

ROLLING BEARINGS

Bearings Designation
And Nomenclature



2 WHEELERS



3 WHEELERS



4 WHEELERS



TRACTORS



LCV, HCV



INDUSTRIES



RAILWAYS

CK BIRLA GROUP

flexible solutions

About National Engineering Industries Ltd. (NBC Bearings)

A symbol of dependability and flexible engineering solutions, NBC Bearings is the brand of National Engineering Industries. Founded in 1946, National Engineering Industries Ltd (NEI) is India's leading bearings manufacturer and exporter, renowned for excellence in quality and delivery. In 2021, NBC bearings completed 75 years of its incorporation.

Headquartered in Jaipur, Having started with 30,000 bearings in 19 sizes in 1946, NBC has evolved to manufacture over 200 million bearings each year offering in 2300+ variants to serve a host of customers in India and over 30 other countries across five continents in automotive, railways and industrial segments. NBC also serves the Indian aftermarket through a countrywide network of 550+ authorized stockists and thousands of retailers.

Award & Recognitions :

NBC has been the recipient of several award and accolades for its quality consciousness and manufacturing prowess. Most prominent being the coveted Deming Grand Prize which is the highest honour in quality awarded to a company for excellence in Total Quality Management (TQM). NBC bearings is the only bearing manufacturer to win both - The Deming Application Award and The Deming Grand Prize Award.

The award is given by the Japanese Union of Scientists and Engineers (JUSE) to companies for demonstrating practicing TQM in the areas of production, customer service, safety, human resource, corporate social responsibility, environment, etc. NBC stands committed to an endless journey of continuous improvement through TQM.



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2.1 Bearing Designation

The bearing designation may consist of a basic designation with or without prefixes and suffixes. It includes

- Bearing type
- Boundary dimensions
- Basic design

The number and letter combinations indicates bearing type and dimensions. Basic design includes tolerances, internal clearances & other related specifications. In bearing designation system:

- The first digit indicates the bearing type.
- The second & third identify the ISO dimension series. The second digit indicates the width or height series. The third digit indicates the diameter series.
- The last two digits indicates the bearing bore, which multiplied by 5 gives the bearing bore diameter in mm.

There are exceptions in the basic bearing designation system:

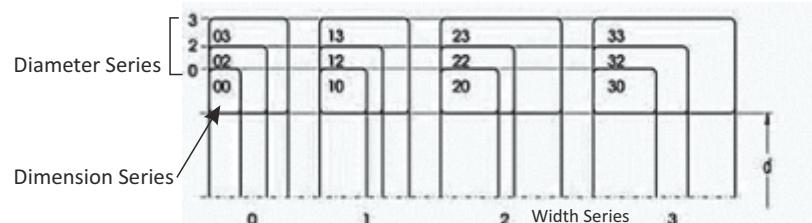
1. Bearings size code for the following bore diameter are:

- 00 = 10 mm
- 01 = 12 mm
- 02 = 15 mm
- 03 = 17 mm

2. For bearings with a bore diameter < 10 mm, or ≥ 500 mm, the bore diameter (d) is generally given as 617/7 ($d = 7$ mm) or 294/530 ($d = 530$ mm).

3. In case of standard bearing, when bearing diameter are non-standard, then it is denoted as 63/28 ($d=28$ mm)

Bearing Series indicates the bearing type and the dimension series.

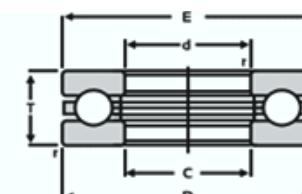
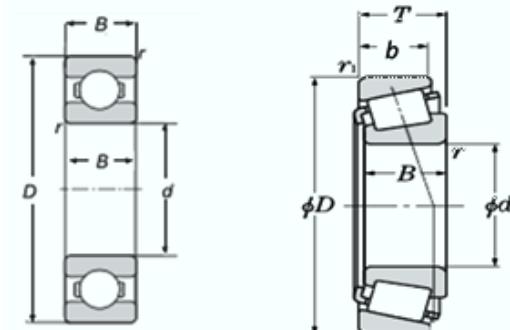


Deep Groove Ball Bearing	160XX, 68XX, 69XX, 60XX, 62XX, 63XX, 64XX,
Angular Contact Ball Bearing	32XX, 33XX, 72XX, QJ2XX, QJ3XX
Self – Aligning Ball Bearing	N2XX, N3XX, N4XX, NJ2XX, NJ3XX, NJ4XX, NJ22XX, NJ23XX, NU2XX, NU3XX, NU4XX, NU10XX, NU22XX, NU23XX, NUP3XX, NUP4XX, NUP22XX, NUP23XX, NN30XX, NNU49XX
Needle Roller Bearing	K, HK, BK, N48, NA49, NA69,
Taper Roller Bearing	302XX, 303XX, 313XX, 320XX, 322XX, 323XX, 329XX, 330XX
Spherical Roller Bearing	213XX, 222XX, 223XX, 230XX, 231XX, 232XX, 233XX, 239XX, 240XX
Thrust Ball Bearing	511XX, 512XX, 513XX, 532XX, 522XX, 523XX, 524XX,

The bearing boundary /fitment dimensions consists of bore, outer diameter, width size & chamfer dimensions and are based on the ISO dimensional system which specifies the following dimensions for rolling bearings: bore diameter, d , outside diameter, D , width, B or T and chamfer dimension, r .

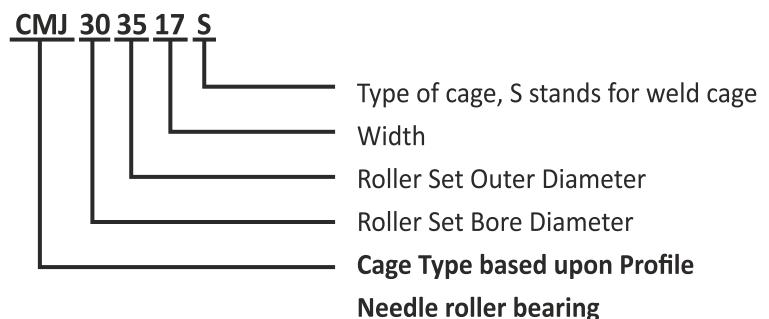
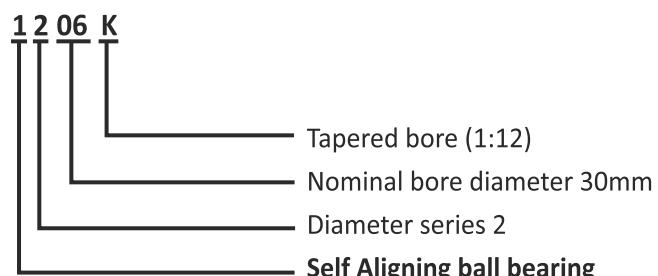
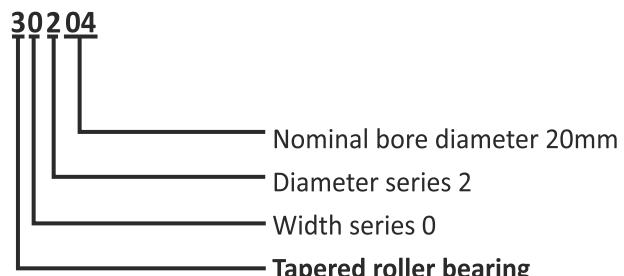
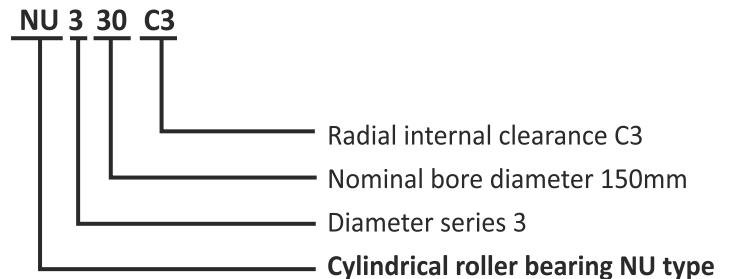
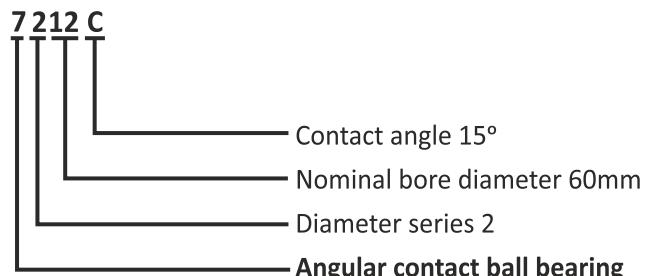
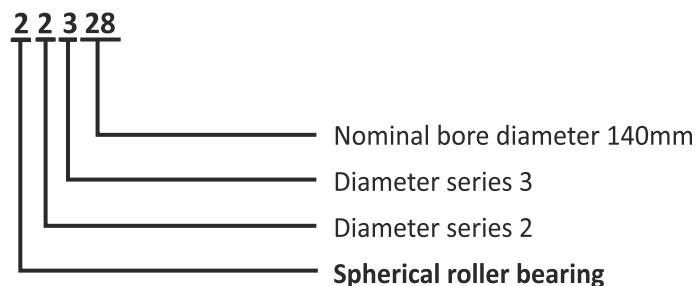
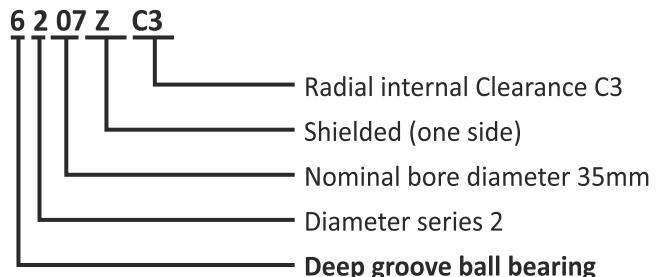
The boundary dimensions for metric bearings based on ISO standards are:

- ISO15 for radial rolling bearings, except tapered roller bearings, insert bearings and needle roller bearings
- ISO355 for tapered roller bearings
- ISO104 for thrust bearings



Bearing Designation (Examples)

Rolling bearing part numbers indicate bearing type, dimensions, tolerances, internal construction & other related specifications.



2.2 Bearing Nomenclature:

Bearing Basic Number

Series code	Interpretation			Diameter code	Interpretation		
	Bearing type	Dimension series code					
		Width series	Dia. Series				
68	Deep groove ball bearings	-	8	/0.6	0.6		
69			9	/1.5	1.5		
60			0	/xx	xx		
62			2				
63			3				
78	Angular contact ball bearings	-	8	00	10		
79			9	01	12		
70			0	02	15		
72			2	03	17		
73			3				
12	Self aligning ball bearings	-	2	04	dia. code multiplied by 5 gives the bore dia. Value in mm		
13			3	05			
22			2	.			
23			3	.			
				92			
				96			
NU10	Roller bearings	1	0	/500	500		
NU2		-	2	/530	530		
NU22	NU, NJ, NH,	2	2	/560	560		
NU3	NUP, N, NF,	-	3	.	.		
NU23	NNU, NN,	2	3	.			
NU4	RNU, RN	-	4	.	2,360		
NNU49	Cylindrical	4	9	/2,360	2,360		
NN30		3	0	/2,500	2,500		
302	Tapered roller bearings	0	2				
303		0	3				
313		1	3				
320		2	0				
322		2	2				
323		2	3				
329		2	9				
330		3	0				
331		3	1				
332		3	2				

CODE	INTERPRETATION (PREFIXES)
4T	Case carburized bearing (Inner ring, outer ring & roller)
TS1-	Bearing with special heat treatment for operating temp. up to 130°C
TS2-	Bearing with special heat treatment for operating temp. up to 160°C
TS3-	Bearing with special heat treatment for operating temp. up to 200°C
TS4-	Bearing with special heat treatment for operating temp. up to 250°C
TM-	Long life special heat-treated bearing (one ring)
TMB-	Long life special heat-treated bearing (both the rings)
AST-	Bearing with one of the components treated in carbo nitriding (rollers are with normal heat treatment)
ASTB-	Bearing with both the components treated in carbo nitriding (rollers are with normal heat treatment)
CR-	Creep resistance bearing with single side O-ring on outer race
CR2-	Creep Resistance bearing with both side 'O' ring on outer race
L-	Light series (taper roller bearing-inch series)
LM-	Light medium series (taper roller bearing- inch series)
HM-	Heavy medium series (taper roller bearing- inch series)
M-	Medium series (taper roller bearing- inch series)
H-	Heavy series (non-interchangeable with other cones & cups- for taper roller bearing inch series)
HH-	Heavy heavy series (non-interchangeable with other cones & cups for taper roller bearing- inch series)
N-	Taper bearing having non-standard boundary dimensions
N-	Cylindrical bearing having non-standard boundary dimensions
NA-	Cones mated with double cup to form double row non-adjustable bearing (non-interchangeable with other cones & cups)
X-	Inch series tapered roller bearing converted into metric series
T-	Tapered roller thrust bearing
J-	Inch series bearing with metric designation
SP-	Standard bearing with deviations in Dimensions(OD/width ect.) from original bearing number
QJ-	Four point angular contact ball bearing
BB,LS,MS-	Ball bearing with non-standard boundary dimensions
Nxxxx	Ball bearing having non-standard boundary dimensions (xxx - is auto generated numeric digit i.e. 123 etc.)

Note: For any Prefix not found in the table, please contact NEI Engineering

NOMENCLATURE: BEARING SUFFIXES

Suffixes for Internal Design Modification Code

CODE	INTERPRETATION
A-	Internal design modification from A onward
B-	Contact angle 40°, angular contact ball bearing
B-	Contact angle 10° ~17°, Tapered roller bearings
C-	contact angle 15°, angular contact ball bearing
C-	Contact angle 17° ~24°, Tapered roller bearings
C(n),CS(n)	Deep groove ball bearing with increased/different load ratings (C1, CS1 etc.)
D-	Contact angle 24° ~32°, Tapered roller bearings
E-	Cylindrical/Spherical roller bearing with optimized internal geometry for increased load rating
E-	Tapered roller bearing with special crown on raceways
F-	For different bearing stand requirement other then ISO
M-	Modified design (ball bearing, tapered roller bearing)
X(n)-	Special feature (Inner ring or outer ring) e.g. X1, X2
SPL-	Optimized internal design for low torque
C-	Spherical roller bearing with symmetrical rollers, flangeless inner ring, a non-integral guide ring between the two rows of rollers centered on the inner ring and one pressed steel window-type cage for each roller row
CA-	Spherical roller bearing with one-piece machined brass cage (double pronged), symmetrical rollers and retaining ribs
CC-	Similar to 'C' configuration but with enhanced roller & raceways surface finish
V-	Full complementary cylindrical roller bearing
LT-	Optimized internal design for low torque
AN	Special groove profile for Inner or Outer ring.

Note: For any Suffix not found in the table, please contact NEI Engineering

Suffixes for Seal/Shield

CODE	INTERPRETATION
LB-	Synthetic rubber seal, non-contact type, on one side
LLB-	Synthetic rubber seal, non- contact type, on both side
LH-	Low friction synthetic rubber seal , contact type, double lip , on one side
LLH-	Low friction synthetic rubber seal , contact type, double lip , on both side
LU-	Synthetic rubber seal, contact type, double lip , on one side
LLU-	Synthetic rubber seal, contact type, double lip , on both side
LV-	Low friction synthetic rubber seal , contact type, triple lip , on one side
LLV-	Low friction synthetic rubber seal , contact type, triple lip , on both side
LUA-	Acrylic rubber seal (Contact type), single side with Seal groove on Inner race
LLUA-	Acrylic rubber seal (Contact type), both side with Seal groove on Inner race
LUA1-	Fluorine rubber seal (FKM), LU type, on one side, for high temperature up to 200° C
LLUA1-	Fluorine rubber seal, LU type, on both side, for high temperature up to 200° C
LUA2-	Silicone rubber seal, LU type, on one side, for extreme tempreature-100 to +200° C
LLUA2-	Silicone rubber seal, LU type, on both side, for extreme temp. -100 to +200°C
RS-	NBR rubber seal (Contact type), single side with no Seal groove on Inner race
RSS-	NBR rubber seal (Contact type), on both with no Seal groove on Inner race
Z-	Metallic shield, single side
ZZ-	Metallic shield , double side
ZA-	Removable pressed steel shield, on one side
ZZA-	Removable pressed steel shield, on both side
LW-	Synthetic rubber (NBR) seal, contact type, four-lip, on one side, for wheel application
LLW-	Synthetic rubber (NBR) seal, contact type, four-lip, on both side, for wheel application
LWA-	Acrylic rubber (ACM) seal, contact type, four-lip, on one side, for wheel application

Note: For any Suffix not found in the table, please contact NEI Engineering

Suffixes for Seal/Shield

LLWA-	Acrylic rubber (ACM) seal, contact type, four-lip, on both side, for wheel application
LWA1-	Fluorine rubber seal (FKM), contact type, four-lip, on one side, for wheel application
LLWA1	Fluorine rubber seal (FKM), contact type, four-lip, on both side, for wheel application
L-	Seal Groove for Flange type Polyamide cage
Lt1	Low torque seal for UTRB

Suffixes : Cage

J-	Pressed steel cage
T2X-	Polyamide cage
T2X1-	Polyamide Cage with Flange
G2-	Pin type steel cage
TF	Pressed steel cage with Tufftride Treatment
M	Machined brass cage, (spherical / cylindrical roller bearing)

Suffixes: External design modification code

D-	Double row outer ring or inner ring
K-	Tapered bore, 1/12 taper on dia.
K30-	Tapered bore, 1/30 taper on dia.
N-	Standard locating snap ring groove on outer ring
N1-	Locating snap ring groove on outer ring with knurling
NR-	Locating snap ring on outer ring
NX(n)-	Non-standard locating snap ring groove on outer ring (NX1, NX2...)
N2X(n)-	Both sides non-standard locating snap ring groove on outer ring (N2X2, N2X3...)
G-	Helical groove in bearing bore (Multi-row tapered / cylindrical roller bearing components)
W-	Lubrication grooves / slots in the side faces of the bearing rings (Multi-row tapered roller bearings)
W3	Bearing with blind hole in outer ring for Pin fitting(Ball Bearing)
W33-	Bearing with annular groove and three lubrication holes in the outer ring (Spherical roller bearing)
W33X-	Similar to 'W33' configuration but with six lubrication holes

Note: For any Suffix not found in the table, please contact NEI Engineering

Suffixes: Bearing arrangement type code

DB-	Two single-row deep groove/angular contact ball/ tapered roller bearing matched for mounting in a back-to-back arrangement
DF-	Two single-row deep groove/angular contact ball/ tapered roller bearing matched for mounting in a face-to-face arrangement
DT-	Two single-row deep groove/angular contact ball/ tapered roller bearing matched for mounting in a tandem arrangement
TSF	Flanged cup

Suffixes: Internal clearance code

C2-	Clearance less than Normal
CN-	Normal clearance
C3-	Clearance greater than normal
C4-	Clearance greater than C3
C5-	Clearance greater than C4
CNL-	Radial clearance range on lower side of CN
C3L-	Radial clearance range on lower side of C3
C4L-	Radial clearance range on lower side of C4
C5L-	Radial clearance range on lower side of C5
CNH-	Radial clearance range on higher side of CN
C3H-	Radial clearance range on higher side of C3
C4H-	Radial clearance range on higher side of C4
C5H-	Radial clearance range on higher side of C5
CS(n)-	Special radial clearance as per customer requirement (e.g. CS1, CS2 etc.)

Suffixes: Tolerance class code

P0-	Normal Tolerance class (Class 0, 6X) specified by IS/ISO/JIS
P6-	Tolerance class 6 specified by IS/ISO/JIS
P5-	Tolerance class 5 specified by IS/ISO/JIS
P4-	Tolerance class 4 specified by IS/ISO/JIS
P2-	Tolerance class 2 specified by IS/ISO/JIS

Note: For any Suffix not found in the table, please contact NEI Engineering