3.45	2.26	79.3
370652D	0.48	1.41	2.09	1.37	88.4
370652D/HC	0.48	1.41	2.09	1.37	88.4
350652D1	0.35	1.95	2.9	1.91	87.9
352152X2/YA6-1	0.37	1.8	2.7	1.8	87.5
352152X2/YA6	0.24	2.84	4.23	2.78	124
350652-1	0.43	1.6	2.3	1.6	211
32956X2A/DF	0.32	2.1	3.13	2.05	44.1
352956X2	0.32	2.1	3.13	2.05	44.0
352956X2/P5	0.32	2.1	3.13	2.05	44.0
370656	0.82	0.82	1.22	0.8	33.3
352056X2	0.37	1.83	2.72	1.79	81.5
352056X2-1	0.37	1.83	2.72	1.79	82.7
352056X2-2	0.35	1.95	2.99	1.91	82.9
351156X2/YA6	0.4	1.68	2.5	1.64	88.8
350656	0.46	1.5	2.2	1.4	156
352960X2/P6	0.28	2.39	3.56	2.34	60.8
352960X2A-1/HCE	0.28	2.39	3.56	2.34	63.6
352960X2A-1/HCYA10	0.28	2.39	3.56	2.34	63.5
372960/HCYAD	0.67	1	1.5	1	64.4

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 300~339 mm



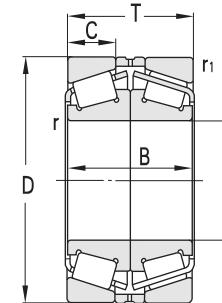
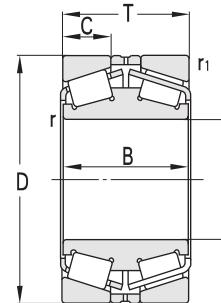
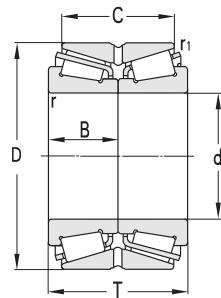
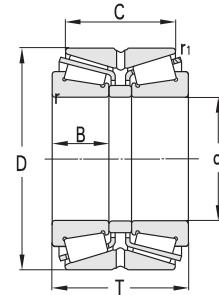
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
300	440	105	105	4	4	980	2050	560	740		
	440	104.749	105	35	4	980	2050	560	740		
	440	105	105	35	4	1020	2300	560	740		
	460	210	95	165	5	1.3	2240	4800	560	740	
	500	205	90	152	5	1.5	2400	4450	530	710	
	500	205	90	152	6	2.5	2400	4450	530	710	
	500	205	90	152	5	1.5	2400	4450	530	710	
	500	205	90	152	6	2.5	2400	4450	530	710	
	500	200	90	160	6	3	2300	4450	530	710	
	500	203	91	152	5	1.5	3000	4950	530	710	
	560	170	170	50	5	5	3520	3800	500	660	
305.034	499.948	200.025	200.025	63.5	3.3	6.5	2630	4850	530	710	
	499.948	200.025	200.025	63.5	3.3	6.4	2630	4850	530	710	
	499.948	200.025	200.025	63.5	3.3	6.4	2630	4850	530	710	
305.07	500	200	200	70	6.4	4.8	1870	3550	530	710	
	500	200	200	67	6.4	4.8	2350	5020	530	710	
	500	200	200	67	3	5	2400	5100	530	710	
305.1	500	200	200	70	6.4	4.8	1870	3550	450	620	
305.2	500	200	200	70	6.4	4.8	1870	3550	530	710	
320	440	160	72	128	4	1	1650	3900	530	710	
	440	195	72	62	4	1	1650	3900	530	710	
	480	151	66.5	121	5	1.5	1870	3550	530	710	
	480	220	100	186	5	1.1	2540	5750	530	710	
	524	185	185	3	4.8	2530	5150	450	600		
	540	160	160	2	5	2220	4350	430	570		
	620	280	280	115	3	5	5300	10600	400	550	
	540	225	100	160	5	1.5	3100	5700	510	660	
330	540	176	176	62	5	5	2450	5100	430	570	
339	600.5	264	264	100	3	6	4800	9700	500	660	

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
370660D/HCYAD	0.88	0.77	1.15	0.8	55.5
370660D/HCYAD-1	0.88	0.77	1.15	0.8	55.4
370660D/HCYAT	0.88	0.77	1.15	0.8	56.3
352060X2	0.36	1.85	2.76	1.81	118
351160	0.32	2.12	3.15	2.077	141
351160/YA6	0.32	2.12	3.15	2.07	141
351160/HAC3	0.32	2.12	3.15	2.077	141
351160/HCYAD	0.32	2.12	3.15	2.07	141
351160X2	0.32	2.12	3.15	2.07	142
351160X2-1/HCE	0.4	1.68	2.5	1.64	148
370660/HCC9	0.81	0.823	1.23	0.81	197
3706/305X4D/HCEYAD	0.88	0.77	1.15	0.75	143
3706/305X4D/HCEYAD-1	0.88	0.77	1.15	0.75	143
3706/305X4D/HCEYADT	0.88	0.77	1.15	0.75	144
3706/305X4	0.79	0.854	1.27	0.835	122
3706/305X4D/HCYA3-1	0.88	0.77	1.15	0.8	155
3706/305X4/HCC9YAB	0.88	0.77	1.15	0.8	163
3706/305.1D/HCYAB	0.79	0.85	1.27	0.83	115
3706/305.2D	0.79	0.854	1.27	0.835	115
352964X2	0.31	2.15	3.21	2.11	67.4
32964X2AT195/DBCR375	0.31	2.15	3.21	2.11	77.5
350664	0.32	2.08	3.1	2.04	88.9
352064	0.46	1.47	2.19	1.44	134
370664-1	0.88	0.77	1.15	0.8	152
370664-2	0.83	0.81	1.2	0.8	161
370664X2	0.43	1.57	2.43	1.53	408
351164	0.4	1.68	2.5	1.64	181
370666/HCC9YAB	0.87	0.77	1.15	0.8	173
306/339/HCC9DFYAB	0.43	1.57	2.43	1.53	324

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 340~400 mm



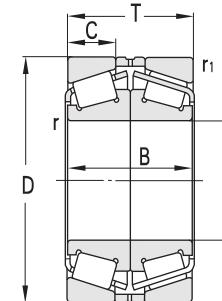
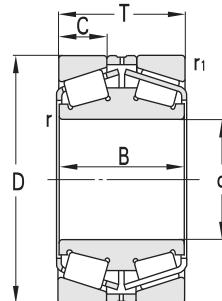
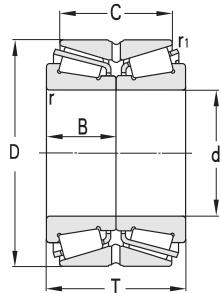
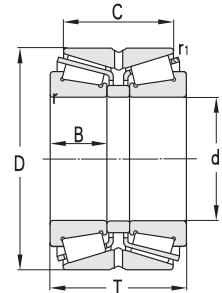
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
								KN	r/min		
340	460	160	72	128	4	1.1	1540	4050	500	660	
520	520	180	82	135	5	1.5	2060	4100	480	640	
580	580	242	106	170	5	1.5	3100	6000	460	620	
	580	238	107	190	6	2	3350	6600	370	500	
360	480	160	72	128	4	1	1640	2240	510	680	
540	540	169	70	134	6	2	2180	4400	460	620	
540	540	185	82	140	5	1.5	2880	6300	460	620	
540	540	185	82	140	5	1.5	2880	6300	460	620	
560	560	160	160	170	3	5	2350	4640	380	500	
600	600	200	200	170	3	5	3000	5830	360	480	
600	600	242	106	170	5	1.5	3410	6800	400	520	
680	680	330	300	300	4	7.5	7200	13300	320	400	
	680	330	300	300	4	7.5	6300	12000	320	400	
379	681.5	307	307	115	5	6	5700	11500	530	710	
380	520	145	65	105	4	1.1	1660	3800	530	710	
520	520	149	65	112	4	1.1	1660	3800	530	710	
560	560	190	82	140	5	1.5	2880	6300	410	540	
560	560	200	200	170	5	5	2800	6540	380	500	
565	565	200	200	170	5	5	2800	6540	380	500	
570	570	180	180	70	2	5	2910	6150	410	540	
570	570	180	180	70	2	5	2910	6150	410	540	
620	620	242	106	170	5	1.5	3410	6850	410	540	
	660	380	310	310	14	3.5	7620	15900	300	400	
390	568	180	180	70	2	5	2350	5840	380	500	
567.5	567.5	180	180	70	3	5	2610	6520	380	500	
570	570	200	200	69	5	5	2800	7000	380	500	
590	590	200	200	69	5	5	2740	6530	360	480	
	590	220	220	70	3	5	2740	6530	360	480	
400	540	150	65	105	4	1.1	1650	3850	530	710	
600	600	189	190	63	5	1.5	2680	5500	410	540	
	600	206	90	150	5	1.5	2890	6300	410	540	

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
352968X2	0.31	2.15	3.2	2.1	71.0
351068	0.29	2.35	3.5	2.3	127
351168	0.42	1.6	2.38	1.56	235
351168X2	0.4	1.68	2.5	1.64	237
352972X2	0.33	2.05	3.05	2	74.7
351072X2	0.37	1.82	2.7	1.78	122
351072	0.37	1.82	2.7	1.78	120
351072/HCE-CB	0.37	1.82	2.7	1.78	120
370672	0.72	0.94	1.4	0.9	141
370672-1	0.94	0.72	1.07	0.7	221
351172	0.44	0.54	2.3	1.51	221
370672-2	0.6	1.1	1.7	1.1	541
370672/HC	0.6	1.1	1.7	1.1	526
306/379/DF	0.43	1.57	2.34	1.57	492
351976	0.38	1.77	2.64	1.73	78.8
351976X2	0.38	1.77	2.64	1.73	82.4
351076	0.39	1.75	2.61	1.71	137
370676	0.79	0.85	1.25	0.8	166
370676-1	0.79	0.85	1.25	0.8	170
371076X3D/HCEYAB	0.87	0.78	1.16	0.76	162
371076X3D/HCYAD	0.87	0.78	1.16	0.76	162
351176	0.46	1.47	2.18	1.43	250
350676	0.33	2	3	2	521
370678-1	0.83	0.81	1.2	0.8	156
370678/HCYA3	0.73	0.92	1.37	0.9	157
370678	0.83	0.81	1.2	0.8	166
370678-2	0.83	0.81	1.2	0.8	201
370678-3	0.83	0.81	1.2	0.8	250
351980/P5	0.45	1.5	2.23	1.47	84.6
371080X2	0.38	1.78	2.65	1.74	174
351080	0.38	1.78	2.65	1.74	179

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 400~480 mm



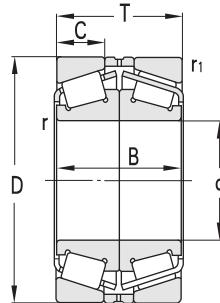
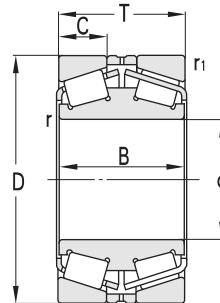
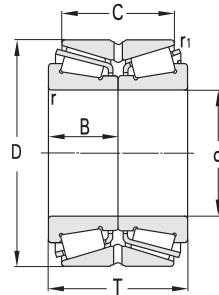
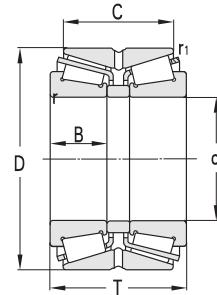
Principal dimensions	d	D	T	B	C	rmin	r1min	Basic load ratings		Limit speed ratings	
								Cr	Cor	Grease	Oil
mm											
								KN		r/min	
400	600	206	90	150	5	1.5	2890	6300	410	540	
	600	206	90	150	6	2	2890	6300	410	540	
	650	240	240	80	6	6	3740	8400	360	480	
	650	240	240	80	6.4	6.4	3800	8200	360	480	
	650	200	200	68.25	6	6	3400	6500	360	480	
	650	255	112	180	6	2.5	3630	7400	360	480	
410	580	160	160	55	7	4	2060	5080	360	480	
420	560	145	65	105	4	1.1	1880	4450	360	480	
	620	190	95	125	5	1	2620	5300	360	480	
	620	200	200	5	2	5	2950	7150	360	480	
	620	206	90	150	5	1.5	2670	5880	360	480	
	700	224	224	86	6	6	4540	9480	360	480	
	700	275	122	200	6	2.5	4430	9150	360	480	
430	535	84	84		1	3	1060	2950	360	480	
431.902	685.698	254	254	106	3.3	6.4	4500	10700	280	380	
440	650	212	94	152	6	2.5	3150	6900	360	480	
	720	275	122	190	6	2.5	4950	10400	360	480	
450	595	178	178		3	6	2950	8130	360	480	
	702	180	180		2.5	6	3120	6940	330	400	
460	680	180	180		2.5	6	3120	6940	360	480	
	680	230	100	175	6	2.5	3410	7450	360	480	
	680	230	230	85	4	4	3910	9400	360	480	
	702	180	180		2.5	6	3120	6940	340	450	
465	845	410	410	155	7.5	7.5	9200	19600	220	300	
480	650	180	78	130	5	1.5	2150	5150	360	480	
	700	275	122	200	6	3	4150	9500	250	320	

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
351080/HAC3	0.38	1.78	2.65	1.74	179
351080/HCYAD	0.38	1.78	2.65	1.74	179
1-7017	0.87	0.78	1.16	0.76	299
1-7028	0.87	0.78	1.16	0.76	289
370680X2D/HCYAB	0.87	0.78	1.16	0.76	252
351180	0.41	1.66	2.47	1.63	279
370682/HCYA3	0.87	0.78	1.16	0.76	133
351984	0.38	1.77	2.64	1.73	87.0
351084X2D1	0.41	1.63	2.43	1.6	166
370684	0.75	0.9	1.35	0.9	211
351084	0.41	1.64	2.44	1.6	191
373184	0.32	2.12	3.15	2.07	382
351184J	0.32	2.12	3.15	2.07	376
370686	0.54	1.3	1.8	1.3	45.0
3706/431X4	0.33	2	3	2	358
351088	0.44	1.52	2.26	1.49	212
351188	0.46	1.48	2.2	1.44	404
370690	0.33	2	3	2	141
370690-1	0.99	0.69	1.02	0.67	261
370692	0.99	0.7	1	0.7	211
351092	0.31	2.18	3.24	2.13	253
371092	0.61	1.11	1.66	1.09	293
370692-1	0.99	0.69	1.02	0.67	251
30693/DF	0.42	1.62	2.42	1.59	1021
351996	0.42	1.61	2.4	1.58	159
351096X2/HCC9	0.36	1.87	2.79	1.83	309

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 482.6~635 mm



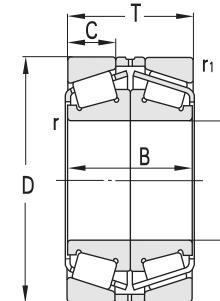
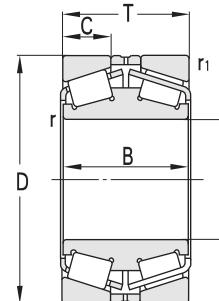
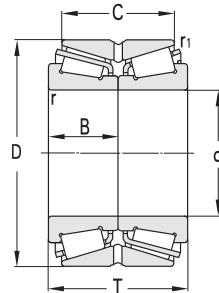
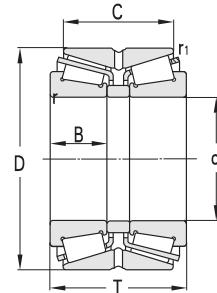
Principal dimensions							Basic load ratings		Limit speed ratings	
d	D	T	B	C	rmin	r1min	Cr	Cor	Grease	Oil
mm							KN	r/min		
482.6	733.425	199.263	200	65	3.3	4	4050	7400	250	320
500	670	180	78	130	5	1.5	1470	6200	350	460
	670	180	78	130	5	1.5	2360	6700	350	460
	670	180	78	130	5	1.5	1470	6200	350	460
	720	236	100	180	6	2.5	3580	8150	410	540
	730	280	280		3	6	6500	15500	250	330
501.65	711.2	250.825	250.825	106.363	3.2	6.4	4950	13400	340	440
510.13	800	285	285	100	5	8	5440	12500	330	430
520	660	140	140		3	5	2030	5650	350	460
	715	180	180		1.5	4	2850	8290	280	360
530	710	190	82	136	5	1.5	2670	6300	320	420
	710	190	82	136	6	2.5	2670	6300	320	420
	730	250	250	104	6	6	5060	13400	320	420
560	750	213	85	156	5	1.5	3410	8500	310	410
	820	242	242		2.5	8	5000	11300	310	410
	820	260	115	185	6	2.5	2920	5700	310	410
570	750	240	240	100	6	6	3850	11800	310	410
580	830	280	280	115	3	6	6250	16400		
600	800	205	90	156	5	1.5	3410	9050	290	390
	800	208	90	160	6	2.5	3400	9050	290	390
	800	190	190	68	5	4	3470	9200	290	390
	870	270	118	198	6	2.5	5390	12700	280	380
	870	270	270	98	6	6	5670	14300	280	380
635	939.8	304.8	304.8	110	3.3	6.4	5400	9400	280	380
	939.8	304.8	304.8	110	3.3	6.4	5800	17000	280	380
	939.8	304.8	305.105	110	3.3	6.4	5800	17000	280	380

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
3706/482.6/HC	0.78	0.86	1.29	0.84	285
3519/500/HC	0.43	1.55	2.31	1.52	158
3519/500/HCYA5	0.43	1.55	2.31	1.52	156
3519/500	0.43	1.55	2.31	1.52	158
3510/500	0.32	2.08	3.1	2.04	276
3706/500-1	0.31	2.2	3.3	2.2	421
3706/500/HC	0.35	1.92	2.86	1.88	323
332171	0.89	0.763	1.14	0.746	532
3706/520	0.68	1	1.5	1	116
3706/520-1	0.79	0.85	1.25	0.8	221
3519/530	0.39	1.73	2.57	1.69	176
3519/530/YA6	0.39	1.73	2.57	1.69	176
3706/530	0.34	2	2.97	1.95	323
3519/560	0.43	1.57	2.34	1.53	232
3706/560	0.88	0.77	1.15	0.8	426
3510/560	0.4	1.7	2.54	1.67	434
3706/570/HC	0.5	1.36	2.02	1.33	287
3706/580/HCEC9YB2	0.31	2.2	3.3	2.2	546
3519/600	0.33	2.05	3.05	2	247
3519/600X2	0.33	2.05	3.05	2	252
3719/600X2	0.61	1.11	1.66	1.09	270
3510/600	0.41	1.63	2.43	1.6	517
3710/600	0.61	1.11	1.66	1.09	726
1-7031	0.83	0.818	1.22	0.8	721
3706/635/HC	0.83	0.818	1.22	0.8	721
3706/635D/HC	0.83	0.818	1.22	0.8	697

# Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 650~1450 mm



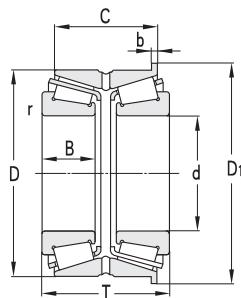
Principal dimensions						Basic load ratings		Limit speed ratings		
d	D	T	B	C	rmin	r1min	Cr	Cor	Grease	Oil
mm							KN		r/min	
650	1030	270	270		15	10	8750	18300	210	280
690	980	355	355	152	6	6.5	9380	25900	210	280
710	900	197	197	79	3	6	4750	13700	250	320
950	240	106	175	6	2.5	4730	13200	250	320	
750	1000	255	112	190	6	2.5	5390	15100	230	310
1000	255	112	190	6	2.5	5390	15100	230	310	
1000	255	112	190	6	2.5	5390	15100	230	310	
1000	264	112	194	6	2.5	5340	15600	230	310	
800	1060	270	115	204	6	2.5	6870	15200	220	300
1100	300	300	6		6	7630	21500	210	270	
1260	375	375		12	12	14600	33400	200	260	
850	1120	268	118	188	6	2.5	6850	18700	210	270
900	1180	275	122	205	6	2.5	7640	21300	200	260
950	1250	300	132	220	7.5	3	7870	22500	180	240
1280	280	120	246	7.5	4	8300	22200	170	220	
1092.2	1320.8	200	87.5	145	6.4	3.5	5050	16900	170	220
1120	1460	335	158	250	7.5	3	9900	29500	160	210
1480	400	296	12	4	13200		37800	160	210	
1160	1540	400		290	12	4	14000	37900	140	190
1250	1500	250		190	6	1.5	7350	22300	100	140
1450	1770	290	115	170	9.5	5	7780	25800	80	120

Designations	Calculation Factor				Weight
	e	Y1	Y2	Yo	
Kg					
3706/650	0.31	2.2	3.3	2.2	902
3706/690/HCEC9YB2	0.35	1.95	2.9	1.91	880
3706/710/HCC9	0.35	1.9	2.9	1.8	314
3519/710	0.46	1.47	2.19	1.44	445
3519/750X2/HC	0.45	1.5	2.24	1.47	535
3519/750X2	0.45	1.5	2.24	1.47	535
3519/750X2/HCYA10	0.45	1.5	2.24	1.47	535
3519/750	0.45	1.5	2.24	1.47	546
3519/800	0.35	1.93	2.87	1.88	606
3706/800	0.79	0.85	1.25	0.8	852
3706/800-1	0.33	2	3	2	1853
3519/850	0.46	1.46	2.18	1.43	645
3519/900	0.37	1.8	2.69	1.76	763
3519/950	0.33	2.05	3.05	2	897
3506/950	0.4	1.68	2.5	1.64	974
3506/1092X4/HC	0.57	1.18	1.76	1.16	514
3519/1120	0.35	1.93	2.87	1.88	1350
3506/1120	0.44	1.5	2.3	1.4	1763
3506/1160	0.44	1.5	2.3	1.4	1902
3506/1250	0.35	1.9	2.9	1.8	797
3506/1450/HC	0.87	0.78	1.16	0.76	1317

# Flanged Double-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 100~150 mm



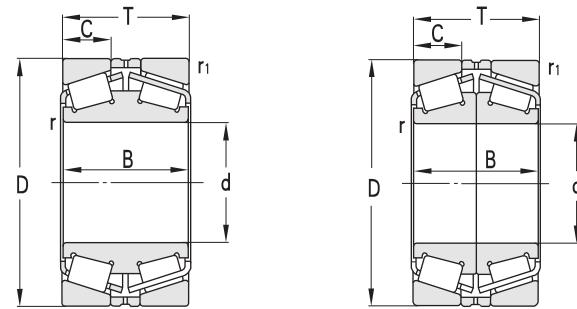
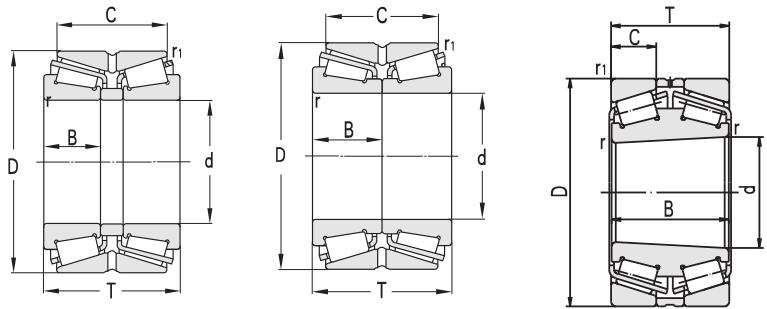
Principal dimensions							Basic load ratings		
d	D	T	C	B	b	D1	rmin	Cr	Cor
<b>mm</b>							<b>KN</b>		
100	165	80	36	60	6.5	175	2.3	570	1190
120	180	85	36	66	7	188	2.5	400	765
140	210	95	42	75	7	220	2.5	495	920
150	215	100	45	80	8	225	2.3	485	900
150	225	105	45	80	7.5	236	3	495	930

Designations	Calculation Factor				Limit speed ratings			Weight
	e	Y1	Y2	Yo	Grease	Oil		
							<b>r/min</b>	
350620DRTN1	0.39	1.72	2.56	1.68	1400	1800	5.09	
352024X2DR	0.37	1.83	2.72	1.79	1200	1600	6.77	
352028X2DR	0.37	1.83	2.72	1.79	950	1300	8.41	
350628DR	0.37	1.8	2.69	1.76	950	1300	13.0	
352030X2DR	0.39	1.73	2.58	1.69	900	1200	13.8	

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 38.1~111.125 mm



## Principal dimensions

基本尺寸

d	D	T	B	C	rmin	Rmin
mm	in	mm	in	mm	in	mm
38.1	1.5	80.035	3.1509843	57.15	2.25	23.698 0.933
47.625	1.875	96.838	3.813	50	1.969	21.946 0.864
52.388	2.0625	112.712	4.4375	65.088	2.5625	26.909 1.0594
57.15	2.25	107.95	4.25	65.09	2.563	29.317 1.154
63.5	2.5	110	4.3307	60.33	2.3752	21.996 0.866
65*		110*		62	28	51
		120*		86	38.5	72
69.85	2.75	146.05	5.75	91.516	3.603	39.688 1.5625
76.2	3	180.975	7.125	114.3	4.5	53.183 2.094
85.136	3.3518	139.992	5.5115	80.962	3.1875	80.134 3.1549
90*		147*		127	40	112
92.075	3.625	152.4	6	82.55	3.25	36.322 1.43
95.25	3.75	149.225	5.875	66.672	2.6249	28.971 1.1406
96.838	3.8125	188.912	7.4375	107.95	4.25	46.038 1.8125
100.211	3.9453	168.275	6.625	95.25	3.75	95.25 3.75
101.6	4	168.275	6.625	92.075	3.625	1.625 3.75
107.95	4.25	200.025	7.875	115.888	4.563	49.212 1.937
110*		165.1	6.5	88.9	3.5	44.514 1.7525
111.125	4.375	214.312	8.4375	115.888	4.5625	52.388 2.0625
						84.138 3.3125

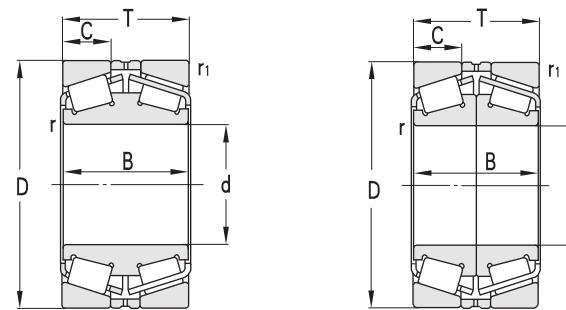
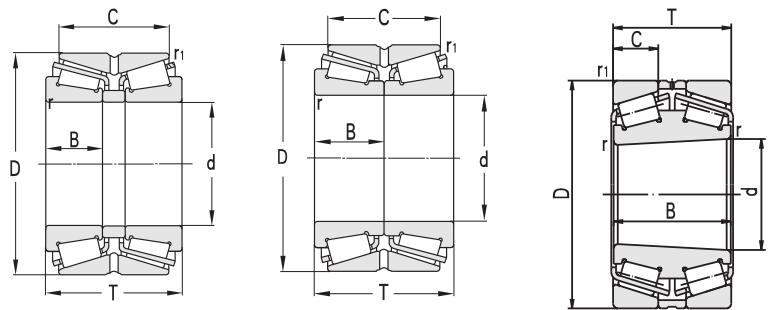
Basic rating load Cr	Cor	Grease	Oil	Designations	Calculation Factor				Weight	
					e	Y1	Y2	Y0		
KN		r/min								
131	194	4800	6400	K27880/K27820D	0.56	1.2	1.79	1.18	1.33	
147	216	3700	5000	K386A/K382A/DB	0.35	2.07	3.08	2.02	1.58	
168	238	3600	4800	K55206/K55444D	0.88	0.76	1.14	0.75	2.87	
211	292	3500	4700	K462/K452D	0.32	2.09	3.11	2.04	2.3	
156	242	3200	4300	K390A/K394A+K390A/K394AB/DB	0.4	1.68	2.5	1.64	2.22	
224	362	3200	4300	KJM511946/KJM511910/DB	0.4	1.68	2.5	1.64	2.25	
320	500	3100	4100	KJH211749/KJH211710/DB	0.34	2	2.98	1.96	3.89	
370	515	3000	3500	KH913849/KH913810/DB	0.78	0.86	1.28	0.84	4.86	
335	420	1900	2600	H917840-90010	0.73	0.92	1.37	0.9	13.6	
300	520	1900	2500	K579TD/K572	0.4	1.67	2.49	1.63	4.8	
395	605	1800	2400	KHM218248/KHM218210/DB	0.33	2.03	3.02	1.98	6.88	
380	585	1900	2500	598/592D/C9	0.44	1.52	2.27	1.49	5.59	
260	490	1900	2500	42376/42587D/C9	0.49	1.37	2.04	1.34	4.05	
270	345	1600	2200	K90381/K90744/DB	0.87	0.78	1.16	0.76	12.2	
370	700	1800	2400	K688TD/K672	0.47	1.43	2.14	1.4	8.29	
370	700	1800	2400	K687/K672D	0.47	1.43	2.14	1.4	7.43	
600	940	1600	2200	K98400/K98789D	0.63	1.07	1.59	1.04	13	
330	640	1800	2400	KNA56425SW/K56650D	0.5	1.36	2.02	1.33	6.37	
335	640	1800	2400	JM822049-90N01	0.5	1.36	2.02	1.33	5.74	
670	1100	1500	2000	KH924045/KH924010D	0.67	1	1.49	0.98	17.7	

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 114.3~161 mm



## Principal dimensions

基本尺寸

d	D	T		B		C		rmin	Rmin
		mm	in	mm	in	mm	in		
114.3	4.5	177.8	7	92.075	3.625	41.275	1.625	69.85	2.75
		177.8	7	92.075	3.625	41.275	1.625	69.85	2.75
		190.5	7.5	106.365	4.1876	49.212	1.937	80.962	3.1875
		190.5	7.5	106.365	4.1876	49.212	1.937	80.962	3.1875
		212.725	8.375	142.875	5.625	66.675	2.625	117.475	4.625
127	5	182.562	7.1875	72.6	2.8583	72.6	2.8583	33.338	1.3125
		228.6	9	115.888	4.5625	49.428	1.946	84.138	3.3125
		234.95	9.25	142.875	5.625	63.5	2.5	114.3	4.5
127.792	5.0312	288.6	11.3622	115.888	4.5625	49.428	1.946	84.138	3.3125
133.35	5.25	196.85	7.75	92.075	3.625	92.075	3.625	38.1	1.5
136.525	5.375	215.9	8.5	123.825	4.875	123.825	4.875	34.925	1.375
		228.6	9	123.825	4.875	57.15	2.25	98.425	3.875
139.7	5.5	200.025	7.875	77.788	3.0625	75.408	2.9688	34.13	1.3437
		215.9	8.5	106.362	4.187	47.181	1.858	80.962	3.187
		215.9	8.5	106.362	4.187	47.181	1.858	80.962	3.187
		236.538	9.3125	131.763	5.188	56.642	2.23	106.363	4.1875
		244.475	9.625	107.95	4.25	53.975	2.125	79.375	3.125
142.875	5.625	200.025	7.875	87.315	3.438	39.688	1.5625	73.025	2.875
		200.025	7.875	93.665	3.688	46.832	1.8438	75.025	2.9537
		236.538	9.3125	131.763	5.188	56.642	2.23	106.363	4.1875
147.638	5.8125	241.3	9.5	133.35	5.25	132.334	5.21	44.45	1.75
152.4	6	222.25	8.75	100.01	3.9374	46.83	1.8437	76.2	3
		254	10	142.875	5.625	66.675	2.625	111.125	4.375
		298.45	11.75	107.95	4.25	111.125	4.375	44.45	1.75
160.325	6.312	288.925	11.375	142.875	5.625	63.5	2.5	111.125	4.375
161	6.3386	231.775	9.125	84.138	5.625	63.5	2.5	111.125	4.375

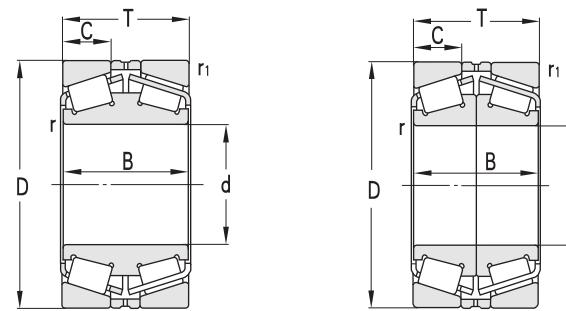
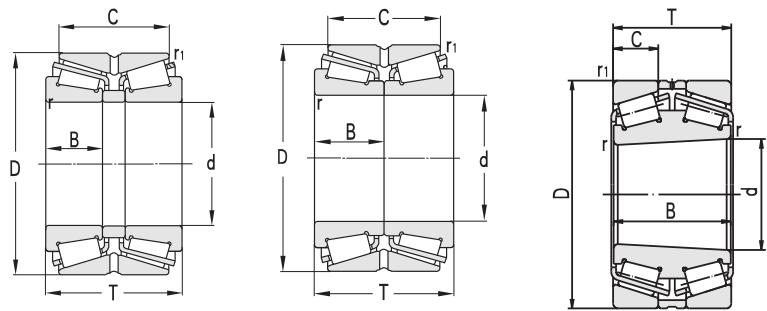
Basic rating load Cr	Cor	Grease	Oil	Designations	Calculation Factor				Weight Kg				
					e	Y1	Y2	Y0					
KN		r/min											
405	675	1600	2100	K64450/K64700D	0.52	1.29	1.92	1.26	8.01				
445	675	1600	2100	64450/64700D/C9	0.52	1.29	1.92	1.26	8.01				
525	965	1600	2100	K71450/K71751D	0.42	1.62	2.42	1.59	11.3				
525	965	1600	2100	K71450/K71751DC	0.42	1.62	2.42	1.59	11.3				
810	1390	1500	2000	938/932CD	0.33	2	3	2	20.8				
375	815	1200	1500	K48290DW/K48220	0.31	2.21	3.29	2.16	6.38				
790	1350	1200	1500	KHM926747/KHM926710D	0.74	0.92	1.36	0.9	19.1				
885	1620	1200	1500	K95500/K95927D	0.37	1.83	2.72	1.79	26				
790	1350	1200	1500	KHM926749/KHM926710D	0.74	0.92	1.36	0.9	18.8				
590	1250	1200	1500	K67390TD/K67322	0.34	1.96	2.92	1.92	9.66				
550	1020	1200	1500	K74539TD/K74850	0.32	2.12	3.15	2.07	9.9				
705	1350	1200	1500	K896/K892D	0.42	1.61	2.39	1.57	19.9				
475	955	1200	1500	K48680D/K48620	0.34	2.01	2.99	1.96	8.18				
550	1020	1200	1600	K74550/K74851CD	0.32	2.12	3.15	2.07	9.94				
550	1020	1200	1600	K74550/K74851D	0.32	2.12	3.15	2.07	9.91				
700	1390	1200	1500	82550/82932D	0.44	1.52	2.27	1.49	23.4				
610	1100	1200	1500	NA81550/81963D/C9	0.35	2.07	3.08	2.02	19.3				
430	1030	1300	1700	48685/48620D	0.34	2.01	2.99	1.96	8.15				
430	1030	1300	1700	NA48685SW/48620D	0.34	2.01	2.99	1.96	8.82				
715	1400	1200	1500	82562/82932D	0.36	1.88	2.8	1.84	23.3				
700	1400	1200	1500	K82581TD/K82950	0.44	1.52	2.27	1.49	32.6				
590	1200	1300	1700	M231649/M231610CD	0.33	2	3	2	12.2				
1110	1850	940	1300	K99600/K99102CD	0.41	1.66	2.47	1.62	26.9				
1090	1720	940	1300	EE517060D/517117	0.33	2.05	3.05	2	35.7				
1170	2170	940	1300	KHM237532/KHM237510D	0.33	2.07	3.09	2.03	37.2				
1170	2170	940	1300	KHM237532/KHM237510D	0.33	2.07	3.09	2.03	37.2				

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 165.1~231.775 mm



## Principal dimensions

基本尺寸

d	D	T	B	C	rmin	Rmin					
mm	in	mm	in	mm	in	mm					
165.1	6.5	225.425	8.875	95.25	3.75	47.816	1.8825	69.85	2.75	3.5	0.8
168.275	6.625	330.2	13	184.15	7.25	79.375	3.125	120.65	4.75	6.4	1.5
170*	230*		87		38		71		3		0.6
174.625	6.875	247.65	9.75	103.188	4.0625	47.625	1.875	84.138	3.3125	3.5	0.8
177.8	7	269.875	10.625	119.062	4.687	55.562	2.1875	93.662	3.6875	3.5	1.5
		282.575	11.125	107.95	4.25	54.166	2.1325	79.375	3.125	3.5	1.5
		288.925	11.375	142.875	5.625	63.5	2.5	111.125	4.375	7	1.5
		288.925	11.375	142.875	5.625	63.5	2.5	111.125	4.375	7	1.5
		320.675	12.625	185.738	7.3125	85.725	3.375	138.112	5.4375	3.5	1.5
		320.675	12.625	185.738	7.3125	85.725	3.375	138.112	5.4375	3.5	1.5
		320.675	12.625	185.738	7.3125	85.725	3.375	138.112	5.4375	3.5	1.5
187.325	7.375	269.875	10.625	119.062	4.687	55.562	2.187	93.662	3.687	3.5	1.5
190.5	7.5	266.7	10.5	90.488	3.5625	89.695	3.5313	38.1	1.5	3.5	3.3
		266.7	10.5	109.538	4.313	54.961	2.1638	84.138	3.3125	3.5	0.8
200.025	7.875	317.5	12.5	146.05	5.75	63.5	2.5	111.125	4.375	4.3	1.5
		317.5	12.5	146.05	5.75	63.5	2.5	111.125	4.375	4.3	1.5
		317.5	12.5	146.05	5.75	63.5	2.5	111.125	4.375	4.3	1.5
		384.175	15.125	238.125	9.375	112.712	4.4375	193.675	7.625	6.4	1.5
203.2	8	276.225	10.875	95.25	3.75	47.816	1.8825	73.025	2.875	3.5	0.8
		317.5	12.5	146.05	5.75	63.5	2.5	111.125	4.375	4.3	1.5
		368.3	14.5	158.75	6.25	152.4	6	152.4	6	3.3	3.3
		368.3	14.5	193.675	7.625	88.897	3.4999	136.525	5.375	3.3	1.5
		276.225	10.875	95.25	3.75	47.816	1.8825	73.025	2.875	3.5	0.8
220.662	8.6875	314.325	12.375	115.886	4.5624	115.888	4.5625	49.213	1.9375	3.3	1.5
231.775	9.125	317.5	12.5	95.25	3.75	52.388	2.0625	36.512	1.4375	0.8	3.3

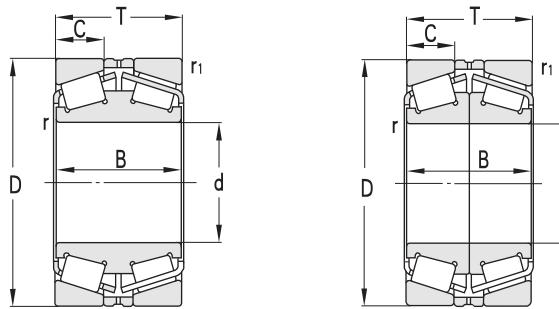
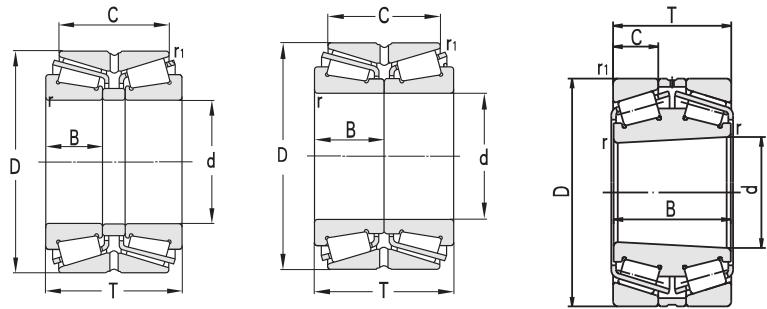
Basic rating load Cr	Cor	Grease	Oil	Designations	Calculation Factor					Weight
					e	Y1	Y2	Y0		
KN	r/min									
445	1130	1150	1400	KNA46790SW/K46720D	0.38	1.78	2.65	1.74	10.4	
1500	2370	840	1100	KH936349/KH936310D	0.81	0.8	1.2	0.8	63.4	
495	1100	1000	1300	KJHM534149/KJHM534110/DB	0.38	1.76	2.62	1.72	9.4	
710	1500	940	1300	67787/67720CD	0.44	1.52	2.27	1.49	15.5	
795	1720	940	1300	KM238840/KM238810D	0.33	2.03	3.02	1.98	22	
700	1450	940	1300	KNA87700SW/K87112D	0.41	1.66	2.47	1.62	24	
1170	2170	940	1300	KHM237545/KHM237510D	0.33	2.07	3.09	2.03	36.2	
1010	2020	940	1300	K94700/K94114CD	0.47	1.44	2.15	1.41	34	
1590	2830	840	1100	KH239640/KH239612D	0.32	2.12	3.15	2.07	58.9	
1590	2830	840	1100	KH239640/KH239612CD	0.32	2.12	3.15	2.07	55.4	
1400	2760	840	1100	KEE222070/K222127CD	0.4	1.68	2.50	1.64	61.5	
795	1720	940	1300	KM238849/KM238810DC	0.33	2.04	3.03	1.99	19.3	
615	1520	940	1300	K67885DW/K67820	0.48	1.41	2.11	1.38	15.9	
615	1520	940	1300	KNA67885SW/K67820D	0.48	1.41	2.11	1.38	15.3	
1035	2270	840	1100	93787/93127D	0.52	1.29	1.92	1.26	40.8	
1035	2270	840	1100	K93787/K93127D	0.52	1.29	1.92	1.26	40.8	
1035	2270	840	1100	K93787/K93127CD	0.52	1.29	1.92	1.26	40.6	
2320	5080	690	920	KH247535/KH247510CD	0.33	2.03	3.02	1.98	112	
610	1440	940	1300	KLM241149NW/KLM24110D	0.32	2.12	3.15	2.07	15.3	
1035	2270	840	1100	K93800/K93127D	0.52	1.29	1.92	1.26	39.8	
1780	3300	690	920	EE420800D/421450	0.4	1.7	2.5	1.6	75.2	
1680	2900	840	1100	KEE420801/K421451CD	0.4	1.69	2.52	1.65	78.8	
640	1350	840	1100	KLM241149NWSH/KLM24110DSH	0.32	2.1	3.12	2.05	15	
1010	2350	760	1000	M244249DW/M244210/YB2	0.33	2.03	3.02	1.98	29.3	
835	1850	760	1000	KLM245848/KLM245810/DF	0.33	2.03	3.02	1.98	22.8	

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 234.95~269.875 mm



## Principal dimensions

基本尺寸

d	D	T	B	C	rmin	Rmin
mm	in	mm	in	mm	in	mm
234.95	9.25	327.025	12.875	93.662	3.688	93.662
		327.025	12.875	93.662	3.688	93.662
		327.025	12.875	114.3	4.5	52.388
		327.025	12.875	114.3	4.5	52.388
228.6	9	327.025	12.875	114.3	4.5	52.388
		355.6	14	152.4	6	69.85
		488.95	19.25	254	10	111.125
241.3	9.5	327.025	12.875	114.3	4.5	52.388
		327.025	12.875	114.3	4.5	52.388
		444.5	17.5	209.55	8.25	100.012
247.65	9.75	406.4	16	215.9	8.5	219.075
249.25	9.813	381	15	171.45	6.75	76.2
254	10	347.662	13.6875	101.6	4	50.99
		347.662	13.6875	101.6	4	50.99
		393.7	15.5	157.162	6.1875	69.85
		422.275	16.625	178.592	7.0312	79.771
		431.724	16.997	173.038	6.813	86.519
		438.15	17.25	165.1	6.5	165
		444.5	17.5	133.35	5.25	133.35
260.35	10.25	365.125	14.375	130.175	5.125	58.738
		400.05	15.75	155.58	6.1252	67.47
		406.4	16	155.575	6.125	152.4
		422.275	16.625	178.592	7.0312	79.771
266.7	10.5	352.425	13.875	107.95	4.25	54.166
269.875	10.625	381	15	136.525	5.375	136.525
						57.15
						2.25
						3.3
						3.3

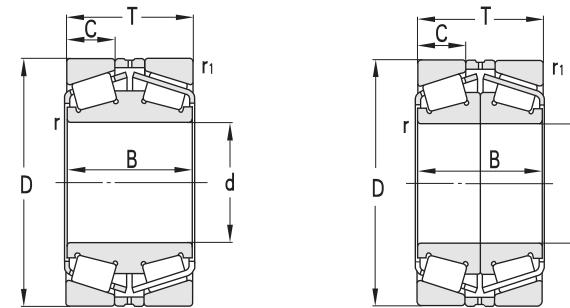
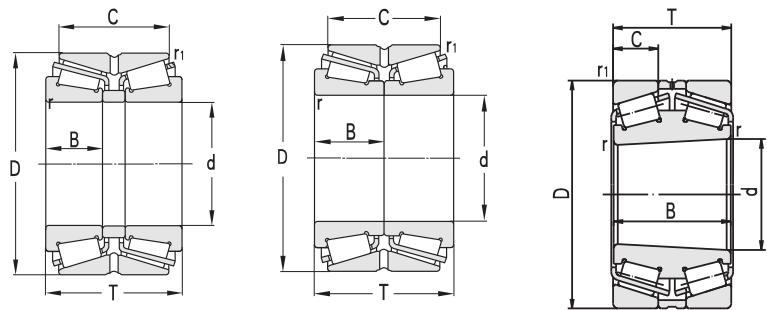
Basic rating load Cr	Cor	Grease	Oil	Designations	Calculation Factor				Weight	
					e	Y1	Y2	Y0		
KN		r/min								
805	1860	760	1000	K8576DW/8520	0.41	1.66	2.47	1.62	25	
805	1860	760	1000	K8576DW/8520/YB2	0.41	1.66	2.47	1.62	25	
790	1830	760	1000	K8575/K8520CD	0.41	1.66	2.47	1.62	26.9	
790	1830	760	1000	K8575/K8520D-C3	0.41	1.66	2.47	1.62	26.9	
790	1830	760	1000	K8573/K8520CD	0.41	1.66	2.47	1.62	28.9	
1300	2700	760	1000	KHM746646/KHM746610CD	0.47	1.44	2.15	1.41	52.4	
2800	4450	630	840	HH949549/HH949510D	0.94	0.7	1.1	0.7	203	
790	1830	760	1000	K8578/K8520DC	0.41	1.66	2.47	1.62	25	
790	1830	760	1000	K8578/K8520CD	0.41	1.66	2.47	1.62	25	
2480	4650	760	1000	KEE923095/K923176D	0.34	2	2.98	1.96	135	
2900	6400	760	1000	KHH249949D/KHH249910	0.33	2.03	3.15	1.98	114	
1240	2960	690	920	KEE126098/K126151CD	0.52	1.31	1.94	1.28	63.4	
825	1740	690	920	KLM249747NW/KLM249710D	0.33	2.03	3.02	1.98	25.3	
825	1740	690	920	KLM249747NWSH/KLM249710D	0.33	2.03	3.02	1.98	24.2	
1290	2830	690	920	KEE275100/K275156D	0.4	1.68	2.5	1.64	66.4	
2190	4000	580	770	HM252343/HM252310D	0.33	2	3	2	98	
1130	1760	630	840	NA551002/551701D	0.33	2.05	3.05	2	93.1	
2200	3900	580	770	EE738101DW/738172	0.35	1.92	2.86	1.88	104	
2070	3600	580	770	EE822101D/822175	0.33	2.06	3.06	2.01	88	
3350	5400			HH953749/HH953710D	0.94	1.7	1.1	0.7	258	
975	2200	670	900	EE134102/134144D	0.37	1.8	2.69	1.76	37.3	
1260	2500	670	900	KEE221026/K221576CD	0.39	1.71	2.54	1.67	61.7	
1620	3520	670	900	EE324103/324160	0.33	2.03	3.02	1.98	79.9	
1980	3750	670	900	HM252348/HM252310CD	0.33	2.03	3.02	1.98	89.1	
1760	3750	670	900	KHM252348/KHM252310CD	0.33	2.03	3.02	1.98	89.1	
840	1780	670	900	KLM251649NW/KLM251610D	0.32	2.12	3.15	2.07	25.3	
1760	3700	630	840	M252349D/M252310	0.33	2.03	3.02	1.98	51.5	

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 273.05~330.2 mm



## Principal dimensions

基本尺寸

d	D	T	B	C	rmin	Rmin
mm	in	mm	in	mm	in	mm
273.05	10.75	393.7	15.5	157.162	6.1875	69.85
279.4	11	469.9	18.5	200.025	7.875	93.662
		488.95	19.25	254	10	120.65
280.192	11.0312	406.4	16	149.226	5.875	67.673
288.925	11.375	406.4	16	144.462	5.688	144.462
300.038	11.8125	422.275	16.625	150.812	5.9375	150.812
		422.275	16.625	174.625	6.875	82.55
303.212	11.9375	495.3	19.5	263.525	10.375	263.525
304.8	12	393.7	15.5	107.95	4.25	54.166
		393.7	15.5	107.95	4.25	50.8
		393.7	15.5	107.95	4.25	50.8
		412.75	16.25	123.825	4.875	53.975
		444.5	17.5	146.05	5.75	61.912
		495.3	19.5	168.595	6.638	74.612
305.034	12.009	499.948	19.683	200.025	7.875	200.025
305.054	12.01	499.949	19.683	200.025	7.875	200.025
305.069	12.0106	560	22.0472	200	7.874	7.874
305.07	12.0106	560	22.0472	200	7.874	7.874
317.5	12.5	422.275	16.625	128.587	5.0625	128.588
		444.5	17.5	146.05	5.75	61.912
		447.675	17.625	158.75	6.25	158.75
		447.675	17.625	180.975	7.125	85.725
330.2	13	482.6	19	177.8	7	80.167
				3.1562	127	5
					3.3	1.5

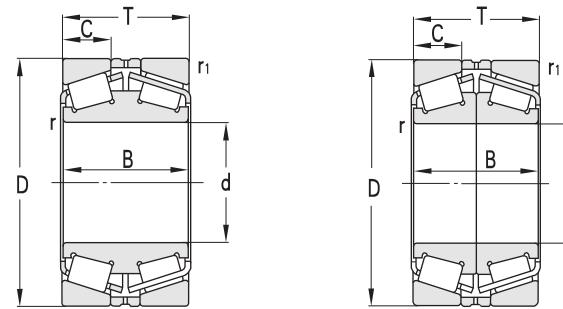
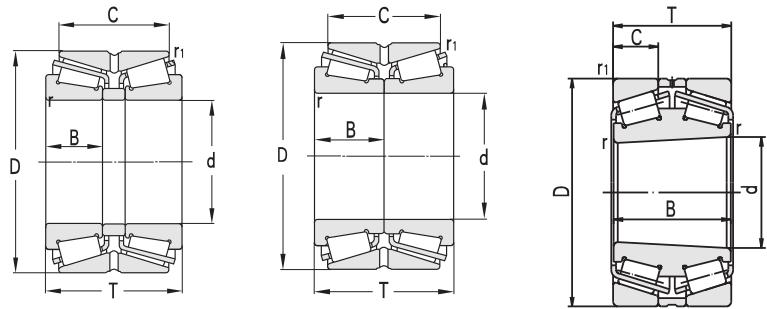
Basic rating load Cr	Cor	Grease	Oil	Designations	Calculation Factor				Weight
					e	Y1	Y2	Y0	
KN	r/min								
1290	2830	600	800	KEE275108/K275156CD	0.4	1.68	2.5	1.64	56.3
2740	5000	590	780	EE722110/722186D	0.38	1.79	2.67	1.75	132
2910	5650	580	770	EE295110/295192D	0.31	2.18	3.45	2.13	188
1320	2950	600	800	KEE128111/K128160CD	0.39	1.71	2.54	1.67	56.7
1790	4200	580	770	KM255449TD/KM255410	0.34	2	2.98	1.96	61.66
1770	4050	580	770	HM256849D/HM256810	0.34	2	2.98	1.96	56.4
1720	4050	580	770	HM256849/HM256810D	0.34	2	2.98	1.96	69.7
3900	8850	460	600	KHH258249TD/KHH258210	0.33	2	3	2	215
1070	2330	580	770	KL357049NW/KL357010D	0.33	2.04	3.04	2	30.1
1070	2330	580	770	L357049/L357010D	0.33	2.04	3.04	2	30.5
1070	2330	580	770	L357049/L357010CD	0.36	1.89	2.81	1.84	30.5
1060	2350	580	770	EE109120/109163D	0.43	1.6	2.3	1.6	42.4
1240	2770	550	700	EE291201/291751D	0.38	1.79	2.67	1.75	64.9
1850	3400	500	660	EE941205/941953D	0.4	1.68	2.5	1.64	115
2430	5000	460	600	KHM95741DW/KHM95710	0.88	0.77	1.15	0.75	149
1870	3650	460	600	M959442D/M959410	1.17	0.58	0.86	0.56	145
2150	4380			45T615620D	1.09	0.62	0.92	0.61	210
2850	5250			3706/305X4-1	0.88	0.77	1.15	0.8	199
1420	3650	490	650	LM258648DW/LM258610/YB2	0.32	2.11	3.15	2.07	49.7
1240	2770	490	650	KEE291250/K291751CD	0.38	1.79	2.67	1.75	59.0
1810	4150	490	650	HM259049D/HM259010	0.33	2.03	3.02	1.98	80.7
1800	4650	490	650	KHM259049/KHM259010CD	0.33	2	3	2	85.4
2180	4900	480	630	EE526132/526191D	0.4	1.7	2.5	1.6	101

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 333.375~384.175 mm



## Principal dimensions

基本尺寸

d	D	T		B		C		rmin	Rmin
		mm	in	mm	in	mm	in		
333.375	13.125	469.9	18.5	166.688	6.5625	166.688	6.5625	71.438	2.8125
		469.9	18.5	166.688	6.5625	166.688	6.5625	71.438	2.8125
		469.9	18.5	190.5	7.5	90.488	3.5625	152.4	6
342.9	13.5	457.098	17.996	142.875	5.625	63.5	2.5	101.6	4
		457.098	17.996	142.875	5.625	63.5	2.5	104.775	4.125
		533.4	21	139.7	5.5	146.05	5.75	50.8	2
		533.4	21	174.625	6.875	76.2	3	123.825	4.875
343.052	13.506	457.098	17.996	122.238	4.8125	122.238	4.8125	49.212	1.9375
346.075	13.625	488.95	19.25	104.775	4.125	95.25	3.75	1.5	6.4
		488.95	19.25	174.625	6.875	174.625	6.875	74.612	2.937
		488.95	19.25	200.026	7.875	95.25	3.75	158.75	6.25
355.6	14	444.5	17.5	136.524	5.375	60.325	2.375	111.125	4.375
		444.5	17.5	136.524	5.375	60.325	2.375	111.125	4.375
		444.5	17.5	136.524	5.375	60.325	2.375	111.125	4.375
		501.65	19.75	145.05	5.7106	61.413	2.4178	107.95	4.25
		514.35	20.25	193.675	7.625	84.138	3.3125	152.4	6
368.249	14.498	523.875	20.625	214.312	8.4375	101.6	4	169.862	6.6875
368.3	14.5	523.875	20.625	185.738	7.3125	185.738	7.3125	79.375	3.125
		596.9	23.5	165.1	6.5	158.75	6.25	60.325	2.375
		596.9	23.5	203.2	8	92.075	3.625	133.35	5.25
374.65	14.75	501.65	19.75	130.175	5.125	120.65	4.75	50.8	2
381	15	590.55	23.25	244.475	9.625	114.3	4.5	193.675	7.625
		590.55	23.25	244.475	9.625	114.3	4.5	193.675	7.625
384.175	15.125	546.1	21.5	193.675	7.625	193.675	7.625	82.55	3.25
		546.1	21.5	193.675	7.625	193.675	7.625	82.55	3.25
		546.1	21.5	193.675	7.625	193.675	7.625	82.55	3.25
		546.1	21.5	222.25	8.75	104.775	4.125	177.8	7

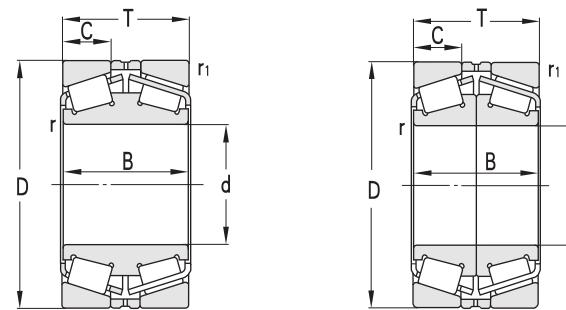
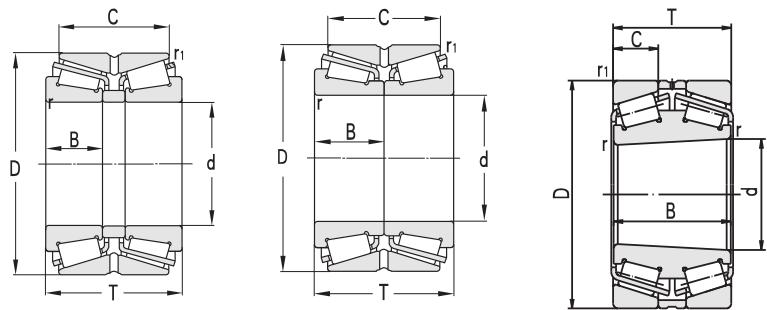
Basic rating load Cr	Cor	Grease	Oil	Limit rating speed r/min	Designations	Calculation Factor				Weight Kg
						e	Y1	Y2	Y0	
2470	5900	480	630	HM261049DW/HM261010	0.33	2	3	2	2	92.8
2470	5900	480	630	HM261049D/HM261010	0.33	2	3	2	2	92.8
2470	5900	480	630	HM261049/HM261010CD	0.33	2	3	2	2	98.2
1300	3550	480	630	KLM961548/KLM961511D	0.7	0.97	1.44	0.94	44.8	
1300	3500	480	630	KLM961548E/KLM961511DX2A6	0.7	0.97	1.44	0.94	45	
2300	4350	420	560	EE971355D/972100	0.33	2	3	2	2	116
2300	4350	420	560	EE971354/972103D	0.33	2	3	2	2	128
1480	3350	480	630	LM761649DGW/LM761610	0.48	1.4	2.1	1.4	53.6	
1090	2680	480	630	3706/346X4	0.5	1.35	2	1.3	62.3	
2420	5800	480	630	HM262749TD/HM262710D	0.34	1.99	2.96	1.95	102	
2420	5800	480	630	HM262749/HM262710CD	0.34	1.99	2.96	1.95	109	
1110	3450	460	600	L163149/L163110CD	0.31	2.2	3.27	2.15	46.1	
1110	3450	460	600	KL163149/KL163110CD	0.31	2.2	3.27	2.15	46.1	
1110	3450	460	600	KL163149NW/KL163110CD	0.31	2.2	3.27	2.15	46.1	
1410	3450	420	560	KEE231400/K231976CDX2	0.44	1.53	2.28	1.5	83.4	
2150	4950	410	540	EE333140/333203CD	0.37	1.8	2.7	1.8	120	
3000	7400	410	540	HM265049/HM265010CD	0.33	2	3	2	141	
3000	6200	410	540	HM265049DW/HM265010/C9	0.33	2	3	2	128	
3000	5800	400	520	EE181454DW/182350	0.4	1.7	2.5	1.6	159	
2640	5200	400	520	EE181453/182351D	0.42	1.62	2.42	1.59	191	
1600	4000	460	600	KLM765149DW/KLM765110	0.47	1.44	2.14	1.4	69.4	
4500	6600	380	500	M268730/M268710D/C9	0.33	2.03	3.02	1.98	247	
2820	8050	380	500	M268730/M268710CD/HE	0.33	2.03	3.02	1.98	245	
3200	8200	410	540	HM266449TD/HM266410	0.33	2.04	3.02	1.98	151	
3200	8200	410	540	HM266449DW/HM266410	0.33	2.04	3.02	1.98	151	
3200	8200	410	540	HM266449D/HM266410	0.33	2.04	3.02	1.98	152	
3200	8200	410	540	HM266448/HM266410CD	0.33	2.04	3.02	1.98	161	

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 390~488.95 mm



## Principal dimensions

基本尺寸

d	D	T	B	C	rmin	Rmin
mm	in	mm	in	mm	in	mm
390*	570*	180	180	63		1.5 4
393.7 15.5	546.1 21.5	138.112 5.4375	138.112 5.4375	53.975	2.125	6.4 1.5
406.4 16	539.75 21.25	142.875 5.625		101.6 4	6.4 1.5	
	546.1 21.5	138.113 5.4375	138.113 5.4375		1.5 6.4	
	590.55 23.25	193.674 7.625	193.675 7.625	80.692	3.1769	3.3 6.4
408.4 16.0787	546.1 21.5	120 4.7244	98 3.8583		1 3	
	546.1 21.5	150 5.9055	125 4.9213		1.5 3.3	
409.575 16.125	546.1 21.5	161.925 6.375	161.925 6.375	66.675 2.625	1.5 6.4	
	635 25	257.175 10.125	120.65 4.75	206.375 8.125	6.4 1.5	
415.925 16.375	590.55 23.25	209.55 8.25	209.55 8.25	88.9 3.5	3.3 6.4	
	590.55 23.25	209.55 8.25	209.55 8.25	88.9 3.5	3.3 6.4	
	590.55 23.25	250 9.8425	114.3 4.5	199.2 7.8425	6.4 1.6	
	590.55 23.25	244.475 9.625	114.3 4.5	193.675 7.625	6.4 1.5	
	590.55 23.25	244.475 9.625	114.3 4.5	193.675 7.625	6.4 1.5	
431.8 17	571.5 22.5	155.575 6.125	74.612 2.9375	111.125 4.375	3.3 1.5	
447.675 17.625	635 25	223.838 8.8125	223.838 8.8125	95.25 3.75	3.3 6.4	
	635 25	257.175 10.125	120.65 4.75	206.375 8.125	6.4 1.5	
457.2 18	596.9 23.5	165.1 6.5	73.025 2.875	120.65 4.75	9.7 1.5	
479.425 18.875	679.45 26.75	276.225 10.875	128.588 5.0625	222.25 8.75	6.4 1.5	
	679.45 26.75	276.225 10.875	128.588 5.0625	222.25 8.75	6.4 1.5	
	679.45 26.75	276.225 10.875	128.588 5.0625	222.25 8.75	6.4 1.5	
	679.45 26.75	276.225 10.875	128.588 5.0625	222.25 8.75	6.4 1.5	
482.6 19	615.95 24.25	184.15 7.25	85.725 3.375	146.05 5.75	6.4 1.5	
488.9519.25	634.873 24.995	180.975 7.125	84.138 3.3125	136.525 5.375	6.4 1.5	

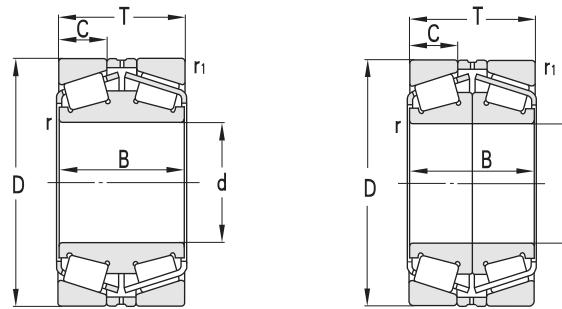
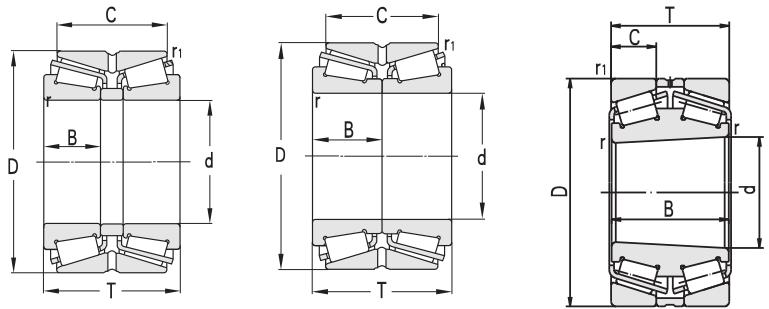
Basic rating load Cr	Cor	Grease	Oil	Designations	Calculation Factor				Weight					
					e	Y1	Y2	Y0						
KN		r/min												Kg
2190	5230	400	520	KJM966748DW/KJM966710	0.83	0.8	1.2	0.8	158					
2150	4650	410	540	LM767745D/LM767710/YB2	0.47	1.42	2.12	1.39	100					
1620	4350	410	540	3506/406.4	0.48	1.4	2.1	1.4	82.6					
2080	5000	410	540	3706/406.4	0.48	1.4	2.1	1.4	88.6					
3600	7100	410	540	EE833161XD/833232/YB2	0.33	2.03	3.02	1.98	186					
1480	3400	410	540	3706/408.4	0.88	0.77	1.15	0.8	76.3					
1750	4650	410	540	3706/408.4-1	0.83	0.8	1.2	0.8	99.2					
2800	8500	410	540	M667947D/M667910	0.43	1.6	2.3	1.6	104					
4650	10300	380	500	M270730/M270710CD	0.33	2	3	2	300					
3960	8400	410	540	M268749DW/M268710	0.33	2.03	3.02	1.98	179					
3960	8400	410	540	M268749D/M268710-3	0.33	2.03	3.02	1.98	183					
3600	8250	380	500	M268749/M268710DX2	0.33	2.03	3.02	1.98	206					
3250	8550	380	500	M268749/M268710DC/HEC9	0.33	2.03	3.02	1.98	205					
3250	8550	380	500	M268749/M268710DC/HE	0.33	2.03	3.02	1.98	205					
1660	4200	410	540	LM869448/LM869410CD	0.55	1.24	1.84	1.21	102					
3900	10300	360	480	KM270749D/KM270710	0.33	2	3	2	232					
4650	10300	360	480	M270749/M270710CD	0.33	2	3	2	247					
1860	5000	380	500	EE244180/244236CD	0.4	1.67	2.48	1.63	109					
4180	10900	320	440	KM272749/KM272710D	0.33	2.03	3.02	1.98	307					
4180	10900	320	440	M272749/M272710DC	0.33	2.03	3.02	1.98	307					
4200	10900	320	440	M272749/M272710DC/HEC9	0.33	2.03	3.02	1.98	307					
4200	10900	320	440	M272749/M272710DC/HE	0.33	2.03	3.02	1.98	307					
2540	7510	360	480	LM272249/LM272210D	0.33	2.03	3.02	1.98	130					
2230	6250	360	480	LM772748/LM772710CD	0.47	1.43	2.12	1.4	138					

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 489.026~609.6 mm



## Principal dimensions

基本尺寸

d	D	T	B	C	rmin	Rmin	
mm	in	mm	in	mm	in	mm	
489.026	19.253	634.873	24.995	152.4	6	152.4	6
		634.873	24.995	177.8	7	80.962	3.1875
				142.875	5.625	63.5	2.5
						3.3	3.3
						6.4	1.5
498.475	19.625	634.873	24.995	177.8	7	80.962	3.1875
		634.873	24.995	177.8	7	80.962	3.1875
				142.875	5.625	142.875	5.625
						6.4	1.5
501.65	19.75	673.1	26.5	184.15	7.25	184.15	7.25
		711.2	28	250.825	9.875	250.825	9.875
		711.2	28	292.1	11.5	136.525	5.375
				231.775	9.125	103.363	4.0694
						3.2	6.4
						6.4	1.5
508	20	838.2	33	304.8	12	139.7	5.5
				222.25	8.75	222.25	8.75
						9.7	3.3
519.112	20.4375	736.6	29	258.672	10.1839	258.672	10.1839
						6.4	3.3
520.7	20.5	736.6	29	186.502	7.3426	81.758	3.2188
				114.3	4.5	114.3	4.5
536.575	21.125	761.873	29.995	269.875	10.625	269.875	10.625
		761.873	29.995	311.151	12.25	146.05	5.75
				247.65	9.75	247.65	9.75
						6.4	1.5
558.5	21.9882	736.6	29	225.425	8.875	104.775	4.125
				177.8	7	177.8	7
						1.5	6.4
558.8	22	736.6	29	187.328	7.3751	138.112	5.4375
		736.6	29	196.85	7.75	80.962	3.1875
		736.6	29	225.425	8.875	104.775	4.125
				177.8	7	177.8	7
						6.4	1.5
571.5	22.5	812.8	32	285.75	11.25	285.75	11.25
		812.8	32	333.375	13.125	155.575	6.125
				263.525	10.375	263.525	10.375
						6.4	1.5
602.945	23.738	787.4	31	206.375	8.125	93.662	3.6875
				158.75	6.25	158.75	6.25
						6.4	1.5
609.6	24	787.4	31	171.45	6.75	171.45	6.75
		787.4	31	206.375	8.125	93.662	3.6875
		812.8	32	190.5	7.5	82.55	3.25
		820	32.2835	171.45	6.75	171.45	6.75
				146.05	5.75	146.05	5.75
						3.3	6.4
						6.4	1.5

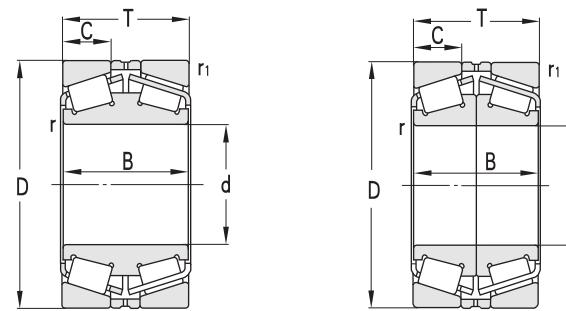
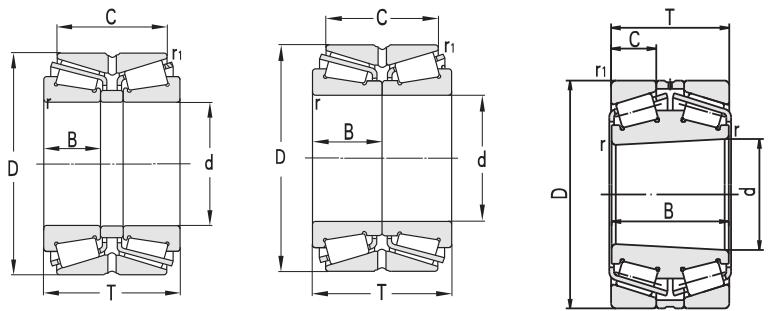
Basic rating load Cr	Cor	Grease	Oil	Limit rating speed Designations	Calculation Factor				Weight
					e	Y1	Y2	Y0	
2700	7300	360	480	EE243193D/243250	0.35	1.9	2.9	1.8	129
2700	7300	360	480	EE243192/243251D	0.35	1.9	2.9	1.8	129
2700	7300	360	480	EE243196/243251D	0.35	1.9	2.9	1.8	124
2700	7300	360	480	EE243196/243251DC	0.35	1.9	2.9	1.8	124
3850	9600			3706/501X4	0.31	2.2	3.3	2.2	191
4500	13400			3706/500/HC	0.33	2	3	2	321
4500	13400			M274149/M274110DC	0.33	2	3	2	355
6300	13500			EE426200/426331CD	0.48	1.4	2.1	1.4	628
5950	15300			3706/519X4	0.33	2	3	2	368
3000	6650			EE982051/982901CD	0.48	1.4	2.1	1.4	208
6200	15500			M276449DW/M276410	0.33	2	3	2	412
6200	15500			M276449/M276410DC	0.33	2	3	2	431
4400	12800			LM377449/LM377410CD/HE	0.35	1.92	2.86	1.88	256
3350	8200			3506/558.8	0.35	1.9	2.9	1.8	191
14250	11500			LM377448/	0.35	1.9	2.9	1.8	233
4250	11500			LM377448/LM377410CD	0.35	1.9	2.9	1.8	151
7700	18000			M278749DW/M278710	0.33	2	3	2	524
6400	15900			M278749/M278710D	0.33	2	3	2	521
4000	10500			EE649237/649311CD	0.37	1.8	2.7	1.8	181
4000	10500			EE649241D/649310	0.37	1.8	2.7	1.8	219
4000	10500			EE649240/649311CD	0.37	1.8	2.7	1.8	233
3500	8700			EE743240/743321D	0.33	2	3	2	251
4000	10500			3706/609.6	0.37	1.8	2.7	1.8	266
4000	10500			3506/609.6	0.37	1.8	2.7	1.8	293

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 635~1562.1 mm



## Principal dimensions

基本尺寸

		D	T	B	C	rmin	Rmin				
mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
635	25	939.8	37	304.8	12	107.95	4.25	3.2	6.4		
		990.6	39	339.725	13.375	212.725	8.375	6.4	6.4		
660.4	26	812.8	32	176.212	6.9375	176.212	6.9375	73.025	2.875	3.3	6.4
682.625	26.875	965.2	38	338.138	13.3125	338.138	13.3125	142.875	5.625	3.3	6.4
685.8	27	876.3	34.5	200.024	7.875	92.075	3.625	152.4	6	6.4	1.5
711.2	28	914.4	36	190.5	7.5			139.7	5.5	6.4	1.5
723.9	28.5	914.4	36	187.325	7.375	80.962	3.1875	139.7	5.5	5.5	3.3
762	30	965.2	38	187.325	7.375	80.962	3.1875	133.35	5.25	6.4	1.5
774.7	30.5	965.2	38	187.325	7.375	80.962	3.1875	133.35	5.25	6.4	1.5
774.962	30.5103	1016	40	266.7	10.5			209.55	8.25	8	2.5
812.8	32	1016	40	190.5	7.5			146.05	5.75	6.4	1.5
		1066.8	42	190.5	7.5			146.05	5.75	6.4	1.5
863.6	34	1130.3	44.5	323.85	12.75	323.85	12.75	138.112	5.4375	4.8	12.7
		1130.3	44.5	323.85	12.75	323.85	12.75	138.112	5.4375	4.8	12.7
		1371.6	54	469.9	18.5			285.75	11.25	28	2
901.7	35.5	1295.4	51	450.88	17.7512	438.15	17.25			4.8	12.7
914.4	36	1066.8	42	139.7	5.5	63.5	2.5	101.6	4	6.4	3.3
939.8	37	1270	50	457.2	18	317.5	12.5	12	3.3		
		1333.5	52.5	463.55	18.25	463.55	18.25	200.025	7.875	4.8	12.7
1320.8	52	1727.2	68	412.75	16.25			254	10	28	2
1562.1	61.5	1806.575	71.125	279.4	11			196.85	7.75	9.7	3.3

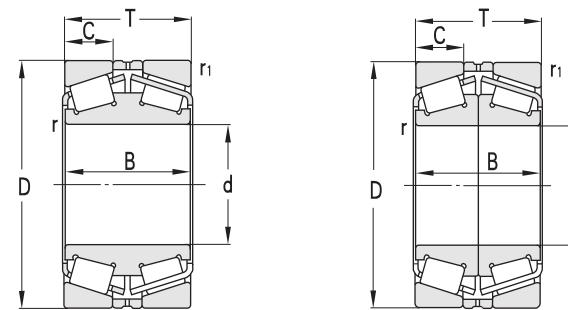
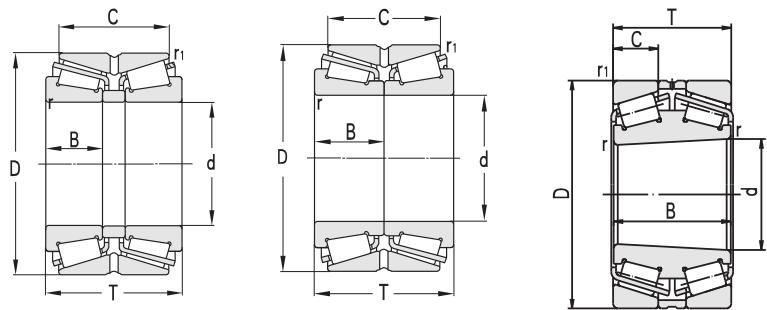
Basic rating load Cr	Cor	Grease	Oil	Designations	Calculation Factor				Weight	
					e	Y1	Y2	Y0		
KN	r/min									Kg
6270 8000	17000 15800	250	330	3706/635/HC- 1 3506/635	0.88 0.88	0.77 0.77	1.14 1.15	0.75 0.8	762 841	
3500	11100			L281149D/L281110	0.33	2	3	2	194	
9450	24800			M282249D/M282210	0.33	2	3	2	812	
3850	10500			EE655270/655346D	0.43	1.6	2.3	1.6	271	
3700	9550			3506/711.2	0.37	1.8	2.7	1.8	266 kg	
3300	10000	200	280	KEE755285/K755361D	0.38	1.77	2.64	1.73	255	
3500	9700			EE752300/752381D	0.4	1.7	2.5	1.5	291	
3500	9700			EE752305/752381D	0.4	1.7	2.5	1.5	266	
6300	16000			3506/774X4	0.33	2	3	2	526	
3500	10000			3506/812.8	0.43	1.6	2.3	1.6	349	
3500	10000			3506/812.8- 1	0.43	1.6	2.3	1.6	446	
10000	30500			LM286249D/LM286210	0.33	2	3	2	296	
10000	30500			LM286249DGW/LM286210	0.33	2	3	2	296	
14500	31000			3506/863.6	0.88	0.77	1.15	0.8	2250	
16000	42500			3706/901.7	0.35	1.9	2.9	1.8	2000	
2350	7860			LL686947/LL686910D	0.41	1.64	2.5	1.6	180	
9600 16800	28600 48500			3506/939.8 LM287849D/LM287810	0.88 0.33	0.77 2	1.15 3	0.8 2	1538 2220	
13000	40000			3506/1320.8	0.83	0.81	1.2	0.8	2320	
7100	27000			3506/1562.1	0.48	1.4	2.1	1.4	1050	

Note: \* indicates the maximum value of ID or OD.

# Double-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 1778~2616.2 mm



## Principal dimensions

基本尺寸

d	D	T	B	C	rmin	Rmin
mm	in	mm	in	mm	in	mm
1778	70	2159	85	393.7	15.5	
2133.6	84	2819.4	111	742	29.2126	
2184.4	86	2527.3	99.5	304.8	12	
2616.2	103	3048	120	381	15	
				266.7	10.5	12.7
				457.2	18	15
				165.1	6.5	16
				209.55	8.25	25.4
						3
						3.5
						5
						6.4

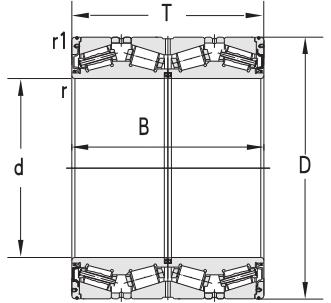
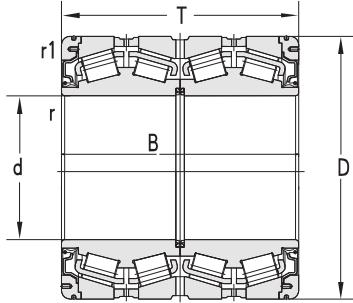
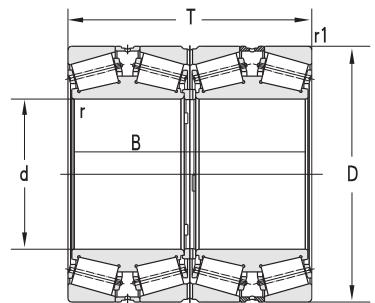
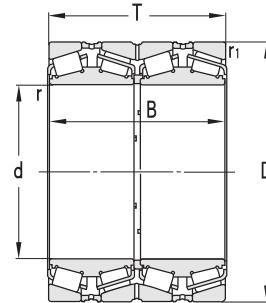
Cr	Cor	Grease	Oil	Designations	Calculation Factor				Weight
					e	Y1	Y2	Y0	
KN		r/min							Kg
15000	52000			3506/1778	0.79	0.85	1.25	0.8	2740
34000	105000			3506/2133.6	0.94	0.72	1.05	0.7	11600
9200	37000			3506/2184.4	1.15	0.59	0.88	0.58	2240
12100	52500			3506/2616.2	1.5	0.45	0.67	0.44	4490

Note: \* indicates the maximum value of ID or OD.

# Four-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 139.7~240 mm



Principal dimensions	d	D	B	T	rmin	r1min	Basic load ratings	
							Cr	Cor
mm								
							KN	
139.7	200.025	157.162	160.338	1.1	1.8	590	1870	
	200.025	74.581	157.162	1.1	1.8	695	1870	
150	210	165	165	0.7	2.3	660	1590	
	210	165	165	0.7	2.3	660	1590	
	225	136	136	3	2.5	595	1460	
170	260	230	230	3	2.5	1030	3100	
177.8	273.05	234.95	234.947	1.5	3.3	1830	3750	
180	250	207	207	2.5	0.7	870	2100	
	260	200	200	2.2	2	1110	2700	
	280	180	180	3	2.5	920	2540	
200	282	206	206	1.5	2.5	1040	2540	
	310	200	200	3	2.5	2170	1520	
	310	275	275	3	2.5	1350	4200	
	360	99	210	4	4	1810	3290	
205	320	205	205	4	3	1160	2850	
220	295	315	315	SP	SP	1270	3780	
	295	315	315	SP	SP	1580	3950	
	300	108	230	3	2.5	1570	4000	
	320	200	200	1	3	1730	4000	
	340	305	305	4	3	2800	5950	
	340	305	305	4	3	2800	5950	
220.663	314.325	330	330	SP	3.2	1910	5480	
240	320	294	294	SP	4	1550	5000	
	338	248	248	4	4	2030	5400	
	338	340	340	SP	4	1900	5160	
	338	118	248	6.4	6.4	2210	5950	
	338	118	248	4	4	2210	5950	

## Designations

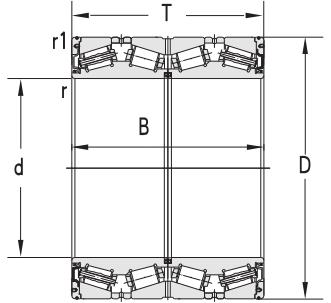
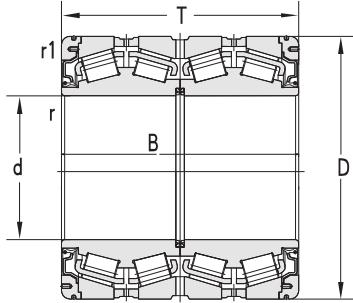
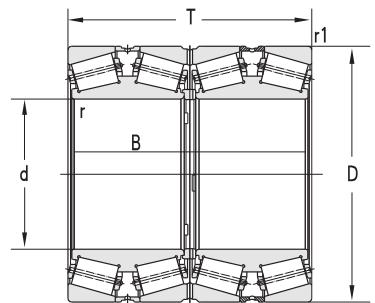
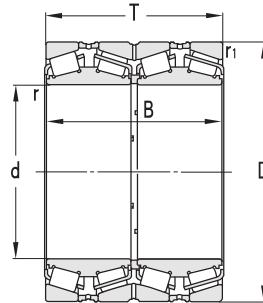
## Weight

		Kg
77928		16.2
3806/139.7/HCP691		16.2
382930X2		21.2
382930X2/C9		21.2
382030X2		17.7
382034X2		43
3806/177X4/HCYAD		49.7
352936X2/DF-1		28.4
382936X3		33.2
380636		39.6
380640-2RS/HCEC9		37.6
382040X2-1		55.6
382040		75.1
382140X2/YB2		90.2
380641		55.4
380644-XRS/HC		56.6
380644-2RS/HCEC9		56.4
382944X2/HCE		47.9
380644		55
382044		99.5
382044/HC		99.5
380644X4-XRS/HC		80.4
382948X2-XRS/HC		61.6
380648/HCC9		69
380648-XRS/HC		78.8
380648/HCC9YAB		69
380648/HCC9YAB		69

# Four-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 240~340 mm



Principal dimensions	d	D	B	T	rmin	r1min	Basic load ratings	
							Cr	Cor
mm								
							KN	
240	338 360	162 310	340 310	SP 4	3	3	1900 3630	5160 2210
250	385 460	255 270	255 270	5 5	5 4	2310 2470	5350 6400	
254	358.775	134.937	269.875	1.5	3.3	1890	4950	
260	360 400 400 400 440	265 255 255 255 300	265 1630 2250 2100 2940	3 3.7 4 5 2	2.5 7.5 7.5 4 5	1900 4950 4800 4900 5850	5050 4950 4800 4900 5850	
279.4	393.7	320	320	SP	3.2	2.500	7200	
280	395 420 460	288 250 324	288 250 324	2 5 5	6 5 4	2890 1690 3680	7450 5300 8350	
300	420 420 424 460 500	300 310 310 390 350	300 310 310 390 350	4 4 4 5 5	3 3 3 4 4	2750 2220 3300 4230 3000	7500 8100 8500 10200 8900	
317.5	422.275		269.875	1.5	3.3	2490	5950	
320	480	380	380	5	4	3300	11500	
330.2	444.5	301.625	301.625	3.3	3.3	3240	7850	
340	460 460 520	310 310 325	310 310 325	4 4 5	4 4 4	2420 3300 3520	9300 8950 8200	

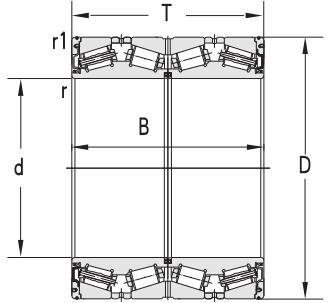
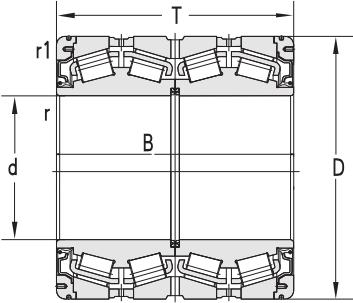
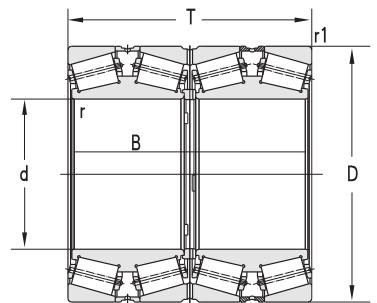
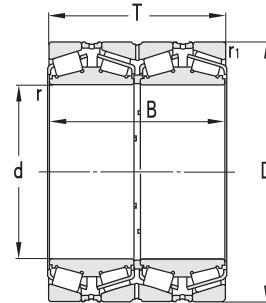
## Designations      Weight

	Kg
380648X2- XRS/HCC9YAB	78.8
382048X2	90.5
380650- 1	107
380650/HC	192
3806/254- XRS/HC	80.5
382952/HC	77.8
380652/HC	117
380652/HC- 1	117
380652/HG2	117
382052	161
382152X2/HCYA6	182
3806/279.4- XRS/HC	120
380656- 1	116
380656	119
381156	219
382960/C9	125
382960X2/HCC9YA3	134
382960X3/HC	140
382160/HC	222
380660/HCC9	280
3806/317.5- XRS/HCC9YAB	99.1
382064X2/HC	252
3806/330.2- XRS/HCC9	126
382968X2/HC	147
382968X2/HCC9	146
381068	247

# Four-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 340~420 mm



## Principal dimensions

d	D	B	T	rmin	r1min	Basic load ratings	
						Cr	Cor
mm							
						KN	
340	520 580	154 425	323 425		5	3850 5550	9060 12300
355	490 490 490	316 316 316	316 316 316	1.5 1.5 1.5	3.3 3.3 3.3	4100 4460 4460	10900 10000 10000
355.6	482.6 488.95	265.114	269.875 317.5	1.5 1.5	3.3 3.3	2570 4750	7440 11000
360	480 510 540 600	375 380 280 420	375 380 280 420	4 2 5 4.7	4 6 5 4.7	2800 5500 4300 4340	11800 14200 8800 13500
380	550 560 560 620 388 620 620 620	330 325 325 360 388 420 420 420	350 325 325 360 388 420 420 420	5 5 2 6 6 4 4 5	5 4 6 6 6 4 4 4	2740 4810 6000 3800 5550 5550 5550 5550	9450 10000 13500 11600 12600 12600 12600 12600
395	545 545 545 545	268.7 268.7 268.7 268	288.7 288.7 288.7 288.9	4 4 4 5	7.5 7.5 7.5 10	2340 2340 2340 2340	6500 6500 6500 6500
400	540 540 600	280 400 356	280 400 356	3.7 5 5	7.5 5 4	2690 6980 3740	6500 13300 12400
409.575	546.1	334.962	334.962	1.5	6.4	3900	11700
420	560	437	437	5	5	7900	16300

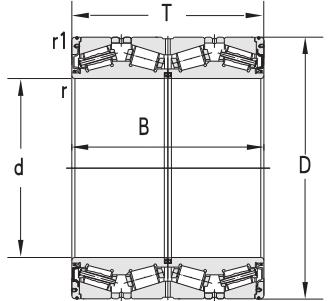
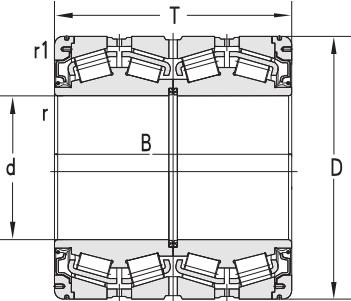
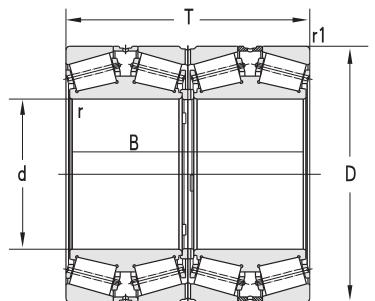
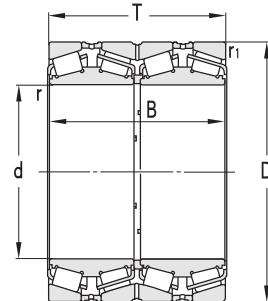
## Designations

Designations	Weight
Kg	
381068X2/HCC9YA6	243
381168	468
380671	186
380671/HC	175
380671/HCC9	175
3806/355.6/HCC9	139
3806/355X4- 2RS/HCC9	165
382972X2/HCYA3	197
380672	256
381072X2/YA6	231
381172/HCYA6	388
380676/HC- 1	273
381076	263
381076X2/YA6	296
380676/HC	443
381176/HC	485
381176/HCC9	485
381176/HCYA2- 1	484
381176/HCYA2	484
380679X2/HC	194
380679X2/HCYA7	194
380679X2/HCC9	194
380679/HCY A3	194
380680/HC- 1	187
380680/HC	262
381080/HC	345
1- 7016	201
380684/HC	298

# Four-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 420~480 mm



## Principal dimensions

d	D	B	T	rmin	r1min	Basic load ratings	
						Cr	Cor
<b>mm</b>							
420	560	437	437	SP	6	4800	15200
	592	432	432	5	5	6600	16300
	620	356	356	5	4	4560	11700
	700	480	480	6	5	5610	18200
	700	480	480	6	5	10500	11900
430	570	336.55	336.55	1.5	3.3	4850	13800
	575	380	380	1.5	5	6200	16200
440	580	420	420	4.5	6.7	5900	17300
	590	480	480	SP	SP	8000	19000
	620	454	454	6	6	6650	18800
	620	454	454	6	6	6650	18800
	620	454	454	6	6	6500	20200
	650	355	355	6*	5*	3680	12100
	650	355	355	6*	6*	3680	12100
	650	355	355	6	5	5000	12300
450	580	450	450	3	6	6000	19300
	595	368	368	3	6	5400	16000
460	610	360	360	3	6	6100	16400
	610	400	400	2.5	4	6000	17000
	620	310	310	5	4	6160	3450
	620	310	310	5	4	6160	3450
	625	421	421	3	9	7050	19800
	650	474	474	6	6	4950	20000
	730	440	440	4	7.5	6160	14800
	730	440	440	4	7.5	6160	14800
475	600	368	368	2	6	5100	16000
	660	450	450	4	6	8410	22000
480	700	420	420	5	5	4730	16900
	700	420	420	6	5	5880	15500

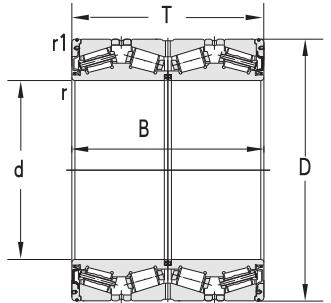
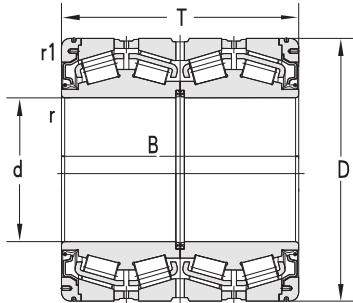
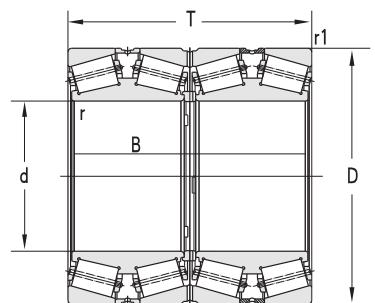
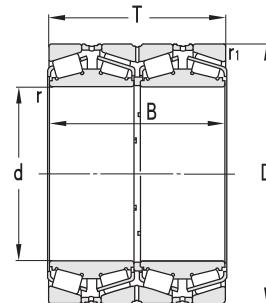
## Designations

Designations	Weight
<b>Kg</b>	
380684-XRS/HCP69	292
380684/HCE-1	375
381084	369
381184X2J/HC	749
381184	755
380686	241
380686-1	282
380688-3	302
381188X1-XRS/HC-1	359
380688/HCC9	432
380688/HC-1	432
380688/HCC9YA8	422
380688/HC	385
380688/HCYA7	385
381088X2/HG	402
380690-2	282
380690-3	287
381992X3/YA	291
380692-2	316
381992/HC	260
381992/HCC9	260
380692-3	382
380692/HCC9-1	506
381192X3/HC	663
381192X3/HCC9	663
380695	251
380695-1	462
381096	582
381096/HCYA2	535

# Four-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 482.6~650 mm



Principal dimensions d	D	B	T	rmin	r1min	Basic load ratings	
						Cr	Cor
mm							
482.6	615.95	400	400	SP	6.4	4700	16000
490	625	385	385	7	4	5390	16500
	625	385	385	SP	4	5200	14350
500	720	400	400	5	5	7500	18600
510	655	379	377	1.5	6.4	6180	18800
	655	377	379	1.5	6.4	5500	16200
530	780	450	450	6	5	7200	18200
540	690	400	400	2	5	6270	11400
558.8	736.6	450	450	5	5	7250	23600
560	750	368	368	5	4	8630	15800
	920	620	620	7.5	6	20000	32000
600	800	365	365	5	5	4400	18100
	800	365	365	5	5	5110	17200
	800	380	380	5	4	4400	18100
	870	480	480	6	6	6760	25500
	980	650	650	7.5	7.5	10600	37500
620	800	363.5	363.5	3	6	7280	21000
630	850	418	418	6	6	5500	22100
	920	515	515	7.5	7.5	7200	27500
	1030	670	670	7.5	6	16500	42000
640	1030	560	560	7.5	12	17600	39300
650	915	674	674	3.3	6.4	15700	44800
	1030	560	560	7.5	12	17600	39300
	1030	560	560	7.5	12	17600	39300

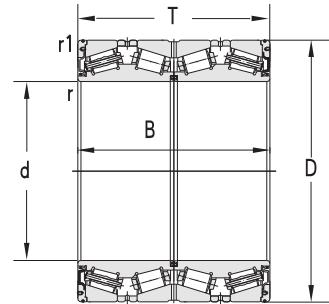
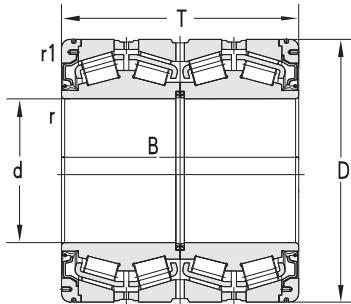
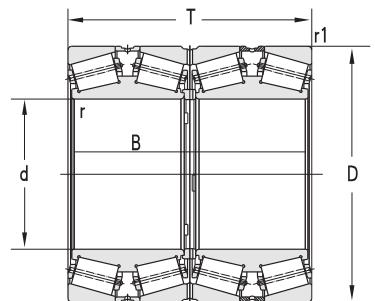
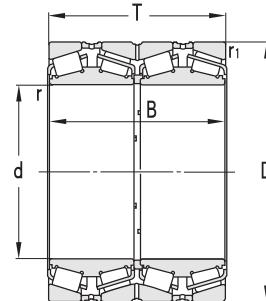
## Designations      Weight

	Kg
3806/482.6-XRS/HCEC9YAB	299
380698/HC	278
380698-XRS/HCEC9YB2	275
3810/500X2/HC	542
3806/510-1	332
3806/510/HCC9	316
3810/530	745
3806/540J/HC	375
3806/558X4/HC	534
3819/560/HC	447
3811/560	1690
3806/600/HC	489
3806/600/HCYA8	521
3819/600/HC	497
3810/600/HC	992
3811/600/HC	1970
3806/620	466
3819/630/HC	682
3810/630/HC	1190
3811/630/HC	2200
3806/650/HCYA7	1770
3806/650-2	1433
3806/650/HCYAD	1735
3806/650/HC	1720

# Four-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 650~1250 mm



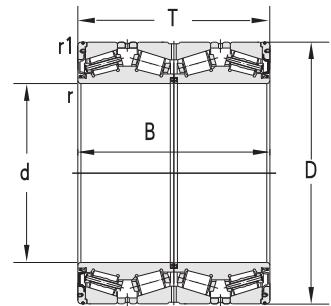
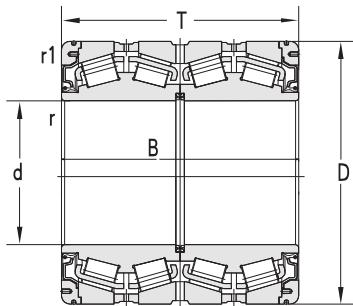
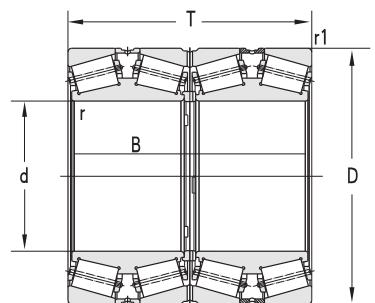
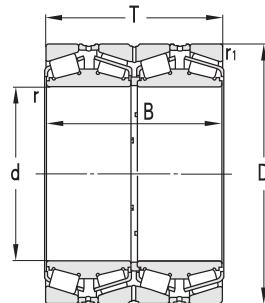
## Principal dimensions

d mm	D	B	T	rmin	r1min	Basic load ratings		Designations	Weight Kg
						Cr	Cor		
650 1030	560 1030	560	560	7.5	12	17600	39300	3806/650/HCC9	1723
660 855	318.48 318.5	318.192 318.5	318.5	4.8 5	9.7 7.5	6070 6960	16600 18200	3806/650/HCC9- 1	1712
660.01 855.015	319.99	319.99	319.99	12	5.2	5220	17000	3806/660	491
670 900	412	412	412	6	6	5770	24600	3806/660- 1	493
685.8 876.3	352.425	355.6	355.6	6.4	6.4	5800	14500	3806/660X4/HC	495
710 900	410	410	410	3	6	5880	27500	3819/670/HC	773
711 914.4	390	420	420	6.4	6.4	6200	19400	3806/685.8- XRS/HCC9	490
711.2 914.4	390 390	420 420	SP 6.4	5 6.4	7900 6200	20100 19400	3806/710/HCYA2	650	
730 940	500	500	500	2	6	11900	35600	1- 7029	674
750 950 1220	410 840 840	410 9.5 9.5	840 9.5 9.5	6 9.5 6	6 9.5 13	9560 17700 24600 21100	27780 68500 64500 70500	3806/711X4- XRS 1- 7029	674 674
780 1220	840	840	840	6	6	23200	70500	331752	926
850 1360	910	910	910	6	12	34200	82600	3806/750/HCEC9	703
1070 1400	889.762	889.762	889.762	4	12	29700	99000	3811/750	3985
1080 1450	950	950	950	5	12	32900	106000	3811/750- RS/HCC9	3880
1250 1550	890	890	890	5	12	29700	112000	3806/780/HCC9	3810

# Four-Row Tapered Roller Bearings (Metric)

**ZWZ**

d 1260~1580 mm



## Principal dimensions

d mm	D	B	T	rmin	r1min	Basic load ratings KN	
						Cr	Cor
1260	1640	1000	1000	5	12	38300	141000
1300	1720	1040	1040	5	12	42000	138000
1370	1765	1050	1035	5	12	42000	150000
1500	1900	1080	1080	4	12	45800	167000
1580	1960	1080	1080	5	12	45000	173000

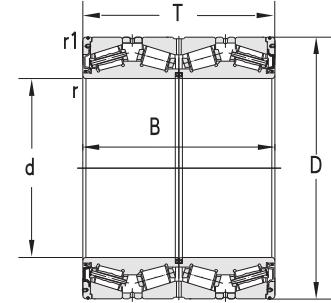
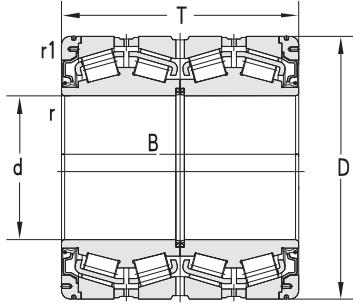
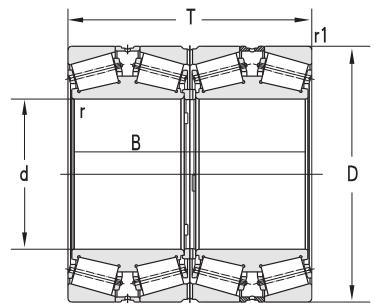
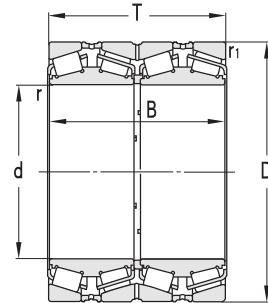
## Designations      Weight

	Kg
3806/1260	5810
3806/1300	7010
3806/1370	6965
3806/1500	7700
3806/1580	7810

# Four-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 133.35~254 mm



## Principal dimensions

d		D		T		B		rmin(radial)	rmin(axial)	r1min(radial)	r1min(axial)	Chamfer dimensions
mm	in	mm	in	mm	in	mm	in	mm				
133.35	5.25	196.85	7.75	193.675	7.625	193.675	7.625	1.5	1.5	3.3	3.3	
177.8	7	247.65	9.75	192.088	7.562	192.088	7.5625	1.5	1.5	3.3	3.3	
187.325	7.375	269.875	10.625	211.138	8.3125	211.138	8.3125	1.5	1.5	3.3	3.3	
190.5	7.5	266.7	10.5	187.325	7.375	188.912	7.4375	1.5	1.5	3.3	3.3	
198.438	7.8125	284.162	11.1875	225.425	8.875	225.425	8.875	1.5	1.5	3.3	3.3	
203.2	8	317.5	12.5	266.7	10.5	266.7	10.5	1.5	1.5	3.3	3.3	
206.375	8.125	282.575	11.125	190.5	7.5	190.5	7.5	0.8	0.8	3.3	3.3	
		282.575	11.125	190.5	7.5	190.5	7.5	0.8	0.8	3.3	3.3	
		282.575	11.125	226	8.8976	226	8.8976	0.6	0.6	3.3	3.3	
220.662	8.6875	314.325	12.375	239.712	9.4375	239.712	9.4375	1.5	1.5	3.3	3.3	
		314.325	12.375	239.712	9.4375	239.712	9.4375	1.5	1.5	3.3	3.3	
		314.325	12.375	239.712	9.4375	239.712	9.4375	1.5	1.5	3.3	3.3	
221.224	8.7096	355.498	13.996	228.6	9	228.6	9	1.5	1.5	3.3	3.3	
228.6	9	311.15	12.25	200.025	7.875	200.025	7.875	1.5	1.5	3.3	3.3	
		311.15	12.25	200.025	7.875	200.025	7.875	1.5	1.5	3.3	3.3	
		400.05	15.75	296.875	11.688	296.875	11.688	3.3	3.3	3.3	3.3	
241.478	9.507	349.148	13.746	228.6	9	228.6	9	1.5	1.5	3.3	3.3	
		349.148	13.746	228.6	9	228.6	9	1.5	1.5	3.3	3.3	
244.475	9.625	327.025	12.875	193.675	7.625	193.675	7.625	3.3	1.5	3.3	3.3	
		327.025	12.875	193.675	7.625	193.675	7.625	3.3	1.5	3.3	3.3	
254	10	358.775	14.125	269.875	10.625	269.875	10.625	3.3	3.3	3.3	3.3	
		358.775	14.125	269.875	10.625	269.875	10.625	3.3	3.3	3.3	3.3	
		358.775	14.125	269.875	10.625	269.875	10.625	3.3	3.3	3.3	3.3	

## Basic load ratings

Cr Cor

## Designations

## Weight

KN	Kg
970	20.2
1070	28.6
1570	41.5
1280	32.9
1280	32.9
2400	76.3
1030	34.4
1030	34.4
1200	40.3
2090	60.2
2160	60.2
2000	59.8
2100	81.8
1560	43.9
1560	43.9
3300	148
2050	71.9
2050	71.9
1740	42.7
1740	42.7
2720	88.9
2720	88.9
2720	88.9

Note: \* indicates the maximum value of ID or OD.

# Four-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 260.35~317.5 mm



Principal dimensions				Chamfer dimensions										
d	D	T	B	rmin(radial)	rmin(axial)	r1min(radial)	r1min(axial)	mm	in	mm	in	mm	in	mm
260.35	10.25	422.275	16.625	314.325	12.375	317.5	12.5	6.4	6.4	3.3	3.3			
266.7	10.5	355.6	14	230.188	9.0625	228.6	9	3.3	1.5	3.3	3.3			
		355.6	14	230.188	9.0625	228.6	9	3.3	1.5	3.3	3.3			
		355.6	14	230.188	9.0625	228.6	9	1.6	1.6	3.3	3.2			
269.875	10.625	381	15	282.575	11.125	282.575	11.125	3.3	3.3	3.3	3.3			
276.225	10.875	393.7	15.5	269.875	10.625	269.875	10.625	1	1	6.4	6.4			
279.4	11	393.7	15.5	269.875	10.625	269.875	10.625	1.5	1.5	6.4	6.4			
		393.7	15.5	269.875	10.625	269.875	10.625	1.5	1.5	6.4	6.4			
		393.7	15.5	269.875	10.625	269.875	10.625	1.5	1.5	6.4	6.4			
		393.7	15.5	269.875	10.625	269.875	10.625	1.5	1.5	6.4	6.4			
288.925	11.375	406.4	16	298.45	11.75	298.45	11.75	3.3	3.3	3.3	3.3			
		406.4	16	298.45	11.75	298.45	11.75	3.3	3.3	3.3	3.3			
292.1	11.5	422.275	16.625	269.875	10.625	269.875	10.625	SP	SP	3.3	3.3			
300.038	11.8125	422.275	16.625	311.15	12.25	311.15	12.25	3.3	3.3	3.3	3.3			
304.648	11.994	438.048	17.246	280.99	11.0626	279.4	11	3.3	3.3	4.8	4.8			
		438.048	17.246	280.99	11.0626	279.4	11	3.3	3.3	4.8	4.8			
304.8	12	419.1	16.5	269.875	10.625	269.875	10.625	1.5	1.5	6.4	6.4			
		482.6	19	365.125	14.375	377.825	14.875	3.3	3.3	3.3	3.3			
		495.3	19.5	342.9	13.5	342.9	13.5	2	2	6.4	6.4			
		501.65	19.75	336.55	13.25	336.55	13.25	2	2	6.4	6.4			
304.902	12.004	412.648	16.246	266.7	10.5	266.7	10.5	3.3	3.3	3.3	3.3			
305	12.0079	438.048	17.246	280.99	11.0626	279.4	11	3.3	3.3	4.8	4.8			
317.5	12.5	422.275	16.625	269.875	10.625	269.875	10.625	1.5	1.5	3.3	3.3			
		438.15	17.25	276.225	10.875	276.225	10.875	1.5	1.5	3.3	3.3			

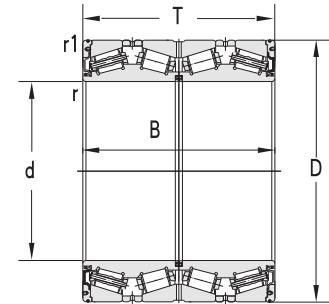
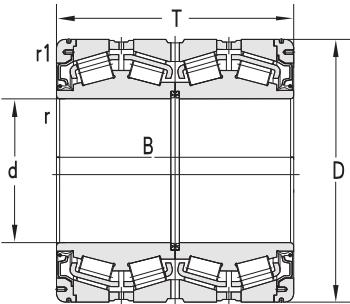
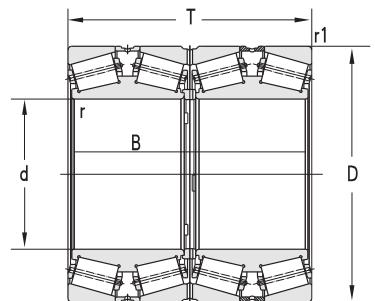
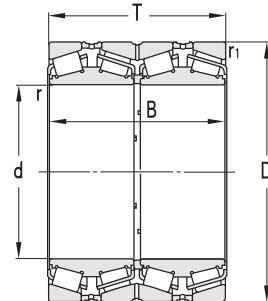
Basic load ratings Cr	Cor	Designations		Weight Kg
		KN		
4100	7900	HM252348D/HM252310-	HM252310D	182
1950	5560	KLM451349DW/KLM451310-	KLM451310D	65.3
1950	5800	LM451349DW/LM451310-	LM451310D	63.9
1700	4800	K76589/K76520-	K76520D	
2930	7550	M252349DW/M252310-	M252310D	105
2880	6200	3806/276X4		105
2880	6200	KEE135111DW/K135155-	K135156D	103
2880	6200	EE135111D/135155-	135156D	103
2880	6200	EE135111DW/135155-	135156DW/HEC9	103
2880	6200	EE135111DW/135155-	135156DW	103
3400	8150	M255449DW/M255410-	M255410D	125
3400	8150	M255449D/M255410-	M255410D	125
3450	7950	EE330116D/330166-	330167D	126
3700	9400	HM256849D/HM256810-	HM256810D	142
3000	6650	M757448D/M757410-	M757410D	130
3000	6650	M757448DW/M757410-	M757410D	130
2850	6800	M257149D/M257110-	M257110D	112
4950	10300	3806/304.8		266
5000	9200	3806/304.8-1		243
4650	9200	3806/304.8-2		255
2930	7000	M257248DW/M257210-	M257210D	102
2980	6600	M757449DW/M757410-	M757410D	129
2980	8100	LM258648DW/LM259610-	LM258610D	104
3450	8200	3806/317.5		132

Note: \* indicates the maximum value of ID or OD.

# Four-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 317.5~385.762 mm



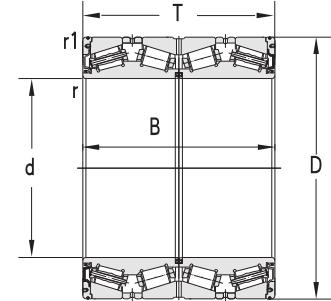
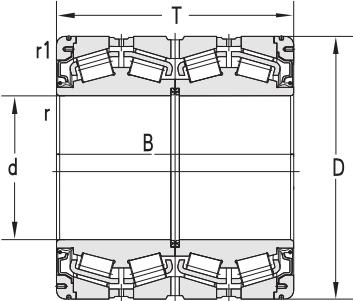
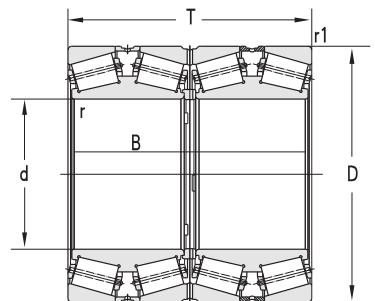
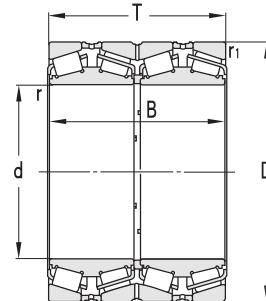
Principal dimensions				Chamfer dimensions							Basic load ratings		Designations		Weight
d	D	T	B	rmin(radial)	rmin(axial)	r1min(radial)	r1min(axial)	Cr	Cor						
mm	in	mm	in	mm	in	mm	in	KN						Kg	
317.5		447.675	17.625	327.025	12.875	327.025	12.875	3.3	3.3	3.3	3.3	4650	10700	HM259049D/HM259010- HM259010D	163
330.2 13	13	444.5	17.5	301.625	11.875	301.625	11.875	3.3	3.3	3.3	3.3	3550	9600	M260149DW/M260110- M260110D	134
330.302 13.004	13.004	438.023	17.245	247.65	9.75	254	10	1.5	1.5	3.3	3.3	2500	7300	EE138131D/138172- 138173XD	109
333.375 13.125	13.125	469.9	18.5	342.9	13.5	342.9	13.5	3.3	3.3	3.3	3.3	4100	10100	HM261049DW/HM261010- HM261010D	186
341.312 13.4375	13.4375	457.098	17.996	254	10	254	10	2	1.5	3.3	3.3	2350	7400	LM761648DW/LM761610- LM761610D	112
		457.098	17.996	254	10	254	10	2	1.5	3.3	3.3	2740	7050	LM761648D/LM761610- LM761610D- 3	112
342.9 13.5	13.5	533.4	21	307.985	12.125	301.625	11.875	3.3	3.3	3.3	3.3	4650	8750	EE971355D/972100- 972103D	239
		571.5	22.5	342.9	13.5	342.9	13.5	3.3	3.3	6.4	6.4	6200	11500	EE536136D/536225- 536226D	366
343.052 13.506	13.506	457.098	17.996	254	10	254	10	2	1.5	3.3	3.3	2670	7400	K1- LM761649DW/LM761610- LM761610D	110
		457.098	17.996	254	10	254	10	2	1.5	3.3	3.3	2670	7350	LM761649DW/LM761610- LM761610D	110
		457.098	17.996	254	10	254	10	1.5	1.5	3.3	3.3	2800	6900	LM761649DWSH/LM761610SH- LM761610DSH- 3	111
345.281 13.5937	13.5937	488.95	19.25	358.775	14.125	358.775	14.125	3.3	3.3	3.3	3.3	4800	12400	3806/345X4	239
346.075 13.625	13.625	488.95	19.25	358.775	14.125	358.775	14.125	3.3	3.3	3.3	3.3	4800	12400	HM262749D/HM262710- HM262710D	221
347.662 13.6875	13.6875	469.9	18.5	292.1	11.5	292.1	11.5	3.3	3.3	3.3	3.3	2600	7950	M262449D/M262410- M262410D	142
		469.9	18.5	260.35	10.25	260.35	10.25	1.5	1.5	3.3	3.3	3750	10100	LM262449DW/LM262410- LM262410D	129
355.6 14	14	482.6	19	269.875	10.625	265.114	10.4376	1.5	1.5	3.3	3.3	2570	7440	3806/355.6/C9C9	139
		488.95	19.25	317.5	12.5	317.5	12.5	1.5	1.5	3.3	3.3	3150	10000	M263349D/M263310- M263310D	177
		488.95	19.25	317.5	12.5	317.5	12.5	1.5	1.5	3.3	3.3	4750	11000	M263349D/M263310- M263310D- XRS	165
368.3 14.5	14.5	523.875	20.625	382.588	15.0625	382.588	15.0625	3.3	3.3	6.4	6.4	6200	14800	HM265049DW/HM265010- HM265010D	274
374.65 14.75	14.75	501.65	17.948	250.825	9.875	260.35	10.25	1.5	1.5	3.3	3.3	3120	7550	EE231475D/231975- 231976D	141
384.175 15.125	15.125	546.1	21.5	400.05	15.75	400.05	15.75	3.3	3.3	6.4	6.4	6120	16400	HM266449DW/HM266410- HM266410CD	310
		546.1	21.5	400.05	15.75	400.05	15.75	1.5	1.5	6.4	6.4	5200	12000	HM266449DW/HM266410- HM266410D- XRS/C9YB2	293
385.762 15.1875	15.1875	514.35	20.25	317.5	12.5	317.5	12.5	3.3	3.3	3.3	3.3	4150	11000	LM665949DW/LM665910- LM665910D	189

Note: \* indicates the maximum value of ID or OD.

# Four-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 406.4~482.6 mm



## Principal dimensions

d	D		T		B		Chamfer dimensions					
	mm	in	mm	in	mm	in	rmin(radial)	rmin(axial)	r1min(radial)	r1min(axial)		
406.4 16	546.1	21.5	268.288	10.5625	288.925	11.375	1.5	1.5	6.4	6.4		
	546.1	21.5	288.925	11.375	288.925	11.375	1.5	1.5	6.4	6.4		
	546.1	21.5	330	12.9921	330	12.9921	1.5	1.5	6.4	6.4		
	565.15	22.25	381	15	381	15	3.3	3.3	6.4	6.4		
	590.55	23.25	400.05	15.75	400.05	15.75	3.3	3.3	6.4	6.4		
	590.55	23.25	400.05	15.75	400.05	15.75	3.3	3.3	6.4	6.4		
409.575 16.125	546.1	21.5	334.962	13.1875	334.962	13.1875	1.5	1.5	6.4	6.4		
	546.1	21.5	334.962	13.1875	334.962	13.1875	1.5	1.5	6.4	6.4		
	546.1	21.5	334.962	13.1875	334.962	13.1875	1.5	1.5	6.4	6.4		
415.925	16.375	590.55	23.25	434.975	17.125	434.975	17.125	3.3	3.3	6.4	6.4	
431.8 17	571.5	22.5	279.4	11	279.4	11	1.5	1.5	3.3	3.3		
	571.5	22.5	336.55	13.25	336.55	13.25	1.5	1.5	6.4	6.4		
444.5 17.5	635	25	355.6	14	355.6	14	6.4	6.4	6.4	6.4		
	571.5	22.5	336.55	13.25	336.55	13.25	1.5	1.5	3.3	3.3		
447.6	17.622	635	25	463.5	18.248	463.5	18.248	3.3	3.3	6.4	6.4	
447.675	17.625	636	25	0.0394	463.55	18.25	463.55	18.25	3.3	3.3	6.4	6.4
449.949	17.7145	594.949	23.4232	368	14.4882	368	14.4882	4	4	8	8	8
457.073	17.995	730.148	28.746	412.75	16.25	419.1	16.5	1.5	1.5	6.4	6.4	
457.2 18	596.9	23.5	276.225	10.875	279.4	11	1.5	1.5	3.3	3.3		
	596.9	23.5	320	12.5984	320	12.5984	3.3	3.3	3.3	3.3		
460*	625		421		421		3	3	9	9		
	625*		421		421		1.5	1.5	6.4	6.4		
462	18.189	596.9	23.5	330.2	13	330.2	13	3.3	3.3	6.4	6.4	
479.425	18.875	679.45	26.75	495.3	19.5	495.3	19.5	3.3	3.3	6.4	6.4	
482.6	19	615.95	24.25	330.2	13	330.2	13	6.4	6.4	6.4	6.4	

## Basic load ratings

Cr Cor

## Designations

## Weight

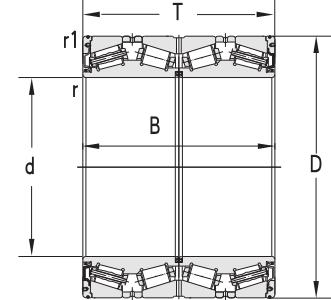
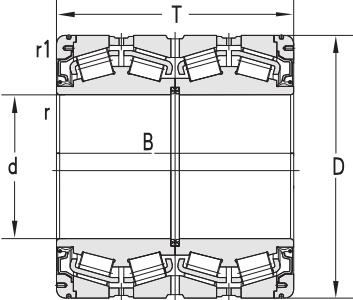
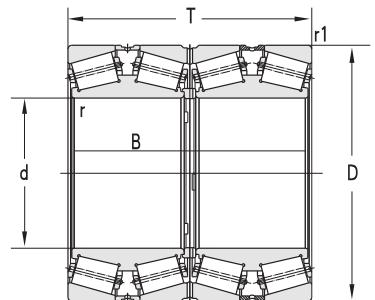
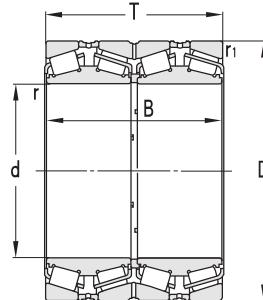
KN	Kg
4150	9450
4200	10000
4900	12500
5900	15200
6850	16300
4700	11600
3470	11500
4150	10400
5400	16500
3550	9500
4700	11500
6500	14500
4800	14200
7500	19800
8100	21800
4900	15700
8800	19000
4400	10500
4700	13500
8050	18400
6450	16900
5400	14500
9850	25000
4860	15200
EE234161D/234215-234216D	182
LM767749DW/LM767710-LM767710D	186
3806/406.4	223
M267949D/M267910-M267910XD	298
EE833161D/833232-833233D	371
M667947DW/M667910-M667910D	206
M667947D/M667910-M667910D	213
M667947DW/M667910-M667910D-XRS/HEC9YB2	205
M268749D/M268710-M268710D	369
LM869449DW/LM869410-LM869410D	199
LM769349D/LM769310-LM769310D	233
EE931070D/931250-931251XD	386
3806/444.5	216
3806/447.6	472
M270749DW/M270710-M270710D	486
M270448DGW/M270410/DB-3	300
3806/457X4	628
L770847DW/L770810-L770810D	202
3806/457.2	234
M271149D/M271110-M271110D	375
M271149DW/M271110-M271110D-XRS/C9YB2	366
3806/462	276
M272749D/M272710-M272710D	586
LM272249DW/LM272210-LM272210D	252

Note: \* indicates the maximum value of ID or OD.

# Four-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 482.6~584.2 mm



## Principal dimensions

d	Chamfer dimensions				rmin(radial)	rmin(axial)	r1min(radial)	r1min(axial)
	D	T	B	mm				
mm	in	mm	in	mm	in	mm	mm	mm
482.6		615.95	24.25	400	16	400	5.3	5.3
		615.95	24.25	406.4	16	330.2	13	1
		615.95	24.25	419.1	16.5	330.2	13	3.5
		615.95	24.25	402.05	15.8287	402.05	1	3.5
		615.95	24.25	420	16.5354	420	1	6.4
		630	24.8031	420	16.5354	420	3.3	6.4
		635	25	421	16.5748	421	3	6.4
		647.7	25.5	417.512	16.4375	417.512	6.4	6.4
				16.4375	417.512	16.4375	3.3	6.4
488.95	19.25	622.3	24.5	365.125	14.375	365.125	6.4	6.4
		622.3	24.5	365.125	14.375	365.125	3	3
489.026	19.253	634.873	24.995	320.675	12.625	320.675	3.3	3.3
501.65	19.75	673.1	26.5	400.05	15.75	387.35	3.3	3.3
		711.2	28	520.7	20.5	520.7	3.3	6.4
508	20	695.325	27.375	415.925	16.375	415.925	3.3	3.3
		762	30	463.55	18.25	463.55	6.4	6.4
514.35	20.25	673.1	26.5	422.275	16.625	422.275	3.3	3.3
519.112	20.4375	736.6	29	536.575	21.125	536.575	3.3	6.4
520.7	20.5	711.2	28	400.05	15.75	400.05	3.3	6.4
536.575	21.125	761.873	29.995	558.8	22	558.8	3.3	6.4
558.8	22	736.6	29	322.265	12.6876	322.268	3.3	6.4
		736.6	29	409.575	16.125	409.575	3.3	6.4
		736.6	29	455.612	17.9375	457.2	3.3	6.4
571.5	22.5	812.8	32	593.725	23.375	593.725	3.3	6.4
584.2	23	730.25	28.75	342.9	13.5	349.25	1.5	6.4
		762	30	396.875	15.625	401.638	3.3	6.4

## Basic load ratings

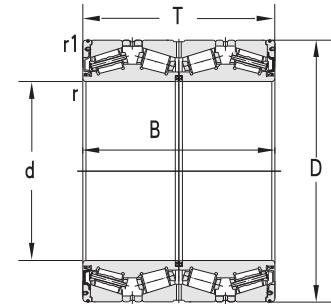
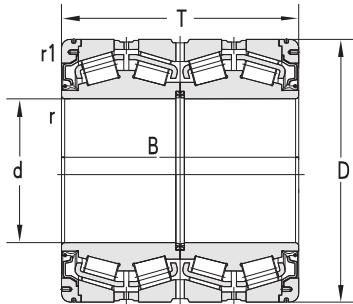
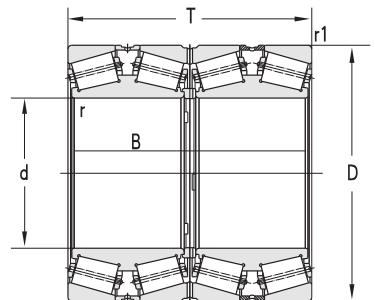
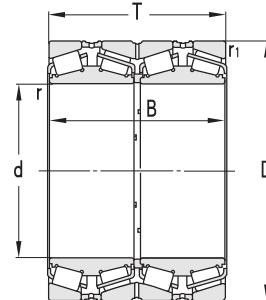
Cr	Cor	Designations		Weight
		KN	Kg	
4700	16000	3806/482.6-XRS/HCEC9YAB		299
4860	15200	3806/482.6-1		251
5000	15200	3806/482.6-2		263
4800	13600	3806/482.6-3		246
5500	17100	3806/482.6-4		292
6400	19000	3806/482.6-5		343
7250	20200	M272449D/M272410-M272410D		362
7200	19800	M272647DW-M272610-M272610D		401
3700	12000	1-7022		262
5500	17000	3806/488X4		266
4750	12000	LM772749DW/LM772710-LM772710D		249
7000	19000	EE641198D/641265-641266D		687
9690	26900	M274149DW/M274110-M274110D		687
5800	19600	LM274049DW/LM274010-LM274010D		464
9800	27000	EE531201D/531300-531301XD		750
7000	21000	LM274449DW/LM274410-LM274410D		408
10800	30000	LM275349D/LM275310-LM275310XD		748
7200	19500	LM275349D/LM275310-LM275310XD		459
10800	31500	M276449DW/M276410-M276410D		832
6200	16000	EE8432DW/843290-843291D		372
6450	19800	LM377449DW/LM377410-LM377410D		478
8400	23000	LM277149DA/LM277110-LM277110D		520
11800	31500	M278749DW/M278710-M278710D		998
6600	16500	3806/584.2		328
7500	22300	LM778549DW/LM778510-LM778510D		486

Note: \* indicates the maximum value of ID or OD.

# Four-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 584.2~708.025 mm



## Principal dimensions

d		D		T		B		Chamfer dimensions			
		mm	in	mm	in	mm	in	rmin(radial)	rmin(axial)	r1min(radial)	r1min(axial)
584.2		901.7	35.5	523.08	20.5937	539.747	21.2499	3.3	3.3	9.7	9.7
558.8	22	736.6	29	409.575	16.125	409.575	16.125	3.3	3.3	6.4	6.4
		736.6	29	409.575	16.125	409.575	16.125	3.3	3.3	6.4	6.4
585.788	23.0625	771.525	30.375	479.425	18.875	479.425	18.875	3.3	3.3	6.4	6.4
		771.525	33.25	479.425	24.25	479.425	24.25	3.3	3.3	6.4	6.4
595.312	23.4375	844.55	33.25	615.95	24.25	615.95	24.25	3.3	3.3	6.4	6.4
596.9	23.5	980		38.5827	604.838	23.8125	609.6	24	6.4	6.4	12.7
603.25	23.75	857.25	33.75	622.3	24.5	622.3	24.5	8.7	12.7	8.3	6.5
		857.25	33.75	622.3	24.5	622.3	24.5	3.3	3.3	6.4	6.4
609.6	24	787.4	31	361.95	14.25	361.95	14.25	3.3	3.3	6.4	6.4
		813.562	32.03	622.3	24.5	622.3	24.5	3.3	3.3	6.4	6.4
		863.6	34	660.4	26	660.4	26	3.3	3.3	6.4	6.4
635	25	901.7	35.5	654.05	25.75	654.05	25.75	3.3	3.3	6.4	6.4
646.112	25.4375	857.25	33.75	542.925	21.375	542.925	21.375	3.3	3.3	6.4	6.4
657.225	25.875	933.45	36.75	676.275	26.625	676.275	26.625	3.3	3.3	6.4	6.4
660.4	26	812.8	32	356.125	14.375	356.125	14.375	3.3	3.3	6.4	6.4
679.45	26.75	901.7	35.5	552.45	21.75	552.45	21.75	3.3	3.3	6.4	6.4
682.625	26.875	965.2	38	701.675	27.625	701.675	27.625	3.3	3.3	6.4	6.4
685.8	27	876.3	34.5	352.425	13.875	355.6	14	SP	SP	6.4	6.4
		876.3	34.5	352.425	13.875	355.6	14	3.3	3.3	6.4	6.4
708.025	27.875	930.275	36.625	565.15	22.25	565.15	22.25	3.3	3.3	SP	SP

## Basic load ratings

### Designations

### Weight

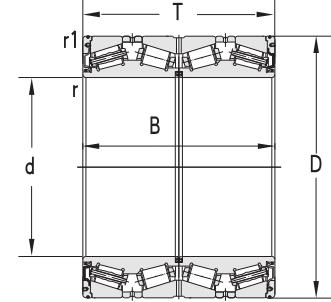
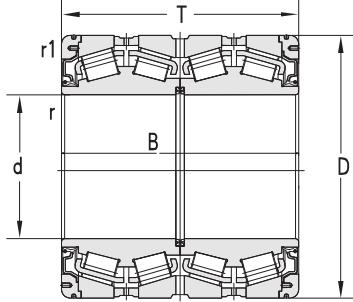
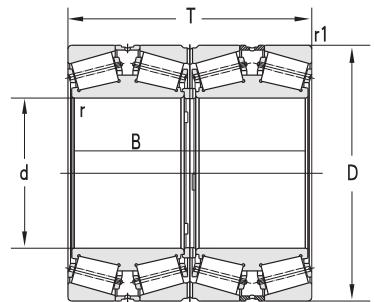
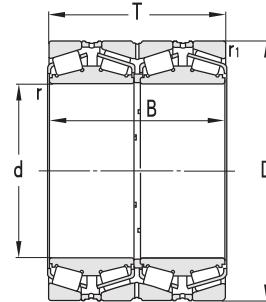
Cr	Cor	KN	Kg
12800	27500	EE665231D/665355- 665336D	1250
6430	20500	LM377449D/LM377410- LM377410D/HE	460
6430	20500	LM377449D/LM377410- LM377410D/HEC9	460
9000	24200	LM278849D/LM278810- LM278810D- XRS	600
10000	29800	LM278849D/LM278810- LM278810D	621
17200	38500	M280049D/M280010- M280010D	1180
16000	36000	3806/596.9	1910
14000	38900	M280249DWA6/M280210A6- M280210D	1168
14000	38900	M280249D/M280210- M280210XD	1168
7100	22000	EE649241D/649310- 649311D	460
10500	30000	3806/609.6	716
14800	41000	M280349D/M280310- M280310D	1230
15000	44500	M281049D/M281010- M281010D	1430
11300	33500	LM281049DW/LM281010- LM281010D	859
16500	48500	M281649D/M281610- M281610D	1580
5300	19800	L281149DW/L281110- L281110D	403
12800	38500	LM281849DW/LM281810- LM281810D	980
17400	50000	M282249D/M282210- M282210D	1714
5800	14500	3806/685.8- XRS/HCC9	490
7500	19800	EE655271DW/655345- 655346D	506
12000	38500	LM282549DW/LM282510- LM282510D	1040

Note: \* indicates the maximum value of ID or OD.

# Four-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 711.2~1139.825 mm



Principal dimensions				Chamfer dimensions											
d	D	T	B	rmin(radial)	rmin(axial)	r1min(radial)	r1min(axial)	mm	in	mm	in	mm	in	mm	
711.2	28	914.4	36	317.5	12.5	317.5	12.5	3.3	SP	3.3	SP	6.4	7.5	6.4	
		914.4	36	390		390									
714.375	28.125	1016	40	704.85	27.75	704.85	27.75	3.3		3.3		6.4		6.4	
717.55	28.25	946.15	37.25	565.15	22.25	565.15	22.25	3.3		3.3		6.4		6.4	
730.25	28.75	1035.05	40.75	755.65	29.75	755.65	29.75	3.3		3.3		6.4		6.4	
749.3	29.5	990.6	39	605	23.8189	605	23.8189	3.3	SP	3.3	SP	6.4	12.7	6.4	
		1066.8	42	723.9	28.5	736.6	29								
762	30	1066.8	42	723.9	28.5	736.6	29	SP	SP	12.7		12.7		12.7	
		1079.5	42.5	787.4	31	787.4	31	4.8	4.8	12.7		12.7		12.7	
812.8	32	1143	45	768.35	30.25	768.35	30.25	6.4		6.4		12.7		12.7	
825.5	32.5	1168.4	46	844.55	33.25	844.55	33.25	4.8		4.8		12.7		12.7	
863.6	34	1130.3	44.5	669.925	26.375	669.925	26.375	4.8		4.8		12.7		12.7	
		1169.987	46.0625	844.55	33.25	844.55	33.25	4.8		4.8		12.7		12.7	
		1181.1	46.5	666.75	26.25	666.75	26.25	4.8		4.8		12.7		12.7	
		1219.2	48	876.3	34.5	889	35	4.8		4.8		12.7		12.7	
877.888	34.5625	1220	48.0315	844.55	33.25	844.55	33.25	4.8		4.8		12.7		12.7	
901.7	35.5	1295.4	51	901.7	35.5	914.4	36	4.8		4.8		12.7		12.7	
938.213	36.9375	1270	50	825.5	32.5	825.5	32.5	4.8		4.8		12.7		12.7	
939.8	37	1333.5	52.5	952.5	37.5	952.5	37.5	4.8		4.8		12.7		12.7	
1003.3	39.5	1358.9	53.5	800.1	31.5	800.1	31.5	4.8		4.8		12.7		12.7	
1139.825	44.875	1509.712	59.4375	923.925	36.375	923.925	36.375	4.8		4.8		12.7		12.7	

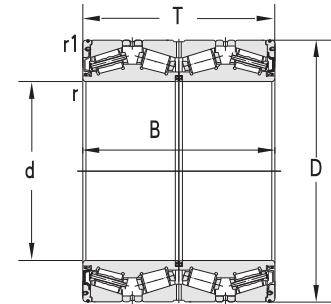
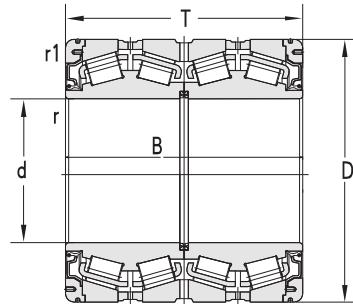
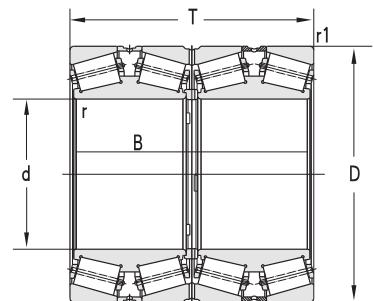
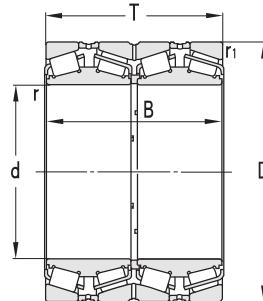
Basic load ratings	Designations	Weight	
		Cr	Cor
KN			Kg
7000	19200	EE755281D/755360- 755361D	524
7900	20100	3806/711X4- XRS	620
18500	52500	M383240DGW/M383210- M383210D	1940
13000	40000	LM282847DW/M282810- M282810D	1080
19800	20200	M283449DW/M283410- M283410D	2160
14500	45000	LM283649D/LM283610- LM283610D	1240
19500	58000	EE325296DGW/325420- 325421XD	2240
21000	58000	M284148DW/M284111- M284110D	2100
21800	65000	M284249DW/M284210- M284210D	2490
21000	62500	3806/812.8	2600
25600	76000	M285848DW/M285810- M285810D	3040
19500	61500	LM286249DW/LM286210- LM286210D	2000
23200	76000	3806/863.6	2690
20000	56500	LM286449D/LM286410- LM286410D	2140
27900	81000	EE547341D/547480- 547481D	3480
25000	76000	3806/877X4	3090
30000	86000	EE634356D/634510- 634510D	4180
25500	81000	LM287649D/LM287610- LM287610D	3220
31500	94500	LM287849DW/LM287810- LM287810D	4500
27200	81000	3806/1003.3	3460
33000	106000	3806/1139X4	4850

Note: \* indicates the maximum value of ID or OD.

# Four-Row Tapered Roller Bearings (Inch)

**ZWZ**

d 1200.15~1346.2 mm



## Principal dimensions

d	D		T		B		Chamfer dimensions				
	mm	in	mm	in	mm	in	rmin(radial)	rmin(axial)	r1min(radial)	r1min(axial)	
1200.15	47.25	1593.85	62.75	990.6	39	990.6	39	4.8	4.8	12.7	12.7
1346.2	53	1729.74	68.1	1143	45	1143	45	5	5	12	12

## Basic load ratings

Cr Cor Designations

Weight

KN

Kg

37500 124000 LM288949D/LM288910- LM288910D

5640

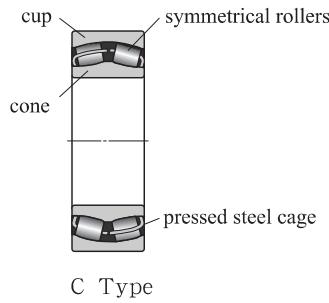
49000 162000 3806/1346.2

6970

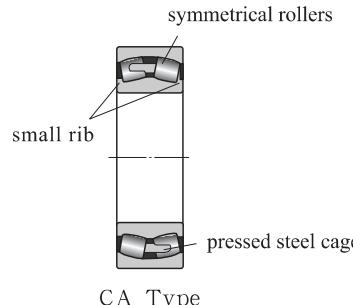
## Product Characteristics

Two rows of spherical rollers are put between the spherical raceways on the outer ring and the two grooves on the inner ring for self-aligning roller bearings. Since the curve center of outer ring is same as the center of the whole bearing arrangement, these bearings are self-aligned and automatically adjust the bending of the shaft and housing and the eccentricity. Except radial load, these bearings also can carry combined axial and radial load in double direction. The especial carrying load capacity makes these bearings suitable for heavy load and shock load.

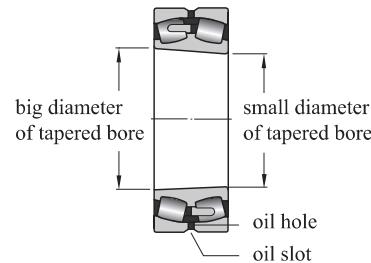
Self-aligning roller bearings are mainly used in various kinds of machinery such as metallurgic machinery, mining machinery, paper machinery, textile machinery, electrical machinery. They are used widely in mechanical industry.



C Type



CA Type



## Types of bearings

ZWZ spherical roller bearings can be divided into the following types:

- Self-aligning roller bearings with cylindrical bores
- Self-aligning roller bearings with tapered bores.
- Self-aligning roller bearings used in vibration riddles.
- Split Self-aligning roller bearings
- Self-aligning roller bearings with cylindrical bores

These bearings can be divided into CA and C versions according to inner rings (with or without ribs) and cages. The CA version Self-aligning roller bearings with solid cages with double claws which are made of brass or carbon steel, have two small ribs on two ends of the inner ring ,no ribs at the middle, this version is mostly used on large size and extra large size bearings. The C version of Self-aligning roller bearings with pressed steel cage do not have rib on inner ring, and have movable central ring in the middle. Their rollers are guided by themselves. The rating load of these bearings are increased due to longer length of rollers, they have higher limit rotational speed and lower friction consumption.

### ● Self-aligning roller bearings with tapered bores

The features of Self-aligning roller bearings with tapered bores are same as Self-aligning roller bearings with cylindrical bore. The difference is that their inner bore is tapered, normally the tapered is 1:12.and is denoted with the suffix K. The tapered 1:30 is applicable for 240 and 241 series, denoted with suffix K30.

Self-aligning roller bearings with tapered bore can be mounted directly on conical shaft necks by nuts, and also can be fixed on shafts with cylindrical bore by adapter sleeve or withdrawal sleeve.

### ● Vibration riddles spherical roller bearings

The new version vibration resistance Self-aligning roller bearings are developed by ZWZ especially for vibration machinery. They can be used on universal machinery. They have heavier load carrying capacity, resistant shock, vibration resistance, small friction, lower temperature rise and longer service life.

These bearings have the same boundary dimension as the basic version, and have fixed center ribs on the inner rings, they can carry axial load. The new design with special structure of cage, double guides by inner and outer diameter, can control the guide gap and displacement between the cage, inner and outer rings, prevents from vibration and reduces vibration.

The code name of vibration riddles Self-aligning roller bearings is denoted with the suffix VB.

### ● Split spherical roller bearings

These bearings are mainly used in the applications where it is difficult to touch bearings or separable bearings are used, and the broken down cost is expensive. For example, cranks.

ZWZ can manufacture different structures of split self-aligning roller bearings according to customer's demands. In order to meet the requirements of mounting, the split inner rings and outer rings are normally adopted. The jamming rings on the two sides of wide inner rings make the mounting easy.

The code name of split Self-aligning roller bearings is denoted with .the suffix D.

## Dimension Scope:

The boundary dimensions of ZWZ spherical roller bearing are listed in the bearings dimensions datasheet.

Bore diameter dimension range:30 mm to 1800mm

Outside diameter dimension range:68mm to 2180mm

Width dimension range: 20mm to 530mm

## Tolerance

ZWZ manufactures Self-aligning roller bearings with P0 and P6 precision grades. Also ZWZ can manufacture self-aligning roller bearings with P5 according to customer's demands. All the tolerance values conform to GB307.1 standard. All the tolerance values are listed in the preface tables.

## Radial clearance

ZWZ manufactures self-aligning roller bearings with C0, C2, C3, C4 and C5 clearances all the conform to GB4604 standard. The C3 group clearances are taken as standard clearance for Self-aligning roller bearings with tapered bores. The radial clearance values are listed in the preface tables and these values are adapted to bearings without load.

ZWZ can manufacture self-aligning roller bearings with non standard clearances according to customer's demands.

The clearance of Self-aligning roller bearings applied to vibration riddles is C4 group clearance.

## Cage

Normally, CA version Self-aligning roller bearings use brass, bronze cages or carbon steel solid cages. But C version Self-aligning roller bearings use normally steel sheet pressed cages. Please contact ZWZ in advance if you need Self-aligning roller bearings with non standard cages.

## The equivalent load

The equivalent dynamic load

When  $F_a/F_r \leq e$ ,

$P = F_r + Y_1 F_a$

When  $F_a/F_r > e$ ,

$P = 0.67F_r + Y_2 F_a$

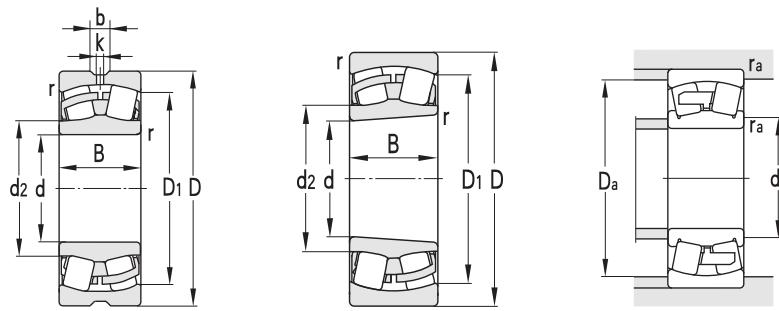
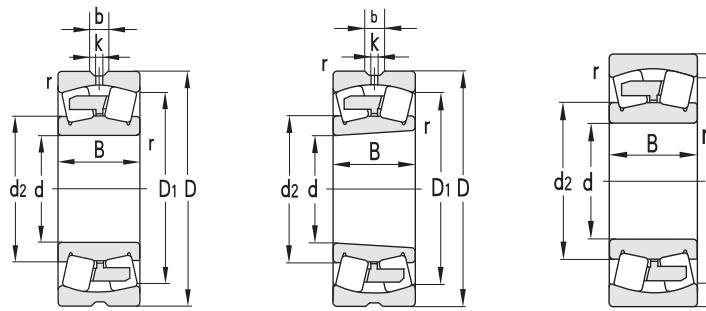
The factors e, Y1 and Y2 are listed in the bearing dimension tables.

The equivalent static load

$P_0 = F_r + Y_0 F_a$

The factors Y0 are listed in the bearing dimension tables.

d 30~55 mm



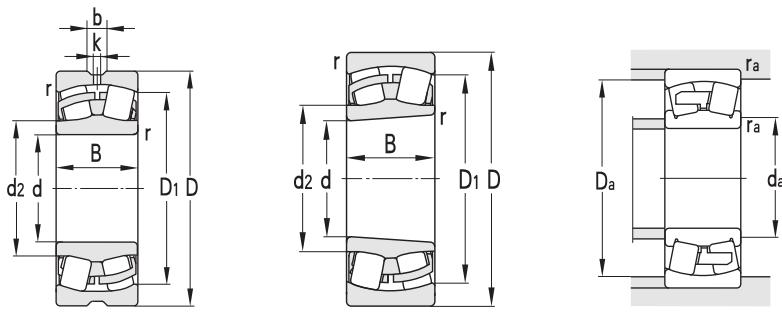
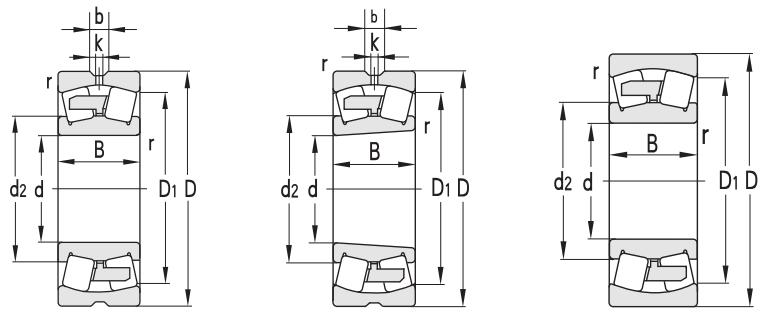
Principal dimensions			Basic load ratings		Limit speed ratings		Designations		
d	D	B	rsmin	Cr	Cor	Grease	Oil		
mm			KN		r/min				
30	68	20	1	51	54	6000	7500	22206X1CAN	
40	80	23	1.1	77.5	88.5	6000	7500	22208C/W33	
	80	23	1.1	77.5	88.5	6000	7500	22208CK	
	90	33	1.5	116	130	4500	5600	22308CA	
	90	33	1.5	116	130	4500	5600	22308CAK/W33	
	90	33	1.5	120	130	4500	5600	22308C	
	90	33	1.5	120	130	4500	5600	22308CK/W33	
45	85	23	1.1	88.6	95	5300	6700	22209CA	
	100	36	1.5	140	168	3800	4800	22309CA	
	100	36	1.5	140	168	3800	4800	22309CAK/W33	
	100	36	1.5	140	168	3800	4800	22309CAK	
50	90	23	1.1	78.1	95	5000	6300	22210CA	
	90	23	1.1	78.5	96	5000	6300	22210/W33	
	90	23	1.1	78.1	95	5000	6300	22210CAK/W33	
	90	23	1.1	85	101	5000	6300	22210C	
	110	27	2	129	129	3400	4300	21310CA/C3	
	110	40	2	181	208	3400	4300	22310C/W33	
	110	40	2	181	208	3400	4300	22310CK/W33	
	110	40	2	181	208	3400	4300	22310CA/W33	
	110	40	2	181	208	3400	4300	22310CA/W33A	
	110	40	2	181	208	3400	4300	22310CAK	
	55	100	25	1.5	106	126	4500	5600	22211CA
	100	25	1.5	106	126	4500	5600	22211CAK	
	100	25	1.5	101	126	4500	5600	22211/W33	
	100	25	1.5	101	126	4500	5600	22211K/W33	
	100	25	1.5	116	126	4500	5600	22211C	
	100	25	1.5	116	126	4500	5600	22211CK/W33	
	120	43	2	213	248	3200	4000	22311C	
	120	43	2	193	230	3200	4000	22311CA/W33	
	120	43	2	193	230	3200	4000	22311CA/YB2	
	120	43	2	193	230	3200	4000	22311CAK/W33	
	120	43	2	213	248	3200	4000	22311CK	

Other dimensions				Contact surface and chamfer dimensions			Calulation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm	mm	mm	mm	mm	mm	mm					Kg
41	52.3						37	60	1	0.32	2.09
50.4	68.9	5.5	2	47	73	1	0.28	2.40	3.50	2.50	0.523
50.4	68.9	5.5	2	47	73	1	0.28	2.40	3.50	2.50	0.521
56	74	5.5	2.5	49	81	1.5	0.39	1.73	2.58	1.69	1.01
56	74	5.5	2.5	49	81	1.5	0.39	1.73	2.58	1.69	0.983
56	74	5.5	2.5	49	81	1.5	0.38	1.80	2.70	1.80	1.01
56	74	5.5	2.5	49	81	1.5	0.38	1.80	2.70	1.80	0.986
57.6	73	5.5	2	52	78	1	0.28	2.40	3.50	2.50	0.629
57.4	81.4	5.5	2	54	91	1.5	0.26	2.60	3.90	2.50	1.56
63	81.4	5.5	2.5	54	91	1.5	0.38	1.80	2.60	1.70	1.52
63	81.4	5.5	2.5	54	91	1.5	0.38	1.80	2.60	1.70	1.52
62.2	81.6	5.5	2	57	83	1	0.26	2.60	3.90	2.50	0.630
63	81.6	5.5	2	57	83	1	0.27	2.50	3.70	2.50	0.629
62.2	81.6	5.5	2	57	83	1	0.26	2.60	3.90	2.50	0.630
62.5	81.6	5.5	2	57	83	1	0.25	2.60	3.90	2.50	0.642
69	92			60	100	2	0.24	2.80	4.20	2.80	1.34
62.9	90.6	5.5	2.5	61	100	2	0.38	1.80	2.70	1.80	1.96
62.9	90.6	5.5	2.5	61	100	2	0.38	1.80	2.70	1.80	1.89
69	90.6	5.5	2.5	60	100	2	0.38	1.80	2.60	1.70	2.17
69	90.6	5.5	2.5	60	100	2	0.38	1.80	2.60	1.70	2.06
69	90.6	5.5	2.5	60	100	2	0.38	1.80	2.60	1.70	2.13
68.8	87.3	5.5	2	64	91	1.5	0.25	2.70	4.00	2.60	0.887
68.8	87.3	5.5	2	64	91	1.5	0.25	2.70	4.00	2.60	0.879
70	87.3	5.5	2	64	91	1.5	0.26	2.60	3.90	2.50	0.742
70	87.3	5.5	2	64	91	1.5	0.26	2.60	3.90	2.50	0.724
65.7	87.3	5.5	2	62	91	1.5	0.24	2.80	4.20	2.80	0.856
65.7	87.3	5.5	2	62	91	1.5	0.24	2.80	4.20	2.80	0.844
69	99.5	5.5	2.5	65	110	2	0.37	1.90	2.90	1.80	2.37
75	99.5	5.5	2.5	65	110	2	0.37	1.80	2.70	1.80	2.60
75	99.5	5.5	2.5	65	110	2	0.37	1.80	2.70	1.80	2.60
75	99.5	5.5	2.5	65	110	2	0.37	1.80	2.70	1.80	2.42
69	99.5	5.5	2.5	65	110	2	0.37	1.90	2.90	1.80	2.32

# Spherical Roller Bearings

**ZWZ**

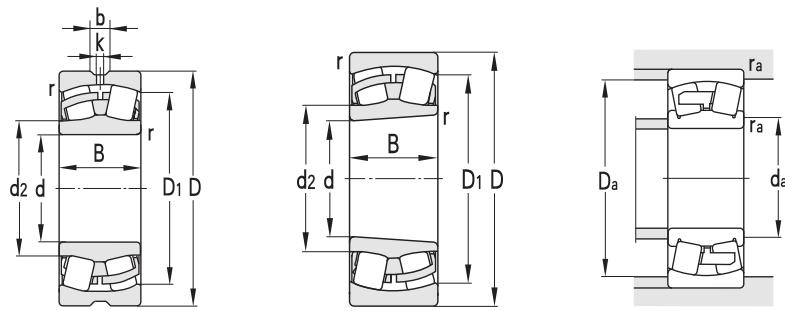
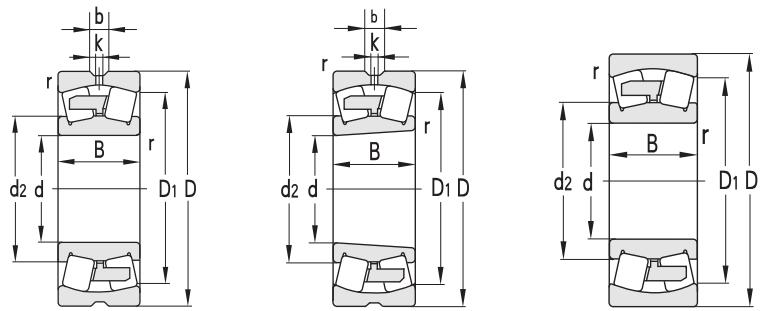
d 60~70 mm



Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Grease	Oil	Designations
				rsmin	Cr	Cor	r/min			
60	110	28	1.5	126	154	4000	5000	22212CA	22212CA/W33	
	110	28	1.5	126	154	4000	5000	22212CAK/W33	22212CA-2RS/S0	
	110	28	1.5	121	145	4000	5000	22212	22212/W33	
	110	28	1.5	120	150	4300	5300	22212C	22212C/W33	
	110	28	1.5	120	150	4300	5300	22212CK	22212CK/W33	
	130	46	2.1	243	286	2800	3600	22312C	22312C/W33	
	130	46	2.1	243	286	2800	3600	22312CK	22312CK/W33	
	130	46	2.1	225	248	3000	3800	22312K	22312K/W33	
	130	46	2.1	233	284	3000	3800	22312CA	22312CA/W33	
	130	46	2.1	233	284	3000	3800	22312CA/YB2	22312CAF3	
	130	46	2.1	233	284	3000	3800	22312CAK		
65	120	31	1.5	149	193	3800	4800	22213CA	22213CA/W33	
	120	31	1.5	149	193	3800	4800	22213CAK	22213CAK/W33	
	120	31	1.5	143	175	3800	4800	22213	22213/W33	
	120	31	1.5	143	175	3800	4800	22213K	22213K/W33	
	120	31	1.5	155	195	3800	4800	22213C	22213C/W33	
	120	31	1.5	155	195	3800	4800	22213CK	22213CK/W33	
	140	33	2.1	173	200	2800	3600	21313CA		
	140	48	2.1	265	325	2600	3400	22313C	22313C/YB2	
	140	48	2.1	265	325	2600	3400	22313C	22313C/W33	
	140	48	2.1	262	325	2600	3400	22313CA	22313CA/W33	
	140	48	2.1	262	325	2600	3400	22313CAF3	22313CAF3	
	140	48	2.1	262	325	2600	3400	22313CAK	22313CAK/W33	
	140	48	2.1	262	325	2600	3400	22313CK	22313CK/W33	
70	125	31	1.5	155	205	3600	4500	22214CA	22214CA/W33	
	125	31	1.5	155	205	3600	4500	22214CAK		
	125	31	1.5	159	200	3600	4500	22214	22214/W33	
	125	31	1.5	170	220	3600	4500	22214C	22214C/W33	
	125	31	1.5	170	220	3600	4500	22214CK	22214CK/W33	
	150	35	2.1	205	233	2400	3200	21314CA		
	150	51	2.1	315	390	2200	3000	22314C	22314C/W33	
	150	51	2.1	315	390	2200	3000	22314CK	22314CK/W33	
	150	51	2.1	330	360	2200	3000	22314CA	22314CA/W33	
	150	51	2.1	330	360	2200	3000	22314CAK	22314CAK/W33	

Other dimensions	Contact surface and chamfer dimensions					Caluation Factor					Weight
	d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0
75.2	95	5.5	2	69	101	1.5	0.24	2.80	4.20	2.80	1.01
75.2	95	5.5	2	69	101	1.5	0.24	2.80	4.20	2.80	0.982
75.5	95	5.5	2	69	101	1.5	0.27	2.50	3.70	2.50	1.09
75.5	95	5.5	2	69	101	1.5	0.24	2.80	4.20	2.80	1.11
81.4	108	5.5	3	72	118	2	0.37	1.90	2.90	1.80	3.25
81.4	108	5.5	3	72	118	2	0.37	1.90	2.90	1.80	3.21
79	108	5.5	3	72	118	2	0.40	1.68	2.50	1.64	2.86
81.4	108	5.5	3	72	118	2	0.37	1.80	2.70	1.80	3.33
81.4	108	5.5	3	72	118	2	0.37	1.80	2.70	1.80	3.33
81.4	108	5.5	3	72	118	2	0.37	1.80	2.70	1.80	3.33
81.5	103	5.5	2.5	74	111	1.5	0.25	2.70	4.00	2.50	1.56
81.5	103	5.5	2.5	74	111	1.5	0.25	2.70	4.00	2.50	1.52
82	103	5.5	2.5	74	111	1.5	0.27	2.50	3.70	2.50	1.57
82	103	5.5	2.5	74	111	1.5	0.27	2.50	3.70	2.50	1.54
81.5	103	5.5	2.5	74	111	1.5	0.25	2.70	4.00	2.50	1.55
87.9	119			77	128	2	0.25	2.70	4.00	2.60	2.58
81.4	116			77	128	2	0.35	1.90	2.90	1.80	4.97
88.6	116	5.5	3	77	128	2	0.35	1.90	2.90	1.80	4.92
88.6	116	5.5	3	77	128	2	0.35	1.90	2.90	1.80	4.92
88.6	116	5.5	3	77	128	2	0.35	1.90	2.90	1.80	4.90
88.6	116	5.5	3	77	128	2	0.35	1.90	2.90	1.80	4.90
88.6	116	5.5	3	77	128	2	0.35	1.90	2.90	1.80	4.88
86.8	109	6	2.5	79	116	1.5	0.24	3.00	4.60	2.80	1.83
86.8	109	6	2.5	79	116	1.5	0.24	3.00	4.60	2.80	1.81
87.2	109	6	2.5	79	116	1.5	0.26	2.60	3.90	2.50	1.66
86.8	109	6	2.5	79	116	1.5	0.24	3.00	4.60	2.80	1.63
95.4	127			82	138	2	0.25	2.70	4.00	2.60	3.02
95.8	125	8.3	4	82	138	2	0.35	1.90	2.90	1.80	4.48
95.8	125	8.3	4	82	138	2	0.35	1.90	2.90	1.80	4.45
95.8	125	8.3	4	82	138	2	0.35	1.90	2.90	1.80	5.23
95.8	125	8.3	4	82	138	2	0.35	1.90	2.90	1.80	5.21

d 70~85 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	B	rsmin	Cr	Cor	Grease	Oil	

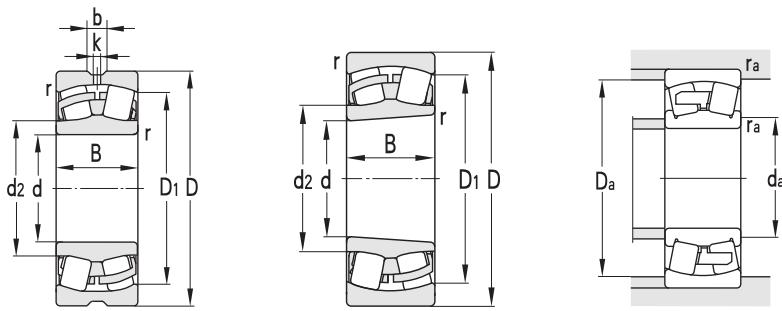
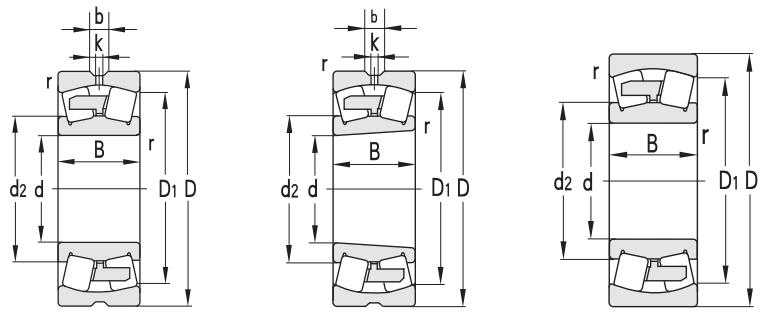
			KN		r/min				
mm	mm	mm	KN	KN	r/min	r/min			
70	150	51	2.1	330	360	2200	3000	22314CAF3	22314CAKF3
75	115	40	1.1	160	250	2900	3500	24015CA	24015CA/W33
	130	31	1.5	160	208	3400	4300	22215CA	22215CA/W33
	130	31	1.5	160	208	3400	4300	22215CAK	
	130	31	1.5	160	208	3400	4300	22215C	22215C/W33
	130	31	1.5	160	208	3400	4300	22215CK	22215CK/W33
	160	55	2.1	345	420	2200	3000	22315C	22315C/W33
	160	55	2.1	345	420	2200	3000	22315CK	22315CK/W33
	160	55	2.1	345	420	2200	3000	22315CA	22315CA/W33
	160	55	2.1	345	420	2200	3000	22315CAF3	22315CAF3/W33
	160	55	2.1	345	420	2200	3000	22315CAK	22315CAK/W33
80	140	33	2	165	225	3200	4000	22216C	22216C/W33
	140	33	2	165	225	3200	4000	22216CK	22216CK/W33
	140	33	2	165	225	3200	4000	22216CA	22216CA/W33
	140	33	2	165	225	3200	4000	22216CAK	
	170	58	2.1	395	500	2000	2800	22316C	22316C/W33
	170	58	2.1	395	500	2000	2800	22316CK	22316CK/W33
	170	58	2.1	380	495	2000	2800	22316CA	22316CA/W33
	170	58	2.1	380	495	2000	2800	22316CA/HAC9W33YA8	
	170	58	2.1	380	495	2000	2800	22316CAF3	
	170	58	2.1	380	495	2000	2800	22316CAK	
85	150	36	2	220	290	2800	3600	22217C	22217C/W33
	150	36	2	220	290	2800	3600	22217CK	22217CK/W33
	150	36	2	193	254	3000	3800	22217CA	22217CA/W33
	150	36	2	193	254	3000	3800	22217CAK	
	180	41	3	294	360	2000	2800	21317CA	
	180	60	3	430	545	1900	2600	22317C	22317C/W33
	180	60	3	430	545	1900	2600	22317CK	22317CK/W33
	180	60	3	391	505	1900	2600	22317CA	22317CA/W33
	180	60	3	391	505	1900	2600	22317ACA	
	180	60	3	391	505	1900	2600	22317CAF3	
	180	60	3	391	505	1900	2600	22317CAK	22317CAK/W33
	180	60	3	391	505	1900	2600	22317CAKF3	22317CAKF3/W33

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
											Kg
95.8	125			82	138	2	0.35	1.90	2.90	1.80	5.14
87.5	100	5.5	3	82	106	1	0.32	2.09	3.11	2.04	4.48
92	114	5.5	2.5	84	121	1.5	0.24	3.00	4.60	2.80	4.71
92	114			84	121	1.5	0.24	3.00	4.60	2.80	4.67
92	114	5.5	2.5	84	121	1.5	0.24	3.00	4.60	2.80	4.71
92	114	5.5	2.5	84	121	2	0.24	3.00	4.60	2.80	4.70
101	133	8.3	4	87	148	2	0.35	1.90	2.90	1.80	5.39
101	133	8.3	4	87	148	2	0.35	1.90	2.90	1.80	5.37
101	133	8.3	4	87	148	2	0.35	1.90	2.90	1.80	5.44
101	133	8.3	4	87	148	2	0.35	1.90	2.90	1.80	5.40
101	133	8.3	4	87	148	2	0.35	1.90	2.90	1.80	5.32
98.9	122	5.5	2.5	91	129	2	0.22	3.00	4.60	2.80	2.10
98.9	122	5.5	2.5	91	129	2	0.22	3.00	4.60	2.80	2.09
98.9	122	5.5	2.5	91	129	2	0.24	2.80	4.20	2.80	2.08
98.9	122			91	129	2	0.24	2.80	4.20	2.80	2.03
109	142	8.3	4	92	158	2	0.34	1.90	2.90	1.80	6.60
109	142	8.3	4	92	158	2	0.34	1.90	2.90	1.80	6.56
109	142	8.3	4	92	158	2	0.34	1.99	2.96	1.94	7.47
109	142	8.3	4	92	158	2	0.34	1.99	2.96	1.94	7.36
109	142	8.3	4	92	158	2	0.34	1.99	2.96	1.94	7.34
109	142	8.3	4	92	158	2	0.34	1.99	2.96	1.94	7.40
105	132	6.5	3	96	139	2	0.23	3.00	4.60	2.80	2.73
105	132	6.5	3	96	139	2	0.23	3.00	4.60	2.80	2.64
105	132	6.5	3	96	139	2	0.24	2.80	4.20	2.80	2.69
105	132			96	139	2	0.24	2.80	4.20	2.80	2.64
118	152			99	166	2.5	0.24	2.80	4.20	2.80	5.42
105	150	8.3	4	99	166	2.5	0.33	2.00	3.00	2.00	7.38
105	150	8.3	4	99	166	2.5	0.33	2.00	3.00	2.00	7.23
115	150	8.3	4	99	166	2.5	0.34	1.99	2.96	1.94	8.19
115	150	8.3	4	99	166	2.5	0.34	1.99	2.96	1.94	8.19
115	150	8.3	4	99	166	2.5	0.34	1.99	2.96	1.94	8.12
115	150	8.3	4	99	166	2.5	0.34	1.99	2.96	1.94	8.08
115	150	8.3	4	99	166	2.5	0.34	1.99	2.96	1.94	8.01

# Spherical Roller Bearings

**ZWZ**

d 90~100 mm



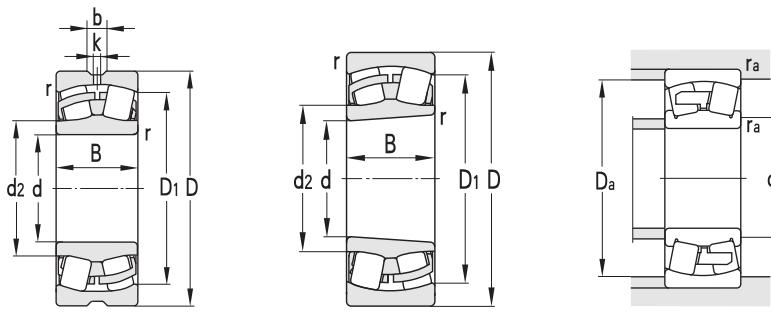
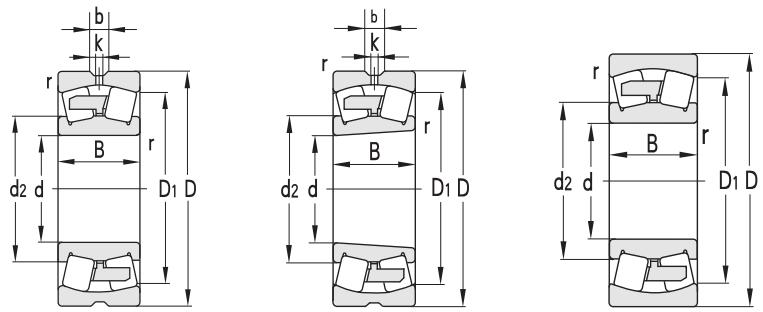
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
	mm				KN		r/min	
90	140	50	1.5	233	390	2600	3400	24018CA 24018CA/W33
	160	40	2	255	375	2600	3400	22218C 22218C/W33
	160	40	2	255	375	2600	3400	22218CK 22218CK/W33
	160	40	2	269	360	2600	3400	22218CA 22218CA/W33
	160	40	2	269	360	2600	3400	22218CAF3
	160	40	2	269	360	2600	3400	22218CAK 22218CAK/W33
	160	52.4	2	287	415	2000	2800	23218
	160	52.4	2	319	475	1900	2600	23218C
	160	52.4	2	319	475	1900	2600	23218CA 23218CA/W33
	160	52.4	2	369	480	1900	2600	23218CA/HAC9SOW24
	160	52.4	2	319	475	1900	2600	23218CAK 23218CAK/W33
	160	67	2	334	475	1900	2600	24218X2CA/YB2
	190	64	3	485	625	1800	2400	22318C 22318C/W33
	190	64	3	485	625	1800	2400	22318CK 22318CK/W33
	190	64	3	485	625	1800	2400	22318CA 22318CA/W33
	190	64	3	485	625	1800	2400	22318CAF3
	190	64	3	485	625	1800	2400	22318CAK 22318CAK/W33
	190	64	3	485	625	1800	2400	22318ACA
	190	64	3	400	505	1800	2400	22318
95	170	43	2.1	284	380	2400	3200	22219C 22219C/W33
	170	43	2.1	284	380	2400	3200	22219CK 22219CK/W33
	170	43	2.1	270	375	2400	3200	22219CA 22219CA/W33
	170	43	2.1	270	375	2400	3200	22219CAK 22219CAK/W33
	200	67	3	535	690	1800	2400	22319C 22319C/W33
	200	67	3	535	690	1800	2400	22319CK 22319CK/W33
	200	67	3	512	685	1800	2400	22319CA 22319CA/W33
	200	67	3	512	685	1800	2400	22319CAF3
	200	67	3	512	685	1800	2400	22319CAKF3 22319CAKF3/W33
100	150	37	1.5	215	400	2400	3200	23020CA
	150	37	1.5	206	325	2400	3200	23020C 23020C/W33
	150	37	1.5	206	325	2400	3200	23020CK 23020CK/W33
	150	50	1.5	271	445	2400	3200	24020CA/W33
	165	52	2	315	510	2000	2800	23120CA 23120CA/W33
	165	52	2	315	510	2000	2800	23120CAK/W33

Other dimensions	Contact surface and chamfer dimensions					Caluation Factor					Weight
	d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0
mm											Kg
106	121	5.5	3	100	125	1.5	0.33	2.00	3.00	2.00	3.25
106	139	8.3	2.5	101	149	2	0.23	2.80	4.20	2.80	4.50
106	139	8.3	2.5	101	149	2	0.23	2.80	4.20	2.80	4.35
111	139	8.3	2.5	101	149	2	0.25	2.70	4.00	2.60	3.40
111	139	8.3	2.5	101	149	2	0.25	2.70	4.00	2.60	3.38
111	139	8.3	2.5	101	149	2	0.25	2.70	4.00	2.60	3.28
111	133			101	149	2	0.35	1.90	2.90	1.80	4.64
106	136			101	149	2	0.31	2.20	3.30	2.20	4.66
112	136	5.5	2.5	101	149	2	0.25	2.70	4.00	2.60	4.82
112	136	5.5	2.5	101	149	2	0.25	2.70	4.00	2.60	4.72
112	136	5.5	2.5	101	149	2	0.25	2.70	4.00	2.60	4.55
112	136			101	149	2	0.31	2.20	3.30	2.20	5.87
123	159	8.3	5	104	176	2.5	0.35	2.00	3.00	2.00	10.1
123	159	8.3	5	104	176	2.5	0.35	2.00	3.00	2.00	9.25
123	159	8.3	5	104	176	2.5	0.34	1.99	2.96	1.94	11.5
123	159	8.3	5	104	176	2.5	0.34	1.99	2.96	1.94	11.2
123	159	8.3	5	104	176	2.5	0.34	1.99	2.96	1.94	11.1
123	159	8.3	5	104	176	2.5	0.34	1.99	2.96	1.94	9.44
121	159			104	176	2.5	0.36	1.87	2.79	1.83	8.62
114	148	8.3	3	107	158	2	0.24	2.80	4.20	2.80	4.16
114	148	8.3	3	107	158	2	0.24	2.80	4.20	2.80	4.07
119	148	8.3	3	107	158	2	0.24	2.80	4.20	2.80	4.68
119	148	8.3	3	107	158	2	0.24	2.80	4.20	2.80	4.48
128	167	8.3	5	109	186	2.5	0.34	2.00	3.00	2.00	10.2
128	167	8.3	5	109	186	2.5	0.34	2.00	3.00	2.00	10.0
128	167	8.3	5	109	186	2.5	0.34	1.99	2.96	1.94	10.5
128	167	8.3	5	109	186	2.5	0.34	1.99	2.96	1.94	10.5
128	167	8.3	5	109	186	2.5	0.34	1.99	2.96	1.94	10.3
116	135			110	140	2	0.23	2.90	4.40	2.80	2.51
116	135	5.5	3	110	140	2	0.22	2.90	4.40	2.80	2.21
116	135	5.5	3	110	140	2	0.22	2.90	4.40	2.80	2.17
115	133	5.5	3	110	140	2	0.30	2.25	3.35	2.20	3.18
121	143	5.5	3	110	155	2	0.30	2.90	4.40	2.80	4.42

# Spherical Roller Bearings

**ZWZ**

d 100~110 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations
d	D	B	rsmin	Cr	Cor	Grease	
mm							
KN							r/min

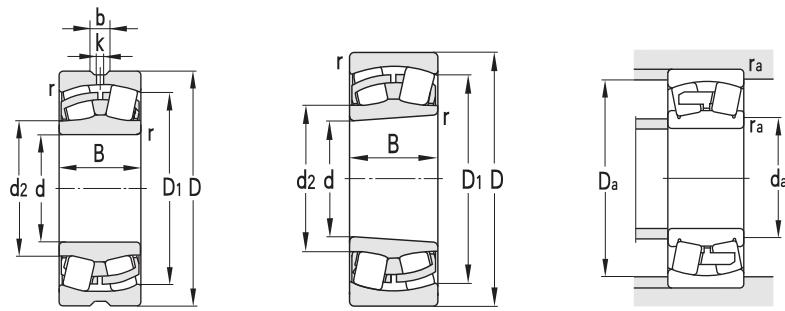
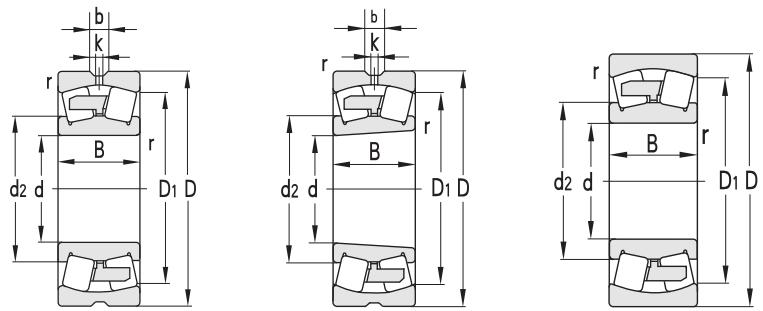
100	165	52	2	310	465	2000	2800	23120K/W33	
	165	52	2	330	515	2000	2800	23120C	23120C/W33
	165	52	2	330	515	2000	2800	23120CK	23120CK/W33
	180	46	2.1	320	425	2200	3000	22220C	22220C/W33
	180	46	2.1	320	425	2200	3000	22220CK	22220CK/W33
	180	46	2.1	305	425	2200	3000	22220CA	22220CA/W33
	180	46	2.1	305	425	2200	3000	22220CAF3	22220CAF3
	180	46	2.1	305	425	2200	3000	22220CAK	22220CAK/W33
	180	60.3	2.1	415	600	1700	2200	23220C	23220C/W33
	180	60.3	2.1	440	570	1700	2200	23220CA	23220CA/W33
	180	60.3	2.1	440	570	1700	2200	23220CAK/W33	23220CAK/F3/W33
	215	73	3	610	800	1700	2200	23230C	23230C/W33
	215	73	3	610	800	1700	2200	23230CK	23230CK/W33
	215	73	3	594	815	1700	2200	23230CA	23230CA/W33
	215	73	3	594	815	1700	2200	23230CAF3	23230CAF3
	215	73	3	594	815	1700	2200	23230CAK	23230CAK/W33
105	175	56	2	402	550	1900	2700	23121CA	23121CAL
	175	56	2	402	550	1900	2700	23121CA/W33	
	175	56	2	365	560	1900	2700	23121C	23121C/W33
	175	56	2	365	560	1900	2700	23121CK	23121CK/W33
110	170	45	2	278	460	2200	3000	23022CA	23022CA/W33
	170	45	2	278	460	2200	3000	23022CAF3	23022CAF3/W33
	170	45	2	288	460	2200	3000	23022C	23022C/W33
	170	45	2	288	460	2200	3000	23022CK	23022CK/W33
	170	60	2	330	580	2100	2800	24022CA	24022CA/W33
	170	60	2	330	580	2100	2800	24022CA/W33A	
	180	56	2	358	580	1900	2600	23122CA	23122CAK/C3W33
	180	56	2	358	580	1900	2600	23122CAF3	
	180	56	2	358	580	1900	2600	23122CAK/F3/W33	
	180	56	2	375	590	1900	2600	23122C	23122C/W33
	180	56	2	375	590	1900	2600	23122CK	23122CK/W33
	180	69	2	479	400	1000	1400	24122C	24122C/W24
	180	69	2	468	750	1000	1400	24122CA	24122CA/W33
200	53	2.1	415	575	2000	2800	22222C	22222C/W33	

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm											Kg
121	143	5.5	3	110	155	2	0.30	2.25	3.35	2.20	4.44
121	143	5.5	3	110	155	2	0.30	2.30	3.40	2.20	4.43
121	143	5.5	3	110	155	2	0.30	2.30	3.40	2.20	4.39
124	156	8.3	3	112	168	2	0.24	2.80	4.20	2.80	5.30
124	156	8.3	3	112	168	2	0.24	2.80	4.20	2.80	5.25
124	156	8.3	3	112	168	2	0.24	2.80	4.20	2.80	5.18
124	156	8.3	3	112	168	2	0.24	2.80	4.20	2.80	5.10
124	156	8.3	3	112	168	2	0.24	2.80	4.20	2.80	4.96
125	153	9.5	4	112	168	2	0.33	2.00	3.00	2.00	6.65
125	153	9.5	4	112	168	2	0.33	2.00	3.00	2.00	6.58
125	153	9.5	4	112	168	2	0.33	2.00	3.00	2.00	6.21
138	179	11.1	5	114	201	2.5	0.35	2.00	3.00	2.00	13.1
138	179	11.1	5	114	201	2.5	0.35	2.00	3.00	2.00	12.9
138	179	11.1	5	114	201	2.5	0.35	1.90	2.90	1.80	13.8
138	179	11.1	5	114	201	2.5	0.35	1.90	2.90	1.80	13.4
138	179	11.1	5	114	201	2.5	0.35	1.90	2.90	1.80	13.8
127	151	5.5	3	115	165	2	0.31	2.20	3.30	2.20	5.48
127	151	5.5	3	115	165	2	0.31	2.20	3.30	2.20	5.35
127	151	5.5	3	115	165	2	0.30	2.20	3.30	2.20	5.36
127	151	5.5	3	115	165	2	0.30	2.20	3.30	2.20	5.19
128	150	7.5	3	120	160	2	0.25	2.70	4.00	2.60	3.54
128	150	7.5	3	120	160	2	0.25	2.70	4.00	2.60	3.50
128	150	7.5	3	120	160	2	0.24	2.90	4.40	2.80	3.68
128	150	7.5	3	120	160	2	0.24	2.90	4.40	2.80	3.57
128	150	5.5	3	120	160	2	0.32	2.09	3.11	2.04	4.98
128	150	5.5	3	120	160	2	0.32	2.09	3.11	2.04	4.90
132	156	5.5	3	120	170	2	0.30	2.25	3.35	2.20	5.73
132	156	5.5	3	120	170	2	0.30	2.25	3.35	2.20	5.73
132	156	5.5	3	120	170	2	0.30	2.25	3.35	2.20	5.51
132	156	5.5	3	120	170	2	0.30	2.30	3.40	2.20	5.69
132	156	5.5	3	120	170	2	0.30	2.30	3.40	2.20	5.67
133	153	6	2.5	120	170	2	0.35	1.90	2.90	1.80	6.90
133	153	5.5	4	120	170	2	0.35	1.90	2.90	1.80	6.92
133	173	8.3	4	122	188	2	0.26	2.70	4.00	2.50	7.32

# Spherical Roller Bearings

**ZWZ**

d 100~120 mm



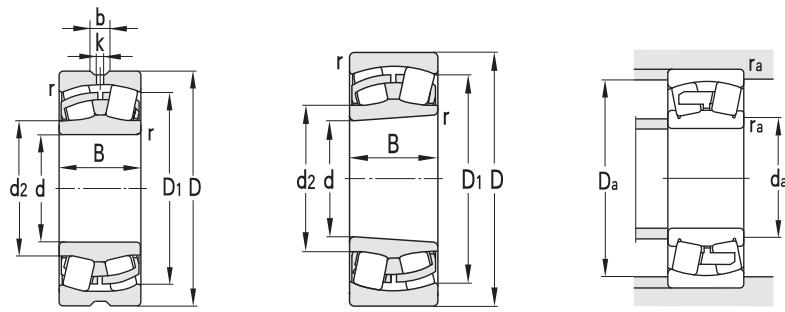
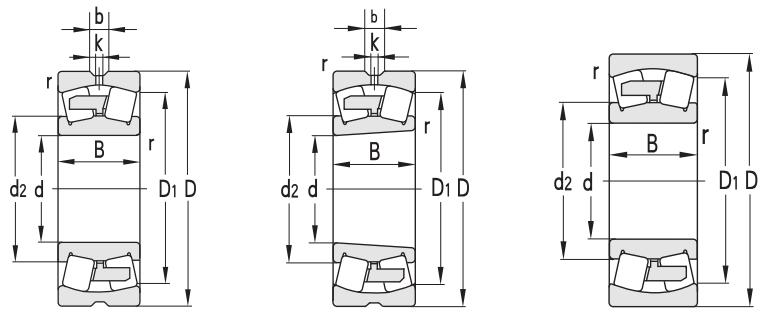
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
100	200	53	2.1	415	575	2000	2800	22222CK 22222CA 22222CAF3
	200	53	2.1	380	545	2000	2800	22222CAK 22222CAKF3
	200	53	2.1	380	545	2000	2800	22222CAK/W33
	200	69.8	2.1	380	545	2000	2800	23222CA 23222CAF3 23222CAF3/W33
	200	69.8	2.1	539	720	1600	2000	23222CAK 23222CAKF3 23222CAK/W33
	200	69.8	2.1	539	720	1600	2000	23222CAK/W33
	200	69.8	2.1	539	720	1600	2000	23222CAKF3 23222CAK/W33
	200	69.8	2.1	490	720	1700	2200	23222CAK/W33
	200	69.8	2.1	550	830	1600	2000	23222C 22322C/W33
	240	80	3	760	995	1600	2000	22322CK 22322CA 22322CAF3
	240	80	3	760	995	1600	2000	22322CAK 22322CAKF3 22322CAK/W33
	240	80	3	693	955	1600	2000	22322CAK/W33
	240	80	3	693	955	1600	2000	22322CAKF3 22322CAK/W33
	240	80	3	693	955	1600	2000	22322CAK
120	180	46	2	290	495	2000	2800	23024C 23024CK 23024CA
	180	46	2	290	495	2000	2800	23024CAK 23024CA/W33
	180	46	2	300	495	2000	2800	23024CAK/W33
	180	46	2	300	495	2000	2800	23024CAKF3/W33
	180	46	2	300	495	2000	2800	24024CA 24024CA/W33
	180	60	2	360	660	1600	2000	24024CA/W513
	180	60	2	360	660	1600	2000	24024CA/W33
	200	62	2	460	715	1800	2400	23124CA 23124CAK/W33
	200	62	2	460	715	1800	2400	23124C 23124C/W33
	200	62	2	460	715	1800	2400	23124CK 23124CK/W33
	200	62	2	430	650	1900	2600	23124/W33
	200	62	2	430	650	1900	2600	23124K
	200	80	2	570	925	1400	1800	24124CA 24124CA/W33
	200	80	2	570	925	1400	1800	24124CAF3
	215	58	2.1	485	680	1900	2600	22224C 22224CK 22224CA
	215	58	2.1	485	680	1900	2600	22224CAK 22224CAF3
	215	58	2.1	490	680	1900	2600	22224CAK/W33
	215	58	2.1	490	680	1900	2600	22224CAKF3 22224CAKF3/W33

Other dimensions	Contact surface and chamfer dimensions					Calulation Factor					Weight
	d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0
mm											Kg
133	173	8.3	4	122	188	2	0.26	2.70	4.00	2.50	7.16
139	173	8.3	4	122	188	2	0.26	2.60	3.90	2.50	7.43
139	173	8.3	4	122	188	2	0.26	2.60	3.90	2.50	7.37
139	173	8.3	4	122	188	2	0.26	2.60	3.90	2.50	7.25
138	168	12	5	122	188	2	0.34	1.99	2.96	1.94	10.1
138	168	12	5	122	188	2	0.34	1.99	2.96	1.94	10.0
138	168	12	5	122	188	2	0.34	1.99	2.96	1.94	9.83
138	168	12	5	122	188	2	0.34	1.99	2.96	1.94	9.77
139	168	12	5	122	188	2	0.35	1.90	2.90	1.80	9.54
138	168	12	5	122	188	2	0.33	2.00	3.00	2.00	9.73
151	197	13.9	6	122	188	2.5	0.34	2.20	3.30	2.20	17.9
151	197	13.9	6	122	188	2.5	0.34	2.20	3.30	2.20	17.7
151	197	13.9	6	122	188	2.5	0.31	2.20	3.30	2.20	18.9
151	197	13.9	6	122	188	2.5	0.31	2.20	3.30	2.20	18.7
151	197	13.9	6	122	188	2.5	0.31	2.20	3.30	2.20	18.5
134	162			130	170	2	0.22	3.00	4.60	2.80	4.19
134	162			130	170	2	0.22	3.00	4.60	2.80	4.32
139	162	5.5	3	130	170	2	0.23	2.90	4.40	2.80	4.44
139	162	5.5	3	130	170	2	0.23	2.90	4.40	2.80	4.42
139	162	5.5	3	130	170	2	0.23	2.90	4.40	2.80	4.34
139	158	5.5	4	130	170	2	0.31	2.20	3.30	2.20	5.83
139	158	5.5	4	130	170	2	0.31	2.20	3.30	2.20	5.79
146	174	5.5	3	130	190	2	0.30	2.30	3.40	2.20	12.4
146	174	5.5	3	130	190	2	0.29	2.40	3.60	2.50	7.97
146	174	5.5	3	130	190	2	0.29	2.40	3.60	2.50	7.96
146	174	5.5	3	130	190	2	0.29	2.40	3.60	2.50	7.97
146	174	5.5	3	130	190	2	0.31	2.20	3.30	2.20	7.73
146	167	5.5	3	130	190	2	0.30	2.30	3.40	2.20	10.6
146	167	5.5	3	130	190	2	0.30	2.30	3.40	2.20	10.5
146	167	5.5	3	130	190	2	0.38	1.80	2.70	1.80	10.0
149	187	11.1	4	132	203	2	0.25	2.60	3.90	2.50	9.78
149	187	11.1	4	132	203	2	0.25	2.60	3.90	2.50	9.66
149	187	11.1	4	132	203	2	0.26	2.60	3.90	2.50	9.87
149	187	11.1	4	132	203	2	0.26	2.60	3.90	2.50	9.76
149	187	11.1	4	132	203	2	0.26	2.60	3.90	2.50	9.68

# Spherical Roller Bearings

**ZWZ**

d 120~130 mm



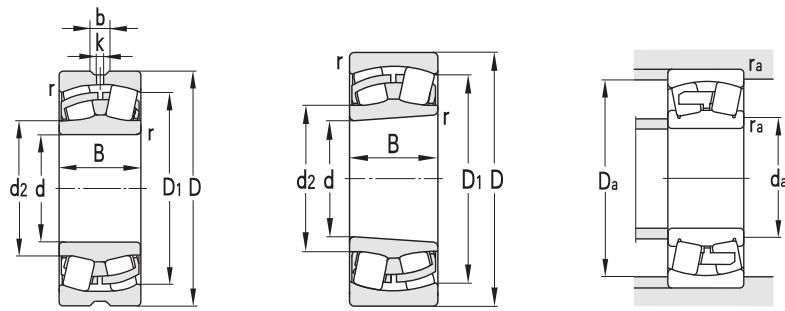
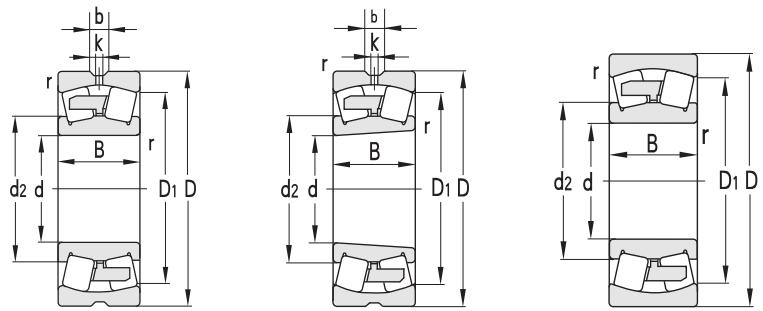
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
mm				KN		r/min		
120	215	76	2.1	615	940	1500	1900	23224CA 23224CAF3/W33 23224CAKF3/W33
	215	76	2.1	615	940	1500	1900	
	215	76	2.1	615	940	1500	1900	
	215	76	2.1	615	940	1500	1900	
	240	100	2.1	570	925	1500	1900	24124X3CA/C9WN33
	260	86	3	840	1120	1400	1800	22324C 22324CK 22324CA 22324CAF3 22324CAKF3/W33
	260	86	3	840	1120	1400	1800	
	260	86	3	840	1100	1400	1800	
	260	86	3	840	1100	1400	1800	
	260	86	3	840	1100	1400	1800	
	260	86	3	840	1100	1400	1800	22324ACA
130	200	52	2	410	680	1900	2600	23026CA 23026CAF3/W33
	200	52	2	410	680	1900	2600	
	200	52	2	410	680	1900	2600	23026CAK 23026CAKF3/W33
	200	52	2	410	680	1900	2600	
	200	52	2	400	650	1900	2600	23026C 23026CA/W33
	200	52	2	400	650	1900	2600	23026CK 24026CA/W33 24026CA/W513
	200	69	2	470	810	1800	2400	
	210	64	2	490	790	1700	2200	23126C 23126CA/W33
	210	64	2	490	790	1700	2200	23126CK 23126CA/W33
	210	64	2	490	790	1700	2200	23126CA 23126CAKF3/W33
	210	64	2	490	790	1700	2200	
	210	80	2	555	980	1700	2200	24126CA 24126CA/W33
	220	73	3	575	905	1700	2200	23226X3CAQ1/HG2P63
	230	64	3	560	805	1800	2400	22226C/W33
	230	64	3	560	805	1800	2400	22226CK 22226CA/W33
	230	64	3	560	805	1800	2400	22226CA 22226CAK 22226CAKF3/W33
	230	64	3	560	805	1800	2400	22226CAK 22226CAKF3
	230	80	3	580	910	1400	1800	23226/W33
	230	80	3	737	1020	1300	1700	23226CA 23226CAF3 23226CAF3/HAC95OW20X
	230	80	3	737	1020	1300	1700	
	230	80	3	737	1020	1300	1700	23226CAK 23226CAKF3
	280	93	4	970	1320	1300	1700	22326C 22326CA/W33

Other dimensions	Contact surface and chamfer dimensions					Calulation Factor					Weight	
	d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm					mm							Kg
150	182	8.3	5	132	203	2	0.35	1.90	2.90	1.80	12.1	
150	182	8.3	5	132	203	2	0.35	1.90	2.90	1.80	12.0	
150	182	8.3	5	132	203	2	0.35	1.90	2.90	1.80	11.9	
150	182	8.3	5	132	203	2	0.34	1.90	2.90	1.80	11.5	
146	167			130	190	2	0.38	1.80	2.60	1.70	21.3	
165	218	13.9	6	134	246	2.5	0.35	1.90	2.90	1.80	23.8	
165	218	13.9	6	134	246	2.5	0.35	1.90	2.90	1.80	21.8	
165	215	13.9	6	134	246	2.5	0.34	1.99	2.96	1.94	23.3	
165	215	13.9	6	134	246	2.5	0.34	1.99	2.96	1.94	23.1	
165	215	13.9	6	134	246	2.5	0.34	1.99	2.96	1.94	22.8	
165	215	13.9	6	134	246	2.5	0.34	1.99	2.96	1.94	21.3	
153	179	9.5	4	140	190	2	0.24	2.80	4.20	2.80	7.04	
153	179	9.5	4	140	190	2	0.24	2.80	4.20	2.80	6.75	
153	179	9.5	4	140	190	2	0.24	2.80	4.20	2.80	6.68	
153	179	9.5	4	140	190	2	0.24	2.80	4.20	2.80	6.57	
153	179	9.5	4	140	190	2	0.24	2.90	4.40	2.80	5.72	
153	179	9.5	4	140	190	2	0.24	2.90	4.40	2.80	5.54	
151	175	5.5	3	140	190	2	0.32	2.09	3.11	2.04	7.76	
156	183	8.3	4	140	200	2	0.28	2.40	3.50	2.50	9.56	
156	183	8.3	4	140	200	2	0.28	2.40	3.50	2.50	9.13	
156	183	8.3	4	140	200	2	0.28	2.40	3.50	2.50	10.7	
156	183	8.3	4	140	200	2	0.28	2.40	3.50	2.50	10.1	
153	180	8.3	4	140	200	2	0.35	1.90	2.90	1.80	10.6	
157	188			140	210	2	0.32	2.09	3.11	2.04	11.3	
162	200	10	5	144	216	2.5	0.26	2.50	3.70	2.50	11.5	
162	200	10	5	144	216	2.5	0.26	2.50	3.70	2.50	11.3	
162	200	10	5	144	216	2.5	0.27	2.50	3.70	2.50	12.4	
162	200	10	5	144	216	2.5	0.27	2.50	3.70	2.50	12.2	
162	200	12	5	144	216	2.5	0.27	2.50	3.70	2.50	12.1	
164	194	12	5	144	216	2.5	0.34	1.99	2.96	1.94	14.9	
161	194	12	5	144	216	2.5	0.33	2.00	3.00	2.00	15.9	
161	194	12	5	144	216	2.5	0.33	2.00	3.00	2.00	15.8	
161	194	12	5	144	216	2.5	0.33	2.00	3.00	2.00	15.8	
178	232	16.7	6	148	262	3	0.34	1.90	2.90	1.80	24.8	

# Spherical Roller Bearings

**ZWZ**

d 130~140 mm



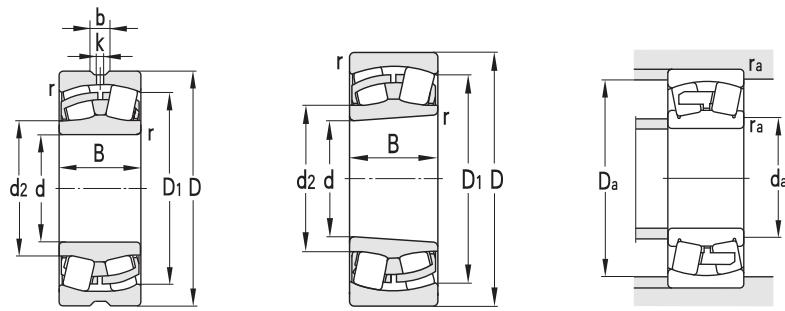
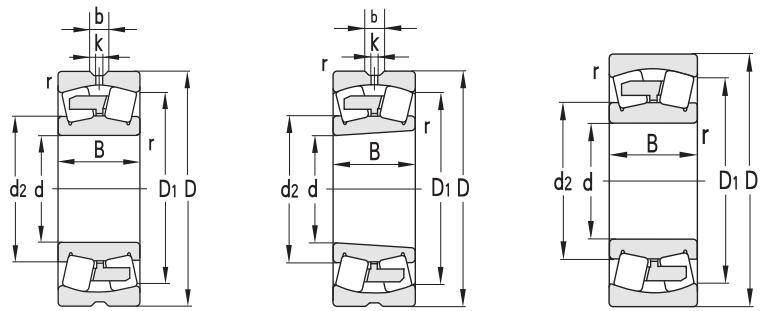
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	B	rsmin	Cr	Cor	Grease	Oil	
			mm	KN		r/min		
130	280	93	4	970	1320	1300	1700	22326CK 22326CK/W33
	280	93	4	924	1300	1300	1700	22326CA 22326CA/W33
	280	93	4	924	1300	1300	1700	22326CAF3 22326CAF3/W33
	280	93	4	924	1300	1300	1700	22326CAK 22326CAK/W33
	280	93	4	924	1300	1300	1700	22326ACA
	280	93	4	1060	1500	1300	1700	22326CAQ1/HA
140	210	53	2	402	705	1800	2400	23028CA 23028CA/W33
	210	53	2	402	705	1800	2400	23028CAF3
	210	53	2	402	705	1800	2400	23028CAK 23028CAK/W33
	210	53	2	420	715	1800	2400	23028C 23028C/W33
	210	53	2	420	715	1800	2400	23028CK 23028CK/W33
	210	69	2	484	920	1800	2400	24028CA 24028CA/W33
	225	68	2.1	570	935	1600	2000	23128CA 23128CA/W33
	225	68	2.1	570	935	1600	2000	23128CAN
	225	68	2.1	570	935	1600	2000	23128C 23128C/W33
	225	68	2.1	570	935	1600	2000	23128CK 23128CK/W33
	225	85	2.1	638	1150	850	1100	24128CA 24128CAF3
	225	85	2.1	638	1150	850	1100	24128CAK30/W33
	250	68	3	616	930	1700	2200	22228CA 22228CA/W33
	250	68	3	616	930	1700	2200	22228CAF3 22228CAF3/W33
	250	68	3	616	930	1700	2200	22228CAK 22228CAK/W33
	250	68	3	616	930	1700	2200	22228CAKF3/W33
	250	68	3	670	960	1700	2200	22228C 22228C/W33
	250	68	3	670	960	1700	2200	22228CK 22228CK/W33
	250	88	3	770	1095	1300	1700	23228K/W33
	250	88	3	1000	1365	1200	1600	23228CA 23228CA/W33
	250	88	3	1000	1365	1200	1600	23228CAK 23228CAK/W33
	300	102	3.7	1160	1590	1100	1500	22328C 22328C/W33
	300	102	3.7	1160	1590	1100	1500	22328CK 22328CK/W33
	300	102	4	1330	1950	1100	1500	22328CA 22328CA/W33
	300	102	4	1330	1950	1100	1500	22328CAF3 22328CAF3/W33
	300	102	4	1330	1950	1100	1500	22328CAK 22328CAK/W33
	300	118	4	1350	1780	1100	1500	23328CA
150	225	56	2.1	435	730	1700	2200	23030C 23030C/W33

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm	mm	mm	mm	mm	mm	mm					Kg
178	232	16.7	6	148	262	3	0.34	1.90	2.90	1.80	24.2
178	232	16.7	6	148	262	3	0.34	1.99	2.96	1.94	18.3
178	232	16.7	6	148	262	3	0.34	1.99	2.96	1.94	18.0
178	232	16.7	6	148	262	3	0.34	1.99	2.96	1.94	18.0
178	232	16.7	6	148	262	3	0.34	1.99	2.96	1.94	28.9
178	232	16.7	6	148	262	3	0.34	1.99	2.96	1.94	18.1
162	188	8.3	4.5	150	200	2	0.23	2.90	4.40	2.80	6.70
162	188	8.3	4.5	150	200	2	0.23	2.90	4.40	2.80	6.68
162	188	8.3	4.5	150	200	2	0.23	2.90	4.40	2.80	6.50
162	188	8.3	4.5	150	200	2	0.22	3.00	4.60	2.80	6.31
162	188	8.3	4.5	150	200	2	0.22	3.00	4.60	2.80	6.11
162	188	8.3	4.5	150	200	2	0.30	2.30	3.40	2.20	8.31
166	196	8.3	5	152	213	2	0.29	2.30	3.50	2.40	10.9
166	196	8.3	5	152	213	2	0.29	2.30	3.50	2.40	10.9
166	196	8.3	5	152	213	2	0.28	2.40	3.60	2.50	10.7
166	196	8.3	5	152	213	2	0.28	2.40	3.60	2.50	10.4
165	192	8.3	4.5	152	213	2	0.37	1.80	2.70	1.80	13.5
165	192	8.3	4.5	152	213	2	0.37	1.80	2.70	1.80	13.2
176	218	11.1	5	154	236	2.5	0.26	2.60	3.90	2.50	16.2
176	218	11.1	5	154	236	2.5	0.26	2.60	3.90	2.50	15.6
176	218	11.1	5	154	236	2.5	0.26	2.60	3.90	2.50	15.0
176	218	11.1	5	154	236	2.5	0.26	2.60	3.90	2.50	14.8
176	218	11.1	5	154	236	2.5	0.26	2.60	3.90	2.50	14.5
176	218	11.1	5	154	236	2.5	0.26	2.60	3.90	2.50	14.5
172	215	15	6	154	236	2.5	0.36	1.87	2.79	1.83	18.3
173	215	15	6	154	236	2.5	0.33	2.00	3.00	2.00	19.7
173	215	15	6	154	236	2.5	0.33	2.00	3.00	2.00	19.3
191	249	16.7	7	158	282	3	0.34	1.90	2.90	1.80	35.2
191	249	16.7	7	158	282	3	0.34	1.90	2.90	1.80	34.4
191	249	16.7	7	158	282	3	0.35	1.90	2.90	1.80	36.2
191	249	16.7	7	158	282	3	0.35	1.90	2.90	1.80	35.9
191	249	16.7	7	158	282	3	0.35	1.90	2.90	1.80	36.2
190	243	16.7	7	158	280	3	0.40	1.69	2.51	1.65	41.7
174	201	8.3	4.5	162	213	2	0.22	3.00	4.60	2.80	7.82

# Spherical Roller Bearings

**ZWZ**

d 150~160 mm



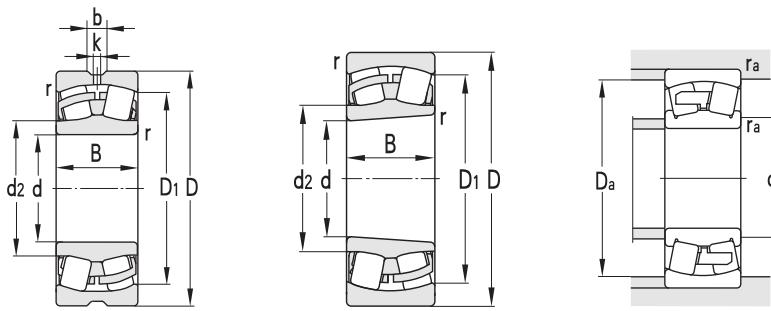
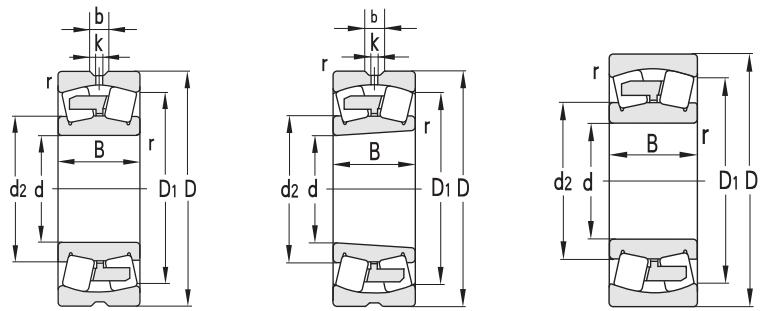
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations		
				rsmin	Cr	Cor	Grease			
mm				KN		r/min				
150	225	56	2.1	435	730	1700	2200	23030CK	23030CK/W33	
	225	56	2.1	440	795	1700	2200	23030CA	23030CA/W33	
	225	56	2.1	440	795	1700	2200	23030CAF3		
	225	75	2.1	550	1050	1300	1700	24030CA/W33	24030CAK30/W33	
	225	75	2.1	550	1050	1300	1700	24030CA/W33X		
	250	80	2.1	745	1230	1400	1800	23130C	23130C/W33	
	250	80	2.1	745	1230	1400	1800	23130CK	23130CK/W33	
	250	80	2.1	820	1300	1400	1800	23130CA	23130CA/W33	
	250	80	2.1	820	1300	1400	1800	23130CAF3	23130CAF3/W33	
	250	80	2.1	820	1300	1400	1800	23130CAK	23130CAK30/W33	
	250	100	2.1	865	1400	800	1000	24130CA	24130CA/W33	
	250	100	2.1	865	1400	800	1000	24130CAK30/CW33		
	250	100	2.1	850	1470	800	1000	24130C		
	270	73	3	671	1000	1600	2000	22230C/W33		
	270	73	3	693	1050	1600	2000	22230CA	22230CA/W33	
	270	73	3	693	1050	1600	2000	22230CAF3	22230CAK	
	270	73	3	693	1050	1600	2000	22230ACA		
	270	96	3	1050	1550	1100	1500	23230C		
	270	96	3	1050	1550	1100	1500	23230CA	23230CA/W33	
	320	108	4	1230	1810	1000	1400	22330CA	22330CA/W33	
	320	108	4	1230	1810	1000	1400	22330CAK	22330CAK30	
	160	240	60	2.1	510	875	1700	2200	23032C	23032C/W33
	240	60	2.1	510	875	1700	2200	23032CK	23032CK/W33	
	240	60	2.1	490	875	1700	2200	23032CA	23032CA/W33	
	240	60	2.1	490	875	1700	2200	23032CAF3		
	240	80	2.1	627	1210	1100	1500	24032CA/W33	24032CAF3/W33	
	240	80	2.1	627	1210	1100	1500	24032CAK30F3	24032CAK30/W33	
	240	80	2.1	560	1020	1200	1600	24032CK/W33		
	270	86	2.1	840	1430	1300	1700	23132CA	23132CA/W33	
	270	86	2.1	870	1420	1300	1700	23132CK	23132CK/W33	
	270	86	2.1	840	1430	1300	1700	23132CAF3	23132CAK	
	270	86	2.1	685	1140	1400	1800	23132CK		
	270	86	2.1	870	1420	1400	1800	23132CK	23132CK/W33	
	270	109	2.1	1120	1690	700	900	24132CA/HAC9SOW20X		
	270	109	2.1	952	1690	700	900	24132CA/W33	24132CA/W33X	

Other dimensions	Contact surface and chamfer dimensions					Caluation Factor					Weight
	d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0
mm					mm						Kg
174	201	8.3	4.5	162	213	2	0.22	3.00	4.60	2.80	7.15
174	201	8.3	4.5	162	213	2	0.22	3.00	4.60	2.80	8.01
174	201	11.1	5	162	213	2	0.22	3.00	4.60	2.80	7.96
175	196	5.5	3	162	213	2	0.31	2.20	3.30	2.20	9.39
175	196	5.5	3	162	213	2	0.31	2.20	3.30	2.20	9.39
173	216	11.1	5	162	238	2	0.30	2.30	3.40	2.20	16.2
173	216	11.1	5	162	238	2	0.30	2.30	3.40	2.20	15.7
182	216	11.1	5	162	238	2	0.30	2.30	3.40	2.20	16.5
182	216	11.1	5	162	238	2	0.30	2.30	3.40	2.20	16.4
182	216	11.1	5	162	238	2	0.30	2.30	3.40	2.20	16.4
180	208	8.3	4.5	162	238	2	0.37	1.80	2.70	1.80	19.2
180	208	8.3	4.5	162	238	2	0.37	1.80	2.70	1.80	19.0
180	208	12	6	164	256	2.5	0.26	2.60	3.90	2.50	18.6
179	234	12	6	164	256	2.5	0.26	2.60	3.90	2.50	18.7
189	234	12	6	164	256	2.5	0.26	2.60	3.90	2.50	18.5
189	234	11.1	6	164	256	2.5	0.26	2.60	3.90	2.50	18.2
177	228	164	256	2.5	0.35	1.90	2.90	1.80	2.90	2.50	25.7
188	228	11.1	6	164	256	2.5	0.35	1.90	2.90	1.80	26.6
203	265	16.7	9	168	302	3	0.36	1.87	2.79	1.83	41.5
203	265	16.7	9	168	302	3	0.36	1.87	2.79	1.83	41.1
180	216	11.1	4	172	228	2	0.22	3.00	4.60	2.80	8.86
180	216	11.1	4	172	228	2	0.22	3.00	4.60	2.80	8.63
186	216	8.3	5	172	228	2	0.22	3.00	4.60	2.80	10.0
186	216	8.3	5	172	228	2	0.22	3.00	4.60	2.80	9.97
183	209	8.3	5	172	228	2	0.30	2.30	3.40	2.20	13.2
183	209	8.3	5	172	228	2	0.30	2.30	3.40	2.20	13.2
184	209	8.3	5	172	228	2	0.32	2.09	3.11	2.04	12.1
188	234	13.9	6	172	258	2	0.30	2.30	3.40	2.20	21.9
188	234	13.9	6	172	258	2	0.30	2.30	3.40	2.20	21.9
195	234	231	172	258	2	0.30	2.30	3.40	2.20	21.9	
193	231	231	172	258	2	0.34	1.99	2.96	1.94	20.6	
193	231	13.9	6	172	258	2	0.34	1.99	2.96	1.94	21.2
195	225	8.3	4	172	258	2	0.40	1.69	2.51	1.65	24.6
193	225	8.3	4	172	258	2	0.40	1.69	2.51	1.65	24.6

# Spherical Roller Bearings

**ZWZ**

d 160~170 mm



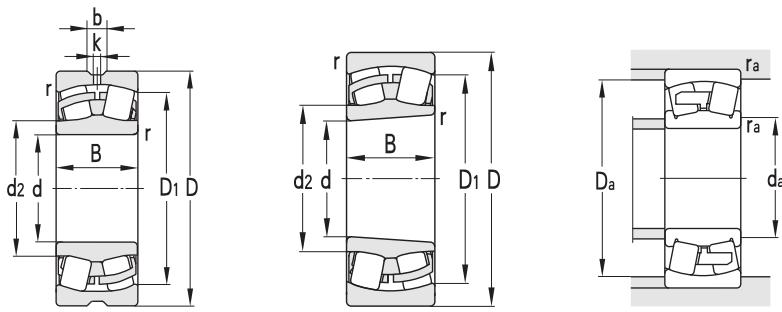
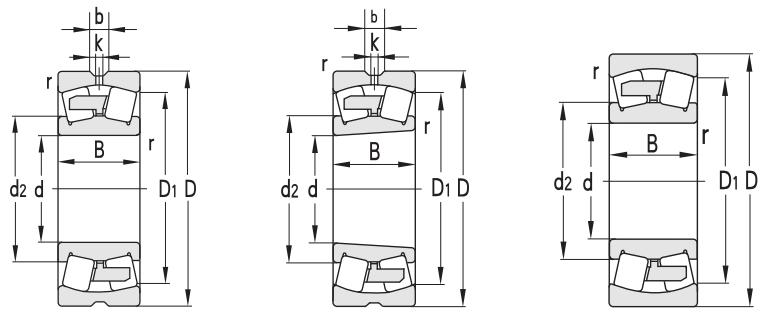
Principal dimensions			Basic load ratings		Limit speed ratings		Designations		
d	D	B	r <sub>min</sub>	Cr	Cor	Grease	Oil		
			KN		r/min				
160	270	109	2. 1	950	1690	700	900	24132CAK30/C3W33	
290	80	3	825	1300	1500	1900	22232CA	22232CAF3	
290	80	3	825	1300	1500	1900	22232CAK		
290	80	3	825	1300	1500	1900	22233ACA		
290	80	3	820	1200	1500	1900	22232Q1/VBW33		
290	80	3	860	1280	1500	1900	22232CK	22232CK/W33	
290	80	3	860	1280	1500	1900	22232CK	22232C/W33	
290	104	3	1210	1760	1000	1400	23232C	23232C/W33	
290	104	3	1050	1770	1000	1400	23232CA	23232CA/W33	
290	104	3	1050	1770	1000	1400	23232CAK	23232CAK/W33	
290	104	3	1210	1760	1000	1400	23232CK	23232CK/W33	
340	114	4	1450	2050	950	1300	22332C	22332C/W33	
340	114	4	1400	2050	950	1300	22332CAK		
340	114	4	1460	2050	950	1300	22332CA	22332CA/W33	
340	114	4	1400	2050	950	1300	22332CAF3	22332CAF3/W33	
340	114	4	1400	2050	950	1300	22332CAF3		
340	114	4	1450	2050	950	1300	22332CK	22332CK/W33	
340	114	4	1330	1810	950	1300	22332Q1/VBW33		
340	136	4	1300	1840	950	1300	23332Q1/VBW33		
170	260	67	2. 1	610	1090	1600	2000	23034CA	23034CA/W33
260	67	2. 1	610	1090	1600	2000	23034CAF3	23034CAK	
260	67	2. 1	610	1090	1600	2000	23034CAK3	23034CAK/F3/W33	
260	67	2. 1	625	1150	1600	2000	23034CK	23034CK/W33	
260	67	2. 1	625	1150	1600	2000	23034C	23034C/W33	
260	90	2. 1	775	1500	1000	1400	24034CA	24034CA/W33	
280	88	2. 1	850	1390	1200	1600	23134CA		
280	88	2. 1	850	1390	1200	1600	23134CAK	23134CAK/F3	
280	88	2. 1	910	1520	1200	1600	23134C		
280	88	2. 1	910	1520	1200	1600	23134CK	23134CK/W33	
280	109	2. 1	1010	1830	670	850	24134CA	24134CA/W33	
280	109	2. 1	1050	1830	670	850	24134CA		
310	86	4	930	1450	1300	1700	22234CA	22234CA/W33	
310	86	4	930	1450	1300	1700	22234CAK	22234CAK/W33	
310	86	4	970	1450	1300	1700	22234C	22234C/W33	
310	86	4	970	1450	1300	1700	22234CK	22234CK/W33	

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d <sub>2</sub>	D <sub>1</sub>	b	k	d <sub>a(min)</sub>	d <sub>a(max)</sub>	r <sub>a(max)</sub>	e	y <sub>1</sub>	y <sub>2</sub>	y <sub>0</sub>	
mm	mm	mm	mm	mm	mm	mm					Kg
193	225	8. 3	4	172	258	2	0. 40	1. 69	2. 51	1. 65	24. 2
193	249			174	276	2. 5	0. 27	2. 50	3. 70	2. 50	24. 6
201	249			174	276	2. 5	0. 27	2. 50	3. 70	2. 50	24. 1
201	249			174	276	2. 5	0. 27	2. 50	3. 70	2. 50	24. 1
201	249	13. 9	5	174	276	2. 5	0. 27	2. 50	3. 70	2. 50	22. 5
201	249	13. 9	5	174	276	2. 5	0. 27	2. 50	3. 70	2. 50	22. 2
201	244	13. 9	7	174	276	2. 5	0. 35	1. 90	2. 90	1. 80	30. 0
201	244	13. 9	7	174	276	2. 5	0. 35	1. 90	2. 90	1. 80	30. 2
200	244	13. 9	7	174	276	2. 5	0. 35	1. 90	2. 90	1. 80	29. 2
189	284	16. 7	7	178	322	3	0. 35	1. 90	2. 90	1. 80	51. 6
201	284	16. 7	7	178	322	3	0. 35	1. 90	2. 90	1. 80	52. 8
201	284	16. 7	7	178	322	3	0. 35	1. 90	2. 90	1. 80	51. 6
216	284	16. 7	7	178	322	3	0. 35	1. 90	2. 90	1. 80	52. 5
216	284	16. 7	7	178	322	3	0. 35	1. 90	2. 90	1. 80	52. 5
216	284	16. 7	7	178	322	3	0. 35	1. 90	2. 90	1. 80	50. 9
216	284	22	8	178	322	3	0. 35	1. 90	2. 90	1. 80	60. 6
198	231	11. 1	5	182	248	2	0. 23	2. 90	4. 40	2. 80	14. 1
198	231			182	248	2	0. 23	2. 90	4. 40	2. 80	14. 0
198	231	11. 1	5	182	248	2	0. 23	2. 90	4. 40	2. 80	13. 5
192	231	11. 1	5	182	248	2	0. 23	2. 90	4. 40	2. 80	13. 7
192	231	11. 1	5	182	248	2	0. 23	2. 90	4. 40	2. 80	13. 6
198	227	8. 3	4	182	248	2	0. 33	2. 00	3. 00	2. 00	17. 8
204	243			182	268	2	0. 30	2. 30	3. 40	2. 20	26. 1
204	243			182	268	2	0. 30	2. 30	3. 40	2. 20	24. 6
204	243			182	268	2	0. 30	2. 30	3. 40	2. 20	22
204	243			182	268	2	0. 30	2. 30	3. 40	2. 20	22
204	243	8. 3	5	182	268	2	0. 30	2. 30	3. 40	2. 20	24. 6
203	237	8. 3	5	182	268	2	0. 37	1. 80	2. 70	1. 80	24. 8
203	237			182	268	2	0. 37	1. 80	2. 70	1. 80	25. 4
215	268	16. 7	6	188	292	3	0. 27	2. 50	3. 70	2. 50	26. 8
215	268	16. 7	6	188	292	3	0. 27	2. 50	3. 70	2. 50	26. 2
215	268	16. 7	6	188	292	3	0. 27	2. 50	3. 70	2. 50	29. 2
215	268	16. 7	6	188	292	3	0. 27	2. 50	3. 70	2. 50	28. 5

# Spherical Roller Bearings

**ZWZ**

d 170~190 mm



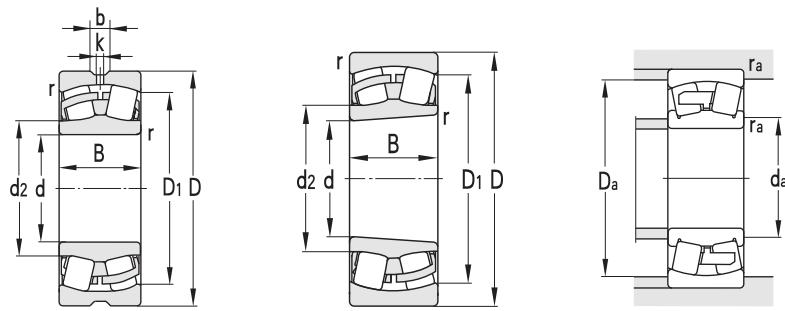
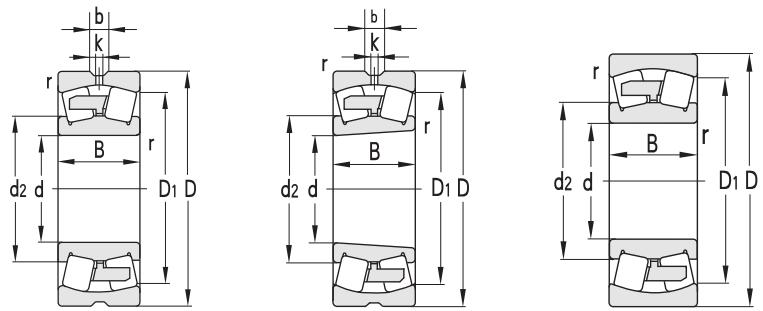
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
mm				KN		r/min		
170	310	110	4	1180	1930	950	1300	23234CA 23234CAF3/W33
	360	120	4	1450	2120	950	1300	22334C/YA7
	360	120	4	1450	2120	950	1300	22334CA/W33
	360	120	4	1450	2120	950	1300	22334CA/W33X
	360	120	4	1450	2120	950	1300	22334ACA
	360	120	4	1640	2120	950	1300	22334CA/HCEW33
180	250	52	2	473	830	1700	2200	23936CAF3/W33
	280	74	2.1	693	1280	1400	1800	23036CA 23036CA/W33
	280	74	2.1	693	1280	1400	1800	23036CAF3
	280	74	2.1	730	1290	1400	1800	23036C 23036CK/W33
	280	100	2.1	919	1750	950	1300	24036CA 24036CA/W33
	300	96	3	990	1720	1100	1500	23136CA 23136CA/W33
	300	96	3	990	1720	1100	1500	23136CAF3
	300	96	3	990	1720	1100	1500	23136CAK 23136CAK30/W33
	300	96	3	1030	1720	1100	1500	23136C/W33
	300	118	3	1120	2030	630	800	24136CA 24136CA/W33
	300	118	3	1120	2030	630	800	24136CAQ1
	320	86	4	985	1550	1300	1700	22236CA 22236CA/W33
	320	86	4	985	1550	1300	1700	22236CAF3 22236CAQ1
	320	86	4	985	1550	1300	1700	22236CAK 22236CAKF3
	320	86	4	985	1550	1300	1700	22236CK 22236CK/W33
	320	86	4	985	1550	1300	1700	22236C 22236C/W33
	320	112	4	1280	2130	900	1200	23236CA
	320	112	4	1280	2130	900	1200	23236CA/HCW33 23236CA/HCW33YA2
	320	112	4	1280	2130	900	1200	23236CAF3 23236CAF3/W33
	320	112	4	1280	2130	900	1200	23236CAK/W33 23236CAKF3/W33
	380	126	4	1620	2400	900	1200	22336CA 22336CA/W33
	380	126	4	1620	2400	900	1200	22336CAF3/W33 22336CAK
	380	126	4	1690	2400	900	1200	22336CK 22336CK/W33
190	260	52	2	440	855	1600	2000	23938CA/W33
	290	75	2.1	770	1450	1300	1700	23038C

Other dimensions	d2	D1	b	k	Contact surface and chamfer dimensions			Caluation Factor			Weight
					da(min)	Da(max)	ra(max)	e	y1	y2	
mm					mm						Kg
214	261	13.9	7	188	292	3	0.34	1.99	2.96	1.94	38.0
211	299			188	342	3	0.37	1.80	2.70	1.80	59.7
231	299	16.7	7	188	342	3	0.34	1.99	2.96	1.94	62.6
231	299	16.7	7	188	342	3	0.34	1.99	2.96	1.94	62.6
231	299	16.7	7	188	342	3	0.34	1.99	2.96	1.94	61.4
231	299	16.7	7	188	342	3	0.34	1.99	2.96	1.94	62.6
204	230	9.5	4	190	240	2	0.18	3.80	5.60	3.60	7.34
214	247	13.9	7.5	192	268	2	0.25	2.70	4.00	2.60	17.7
214	247			192	268	2	0.25	2.70	4.00	2.60	17.6
214	247	13.9	7.5	192	268	2	0.25	2.70	4.00	2.60	17.1
210	242	8.3	4	192	268	2	0.33	2.00	3.00	2.00	26.6
210	242	8.3	4	192	268	2	0.33	2.00	3.00	2.00	26.6
216	259	13.9	6	194	286	2.5	0.30	2.30	3.40	2.20	27.1
216	259			194	286	2.5	0.30	2.30	3.40	2.20	27.0
216	259	13.9	6	194	286	2.5	0.30	2.30	3.40	2.20	26.3
216	259	11.1	6	194	286	2.5	0.37	1.80	2.70	1.80	33.0
212	252			194	286	2.5	0.37	1.80	2.70	1.80	33.0
224	278	16.7	6	198	302	3	0.26	2.60	3.90	2.50	29.4
224	278			198	302	3	0.26	2.60	3.90	2.50	29.2
224	278	16.7	6	198	302	3	0.26	2.60	3.90	2.50	29.3
224	278	16.7	6	198	302	3	0.26	2.60	3.90	2.50	29.3
222	271			198	302	3	0.35	1.90	2.90	1.80	38.7
222	271	13.9	7	198	302	3	0.35	1.90	2.90	1.80	38.6
222	271	13.9	7	198	302	3	0.35	1.90	2.90	1.80	38.5
222	271	13.9	7	198	302	3	0.35	1.90	2.90	1.80	38.4
242	316	22.3	8	198	362	3	0.34	1.99	2.96	1.94	72.2
242	316	22.3	8	198	362	3	0.34	1.99	2.96	1.94	71.3
242	316	22.3	8	198	362	3	0.34	1.99	2.96	1.94	68.3
242	316	22.3	8	198	362	3	0.34	1.99	2.96	1.94	69.6
213	238	5.5	3	202	248	2	0.18	3.80	5.60	3.60	8.29
215	259			202	278	2	0.23	2.90	4.40	2.80	16.9

# Spherical Roller Bearings

**ZWZ**

d 190~200 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations		
d	D	B	rsmin	Cr	Cor	Grease	Oil		
mm									
				KN		r/min			

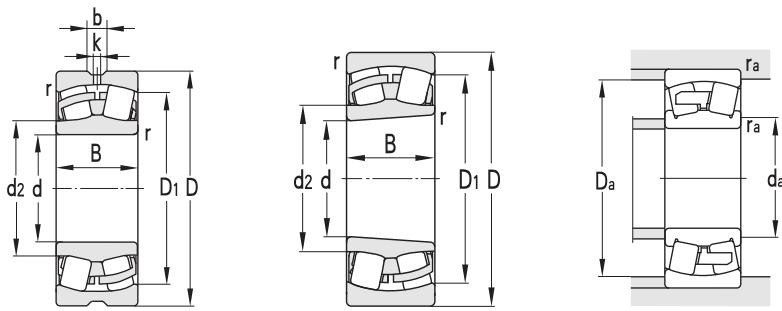
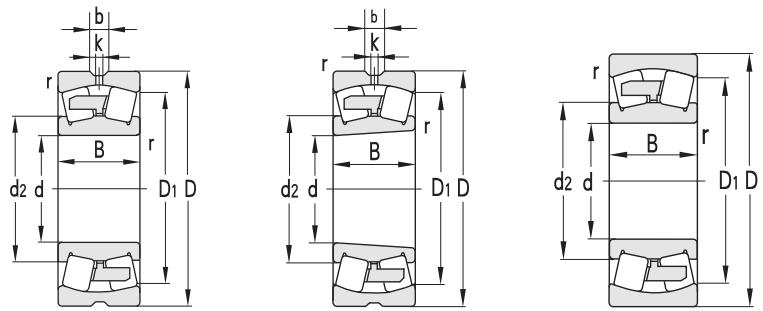
190	290	75	2.1	770	1450	1300	1700	23038CA	23038CA/W33
	290	75	2.1	770	1450	1300	1700	23038CAF3	
	290	75	2.1	770	1450	1300	1700	23038CAK	23038CAK/W33
	290	75	2.1	770	1450	1300	1700	23038CAKF3	/W33
	290	100	2.1	941	1840	950	1300	24038CA	24038CAF3
320	104	3	1140	1840	1000	1400	23138CA	23138CA/W33	
320	128	3	1320	2400	600	750	24138CA	24138CA/W33	
320	128	3	1320	2400	600	750	24138CAF3	24138CAK30/W33	
320	128	3	1320	2400	600	750	24138CA/HCW33	24138CA/C9W33	
320	128	3	1320	2400	600	750	24138CAK30F3	/W33	
340	92	4	1050	1620	1200	1600	22238CA	22238CA/W33	
340	92	4	1050	1620	1200	1600	22238CAF3	22238CAKF3	
340	92	4	1050	1620	1200	1600	22238CAK	22238CAK/W33	
340	92	4	1120	1680	1200	1600	22238CK	22238CK/W33	
340	92	4	1120	1680	1200	1600	22238C	22238C/W33	
340	120	4	1420	2400	850	1100	23238CA	23238CA/W33	
340	120	4	1420	2400	850	1100	23238CAK/W33		
400	132	5	1800	2630	850	1100	22338C		
400	132	5	1800	2630	850	1100	22338CA	22338CA/W33	
400	132	5	1920	2780	850	1100	22338C	22338C/W33	
400	132	5	1920	2780	850	1100	22338CK	22338CK/W33	
400	132	5	1800	2630	850	1100	22338CAF3		
400	132	5	1800	2630	850	1100	22338ACA	22338ACA/W33X	
200									
280	60	2.1	545	1150	1600	2000	23940CAF3/W33		
	280	186	1.1				H2344		
310	82	2.1	850	1560	1200	1600	23040CA	23040CA/W33	
310	82	2.1	850	1560	1200	1600	23040CAK	23040CAK/W33	
310	82	2.1	880	1560	1200	1600	23040C	23040C/W33	
310	82	2.1	880	1560	1200	1600	23040CK	23040CK/W33	
310	109	2.1	1080	2130	900	1200	24040CA/W33	24040CAK30/W33	
340	112	3	1300	2240	950	1300	23140CA	23140CA/W33	
340	112	3	1300	2240	950	1300	23140CAK	23140CAK/W33	
340	112	3	1340	2240	950	1300	FL-23140C	/W33	

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm											Kg
224	259	13.9	5	202	278	2	0.23	2.90	4.40	2.80	17.3
224	259	13.9	5	202	278	2	0.23	2.90	4.40	2.80	17.2
224	259	13.9	5	202	278	2	0.23	2.90	4.40	2.80	16.8
224	259	13.9	5	202	278	2	0.23	2.90	4.40	2.80	16.5
219	252			202	278	2	0.31	2.20	3.30	2.20	22.9
232	276	13.9	7	204	306	2.5	0.31	2.20	3.30	2.20	34.3
226	267	11.1	6	204	306	2.5	0.40	1.69	2.51	1.65	41.9
226	267	11.1	6	204	306	2.5	0.40	1.69	2.51	1.65	41.8
226	267	11.1	6	204	306	2.5	0.40	1.69	2.51	1.65	41.8
226	267	11.1	6	204	306	2.5	0.40	1.69	2.51	1.65	41.5
235	293	16.7	6	208	322	3	0.26	2.60	3.90	2.50	37.4
235	293	16.7	6	208	322	3	0.26	2.60	3.90	2.50	37.2
235	293	16.7	6	208	322	3	0.26	2.60	3.90	2.50	37.3
235	293	16.7	6	208	322	3	0.26	2.60	3.90	2.50	37.0
235	293	16.7	6	208	322	3	0.26	2.60	3.90	2.50	37.9
235	293	16.7	6	208	322	3	0.26	2.60	3.90	2.50	37.9
237	288	16.7	7	208	322	3	0.35	1.90	2.90	1.80	44.8
237	288	16.7	7	208	322	3	0.35	1.90	2.90	1.80	43.1
238	334			212	378	4	0.34	1.99	2.96	1.94	80.8
257	334	22.3	8	212	378	4	0.34	1.99	2.96	1.94	82.2
257	334	22.3	8	212	378	4	0.34	1.99	2.96	1.94	81.9
257	334	22.3	8	212	378	4	0.34	1.99	2.96	1.94	80.9
257	334	22.3	12	212	378	4	0.34	1.99	2.96	1.94	81.7
257	334	22.3	12	212	378	4	0.34	1.99	2.96	1.94	81.0
226	254	9.5	4	212	268	2	0.19	3.61	5.38	3.53	12.1
237	276	13.9	7.5	212	298	2	0.25	2.70	4.00	2.60	16.8
237	276	13.9	7.5	212	298	2	0.25	2.70	4.00	2.60	22.4
237	276	13.9	7.5	212	298	2	0.25	2.70	4.00	2.60	23.3
237	276	13.9	7.5	212	298	2	0.25	2.70	4.00	2.60	24.5
233	268	11.1	5	212	298	2	0.33	2.00	3.00	2.00	31.3
243	292	16.7	7	214	326	2.5	0.31	2.20	3.30	2.20	43.8
243	292	16.7	7	214	326	2.5	0.31	2.20	3.30	2.20	42.6
243	292	16.7	7	214	326	2.5	0.31	2.20	3.30	2.20	41.6

# Spherical Roller Bearings

**ZWZ**

d 200~240 mm



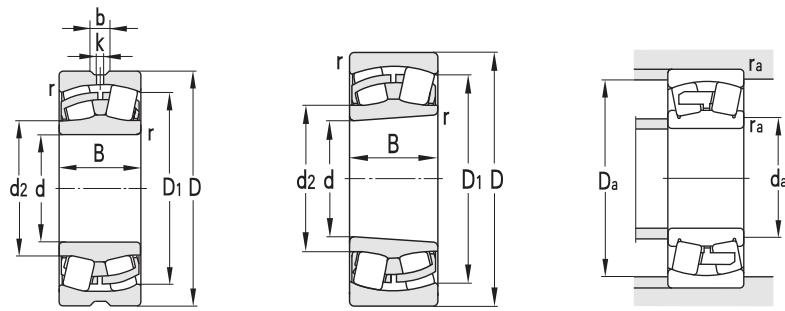
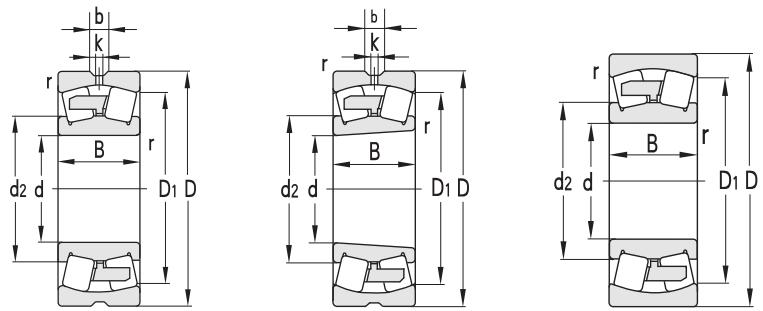
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Grease	Oil	Designations	
				rsmin	Cr	Cor	B				
	mm				KN		r/min				
200	340	140	3	1520	2800	5601	700	24140CA/W33	24140CAK30F3/W33		
	360	98	4	1210	1950	1100	1500	22240C			
	360	98	4	1210	1950	1100	1500	22240CA	22240CA/W33		
	360	98	4	1210	1950	1100	1500	22240CAF3	22240CAF3		
	360	98	4	1210	1950	1100	1500	22240CAK	22240CAK/W33		
	360	128	4	1530	2530	850	1100	23240CA/W33			
	360	128	4	1530	2530	850	1100	23240CAK	23240CAK/W33		
	360	128	4	1560	2730	900	1200	23240/W33			
	420	138	5	1910	2860	850	1100	22340CA	22340CAF3		
	420	138	5	1910	2860	850	1100	22340CAK	22340CAK/W33		
	420	138	5	2000	2870	850	1100	FL-22340C/W33			
	420	138	5	2000	2870	850	1100	22340CK	22340CK/W33		
	420	138	5	2000	2870	850	1100	22340C	22340C/W33		
	420	165	5	2220	3500	750	950	23340CAF3			
220	300	60	2.1	550	1190	1500	1900	23944CA/W33	23944CAF3/C3W33		
	340	90	3	1030	1900	1100	1500	23044CA	23044CA/W33		
	340	90	3	1030	1900	1100	1500	23044CAK	23044CAK/W33		
	340	90	3	1030	1900	1100	1500	23044CA/YA2			
	340	90	3	1030	1900	1100	1500	23044CAKF3			
	340	118	3	1270	2500	850	1100	24044CA/W33	24044CA/W33X		
	340	118	3	1270	2500	850	1100	24044CAN			
	340	118	3	1270	2500	850	1100	24044CAK30/W33			
	340	118	3	1270	2500	850	1100	24044CAF3	24044CAF3/W33		
	370	120	4	1510	2710	900	1200	23144CA	23144CA/W33		
	370	120	4	1510	2750	900	1200	23144CA/HG2W33			
	370	120	4	1510	2710	900	1200	23144CAK	23144CAK/W33		
	370	120	4	1730	2750	900	1200	23144CAKF3/W33			
	370	150	4	1800	3410	500	630	24144CA/W33	24144CAK30		
	400	108	4	1490	2400	950	1300	22244CA	22244CA/W33		
	400	108	4	1490	2400	950	1300	22244CA/W33X	22244CAF3		
	400	108	4	1490	2400	950	1300	22244CAK			
	400	144	4	1950	3200	750	950	23244CA/W33	23244CAK/W33		
	460	145	5	2370	3450	980	1360	22344CA/W33	22344CAK/W33		
240	320	60	2.1	530	1310	1300	1700	23948CA/W33			

Other dimensions	d2	D1	b	k	Contact surface and chamfer dimensions			e	y1	y2	y0	Weight
					da(min)	Da(max)	ra(max)					
	mm				mm	mm	mm					Kg
	242	283	11.1	6	214	326	2.5	0.40	1.70	2.50	1.60	52.1
	237	309	16.7	6	218	342	3	0.26	2.60	3.90	2.50	43.7
	250	309	218	342	3	0.26	2.60	3.90	2.50	44.7		
	250	309	218	342	3	0.26	2.60	3.90	2.50	44.3		
	250	309	16.7	6	218	342	3	0.26	2.60	3.90	2.50	44
	249	304	16.7	8	218	342	3	0.35	1.90	2.90	1.80	53.4
	249	304	16.7	8	218	342	3	0.35	1.90	2.90	1.80	52
	248	304	16.7	8	218	342	3	0.36	1.87	2.79	1.83	56.5
	269	350	222	398	4	0.34	1.99	2.96	1.94	97		
	269	350	222	398	4	0.34	1.99	2.96	1.94	95.3		
	269	350	22.3	8	222	398	4	0.34	1.99	2.96	1.94	92
	269	350	22.3	8	222	398	4	0.34	1.99	2.96	1.94	90
	269	350	22.3	8	222	398	4	0.34	1.99	2.96	1.94	92
	266	340	222	398	4	0.40	1.68	2.50	1.64	122		
	242	278	8.3	4	232	288	2	0.18	3.80	5.60	3.60	12.9
	260	303	13.9	6	234	326	2.5	0.24	2.80	4.20	2.80	32
	260	303	13.9	6	234	326	2.5	0.24	2.80	4.20	2.80	31.6
	260	303	234	326	2.5	0.25	2.75	4.09	2.69	31.5		
	260	303	234	326	2.5	0.24	2.80	4.20	2.80	31		
	257	295	11.1	5	234	326	2.5	0.33	2.00	3.00	2.00	39.1
	257	295	11.1	5	234	326	2.5	0.33	2.00	3.00	2.00	39.1
	257	295	11.1	5	234	326	2.5	0.33	2.00	3.00	2.00	38.5
	257	295	11.1	5	234	326	2.5	0.33	2.00	3.00	2.00	38.5
	257	295	11.1	5	234	326	2.5	0.33	2.00	3.00	2.00	39
	268	320	16.7	7	238	352	3	0.30	2.30	3.40	2.20	54.7
	268	320	16.7	7	238	352	3	0.30	2.30	3.40	2.20	54.6
	268	320	16.7	7	238	352	3	0.30	2.30	3.40	2.20	53.1
	268	320	16.7	7	238	352	3	0.30	2.30	3.40	2.20	52.7
	262	308	11.1	6	238	352	3	0.40	1.70	2.50	1.60	66.4
	275	344	16.7	8	238	382	3	0.27	2.50	3.70	2.50	63.5
	275	344	16.7	8	238	382	3	0.27	2.50	3.70	2.50	62
	275	344	16.7	8	238	382	3	0.27	2.50	3.70	2.50	63.2
	272.5	334	16.7	8	238	382	3	0.36	1.89	2.81	1.85	77.3
	293.5	384.5	22.3	12	246	422	4	0.32	2.09	3.11	2.04	119
	266	295	9.5	4	252	308	2	0.15	4.50	6.70	4.50	15

# Spherical Roller Bearings

**ZWZ**

d 240~260 mm



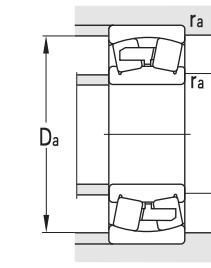
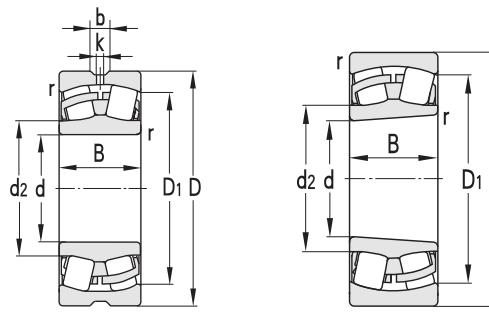
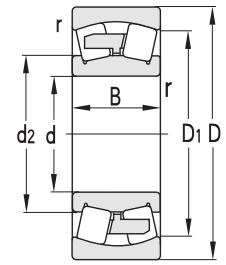
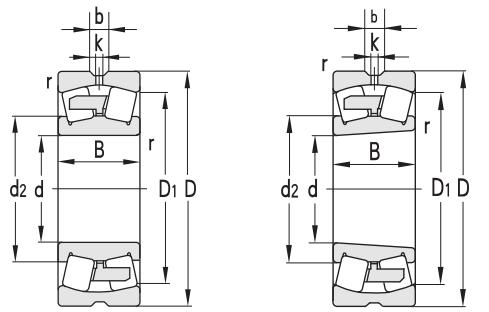
Principal dimensions			Basic load ratings			Limit speed ratings			Designations		
d	D	B	rsmin	Cr	Cor	Grease	Oil				
mm				KN				r/min			
240	320	60	2. 1	530	1310	1300	1700	23948CAF3	23948CAF3/W33		
330	60	2. 1	610	1380	1200	1500	23948X1CAF3/H	OH3152H			
330	190	1. 1									23. 3
360	92	3	1080	2080	1000	1400	23048CA	23048CA/W33			
360	92	3	1080	2080	1000	1400	23048CAK	23048CAK/W33			
360	92	3	1080	2080	1000	1400	23048CAQ1				
360	118	3	1360	2800	800	1000	24048CA	24048CA/W33X			
360	118	3	1360	2800	800	1000	24048CAK30				
400	128	4	1650	3000	850	1100	23148CA	23148CA/W33			
400	128	4	1650	3000	850	1100	23148CAK/W33				
400	128	4	1750	3040	850	1100	23148CK	23148CK/W33			
400	128	4	1750	3040	850	1100	23148C	23148C/W33			
400	160	4	2010	3400	480	600	24148CA	24148CA/W33			
400	160	4	2010	3400	480	600	24148CAK30/C3W33	24148CAK30F3/W33			
440	120	4	2000	2850	900	1200	22248CA	22248CA/W33			
440	120	4	2000	2850	900	1200	22248CAK	22248CAK/W33			
440	120	4	2000	2850	900	1200	22248CAF3/C9W33	22248CAF3/W33			
440	120	4	2000	2850	900	1200	22248K	22248K/W33			
440	160	4	2520	3950	670	850	23248CA	23248CA/W33			
440	160	4	2520	3950	670	850	23248CAK	23248CAK/W33			
440	160	4	2520	3950	670	850	23248CAF3				
500	155	5	2610	4100	650	800	22348CA/W33	22348CAK/W33			
241	360	92	3	985	2080	1000	1400	23048CAQ1/YA2			
250	410	128	4	1860	3350	1000	1400	2650CA			
260	350	195	1. 1	900	1750	1100	1500	OH3156H			
360	75	2. 1									25. 9
400	104	4	1350	2550	900	1200	23952CA	23952CA/W33			
400	104	4	1350	2550	900	1200	23052CA	23052CA/W33			
400	104	4	1350	2550	900	1200	23052CAF3				
400	104	4	1350	2550	900	1200	23052CAK	23052CAK/W33			
400	104	4	1350	2550	900	1200	23052CAF3				
400	104	4	1410	2560	900	1200	23052CK	23052CK/W33			

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm											Kg
266	295	9. 5	4	252	308	2	0. 15	4. 50	6. 70	4. 50	14. 9
266	295	9. 5	4	252	308	2	0. 15	4. 50	6. 70	4. 50	15. 8
278	322	13. 9	6	254	346	2. 5	0. 24	2. 80	4. 20	2. 80	34. 2
278	322	13. 9	6	254	346	2. 5	0. 24	2. 80	4. 20	2. 80	32. 2
278	322	11. 1	5	254	346	2. 5	0. 24	2. 80	4. 20	2. 80	34. 2
278	318	11. 1	5	254	346	2. 5	0. 30	2. 30	3. 40	2. 20	46. 5
289	345	16. 7	8	258	382	3	0. 31	2. 21	3. 29	2. 16	68. 2
289	345	16. 7	8	258	382	3	0. 31	2. 21	3. 29	2. 16	66. 5
289	345	16. 7	8	258	382	3	0. 31	2. 21	3. 29	2. 16	62. 8
285	336	11. 1	6	258	382	3	0. 40	1. 70	2. 50	1. 60	79
285	336	11. 1	6	258	382	3	0. 40	1. 70	2. 50	1. 60	75. 6
285	336	11. 1	6	258	382	3	0. 40	1. 70	2. 50	1. 60	77. 8
290	383	18	7	258	422	3	0. 27	2. 50	3. 70	2. 50	85. 3
290	383	18	7	258	422	3	0. 27	2. 50	3. 70	2. 50	82. 4
303	379	18	7	258	422	3	0. 27	2. 50	3. 70	2. 50	85
305	379	18	7	258	422	3	0. 27	2. 50	3. 70	2. 50	84. 1
369	369	22. 3	8	258	422	3	0. 35	1. 90	2. 90	1. 80	102
369	369	22. 3	8	258	422	3	0. 35	1. 90	2. 90	1. 80	102
369	369	22. 3	8	258	422	3	0. 35	1. 90	2. 90	1. 80	102
330	390	22. 3	12	297	439	4	0. 32	2. 09	3. 11	2. 04	148
278	322			254	346	2. 5	0. 24	2. 80	4. 20	2. 80	34
299	356			272	382	3	0. 29	2. 30	3. 50	2. 40	59. 4
294	328	12	6	272	348	2	0. 18	3. 80	5. 60	3. 60	21. 6
306	357	16. 7	7	278	382	3	0. 23	2. 90	4. 40	2. 80	49. 8
306	357	16. 7	7	278	382	3	0. 23	2. 90	4. 40	2. 80	49. 5
306	357	16. 7	7	278	382	3	0. 23	2. 90	4. 40	2. 80	46. 9
306	357	16. 7	7	278	382	3	0. 23	2. 90	4. 40	2. 80	46. 6
306	357	16. 7	7	278	382	3	0. 23	2. 90	4. 40	2. 80	47. 8

# Spherical Roller Bearings

**ZWZ**

d 260~280 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations		
d	D	B	rsmin	Cr	Cor	Grease	Oil		
mm					KN				
KN					r/min				

260	400	140	4	1710	3500	700	900	24052CA/W33	
	400	140	4	1710	3500	700	900	24052CAF3	24052CAF3/W33
	400	140	4	1710	3500	700	900	24052CAK30	/W33
	440	144	4	2190	4050	800	1000	23152CA	23152CA/W33
	440	144	4	2190	4050	800	1000	23152CAK	23152CAK/W33
	440	144	4	2190	4050	800	1000	23152CAK/HG2C9YAGW33	
	440	144	4	2190	4050	800	1000	23152CAK30	/W33
	440	180	4	2100	4350	430	530	24152CA	24152CA/W33
	440	180	4	2240	4380	430	530	24152CA/HAW36	24152CAQ1/HAW36
	440	180	4	2100	4350	430	530	24152CAK30	/W33
	440	180	4	2100	4350	430	530	24152CAF3	/W33
	440	180	4	2420	4380	430	530	SX-24152	
	480	130	5	2280	3600	850	1100	22252CA	22252CA/W33
	480	130	5	2280	3600	850	1100	22252CAK	
	480	174	5	2800	4750	630	800	23252CA	/W33
	480	174	5	2800	4750	630	800	23252CA/W33X	
	480	174	5	2800	4750	630	800	23252CA/W33XB	
	480	174	5	2800	4750	630	800	23252CAF3	/W33
	480	174	5	2800	4750	630	800	23252CAK	/W33
	480	174	5	2800	4750	630	800	23252CAKL	/W33
	540	165	6	3080	4750	630	800	22352CA	/W33
	540	165	6	3080	4750	630	800	22352CAK	/W33
	540	165	6	3100	4650	630	800	22352C/C9W33	
	540	165	6	3080	4750	630	800	22352CAF3	/W33
	540	165	6	3080	4750	630	800	22352CAKF3	/W33

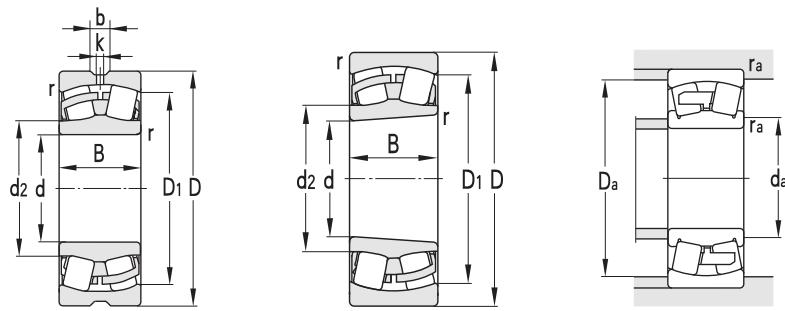
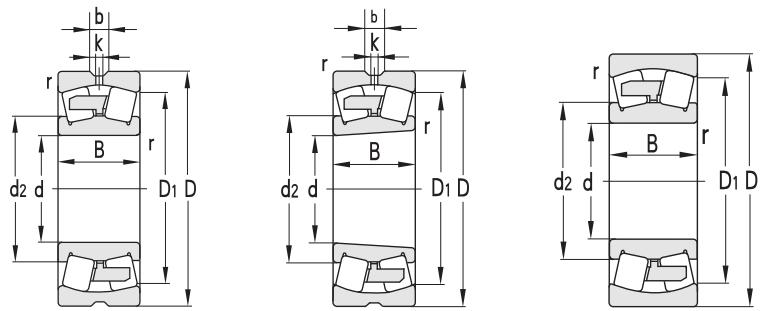
280	350	52	2	435	1230	1200	1500	23856CA	23856CA/W33
	380	75	2.1	803	1850	1000	1400	23956CAQ1	/W33
	380	75	2.1	803	1850	1000	1400	23956CA	/W33
	420	106	4	1320	2850	850	1100	23056CA	
	420	106	4	1320	2850	850	1100	23056CAK	
	420	106	4	1550	2940	850	1100	23056CK	23056CK/W33
	420	106	4	1550	2940	850	1100	23056C	23056C/W33
	420	140	4	1780	3700	670	850	24056CA	/W33
	420	140	4	1780	3700	670	850	24056CAF3	24056CAF3/W33
	420	140	4	1780	3700	670	850	24056CAKF3	24056CAKF3/W33

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm											Kg
mm											
300	347	11.1	6	278	382	3	0.33	2.00	3.00	2.00	66.7
300	347	11.1	6	278	382	3	0.33	2.00	3.00	2.00	64.9
300	347	11.1	6	278	382	3	0.33	2.00	3.00	2.00	65.2
310	379	16.7	9	278	422	3	0.31	2.20	3.30	2.20	88.9
310	379	16.7	9	278	422	3	0.31	2.20	3.30	2.20	88.7
310	379	16.7	9	278	422	3	0.31	2.20	3.30	2.20	88.7
310	379	16.7	9	278	422	3	0.31	2.20	3.30	2.20	86.7
312	366	13.9	8	278	422	3	0.39	1.73	2.58	1.69	115
312	366	13.9	8	278	422	3	0.39	1.73	2.58	1.69	114
312	366	13.9	8	278	422	3	0.39	1.73	2.58	1.69	112
312	366	13.9	8	278	422	3	0.39	1.73	2.58	1.69	113
312	366	13.9	8	278	422	3	0.39	1.73	2.58	1.69	114
330	414	22.3	12	282	458	4	0.27	2.51	3.74	2.45	106
330	414	22.3	12	282	458	4	0.27	2.51	3.74	2.45	105
320	404	22.3	8	282	458	4	0.35	1.90	2.90	1.80	141
320	404	22.3	12	282	458	4	0.35	1.90	2.90	1.80	141
320	404	25	15	282	458	4	0.35	1.90	2.90	1.80	141
320	404	22.3	8	282	458	4	0.35	1.90	2.90	1.80	138
320	404	22.3	8	282	458	4	0.35	1.90	2.90	1.80	145
320	404	22.3	8	282	458	4	0.35	1.90	2.90	1.80	137
349	455	22.3	8	288	512	5	0.31	2.20	3.30	2.20	186
349	455	22.3	8	288	512	5	0.31	2.20	3.30	2.20	185
349	455	22.3	8	288	512	5	0.31	2.20	3.30	2.20	185
349	455	22.3	8	288	512	5	0.31	2.20	3.30	2.20	184
349	455	22.3	8	288	512	5	0.31	2.20	3.30	2.20	183
305	328	8.3	4.5	278	348	2	0.13	5.36	7.98	5.24	11.4
316	346	12	6	292	368	2	0.18	3.80	5.66	3.72	25.7
316	346	12	6	292	368	2	0.18	3.80	5.66	3.72	25.7
323	377	16.7	7	298	402	3	0.23	2.91	4.40	2.84	56.8
323	377	16.7	7	298	402	3	0.23	2.91	4.40	2.84	56.6
323	377	16.7	7	298	402	3	0.23	2.91	4.40	2.84	53.9
317	366	11.1	6	298	402	3	0.31	2.20	3.30	2.20	69.2
317	366	11.1	6	298	402	3	0.31	2.20	3.30	2.20	68.9
317	366	11.1	6	298	402	3	0.31	2.20	3.30	2.20	67.2

# Spherical Roller Bearings

**ZWZ**

d 280~300 mm



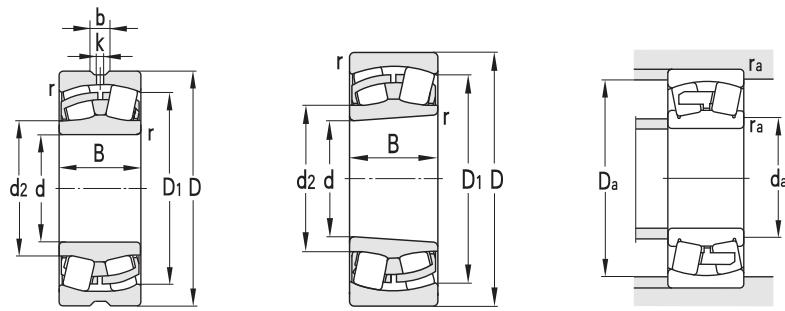
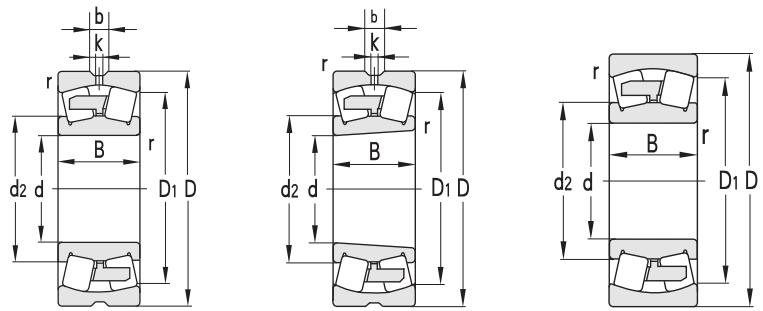
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
	mm				KN		r/min	
280	460	146	5	2190	4150	750	950	23156CA 23156CA/W33
	460	146	5	2340	4200	800	1000	23156/W33
	460	146	5	2190	4150	750	950	23156CAF3
	460	146	5	2190	4150	750	950	23156CAK3
	460	146	5	2190	4150	750	950	23156CAK 23156CAK/W33
	460	130	5	1700	3400	750	950	23156X2CA
	460	180	5	2530	4750	400	500	24156CA
	460	180	5	2530	4750	400	500	24156CA/HCW33 24156CA/W33
	500	130	5	2190	3600	800	1000	22256CA 22256CA/W33
	500	130	5	2190	3600	800	1000	22256CAK 22256CAK/W33
	500	130	5	2190	3600	800	1000	22256CAF3
	500	130	5	2130	3300	850	1100	22256/W33
	500	130	5	2130	3300	850	1100	22256K/W33
	500	176	5	2840	5100	600	750	23256CA
	500	176	5	2840	5100	600	750	23256CAF3 23256CAF3/W33
	500	176	5	2840	5100	600	750	23256CAK/W33
	580	175	6	3520	5700	600	750	22356CA/W33
	580	175	6	3520	5700	600	750	22356CAK/W33
	580	175	6	3520	5700	600	750	22356CAF3/W33
	580	175	6	3800	5250	630	800	22356/W33
300	380	60	3	640	1650	950	1400	23860CA/W33
	380	60	3	640	1650	950	1400	23860CAK/W33
	400		1.5					H3264
	420	90	3	1160	2500	950	1300	23960CA/W33
	420	90	3	1160	2500	950	1300	23960CAK
	460	118	4	1770	3450	800	1000	23060CA 23060CA/W33
	460	118	4	1770	3450	800	1000	23060CAK
	460	118	4	1770	3450	800	1000	23060CAK/W33
	440	105	4	1310	2880	870	1100	23060X3CA/W33
	460	118	4	1770	3450	800	1000	23060CAF3/W33
	460	118	4	1770	3450	800	1000	FL- 23060C/W33
	460	160	4	2220	2700	600	750	24060CA 24060CA/W33
	500	160	5	2680	4750	670	850	23160CA/C9W33 23160CA/HCEC9W33

Other dimensions	Contact surface and chamfer dimensions					Calulation Factor					Weight
	d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0
											Kg
333	400	16.7	8	302	438	4	0.30	2.30	3.40	2.20	104
337	400	16.7	8	302	438	4	0.32	2.09	3.11	2.04	99.1
333	400			302	438	4	0.30	2.30	3.40	2.20	103
333	400			302	438	4	0.30	2.30	3.40	2.20	100
333	400	16.7	8	302	438	4	0.30	2.30	3.40	2.20	101
332	404			302	438	4	0.27	2.50	3.72	2.45	87
327	393			302	438	4	0.40	1.70	2.50	1.60	119
327	388	13.9	8	302	438	4	0.40	1.70	2.50	1.60	119
347	435	22.3	8	302	478	4	0.26	2.60	3.90	2.50	118
347	435	22.3	8	302	478	4	0.26	2.60	3.90	2.50	117
347	435			302	478	4	0.26	2.60	3.90	2.50	117
348	435	22.3	8	302	478	4	0.27	2.50	3.70	2.50	113
348	435	22.3	8	302	478	4	0.27	2.50	3.70	2.50	109
340	424			302	478	4	0.35	1.90	2.90	1.80	147
340	424	22.3	8	302	478	4	0.35	1.90	2.90	1.80	146
340	424	22.3	8	302	478	4	0.35	1.90	2.90	1.80	153
340	424	22.3	8	302	478	4	0.35	1.90	2.90	1.80	142
364	485	22.3	8	308	552	5	0.30	2.30	3.40	2.20	221
364	485	22.3	8	308	552	5	0.30	2.30	3.40	2.20	217
364	485	22.3	8	308	552	5	0.30	2.30	3.40	2.20	221
372	485	22.3	8	314	552	5	0.32	2.09	3.11	2.04	229
328	357	12	6	310	368	2	0.13	5.20	7.70	5.00	18.2
328	357	12	6	310	368	2	0.13	5.20	7.70	5.00	17.6
339	382	15	6	314	406	2.5	0.19	3.60	5.30	3.60	40.1
339	382			314	406	2.5	0.19	3.60	5.30	3.60	39
351	409	16.7	9	318	442	3	0.23	2.90	4.40	2.80	75.8
351	409			318	442	3	0.23	2.90	4.40	2.80	73.6
351	409	16.7	7	318	442	3	0.23	2.90	4.40	2.80	73.4
343	396	16.7	9	302	438	3	0.21	3.16	4.71	3.09	54.7
351	409	16.7	7	318	442	3	0.23	2.90	4.40	2.80	74.9
351	409	16.7	7	318	442	3	0.23	2.90	4.40	2.80	69.5
342	399	13.9	7	318	442	3	0.32	2.09	3.11	2.04	99
356	433	16.7	9	322	478	4	0.30	2.30	3.40	2.20	126

# Spherical Roller Bearings

**ZWZ**

d 300~320 mm



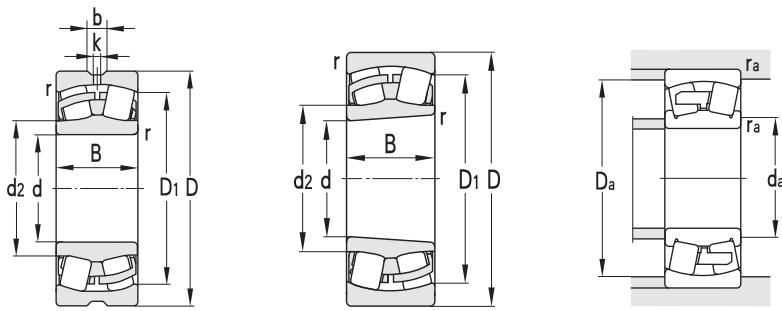
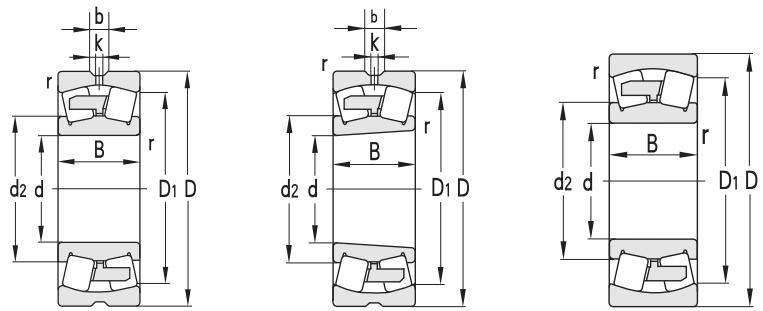
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
	mm				KN		r/min	
300	500	160	5	2680	4750	670	850	23160CAF3 23160CAF3/C9W33
	500	160	5	2680	4750	670	850	23160CAK/W33 23160CAKF3
	500	200	5	3100	6000	600	750	24160CA 24160CA/W33
	500	200	5	3100	6000	600	750	SX-24160C
	540	140	5	2620	4300	750	950	22260CA
	540	140	5	2620	4300	750	950	22260CAF3 22260CAF3/W33
	540	140	5	2620	4300	750	950	22260CAKF3
	540	140	5	2400	3750	800	1000	22260CAK/W33
	540	140	5	2400	3750	800	1000	22260CAF1 23260CAF3/W33
	540	192	5	3300	5600	530	670	23260CAF1 23260CAF1/W33
	540	192	5	3300	5600	530	670	23260CAK/W33
320	400	60	2.1	670	1620	920	1280	23864CA/W33
	400	60	2.1	670	1620	920	1280	23864CAK/W33
	440	90	3	1200	2650	900	1200	23964CA/W33
	440	254	1.5					OH3168H
	480	121	4	1930	2200	800	1000	23064CA 23064CA/W33
	480	121	4	1930	2200	800	1000	23064CAK 23064CAK/W33
	480	121	4	1930	2200	800	1000	23064CAF3/W33
	480	160	4	2300	5100	560	700	24064CA 24064CA/W33
	480	160	4	2300	5100	560	700	24064CAF3 24064CAF3/W33
	480	160	4	2300	5100	560	700	24064CAK30/W33
	540	176	5	3150	3200	630	800	23164CA 23164CA/W33
	540	176	5	3150	3200	630	800	23164CAK 23164CAK/W33
	540	210	5	3560	6500	340	430	24164CA/W33
	580	150	5	3000	4550	670	850	22264CA 22264CA/W33
	580	150	5	3000	4550	670	850	22264CAK 22264CAK/W33
	580	150	5	2770	4350	700	900	22264CAK/W33
	580	150	5	2770	4350	700	900	22264CAF3 23264CAF3/W33
	580	208	5	3900	6800	500	630	23264CAF3/W33
	580	208	5	3900	6800	500	630	23264CAK/W33
	580	208	5	4500	6820	500	630	23264CAK/W33
340	460	90	7.5	4530	6820	500	630	22364CAK/W33

Other dimensions	d2	D1	b	k	Contact surface and chamfer dimensions			Caluation Factor				Weight
					da(min)	Da(max)	ra(max)	e	y1	y2	y0	
	mm				mm	mm	mm					Kg
356	433	16.7	9	322	478	4	0.30	2.30	3.40	2.20	125	
356	433	16.7	9	322	478	4	0.30	2.30	3.40	2.20	125	
356	420	13.9	6	322	478	4	0.39	1.75	2.61	1.71	161	
356	420	13.9	6	322	478	4	0.39	1.75	2.61	1.71	161	
374	467	322	518	4	0.26	2.60	3.90	2.50	1.38			
374	467	22.3	8	322	518	4	0.26	2.60	3.90	2.50	136	
374	467	22.3	8	322	518	4	0.26	2.60	3.90	2.50	136	
374	467	22.3	8	322	518	4	0.27	2.50	3.70	2.50	140	
374	467	22.3	8	322	518	4	0.27	2.50	3.70	2.50	137	
373	455	22	10	322	518	4	0.35	1.90	2.90	1.80	192	
373	455	22	10	322	518	4	0.35	1.90	2.90	1.80	190	
373	455	22	10	322	518	4	0.35	1.90	2.90	1.80	189	
346	376	13.9	6	332	388	2	0.12	5.60	8.40	5.60	20.3	
346	376	13.9	6	332	388	2	0.12	5.60	8.40	5.60	19.4	
360	402	15	6	338	426	2.5	0.18	3.80	5.60	3.60	42.7	
												52.4
368	431	16.7	8	338	462	3	0.23	2.90	4.40	2.80	84.8	
368	431	16.7	8	338	462	3	0.23	2.90	4.40	2.80	84.3	
368	431	16.7	8	338	462	3	0.23	2.90	4.40	2.80	84.7	
368	421	22	8	338	462	3	0.32	2.09	3.11	2.04	105	
368	421	22	8	338	462	3	0.32	2.09	3.11	2.04	106	
368	421	22	8	338	462	3	0.32	2.09	3.11	2.04	103	
389	465	22.3	8	342	518	4	0.31	2.20	3.30	2.20	200	
389	465	22.3	8	342	518	4	0.31	2.20	3.30	2.20	195	
364	455	16.7	9	342	518	4	0.40	1.70	2.50	1.60	206	
400	502	22.3	8	342	558	4	0.26	2.60	3.90	2.50	175	
400	502	22.3	8	342	558	4	0.26	2.60	3.90	2.50	172	
400	502	22.3	8	342	558	4	0.27	2.50	3.70	2.50	177	
400	490	24	10	342	558	4	0.35	1.90	2.90	1.80	253	
400	490	24	10	342	558	4	0.35	1.90	2.90	1.80	252	
400	490	24	10	342	558	4	0.35	1.90	2.90	1.80	243	
400	490	24	10	342	558	4	0.35	1.9	2.9	1.8	245	
378	423	15	6	354	446	2.5	0.17	4.00	5.90	4.00	46	

# Spherical Roller Bearings

**ZWZ**

d 340~360 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	B	rsmin	Cr	Cor	Grease	Oil	
mm						KN		
						r/min		

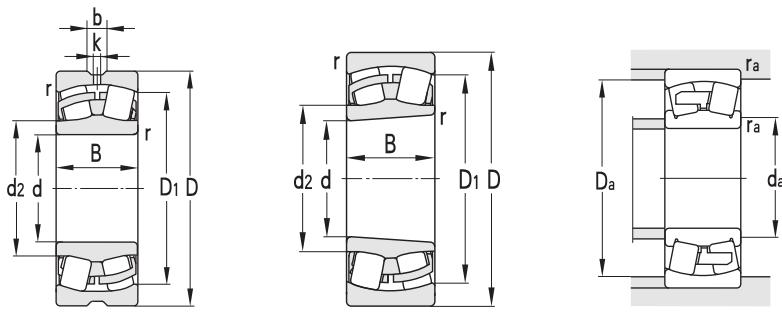
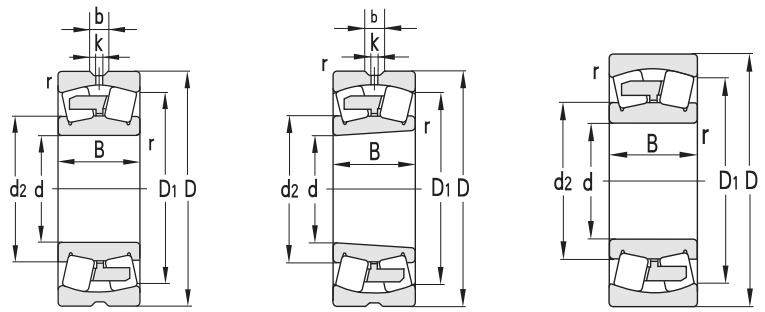
340	460	90	3	1200	2700	900	1200	23968CAK/W33
	460	90	3	1200	2700	900	1200	23968CAF3/W33
460	259	1.5						OH3172H
520	133	5	2180	4400	700	900	23068CA	23068CA/W33
520	133	5	2180	4400	700	900	23068CA/W33YA1	
520	133	5	2180	4400	700	900	23068CAF3	23068CAF3/W33
520	133	5	2180	4400	700	900	23068CAF3	23068CAKF3/W33
520	180	5	2710	5700	530	670	24068CA/W33	
520	180	5	2710	5700	530	670	24068CAK/W33	
520	180	5	2710	5700	530	670	24068CAF1/H	24068CAF1/W33
520	180	5	2710	5700	530	670	24068CAF3	24068CAF3/W33
520	180	5	2710	5700	530	670	24068CAK30F1	24068CAK30F1/W33
520	180	5	2710	5700	530	670	24068CAK30F3	24068CAK30F3/W33
580	190	5	3500	6300	600	750	23168CA	23168CA/W33
580	190	5	3500	6300	600	750	23168CAK/W33	
580	190	5	3500	6300	600	750	23168CAF3	23168CAF3/W33
580	190	5	3500	6300	600	750	23168CAKF3	23168CAKF3/W33
580	243	5	4050	7950	320	400	24168CAK30/W33	
580	243	5	4050	7950	320	400	24168CA	24168CA/W33
620	224	6	4400	7700	430	530	23268CA	
620	224	6	4400	7700	430	530	23268CAK/W33	
360	480	90	3	1290	2820	850	1100	23972CA
	480	90	3	1290	2820	850	1100	23972CAK/W33
540	134	5	2280	4800	670	850	23072CA	23072CA/W33
540	134	5	2280	4800	670	850	23072CAK	
540	134	5	2280	4800	670	850	23072CAF3	23072CAF1
540	134	5	2280	4800	670	850	23072CAF3	23072CAF3/W33
540	134	5	2280	4800	670	850	23072CAF3	23072CAF3/HAW33
540	134	5	2280	4800	670	850	FL-23072C	23072CAF3/W33
540	180	5	2940	6100	600	750	24072CA	24072CA/W33
540	180	5	2940	6100	600	750	24072CAK	24072CAK/W33
540	180	5	2940	6100	600	750	24072CAK30	
600	192	5	3580	6850	560	700	23172CA	23172CA/W33

Other dimensions				Contact surface and chamfer dimensions			Calulation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
378	423	15	6	354	446	2.5	0.17	4.00	5.90	4.00	45.9
378	423	15	6	354	446	2.5	0.17	4.00	5.90	4.00	45.6
400	464	22.3	8	362	498	4	0.24	2.80	4.20	2.80	57.3
400	464	22.3	8	362	498	4	0.24	2.80	4.20	2.80	115
400	464	22.3	8	362	498	4	0.24	2.80	4.20	2.80	114
400	464	22.3	8	362	498	4	0.24	2.80	4.20	2.80	114
400	464	22.3	8	362	498	4	0.24	2.80	4.20	2.80	111
394	451	16.7	8	362	498	4	0.33	2.00	3.00	2.00	137
394	451	16.7	8	362	498	4	0.33	2.00	3.00	2.00	132
394	451	16.7	8	362	498	4	0.33	2.00	3.00	2.00	136
394	451	16.7	8	362	498	4	0.33	2.00	3.00	2.00	136
394	451	16.7	8	362	498	4	0.33	2.00	3.00	2.00	134
394	451	16.7	8	362	558	4	0.31	2.20	3.30	2.20	211
412	497	22.3	8	362	558	4	0.31	2.20	3.30	2.20	208
412	497	22.3	8	362	558	4	0.31	2.20	3.30	2.20	210
412	497	22.3	8	362	558	4	0.31	2.20	3.30	2.20	206
408	486	22.3	10	362	558	4	0.40	1.70	2.50	1.60	256
408	486	22.3	10	362	558	4	0.4	1.7	2.5	1.6	261
426	528	22.3	12	368	592	5	0.35	1.90	2.90	1.80	297
426	528	22.3	12	368	592	5	0.35	1.90	2.90	1.80	292
403	441	11.1	6	374	466	2.5	0.16	4.20	6.30	4.00	46.6
403	441	11.1	6	374	466	2.5	0.16	4.20	6.30	4.00	46.4
419	486	22.3	8	382	518	4	0.23	2.90	4.40	2.80	126
419	486	22.3	8	382	518	4	0.23	2.90	4.40	2.80	125
419	486	22.3	8	382	518	4	0.23	2.90	4.40	2.80	124
419	486	22.3	8	382	518	4	0.23	2.90	4.40	2.80	125
419	486	22.3	8	382	518	4	0.23	2.90	4.40	2.80	124
419	486	22.3	8	382	518	4	0.23	2.90	4.40	2.80	124
398	474	16.7	8	382	518	4	0.31	2.2	3.3	2.2	150
398	474	16.7	8	382	518	4	0.31	2.2	3.3	2.2	143
398	474	16.7	8	382	518	4	0.31	2.2	3.3	2.2	148
434	518	22.3	12	382	578	4	0.30	2.30	3.40	2.20	255

# Spherical Roller Bearings

**ZWZ**

d 360~380 mm



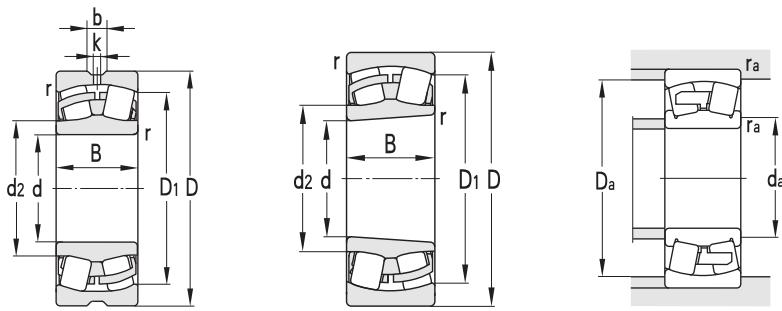
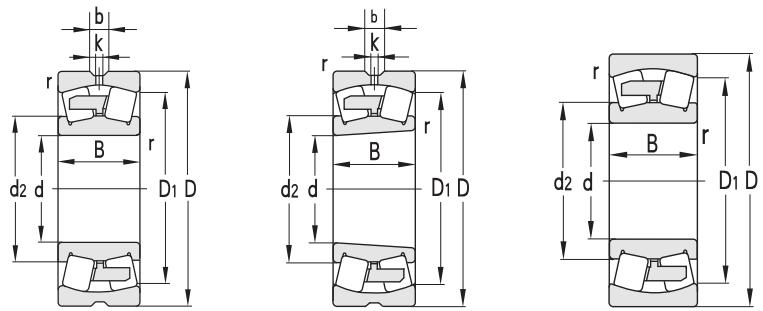
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
mm								
				KN		r/min		
360	600	192	5	3580	6850	560	700	23172CAK/W33
	600	192	5	3580	6850	560	700	23172CAF1/W33
	600	243	5	5600	8400	300	380	24172CA 24172CA/W33
	600	243	5	5600	8400	300	380	24172CAK/W36
	600	243	5	5600	8400	300	380	24172CAF1 24172CAF1/W33
	600	243	5	5600	8400	300	380	24172CAK30/W33
	600	243	5	5600	8400	300	380	24172CAK30F1/W33
	600	243	5	5600	8400	300	380	24172CAQ1/W36
	600	243	5	5600	8400	300	380	SX- 24172
	650	170	6	3630	6200	380	480	22272CA/W33
	650	232	6	4650	8300	400	500	23272CA 23272CA/W33
	650	232	6	4650	8300	400	500	23272CAK
	650	232	6	4650	8300	400	500	23272CAKF3/W33
	750	224	7.5	4900	8600	400	500	22372CAK 22372CAK/W33
	750	224	7.5	4900	8600	400	500	22372CAF3
	750	224	7.5	4900	8600	400	500	22372CAKF3
380	520	106	4	1730	3800	800	1000	23976CAF1/W33 23976CAF3/W33
	560	135	5	2480	5000	630	800	23076CA 23076CA/W33
	560	135	5	2480	5000	630	800	23076CAK/W33
	560	135	5	2480	5000	630	800	23076CAF1/W33 23076CAF3/W33
	560	135	5	2480	5000	630	800	23076CAF3 23076CAF3/W33
	560	180	5	3080	6580	480	600	24076CAF3 24076CAF3/W33
	560	180	5	3080	6580	480	600	24076CAK30F3/W33
	560	180	5	3080	6580	480	600	24076CA 24076CA/W33
	620	194	5	3400	7350	400	500	23176CA 23176CAK/W33
	620	194	5	3400	7350	400	500	23176CAF3/HAW33 23176CAF3/W33
	620	194	5	3400	7350	400	500	23176CAKF3/W33
	620	194	5	3400	7350	400	500	23176CAK/W33
	620	243	5	4400	9200	300	380	24176CA/C9 24176CA/W33
	680	240	6	4800	9200	380	480	23276CAKF3/W33
400	540	106	4	1750	3950	750	950	23980CAF1/W33 23980CAF3/W33
	540	100	4	1750	3950	750	950	23980X2CAF3/W33 23980X2CAF3/W33YA1

Other dimensions	Contact surface and chamfer dimensions				Calulation Factor				Weight		
	d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0
mm									Kg		
mm									Kg		
434	518	22.3	12	382	578	4	0.30	2.30	3.40	2.20	254
434	518	22.3	12	382	578	4	0.30	2.30	3.40	2.20	250
430	511	20	12	382	578	4	0.37	1.80	2.70	1.80	270
430	511	20	8	382	578	4	0.37	1.80	2.70	1.80	270
430	511	20	12	382	578	4	0.37	1.80	2.70	1.80	269
430	511	20	12	382	578	4	0.37	1.80	2.70	1.80	267
430	511	20	12	382	578	4	0.37	1.80	2.70	1.80	266
430	511	20	12	382	578	4	0.37	1.80	2.70	1.80	270
430	511	20	8	382	578	4	0.37	1.80	2.70	1.80	271
449	563	22.3	8	388	622	5	0.26	2.60	3.87	2.54	253
443	547	22.3	10	388	622	5	0.35	1.90	2.90	1.80	335
443	547	22.3	10	388	622	5	0.35	1.90	2.90	1.80	333
443	547	22.3	10	388	622	5	0.35	1.90	2.90	1.80	330
471	631	22.3	12	392	720	6	0.31	2.21	3.29	2.16	460
471	631	22.3	12	392	720	6	0.31	2.21	3.29	2.16	466
471	631	22.3	12	392	720	6	0.31	2.21	3.29	2.16	456
426	476	15	10	398	502	3	0.17	4.00	5.90	4.00	69.5
441	505	22.3	8	402	538	4	0.22	3.00	4.60	2.80	130
441	505	22.3	8	402	538	4	0.22	3.00	4.60	2.80	126
441	505	22.3	8	402	538	4	0.22	3.00	4.60	2.80	129
441	505	22.3	8	402	538	4	0.22	3.00	4.60	2.80	125
435	494	22.3	8	402	538	4	0.30	2.30	3.40	2.20	150
435	494	22	10	402	538	4	0.30	2.30	3.40	2.20	153
435	494	22	10	402	538	4	0.3	2.3	3.4	2.2	151
457	540	22	8	402	598	4	0.30	2.30	3.40	2.20	250
457	540	22	8	402	598	4	0.30	2.30	3.40	2.20	244
457	540	22	8	402	598	4	0.30	2.30	3.40	2.20	248
457	540	22	8	402	598	4	0.30	2.30	3.40	2.20	241
457	540	22	8	402	598	4	0.30	2.30	3.40	2.20	243
457	540	22	8	402	598	4	0.3	2.3	3.4	2.2	251
457	540	22	8	402	598	4	0.3	2.3	3.4	2.2	296
468	574	22.3	10	408	652	5	0.35	1.90	2.90	1.80	386
445	497	15	7.5	418	522	3	0.17	4.00	5.90	4.00	72.4
445	498	13.9	7.5	418	522	3	0.16	4.20	6.30	4.00	67.8

# Spherical Roller Bearings

**ZWZ**

d 400~420 mm



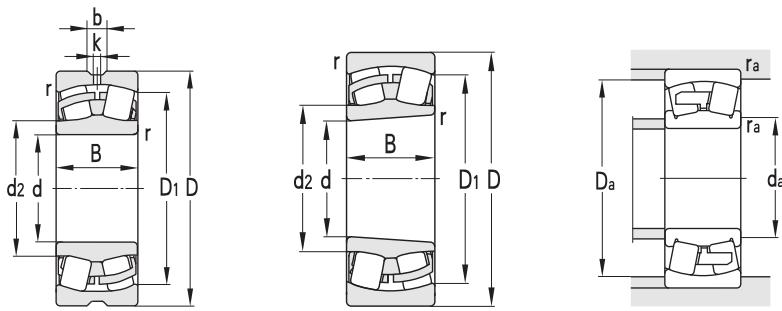
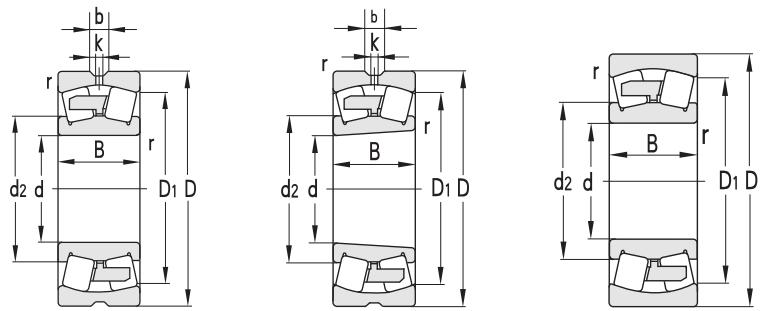
Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
	mm				KN		r/min	
400	590	142	5	2650	5600	630	800	23080X3CA 23080X3CA/W33
	600	148	5	2790	5900	600	750	23080CA 23080CAF3/W33
	600	148	5	2790	5900	600	750	23080CAF3 23080CAKF3/W33
	600	148	5	2790	5900	600	750	23080CAKF3/W33
	600	200	5	3960	7800	450	560	24080CAF3 24080CAF3/W33
	600	200	5	3960	7800	450	560	24080CA/W33
	600	200	5	3960	7800	450	560	24080CAK30/W33
	650	200	6	4250	8200	380	480	23180CA 23180CA/W33
	650	200	6	4250	8200	380	480	23180CAF3 23180CAF3/W33
	650	200	6	4250	8200	380	480	23180CAF3/W33
	650	200	6	4250	8200	380	480	23180CA/HCRW33
	670	216	6	4000	8550	380	480	23180X3CA/W33
	650	250	6	4800	9600	320	400	24180CAF3 24180CAF3/W33
	650	250	6	4800	9600	320	400	24180CA 24180CA/W33
	720	256	6	6150	11300	340	430	23280CA 23280CA/W33
	720	256	6	6150	11300	340	430	23280CAF3/W33 23280CAF3
	720	256	6	6150	11300	340	430	23280CAF3/W33
	820	243	7.5	5400	9600	340	430	22380CA/HCW33 22380CA/W33
420	520	75	2.1	950	2630	750	950	23884CAK 23884CAK/W33
	560	106	4	1530	4050	700	900	23984ACA/W33
	560	106	4	1530	4050	700	900	23984CA/W33
	620	150	5	2970	6400	450	560	23084CA
	620	150	5	2970	6400	450	560	23084CAF3 23084CAF3/W33
	620	150	5	2970	6400	450	560	23084CAK30/W33X
	620	200	5	3690	8450	380	480	24084CA/W33
	620	200	5	3690	8450	380	480	24084CAF3/W33
	620	200	5	3690	8450	380	480	24084CAK30F3/W33X
	700	224	6	4680	9200	360	450	23184CA/W33
	700	224	6	4680	9200	360	450	23184CAK 23184CAK/W33
	700	224	6	4680	9200	360	450	23184CAF3 23184CAF3/W513
	700	280	6	5750	11100	300	380	24184CA/W33
	700	280	6	6050	11800	300	380	24184CAK30/W33
	700	280	6	6050	11800	300	380	24184CA/HCRW33
	760	272	7.5	6170	11900	320	400	23284CA/W33
	760	272	7.5	6170	11900	320	400	23284CAK/W33

Other dimensions	Contact surface and chamfer dimensions				Caluation Factor				Weight		
	d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Kg
461	532	22.3	12	422	578	4	0.21	3.14	4.68	3.07	133
460	538	22	12	422	578	4	0.23	2.90	4.40	2.80	161
460	538	22	12	422	578	4	0.23	2.90	4.40	2.80	158
460	538	22	12	422	578	4	0.30	2.30	3.40	2.20	202
458	524	22	12	422	578	4	0.30	2.30	3.40	2.20	203
458	524	22	12	422	578	4	0.3	2.3	3.4	2.2	202
458	524	22	12	422	578	4	0.28	2.40	3.60	2.50	275
480	568	22.3	8	428	622	5	0.28	2.40	3.60	2.50	273
480	568	22.3	8	428	622	5	0.28	2.40	3.60	2.50	264
480	568	22.3	8	428	622	5	0.28	2.40	3.60	2.50	274
480	579	22.3	8	428	622	5	0.28	2.40	3.60	2.50	293
476	563	22.3	8	428	622	5	0.36	1.87	2.79	1.83	323
476	563	22.3	8	428	622	5	0.36	1.87	2.79	1.83	325
499	606	22	10	428	692	5	0.35	1.90	2.90	1.80	350
499	606	22	10	428	692	5	0.35	1.90	2.90	1.80	353
499	606	22	10	428	692	5	0.35	1.90	2.90	1.80	350
520	694	22.3	12	442	790	6	0.31	2.21	3.29	2.16	623
454	490	13.9	5	430	504	2	0.12	5.60	8.40	5.60	34.6
464	517	16.7	9	435	545	3	0.16	4.20	6.30	4.00	72.4
464	517	16.7	9	435	545	3	0.16	4.20	6.30	4.00	73.6
484	558	22	8	442	598	4	0.22	3.00	4.60	2.80	150
484	558	22	8	442	598	4	0.22	3.00	4.60	2.80	149
484	558	22	8	442	598	4	0.22	3.00	4.60	2.80	144
479	548	22.3	12	442	598	4	0.30	2.30	3.40	2.20	202
479	548	22.3	12	442	598	4	0.30	2.30	3.40	2.20	201
479	548	22.3	12	442	598	4	0.30	2.30	3.40	2.20	197
505	605	22.3	12	448	672	5	0.30	2.30	3.40	2.20	353
505	605	22.3	12	448	672	5	0.30	2.30	3.40	2.20	352
505	605	22.3	12	448	672	5	0.30	2.30	3.40	2.20	352
497	599	22.3	12	448	674	5	0.38	1.80	2.60	1.70	436
495	596	22.3	12	448	674	5	0.38	1.80	2.60	1.70	428
495	596	22.3	12	448	674	5	0.38	1.80	2.60	1.70	436
525	643	22	12	456	724	6	0.35	1.90	2.90	1.80	550
525	643	22	12	456	724	6	0.35	1.90	2.90	1.80	549

# Spherical Roller Bearings

**ZWZ**

d 420~480 mm



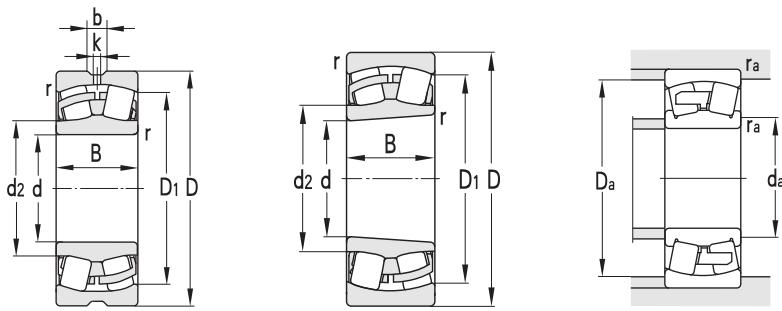
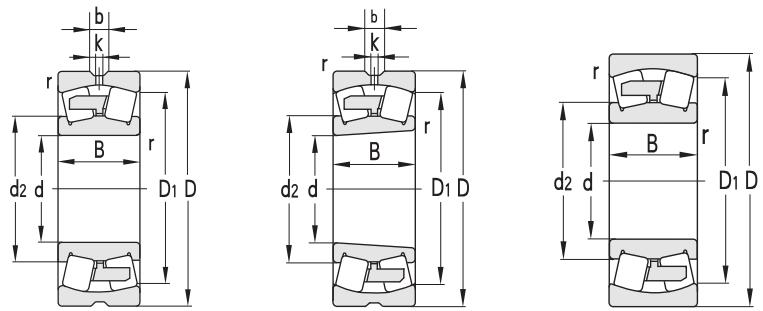
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	B	rsmin	Cr	Cor	Grease	Oil	
			KN		r/min			
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420	760	272	7.5	6170	11900	320	400	23284CAF3/C9W33
440	600	118	4	2030	4850	450	560	23988CA/W33
	650	157	6	3060	6500	430	530	23088CAK/W33
	650	157	6	3060	6500	430	530	23088CAF3
	650	157	6	3060	6500	430	530	23088CAF3/W33
	650	212	6	4150	9100	360	450	24088CA/W33
	650	212	6	4150	9100	360	450	24088CAK30F3/W33
	720	226	6	4950	10000	340	430	23188CA
	720	226	6	4950	10000	340	430	23188CAF3/W33
	720	280	6	6250	12500	300	380	24188CA/W33
	720	280	6	6250	12500	300	380	24188CAK30/W33
	790	280	7.5	6850	12800	320	400	23288CA/W33
	790	280	7.5	6850	12800	320	400	23288CAF3/W33
460	580	118	3	1730	4850	450	560	24892CA/W33
	580	118	3	1730	4850	450	560	24892CAK30/W33
	620	118	4	2120	5000	430	530	23992CA/W33
	620	110	4	1980	4400	430	530	23992X2CA/W33AYA1
	650	120	4	2430	5150	420	510	23992X3CA
	680	163	6	3280	6950	400	500	23092CAF3/W33
	680	163	6	3280	6950	400	500	23092CAK3
	680	218	6	4650	10200	340	430	24092CAF3/W33
	680	218	6	4650	10200	340	430	24092CA/HCRW33
	760	240	7.5	5500	10000	320	400	23192CA
	760	240	7.5	5500	10000	320	400	23192CAF3
	760	240	7.5	5500	10000	320	400	23192CAK3/W33
	760	300	7.5	6890	14400	160	200	24192CA/W33
	760	300	7.5	6890	14400	160	200	24192CAK30/W33
	760	300	7.5	6890	14400	160	200	24192CAF3/W33
	830	296	7.5	7350	13500	300	380	23292CAK3/W33
479	790	258	7.5	5300	12100	300	380	231/479X2CAF1/W33XYB2
480	600	90	3	1420	4000	450	600	23896CA
	650	128	5	2370	5750	400	500	23996CA/W33

Other dimensions				Contact surface and chamfer dimensions			Calulation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm	mm	mm	mm	mm	mm	mm					Kg
525	643	22	12	456	724	6	0.35	1.90	2.90	1.80	546
492	553	16.7	8	462	578	3	0.17	4.00	5.90	4.00	101
507	585	22.3	8	468	622	5	0.22	3.00	4.60	2.80	179
507	585	22.3	8	468	622	5	0.22	3.00	4.60	2.80	185
507	585	22.3	8	468	622	5	0.22	3.00	4.60	2.80	178
502	569	22.3	12	468	626	5	0.30	2.30	3.40	2.20	251
502	569	22.3	12	468	626	5	0.30	2.30	3.40	2.20	245
522	626	22.3	12	468	692	5	0.30	2.30	3.40	2.20	378
517	618	22.3	12	468	692	5	0.37	1.80	2.70	1.80	436
517	618	22.3	12	468	692	5	0.37	1.80	2.70	1.80	455
548	675	22.3	12	472	578	6	0.35	1.90	2.90	1.80	611
548	675	22.3	12	472	578	6	0.35	1.90	2.90	1.80	578
504	540	15	6	472	566	2.5	0.17	4.00	5.90	4.00	82
504	540	15	6	472	566	2.5	0.17	4.00	5.90	4.00	82
511	572	16.7	9	475	605	3	0.16	4.20	6.30	4.00	105
511	574	16.7	9	475	605	3	0.16	4.20	6.30	4.00	96.8
520	592	16.7	9	480	615	3	0.17	4.00	5.90	4.00	132
531	613	23.5	12	488	652	5	0.22	3.00	4.60	2.80	226
531	613	23.5	12	488	652	5	0.22	3.00	4.60	2.80	225
528	600	24	12	488	652	5	0.29	2.35	3.50	2.30	304
528	600	24	12	488	652	5	0.29	2.35	3.50	2.30	308
557	660	22	8	496	724	6	0.30	2.30	3.40	2.20	443
557	660	22	8	496	724	6	0.30	2.30	3.40	2.20	440
557	660	22	8	496	724	6	0.30	2.30	3.40	2.20	438
540	639	22.3	8	496	724	6	0.37	1.80	2.70	1.80	461
540	639	22.3	8	496	724	6	0.37	1.80	2.70	1.80	460
566	698	22.3	10	496	794	6	0.35	1.90	2.90	1.80	698
578	683	22	12	516	754	6	0.31	2.20	3.30	2.20	497
523	563	16.7	10	500	580	2.5	0.13	5.36	7.98	5.24	60.4
532	596	16.7	10	502	628	4	0.18	3.80	5.60	3.60	126

# Spherical Roller Bearings

**ZWZ**

d 480~500 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	B	rsmin	Cr	Cor	Grease	Oil	
mm								
KN								r/min

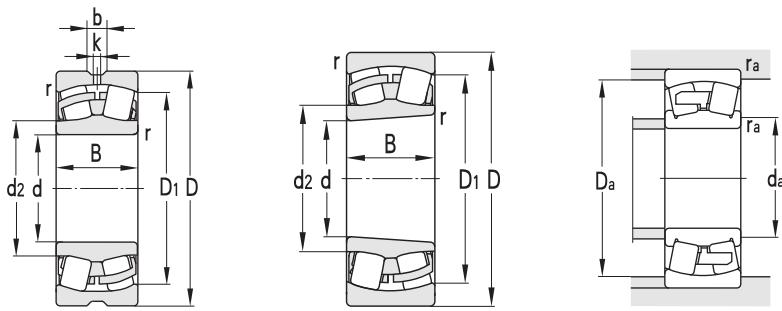
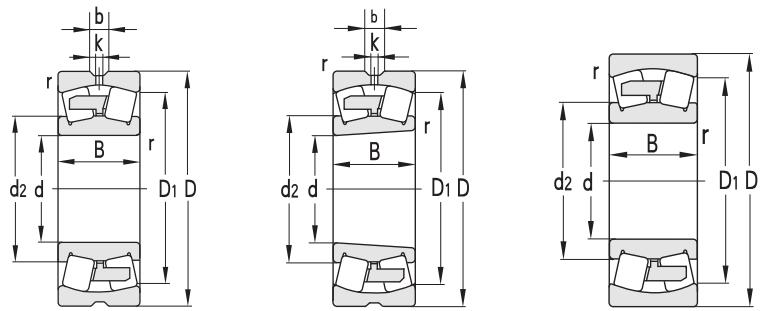
480	650	128	5	2370	5750	400	500	23996CAF1/W33 23996CAF3/W33
	650	128	5	2370	5750	400	500	23996CAF1 23996CAF3
	650	128	5	2370	5750	400	500	23996CAF1/W33
	700	165	6	3300	6900	380	480	23096CA/W33
	700	165	6	3300	6900	380	480	23096CAK/W33
	700	165	6	3260	7530	400	500	23096F3/W33
	700	218	6	4650	10400	340	430	24096CA/W33
	700	218	6	4650	10400	340	430	24096CAK30/W33
	790	248	7.5	6100	12000	300	380	23196CAF1/W33X 23196CAF3/W33X
	790	248	7.5	6100	12000	300	380	23196CAF1/W33X 23196CAF3/W33X
	790	308	7.5	8000	14900	240	320	24196CAF3/W33
	790	308	7.5	8000	14900	240	320	24196CAF30/W33
	870	310	7.5	7750	15200	260	340	23296CAF3/W33
	870	310	7.5	7750	15200	260	340	23296CAF3/W33
	870	310	7.5	7750	15200	260	340	23296CAK/W33
	870	310	7.5	6750	15200	280	360	23296/W33
	870	310	7.5	6750	15200	280	360	23296F3

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm											Kg
532	596	16.7	10	502	628	4	0.18	3.80	5.60	3.60	125
532	596	16.7	10	504	628	4	0.18	3.80	5.60	3.60	121
532	596	16.7	10	504	628	4	0.18	3.80	5.60	3.60	121
552	634	22.3	12	504	678	5	0.21	3.20	4.80	3.20	217
5552	634	22.3	12	504	678	5	0.21	3.20	4.80	3.20	206
553	625	22.3	12	504	678	5	0.23	2.90	4.40	2.80	247
542	618	22.3	12	504	678	5	0.28	2.40	3.60	2.50	296
542	618	22.3	12	504	678	5	0.28	2.40	3.60	2.50	290
578	687	22	12	516	754	6	0.30	2.30	3.40	2.20	516
578	687	22	12	516	754	6	0.30	2.30	3.40	2.20	485
568	673	22.3	8	513	759	6	0.37	1.80	2.70	1.80	584
568	673	22.3	8	513	759	6	0.37	1.80	2.70	1.80	582
581	732	22.3	12	516	834	6	0.35	1.90	2.90	1.80	853
581	732	22.3	12	516	834	6	0.35	1.90	2.90	1.80	848
581	732	22.3	12	516	834	6	0.35	1.90	2.90	1.80	859
581	736	22.3	12	516	834	6	0.35	1.90	2.90	1.80	910
581	736	22.3	12	516	834	6	0.35	1.90	2.90	1.80	909
542	586	16.7	8	512	606	2.5	0.12	5.60	8.40	5.60	66
542	586	16.7	8	512	606	2.5	0.12	5.60	8.40	5.60	54
555	619	22.3	12	522	648	4	0.17	4.00	5.90	4.00	120
555	619	22.3	12	522	648	4	0.17	4.00	5.90	4.00	119
555	619	22.3	12	522	648	4	0.17	4.00	5.90	4.00	119
555	619	22.3	12	522	648	4	0.17	4.00	5.90	4.00	119
555	619	22.3	12	522	648	4	0.17	4.00	5.90	4.00	119
555	619	22.3	12	522	648	4	0.17	4.00	5.90	4.00	119
568	653	22.3	12	528	692	5	0.21	3.20	4.80	3.20	228
568	653	22.3	12	528	692	5	0.21	3.20	4.80	3.20	227
568	653	22.3	8	528	692	5	0.21	3.20	4.80	3.20	227
568	653	22.3	8	528	692	5	0.21	3.20	4.80	3.20	228
568	653	22.3	8	528	692	5	0.21	3.20	4.80	3.20	227
568	653	22.3	8	528	692	5	0.21	3.20	4.80	3.20	227
568	653	22.3	8	528	692	5	0.21	3.20	4.80	3.20	227
568	653	22.3	8	528	692	5	0.21	3.20	4.80	3.20	227
565	645	22.3	12	523	698	5	0.26	2.60	3.90	2.50	297
565	645	22.3	12	523	698	5	0.26	2.60	3.90	2.50	298
588	712	22.3	12	531	798	6	0.37	1.80	2.70	1.80	712
588	712	22.3	12	531	798	6	0.37	1.80	2.70	1.80	719
620	774	22.3	12	536	884	6	0.35	1.90	2.90	1.80	985

# Spherical Roller Bearings

**ZWZ**

d 500~560 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	B	rsmin	Cr	Cor	Grease		
mm						KN		
mm						r/min		

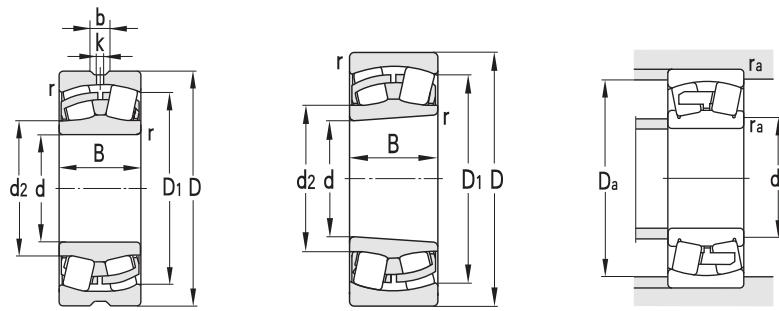
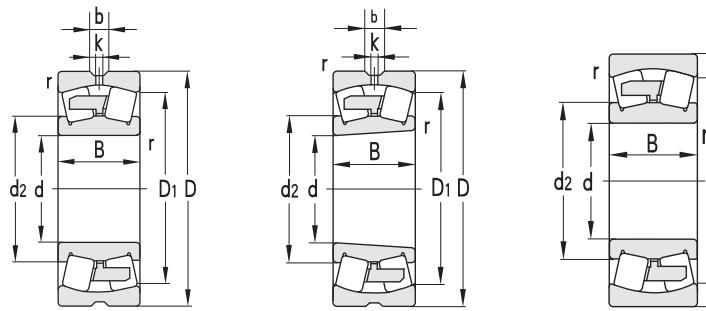
500	920	336	7.5	9460	18600	280	360	232/500CAF/W33
530	650	90	3	1500	4200	400	500	238/530CAF1/W33
	650	118	3	1820	5280	380	480	248/530CA/W33
	650	118	3	1820	5280	380	480	248/530CAF30/W33
710	316	5	2900	6700	360	450	239/530CAF3/W33AYA1	
710	136	5	3050	7100	360	450	239/530CAF/W33	
710	136	5	3050	7100	360	450	239/530CA/HCRW33	
780	185	6	4700	10200	340	430	230/530CA/W33X	
780	185	6	4700	10200	340	430	230/530CAF3/W33X	
780	185	6	4700	10200	340	430	230/530CAF/W33	
780	185	6	4700	10200	340	430	230/530CAK/W33	
780	185	6	4700	10200	340	430	230/530CA/HCRW33	
780	250	6	5400	12700	280	360	240/530CA/W33	
780	250	6	5400	12700	280	360	240/530CA/HCRW33	
870	272	7.5	7600	15300	260	340	231/530CA/W33	
870	272	7.5	7600	15300	260	340	231/530CAF/W33	
870	335	7.5	10300	18700	190	280	241/530CA/W33	
870	335	7.5	10000	18700	190	280	241/530CAF30/W33	
980	335	9.5	10300	20300	210	290	232/530CAF30/W33	
560	750	140	5	3050	7200	340	430	239/560CAF1/W33
750	140	5	3050	7200	340	430	239/560CAF3/W33	
820	195	6	4300	10500	320	410	230/560CA/W33	
820	195	6	4950	10500	320	410	230/560CAF3/W33	
820	195	6	4950	10500	320	410	230/560CAF3/W33	
820	195	6	4950	10500	320	410	230/560CAK/W33	
820	258	6	5700	13200	220	300	240/560CA/W33	
820	258	6	5700	13200	220	300	240/560CAF30/W33	
920	280	7.5	7590	15700	240	320	231/560CA/W33	
920	280	7.5	7590	15700	240	320	231/560CAK/W33	
920	280	7.5	7590	15700	240	320	231/560CA/HCRW33	
920	355	7.5	10000	20100	120	160	241/560CAF30/W33	
920	355	7.5	10000	20100	120	160	241/560CAF30/W33	
1030	365	9.5	11200	21000	190	260	232/560CA/W33	
1030	365	9.5	11200	21000	190	260	232/560CAF/W33	

Other dimensions				Contact surface and chamfer dimensions			Calulation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm											Kg
620	774	22.3	12	536	884	6	0.35	1.90	2.90	1.80	973
575	613	22.4	12	552	652	2.5	0.12	5.60	8.40	5.60	64.2
573	612	22	8	543	636	2.5	0.15	4.50	6.70	4.50	91
573	612	22	8	543	636	2.5	0.15	4.50	6.70	4.50	86
586	658	22.3	12	548	690	4	0.17	4.00	5.90	4.00	154
586	658	22.3	12	548	690	4	0.17	4.00	5.90	4.00	150
586	658	22.3	12	548	690	4	0.17	4.00	5.90	4.00	155
614	703	24	12	558	752	5	0.22	3.00	4.60	2.80	339
614	703	24	12	558	752	5	0.22	3.00	4.60	2.80	335
614	703	24	12	558	752	5	0.22	3.00	4.60	2.80	328
614	703	24	12	558	752	5	0.22	3.00	4.60	2.80	338
605	691	22.3	12	553	758	5	0.29	2.30	3.50	2.40	416
605	691	22.3	12	553	758	5	0.29	2.30	3.50	2.40	416
635	762	22.3	12	560	837	6	0.30	2.30	3.40	2.20	665
635	762	22.3	12	560	837	6	0.30	2.30	3.40	2.20	640
622	748	22.3	12	560	837	6	0.37	1.80	2.80	1.80	846
622	748	22.3	12	560	932	8	0.36	1.87	2.79	1.83	1220
656	818	22.3	12	565	932	8	0.36	1.87	2.79	1.83	1220
621	693	22.3	12	582	728	4	0.16	4.20	6.30	4.00	177
621	693	22.3	12	582	728	4	0.16	4.20	6.30	4.00	177
644	741	22.3	9	588	792	5	0.22	3.14	4.67	3.07	363
644	741	22.3	9	588	792	5	0.22	3.14	4.67	3.07	360
644	741	22.3	9	588	792	5	0.22	3.14	4.67	3.07	351
644	741	22.3	9	588	792	5	0.22	3.14	4.67	3.07	353
640	721	22.3	12	585	798	5	0.28	2.40	3.60	2.50	471
640	721	22.3	12	585	798	5	0.28	2.40	3.60	2.50	464
677	803	22.3	12	596	884	6	0.30	2.30	3.40	2.20	756
677	803	22.3	12	596	884	6	0.30	2.30	3.40	2.20	745
677	8.3	22.3	12	596	884	6	0.30	2.30	3.40	2.20	756
634	796	22.3	12	596	884	6	0.37	1.80	2.80	1.80	953
634	796	22.3	12	596	884	6	0.37	1.80	2.80	1.80	958
705	877	22.3	12	600	990	8	0.35	1.90	2.90	1.80	1380
705	877	22.3	12	600	990	8	0.35	1.90	2.90	1.80	1340

# Spherical Roller Bearings

**ZWZ**

d 580~670 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	B	rsmin	Cr	Cor	Grease		
						KN		r/min

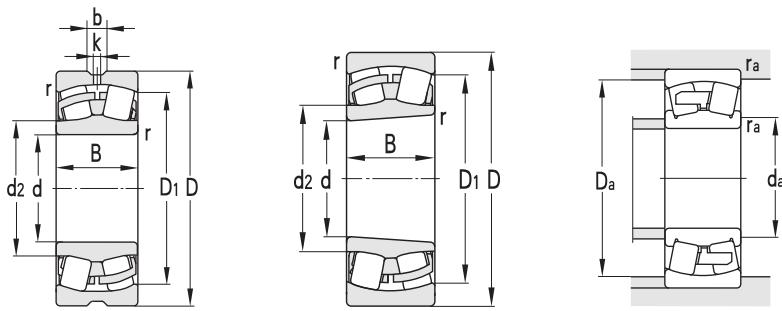
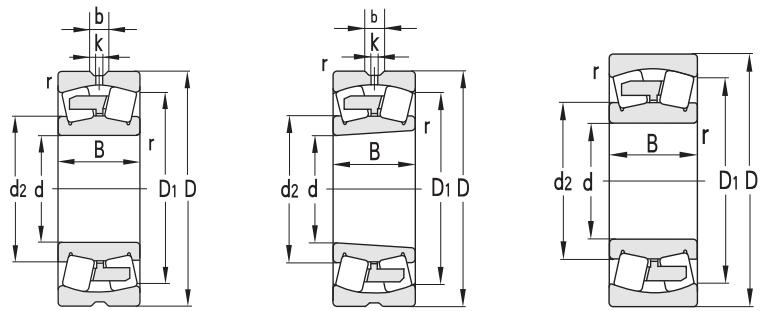
580	780	130	5	3050	6800							26/580CAKF3/W33
600	800	150	5	2960	8400	320	400	239/600CA	239/600CAF3/W33			
	800	150	5	2960	8400	320	400	239/600CAK/W33				
	800	200	5	4070	11200	320	400	249/600CAF1/W33	249/600CAF3/W33			
	870	200	6	5170	11600	300	380	230/600CAF3	230/600CAF3/W33			
	870	200	6	5170	11600	300	380	230/600CAKF3				
	870	200	6	5170	11600	300	380	230/600CA/W33				
	870	200	6	5170	11600	300	380	230/600CAK/W33				
	870	272	6	6600	15400	220	300	240/600CA/W33				
	870	272	6	6600	15400	220	300	240/600CA/HCRW33				
	870	272	6	7690	15900	240	320	240/600/W33				
	980	300	7.5	8900	18800	180	250	231/600CAF3/W33				
	980	375	7.5	10000	21600	110	150	241/600CA	241/600CA/HCW33			
	980	375	7.5	10000	21600	110	150	241/600CAF30/W33				
	980	375	7.5	10000	21600	110	150	241/600CA/W33				
	1090	388	9.5	12500	25000	190	260	232/600CAKF3/YA2W33				
630	780	112	4	2200	6300	300	380	238/630CAF3/W33				
	850	165	6	3905	9750	280	360	239/630CA	239/630CAF3/W33			
	850	165	6	3905	9750	280	360	239/630CAK/W33				
	920	212	7.5	5670	12800	260	340	230/630CAF3	230/630CAF3/W33			
	920	290	7.5	7350	17100	220	300	240/630/W33				
	1030	315	7.5	10000	21000	180	250	231/630CA/W33				
	1030	315	7.5	10000	21000	180	250	231/630CAK/W33				
	1030	400	7.5	12500	27200	160	210	241/630CA/W33				
	1030	400	7.5	12500	27200	160	210	241/630CAF30/W33				
670	820	112	4	2210	6300	270	350	238/670CA/W33				
	820	112	4	2210	6300	270	350	238/670CAF3/W33				
	820	150	4	3100	9600	270	350	248/670CA/W33				
	900	170	6	4370	10600	260	340	FL-239/670CA/W33				
	900	170	6	4400	10600	260	340	239/670CAF3/W33				
	980	230	7.5	6900	15000	240	310	230/670CAF3	230/670CAF3/W33			
	980	230	7.5	6900	15000	240	310	230/670CAF3/W33				
	980	308	7.5	9500	20000	190	270	240/670CA	240/670CA/W33			

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
668	742	22.3	12	622	778	4	0.17	4.00	5.90	4.00	220
668	742	22.3	12	622	778	4	0.17	4.00	5.90	4.00	213
666	728	22.3	12	622	760	4	0.22	3.00	4.60	2.80	287
685	787	22.3	9	628	842	5	0.22	3.00	4.60	2.80	442
685	787	22.3	9	628	842	5	0.22	3.00	4.60	2.80	430
685	787	22.3	9	628	842	5	0.22	3.00	4.60	2.80	431
685	787	22.3	9	628	842	5	0.22	3.00	4.60	2.80	419
682	770	22.3	12	628	850	5	0.30	2.30	3.40	2.80	551
682	770	22.3	12	628	850	5	0.30	2.30	3.40	2.80	551
680	770	22.3	12	628	850	5	0.30	2.30	3.40	2.20	550
717	855	22.3	12	660	996	6	0.29	2.30	3.50	2.40	894
709	827	22	8	636	944	6	0.36	1.90	2.82	1.85	1140
709	827	22	8	636	944	6	0.36	1.90	2.82	1.85	1134
709	827	22	8	636	944	6	0.36	1.90	2.82	1.85	1151
750	920	100	8	700	1000	8	0.35	1.93	2.88	1.80	1568
682	738	16.7	9	645	765	3	0.12	5.60	8.40	5.60	124
705	786	22.3	12	658	822	5	0.17	4.00	5.90	4.00	280
705	786	22.3	12	658	822	5	0.17	4.00	5.90	4.00	220
721	831	22.3	9	666	884	6	0.21	3.20	4.80	3.20	471
722	815	22.3	10	666	884	6	0.30	2.30	3.40	2.20	661
756	918	22.3	12	668	996	6	0.30	2.30	3.40	2.20	1080
756	918	22.3	12	668	996	6	0.30	2.30	3.40	2.20	1020
736	885	22.3	12	662	996	6	0.37	1.80	2.70	1.80	1440
736	885	22.3	12	662	996	6	0.37	1.80	2.70	1.80	1400
722	778	16.7	9	686	805	3	0.11	6.10	9.10	6.30	136
722	778	16.7	9	686	805	3	0.11	6.10	9.10	6.30	128
716	771	16.7	9	686	805	3	0.16	4.20	6.30	4.00	178
743	831	22.3	12	692	876	5	0.17	4.00	5.90	4.00	315
743	831	22.3	12	692	876	5	0.17	4.00	5.90	4.00	313
760	885	22.3	12	706	944	6	0.22	3.00	4.60	3.20	601
760	885	22.3	12	706	944	6	0.22	3.00	4.60	3.20	596
760	866	22.3	12	700	952	6	0.28	2.40	3.60	2.50	807

# Spherical Roller Bearings

**ZWZ**

d 670 ~ 750 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations
d	D	B	rsmin	Cr	Cor	Grease	
mm							
KN							r/min

670 1090 336 7.5 11000 22500 175 240 231/670CA/W33  
1090 336 7.5 11000 22500 175 240 231/670CAF1/W33  
1090 412 7.5 14000 31500 150 190 241/670CA/W33  
1220 438 12 15000 32000 160 210 232/670CA/W33  
1220 438 12 15000 32000 160 210 232/670CAF1/W33

710 870 118 4 2680 7550 260 340 238/710CAF3/W33  
950 180 6 5000 12000 240 310 239/710CAF1/W33 239/710CAF3/W33  
950 243 6 6200 17000 200 280 249/710CAF1/W33X  
1030 236 7.5 6300 16200 220 300 230/710CAF3/W33  
1030 236 7.5 7060 15700 220 300 230/710CA/W33  
1030 315 7.5 9300 22500 180 250 240/710CA/W33  
1030 315 7.5 9300 22500 180 250 240/710CAF30/W33  
1150 345 9.8 12000 25800 170 220 231/710CA/W33  
1150 345 9.8 12000 25800 170 220 231/710CAF1/W33  
1150 438 9.5 11900 29700 90 120 241/710CAF1/W33 241/710CAF3/W33  
1150 438 9.5 13200 31000 105 140 241/710K30/HCW33  
1280 450 12 17500 34400 160 210 232/710CA/W33

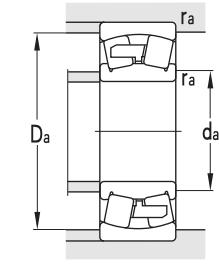
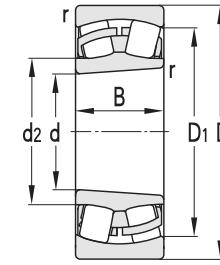
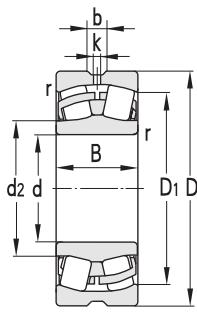
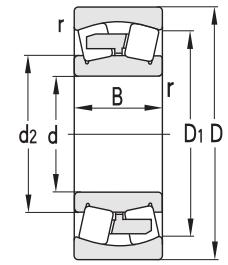
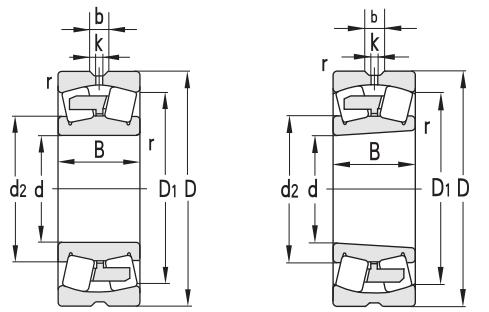
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920 128 5 2950 8600 240 310 238/750CAF1/W33  
920 170 5 3550 10900 220 300 248/750F1 248/750F3  
1000 185 6 5500 13700 210 290 239/750CA/W33  
1000 185 6 5500 13700 210 290 239/750CAF1/W33  
1000 250 6 7600 18200 180 250 249/750CA/W33  
1000 250 6 7600 18200 180 250 249/750CAF30/W33  
1090 250 7.5 7000 17900 200 280 230/750CA 230/750CAF1/W33XYA7  
1090 250 7.5 7000 17900 200 280 230/750CAF3 230/750CAF3/W33  
1090 335 7.5 10000 24800 170 220 240/750CA/W33  
1090 335 7.5 10000 24800 170 220 240/750CAF30/W33  
1220 365 9.5 13500 28800 160 210 231/750CA/W33  
1220 365 9.5 13500 28800 160 210 231/750CAF1/W33  
1220 475 9.5 16000 37000 130 170 241/750CA/W33  
1220 475 9.5 16000 37000 130 170 241/750CAF30/W33  
1360 475 15 16390 36000 90 120 232/750CAF1/W33 232/750CAF3/W33  
1360 475 15 16390 36000 90 120 232/750CAF3/W33

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm											Kg
801	958	22.3	12	700	1056	6	0.30	2.30	3.40	2.20	1280
801	958	22.3	12	700	1056	6	0.30	2.30	3.40	2.20	1240
786	934	22.3	12	705	1056	6	0.36	1.87	2.79	1.83	1560
832	1027	22.3	12	718	1170	10	0.35	1.90	2.90	1.80	2300
832	1027	22.3	12	718	1170	10	0.35	1.90	2.90	1.80	2260
761	824	22.3	12	725	855	3	0.11	6.10	9.10	6.30	156
787	882	22.3	12	733	927	5	0.17	4.00	5.90	4.00	364
791	864	22.3	12	733	927	5	0.22	3.00	4.60	2.80	500
814	939	22.3	12	746	994	6	0.21	3.20	4.80	3.20	669
814	939	22.3	12	746	994	6	0.21	3.20	4.80	3.20	580
806	918	22.3	12	738	1002	6	0.27	2.50	3.70	2.50	910
806	918	22.3	12	738	1002	6	0.27	2.50	3.70	2.50	893
851	1016	22.3	12	750	1110	8	0.28	2.40	3.60	2.50	1480
851	1016	22.3	12	750	1110	8	0.28	2.40	3.60	2.50	1430
838	982	22.3	12	754	1106	8	0.35	1.90	2.90	1.80	1791
836	974	23.5	12.5	754	1106	8	0.38	1.80	2.60	1.70	1800
876	1096	22.3	12	758	1232	10	0.35	1.90	2.90	1.80	2640
806	873	22.3	12	770	902	4	0.11	6.10	9.10	6.30	188
806	873	22.3	12	770	902	4	0.11	6.10	9.10	6.30	180
808	864	22.3	12	770	902	4	0.16	4.20	6.30	4.00	249
831	930	22.3	12	772	976	5	0.16	4.20	6.30	4.00	414
831	930	22.3	12	772	976	5	0.16	4.20	6.30	4.00	401
830	916	22.3	12	773	976	5	0.22	3.00	4.60	2.80	566
830	916	22.3	12	773	976	5	0.22	3.00	4.60	2.80	558
847	987	22.3	12	786	1054	6	0.21	3.20	4.80	3.20	789
847	987	22.3	12	786	1054	6	0.21	3.20	4.80	3.20	786
852	970	22.3	12	779	1062	6	0.28	2.40	3.60	2.50	1100
852	970	22.3	12	779	1062	6	0.28	2.40	3.60	2.50	1070
898	1080	22.3	12	798	1180	8	0.28	2.40	3.60	2.50	1760
898	1080	22.3	12	798	1180	8	0.28	2.40	3.60	2.50	1760
872	1039	22.3	12	792	1175	8	0.35	1.90	2.90	1.80	2195
872	1039	22.3	12	792	1175	8	0.35	1.90	2.90	1.80	2160
930	1145	22.3	12	876	1536	14	0.36	1.87	2.79	1.83	3100
930	1145	22.3	12	876	1536	14	0.36	1.87	2.79	1.83	3012

# Spherical Roller Bearings

**ZWZ**

d 800~900 mm



Principal dimensions			Basic load ratings		Limit speed ratings		Designations		
d	D	B	rsmin	Cr	Cor	Grease	Oil		
mm				KN		r/min			
800	980	180	5	4150	13000	170	220	248/800CA/W33	
1060	195	6	6350	14200	190	270	239/800CA/W33		
1060	195	6	6350	14200	190	270	239/800CAF/W33		
1060	258	6	7800	19500	175	240	249/800CA/W33		
1060	258	6	7800	19500	175	240	249/800CAF30/W33		
1060	258	6	7000	19300	175	240	249/800CAF3/C9W33YA3		
1150	258	7.5	8090	19100	170	220	230/800CA/W33		
1150	345	7.5	10300	24600	170	220	240/800CAF3	240/800CAF3/W33	
1150	358	7.5	6850	15600	170	220	230/800D		
1280	375	9.5	14500	31000	150	190	231/800CA/W33		
1280	375	9.5	14500	31000	150	190	231/800CAF/W33		
1280	475	9.5	16300	37100	130	170	241/800CAF1/W33	241/800CAF3/W33	

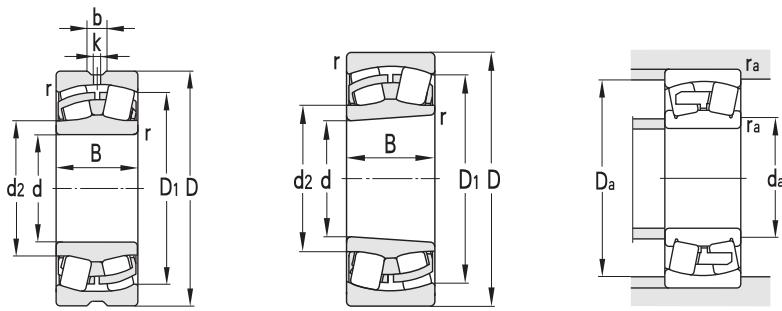
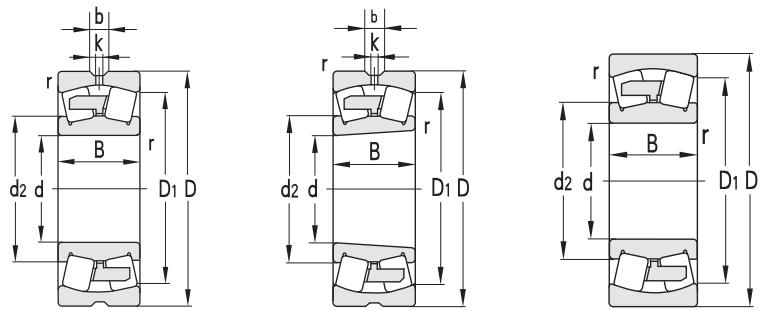
Principal dimensions			Basic load ratings		Limit speed ratings		Designations		
d	D	B	rsmin	Cr	Cor	Grease	Oil		
mm				KN		r/min			
850	1030	136	5	3300	9800	180	250	238/850CA/W33	
1030	136	5	3300	9800	180	250	238/850CAF/W33		
1120	200	6	5800	15500	180	250	239/850CA/W33		
1120	200	6	5800	15500	180	250	239/850CAF/W33		
1120	272	6	8200	22500	170	220	249/850CA/W33		
1120	272	6	8200	22500	170	220	249/850CAF30/W33		
1220	272	7.5	8450	22500	180	240	230/850CAF1		
1220	272	7.5	8450	22500	180	240	230/850CAF1	230/850CAF3	
1220	365	7.5	10400	29700	160	200	240/850CAF1/W33X	240/850CAF1/YA1	
1220	365	7.5	10400	29700	160	200	240/850CAF1/W33	240/850CAF1	
1220	365	7.5	10400	29700	160	200	240/850CAF3/W33X	240/850CAF3/YA1	
1220	365	7.5	10400	29700	160	200	240/850CAF3/W33	240/850CAF3	
1360	400	12	16000	34200	130	170	231/850CA/W33		
1360	400	12	16000	34200	130	170	231/850CAF/W33		
1360	500	12	20000	45100	105	140	241/850CA/W33		
1360	500	12	20000	45100	105	140	241/850CA30K/W33		
884	1320	365	7.5	12900	28900	110	150	240/884/HCC9YA1	
900	1090	190	5	4890	15500	210	375	248/900CA/W33	
1180	206	6	6050	16400	180	240	239/900CAF1/W33	239/900CAF3/W33	
1180	206	6	6050	16400	180	240	239/900CAF3/W33		

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm				mm							Kg
860	920	22.3	12	820	962	4	0.15	4.50	6.70	4.50	330
883	985	22.3	12	823	1036	5	0.16	4.20	6.30	4.00	480
883	985	22.3	12	823	1036	5	0.16	4.20	6.30	4.00	460
880	971	22.3	12	823	1036	5	0.21	3.20	4.80	3.20	648
880	971	22.3	12	823	1036	5	0.21	3.20	4.80	3.20	635
880	971	22.3	12	823	1036	5	0.21	3.20	4.80	3.20	634
900	1029	22.3	12	836	1114	6	0.20	3.40	5.00	3.20	894
900	1029	22.3	12	836	1114	6	0.27	2.50	3.70	2.50	1092
900	1029	22.3	12	836	1114	6	0.27	2.50	3.70	2.50	1087
948	1140	22.3	12	842	1238	8	0.28	2.40	3.60	2.50	1960
948	1140	22.3	12	842	1238	8	0.28	2.40	3.60	2.50	1900
938	1102	22.3	12	842	1238	8	0.35	1.90	2.90	1.80	2350
910	980	22.3	12	866	1012	4	0.11	6.10	9.10	6.30	244
910	980	22.3	12	866	1012	4	0.11	6.10	9.10	6.30	236
938	1045	22.3	12	872	1097	5	0.16	4.20	6.30	4.00	570
938	1045	22.3	12	872	1097	5	0.16	4.20	6.30	4.00	550
938	1028	22.3	12	872	1097	5	0.22	3.00	4.60	2.80	750
938	1028	22.3	12	872	1097	5	0.22	3.00	4.60	2.80	730
954	1108			886	1184	6	0.20	3.40	5.00	3.20	1074
954	1108			886	1184	6	0.20	3.40	5.00	3.20	1070
956	1086	22.3	12	886	1184	6	0.27	2.50	3.70	2.50	1410
956	1086	22.3	12	886	1184	6	0.27	2.50	3.70	2.50	1410
956	1086	22.3	12	886	1184	6	0.27	2.50	3.70	2.50	1410
956	1086	22.3	12	886	1184	6	0.27	2.50	3.70	2.50	1410
1008	1204	22.3	12	898	1312	10	0.28	2.40	3.60	2.50	2260
1008	1204	22.3	12	898	1312	10	0.28	2.40	3.60	2.50	2180
986	1180	22.3	12	898	1312	10	0.35	1.90	2.90	1.80	2750
986	1180	22.3	12	898	1312	10	0.35	1.90	2.90	1.80	2720
1038	1184	24	12	936	1258	6	0.28	2.40	3.60	2.50	1811
963	1031	22.3	12	918	1073	4	0.14	4.80	7.20	4.50	370
988	1096	22.3	12	928	1150	5	0.15	4.50	6.70	4.50	611
988	1096	22.3	12	928	1150	5	0.15	4.50	6.70	4.50	591

# Spherical Roller Bearings

**ZWZ**

d 900~1060 mm



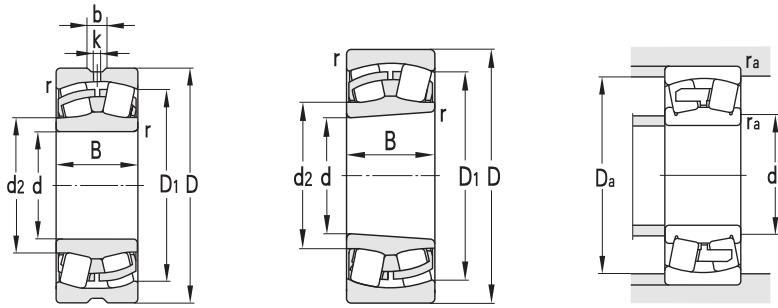
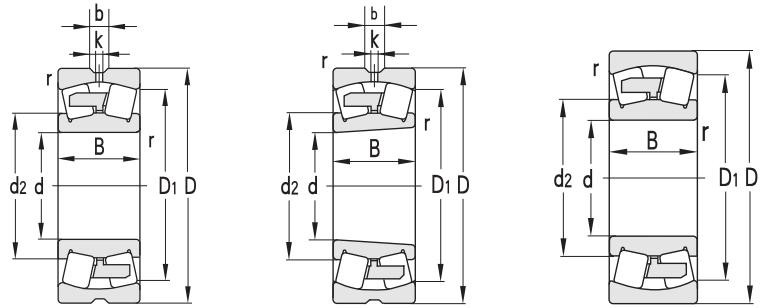
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	B	rsmin	Cr	Cor	Grease	Oil	
mm				KN		r/min		
900	1270	365	7.5	11400	28400	160	210	240/900X3/HC 240/900X3/HCYA3
	1270	365	7.5	11400	28400	160	210	240/900X3/HCC9YA1
	1270	365	9.5	9800	24600	160	210	240/900X3D-2
	1280	280	7.5	10100	23300	160	210	230/900CA/W33
	1280	280	7.5	10100	23300	160	210	230/900CAF3/W33
	1280	280	7.5	10200	23500	160	210	230/900CAK/W33
	1280	375	7.5	13000	34200	140	190	240/900CA/W33
	1280	375	7.5	10070	27900	150	190	240/900/W33
	1320	365	7.5	10500	27600	130	170	240/900X3/HCC9-1
	1420	515	12	21000	48500	95	140	241/900CAK/W33
	1420	515	12	21000	48500	95	140	241/900CAK30/W33
950	1250	224	7.5	7350	19000	160	225	239/950CA/W33
	1250	300	7.5	9300	25500	135	180	249/950CA/W33
	1250	300	7.5	9300	25500	135	180	249/950CAK30/W33
	1360	300	7.5	11000	26800	150	210	230/950CAF3/W33
	1360	412	7.5	15000	38500	125	160	240/950CA/W33
	1360	412	7.5	15000	38500	125	160	240/950CAK30/W33
	1500	545	7.5	24000	54500	90	125	241/950CA/W33
	1500	545	7.5	24000	54500	90	125	241/950CAK30/W33
1000	1220	165	6	4400	13600	125	160	238/1000CAKF1A/W20 238/1000CAKF3A/W20
	1320	315	7.5	10200	29200	125	160	249/1000CA/W33
	1320	315	7.5	10200	29200	125	160	249/1000CAK30/W33
	1420	308	7.5	12700	30500	130	175	230/1000CAF1/W33 230/1000CAF3/W33
	1420	412	7.5	15200	40500	110	150	240/1000CAF3/W33
	1580	462	12	21500	48200	95	130	231/1000CA/W33
	1580	462	12	21500	48200	95	130	231/1000CAK/W33
	1580	580	12	26500	62200	85	110	241/1000CA/W33
	1580	580	12	26500	62200	85	110	241/1000CAK30/W33
1060	1280	165	6	4700	14800	150	195	238/1060CA/W33
	1280	165	6	4700	14800	150	195	238/1060CAK/W33
	1280	218	6	6000	19500	125	160	248/1060CA/W33
	1280	218	6	6000	19500	125	160	248/1060CAF30/W33
	1400	250	7.5	9870	26300	145	170	239/1060CAKF3/W33X

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm				mm							Kg
1007	1139	24	12	936	1236	6	0.28	2.40	3.60	2.50	1434
1007	1139	22.3	12	936	1236	6	0.28	2.40	3.60	2.50	1434
1007	1139	22.3	12	936	1236	6	0.28	2.40	3.60	2.50	1970
1024	1175	22.3	12	928	1250	6	0.20	3.40	5.00	3.20	1220
1024	1175	22.3	12	928	1250	6	0.20	3.40	5.00	3.20	1168
1024	1175	22.3	12	928	1250	6	0.20	3.40	5.00	3.20	1180
1010	1136	22.3	12	936	1244	6	0.26	2.60	3.90	2.50	1600
1008	1136	24	12	936	1244	6	0.26	2.60	3.90	2.50	1520
1021	1184	22.3	12	940	1282	6	0.26	2.60	3.90	2.50	1730
1042	1233	22.3	12	948	1372	10	0.35	1.90	2.90	1.80	3400
1042	1233	22.3	12	948	1372	10	0.35	1.90	2.90	1.80	3360
1046	1163	22.3	12	978	1222	6	0.15	4.50	6.70	4.50	759
1048	1149	22.3	12	978	1222	6	0.21	3.20	4.80	3.20	1030
1048	1149	22.3	12	978	1222	6	0.21	3.20	4.80	3.20	1000
1075	1234	22.3	12	978	1330	6	0.20	3.40	5.00	3.20	1440
1072	1212	22.3	12	978	1330	6	0.27	2.50	3.70	2.50	2100
1072	1212	22.3	12	978	1330	6	0.27	2.50	3.70	2.50	2000
1104	1304	22.3	12	998	1452	6	0.35	1.90	2.90	1.80	3600
1104	1304	22.3	12	998	1452	6	0.35	1.90	2.90	1.80	3540
1069	1154	9	9	972	1260	5	0.11	5.92	8.81	5.78	402
1108	1211	22.3	12	1027	1291	6	0.21	3.20	4.80	3.20	1220
1108	1211	22.3	12	1027	1291	6	0.21	3.20	4.80	3.20	1200
1140	1303	22.3	12	1028	1392	6	0.19	3.60	5.30	3.60	1590
1130	1267	22.3	12	1028	1392	6	0.26	2.60	3.90	2.50	2130
1181	1404	22.3	12	1048	1532	10	0.28	2.40	3.50	2.50	3520
1181	1404	22.3	12	1048	1532	10	0.28	2.40	3.50	2.50	3410
1160	1372	22.3	12	1048	1532	10	0.35	1.90	2.90	1.80	4350
1160	1372	22.3	12	1048	1532	10	0.35	1.90	2.90	1.80	4260
1134	1218	22.3	12	1082	1258	5	0.11	6.10	9.10	6.30	440
1134	1218	22.3	12	1082	1258	5	0.11	6.10	9.10	6.30	425
1136	1211	22.3	12	1082	1258	5	0.14	4.80	7.20	4.50	576
1136	1211	22.3	12	1082	1258	5	0.14	4.80	7.20	4.50	565
1170	1304	22.3	12	1088	1392	6	0.16	4.20	6.30	4.00	1041

# Spherical Roller Bearings

**ZWZ**

d 1060~1320 mm



Principal dimensions	d	D	B	Basic load ratings		Limit speed ratings		Designations
				rsmin	Cr	Cor	Grease	
	mm				KN		r/min	

1060	1400	250	7.5	9870	26300	145	170	239/1060CAKF3/W33 239/1060CAKF3/C9W33
	1400	335	7.5	11100	31500	145	170	249/1060CAF3/W33
	1400	335	7.5	11000	32600	115	150	249/1060CA/W33
	1400	335	7.5	11000	32600	115	150	249/1060CAK30/W33
	1500	325	9.5	13500	33000	125	160	230/1060CA/W33
	1500	325	9.5	13500	33000	125	160	230/1060CAF/W33
	1500	438	9.5	17000	44100	110	150	240/1060F3/HCW33
	1500	438	9.5	17000	44100	110	150	240/1060F3/W33
	1500	438	9.5	17000	46000	100	145	240/1060CA/W33
	1500	438	9.5	17000	46000	100	145	240/1060CAK30/W33
	1500	585	9.5	15000	40000	100	145	240/1060D

1120	1360	243	6	7150	23500	105	165	248/1120CA/W33
	1360	243	6	7150	23500	105	165	248/1120CAF30/W33
	1460	335	7.5	12000	35200	90	135	249/1120CAF3/W33
	1580	345	9.5	15000	38100	90	125	230/1120CAF3/W33X
	1580	462	9.5	18100	49500	90	125	240/1120CA/W33
	1580	462	9.5	18100	49500	90	125	240/1120CAF30/W33

1180	1420	180	6	5600	18000	150	190	238/1180CAKF1A/W20
	1420	180	6	5340	17200	150	190	238/1180CAF3A/W20
	1420	243	6	7700	27200	135	160	248/1180CA/W33
	1420	243	6	7700	27200	135	160	248/1180CAF30/W33
	1540	272	7.5	10290	29600	110	150	239/1180CAF3/W33X 239/1180CAKF1/W33X
	1540	272	7.5	10700	29600	110	150	239/1180CAF3/W33X
	1540	355	7.5	13310	40000	110	150	249/1180CAF1/W33X
	1540	355	7.5	13900	40000	110	150	249/1180CAF30F3/W33
	1660	355	9.5	10290	29600	110	150	230/1180CAF1/W33X

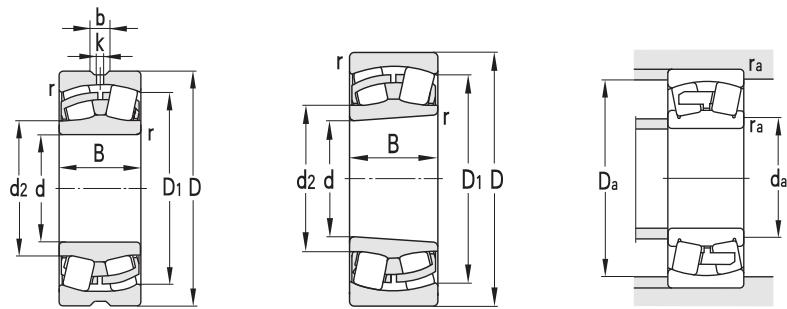
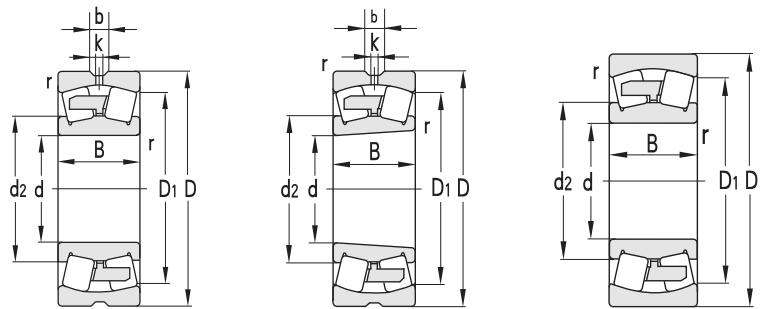
1250	1750	375	9.5	17500	44800	95	125	230/1250CAF/W33
	1750	375	9.5	17500	44800	95	125	230/1250CAK/W33

Other dimensions	d2	D1	b	k	Contact surface and chamfer dimensions			Caluation Factor				Weight
					da(min)	Da(max)	ra(max)	e	y1	y2	y0	
1170	1304	22.3	12	1088	1392	6	0.16	4.20	6.30	4.00	1041	
1170	1304	22.3	12	1088	1392	6	0.16	4.20	6.30	4.00	1441	
1164	1285	22.3	12	1088	1372	6	0.21	3.20	4.80	3.20	1420	
1164	1285	22.3	12	1088	1372	6	0.21	3.20	4.80	3.20	1390	
1200	1377	22.3	12	1093	1465	8	0.19	3.60	5.30	3.60	2300	
1200	1377	22.3	12	1093	1465	8	0.19	3.60	5.30	3.60	2210	
1185	1339	22.3	12	1093	1465	8	0.27	2.50	3.70	2.50	2500	
1185	1339	22.3	12	1093	1465	8	0.27	2.50	3.70	2.50	2500	
1190	1339	22.3	12	1093	1465	8	0.26	2.60	3.90	2.50	2530	
1190	1339	22.3	12	1093	1465	8	0.26	2.60	3.90	2.50	2490	
1190	1339	22.3	12	1093	1465	8	0.26	2.60	3.90	2.50	3083	
1198	1278	22.3	12	1140	1335	5	0.15	4.50	6.70	4.50	740	
1198	1278	22.3	12	1140	1335	5	0.15	4.50	6.70	4.50	725	
1235	1348	22.3	12	1146	1431	6	0.20	3.40	5.00	3.20	1500	
1286	1443	40	25	1155	1545	8	0.19	3.40	5.00	3.20	2210	
1268	1421	22.3	12	1155	1545	8	0.26	2.60	3.90	2.50	2940	
1268	1421	22.3	12	1155	1545	8	0.26	2.60	3.90	2.50	2850	
1254	1349	9	1180	1450	5	0.11	6.28	9.35	6.14	577		
1254	1349	9	1180	1450	5	0.11	6.28	9.35	6.14	580		
1250	1344	22.3	12	1180	1450	5	0.14	4.80	7.20	4.50	790	
1250	1344	22.3	12	1180	1450	5	0.14	4.80	7.20	4.50	770	
1296	1432	24	12	1216	1536	6	0.16	4.20	6.30	4.00	1350	
1296	1432	24	12	1216	1536	6	0.16	4.20	6.30	4.00	1390	
1290	1422	22.3	12	1216	1536	6	0.20	3.42	5.09	3.34	1772	
1290	1422	22.3	12	1216	1536	6	0.20	3.42	5.09	3.34	1742	
1328	1509	24	12	1240	1600	8	0.20	3.42	5.09	3.34	2460	
1412	1610	22.3	12	1285	1715	8	0.19	3.60	5.30	3.60	2850	
1412	1610	22.3	12	1285	1715	8	0.19	3.60	5.30	3.60	2760	
1418	1513	22.3	12	1342	1578	5	0.15	4.50	6.70	4.50	1180	
1418	1513	22.3	12	1342	1578	5	0.15	4.50	6.70	4.50	1150	
1446	1588	24	12	1350	1691	6	0.21	3.20	4.80	3.20	2510	
1446	1588	24	12	1350	1691	6	0.21	3.20	4.80	3.20	2460	

# Spherical Roller Bearings

**ZWZ**

d 1320~1800 mm



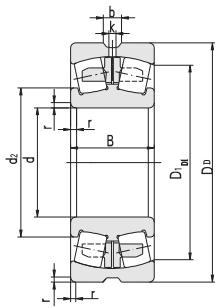
Principal dimensions			Basic load ratings		Limit speed ratings		Designations
d	D	B	rsmin	Cr	Cor	Grease	
mm				KN		r/min	
1320	1850	530	12	23200	63300	70	85 240/1320CAF3/W33T
1400	1820	425	9.5	20000	58500	70	85 249/1400CAF3/W33
1500	1820	315	7.5	12000	40000	65	83 248/1500CA/W33
1800	2180	315	7.5	12000	40000	65	83 248/1500CAK30F3/W20
1800	2180	375	9.5	17400	62800	62	70 248/1800CA/W33
		375	9.5	17400	62800	62	70 248/1800CAK30/W33

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm				mm							Kg
1485	1662	40	25	1390	1765	11	0.25	2.70	4.00	2.60	4540
1528	1681	22.3	12	1452	1768	8	0.20	3.42	5.09	3.34	2920
1608	1710	24	12	1528	1792	6	0.15	4.50	6.70	4.50	1730
1608	1710	24	12	1528	1792	6	0.15	4.50	6.70	4.50	1700
1935	2058	24	12	1832	2145	8	0.15	4.50	6.70	4.50	2920
1935	2058	24	12	1832	2145	8	0.15	4.50	6.70	4.50	2870

# Vibrating Screen Spherical Roller Bearings

**ZWZ**

d 80~200 mm



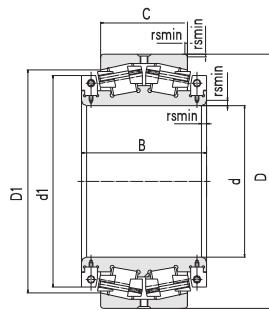
Principal dimensions			Basic load ratings		Limit speed ratings		Designations					
d	D	B	r <sub>min</sub>	Cr	Cor	Grease	Oil					
			KN		r/min							
mm	mm	mm										
80	170	58	2.1	345	495	2000	2800	22316/VBW33				
85	180	60	3	355	505	1900	2600	22317Q1/VB				
90	190	64	3	462	625	1800	2400	22318/VBW33				
95	200	67	3	485	685	1800	2400	22319/VBW33				
100	215	73	3	530	650	1800	2400	22320Q1/VB				
	215	73	3	530	650	1800	2400	22320Q1/VBW33				
105	175	56	2	402	550	1900	2700	22321Q1/VB				
110	240	80	3	650	910	1600	2000	22322Q1/VB				
	240	80	3	650	910	1600	2000	22322Q1/VBW33				
120	260	86	3	840	1100	1400	1800	22324Q1/VB				
130	230	64	3	495	685	1800	2400	22226KQ1/VBW33				
	280	93	4	840	1300	1300	1700	22326/VBHAC9W33				
	280	93	4	840	1300	1300	1700	22326/VBW33				
140	300	102	4	840	1300	1200	1600	22328Q1/VBW33				
	300	118	4	1060	1450	1100	1500	23328Q1/VBW33				
150	320	108	4	1160	1580	1100	1500	22330Q1/VBW33				
160	340	114	4	1400	2050	950	1300	22332Q1/VBW33				
170	360	136	4	1880	2540	800	1000	23334X2Q1/VBHAC9W33				
180	380	126	4	1620	2400	900	1200	22336Q1/VBW33				
190	400	132	5	1800	2630	850	1100	22338Q1/VBW33				
200	420	138	5	1910	2860	850	1100	22340Q1/VBW33				

Other dimensions				Contact surface and chamfer dimensions			Caluation Factor				Weight
d2	D1	b	k	da(min)	Da(max)	ra(max)	e	y1	y2	y0	
mm	mm	mm	mm	mm	mm	mm					Kg
109	142	8.3	4	92	158	2	0.34	1.99	2.96	1.94	6.24
115	150			99	166	2.5	0.34	1.99	2.96	1.94	8.19
123	159	8.3	5	104	176	2.5	0.34	1.99	2.96	1.94	8.49
128	167	8.3	5	109	186	2.5	0.34	1.99	2.96	1.94	10.5
135	179	11.1	5	114	201	2.3	0.37	1.80	2.70	1.80	13.5
135	179			114	201	2.3	0.37	1.80	2.70	1.80	13.5
127	151			115	165	2	0.31	2.20	3.30	2.20	5.48
150	197	8.3	4	124	226	2.5	0.37	1.80	2.70	1.80	18.9
150	197			124	226	2.5	0.37	1.80	2.70	1.80	18.8
165	215	16.7	6	134	246	2.5	0.35	1.90	2.90	1.80	23.3
172	210	16.7	9	144	216	2.5	0.30	2.50	3.70	2.50	11.2
178	232	16.7	9	148	262	3	0.36	1.88	2.79	1.83	28.6
178	232	16.7	9	148	262	3	0.36	1.88	2.79	1.83	28.6
186	247	16.7	7	158	282	3	0.37	1.80	2.70	1.80	37.0
210	270			158	280	3	0.42	1.69	2.51	1.65	41.8
203	265	22.3	8	168	302	3	0.37	1.80	2.70	1.80	44.8
201	284	22.3	8	178	322	3	0.36	1.87	2.79	1.83	52.8
226	292	22.3	8	188	342	3	0.41	1.65	2.45	1.61	69.0
242	316	22.3	8	198	362	3	0.35	1.90	2.90	1.80	71.3
257	334	22.3	8	212	378	4	0.35	1.90	2.90	1.80	82.2
269	350	22.3	8	222	398	4	0.35	1.90	2.90	1.80	97

# Split Spherical Roller Bearings

**ZWZ**

d 120~800 mm



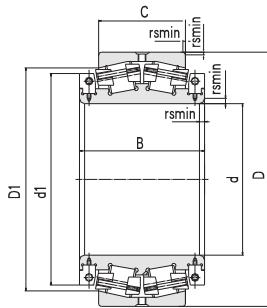
Principal dimensions				Basic load ratings			Designations
d	D	B	C	rsmin	Cr	Cor	
mm							
					KN		
120	200	142	80	2	540	870	24124D
140	230	102	53	2	350	580	23028D
180	300	125	74	2.1	680	1050	23136X2D
280	500	260	176	5	2650	4400	23256D
300	500	240	160	5	1660	4800	23160D
360	540	220	134	5	2150	4480	23072D
400	600	240	148	5	2750	5800	23080D
420	620	238	150	6	2750	5850	23084D
460	700	245	165	6	3150	6500	23092X3D
530	780	265	185	6	3400	8100	230/530D
560	870	330	200	6	5020	10500	230/560X3D
600	980	515	375	7.5	10000	21500	241/600D
630	920	310	212	7.5	5650	12500	230/630D
670	980	350	230	7.5	6400	13500	230/670D
710	950	375	243	6	5720	15100	249/710D
	1030	360	236	7.5	6900	15500	230/710D
750	1000	360	250	6	6310	16800	249/750D
	1090	340	250	7.5	6810	15230	230/750D
800	1060	370	258	6	6850	18500	249/800D
	1150	490	325	7.5	12200	30500	240/800X2D

Other dimensions		Calulation Factor			Weight	
d2	D1	e	y1	y2	y0	
mm						
						Kg
165	168	0.37	1.8	2.7	1.8	18.5
181	190	0.22	3	4.6	2.8	15.2
221	247	0.24	2.8	4.2	2.8	32
420	438	0.35	1.9	2.9	1.9	178
419	434	0.3	2.3	3.4	2.2	153
477	481	0.23	2.9	4.4	2.8	158
523	540	0.23	2.9	4.4	2.8	210
542	561	0.22	3	4.6	2.8	223
605	635	0.21	3.2	4.8	3.2	346
666	704	0.21	3.2	4.8	3.2	389
734	785	0.22	3	4.6	2.8	585
812	833	0.35	1.9	2.9	1.8	1370
799	836	0.21	3.2	4.8	3.2	636
862	890	0.21	3.2	4.8	3.2	820
862	867	0.22	3	4.6	2.8	710
902	938	0.21	3.2	4.8	3.2	895
901	915	0.22	3	4.6	2.8	716
931	992	0.2	3.4	5	3.2	961
957	967	0.21	3.2	4.8	3.2	815
1045	1075	0.27	2.5	3.7	2.5	1990

# Split Spherical Roller Bearings

**ZWZ**

d 850~1250 mm



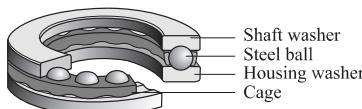
Principal dimensions				Basic load ratings			Designations	
d	D	B	C	rsmin	Cr	Cor		
mm								
KN								
850	1120	390	272	6	7350	20500	249/850D	
	1220	455	365	7.5	10900	25800	240/850D	
	1220	540	365	7.5	10900	25800	240/850WBD	
	1280	540	375	7.5	12200	30600	240/850X3D	
884	1320	478	365	9.5	11000	24900	240/884D/HC	
900	1180	400	280	6	8100	22600	239/900X2	
	1270	470	365	9.5	9800	24600	240/900X3D	
	1280	498	375	9.5	9800	24600	240/900X2D/HC	
	1320	478	365	9.5	9850	24100	240/900X3D/HCC9-2	
950	1250	420	300	7.5	8800	25200	249/950D	
	1360	420	300	7.5	9100	21000	230/950D	
1000	1470	530	345	9.5	14400	35900	230/1000X3D	
1060	1460	500	335	7.5	11400	33000	249/1060X1D	
1120	1460	500	335	7.5	11300	33000	249/1120D	
	1540	525	355	7.5	14200	43000	240/1120X3D	
1150	1750	610	400	9.5	20000	48300		
1180	1540	500	355	7.5	10000	31500	249/1150D	
	1750	670	500	9.5	22500	46500		
1250	1750	560	375	9.5	19500	48000	249/1180X3D	

Other dimensions		Calulation Factor				Weight	
d2	D1	e	y1	y2	y0		
mm							
mm							
1010	1027	0.22	3	4.6	2.8	835	
1030	1092	0.27	2.5	3.7	2.5	1646	
1060	1092	0.27	2.5	3.7	2.5	1781	
1124	1146	0.26	2.6	3.9	2.5	2380	
1068	1205	0.25	2.7	4	2.6	2457	
1059	1085	0.21	3.2	4.8	3.2	1120	
1118	1130	0.25	2.7	4	2.6	1970	
1118	1130	0.25	2.7	4	2.6	2064	
1140	1178	0.24	2.8	4.2	2.8	2050	
1132	1148	0.21	3.2	4.8	3.2	1320	
1169	1234	0.2	3.4	5	3.2	1956	
1271	1338	0.21	3.2	4.8	3.2	3030	
1331	1349	0.2	3.4	5	3.2	2476	
1331	1349	0.2	3.4	5	3.2	2100	
1403	1419	0.2	3.4	5	3.2	2920	
1482	1576	0.22	3	4.6	2.8	4760	
1394	1428	0.2	3.4	5	3.2	2254	
1501	1572	0.27	2.5	3.7	2.5	5370	
1562	1607	0.19	3.6	5.3	3.6	3850	

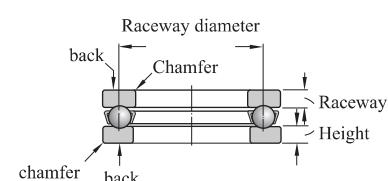
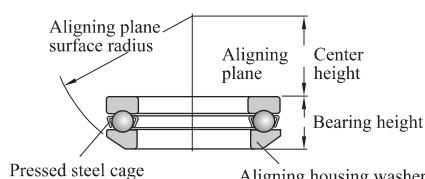
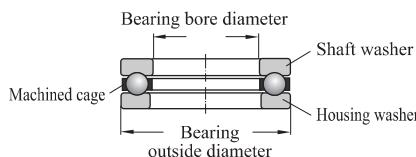
## Product Characteristics

Thrust ball bearing consists of shaft washer, housing washer, steel balls and cage. The ring matched with shaft is called shaft washer, matched with housing called housing washer. If the installation surface profile of housing washer is spherical, the bearing can be self-aligned, which can reduce installation deviation.

Thrust ball bearings mainly bear axial loads and can transfer big axial loads. It can not bear radial loads. This type the bearing can be applied to steering system of automobile and main shaft of machinery.



(Thrust ball bearing)



## Types of bearings

Thrust ball bearings produced by ZWZ cover 2 types:

- Single direction thrust ball bearing;
- Double direction thrust ball bearing.

### Single- direction thrust ball bearing:

Single- direction thrust ball bearing consists of one shaft washer, two housing washers, one center shaft washer, steel balls which are the cage unit. Bearing can be separated. Shaft washer, housing washers, steel ball - cage unit can be installed individually. These bearings cover 3 types:

- Bearing with flat housing washer
- Bearing with self-aligning housing washer
- Bearing with self-aligning washer and self-aligning seat washer

Double direction thrust ball bearing can bear axial loads from double direction, and can locate the bearing from 2 direction.

## Dimension scope

Thrust ball bearings produced by ZWZ are listed in the table,

Inner diameter range: 25mm~1380mm

Outer diameter range: 42mm~1540

mm

Width range: 11mm~160mm

## Tolerance

ZWZ standard thrust ball bearing precisions cover P0, P6, P5, and P4 and conform to the national standards. Please refer to tolerance table in preface.

## Cage

Normally pressed cage and solid cage are adopted for this type of bearings. Other cages can be used for this type of bearing for special applications.

If bearing maximum O.D. is 250 mm, pressed steel cage adopted. Cage type is not indicated in the suffix of bearing specifications.

If bearing minimum OD is 250 mm, then solid brass cage adopted. And cage type is not indicated in the suffix of bearing specifications.

## Minimum axial loads

When bearing in operation, of loads applied to bearing too small, the axial direction not been pressed tightly, then due to the function of eccentric force, slide occurs to steel balls which can affect bearing operation. In order to avoid this, minimum axial loads Famin must be applied to the bearing.

$$F_{\text{amin}} = 5.1 \left( \frac{n \cdot C_{\text{0a}}}{1000} \right) \times 10^{-6}$$

Famin: minimum loads needed [KN]

n: Rotating speed r/min

C0a: basic rating loads [KN]

## Angle deviation allowance

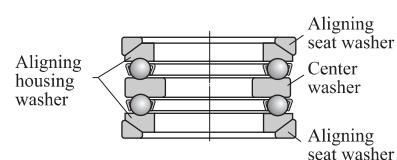
Two supporting surfaces must be parallel, any deviation is not allowed. Thrust ball bearing with spherical seat washer and spherical washer can be aligned, which can reduce the angle deviation when bearings installed.

## Equivalent dynamic load

P=Fa [KN]

## Equivalent static load

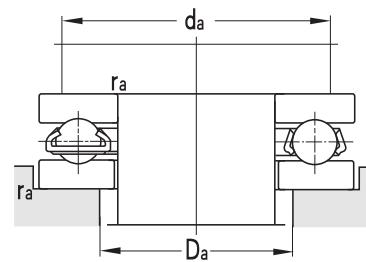
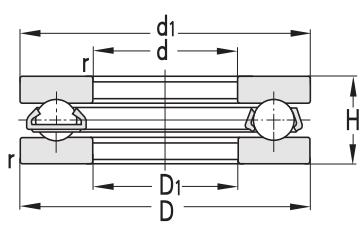
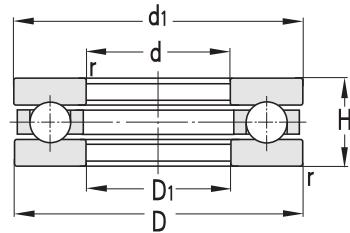
P0=Fa [KN]



# Thrust Ball Bearings

**ZWZ**

d 25~55 mm



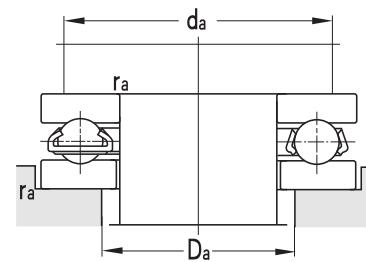
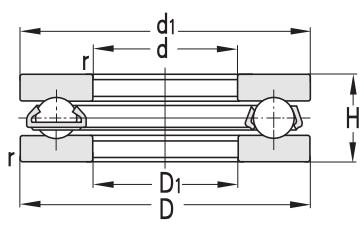
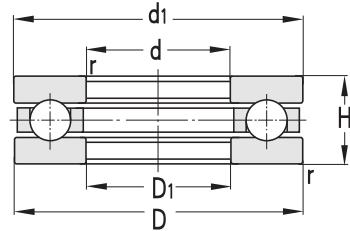
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	H	rmin	Cr	Cor	Grease	Oil	
			KN		r/min			
25	42	11	0.6	18.2	28.0	4800	6300	51105
	52	18	1	35.0	42.0	3400	4500	51305
30	52	16	0.6	27.3	40.0	3600	4800	51206
	60	21	1	42.5	56.0	2800	3800	51306
	70	28	1	69.0	74.0	2000	3000	51406
35	52	12	0.6	20.8	36.0	4300	5600	51107
	52	12	0.6	20.8	36.0	4300	5600	51107M
	62	18	1	37.3	55.5	3000	4000	51207
	68	24	1	55.5	73.8	2400	3400	51307
	68	24	1	55.5	73.8	2400	3400	51307/YA6
36.6	53.8	12	0.7	15.2	28.7	2400	3400	517/36.6M
40	60	13	0.6	27.3	51.0	3800	5000	51108
	60	13	0.6	27.3	51.0	3800	5000	51108M
	68	19	1	46.8	78.0	2800	3800	51208
	68	19	1	46.8	78.0	2800	3800	51208M
	78	26	1	68.5	95.0	2000	2400	51308
	100	28	1.1	75.5	151	1700	2400	51708
42	60	13	0.6	27.3	51.0	3800	5000	
45	65	14	0.6	26.7	50.0	3400	4500	51109
	65	14	0.6	26.7	50.0	3400	4500	51109M
	73	20	1	37.0	81.0	2600	3600	51209
	85	28	1	72.3	96.0	1900	2800	51309
50	70	14	0.6	27.3	58.0	3200	4300	51110
	70	14	0.6	27.3	58.0	3200	4300	51110M
	78	22	1	54.6	94.0	2400	3400	51210
	95	31	1.1	96.2	145	1800	2600	51310
	110	43	1.5	159	197	1500	2000	51410M
55	78	16	0.6	33.5	72.0	2800	3800	51111

Other dimensions		Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	ra(max)		
mm	mm	mm	mm	mm	Kg	
42	26	35	32	0.6	0.0589	
52	27	41	36	1	0.165	
52	32	43	39	0.6	0.138	
60	32	48	42	1	0.266	
70	32	54	46	1	3.94	
52	37	45	42	0.6	0.0779	
52	37	45	42	0.6	0.0817	
62	37	51	46	1	0.193	
68	37	55	48	1	0.361	
68	37	55	48	1	0.301	
53.8	36.8	46.8	43.6	0.7	0.089	
60	42	52	48	0.6	0.118	
60	42	52	48	0.6	0.118	
68	42	57	51	1	0.273	
68	42	57	51	1	0.324	
78	42	63	55	1	0.521	
100	58	75	65	1	0.970	
60	42	52	48	0.6	0.115	
65	47	57	53	0.6	0.139	
65	47	57	53	0.6	0.139	
73	47	62	56	1	0.332	
85	47	69	61	1	0.656	
70	52	62	58	0.6	0.155	
70	52	62	58	0.6	0.155	
78	52	67	61	1	0.374	
95	52	77	68	1	0.942	
110	52	86	74	1.5	1.86	
78	57	69	64	0.6	0.226	

# Thrust Ball Bearings

**ZWZ**

d 55~80 mm



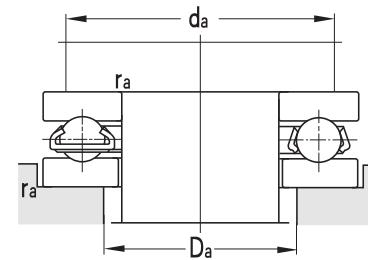
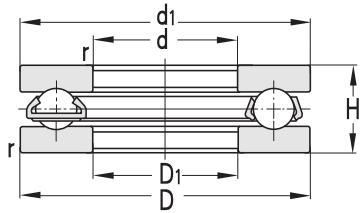
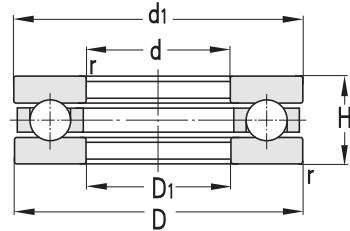
Principal dimensions				Basic load ratings		Limit speed ratings		Designations	
d	D	H	rmin	Cr	Cor	Grease	Oil		
mm				KN		r/min			
55	78	16	0.6	33.5	72.0	2800	3800	51111M	
	90	25	1	68.9	123	1900	2800	51211	
	105	35	1.1	119	174	1600	2200	51311	
	120	48	1.5	191	226	1300	1800	51411	
60	85	17	1	39.5	87.0	2600	3600	51112	
	85	17	1	39.5	87.0	2600	3600	51112M	
	95	26	1	74.0	141	1900	2800	51212	
	95	26	1	74.0	141	1900	2800	51212M	
	110	35	1.1	100	208	1600	2200	51312	
	130	51	1.5	200	262	1100	1600	51412M	
65	90	18	1	45.5	103	2400	3400	51113	
	90	18	1	45.5	103	2400	3400	51113M	
	100	27	1	75.4	151	1800	2600	51213	
	115	36	1.1	107	228	1500	2000	51313	
	140	56	2	239	330	1000	1500	51413M	
70	95	18	1	49.4	119	2400	3400	51114	
	95	18	1	49.4	119	2400	3400	51114M	
	105	27	1	76.7	161	1800	2600	51214	
	105	27	1	76.7	161	1800	2600	51214M	
	125	40	1.1	148	270	1400	1900	51314	
	125	40	1.1	148	270	1400	1900	51314M	
	150	60	2	257	350	950	1400	51414M	
75	100	19	1	48.1	120	2200	3200	51115	
	100	19	1	48.1	120	2200	3200	51115M	
	110	27	1	64.2	173	1200	2400	51215	
	135	44	1.5	175	288	1900	1700	51315	
	160	65	2	251	438	1300	2000	51415	
80	105	19	1	49.4	130	2000	3000	51116	
	115	28	1	87.1	193	1700	2400	51216	
	140	44	1.5	182	315	1200	1700	51316	
	140	44	1.5	173	395	1200	1700	51316M	

Other dimensions		Abutment and fillet dimensions			Weight
d1	D1	da(min)	Da(max)	ra(max)	Kg
78	57	69	64	0.6	0.226
90	57	76	69	1	0.571
105	57	85	75	1	1.35
120	57	94	81	1.5	2.61
85	62	75	70	1	0.263
85	62	75	70	1	0.263
95	62	81	74	1	0.695
95	62	81	74	1	0.752
110	62	90	80	1	1.39
130	62	102	88	1.5	3.48
90	67	80	75	1	0.315
90	67	80	75	1	0.363
100	67	86	79	1	0.733
115	67	95	85	1	1.54
140	68	110	95	2	4.17
95	72	85	80	1	0.351
95	72	85	80	1	0.377
105	72	91	84	1	0.764
105	72	91	84	1	0.756
125	72	103	92	1	2.00
125	72	103	92	1	2.85
150	73	118	102	2	5.06
100	77	90	85	1	0.382
100	77	90	85	1	0.382
110	77	96	89	1	0.83
135	77	111	99	1.5	2.61
160	78	126	109	2	6.61
105	82	95	90	1	0.399
115	82	101	94	1	0.92
140	82	116	104	1.5	2.63
140	82	116	104	1.5	2.92

# Thrust Ball Bearings

**ZWZ**

d 80~110 mm



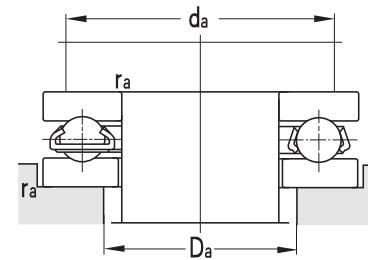
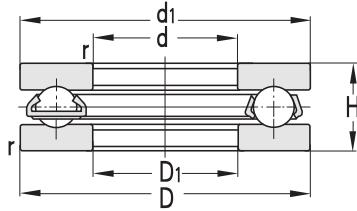
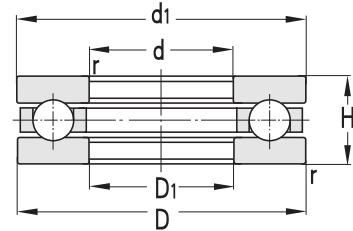
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	H	rmin	Cr	Cor	Grease	Oil	
			KN		r/min			
80	170	68	1.1	317	485	850	1200	51416
85	110	19	1	49.4	132	1600	3000	51117
	125	31	1	111	237	1100	2200	51217
	150	49	1.5	223	475	850	1600	51317
	150	49	1.5	223	475	850	1600	51317M
	180	72	1.1	336	534	850	1200	51417M
	180	72	1.1	336	534	1200	1800	51417
90	120	22	1	65.0	170	1500	2600	51118
	120	22	1	65.0	170	1500	2600	51118M/P4
	135	35	1.1	132	285	1000	2000	51218
	155	50	1.5	232	517	800	1500	51318
	155	50	1.5	232	517	800	1500	51318M
	190	77	2.1	381	621	1100	1700	51418M
100	135	25	1	81.0	213	1700	2400	51120
	135	25	1	81.0	213	1300	2400	51120M
	150	38	1.1	125	347	950	1800	51220
	150	38	1.1	125	347	950	1800	51220M
	170	55	1.5	229	513	950	1400	51320
	170	55	1.5	229	513	700	1400	51320M
	172	57	1.8	275	513	1300	1400	51820
	210	85	3	448	775	700	950	51420
	210	85	3	421	734	950	1300	51420M
100.2	150	38	1.1	125	347	1600	1800	517/100.2
110	145	25	1	83.0	233	1200	2200	51122
	145	25	1	83.0	233	1200	2200	51122M
	160	38	1.1	131	393	850	1700	51222
	160	38	1.1	131	393	850	1700	51222M
	190	63	2	304	588	850	1200	51322M
	190	63	2	304	588	630	1200	51322
	230	95	3	490	900	850	1600	51422M

Other dimensions		Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	ra(max)		
mm	mm	mm	mm	mm	Kg	
170	83	133	117	2	7.89	
110	87	100	95	1	0.419	
125	88	109	101	1	1.21	
150	88	124	111	1.5	3.49	
150	88	124	111	1.5	3.97	
177	88	141	124	2	8.60	
177	88	141	124	2	8.35	
120	92	108	102	1	0.632	
120	92	108	102	1	0.721	
135	93	117	108	1	1.67	
155	93	129	116	1.5	4.02	
155	93	129	116	1.5	4.44	
187	93	149	131	2	9.91	
135	102	121	114	1	0.937	
135	102	121	114	1	0.937	
150	103	130	120	1	2.12	
150	103	130	120	1	2.33	
170	103	142	128	1.5	4.85	
170	103	142	128	1.5	4.92	
172	100.2	143	129	1.8	5.36	
205	103	165	145	2.5	13.6	
205	103	165	145	2.5	13.5	
150	100.2	130	120	1	2.20	
145	112	131	124	1	1.12	
145	112	131	124	1	1.21	
160	113	140	130	1	2.43	
160	113	140	130	1	2.67	
187	113	158	142	2	7.36	
187	113	158	142	2	7.08	
225	113	181	159	2.5	18.6	

# Thrust Ball Bearings

**ZWZ**

d 120~160 mm



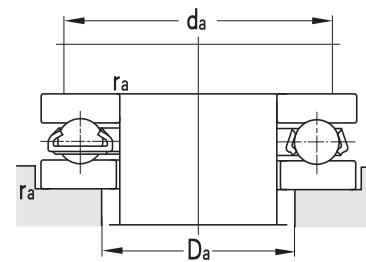
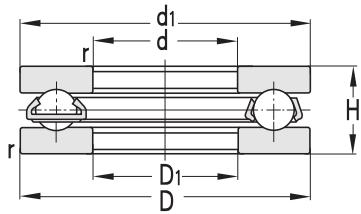
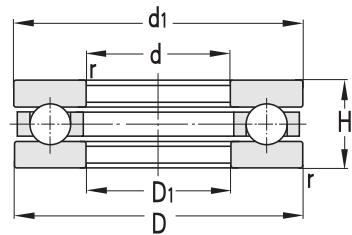
Principal dimensions				Basic load ratings		Limit speed ratings		Designations	
d	D	H	rmin	Cr	Cor	Grease	Oil		
mm				KN		r/min			
120	155	25	1	84.0	236	1600	2200	51124	
	155	25	1	84.0	236	1600	2200	51124M	
	170	39	1.1	167	399	1100	2200	51224	
	170	39	1.1	167	399	800	1600	51224M	
	210	70	2.1	348	711	800	1100	51324M	
	210	70	2.1	348	711	1100	1400	51324	
130	170	27	3	113	328	1300	1900	51726M	
	170	30	1	111	316	1400	1900	51126M	
	170	30	1	111	316	950	1900	51126	
	190	45	1.5	230	535	750	1400	51226	
	225	75	2.1	394	843	750	1000	51326M	
	225	75	2.1	394	843	560	1000	51326	
140	170	110	4	637	1284	560	750	51426M	
	170	110	4	637	1284	750	1400	51426	
	180	31	1	114	344	1300	1800	51128	
	180	31	1	114	344	950	1800	51128M	
	200	46	1.5	226	543	950	1400	51228	
	200	46	1.5	234	572	700	1400	51228M	
150	215	50	1.5	262	651	900	1300	51230M	
	215	50	1.5	262	651	900	1300	51230	
	250	80	2.1	429	1021	670	900	51330M	
	250	80	2.1	429	1021	670	900	51330	
	300	120	4	673	1479	500	670	51430M	
	190	31	1	117	371	1200	1700	51130M	
160	190	31	1	117	371	900	1700	51130	
	190	31	1	117	371	900	1700	51130	
	200	35	2.1	164	460	1100	1600	51730M	
	215	50	1.5	262	651	900	1300	51230	
	250	80	2.1	429	1021	670	900	51330M	
	250	80	2.1	429	1021	670	900	51330	

Other dimensions				Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	ra(max)				
mm	mm	mm	mm	mm			Kg	
155	122	141	134	1	1.13			
155	122	141	134	1	1.25			
170	123	150	140	1	2.71			
170	123	150	140	1	2.58			
205	123	173	157	2	9.85			
205	123	173	157	2	9.43			
245	123	197	173	3	23.9			
170	130.2	154	146	1	1.65			
170	170	154	146	1	1.86			
170	170	154	146	1	1.67			
187	133	166	154	1.5	4.17			
220	134	186	169	2	12.5			
220	134	186	169	2	11.6			
265	134	213	187	3	29.0			
265	134	213	187	3	28.8			
178	142	164	156	1	1.80			
178	142	164	156	1	2.00			
197	143	176	164	1.5	4.49			
197	143	176	164	1.5	4.33			
235	144	199	181	2	14.6			
275	144	223	197	3	31.6			
188	152	174	166	1	2.19			
188	152	174	166	1	1.96			
200	150.3				3.15			
212	153	189	176	1.5	5.80			
212	153	189	176	1.5	5.61			
245	154	209	191	2	17.0			
245	154	209	191	2	17.0			
295	154	239	211	3	38.7			
198	162	184	176	1	2.38			
222	163	199	186	1.5	6.19			
222	163	199	186	1.5	6.08			

# Thrust Ball Bearings

**ZWZ**

d 160~240 mm



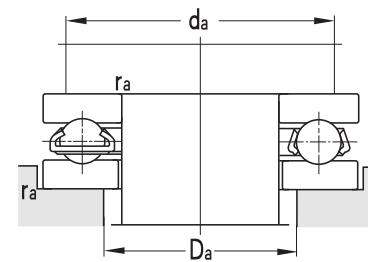
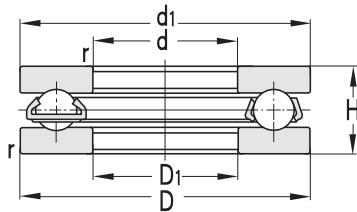
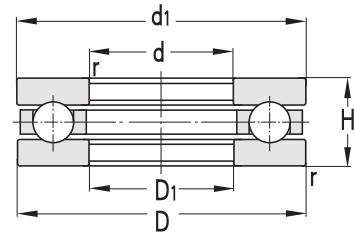
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	H	rmin	Cr	Cor	Grease	Oil	
			KN		r/min			
160	270	87	3	455	1097	630	850	51332M
170	215	34	1.1	131	443	1100	1600	51134M
	215	34	1.1	92.5	385	1100	1600	51134M-1
	215	34	1.1	131	443	1100	1600	51134
240	240	55	1.5	281	744	800	1100	51234M
240	240	55	1.5	281	744	800	1100	51234
	280	87	1.5	472	1268	600	800	51334M
180	225	34	1.1	151	500	1000	1500	51136M
	225	34	1.1	151	500	1000	1500	51136
	250	56	1.5	295	825	800	1100	51236M
	250	56	1.5	295	825	800	1100	51236
	300	95	3	515	1436	560	750	51336
190	240	37	1.1	178	592	950	1400	51138M
	240	37	1.1	178	592	950	1400	51138
	270	62	2	357	1019	750	1000	51238M
	270	62	2	357	1019	750	1000	51238
	320	105	4	607	1662	700	800	51338M
190.5	266.7	57.1	4	270	815	710	1030	517/190.5
200	250	37	1.1	183	636	950	1400	51140M
	280	62	2	352	1029	750	1000	51240M
	280	62	2	352	1029	750	1000	51240
	340	110	4	660	1865	480	630	51340M
220	270	37	1.1	186	682	900	1300	51144
300	63	2	366	1148	700	950	51244	
300	63	2	366	1148	700	950	51244M	
	300	93.75	2	399	1304	650	900	51244X2V
230	300	53.4	2.1	264	834	650	900	51746
240	300	45	1.5	259	927	800	1100	51148

Other dimensions		Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	ra(max)		
mm	mm	mm	mm	mm	Kg	
265	164	225	205	2.5	18.8	
213	172	197	188	1	2.99	
213	172	197	188	1	2.94	
213	172	197	188	1	2.64	
237	173	212	198	1.5	7.65	
237	173	212	198	1.5	7.33	
275	174	235	215	2.5	19.9	
222	183	207	198	1	3.08	
222	183	207	198	1	2.86	
247	183	222	208	1.5	8.15	
247	183	222	208	1.5	8.02	
295	184	251	229	2.5	26.7	
237	193	220	210	1	4.02	
237	193	220	210	1	3.62	
267	194	238	222	2	11.7	
267	194	238	222	2	11.0	
315	195	266	244	3	33.5	
190.5	266.7	242.6	214.6	4	14.3	
247	203	230	220	1	3.60	
277	204	248	232	2	11.5	
277	204	248	232	2	10.9	
335	205	282	258	3	30.8	
267	223	250	240	1	4.45	
297	224	268	252	2	12.9	
297	224	268	252	2	12.2	
300	220.5	268	252	2	19.8	
300	230.3	270	260	2	9.47	
297	243	276	264	1.5	7.28	

# Thrust Ball Bearings

**ZWZ**

d 240~460 mm



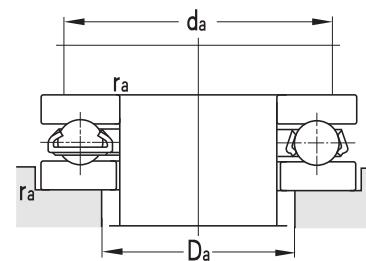
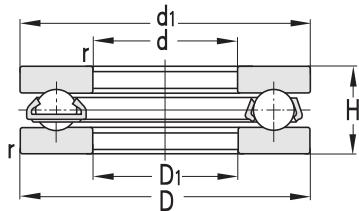
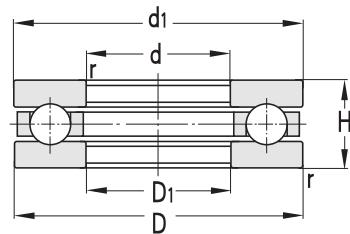
Principal dimensions				Basic load ratings		Limit speed ratings		Designations	
d	D	H	rmin	Cr	Cor	Grease	Oil		
				KN		r/min			
240	340	78	2.1	454	1483	630	860	51248	
	340	70	2.5	417	1392	600	800	51948	
	340	70	2.5	417	1392	600	800	51948M	
	380	112	4	693	2224	500	700	51348	
260	320	45	1.5	264	994	800	1100	51152	
	360	79	2.1	474	1651	560	750	51252	
	360	79	2.1	474	1651	560	750	51252M	
280	350	53	1.5	337	1274	640	900	51156	
	380	80	2.1	493	1821	560	750	51256	
300	380	62	2	416	1634	630	850	51160	
	420	95	3	589	2245	480	630	51260	
	435	104	3.7	738	2759	450	600	51760	
320	400	63	2	426	1756	600	800	51164	
340	420	64	2	420	1768	600	800	51168	
	460	96	3	604	2495	450	600	51268	
	460	96	3	604	2495	450	600	51268/YB5	
	540	160	5	1122	4439	400	530	51368	
350	476	85	3.7	632	2717	400	530	51770	
360	440	65	2	430	1890	560	750	51172	
	500	110	4	793	3591	400	530	51272	
400	480	65	2	435	2020	530	700	51180	
420	500	65	2	442	2560	530	700	51184	
440	540	80	2.1	565	2770	450	600	51188	
460	560	80	2.1	585	2960	450	600	51192	

Other dimensions		Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	ra(max)		
335	244	299	281	2	21.1	
340	238	299	281	2.5	19.4	
340	238	299	281	2.5	18.8	
375	245	320	300	3	49.6	
317	263	296	248	1.5	7.56	
355	264	319	301	2	23.3	
355	264	319	301	2	22.0	
347	283	322	308	1.5	11.4	
375	284	339	321	2	25.3	
376	304	348	332	2	17.4	
415	304	371	349	2.5	40.0	
435	300.3	379	356	3	50.7	
396	324	368	352	2	18.0	
416	344	388	372	2	19.9	
455	345	411	389	2.5	44.6	
455	345	411	389	2.5	44.6	
535	345	452	356	4	137	
476	350.4	425	401	3	43.3	
436	364	408	392	2	23.9	
495	365	442	418	3	64.7	
476	404	448	432	2	23.0	
496	424	468	452	2	24.5	
535	444	499	481	2	40.6	
555	464	519	501	2	42.2	

# Thrust Ball Bearings

**ZWZ**

d 460~1380 mm



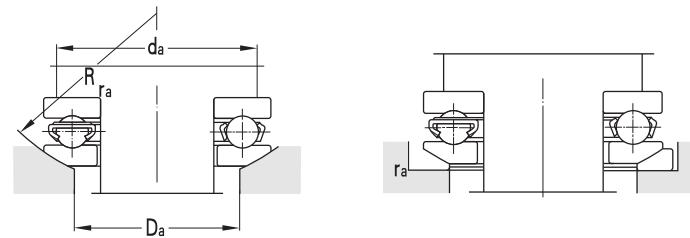
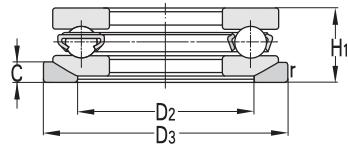
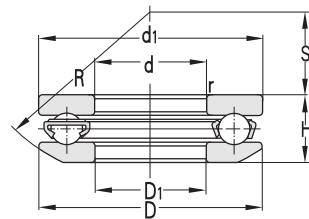
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	H	rmin	Cr	Cor	Grease	Oil	
			KN		r/min			
460	620	130	5	894	4504	430	560	51292
500	600	80	2.1	615	3350	430	560	511/500/P5
	600	80	2.1	615	3350	430	560	511/500
	600	80	2.1	615	3350	430	560	511/500F3
530	640	85	3	665	3800	400	530	511/530
600	710	85	3	720	4450	380	500	511/600
	710	85	3	720	4450	380	500	511/600F3
	710	67	3	520	3400	450	600	591/600
630	780	112	4	906	5515	320	430	517/630
670	800	105	4	888	5778	300	400	511/670F3
	800	105	4	888	5778	300	400	511/670/P5
750	900	90	4	815	5875	300	400	591/750
1380	1540	130	5	1280	13300	170	240	517/1380

Other dimensions		Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	ra(max)		
mm	mm	mm	mm	mm		Kg
615	465	552	528	4	113	
595	505	559	541	2	45.3	
595	505	559	541	2	45.3	
595	505	559	541	2	44.7	
635	534	595	575	2.5	57.1	
705	604	667	643	2.5	64.9	
705	604	665	645	2.5	64.3	
705	604	663	647	2.5	49.2	
760	650	717	693	3	118	
795	674	748	722	3	109	
795	674	748	722	3	111	
895	755	836	814	3	108	
1535	1385	1475	1445	4	319	

# Thrust Ball Bearing With Aligning Seat and Ring

**ZWZ**

d 30~110 mm



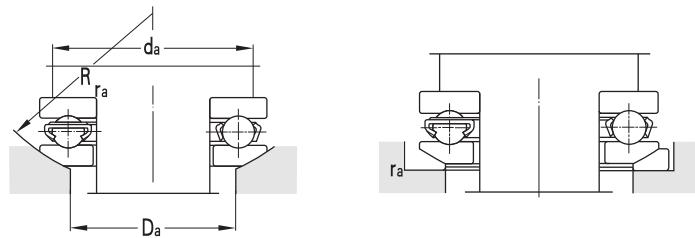
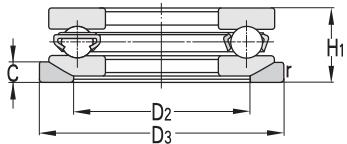
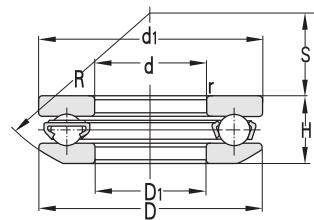
Principal dimensions		Basic load ratings		Limit speed ratings		Designations	
d	D	r <sub>min</sub>	Cr	Cor	Grease	Oil	
mm		KN					r/min
30	52	0.6	26.6	39.9	3600	4800	53206+U206
35	62	1	37.3	55.5	3000	4000	53207+U207
40	68	1	46.9	78.4	2800	3800	53208+U208
45	73	1	47.7	81.3	2600	3600	53209+U209
50	110	1.5	159	197			53410M
55	90	1	69	123	1900	2800	53211+U211
60	110	1	130	208			53312
65	100	1	74.9	151	1800	2600	53213+U213
70	130	1.1	148	250.6	1400	1900	53314+U314
125	1.1	148	250.6				53314
105	1	59	161	1800	2600		53214+U214
75	110	1	82.1	172.7	1700	2400	53215+U215
80	115	1	86.6	193.2	1700	2400	53216+U216
145	1.5	181	315	1200	1700		53316+U316
85	180	1.1	336	534			53417M
90	135	1.1	133	285	1500	2000	53218+U218
100	170	1.5	282	498	950	1400	53320+U320
170	1.5	282	498				53320
205	3	448	775	700	950		53420M+U420
205	3	421	734.5	700	950		53420+U420
110	160	1.1	170	392.5	1200	1700	53222+U222
190	2	304	588	850	1200		53322M+U322

Other dimensions								Abutment and fillet dimensions			Weight	
d1	D1	D2	D3	C	H1	R	S	H	d <sub>a(min)</sub>	d <sub>a(max)</sub>	r <sub>a(max)</sub>	
mm									mm		Kg	
52	32	42	55	5.5	20	45	22	17.8	43	42	0.6	0.180
62	37	48	65	7	22	50	24	19.9	51	48	1	0.263
68	42	55	72	7	23	56	28.5	20.3	57	55	1	0.395
73	47	60	78	7.5	24	56	26	21.3	62	60	1	0.400
110	52						90	35	45.6			1.92
90	57	72	95	9	30	72	35	27.3	76	72	1	0.747
110	62						90	41	38.3			1.44
100	67	82	105	9	32	80	40	28.5	86	82	1	0.898
125	72	98	130	13	48	100	43	44.2	103	98	1	2.51
125	72						100	43	44.2			2.10
105	72	88	110	9	32	80	38	28.8	91	88	1	0.961
110	77	92	115	9.5	32	90	49	28.2	96	92	1	1.15
115	82	98	120	10	33	90	46	29.5	101	98	1	1.18
140	82	110	145	15	52	112	50	47.6	116	110	1.5	3.17
177	88						140	47	77			8.95
135	93	110	140	13.5	42	100	45	38.5	117	110	1	2.33
170	103	135	175	18	64	125	46	59.2	142	135	1.5	5.83
170	103						125	46	59.2			4.90
205	103	155	220	27	98	160	50	90	165	155	2.5	16.5
205	103	155	220	27	98	160	50	90	165	155	2.5	16.2
160	113	135	165	14	45	125	65	40.2	140	135	1	2.87
187	113	150	195	20.5	72	140	51	67.2	158	150	2	9.05

# Thrust Ball Bearing With Aligning Seat and Ring

**ZWZ**

d 110~430 mm



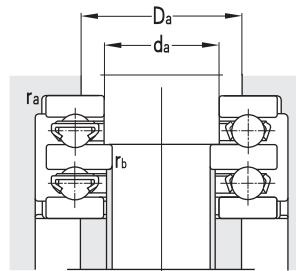
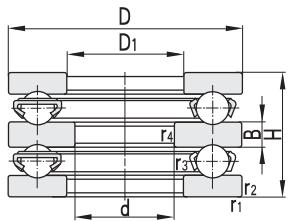
Principal dimensions		Basic load ratings		Limit speed ratings		Designations	
d	D	r <sub>min</sub>	Cr	Cor	Grease	Oil	
mm		KN					r/min
110	190	2	304	588	850	1200	53322+U322
120	170	1.1	168	399	1100	1600	53224+U224
	205	2.1	129	400	800	1100	53324M+U324
	205	2.1	129	400	800	1100	53324+U324
	205	2.1	129	400	800	1100	53324/YB2+U324
	205	2.1	129	400	800	1100	53324U/YB2-1
130	265	4	637	1284			53426M+U426
	265	4	637	1284			53426+U426
150	250	2.1	429	1021			53330M+U330
	250	2.1	429	1021			53330+U330
	250	2.1	429	1021			53330/YB2+U330
	250	2.1	429	1021			53330
	295	4	673	1479			53430M+U430
220	297	2	366	1148			53244+U224
300	375	2.5	382	1483			
430	580	3.7	922	4348			

Other dimensions								Abutment and fillet dimensions			Weight	
d1	D1	D2	D3	C	H1	R	S	H	da(min)	Da(max)	ra(max)	
mm									mm			Kg
187	113	150	195	20.5	72	140	51	67.2	158	150	2	8.78
170	123	145	175	15	46	125	61	40.8	150	145	1	3.07
205	123	165	220	22	80	160	63	74.1	173	165	2	12.3
205	123	165	220	22	80	160	63	74.1	173	165	2	11.9
205	123	165	220	22	80	160	63	74.1	173	165	2	11.9
205	123	165	220	22	80	160	63	74.1	173	165	2	11.9
265	134	200	280	38	128	200	58	115.2				34.8
265	134	200	280	38	128	200	58	115.2				34.6
245	154	200	260	26	92	200	89.5	83.7				19.5
245	154	200	260	26	92	200	89.5	83.7				18.0
245	154	200	260	26	92	200	89.5	83.7				18.6
245	154	225	310	41	140	225	69	125.9				15.1
295	154	225	310	41	140	225	69	125.9				44.1
297	224	260	310	25	75	225	118	65.6				15.6
375	300.3	340	385	17	75	320	202	70				17.2
580	430.5	500	610	45	150	500	301.3	131.7				129

# Double-direction Thrust Ball Bearing

**ZWZ**

d 50~140 mm



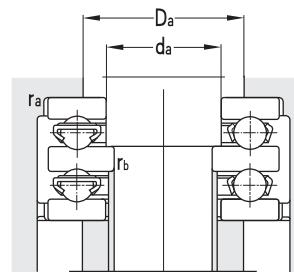
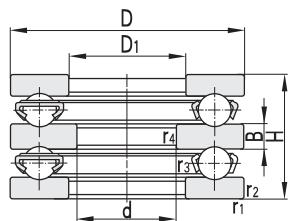
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	H	rmin	r1min	Cr	Cor	Grease	Oil
<b>mm</b>				<b>KN</b>		<b>r/min</b>		
25	52	29	0.6	0.3	27.3	40.0		
30	62	34	1	0.3	37.0	72.5	4800	6000
	68	44	1	0.3	88.4	148		
	68	36	1	0.6	46.8	78.0	4800	6000
35	73	37	1	0.6	48.1	81.0	4000	5300
40	78	39	1	0.6	54.6	94.0	4000	5300
45	90	45	1	0.6	68.9	123	3800	5000
	120	87	1.5	0.6	191	226		
50	95	46	1	0.6	74.1	141	3800	5000
55	100	47	1	0.6	75.4	151	3800	4800
	105	47	1	1	76.7	161	3800	4800
	125	72	1.1	1	148	251		
	150	107	2	1	257	365		
65	115	48	1	1	87.1	193	3200	4300
	180	128	1.1	1.1	337	534		
70	125	55	1	1	112	237	3200	4300
75	135	62	1.1	1	133	285		
80	210	150	3	1.1	448	775		
	210	150	3	1.1	421	734		
	85	150	67	1.1	163	347	3000	4000
	170	97	1.5	1	276	513	3000	4000
90	230	166	3	1.1	490	900		
95	160	67	1.1	1	170	393	2800	3700
	190	110	2	1	304	588		

Designations	Other dimensions		Abutment and fillet dimensions				Weight
	d1	D1	da(min)	Da(max)	ra(max)	rb(max)	
52206	32	7	30	39	0.6	0.3	0.261
52207	37	8	35	46	1	0.3	0.354
52307	37	10	35	48	1	0.3	0.674
52208	42	9	40	51	1	0.6	0.496
52209	47	9	45	56	1	0.6	0.623
52210	52	9	50	61	1	0.6	0.722
52211	57	10	55	69	1	0.6	1.06
53411M	57	20					4.87
52212	62	10	60	74	1	0.6	1.25
52213	67	10	65	79	1	0.6	1.29
52214	72	10					1.37
52314	72	16	70	92	1	1	3.65
52414	73	24					9.15
52216	82	10	80	94	1	1	1.73
52417	88	29					16.0
52217	88	12	85	101	1	1	2.19
52218	93	14					3.11
52420M	103	33					25.3
52420	103	33					24.4
52220	103	15	90	108	1	1	4.05
52320	103	21	100	120	1	1	8.81
53422	113	37					33.4
52222	113	15	110	130	1	1	4.51
52322M	113	24					13.2

# Double-direction Thrust Ball Bearing

**ZWZ**

d 50~140 mm



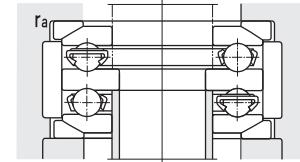
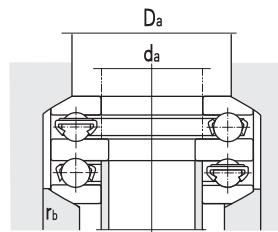
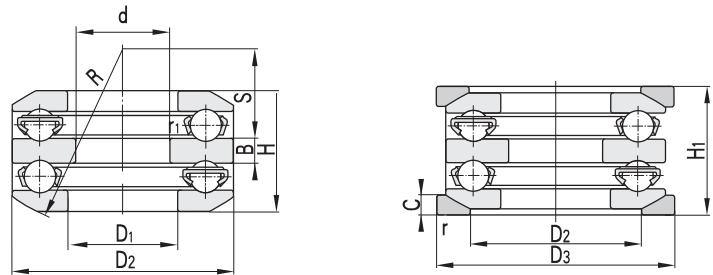
Principal dimensions				Basic load ratings		Limit speed ratings		
d	D	H	rmin	r1min	Cr	Cor	Grease	Oil
<b>mm</b>				<b>KN</b>		<b>r/min</b>		
95	190	110	2	1.5	304 858	588 2060		
250	177	4						
100	210	123	2.1	1.1	348	711		
110	190	80	1.5	1.1	230	535		
280	196	2		2	480	1300		
120	200	81	1.5	1.1	226	543		
300	209	4		2	673	1479		
130	215	89	1.5	1.1	263	651	700	950
250	140	2.1		2.1	429	1021	560	670
250	140	2.1		2.1	429	1021	560	670
140	225	90	1.5	1.1	267	692	600	850
225	90	1.5		1.1	267	692	590	820
150	250	98	1.5	2	295	825		
250	98	1.5		2	295	825	520	800
300	165	3		2	515	1436	520	800
160	270	109	2	2	358	1019		
270	109	2		2	358	1019		
170	280	109	2	2	352	1029		
340	192	4		2	663	1860	52240	204
300	400	80	1.8	1.3	168	810	52340	105
570	700	90	3	1.3	291	2147		
1049.5	1270	220	3	5	1222	9950	340	18
							615	20
							5627/1050	1180

Designations	Other dimensions		Abutment and fillet dimensions				Weight
	d1	D1	da(min)	Da(max)	ra(max)	rb(max)	
							Kg
52322	113	24					12.9
52424M	249	40					42.1
52324	123	21					17.3
52226M	133	18					8.60
52428	279	44					56.8
52228M	143	18					8.67
53430	154	46					70.3
52230	153	20	140	164	1.5	1	10.3
52330M	154	31	150	191	2	1	31.2
52330	154	31	150	191	2	1	29.4
52232M	163	20					11.8
52233	163	20	160	186	1.5	1	11.7
52236M	183	21					15.6
52236	183	21	180	208	1.5	2	14.3
52336M	184	37	180	208	1.5	2	48.8
52238	194	24					21.4
	194	24					20.9
52240	204	24					22.1
52340	105	42					59.3
	340	18					21.1
	615	20					53.7
	5627/1050	1180					392

# Double-direction Thrust Ball Bearings With Aligning Seat and Washer

**ZWZ**

d 30~100 mm



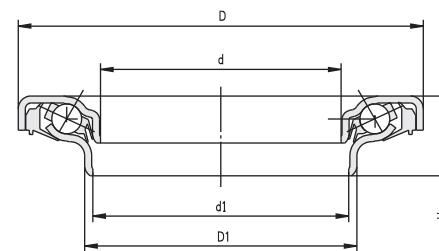
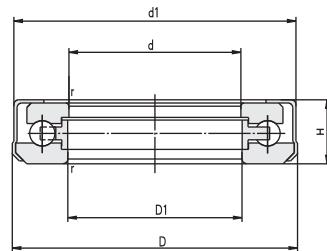
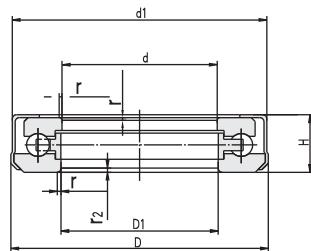
Principal dimensions				Basic load ratings		Designations													
d	D	H	rmin	r1min	Cr	Cor													
				KN															
mm	mm	mm	mm	mm	KN	KN													
30	68	47.2	1	0.3	55.9	74.0	54307+U307												
40	64	35.4	0.6	0.6	24.7	50.0	54208+U208												
85	170	105.4	1.5	1	276	513	54320+U320												
	170	105.4	1.5	1	276	513	54320M+U320												
100	210	131.2	2.1	2.1	378	630	54324M+U324												
	210	131.2	2.1	2.1	378	630	54324+U324												

Other dimensions								Abutment and fillet dimensions					Weight		
D1	D2	D3	B	C	H1	R	S	da(min)	Da(max)	ra(max)	rb(max)				
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Kg			
37	52	72	10	7.5	52	56	21	35	52	1	0.3	0.909			
42	48	69	7	7	42	50	20.9	40	55	1	0.6	0.563			
103	135	175	21	18	115	125	42					10.8			
103		21			125	125	42					8.93			
123	165	220	27	22	143	160	58					23.0			
123	165	220	27	22	143	160	58					22.2			

# Thrust Ball Bearing With Outer Cover

**ZWZ**

d 54.23~64.6 mm



Principal dimensions			Basic load ratings			Limit speed ratings		Designations
d	D	H	rmin	Cr	Cor	Grease	Oil	
mm			KN			r/min		
54.23	90.2	20.2	1.5	23.2	66			517/54X4ZSTN1
69.84	114.3	22.1	1.5	42	96			517/69X4ZSTN1
64.6	71.35	17		10.6	32			*5617/64.6PR

Other dimensions		Weight
d1	D1	
mm		Kg
88.9	54.8	0.402
112.8	70.6	0.642
66.25		0.166

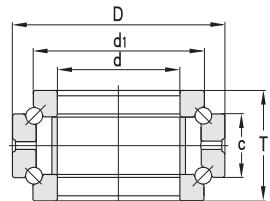
## Product Characteristics

This type of bearings consists of two shaft washers, one seat washer with oil groove and oil holes, one spacer, two rows of rolling elements and cages. If modifying the thickness of the spacer, the bearing clearance and pre-tension can be adjusted. Bearing contact angle is 60°. These bearings can bear the combined loads consisting of the axial loads, which is the main loads, and the radial loads from double direction. Such bearings can be applied to main shafts of grinders, bore machine, turning machine, milling machine and drilling machine. The advantages of these bearings are with high precision, good rigid; tylow temperature, high rotational speed and easy installation disassembly.

## Dimension scope

Basic dimensions are listed in the bearing specification table.

i.d. range: 50 mm~ 300 mm  
O.D. range: 80 mm ~ 420 mm  
Width range: 38 mm ~144 mm



## Tolerance

This type of bearings produced by ZWZ can reach SP and P4 precision. If necessary, we can provide bearing with UP tolerance as well.

## Housing washer tolerance with the class of SP, UP

d mm		SP								μ m	
Exceed	To	△dmp	△ds	Si Se	△ds △dmp	Si Se	△Ts				
-	30	-8	+1	-9	3	-6	1.5	+50	-30		
30	50	-10	+1	-11	3	-8	1.5	+60	-100		
50	80	-12	+2	-14	4	-9	2	+70	-120		
80	120	-15	+3	-18	4	-10	2	+85	-140		
120	180	-18	+3	-21	5	-13	3	+95	-160		
180	250	-22	+4	-26	5	-15	3	+120	-200		
250	315	-25	+5	-30	7	-18	4	+150	-250		
315	400	-30	+5	-35	7	-23	4	+200	-300		

## Housing washer tolerance with the class of SP, UP

d mm		△Dmp		△Cs		μ m	
Exceed	To	upper deviation	low deviation	upper deviation	low deviation	upper deviation	low deviation
30	50	-20	-27				
50	80	-24	-33				
80	120	-28	-38				
120	150	-33	-44			0	-30
150	180	-33	-46				
180	250	-37	-52				
250	315	-41	-59				
315	400	-46	-64				
400	500	-50	-70				
500	630	-55	-77				

## Cage

This type of bearings produced by ZWZ adopts machined brass cage and it is not indicated in the bearing code.

## Preload

The preload for this type of bearing is determined by spacer. See the preload data in the below table.

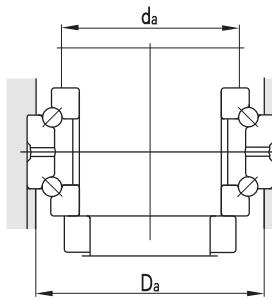
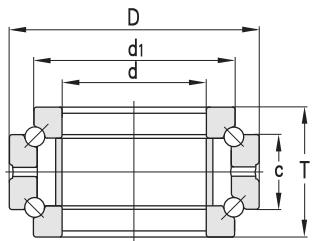
## The preload value of the double direction angular contact ball bearing

Bearing nominal bore diameter		Preload							N
Exceed	To	1	2	0	3	4	5	6	
-	05	-	196	295	390	490	590	785	
05	09	195	295	490	590	680	835	980	
09	13	490	685	980	1175	1375	1670	1960	
13	16	490	980	1470	1765	2060	2450	2945	
16	19	490	980	1470	1765	2160	2550	2945	
19	24	785	1175	1960	2450	2945	3435	4415	
24	26	785	1470	1960	2450	2945	3925	4415	
26	34	980	1470	1960	2450	2945	3925	4905	
34	40	1470	1960	2450	2945	3925	4905	5885	
40	56	1470	1960	2945	3925	4905	5885	6865	
56	68	1960	2450	3435	4905	5885	6865	7850	
68	80	1960	2450	3925	5885	6865	7850	8830	

# Double-direction Thrust Angular Contact Ball Bearings

**ZWZ**

d 50~140 mm



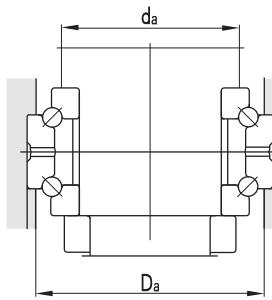
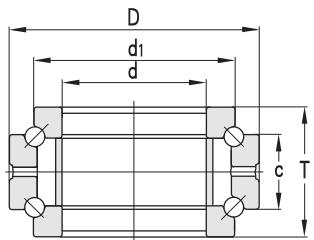
Principal dimensions				Basic load ratings			Limit speed ratings		
d	D	T	C	rmin	r1min	Cr	Cor	Grease	Oil
<b>mm</b>				<b>KN</b>			<b>r/min</b>		
50	80	38	19	1	0.15				
	72	28	14	1	0.3				
75	115	48	24	1.1	0.3				
	105	38	19	1	0.5				
80	125	54	27	1.1	0.3				
	110	38	19	1	0.5				
85	130	54	27	1.1	0.3				
	120	44	22	1	0.5				
90	140	60	30	1.5	0.3				
	125	44	22	1	0.6				
95	145	60	30	1.5	0.3				
	130	44	22	1	0.6				
100	150	60	30	1.5	1	60.3	180	2900	3800
	140	48	24	1	0.6				
105	160	66	33	2	0.6	109	200	2600	3500
	145	48	24	1	0.6				
110	170	72	36	2	0.6				
	150	48	24	1	0.6				
120	180	72	36	2	0.6	139	265	2400	3200
	165	54	27	1	0.6				
130	200	84	42	2	0.6				
	180	60	30	1.5	1				
140	210	84	42	2.1	0.6	113	355	1800	2600
	190	60	30	1.5	1				

Designations	Other dimensions	Abutment and fillet dimensions				Weight
		d1 (max)	da(min)	Da(max)	ra(max)	
*234410	70					
*234910	64					
*234415	102					
*234915	94					
*234416	110					
*234916	99					
*234417	115					
*234917	106					
*234418	123					
*234918	111					
*234419	128					
*234919	116					
234420	133	119	142	1.5	0.3	3.13
*234920	126					
234421	142	125	151	2	0.6	4.15
*234921	121					
*234422	150					
*234922	136					
234424	160	142	171	2	0.6	5.54
*234924	150					
*234426	177					
*234926	163					
234428	187	166	200	2	0.6	8.97
*234928	173					

# Double-direction Thrust Angular Contact Ball Bearings

**ZWZ**

d 150~1374.775 mm



Principal dimensions				Basic load ratings			Limit speed ratings		
d	D	T	C	rmin	r1min	Cr	Cor	Grease	Oil
<b>mm</b>									
				KN			r/min		
150	225 210	90 72	45 36	2.1 2	0.6 1	250 151	390 320	1900 1800	2500 2400
160	240 240 220	96 96 72	48 48 36	2.1 2.1 2	1.1 1.1 1	241 241	680 680	1700 1700	2300 2300
170	260 230	108 72	54 36	2.5 2	1.3 1	287	590	1600	2100
180	280 280 250	120 120 84	60 60 42	2.1 2.1 2	0.6 0.6 1	280	665	1500	2000
190	290 260	120 84	60 42	2.1 2	0.6 1				
200	310 280	132 96	66 48	2.1 2	0.6 1	230	765	1300	1700
220	300 340	96 144	48 72	2 3	1 1	450	1890	1200	1600
240	320 360	96 144	48 72	2 3	1 1	300	1090	1100	1500
280	380 420	120 164	60 82	2 3	1.5 1.5	232	955	1000	1400
300	460 420	190 144	95 72	3 3	1.5 1				
1374.775	1597.025	247.65	49.23	5	3	3000	17300		

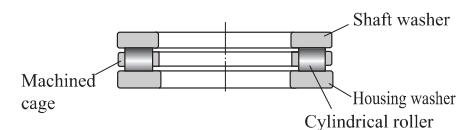
Designations	Other dimensions	Abutment and fillet dimensions				Weight
		d1 (max)	da (min)	Da (max)	ra (max)	
234430	200	178	213	2	0.6	12.5
234930	190	172	200	2	1	7.26
234432	212	190	227	2	0.6	14
234432/P4YAB	212	190	227	2	0.6	14
*234932	200					
234434	230	206	245	2	1	18.5
*234934	210					
*234436	248					
234436/P4YAB	248	230	270	2	1	24.8
*234936	227					
*234438	258					
*234938	237					
234440	274	243	300	2	1	33.6
*234940	252					
*234944	272					
234444	304	265	330	2	1	43.9
*234448	292					
234448	322	287	350	2.5	1	46.7
*234956	348					
*234456	374	323	365	2.5	1	44.9
*234460	406					
*234960	384					
*2327/1374X4/HCEP5						648

## Product Characteristics

This type of bearings consists of raceway washers (shaft washer and housing washer) and roller-cage unit. Cylindrical rollers are produced with crown profile. Therefore, the pressure is distributed evenly between rollers and raceway surface.

The structure of this type of bearings is separable. Bearing shaft washer, housing washer and rolling elements can be assembled separately. When assembled, the axle lines of the shaft and housing are not allowed to be skew.

This type of bearings is for the low rotation speed applications and can bear the axial loads from single direction, can not limit the radial displacements. The axial load capacity is big and the rigidity is also good.



## Types of bearing:

- Single direction thrust cylindrical roller bearing
- Double-direction thrust cylindrical roller bearing

## Dimension scope:

I.D. range: 30 mm~ 1180 mm

O.D. range: 52mm ~1400 mm

Width range: 16 mm~ 100 mm

## Tolerance

The tolerance of such bearings conforms to GB307.4 standard. Please refer the detailed tolerance to the table in the preface. ZWZ can provide this type of bearings with P0, P6, P5 tolerance.

## Cage

Most of these types of bearings produced by ZWZ are of machined brass cages.

When maximum OD is 500mm, machined brass cages adopted, and not indicated in the bearing code.

When Minimum OD is 500 mm, solid steel cage adopted, and not indicated in the bearing code.

## Equivalent dynamic load

$$P=F_a$$

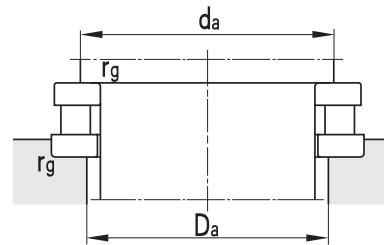
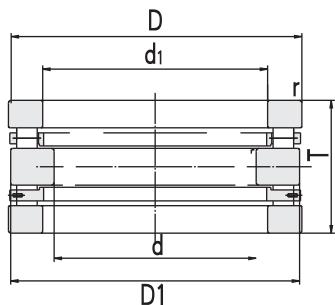
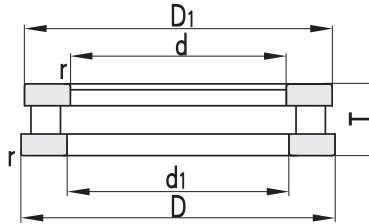
## Equivalent static load

$$P_0=F_a$$

# Thrust Cylindrical Roller Bearings

**ZWZ**

d 30~320 mm



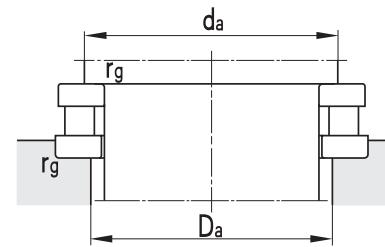
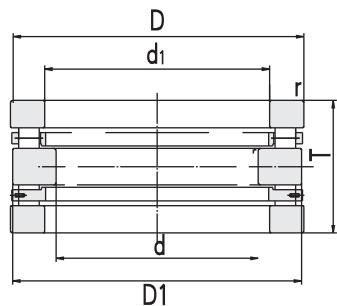
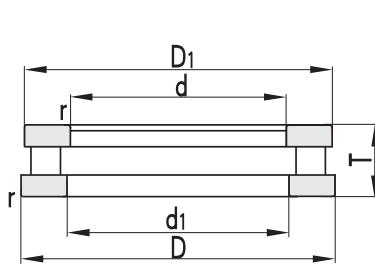
Principal dimensions			Basic load ratings			Limit speed ratings		Designations		
d	D	T	rmin	Cr	Cor	Grease	Oil			
			KN			r/min				
mm	mm	mm								
30	52 54	16 13.8	0.6	59.4 41.3	121 113	3200 3200	3800 3800	81206TN1 81206X2ZRS		
38.5	66.7	18		71	190	2200	2500	817/38.5-ZS		
42	65	14	0.6	45.1	113	2000	2300	811/42TN1		
50	78.6 82 80	22 22 18.89		103 69 72.5	300 223 245	1500 1500 1500	1800 1800 1800	81210X1ZSTN1 81210X1ZRS 81210X2ZRS		
110	160	38	1.1	264	250	900	1300	81222		
120	155	25	1.1	127	145	950	1400	81124		
175	250	82	2	325	1580	400	530	82635		
180	360 360	82 109	5	1580 2090	6270 6240	340 800	450 1200	87436ZW 89436ZW		
200	250 280	37 62	1.1 2	3080 700	3600 3000	700 360	900 500	9140 81240		
240	300	45	1.5	490	2280	420	2280	81148		
260	320	45	1.5	515	2400	430	560	81152		
280	380 380	80 80	2.1 2.1	1130 1130	4680 4680	250 250	350 350	81256F1 81256		
300	420 420 420 460	95 95 95 80	3	1540 1540 1470 780	1550 1550 5950 5600	190 190 190 300	250 250 250 400	81260F1 81260 81260/YB5 82760ZW		
320	400	63	2	720	4100	300	400	81164		

Other dimensions		Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	rg(max)		
mm	mm	mm	mm	mm	Kg	
32	52	32	48	0.6	0.127	
30.2	54	32	50		0.113	
42		40	62		0.232	
44	65	43	61	0.6	0.147	
50.5	78.6	52	72		0.381	
53.5	82	52	87		0.439	
50.1	74.2	52	85		0.333	
113	160	110	140	1	2.80	
120.2	155	126	149	1	1.23	
203	247	217	208	2	11.8	
184	358	190	368	4	41.6	
184	355	190	368		59.1	
203	247	210	240	1	3.74	
204	277	275	210	2	12.9	
243	297	296	248	1.5	7.43	
263	317	273	307	1	8.78	
284	375	372	300	2	29	
284	375	372	300	2	29.2	
304	415	315	405	3	41.3	
304	415	315	405	3	41.6	
304	415	315	405	3	41.6	
300	460	371	389	3	54.6	
324	396	395	334	2	19.7	

# Thrust Cylindrical Roller Bearings

**ZWZ**

d 340~1000 mm



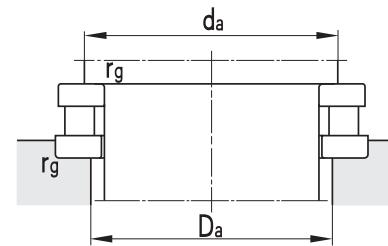
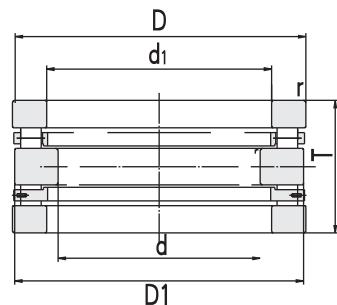
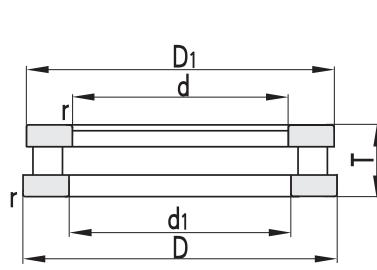
Principal dimensions			Basic load ratings			Limit speed ratings			Designations
d	D	T	rmin	Cr	Cor	Grease	Oil		
			KN			r/min			
mm	mm	mm	mm	KN	KN	mm/min	mm/min	mm/min	
340	620	170	10	4480	21000	140	190	89468ZT	
360	440	65	2	890	4030	180	270	81172/P5	
420	500	65	2	930	4800	200	280	81184	
440	540	80	2.1	1430	1680	170	230	81188	
460	800	206	9.5	6500	32000	110	150	89492ZT	
480	580	80	2	1550	8100	150	200	81196F1	
500	670	135	5	3520	3600	140	190	812/500	
530	640	8585	3	1750	9700	180	250	811/530	
600	710	85	3	1710	10700	170	260	811/600	
672.84	831.8	95.25	6.4	2360	17700	190	240	817/711X4ZW	
710	950	290	6	6330	26200	120	150	822/710	
800	950	120	4	3400	22000	130	180	811/800	
	1060	205	7.5	7300	40000	80	100	812/800	
850	1000	120	4	3400	23000	100	150	811/850	
	1120	212	7.5	8000	45000	80	100	812/850	
900	1060	130	5	4000	27000	100	150	811/900	
	1180	125	7.5	6050	8300	100	130	872/900ZWF1/HC	
	1180	220	7.5	8000	48000	70	100	812/900	
950	1120	135	5	4000	30000	90	140	811/950	
	1250	236	7.5	10000	58000	60	90	812/950	
1000	1180	140	5	4700	32000	90	120	811/1000	

Other dimensions		Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	rg(max)		
mm	mm	mm	mm	mm	Kg	
342	615	411	534	9	241	
364	436	372	428	1.5	22.3	
424	495	438	522	1.5	27.2	
444	535	415	525	2	41.5	
462	795	520	780	9	464	
484	575	500	560	1.5	44.1	
505	665	520	645	5	137	
534	635	632	554	2.5	56.7	
604	705	625	704	2.5	63.4	
711.45	831.8	692	810	5.5	113	
750	945	732	928	5	564	
945	805	923	827	3	170	
1050	810	1015	845	6	520	
995	855	973	877	3	175	
1110	860	1075	895	6	585	
1054	906	1032	909	4	220	
905	1175	925	1155	7.5	393	
1170	910	1130	950	6	660	
1114	956	1091	981	4	250	
1240	960	1200	1000	6	800	
1174	1006	1148	1036	4	290	

# Thrust Cylindrical Roller Bearings

**ZWZ**

d 1000~1180 mm



Principal dimensions			Basic load ratings			Limit speed ratings		Designations		
d	D	T	rmin	Cr	Cor	Grease	Oil			
mm					KN	r/min				
1000	1320	250	9.5	10100	58000	60	80	812/1000		
1060	1250	150	5	5300	36500	80	110	811/1060		
1120	1320	160	5	6000	41500	80	100	811/1120		
1180	1400	100	6	4730	7200	87	110	871/1180ZW/HC		

Other dimensions		Abutment and fillet dimensions			Weight	
d1	D1	da(min)	Da(max)	rg(max)		
mm					Kg	
1308	1012	1260	1060	8	975	
1244	1066	1215	1095	4	230	
1314	1126	1284	1156	4	410	
1185	1395	1205	1375	6	308	

## Product Characteristics

The tapered rollers (with larger spherical end) of these bearings are guided precisely by the integral flanges of the washers (shaft washer and housing washer) with raceways.

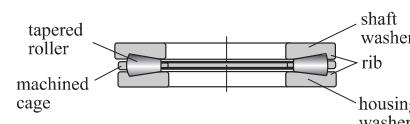
When extended, the design makes the tapered raceway surfaces of the shaft washer and housing washer and the sliding surface of the rollers converge towards to the same single point of the bearing axle line.

Single direction bearings can carry axial load in one direction.

Double direction bearings can carry axial load in two directions.

The middle washer of double direction bearings is connected with the shaft, but due to the clearance inside, a sleeve must be used to fix the middle washer in the axial direction.

The thrust tapered roller bearings with housing can avoid dirt entering and roller falling. As without cage, more rollers can be put in, therefore the bearings can carry bigger axial load, but due to lower limit rotation speed, they can only carry axial load in one direction.



## Applications of tapered roller thrust bearings

Single direction bearings: shaft washer is same as housing washer (all with ribs), suitable for radial direction fixing, are mainly found in crane hooks and rotating platforms of oil drillings etc.,

Full roller bearings are used when axial load is bigger.

During rotation, little shaft eccentric can be allowed for the bearings with plane housing washer raceway.

Double direction bearings: in the mill roll necks.

## Types of bearing

- Single-direction thrust tapered roller bearings
- Double-direction thrust tapered roller bearings
- Thrust tapered roller bearings with housing

## Dimension scope

Bore diameter scope: 50mm-670mm

Outer diameter scope: 85mm-900mm

Width scope: 22mm-230mm

## Tolerance

The tolerance of ZWZ thrust tapered roller bearings are standardized in GB307.4. The clearance dimensions can be found in preface form. ZWZ can supply bearings with P0, P6 and P5 classes.

## Cage

ZWZ tapered roller thrust bearings generally use brass cages and other machined cages. When they use brass cages, there is no suffix in the bearing code; when they use other cages, there is relative suffix in the bearing code.

## Axial equivalent dynamic load rating

$P_a = F_a$

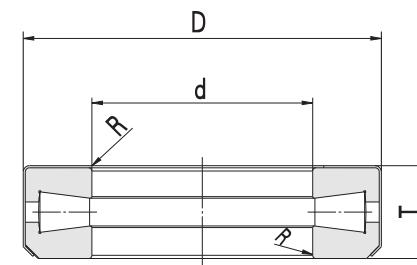
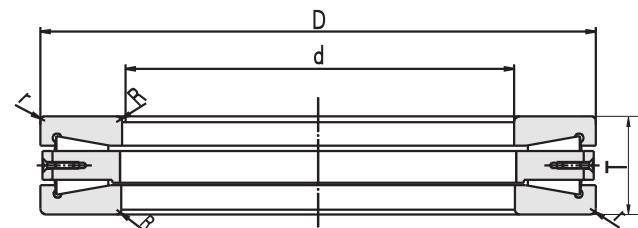
## Axial equivalent static load rating

$P_{oa} = F_a$

# Single-direction Thrust Tapered Roller Bearings

**ZWZ**

d 52.4~380 mm



Principal dimensions				Basic load ratings			Designations
d	D	T	R	r	Cr	Cor	
<b>mm</b>							<b>KN</b>
52.4	85	22	1		134	460	917/52.4ZSV
111.76	223.52	55.88	3.3	3.3	980	3850	917/111X4
177.8	368.3	82.55	8	8	2190	7750	917/177.8
	431.8	101.6	6.4	3.3	3100	12800	917/177.8-1
203.2	419.1	92.075	9.7	9.7	2670	11600	KT811
228.6	482.6	104.775	11.2	11.2	3350	15500	917/228.6
234.95	482.6	104.775	11.2	11.2	3350	15500	917/234X4
280	520	145	6	6	6050	20700	99456
355.6	533.4	101.6	11.2	6	3200	14000	T1421
380	670	175	7.5	7.5	6890	23500	99476

Weight

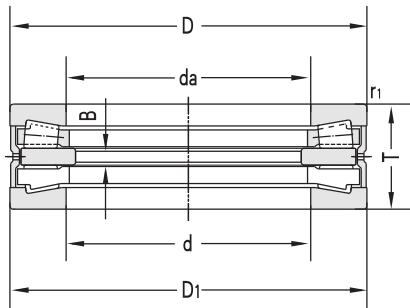
Kg

0.505
11.8
47.6
87.6
70.6
101
99.2
157
85.4
290

# Double-direction Thrust Tapered Roller Bearings

**ZWZ**

d 160~400 mm



Principal dimensions				Basic load ratings		Designations		Other dimensions			
d	D	T	Cr	Cor			da	D1	B	rmin	r1min
mm	mm	KN					mm	mm	mm	mm	mm
160	260	66	230	1470	92232X3	829232	190	195	18	1	1.5
300	110	580	2900	2900			186	190	34	1	1.5
170	240	84	330	1300	92734		182.5	184	20	0.6	2
180	280	90	580	2900	353162		192	196	20	1	2
220	300	96	510	4500	92744/HC		231	236	22	0.6	2
230	400	180	980	4800	829746		254	260	42	1	3
250	300	100	900	5000	92750/YA2		268	275	22	0.6	2
380	100	900	5000	5000	92750/HCYA2		268	275	22	0.6	2
260	360	92	630	3200	350981C		276	285	20	1	2
300	420	100	1050	4450	92760		324	330	23	1.5	2.5
320	440	108	1010	4750	92764/HC		348	355	26	1.5	3
440	108	1010	4750	92764-1			348	355	26	1.1	3
470	130	1350	5800	350982C			340	350	30	1.1	3
348	490	130	1200	7200	92770B		380	390	30	1	3
350	490	130	1200	5300	351100C		380	390	30	1.1	3.5
540	135	1750	9200	353006			384	400	30	1.1	4
360	560	200	2400	12500	829272		382	396	48	1.5	4
380	530	130	1650	9850	92776		398	410	30	3	5
530	130	1650	9850	92776-1			398	410	30	3	5
560	130	1760	9700	92776/YA2			418	430	32	1.5	3
650	215	3400	17000	BFDB353204			446	450	65	2	5
400	650	200	2700	13800	829780		436	450	50	1.5	5

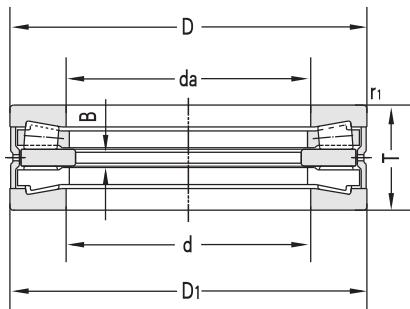
Weight

Kg

# Double-direction Thrust Tapered Roller Bearings

**ZWZ**

d 440~670 mm



Principal dimensions		Basic load ratings		Designations		Other dimensions				
d	D	T	Cr	Cor		da	D1	B	rmin	r1min
mm		KN				mm				
440	650	240	3000	15800	92788/YA2	485	493	90	2	6
460	680	215	3200	16000	92792/HC	504	510	90	2	4
470	720	200	3450	18000	353151	515	535	50	3	4.5
	720	210	3450	18000	BFDB353238/HA3	515	535	60	3	4.5
480	710	218	2900	13000	829796	560	575	57	3	4.5
530	710	218	2300	14000	351475C	560	575	57	3	4.5
550	760	230	2950	13500	350976C	585	610	50	3	4.5
600	880	290	4750	21500	BFDB350824B/HA1	670	680	70	4	5
670	900	230	3600	19500	8292/670	705	725	50	4	5

Weight

Kg

270

271

285

305

245

310

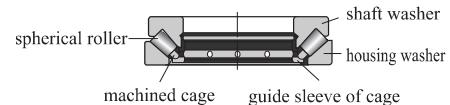
550

425

## Product Characteristics

Same as aligning roller bearings, housing washer raceway surface is a spherical one which takes the same point of bearing central axle as the spherical center point.

The rollers of these bearings are of spherical shape, therefore they are self-aligning and they are not so sensitive to eccentricity and bending of the shaft.



Different with other thrust bearings, these bearings are featured by the extremely big axial load carrying capacity and meanwhile they can also carry certain radial load, however, the radial load should not exceed 55% of the axial load.  
If the load P and P0 do not exceed 0.05Co, and the shaft washer rotates, then the following angels of misalignment are permissible:

Bearing diameter series	Aligning angle
200 series	1° ~ 1.5°
300 series	1.5° ~ 2°
400 series	1.2° ~ 3°

The figures with small values are suitable for comparatively large size bearings, and when the load increases, the permissible misalignment shall decrease.

Oil lubrication is commonly used while working.

Applications of these bearings can be found in hydroelectric generators, vertical motors, propeller axle of vessels, tower cranes and squeezing presses.

### Types of bearings

- Symmetric Thrust Spherical roller bearings
- Asymmetric Thrust Spherical roller bearings

## Dimension scope

The Principal dimensions of ZWZ thrust spherical roller bearings have been listed in dimension table.

Bore diameter range: 60mm-1120mm

Outer diameter range: 130mm-1460mm

Width range: 39mm-354mm

## Tolerance

ZWZ can supply bearings with P0, P6 and P5 class.

## Cage

ZWZ thrust spherical roller bearings generally use brass cages and pressed cages. When they use brass cages, there is no suffix in the bearing code; when they use other cages, there is relative suffix in the bearing code.

## Minimum axial load

The minimum axial load Famin required by the thrust spherical roller bearings when they are in working condition is the bigger value calculated according to the following two formulas:

$$F_{\min} = \frac{C_{\text{oa}}}{2000}$$

$$F_{\min} = 1.8F_r + 1.33\left(\frac{C_{\text{oa}}}{2000}\right)^2 \times 10^{-7}$$

Where:

Fmin: the minimal axial load required kN

N: rotational speed r/min

Coa: basic static load rating kN

Fr: radial load kN

## Equivalent dynamic load

$$P = F_a + 1.2F_r$$

## Equivalent static load

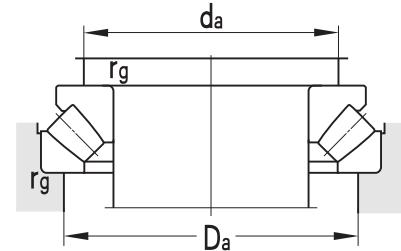
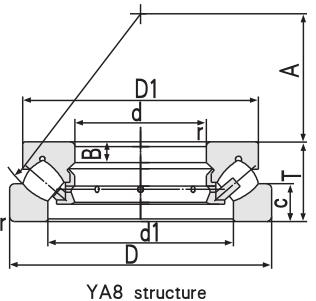
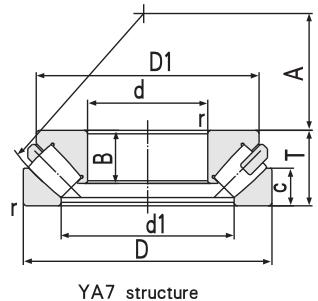
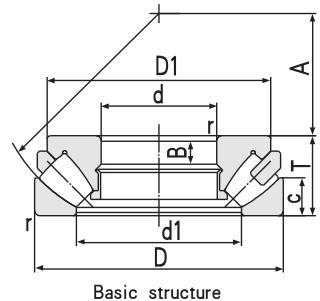
$$P_0 = F_a + 2.7F_r$$

Applications of these bearings can be found in the oil drillers and iron or steel processing machines.

# Thrust Spherical Roller Bearings (Asymmetrical)

**ZWZ**

d 60~130 mm



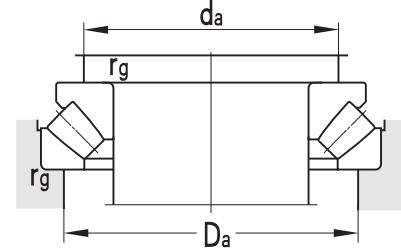
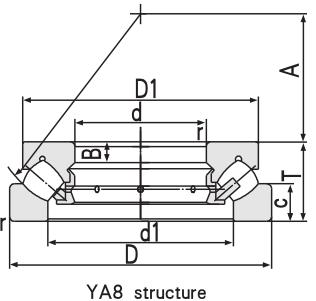
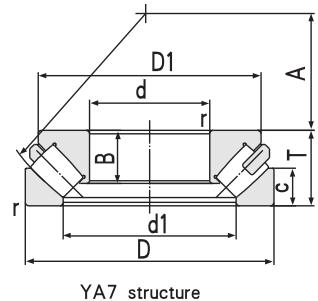
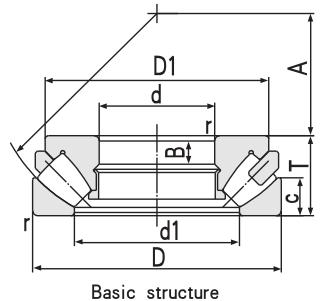
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	T	rmin	Cr	Cor	Grease	Oil	
			KN		r/min			
mm								
60	130	42	1.5	328	425	1800	2600	29412
65	140	45	2	377	490	1700	2400	29413
140	45	2	377	490	1700	2400	29413E	
70	150	48	2	418	1230	1600	2200	29414
75	160	51	2	492	700	1600	2200	29415
80	170	54	2.1	528	1600	1400	2000	29416
170	54	2.1	550	1600	1400	2000	29416Q1	
85	150	39	1.5	330	1070	1600	2200	29317
180	58	2.1	600	1650	1300	1900	29417	
90	155	39	1.5	315	1020	1600	2200	29318
190	60	2.1	667	1980	1300	1800	29418	
190	60	2.1	640	1980	1300	1800	29418Q1	
190	60	2.1	667	1980	1300	1800	29418Q1/HAYA7	
100	170	42	1.5	395	1330	1500	2000	29320
210	67	3	836	2500	1200	1700	29420	
110	190	48	2	505	1640	1200	1700	29322
190	48	2	400	1270	1300	1800	29322/YAD	
230	73	3	996	1540	1100	1600	29422	
120	210	54	2.1	545	2010	1100	1600	29324
250	78	4	910	1590	1000	1500	39424	
250	78	4	1060	3300	900	1300	29424	
250	156	5	980	2700	900	1300	29424D/YA7	
130	225	58	2.1	693	1150	1000	1500	29326E
225	58	2.1	660	2260	1000	1500	29326/YA8	
225	58	2.1	715	2260	1000	1500	29326	
225	116	2.1	690	2260	1000	1500	29326D	

Other dimensions					Abutment and fillet dimensions			Weight
d1	D1	B	C	A	da(min)	Da(max)	rg(max)	
mm					mm			Kg
89	117	27	20	38	90	107	1.5	2.60
95	125	29.5	21	42	100	117	2	3.33
91	120	29.5	21	42	100	117	2	3.14
103	135	31	23	44	105	125	2	4.24
108	140	18	24	47	115	133	2	4.27
113	153.7	19	26.8	50	120	141	2	6.06
113	153.7	19	26.8	50	120	141	2	6.06
111	138	13	18.7	50	115	129	1.5	2.81
120	160	21	27.8	54	130	151	2	6.76
115.5	143.2	13	18.8	52	120	134	1.5	2.93
127	170	22	28.5	56	135	158	2	7.85
127	170	22	28.5	56	135	158	2	7.85
127	170	49.6	28.5	56	135	158	2	7.85
127.5	158.9	14	20.6	58	130	147	1.5	3.80
142	185	24	31.5	62	150	175	2.5	12.3
143	175	16	23	64	145	164	2	6.94
140	175	31	24	64	145	164	2	5.08
155.5	208	26	34.4	69	164	193	2.5	18.1
156	193.5	18	25.9	70	160	181	2	7.45
172	222	50.5	37	74	180	209	3	17.1
181	222	48	38	74	180	209	3	33.3
174	220	153	37		180	209	3	33.3
166	200	36.5	28	76	138	194	2	8.48
168	206.7	19	27.8	76	170	195	2	9.11
168	206.7	19	27.8	76	175	194	2	9.08
168	206.7	19	27.8	76	175	194	2	18.6

# Thrust Spherical Roller Bearings (Asymmetrical)

**ZWZ**

d 130~200 mm



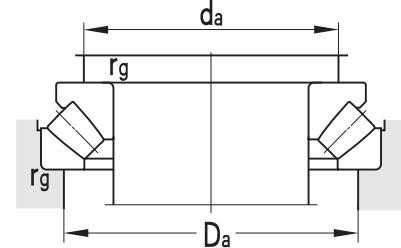
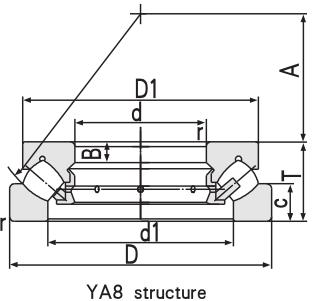
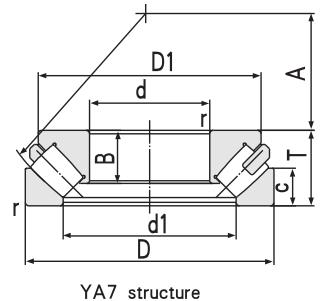
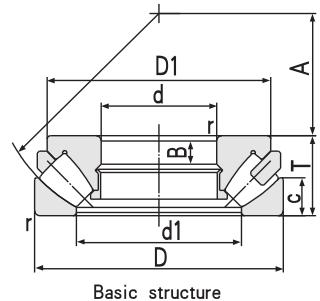
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	T	rmin	Cr	Cor	Grease	Oil	
			KN		r/min			
mm	mm	mm						
130	270	85	4	1220	3500	950	1400	29426 29426/YA7
	270	85	4	1220	3500	950	1400	
140	240	60	2.1	805	2600	950	1400	29328
	280	85	4	1280	4200	850	1200	29428
150	250	60	2.1	820	1210	950	1400	29330
	250	60	2.1	575	2420	950	1400	29330/YA8
	300	90	4	1530	2070	800	1100	29430
	300	90	4	1310	4750	800	1100	29430/YA8
	300	90	4	1320	2370	800	1100	29430E
160	270	67	3	960	3330	850	1200	29332
	270	67	3	960	3330	850	1200	29332F3
	320	95	5	1650	5330	700	1000	29432
170	280	67	3	940	3400	850	1200	29334
	340	103	5	1920	6350	700	950	29434
	340	103	4	1850	3150	700	950	29434E
180	250	42	1.5	420	1760	900	1300	29236
	300	73	3	1090	4050	700	1000	29336
	300	73	3	990	4050	700	1000	29336/YA8
	360	109	5	2250	6750	700	950	29436
	360	109	5	2050	6750	700	950	29436/YA8
190	270	48	2	620	2660	-	1400	29238F3
	320	78	4	1300	4950	750	1000	29338
	320	78	4	1350	5300	750	1000	29338/YA8
	380	115	5	2280	3900	630	850	29438
200	280	48	2	560	2590	-	1400	29240
	340	85	4	1290	5250	700	950	29340
	340	85	4	1140	4750	700	950	29340/YA8
	340	85	4	1530	2330	700	950	29340K
	400	122	5	2500	4300	600	800	29440

Other dimensions					Abutment and fillet dimensions			Weight
d1	D1	B	C	A	da(min)	Da(max)	rg(max)	
mm	mm	mm	mm	mm	mm	mm	Kg	
183	246	31	39.7	81	142.5	227	3	28.3
183	246	67.5	39.7	81	142.5	227	3	28.3
183	221	20	28	82	185	208	2	10.1
203	247	55	47	64	205	236	3	24.8
194	240	20	29	87	195	219	2	11.5
194	240	20	29	87	195	219	2	11.5
214	285	32	44	92	220	253	3	28.9
209.5	273	32	42.1	92	220	253	3	28.6
206	266	58	44	92	220	253	3	27.9
205	249.6	23	31.7	92	210	235	2.5	14.6
205	249.6	23	31.7	92	210	235	2.5	14.5
218.5	285	34	46.9	99	235	270	4	32.8
216	260.3	23	31.7	96	220	245	2.5	15.7
234	310	37.1	48.8	104	250	286	4	42.3
235	302	65.5	50	104	250	286	4	39.7
209	239	15	21.3	97	215	227	1.5	7.05
229	275	25	34.4	103	235	262	2.5	19.9
229	275	25	34.4	103	235	262	2.5	20.3
249.5	326	39	51.2	110	265	304	4	64.2
249.5	326	39	51.2	5	265	304		62.5
222.5	257	15.5	24.1	104	225	243	2	8.37
240.5	298.3	27	38.6	110	250	280	3	25.1
240.5	308	27	38.6	110	250	280	3	25.7
263	345	41	53.7	117	280	321	4	75.6
234.5	266	15	24	108	240	254	2	8.54
259	314	29	39.1	116	265	297	3	29.5
261	325	29	41	116	265	297	3	34.0
261	325	54.5	41	116	265	297	3	34.0
267.5	360	44	56.7	122	295	337	4	83.5

# Thrust Spherical Roller Bearings (Asymmetrical)

**ZWZ**

d 220~400 mm



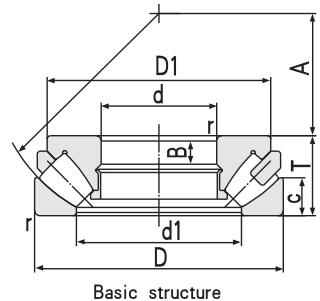
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	T	rmin	Cr	Cor	Grease	Oil	
			KN		r/min			
220	300	48	2	580	2780	-	1300	29244
	360	85	4	1640	2800	670	900	29344
	360	85	4	1580	5900	670	900	29344/YA8
	420	122	6	2570	9110	560	750	29444
240	380	85	4	1770	6100	600	800	29348
	380	85	4	1690	6500	600	800	29348/YA8
	440	122	6	2920	10100	530	750	29448
260	360	60	2. 1	830	4150	-	1100	29252
	420	95	5	2090	7500	600	800	29352
	480	132	6	3330	12100	500	670	29452
	480	132	6	3150	13400	500	670	29452J/HC
280	380	60	2. 1	895	2130	700	1000	29256
	520	145	6	4090	14000	480	630	29456
300	420	73	3	1220	6200	-	900	29260
	480	109	5	2530	10500	700	750	29360
	540	145	6	3500	14800	450	600	29460
320	580	155	7. 5	4500	17600	430	560	29464
340	620	170	7. 5	5460	9750	500	700	29468
	620	170	7. 5	5700	18500	380	500	29468/YA57
360	560	122	5	3080	12400		600	29372
	640	170	7. 5	5230	20800		500	29472
380	520	85	4	1820	8900		700	29276
	600	132	6	3280	15200	450	650	29376
	670	175	7. 5	5600	22500		480	29476
400	540	85	4	1720	4700	500	700	29280
	540	85	4	1650	9050		700	29280F3/YA7
	620	132	6	3500	16800	440	620	29380

Other dimensions					Abutment and fillet dimensions			Weight
d1	D1	B	C	A	da(min)	Da(max)	rg(max)	
mm	mm	mm	mm	mm	mm	mm	Kg	
254	284. 4	15	24	117	260	273	2	9. 20
277. 5	330	29	40. 7	125	285	316	3	28. 6
277. 5	330	29	40. 7	125	285	316	3	29. 4
300	381	43	56. 9	132	315	358	5	73. 2
298. 5	360	29	41. 7	135	305	336	3	35. 4
298. 5	365	29	41. 7	135	305	336	3	20. 3
316	400	43	60	142	335	378	5	96. 1
302	338	19	30	139	310	326	2	16. 9
327. 5	392. 3	32	46	148	335	380	4	50. 2
342	441	48	65	154	365	412	5	102
342	432	88. 2	65	154	360	412	5	101
322. 5	364	19	29. 5	150	325	347	2	21. 7
373. 5	470	54	68. 9	166	395	446	5	127
405	353	21	38	162	360	380	2. 5	29. 5
371. 5	448	37	53	168	385	423	4	72. 7
395	494. 4	52	68. 3	175	395	446	5	138
420	534	55	75	191	450	500	6	182
449. 5	560	61	80	201	475	530	6	218
449. 5	560	61	80. 1	201	475	530	6	206
445	521	41	59. 5	202	460	500	4	103
470	588	63	81	210	495	500	6	221
439	498	27	42	202	450	473	3	50
475	561	44	61. 4	216	495	535	5	129
490	620	67	84. 5	230	525	580	6	252
460	510	27	42	212	470	493	3	64. 6
460	510	64	42	212	470	493	3	62. 9
489	582	44	64. 7	225	510	550	5	153

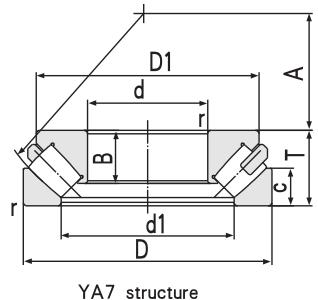
# Thrust Spherical Roller Bearings (Asymmetrical)

**ZWZ**

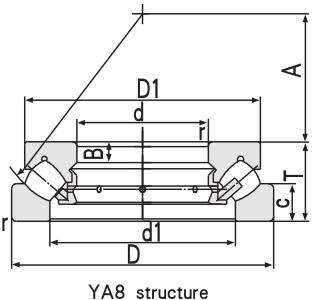
d 400~1120 mm



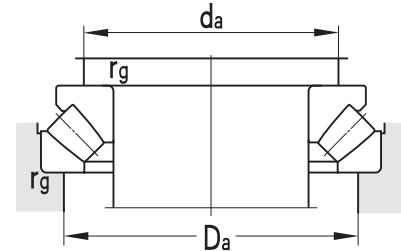
Basic structure



YA7 structure



YA8 structure



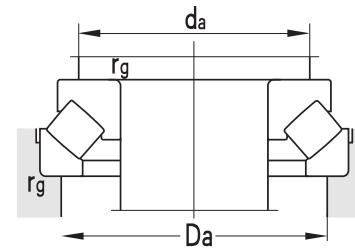
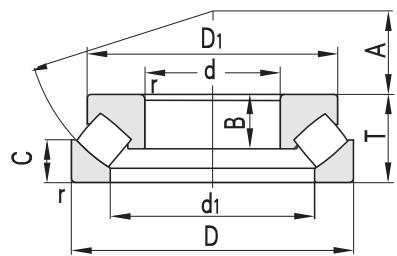
Principal dimensions			Basic load ratings		Limit speed ratings		Designations	
d	D	T	rmin	Cr	Cor	Grease	Oil	
			KN		r/min			
400	710	185	7.5	6230	24500	450	29480	
420	650	140	6	3800	17900	420	600	29384
440	680	145	4	4000	19500	480	29388	
	780	206	9.5	6500	28900	380	29488	
	780	206	9.5	7450	28900	380	29488/HC	
460	620	95	5	2280	12900	400	29292	
	620	95	5	2280	12900	600	29292/YA8	
	710	150	6	4460	18800	450	29392	
500	670	103	5	2550	14600	380	292/500	
	750	150	6	4950	23100	430	293/500	
	750	150	6	4950	23100	430	293/500/YA3	
	870	224	9.5	8900	39500	320	294/500	
530	710	109	5	5000	16600	350	292/530	
	920	236	9.5	10000	40500	300	294/530	
560	750	115	5	3100	8600	360	292/560	
	980	250	12	11100	45400	310	294/560	
710	1220	308	15	15600	71000	220	294/710	
	1220	308	15	15600	71000	220	294/710/HC	
750	1280	315	15	17800	76000	200	294/750	
800	1060	155	7.5	6220	36000	240	292/800	
850	1440	354	15	28600	100000	150	294/850F1	
950	1250	180	705	8430	46900	240	292/950	
1060	1400	206	9.5	10500	62000	180	292/1060	
1120	1460	206	9.5	11000	68600	220	292/1120F1	

Other dimensions					Abutment and fillet dimensions			Weight
d1	D1	B	C	A	da(min)	Da(max)	rg(max)	
					mm			Kg
529.5	652	70	86	236	550	615	6	309
514.5	610	48	6.8	235	535	580	5	175
539	636	48	70.8	245	585	630	5	180
583	716	74	97	260	630	695	8	394
583	716	74	97	260	630	695	8	394
525.5	590	30	49.4	245	540	565	4	74.7
525.5	590	30	49.4	245	540	565	4	76.6
567	668	51	72	257	586	630	5	207
572	640	33	50.5	268	585	615	4	117
601.5	709.4	51	75.5	280	630	675	5	221
601.5	709.4	51	75.5	280	630	675	5	221
648	790	81	106	290	685	755	8	589
604	680	35	54	288	615	655	4	118
686	845	89	114	309	725	800	8	615
640	715	40	56.8	302	655	685	4	131
727	890	92	120	328	770	850	10	741
910	1130	113	148.5	415	965	1070	12	1400
910	1130	113	148.5	415	965	1070	12	1400
972	1164	116	158	436	1015	1120	12	1530
907.5	1010	50	80	426	935	980	6	343
1098	1330	221	172	494	1080	1230	12	2090
1081	1185	58	88	507	1095	1155	6	537
1208	1335	66	100	566	1225	1290	8	767
1272	1385	141.5	101	601	1300	1365	8	804

# Thrust Spherical Roller Bearings (Symmetrical)

**ZWZ**

d 70~340 mm



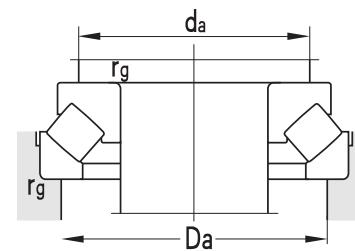
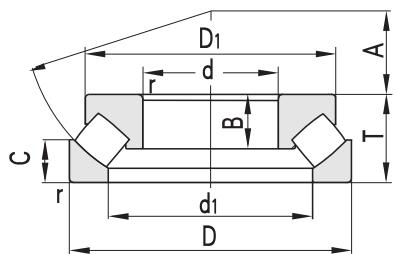
Principal dimensions d	D	T	Basic load ratings		Limit speed ratings		Designations
			rmin	KN	Cr	Cor	
			r/min				
mm	mm	mm					
70	150	48	2.3	314	430	1400	2000 29414/YAD
80	170	54	2.5	407	550	1100	1700 29416/YAD
90	190	60	2.5	484	690	950	1500 29418/YAD
100	210	67	3	644	865	850	1300 29420/YAD
120	210	54	2.5	418	650	1000	1600 29324/YAD
	250	78	3.7	781	1060	750	1100 29424/YAD
	250	78	2.5	781	1060	750	1100 29424/YAD-1
130	225	58	3.7	484	750	950	1500 29326/YAD
	270	85	3.7	836	1100	700	1100 29429/YAD
140	280	85	3.7	908	1120	670	950 29428/YAD
150	300	90	4.7	1090	1710	630	900 29430/YAD
160	320	95	4.7	1100	1720	560	800 29432/YAD
170	340	103	3	1330	2130	530	750 29434/YAD
180	300	73	4.7	974	3000	630	900 29336/YAD
	360	109	2	1330	2130	750	750 29436/YAD
220	300	48	6	484	910	850	1300 29244/YAD
240	440	122	3.7	2110	3550	750	750 29448/YAD
260	360	60	2.1	798	1550	530	750 29252/YAD
280	440	95	5	1600	6060	530	750 29356/YAD
340	460	73	3	1250	2440	530	750 29268/YAD

Other dimensions d1	D1	B	C	A	Abutment and fillet dimensions			Weight
					da(min)	Da(max)	rg(max)	
mm	mm	mm	mm	mm	mm	mm	mm	Kg
103	135	31	23	44	105	125	2	3.87
117	155	35	25	50	120	141	2	5.33
132	170	39	29	56	135	158	2	7.13
146	190	45	32	62	150	175	2.5	10.5
161	188	34	30	57	160	181	2	6.88
181	222	48	38	74	180	209	3	19.5
181	222	48	38	74	180	209	2.5	19.4
170	200	37	29	76	175	194	2	8.26
190	240	55	44	79	195	227	3	23.0
203	247	55	47	64	205	236	3	22.7
220	270	60	48	69	220	253	3	27.3
234	275	61	53	74	235	270	4	33.3
243	310	71	48	104	250	286	3	40.7
230	276	50	35	103	235	262	2.5	19.4
265	308	67	58	82	265	304	2	42.3
260	286	31	24	117	260	273	2	7.92
330	400	78	59	142	335	378	3	74.5
302	335	38	30	139	310	326	2	15.7
348	413	64	46	158	355	390	4	49.1
388	438	48	36	204	400	422	2.5	31.4

# Thrust Spherical Roller Bearings (Symmetrical)

**ZWZ**

d 420~750 mm



Principal dimensions			Basic load ratings			Limit speed ratings		Designations	
d	D	T	rmin	Cr	Cor	Grease	Oil		
			KN		r/min				
mm	mm	mm							
420	580	95	4.7	2060	4150	560	29284/YAD		
500	870	224	9.5	6930	27700	340	294/500/YAD		
630	850	132	6	3580	8350	300	292/630YAD		
710	950	145	6	3960	12000	240	292/710/YAD		
750	1280	315	15	14850	31000	100	294/750/YAD		

Other dimensions					Abutment and fillet dimensions			Weight	
d1	D1	B	C	A	da(min)	Da(max)	rg(max)		
					mm			Kg	
mm	mm	mm	mm	mm	mm	mm	mm	mm	Kg
489	548	62	46	251	500	525	4	78.9	
654	760	140	108	290	685	755	8	462	
728	800	86	65	338	740	780	5	231	
805	895	92	75	380	820	880	5	279	
972	1152	160	158	448	1015	1120	12	1340	

## Product Characteristics

The ceramic bearings produced by ZWZ, the rings of which are made of through hardened steel and the rolling elements are made of ceramic material (Si<sub>3</sub>N<sub>4</sub>). They are compound ceramic bearings. Compound ceramic bearings have good insulation functions. The damage caused by the arc produced from direct current or alternative current, to the grease and the raceway can be avoided. Under high frequency voltage, compound ceramic bearings have high impedance which can avoid high frequency current getting through the rolling elements and the raceway.

## Types of bearings

ZWZ produce following two compound ceramic bearings

- Compound deep groove ceramic ball bearings
- Compound angular contact ceramic ball bearings

## Dimension scope

Compound deep groove ceramic ball bearings

Bore diameter range: 25mm-180mm

Outside diameter range: 47mm-280mm

Width range: 12mm-58mm

Compound angular contact ceramic ball bearings

Bore diameter range: 25mm-65mm

Outside diameter range: 62mm-140mm

Width range: 17mm-33mm

## Tolerance

The tolerances of ZWZ compound ceramic bearings are standardized in GB307.1.

## Clearance

The clearance of ZWZ compound ceramic bearings is the Third class of GB4604 standard.

## Cage

According to different dimensions and applications, ZWZ compound ceramic bearings use following cages:

- Reinforced Nylon 66 cage
- Pressed steel cage
- Brass cage
- Carbon steel cage

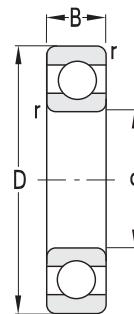
## Equivalent load rating

The equivalent dynamic load and static load can be calculated according to the calculating formula of deep groove ball bearings and angular contact bearings.

# Deep Groove Ceramic Ball Bearings

**ZWZ**

d 25~100 mm

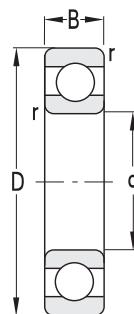


Principal dimensions				Basic load ratings		Designations	Limit speed ratings		Weight	
d	D	B	rsmin	Cr	Cor		Grease	Oil		
mm				KN				r/min		Kg
25	47	12	0.6	8	6	6005/HQ1	18000	15000	0.0782	
	52	15	1	11	8	6205/HQ1	15000	12000	0.134	
	62	17	1.1	17	11	6305/HQ1	14000	11000	0.214	
30	62	16	1	15	11	6206/HQ1	9000	7500	0.25	
	72	19	1.1	20	15	6306/HQ1	11000	9000	0.354	
35	72	17	1.1	20	15	6207/HQ1	11000	9000	0.284	
	80	21	1.5	26	19	6307/HQ1	10000	8500	0.517	
40	80	18	1.1	24	19	6208/HQ1	10000	8500	0.361	
	90	23	1.5	31	24	6308/HQ1	9000	7500	0.642	
45	75	16	1	15	14	6009/HQ1	6500	5600	0.245	
	100	25	1.5	41	32	6309/HQ1	8000	6700	0.85	
50	90	20	1.1	27	23	6210/HQ1	8500	7000	0.504	
	110	27	2	48	28	6310/HQ1	7500	6300	1.07	
55	100	21	1.5	33	29	6211/HQ1	7500	6300	0.605	
	120	29	2	55	45	6311/HQ1	6700	5600	1.35	
60	95	18	1.1	23	23	6012/HQ1	8000	6700	0.426	
	110	22	1.5	37	33	6212/HQ1	7000	6000	0.786	
	130	31	2.1	63	52	6312/HQ1	6000	5000	1.71	
65	120	23	1.5	32	40.0	6213/HQ1	5300	6300	0.973	
75	130	25	1.5	51.0	50	6215/HQ1	4800	5600	1.16	
80	170	39	2.1	94.5	86.5	6316/HQ1	4500	4800	3.64	
95	200	45	3	120	122	6319/HQ1	3200	3800	5.65	
100	215	47	3	173	141	6320M/HQ1	3000	3600	8	

# Deep Groove Ceramic Ball Bearings

**ZWZ**

d 110~130 mm



Principal dimensions				Basic load ratings		Designations	Limit speed ratings	
d	D	B	rsmin	Cr	Cor		Grease	Oil
mm				KN			r/min	
110	240	50	3	195	167	6322M/HQ1	2600	3200
120	260	55	3	175	207	6324/HQ1	2200	2800
130	280	58	4	230	216	6326/HQ1	2200	2600

Weight

Kg

10.6

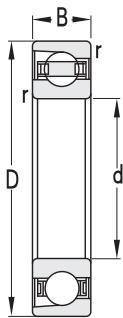
12.2

18.3

# Angular Contact Ceramic Ball Bearings

**ZWZ**

d 25~60 mm



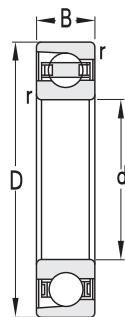
Principal dimensions				Basic load ratings		Designations	
d	D	B	r12min	r34min	Cr	Cor	
mm							
KN							
25	62	17	1.1	0.6	19	14	7305B/HQ1
30	72	19	1.1	0.6	23	18	7306B/HQ1
35	72	17	1.1	0.6	25	22	7207C/HQ1
	72	17	1.1	0.6	20	17	7207B/HQ1
80	21	1.5	0.6	25	23	7307AC/HQ1	
80	21	1.5	0.6	30	25	7307B/HQ1	
40	80	18	1.1	0.6	26	24	7208AC/HQ1
	80	18	1.1	0.6	28	25	7208C/HQ1
80	18	1.1	0.6	36.3	21.5	7208CTN1/HQ1	
90	23	1.5	0.6	36	30	7308B/HQ1	
45	85	19	1.1	0.6	31	29	7209C/HQ1
50	90	20	1.1	0.6	33	32	7210C/HQ1
	90	20	1.1	0.6	29	29	7210B/HQ1
110	27	2	1	55	49	7310AC/HQ1	
110	27	2	1	50	44	7310B/HQ1	
110	27	2	1	58	51	7310C/HQ1	
55	90	18	1.1	0.6	24	26	7011AC/HQ1
100	21	1.5	0.6	39	38	7211AC/HQ1	
100	21	1.5	0.6	41	40	7211C/HQ1	
120	29	2	1	71	65	7311C/HQ1	
120	29	2	1	68	63	7311AC/HQ1	
120	29	2	1	61	56	7311B/HQ1	
60	95	18	1.1	0.6	27	30	7012AC/HQ1
110	22	1.5	0.6	43	43	7212AC/HQ1	
110	22	1.5	0.6	45	45	7212C/HQ1	
130	31	2.1	1.1	73	67	7312AC/HQ1	
	31	2.1	1.1	65	60	7312B/HQ1	

Grease	Oil	Limit speed ratings	Function point	Weight
		r/min	mm	Kg
9000	13000	27.2	0.277	
8000	11000	30.9	0.371	
9000	12000	15.7	0.304	
8000	11000	30.9	0.328	
7500	10000	24.6	0.551	
7500	10000	35	0.551	
8000	11000	16.7	0.364	
8000	11000	17	0.364	
8000	11000	17	0.312	
6300	8500	38.8	0.711	
12000	17000	18.2	0.403	
7600	10000	19.4	0.458	
4480	6400	39.4	0.487	
5600	7500	32.2	1.16	
5000	6700	47.1	1.16	
7000	8700	24.2	1.16	
10000	12000	25.9	0.385	
7100	10000	28.6	0.599	
10000	14000	20.9	0.698	
7000	8700	26.2	1.65	
5000	6700	34.9	1.65	
4500	6300	51.2	1.61	
7100	10000	27.1	0.392	
6700	9000	30.8	0.786	
9500	13000	22.4	0.786	
4800	6300	37.7	2.02	
4300	5600	55.4	2.08	

# Angular Contact Ceramic Ball Bearings

**ZWZ**

d 65 mm



Principal dimensions d	D	B	r12min	r34min	Basic load ratings		Designations
					Cr	Cor	
mm							
					KN		
65	100	18	1.1	0.6	26	31	7013AC/HQ1
	120	23	1.5	0.6	56	59	7213C/HQ1
	120	23	1.5	0.6	54	56	7213AC/HQ1
	120	23	1.5	0.6	56	59	7213C/HQ1
	140	33	2.1	1.1	92	88	7313C/HQ1
	140	33	2.1	1.1	88	84	7313AC/HQ1
	140	33	2.1	1.1	78	75	7313B/HQ1

Grease	Oil	a	Limit speed ratings	Function point	Weight
			r/min	mm	
6700	9500	28.2	0.414		
9000	12000	23.9	1.015		
6000	8500	33.1	1.16		
9000	12000	23.9	1.16		
8000	10000	30.2	2.6		
4300	6000	40.4	2.61		
3800	5300	59.5	2.48		

## Product Characteristics

The electric insulation bearings adopt special flame plating technology, metallizing superior coated film on the outer surface of bearings. Coated film and basebonded strongly, strong bond, insulating property, it can avoid the galvanic action occurred by induced current to bearing, prevent the failure of grease, rolling elements, raceway from electric current, increase the bearing life. It is suitable to be used in electric motors, generators, especially frequency conversion electric motor widely used.

## Types of bearings

ZWZ produces the following three kinds of electric insulation bearings:

- Electric insulation deep groove ball bearings
- Electric insulation angular ball bearings
- Electric insulation cylindrical roller bearings

## Dimension scope

### Electric insulation deep groove ball bearings

Bore diameter range: 40mm---340mm  
Outside diameter range: 80mm---300mm  
Width diameter range: 18mm---62mm

### Electric insulation angular ball bearings

Bore diameter range: 48mm---140mm  
Outside diameter range: 100mm---300mm  
Width diameter range: 25mm---62mm

## Tolerance

ZWZ electric insulation bearings adopt GB30.1 standard tolerance, the relevant clearance class can be supplied if special requirements.

## Clearance

ZWZ electric insulation deep groove ball bearings and cylindrical roller bearings adopt normal group inner clearance in GB4604 standard. We also can produce insulation bearings with other clearance if required.

## Cage

As per different bearing series and dimensions, ZWZ electric insulation bearings adopt following cage:

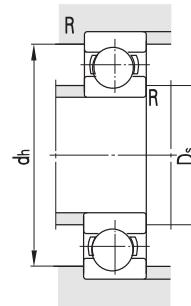
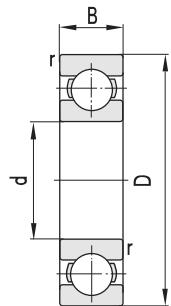
- Reinforced nylon 66 cage
- Pressed steel cage
- Machined solid brass cage

The cage codes please reference to standard deep groove ball bearings, cylindrical roller bearings and angular contact ball bearings.

# Deep Groove Ball Insulation Bearings

**ZWZ**

d 40~95 mm



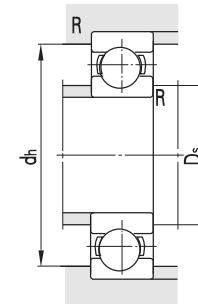
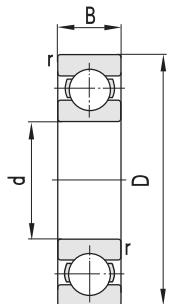
Principal dimensions d	D	B	rsmin	Basic load ratings		Permissible speed ratings		Designations
				Cr	Cor	Grease	Oil	
mm				KN		r/min		
40	80	18	1.1	23.7	16.8	8500	10000	IS- 6208
	90	23	1.5	41.0	24.0	7500	9000	IS- 6308
45	85	19	1.1	24.0	20.4	7500	9000	IS- 6209
	100	25	1.5	40.5	30	6700	8000	IS- 6309
50	90	20	1.1	35.0	23.2	7100	8500	IS- 6210
	110	27	1.5	48.0	36.0	6300	7500	IS- 6310
55	100	21	1.5	33.5	28.8	6300	7500	IS- 6211
	120	29	2	55.0	45.0	5600	6700	IS- 6311
60	110	22	1.5	47.5	33	5600	7100	IS- 6212
	130	31	2.1	63.0	48.5	5300	6300	IS- 6312
65	120	23	1.5	44.0	40.0	5300	6300	IS- 6213
	140	33	2.1	63.0	48.5	4800	5600	IS- 6313
70	125	24	1.5	46.5	46.0	5000	6000	IS- 6214
	150	35	2.1	80	68.0	4500	5300	IS- 6314
75	130	25	1.5	51.0	50.0	4500	5600	IS- 6215
	160	37	2.1	77.0	116	4500	5000	IS- 6315
80	140	26	1.5	55.0	54.5	4500	5300	IS- 6216
	170	39	2.1	94.5	86.5	4500	4800	IS- 6316
85	150	28	2	65.0	65.0	4300	5000	IS- 6217
	180	41	3	102	96.5	3800	4500	IS- 6317
90	160	30	2	73.5	72	3800	4500	IS- 6218
	190	43	3	111	108	3400	4000	IS- 6318
95	170	32	2.1	83.5	81.5	3600	4300	IS- 6219
	200	45	3	120	122	3200	3800	IS- 6319
	200	45	3	110	110	3200	3800	IS- 6319M

Abutment and fillet dimensions			Weight
Ds(min)	dh(max)	R(max)	
46.5	73.5	1	0.361
48	82	1.5	0.642
51.5	78.5	1	0.428
53	92	1.5	0.850
56.5	83.5	1	0.504
59	101	2	1.07
63	92	1.5	0.605
64	111	2	1.39
68	102	1.5	0.793
71	119	2	1.71
73	112	1.5	0.973
76	129	2	2.10
78	117	1.5	1.34
81	139	2	2.55
83	122	1.5	1.16
86	149	2	3.10
89	131	2	1.43
91	159	2	3.64
94	141	2	1.80
98	167	2.5	4.33
99	151	2	2.19
103	177	2.5	4.97
106	159	2	2.61
108	187	2.5	5.65
108	187	2.5	7.11

# Deep Groove Ball Insulation Bearings

**ZWZ**

d 100~140 mm



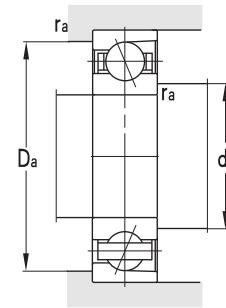
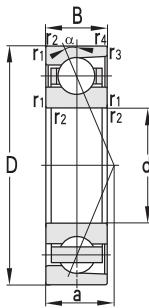
Principal dimensions				Basic load ratings		Permissible speed ratings		Designations	
d	D	B	r <sub>smin</sub>	Cr	Cor	Grease	Oil		
mm				KN		r/min			
100	180	34	2.1	94.0	93	3400	4000	IS- 6220	
	215	47	3	141	133	2800	3600	IS- 6320	
	215	47	3	173	141	2800	3600	IS- 6320M	
105	160	36	2.1	102	105	3200	3800	IS- 6221	
	225	49	3	184	153	2800	3400	IS- 6321	
110	200	38	2.1	102	106	2800	3400	IS- 6222	
	240	50	3	158	176	2400	3000	IS- 6322	
	240	50	3	195	167	2400	3000	IS- 6322M	
120	215	40	2.1	120	131	2800	3400	IS- 6224	
	260	55	3	175	207	2200	2800	IS- 6324	
130	230	40	3	127	148	2600	3200	IS- 6226	
	280	58	4	193	239	2200	2600	IS- 6326	
140	250	42	3	128	150	2400	3000	IS- 6228	
	300	62	4	211	272	2000	2600	IS- 6328	

Abutment and fillet dimensions			Weight
D <sub>s</sub> (min)	d <sub>h</sub> (max)	R(max)	
			mm
111	169	2	3.20
113	202	2.5	7.01
113	202	2.5	8.94
116	179	2	3.66
118	212	2.5	7.84
121	189	2	4.29
123	227	2.5	9.49
123	227	2.5	11.8
131	204	2	5.26
133	247	2.5	12.2
143	217	2.5	6.04
146	264	3	14.7
153	237	2.5	7.41
156	284	3	18.5

# Angular Contact Insulation Bearings

**ZWZ**

d 40~100 mm



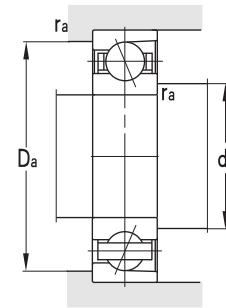
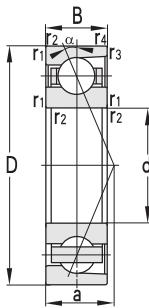
Principal dimensions			Basic load ratings			Abutment and fillet dimensions			
d	D	B	r12min	r34min	Cr	Cor	da(max)	Da(max)	ra(max)
<b>mm</b>			<b>KN</b>			<b>mm</b>			
40	90	23	1.5	0.6	36	30	49	81	1.5
45	85	19	1.1	0.6	31	29	52	78	1
50	90 110	20 27	1.1 2	0.6 1	33 55	32 49	57 60	83 100	1 2
55	100 120	21 29	1.5 2	0.6 1	41 68	40 63	64 65	91 110	1.5 2
60	110 130	22 31	1.5 2.1	0.6 1.1	45 73	45 67	69 72	101 118	1.5 2
65	120 140	23 33	1.5 2.1	0.6 1.1	56 88	59 84	74 77	111 128	1.5 2
70	1250 150	24 35	1.5 2.1	0.6 1.1	61 99	65 96	79 82	116 138	1.5 2
75	130 160	25 37	1.5 2.1	0.6 1.1	61 112	67 113	84 87	121 148	1.5 2
80	140 170	26 39	2 2.1	1 1.1	71 117	79 122	90 92	130 158	2 2
85	130 180	22 41	1.1 3	0.6 1.1	44 126	56 137	92 99	123 166	1 2.5
90	160 190	30 43	2 3	1 1.1	94 135	105 152	100 104	150 176	2 2.5
95	170 200	32 45	2.1 3	1.1 1.1	102 145	114 167	107 109	158 186	2 2.5
100	180 215	34 47	2.1 3	1.1 1.1	114 164	130 199	112 114	168 201	2 2.5

Limit speed ratings Grease	Designations Oil	a		Weight Kg
		r/min	mm	
5100	IS- 7308B	6800	38.8	0.653
12000	IS- 7209C	17000	18.2	0.403
7600	IS- 7210C	10000	19.4	0.458
5600	IS- 7310ACM	7500	32.2	1.16
8000	IS- 7211C	10000	20.9	0.599
5000	IS- 7311ACM	6700	34.9	1.65
9500	IS- 7212C	13000	22.4	0.786
4800	IS- 7312ACM	6300	37.7	2.02
9000	IS- 7213C	12000	23.9	1.015
4300	IS- 7313ACM	6000	40.4	2.61
8500	IS- 7214C	11000	25.1	1.1
4000	IS- 7314ACM	5300	43.2	3.01
5600	IS- 7215ACM	7500	36.4	1.29
5800	IS- 7315ACM	7000	45.9	3.57
5000	IS- 7216ACM	7100	38.7	1.73
3600	IS- 7316ACM	4800	48.7	4.21
5300	IS- 7017ACM	7100	36.1	1.12
3400	IS- 7317ACM	4500	51.4	4.99
6300	IS- 7218C	9000	31.7	2.09
3200	IS- 7318ACM	4300	54.1	6.18
4300	IS- 7219ACM	5600	46.9	2.97
3000	IS- 7319ACM	4000	56.9	6.67
4000	IS- 7220ACM	5300	49.6	3.74
2800	IS- 7320ACM	3800	60.2	9.61

# Angular Contact Insulation Bearings

**ZWZ**

d 110~140 mm



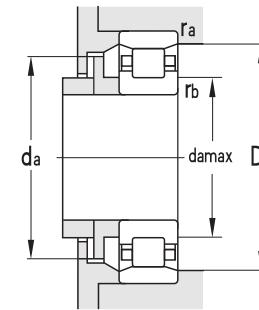
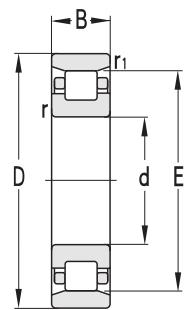
Principal dimensions				Basic load ratings		Abutment and fillet dimensions				
d	D	B	r12min	r34min	Cr	Cor	da(max)	Da(max)	ra(max)	
mm					KN		mm			
110	200	38	2.1		1.1	142	171	122	188	2.5
	240	50	3		1.1	184	231	124	226	2.5
120	260	55	3		1.1	204	269	130	170	2
130	230	40	3		1.1	151	200	144	216	2.5
	280	58	4		1.5	192	268	148	262	3
140	250	42	3		1.1	169	237	154	236	2.5
	300	62	4		1.5	212	308	158	282	3

Grease r/min	Oil	Limit speed ratings		Designations	a mm	Weight Kg
		5000	2600			
2200	3000	IS- 7222C	IS- 7322ACM	39.8	4.07	
		2600	3400	IS- 7322ACM	65.8	9.97
2400	3200	IS- 7324AC		71.8	13.7	
1800	2400	IS- 7226ACM	IS- 7326B	62	7.26	
				115.1	17.9	
2200	3000	IS- 7228ACM	IS- 7328B	66.5	8.71	
1600	2200			123.2	21.2	

# Cylindrical Roller Insulation Bearings

**ZWZ**

d 45~100 mm



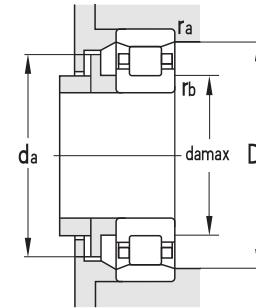
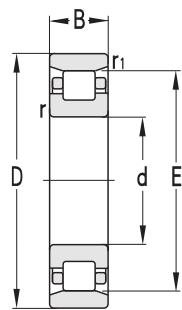
Principal dimensions					Basic load ratings			Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1min</sub>	E	Cr	Cor	Grease	Oil
<b>mm</b>					<b>KN</b>	<b>r/min</b>			
45	100	25	1.5	1.5	88.5	96	109	6300	7500
50	90	20	1.1	1.1	80.4	52	64	6300	7500
	110	27	2	2	97	108	125	5000	6000
55	120	29	2	2	104.5	134	156	4800	5600
	120	29	2	2	106.5	126	144	4800	5600
60	130	31	2.1	2.1	113	148	174	4300	5000
	130	31	2.1	2.1	115	148	174	4300	5000
65	140	33	2.1	2.1	121.5	142	168	4000	4800
	140	33	2.1	2.1	124.5	166	194	4000	4800
70	125	24	1.5	1.5	113.5	117	152	4500	5300
	150	35	2.1	2.1	130	199	242	3600	4300
	150	35	2.1	2.1	133	199	242	3600	4300
75	160	37	2.1	2.1	139.5	255	226	3400	4000
	160	37	2.1	2.1	143	240	264	3400	4000
80	140	26	2	2	127.3	137	184	4000	4800
	170	39	2.1	2.1	147	217	246	3200	3800
	170	39	2.1	2.1	151	275	286	3200	3800
85	180	41	3	3	160	284	361	3000	3600
90	190	43	3	3	165	274	315	2800	3400
	190	43	3	3	169.5	289	356	2800	3400
95	200	45	3	3	173.5	295	340	2600	3200
	200	45	3	3	177.5	307	390	2600	3200
100	180	34	2.1	2.1	163	242	333	3200	3800
	215	47	3	3	185.5	335	400	2400	3000
	215	47	3	3	191.5	372	468	2400	3000

Designations	Abutment and fillet dimensions				Weight
	da(min)	da(max)	Da(max)	Da(min)	
<b>mm</b>					
IS- N309EM	53	86	92	91	0. 964
IS- N210M	56. 5	79	83. 5	82	0. 559
IS- N310EM	59	95	101	99	1. 3
IS- N311M	64	104	111	109	1. 61
IS- N311EM	64	104	111	109	1. 59
IS- N312E	71	110	119	116	1. 94
IS- N312EM	71	112	119	118	2. 06
IS- N313M	76	119	129	124	2. 24
IS- N313EM	76	122	129	127	2. 42
IS- N214EM	78	111	117	116	1. 29
IS- N314M	81	127	139	133	3. 01
IS- N314EM	81	130	139	136	3. 08
IS- N315M	86	136	149	142	3. 59
IS- N315EM	86	140	149	146	3. 65
IS- N216EM	89	125	131	130	1. 672
IS- N316M	91	144	159	150	3. 98
IS- N316EM	91	148	159	154	4. 22
IS- N317EM	98	157	167	163	5. 2
IS- N318M	103	162	177	170	5. 93
IS- N318EM	103	166	177	173	5. 99
IS- N319M	108	170	187	177	6. 92
IS- N319EM	108	174	187	181	7. 1
IS- N220EM	111	160	169	166	3. 77
IS- N320M	113	182	202	190	8. 24
IS- N320EM	113	188	202	195	9. 67

# Cylindrical Roller Insulation Bearings

**ZWZ**

d 105~140 mm



Principal dimensions						Basic load ratings		Limit speed ratings	
d	D	B	r <sub>smin</sub>	r <sub>1min</sub>	E	Cr	Cor	Grease	Oil
mm									
105	225	49	3	3	201	416	527	2200	2800
110	240	50	3	3	207	373	479	2000	2600
	240	50	3	3	211	420	596	2000	2600
120	215	40	2.1	2.1	191.5	270	391	2400	3000
130	230	40	3	3	209.5	354	496	2200	2800
140	300	62	4	4	260	595	806	1900	2400

Designations	Abutment and fillet dimensions				Weight
	da(min)	da(max)	Da(max)	Da(min)	
mm					
IS- N321EM	118	130	212	203	10. 5
IS- N322	123	208	227	210	10. 2
IS- N322EM	123	204	227	215	11. 4
IS- N224M	131	140	204	195	6. 11
IS- N226EM	143	206	217	213	7. 09
IS- N328M	156	256	284	264	21. 9

## Product Characteristics

Self lubricating centripetal spherical plain bearings are applied in circumstances which axle and bearing house need self-aligning and maybe have some slant and swing. This kind of bearing has a series of advantages, no matter from technology or economy it can meet customers' demands preferably, so it is used widespread.

Compared with other type of slide bearings, this type of bearings has following advantages:

### 1. Bear the radial and axial force simultaneously

Since its sliding face are spherical and can transfer force from radial and axial direction simultaneously, so it needn't the thrust liner additionally.

### 2. Possess the best combination of the sliding contact surfaces

Since the bearing is equipped with the sliding cushion layer between the two inner and outer rings, the radial clearance can be controlled in the settled range, the slide will only happen in the place between inner ring and outer ring but not between the ream axle and bearing.

### 3. Non-sensitive to slant

This kind of sliding bearings can adjust deflexion in some range, not influence the pressure distribution in the bearing.

### 4. Amortizing vibration

Since bearings adopt soft sliding cushion materials between inner and outer ring, so this kind of bearings has a favorable buffer function and can absorb attack and avoid vibration.

## Bearing dimensions

The diameter of the new spherical sliding bearing is put forward as per the international standard organization to its dimension limit. The relative dimensions of GET...HS, GET...CHS bearings are listed in this catalogue dimension

table. Meanwhile, the principal dimensions of the thrust spherical knuckle bearings are also listed in this table.

## Bearing tolerance

### Symbol

d: bearing nominal bore diameter

$\triangle d_{mp}$ : the warp of single plane average inner bore diameter

Vdp: the fluctuant volume of inner bore diameter in single radial plane

Vdmp: the fluctuant volume of average inner bore diameter

$\triangle B_s$ : the warp of inner ring single width

D: bearing nominal outer diameter

$\triangle D_{mp}$ : the warp of single plane average outer diameter

VDp: the fluctuant volume of outer diameter in single axial plane

VDmp: the fluctuant volume of average diameter

$\triangle C_s$ : the warp of single width of outer ring

The inner ring tolerance of GET...FHS, GET...HS series self lubrication spherical plane bearing listed in table 1, outer ring tolerance listed in table 2

Table 1 The inner ring tolerance

d mm		$\triangle d_{mp}$		Vdp	Vdmp	$\triangle B_s$	
Exceed	To	upper deviation	low deviation	max	max	upper deviation	low deviation
80	120	0	-20	20	15	0	-200
120	180	0	-250	250	19	0	-250
180	250	0	-30	30	23	0	-300
250	315	0	-35	350	26	0	-350
315	400	0	-40	40	30	0	-400
500	630	0	-50	50	38	0	-500
630	800	0	-75	75	56	0	-750
800	1000	0	-100	100	90	0	-1000
1000	1250	0	-125	125	12	0	-1250

Table 2 The outer ring tolerance

D mm		$\triangle D_{mp}$		VDp	VDmp	$\triangle C_s$	
Exceed	To	upper deviation	low deviation	max	max	upper deviation	low deviation
120	150	0	-18	24	14	0	-500
150	180	0	-25	33	19	0	-500
180	250	0	-30	40	23	0	-600
250	315	0	-35	47	26	0	-700
315	400	0	-40	53	30	0	-800
400	500	0	-45	60	34	0	-900
500	630	0	-50	67	38	0	-1000
630	800	0	-75	100	56	0	-1100
800	1000	0	-100	135	90	0	-120
1000	1250	0	-125	190	125	0	-1300
1250	1600	0	-160	240	160	0	-1600

## Bearing structure design

GET...HS and GET...HS self lubricating centripetal spherical plain bearing have one inner ring and double half outer rings. The inside design is different as per the adopted different self lubricating materials.

### GET...HS structure:

The outer ring are made of medium carbon steel, all the concave round surface of outer ring are planked by adopting lamella made of PTEE fiberglass reinforced plastic. The lamella has been fixed with the axial grooves to load the mote and dust from abrasion, and then the outer ring can be lubricated again. Inner rings are made of carbon steel.

### GET...HS structure:

The outer ring and inner ring are all made of medium carbon steel. The slide surface adopts specially made bronze self-lubricating material, making it into disk shape then embeds into the round hole of inner ring roundness surface.

## Thrust self lubricating spherical plain bearing

GX...C self lubricating thrust spherical plain bearings have one axial ring and one housing ring, the housing ring surface adopts specially made bronze self-lubricating material.

## Bearing type selection

Generally should think of GET...CHS structure first. If can utilize the bearing static load value adequately, due to the dimensions of GET...HS type bearings are smaller than GET...HS type, this type of bearings can gain better economic effect. GET...HS structure bearings which adopt specially made bronze material can bear mortal static load. The bearings with high content of solid lubricant can provide operation free of maintenance, superior slide

function and favourable anti-corruption function.

GET...HS structure bearings are fixed with a sliding liner which made of PTFE compound materials of superior anti-wear function. Due to all outer rings adopt such cushion, this bearing can bear high dynamic load, but its static load capacity is lower than that of GET...HS structure. While bearing dimensions have been defined and the high static load value of GET...CHS bearings can't be exerted fully, generally choose the bearings with the GET...HS structure.

## Bearing Clearance

The radial clearance of GET...HS, GET...HS series bearing is listed in table below:

## The radial clearance of self-lubricating centripetal spherical plain bearing

Bearing nominal bore diameter d mm		GET...FHS type GET...CHS type	
Over	To	min.	max
100	120	85	285
120	140	100	335
140	180	100	335
180	200	100	355
200	220	100	355
220	240	110	366
240	280	110	380
280	300	135	415
300	320	135	490
320	360	135	490
360	380	135	190
380	400	135	510
400	480	145	550
480	500	145	570
500	600	145	610
600	630	160	640
630	670	170	670
670	750	170	670
750	800	170	700
800	950	195	770
950	1000	195	820

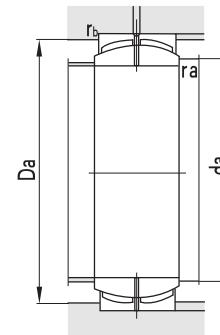
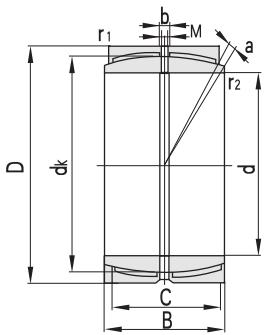
## Bearing Use Temperature

GET...HS type bearing can be used between -40°C and +90°C. When temperature exceeds +50°C, the bearing load capacity will decrease. GET...HS type bearing can be used between -50°C and +300°C.

# Self-lubricating Spherical Plain Bearings

**ZWZ**

d 100~670 mm



Principal dimensions				Weight Kg	Slant angle a°	Basic load ratings		Designations
d	D	B	C			Cr	Cor	
<hr/>								
100	150	71	67	4.47	2	630	920	GET100FHS
110	160	78	74	5.30	2	720	1100	GET110FHS
120	180	85	80	7.88	2	895	1290	GET120FHS
140	210	100	95	12.9	2	1260	1840	GET140FHS
160	230	115	109	16.4	2	1680	2450	GET160FHS
180	260	128	122	24.2	2	2180	3150	GET180FHS
200	290	140	134	33.2	2	2575	3750	GET200FHS
220	320	155	148	45.3	2	3200	4650	GET220FHS
240	340	170	162	53.2	2	3750	5500	GET240FHS
260	370	185	175	68.8	2	4450	6500	GET260FHS
280	400	200	190	88.6	2	5250	7650	GET280FHS
300	430	212	200	108	2	5900	8500	GET300FHS
320	460	230	218	133	2	6750	9850	GET320FHS
340	480	243	230	148	2	7450	11000	GET340FHS
360	520	258	243	198	2	8550	12500	GET360FHS
380	540	272	258	217	2	9600	14000	GET380FHS
400	580	280	265	272	2	10000	15000	GET400FHS
420	600	300	280	297	2	11000	16300	GET420FHS
440	630	315	300	356	2	12800	18900	GET440FHS
460	650	325	308	376	2	13600	19900	GET460FHS
480	680	340	320	430	2	15000	21600	GET480FHS
500	710	355	335	495	2	16100	24600	GET500FHS
530	750	375	355	579	2	17900	26000	GET530FHS
560	800	400	380	722	2	20600	29500	GET560FHS
600	850	425	400	851	2	23100	34500	GET600FHS
630	900	450	425	1029	2	25800	38000	GET630FHS
670	950	475	450	1197	2	28900	42500	GET670FHS

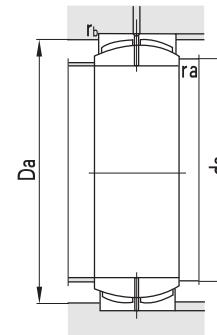
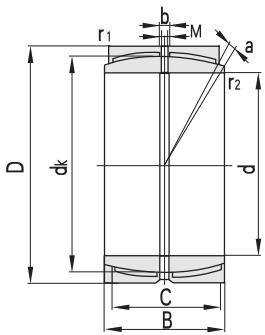
Other dimensions				Abutment and fillet dimensions								
d	dk	r1min	r2min	b	b1	M	da(min)	da(max)	Da(max)	Da(min)	ra(max)	rb(max)
100	135	1.0	1.0	7.5	7.5	4	106.7	114.8	141.9	125.6	1.0	1.0
110	145	1.0	1.0	7.5	7.5	4	117.0	122.0	151.0	135.0	1.0	1.0
120	160	1.0	1.0	7.5	7.5	4	127.5	135.5	171.0	149.0	1.0	1.0
140	185	1.0	1.0	7.5	7.5	4	148.0	155.5	200.0	172.5	1.0	1.0
160	210	1.0	1.0	7.5	7.5	4	169.0	175.5	218.5	195.5	1.0	1.0
180	240	1.1	1.1	7.5	7.5	4	191.0	203.0	246.5	223.5	1.0	1.0
200	260	1.1	1.1	11.5	11.5	5	211.0	219.0	276.0	242.0	1.0	1.0
220	290	1.1	1.1	13.5	13.5	6	232.0	245.0	304.5	270.0	1.0	1.0
240	310	1.1	1.1	13.5	13.5	6	252.5	259.0	323.5	288.5	1.0	1.0
260	340	1.1	1.1	15.5	15.5	7	273.5	285.0	352.5	316.5	1.0	1.0
280	370	1.1	1.1	15.5	15.5	7	294.0	311.0	381.5	344.5	1.0	1.0
300	390	1.1	1.1	15.5	15.5	7	314.5	327.0	411.0	563.0	1.0	1.0
320	414	1.1	3.0	21	21	8	335	344	434	385	1.0	3.0
340	434	1.1	3.0	21	21	8	356	359	453	404	1.0	3.0
360	474	1.1	4.0	21	21	8	377	397	490	441	1.0	4.0
380	494	1.5	4.0	21	21	8	398	412	508	460	1.5	4.0
400	514	1.5	4.0	21	21	8	418	431	549	478	1.5	4.0
420	534	1.5	4.0	21	21	8	439	441	568	497	1.5	4.0
440	574	1.5	4.0	27	27	10	460	479	596	534	1.5	4.0
460	593	1.5	4.0	27	27	10	481	496	612	552	1.5	5.0
480	623	2.0	5.0	27	27	10	503	522	641	580	2.0	5.0
500	643	2.0	5.0	27	27	10	523	536	670	598	2.0	5.0
530	673	2.0	5.0	27	27	10	554	558	709	626	2.0	5.0
560	723	2.0	5.0	27	27	10	585	602	758	673	2.0	5.0
600	773	2.0	6.0	27	27	10	627	645	801	719	2.0	6.0
630	813	3.0	6.0	35	35	13	661	677	850	757	3.0	6.0
670	862	3.0	6.0	35	35	13	702	719	898	802	3.0	6.0

Steel/PTEE composite d 500-1000mm

# Self-lubricating Spherical Plain Bearings

**ZWZ**

d 710~800 mm



Principal dimensions				Weight Kg	Slant angle a°	Basic load ratings		Designations
d	D	B	C			Cr	Cor	
710	1000	500	475	1386	2	32500	47500	GET710FHC
750	1060	530	500	1653	2	36500	53000	GET750FHC
800	1120	565	530	1920	2	4100	59500	GET800FHC
850	1220	600	565	2570	2	47500	68500	GET850FHC
900	1250	635	600	2660	2	51500	75350	GET900FHC
950	1360	670	635	3580	2	59000	86500	GET950FHC
1000	1450	710	670	4425	2	66000	97000	GET1000FHC
320	460	230	218	138	2	5250	12800	GET320CHS
340	480	243	230	153	2	5900	14300	GET340CHS
360	520	258	243	202	2	6700	16300	GET360CHS
380	540	272	258	222	2	7450	17500	GET380CHS
400	580	280	265	277	2	7900	19500	GET400CHS
420	600	300	280	306	2	8700	21500	GET420CHS
440	630	315	300	361	2	10100	25000	GET440CHS
460	650	325	308	381	2	10700	26000	GET460CHS
480	680	340	320	440	2	11500	28100	GET480CHS
500	710	355	335	504	2	12600	30500	GET500CHS
530	750	375	355	594	2	13800	35000	GET530CHS
560	800	400	380	737	2	16100	38500	GET560CHS
600	850	425	400	866	2	17900	44000	GET600CHS
630	900	450	425	1049	2	19500	49000	GET630CHS
670	950	475	450	1217	2	22700	55000	GET670CHS
710	1000	500	475	1405	2	25200	61000	GET710CHS
750	1060	530	500	1683	2	28500	69500	GET750CHS
800	1120	565	530	1960	2	31500	76500	GET800CHS

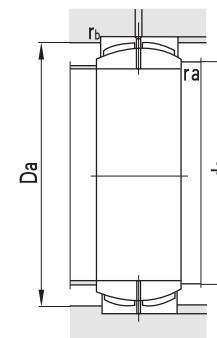
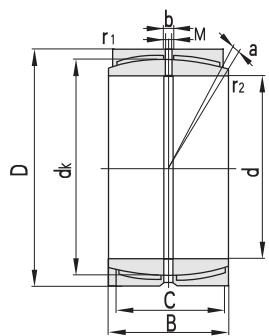
Other dimensions				Abutment and fillet dimensions								
d	dk	r1min	r2min	b	b1	M	da(min)	da(max)	Da(max)	Da(min)	ra(max)	rb(max)
710	912	3.0	6.0	35	35	13	743	762	946	849	3.0	6.0
750	972	3.0	6.0	35	35	13	784	814	1005	904	3.0	6.0
800	1022	3.0	6.0	35	35	13	836	851	1062	951	3.0	6.0
850	1112	3.0	7.5	35	35	13	888	936	1156	1035	3.0	7.5
900	1142	3.0	7.5	35	35	13	938	949	1183	1063	3.0	7.5
950	1242	4.0	7.5	40	40	15	993	1045	1290	11565	4.0	7.5
100	1312	4.0	7.5	40	40	15	1045	1103	1378	1221	4.0	7.5
320	420	1.1	3.0	21	21	8	338	344	425	385	1.0	3.0
340	440	1.1	3.0	21	21	8	359	359	444	404	1.0	3.0
360	480	1.1	4.0	21	21	8	380	397	480	441	1.0	4.0
380	500	1.5	4.0	21	21	8	402	412	499	460	1.5	4.0
400	520	1.5	4.0	21	21	8	422	431	539	478	1.5	4.0
420	540	1.5	4.0	21	21	8	443	441	557	497	1.5	4.0
440	580	1.5	4.0	27	27	10	464	479	584	534	1.5	4.0
460	600	1.5	5.0	27	27	10	485	496	600	552	1.5	5.0
480	630	2.0	5.0	27	27	10	507	522	629	580	2.0	5.0
500	650	2.0	5.0	27	27	10	528	538	658	598	2.0	5.0
530	680	2.0	5.0	27	27	10	559	558	696	626	2.0	5.0
560	730	2.0	5.0	27	27	10	590	602	743	673	2.0	5.0
600	780	2.0	6.0	27	27	10	632	645	786	719	2.0	6.0
630	820	3.0	6.0	35	35	13	666	677	834	757	3.0	6.0
670	870	3.0	6.0	35	35	13	708	719	881	802	3.0	6.0
710	920	3.0	6.0	35	35	13	749	762	929	849	3.0	6.0
750	980	3.0	6.0	35	35	13	791	814	985	904	3.0	6.0
800	1030	3.0	6.0	35	35	13	842	851	1043	951	3.0	6.0

Steel/PTEE composite d 500-1000mm

# Self-lubricating Spherical Plain Bearings

**ZWZ**

d 850~1000 mm



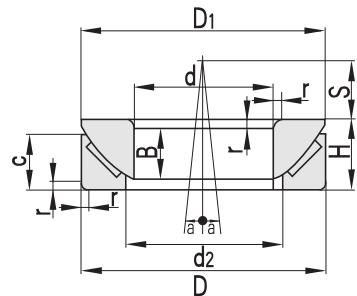
Principal dimensions				Weight Kg	Slant angle a°	Basic load ratings		Designations
d	D	B	C			Cr	Cor	
mm						KN		
850	1220	600	565	2613	2	36000	88500	GET850CHS
900	1250	635	600	2712	2	395000	97000	GET900CHS
950	1360	670	635	3643	2	46000	112000	GET950CHS
1000	1450	710	670	4484	2	52500	127000	GET1000CHS

Other dimensions				Abutment and fillet dimensions								
d	dk	r1min	r2min	b	b1	M	da(min)	da(max)	Da(max)	Da(min)	ra(max)	rb(max)
mm									mm			
850	1120	3.0	7.5	35	35	13	895	936	1134	1035	3.0	7.5
900	1150	3.0	7.5	35	35	13	946	949	1160	1063	3.0	7.5
950	1250	4.0	7.5	40	40	15	1002	1045	1266	1156	4.0	7.5
1000	1320	4.0	7.5	40	40	15	1055	1103	1352	1221	4.0	7.5

# Self-lubricating Thrust Spherical Plain Bearings

**ZWZ**

d 80~220 mm



Principal dimensions d	D	H	B	C	d2	D1	S	rsmin	Weight	
									mm	Kg
80	180	50	43.5	38	107.5	172	42.5	1.0	12.8	
100	210	59	51	46	127	198	45	1.1	16.8	
120	230	64	53.5	50	145	220	52.5	1.1	21.5	
140	260	70	57	54	165	250	57	1.1	28.9	
160	290	75.5	63	58.5	185	280	61.5	1.1	40.5	
180	320	82	67.5	63	210	310	66.5	1.1	52.5	
200	360	92	78	72	230	350	76	1.1	75.6	
220	400	105	88	81	250	390	85.5	1.1	108	

Designations	Slant angle a°	Basic load ratings	
		Cr	Cor
KN			
GX80C	8	1750	3400
GX100C	8	1950	3850
GX120C	6	2150	4550
GX140C	8	2750	5450
GX160C	7	3250	6250
GX180C	8	3700	7250
GX200C	7	4750	9150
GX220C	6	5800	11000

# ZWZ



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