**BUREAU OF INDIAN STANDARDS**
**DRAFT FOR COMMENTS ONLY**

**Doc No.: PGD 13 (25119) P-Draft**
**March 2024**

*प्रारंभिक मसौदा*

# डबल पंक्ति बेलनाकार रोलर बियरिंग्स के लिए विशिष्टता

[IS 6458 *का पहला पुनरीक्षण*]

*Preliminary Draft*

# Specification for Double Row Cylindrical Roller Bearings

[*First revision* of IS 6458]

ICS 21.100.20

| | |
|---|---|
| Bearings Sectional Committee, PGD 13 | Last date for Comment: 25 May 2024 |

## NATIONAL FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Bearings Sectional Committee had been approved by the Production and General Engineering Division Council.

This standard was first published in 1972. This revision was taken up to keep pace with the latest technological developments and international practices.

In this revision, the following changes have been made:

a)
b)

In the preparation of this standard assistance has been derived from……..

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*).’ The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

**Doc No.: PGD 13 (25119) P-Draft**
**March 2024**

*Indian Standard*

# SPECIFICATION FOR DOUBLE ROW CYLINDRICAL ROLLER BEARINGS

(*First Revision*)

## 1 SCOPE

This standard specifies the requirements for double row cylindrical roller bearings and their components including through hardened, induction hardened and cased hardened bearings. This standard does not cover the requirements of special application like super precision bearing or aerospace application.

## 2 REFERENCES

The following Indian Standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

| *IS* | *Title* |
|---|---|
| Doc No. PGD 13 (24061) | Rolling bearings symbols for physical quantities |
| 2399 : 2019 | Rolling bearings — Vocabulary (*second revision*) |
| 3073 : 1967 | Assessment of surface roughness |
| 3823 : 2014 | Rolling bearings — Static load ratings (*third revision*) |
| 3824 : 2014 | Rolling bearings — Dynamic load ratings and rating life (*third revision*) |
| 4397 : 1999 | Cold-rolled carbon steel strips for ball and roller bearing cages/retainers |
| 4398 : 1994 | Carbon-chromium steel for the manufacture of balls, rollers and bearing races (*second revision*) |
| 4905 : 2015 | Random sampling and randomization procedures (*first revision*) |
| 5669 : 2019 | General plan of boundary dimensions for radial rolling bearings |
| 5692 : 2019 | Rolling bearings — Radial bearings — Geometrical product specifications (GPS) and tolerance values (*second revision*) |
| 6453 : 1984 | Technical supply conditions for roller bearing (reaffirmed in 2011) |
| 9202 : 2020 | Rolling Bearings — Cylindrical Rollers — Specification |
| 13406 : 2018 | Rolling bearings — Radial ball bearings with flanged outer ring — Flange dimensions |
| 17111 : 2019 | Heat-treated steels, alloy steels and free-cutting steels — Ball and roller bearing steels |

## 3 TERMINOLOGY

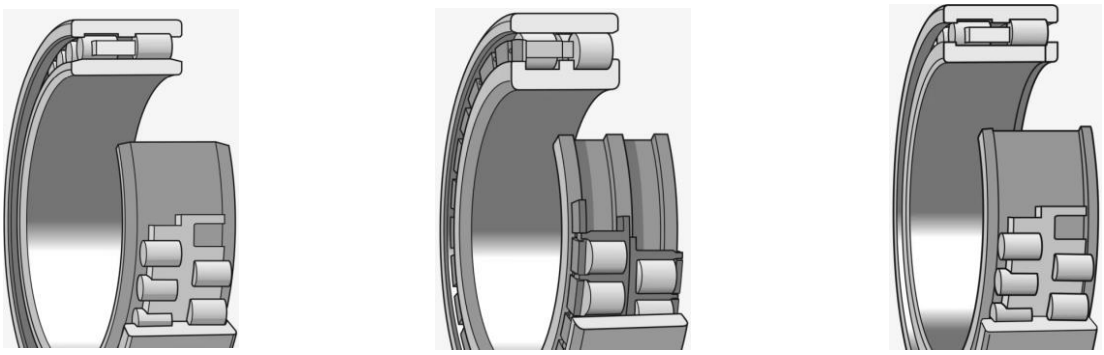
For this standard the terms and definitions given in IS 2399 and the following shall apply.
Supplier – The party producing the bearing and its components.

Purchaser – The party purchasing the bearings. This term also applies authorised person to act on behalf for the purpose of inspection.

### 3.1 Bearing Types and Symbols

This type of double row non locating and double row two direction locating shall conform to the Doc No. PGD 13 (24061).

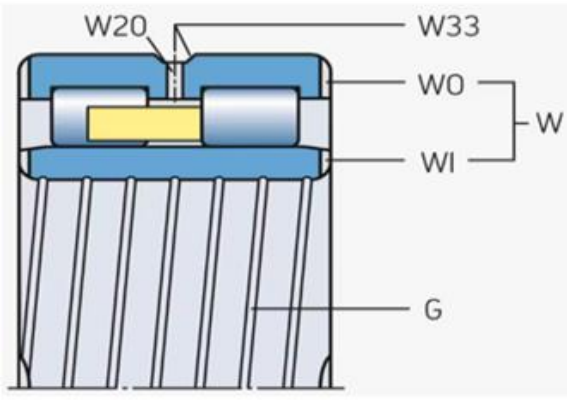
**3.1.1** *Design of double row cylindrical roller bearings*



a) NNU b) NN c) NNUP

FIG. 1

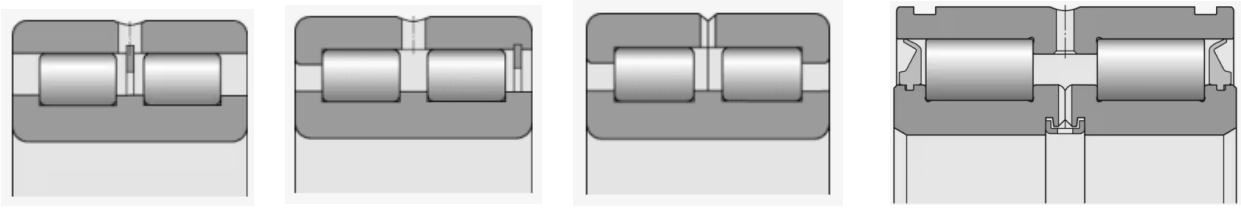
**3.1.1.1** Variants / Features




| | |
|---|---|
| *G* | Helical groove in inner ring bore |
| *W* | Lubrication grooves in the side faces of bearing rings |
| *WI* | Lubrication grooves in the side faces of inner rings |
| *WO* | Lubrication grooves in the side faces of outer rings |
| *W20* | Lubrication holes in outer ring |
| *W33* | Annular groove and lubrication holes in outer ring |

FIG. 2

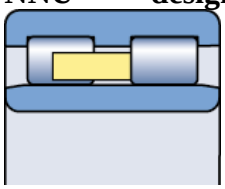
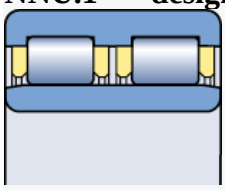
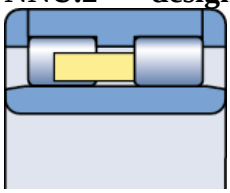
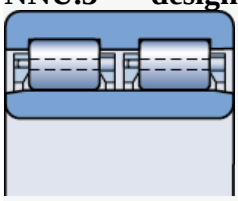
**3.1.2** *Design of double row full complement cylindrical roller bearings*



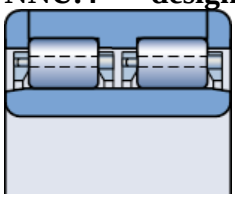
a) NNCF b) NNC c) NNF d) NNCL

FIG. 3

**3.1.2.1** Design and variants

| Bearing design | Flange configurations | Cage design |
|---|---|---|
| **NNU design**  | • outer ring: three integrals<br>• inner ring: none | • one cage<br>• machined brass or steel<br>• double prong-type<br>• roller centered |
| FIG. 4 | | |
| **NNU.1 design**  | • outer ring: three integrals<br>• inner ring: none | • two cages<br>• machined brass<br>• window-type<br>• roller centered |
| FIG. 5 | | |
| **NNU.2 design**  | • outer ring: one integral central and two loose<br>• inner ring: none | • one cage<br>• machined brass or steel<br>• double prong-type<br>• roller centred |
| FIG. 6 | | |
| **NNU.3 design**  | • outer ring: three integrals<br>• inner ring: none | • two cages<br>• machined steel<br>• pin-type<br>• pierced rollers |
| FIG. 7 | | |

**NNU.4 design**

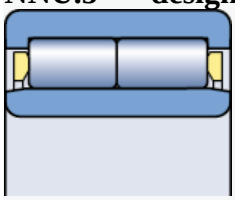


- outer ring: one integral central and two loose
- inner ring: none

- two cages
- machined steel
- pin-type
- pierced rollers

FIG. 8

**NNU.5 design**

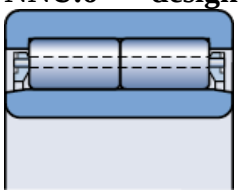


- outer ring: two integrals
- inner ring: none

- one cage
- machined brass
- window-type
- roller centred

FIG. 9

**NNU.6 design**

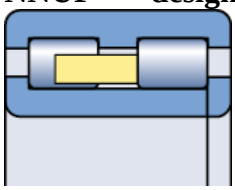


- outer ring: two integrals
- inner ring: none

- one cage
- machined steel
- pin-type
- pierced rollers

FIG. 10

**NNUP design**

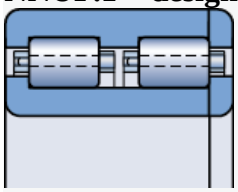


- outer ring: three integrals
- inner ring: one integral and two loose

- one cage
- machined brass or steel
- double prong-type
- roller centred

FIG. 11

**NNUP.1 design**

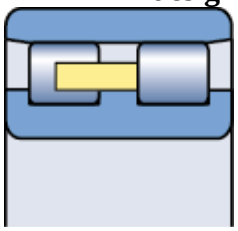


- outer ring: two integral and one loose
- inner ring: one integral and one loose

- two cages
- machined steel
- pin-type
- pierced rollers

FIG. 12

**NN design**

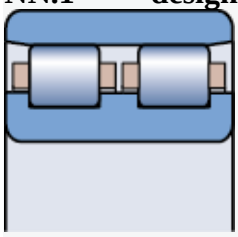


- outer ring: none
- inner ring: three integrals

- one cage
- machined brass or steel
- double prong-type
- roller centred

FIG. 13

**NN.1 design**

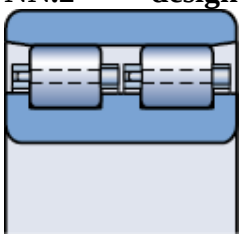


- outer ring: none
- inner ring: three integrals

- two cages
- either PA66 or stamped steel
- window-type
- roller centred

FIG. 14

**NN.2 design**

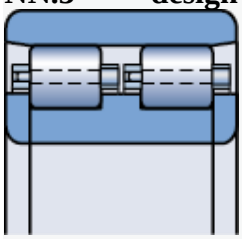


- outer ring: none
- inner ring: three integrals

- two cages
- machined steel
- pin-type
- pierced rollers

FIG. 15

**NN.3 design**



- outer ring: none
- inner ring: one integral and two loose

- two cages
- machined steel
- pin-type
- pierced rollers

FIG. 16

## 4 GENERAL REQUIREMENTS

For requirements that are common to bearing application are covered in, IS 6453. For a cylindrical roller bearing these requirements shall be confirmed as well to assure an optimum performance in application.

## 5 BOUNDARY DIMENSIONS

Geometrical characteristics of the boundary dimensions shall be as specified in the dimension series 49 and 30 of IS 5669.

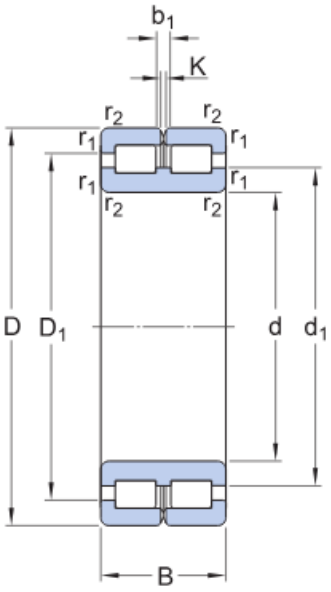



FIG. 17

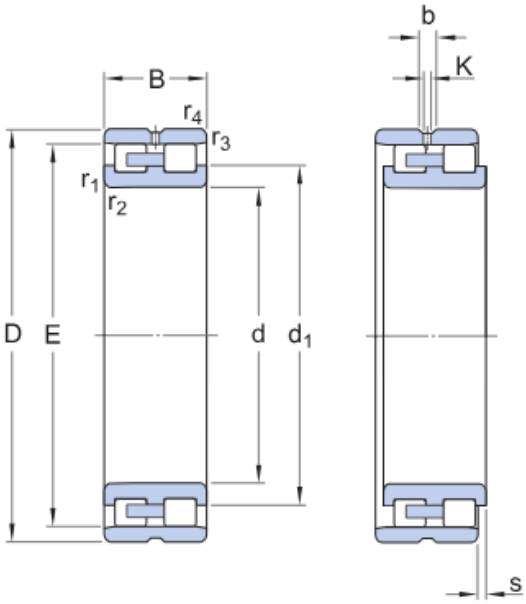



FIG. 18

*d* Bore diameter
*D* Outside diameter
*B* Width
*d1* Shoulder diameter inner ring
*D1* Shoulder diameter outer ring
*b1* Width annular lubrication groove outer ring
*K* Diameter lubrication hole (outer ring)
*r1,2* Chamfer dimension (open bearings)

*d* Bore diameter
*D* Outside diameter
*B* Overall bearing width
*d1* Shoulder diameter inner ring
*E* Raceway diameter outer ring
*b* Width of annular groove
*K* Diameter lubrication hole
*r1,2* Chamfer dimension inner ring
*r3,4* Chamfer dimension outer ring
*s* Permissible axial displacement from the normal

**Table 1 Dimensions and designations**

(*Clause*)

| d | D | B | d1 | D1 | E | b1 | K | r1,2 | r3,4 | s | Designation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | | | | | | | | min. | min. | max. | |
| 20 | 42 | 30 | 28,4 | 33,2 | – | 4,5 | 3 | 0,6 | 0,3 | 1 | NNCF5004CV |
| 25 | 47 | 30 | 34,5 | 38,5 | – | 4,5 | 3 | 0,6 | 0,3 | 1 | NNCF5005CV |
| 30 | 55 | 34 | 40 | 45,5 | – | 4,5 | 3 | 1 | 0,3 | 1,5 | NNCF5006CV |
| 35 | 62 | 36 | 45 | 51,5 | – | 4,5 | 3 | 1 | 0,3 | 1,5 | NNCF5007CV |
| 40 | 68 | 38 | 50,5 | 57,2 | – | 4,5 | 3 | 1 | 0,3 | 1,5 | NNCF5008CV |
| 45 | 75 | 40 | 55,3 | 62,5 | – | 4,5 | 3 | 1 | 0,3 | 1,5 | NNCF5009CV |
| 50 | 80 | 40 | 59 | 67,5 | – | 4,5 | 3 | 1 | 0,3 | 1,5 | NNCF5010CV |
| 55 | 90 | 46 | 68,5 | 78,7 | – | 4,5 | 3,5 | 1,1 | 0,6 | 1,5 | NNCF5011CV |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | 85 | 25 | 70,5 | 73,5 | – | 4,5 | 3,5 | 1 | 1 | 1 | NNCF4912CV |
| | 85 | 25 | 70,5 | – | 77,51 | 4,5 | 3,5 | 1 | – | 1 | NNCL4912CV |
| | 85 | 25 | 70,5 | 73,5 | – | 4,5 | 3,5 | 1 | – | – | NNC4912CV |
| | 95 | 46 | 71,5 | 82 | – | 4,5 | 3,5 | 1,1 | 0,6 | 1,5 | NNCF5012CV |
| 65 | 100 | 46 | 78 | 88,3 | – | 4,5 | 3,5 | 1,1 | 0,6 | 1,5 | NNCF5013CV |
| 70 | 100 | 30 | 70 | 83 | 87 | – | 4,5 | 3,5 | 1 | 1 | NNCF4914CV |
| | 100 | 30 | 83 | – | 91,87 | 4,5 | 3,5 | 1 | – | 1 | NNCL4914CV |
| | 100 | 30 | 83 | 87 | – | 4,5 | 3,5 | 1 | – | – | NNC4914CV |
| | 110 | 54 | 81,5 | 95 | – | 5 | 3,5 | 1,1 | 0,6 | 3 | NNCF5014CV |
| 75 | 115 | 54 | 89 | 103 | – | 5 | 3,5 | 1,1 | 0,6 | 3 | NNCF5015CV |
| 80 | 110 | 30 | 92 | 96 | – | 5 | 3,5 | 1 | 1 | 1 | NNCF4916CV |
| | 110 | 30 | 92 | – | 100,78 | 5 | 3,5 | 1 | – | 1 | NNCL4916CV |
| | 110 | 30 | 92 | 96 | – | 5 | 3,5 | 1 | – | – | NNC4916CV |
| | 125 | 60 | 95 | 111 | – | 5 | 3,5 | 1,1 | 0,6 | 3,5 | NNCF5016CV |
| 85 | 130 | 60 | 99,5 | 116 | – | 5 | 3,5 | 1,1 | 0,6 | 3,5 | NNCF5017CV |
| 90 | 125 | 35 | 103 | 110 | – | 5 | 3,5 | 1,1 | 1,1 | 1,5 | NNCF4918CV |
| | 125 | 35 | 103 | – | 115,2 | 5 | 3,5 | 1,1 | – | 1,5 | NNCL4918CV |
| | 125 | 35 | 103 | 110 | – | 5 | 3,5 | 1,1 | – | – | NNC4918CV |
| | 140 | 67 | 106 | 124 | – | 5 | 3,5 | 1,5 | 1 | 4 | NNCF5018C |
| 100 | 140 | 40 | 116 | 125 | – | 5 | 3,5 | 1,1 | 1,1 | 2 | NNCF4920CV |
| | 140 | 40 | 116 | – | 129,6 | 5 | 3,5 | 1,1 | – | 2 | NNCL4920CV |
| | 140 | 40 | 116 | 125 | – | 5 | 3,5 | 1,1 | – | – | NNC4920CV |
| | 150 | 67 | 116 | 134 | – | 6 | 3,5 | 1,5 | 1 | 4 | NNCF5020CV |
| 110 | 150 | 40 | 125 | 134 | – | 6 | 3,5 | 1,1 | 1,1 | 2 | NNCF4922CV |
| | 150 | 40 | 125 | – | 138,2 | 6 | 3,5 | 1,1 | – | 2 | NNCL4922CV |
| | 150 | 40 | 125 | 134 | – | 6 | 3,5 | 1,1 | – | – | NNC4922CV |
| | 170 | 80 | 127 | 149 | – | 6 | 3,5 | 2 | 1 | 5 | NNCF5022CV |
| 120 | 165 | 45 | 139 | 148 | – | 6 | 3,5 | 1,1 | 1,1 | 3 | NNCF4924CV |
| | 165 | 45 | 139 | – | 153,55 | 6 | 3,5 | 1,1 | – | 3 | NNCL4924CV |
| | 165 | 45 | 139 | 148 | – | 6 | 3,5 | 1,1 | – | – | NNC4924CV |
| | 180 | 80 | 139 | 160 | – | 6 | 3,5 | 2 | 1 | 5 | NNCF5024CV |
| 130 | 180 | 50 | 149 | 160 | – | 6 | 3,5 | 1,5 | 1,5 | 4 | NNCF4926CV |
| | 180 | 50 | 149 | – | 165,4 | 6 | 3,5 | 1,5 | – | 4 | NNCL4926CV |
| | 180 | 50 | 149 | 160 | – | 6 | 3,5 | 1,5 | – | – | NNC4926CV |
| | 200 | 95 | 149 | 175 | – | 7 | 4 | 2 | 1 | 5 | NNCF5026CV |
| 140 | 190 | 50 | 160 | 170 | – | 6 | 3,5 | 1,5 | 1,5 | 4 | NNCF4928CV |
| | 190 | 50 | 160 | – | 175,9 | 6 | 3,5 | 1,5 | – | 4 | NNCL4928CV |
| | 190 | 50 | 160 | 170 | – | 6 | 3,5 | 1,5 | – | – | NNC4928CV |
| | 210 | 95 | 163 | 189 | – | 7 | 4 | 2 | 1 | 5 | NNCF5028CV |
| 150 | 190 | 40 | 166 | 173 | – | 7 | 4 | 1,1 | 1,1 | 2 | NNCF4830CV |
| | 190 | 40 | 166 | – | 178,3 | 7 | 4 | 1,1 | – | 2 | NNCL4830CV |
| | 190 | 40 | 166 | 173 | – | 7 | 4 | 1,1 | – | – | NNC4830CV |
| | 210 | 60 | 171 | 187 | – | 7 | 4 | 2 | 2 | 4 | NNCF4930CV |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 210 | 60 | 171 | – | 192,77 | 7 | 4 | 2 | – | 4 | NNCL4930CV |
| | 210 | 60 | 171 | 187 | – | 7 | 4 | 2 | – | – | NNC4930CV |
| | 225 | 100 | 170 | 198 | – | 7 | 4 | 2 | 1,1 | 6 | NNCF5030CV |
| 160 | 200 | 40 | 174 | 182 | – | 7 | 4 | 1,1 | 1,1 | 2 | NNCF4832CV |
| | 200 | 40 | 174 | – | 186,9 | 7 | 4 | 1,1 | – | 2 | NNCL4832CV |
| 160 | 200 | 40 | 174 | 182 | – | 7 | 4 | 1,1 | – | – | NNC4832CV |
| | 220 | 60 | 185 | 200 | – | 7 | 4 | 2 | 2 | 4 | NNCF4932CV |
| | 220 | 60 | 185 | – | 206,16 | 7 | 4 | 2 | – | 4 | NNCL4932CV |
| | 220 | 60 | 185 | 200 | – | 7 | 4 | 2 | – | – | NNC4932CV |
| | 240 | 109 | 185 | 216 | – | 7 | 4 | 2,1 | 1,1 | 6 | NNCF5032CV |
| 170 | 215 | 45 | 187 | 196 | – | 7 | 4 | 1,1 | 1,1 | 3 | NNCF4834CV |
| | 215 | 45 | 187 | – | 201,3 | 7 | 4 | 1,1 | – | 3 | NNCL4834CV |
| | 215 | 45 | 187 | 196 | – | 7 | 4 | 1,1 | – | – | NNC4834CV |
| | 230 | 60 | 194 | 209 | – | 7 | 4 | 2 | 2 | 4 | NNCF4934CV |
| | 230 | 60 | 194 | – | 215,08 | 7 | 4 | 2 | – | 4 | NNCL4934CV |
| | 230 | 60 | 194 | 209 | – | 7 | 4 | 2 | – | – | NNC4934CV |
| | 260 | 122 | 198 | 232 | – | 7 | 4 | 2,1 | 1,1 | 6 | NNCF5034CV |
| 180 | 225 | 45 | 200 | 209 | – | 7 | 4 | 1,1 | 1,1 | 3 | NNCF4836CV |
| | 225 | 45 | 200 | – | 214,1 | 7 | 4 | 1,1 | – | 3 | NNCL4836CV |
| | 225 | 45 | 200 | 209 | – | 7 | 4 | 1,1 | – | – | NNC4836CV |
| | 250 | 69 | 206 | 224 | – | 7 | 4 | 2 | 2 | 4 | NNCF4936CV |
| | 250 | 69 | 206 | – | 230,5 | 7 | 4 | 2 | – | 4 | NNCL4936CV |
| | 250 | 69 | 206 | 224 | – | 7 | 4 | 2 | – | – | NNC4936CV |
| | 280 | 136 | 212 | 248 | – | 8 | 4 | 2,1 | 2,1 | 8 | NNCF5036CV |
| 190 | 240 | 50 | 209 | 219 | – | 7 | 4 | 1,5 | 1,5 | 4 | NNCF4838CV |
| | 240 | 50 | 209 | – | 225 | 7 | 4 | 1,5 | – | 4 | NNCL4838CV |
| | 240 | 50 | 209 | 219 | – | 7 | 4 | 1,5 | – | – | NNC4838CV |
| | 260 | 69 | 216 | 233 | – | 7 | 4 | 2 | 2 | 4 | NNCF4938CV |
| | 260 | 69 | 216 | – | 240,7 | 7 | 4 | 2 | – | 4 | NNCL4938CV |
| | 260 | 69 | 216 | 233 | – | 7 | 4 | 2 | – | – | NNC4938CV |
| | 290 | 136 | 222 | 258 | – | 8 | 4 | 2,1 | 2,1 | 8 | NNCF5038CV |
| 200 | 250 | 50 | 220 | 230 | – | 7 | 4 | 1,5 | 1,5 | 4 | NNCF4840CV |
| | 250 | 50 | 220 | – | 235,5 | 7 | 4 | 1,5 | – | 4 | NNCL4840CV |
| | 250 | 50 | 220 | 230 | – | 7 | 4 | 1,5 | – | – | NNC4840CV |
| | 280 | 80 | 233 | 252 | – | 8 | 4 | 2,1 | 2,1 | 5 | NNCF4940CV |
| | 280 | 80 | 233 | – | 259,34 | 8 | 4 | 2,1 | – | 5 | NNCL4940CV |
| | 280 | 80 | 233 | 252 | – | 8 | 4 | 2,1 | – | – | NNC4940CV |
| | 310 | 150 | 237 | 275 | – | 8 | 4 | 2,1 | 2,1 | 9 | NNCF5040CV |
| 220 | 270 | 50 | 241 | 251 | – | 7 | 4 | 1,5 | 1,5 | 4 | NNCF4844CV |
| | 270 | 50 | 241 | – | 256,5 | 7 | 4 | 1,5 | – | 4 | NNCL4844CV |
| | 270 | 50 | 241 | 251 | – | 7 | 4 | 1,5 | – | – | NNC4844CV |
| | 300 | 80 | 248 | 269 | – | 8 | 4 | 2,1 | 2,1 | 5 | NNCF4944CV |
| | 300 | 80 | 248 | – | 276,52 | 8 | 4 | 2,1 | – | 5 | NNCL4944CV |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 300 | 80 | 248 | 269 | – | 8 | 4 | 2,1 | – | – | NNC4944CV |
| | 340 | 160 | 255 | 302 | – | 8 | 6 | 3 | 3 | 9 | NNCF5044CV |
| 240 | 300 | 60 | 261 | 275 | – | 8 | 4 | 2 | 2 | 4 | NNCF4848CV |
| | 300 | 60 | 261 | – | 281,9 | 8 | 4 | 2 | – | 4 | NNCL4848CV |
| | 300 | 60 | 261 | 275 | – | 8 | 4 | 2 | – | – | NNC4848CV |
| | 320 | 80 | 271 | 291 | – | 8 | 4 | 2,1 | 2,1 | 5 | NNCF4948CV |
| | 320 | 80 | 271 | – | 299,46 | 8 | 4 | 2,1 | – | 5 | NNCL4948CV |
| | 320 | 80 | 271 | 291 | – | 8 | 4 | 2,1 | – | – | NNC4948CV |
| | 360 | 160 | 276 | 324 | – | 9,4 | 5 | 3 | 3 | 9 | NNCF5048CV |
| 260 | 320 | 60 | 283 | 297 | – | 8 | 4 | 2 | 2 | 4 | NNCF4852CV |
| | 320 | 60 | 283 | – | 304,2 | 8 | 4 | 2 | – | 4 | NNCL4852CV |
| | 320 | 60 | 283 | 297 | – | 8 | 4 | 2 | – | – | NNC4852CV |
| | 360 | 100 | 295 | 321 | – | 9,4 | 5 | 2,1 | 2,1 | 6 | NNCF4952CV |
| | 360 | 100 | 295 | – | 331,33 | 9,4 | 5 | 2,1 | – | 6 | NNCL4952CV |
| | 360 | 100 | 295 | 321 | – | 9,4 | 5 | 2,1 | – | – | NNC4952CV |
| | 400 | 190 | 302 | 362 | – | 9,4 | 5 | 4 | 4 | 10 | NNCF5052CV |
| 280 | 350 | 69 | 308 | 326 | – | 8 | 4 | 2 | 2 | 4 | NNCF4856CV |
| | 350 | 69 | 308 | – | 332,4 | 8 | 4 | 2 | – | 4 | NNCL4856CV |
| | 350 | 69 | 308 | 326 | – | 8 | 4 | 2 | – | – | NNC4856CV |
| | 380 | 100 | 317 | 343 | – | 9,4 | 5 | 2,1 | 2,1 | 6 | NNCF4956CV |
| | 380 | 100 | 317 | – | 353,34 | 9,4 | 5 | 2,1 | – | 6 | NNCL4956CV |
| | 380 | 100 | 317 | 343 | – | 9,4 | 5 | 2,1 | – | – | NNC4956CV |
| | 420 | 190 | 318 | 372 | – | 9,4 | 5 | 4 | 4 | 10 | NNCF5056CV |
| 300 | 380 | 80 | 330 | 349 | – | 9,4 | 5 | 2,1 | 2,1 | 6 | NNCF4860CV |
| | 380 | 80 | 330 | – | 356,7 | 9,4 | 5 | 2,1 | – | 6 | NNCL4860CV |
| | 380 | 80 | 330 | 349 | – | 9,4 | 5 | 2,1 | – | – | NNC4860CV |
| | 420 | 118 | 340 | 374 | – | 9,4 | 5 | 3 | 3 | 6 | NNCF4960CV |
| | 420 | 118 | 340 | – | 385,51 | 9,4 | 5 | 3 | – | 6 | NNCL4960CV |
| | 420 | 118 | 341 | 374 | – | 9,4 | 5 | 3 | – | – | NNC4960CV |
| | 460 | 218 | 352 | 418 | – | 9,4 | 5 | 4 | 4 | 9 | NNCF5060CV |
| 320 | 400 | 80 | 352 | 372 | – | 9,4 | 5 | 2,1 | 2,1 | 6 | NNCF4864CV |
| | 400 | 80 | 352 | – | 379,7 | 9,4 | 5 | 2,1 | – | 6 | NNCL4864CV |
| | 400 | 80 | 352 | 372 | – | 9,4 | 5 | 2,1 | – | – | NNC4864CV |
| | 440 | 118 | 368 | 401 | – | 9,4 | 5 | 3 | 3 | 6 | NNCF4964CV |
| | 440 | 118 | 368 | – | 412,27 | 9,4 | 5 | 3 | – | 6 | NNCL4964CV |
| | 440 | 118 | 368 | 401 | – | 9,4 | 5 | 3 | – | – | NNC4964CV |
| | 480 | 218 | 370 | 434 | – | 9,4 | 5 | 4 | 4 | 9 | NNCF5064CV |
| 340 | 420 | 80 | 368 | 390 | – | 9,4 | 5 | 2,1 | 2,1 | 6 | NNCF4868CV |
| | 420 | 80 | 368 | – | 396,9 | 9,4 | 5 | 2,1 | – | 6 | NNCL4868CV |
| | 420 | 80 | 369 | 369 | – | 9,4 | 5 | 2,1 | – | – | NNC4868CV |
| | 460 | 118 | 385 | 419 | – | 9,4 | 5 | 3 | 3 | 6 | NNCF4968CV |
| | 460 | 118 | 385 | – | 430,11 | 9,4 | 5 | 3 | – | 6 | NNCL4968CV |
| | 460 | 118 | 385 | 419 | – | 9,4 | 5 | 3 | – | – | NNC4968CV |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 520 | 243 | 395 | 468 | – | 9,4 | 5 | 5 | 5 | 11 | NNCF5068CV |
| 360 | 440 | 80 | 391 | 413 | – | 9,4 | 5 | 2,1 | 2,1 | 6 | NNCF4872CV |
| | 440 | 80 | 391 | – | 419,8 | 9,4 | 5 | 2,1 | – | 6 | NNCL4872CV |
| | 440 | 80 | 391 | 413 | – | 9,4 | 5 | 2,1 | – | – | NNC4872CV |
| | 480 | 118 | 404 | 437 | – | 9,4 | 5 | 3 | 3 | 6 | NNCF4972CV |
| | 480 | 118 | 404 | – | 447,95 | 9,4 | 5 | 3 | – | 6 | NNCL4972CV |
| | 480 | 118 | 404 | 437 | – | 9,4 | 5 | 3 | – | – | NNC4972CV |
| | 540 | 243 | 412 | 486 | – | 9,4 | 5 | 5 | 5 | 11 | NNCF5072CV |
| 380 | 480 | 100 | 419 | 447 | – | 9,4 | 5 | 2,1 | 2,1 | 6 | NNCF4876CV |
| | 480 | 100 | 419 | – | 455,8 | 9,4 | 5 | 2,1 | – | 6 | NNCL4876CV |
| | 480 | 100 | 419 | 447 | – | 9,4 | 5 | 2,1 | – | – | NNC4876CV |
| | 520 | 140 | 430 | 469 | – | 9,4 | 5 | 4 | 4 | 7 | NNCF4976CV |
| | 520 | 140 | 430 | – | 481,35 | 9,4 | 5 | 4 | – | 7 | NNCL4976CV |
| | 520 | 140 | 430 | 469 | – | 9,4 | 5 | 4 | – | – | NNC4976CV |
| 400 | 500 | 100 | 434 | 462 | – | 9,4 | 5 | 2,1 | 2,1 | 6 | NNCF4880CV |
| | 500 | 100 | 434 | – | 470,59 | 9,4 | 5 | 2,1 | – | 6 | NNCL4880CV |
| | 500 | 100 | 434 | 462 | – | 9,4 | 5 | 2,1 | – | – | NNC4880CV |
| | 540 | 140 | 451 | 489 | – | 9,4 | 5 | 4 | 4 | 7 | NNCF4980CV |
| | 540 | 140 | 451 | – | 501,74 | 9,4 | 5 | 4 | – | 7 | NNCL4980CV |
| | 540 | 140 | 451 | 489 | – | 9,4 | 5 | 4 | – | – | NNC4980CV |
| | 600 | 272 | 460 | 540 | – | 9,4 | 5 | 5 | 5 | 11 | NNCF5080CV |

NOTE — Designation given is informative and may vary for different manufacturers

## 6 TOLERANCES AND GEOMETRICAL CHARACTERISTICS

Tolerances and geometrical characteristics of the boundary dimensions shall be as specified in IS 5692

Tolerance classes and the corresponding values for certain tolerance characteristics are specified in ISO 492 (for radial bearings)

Three common tolerance classes for roller bearings:

| Tolerance class | Designation suffix | Description |
|---|---|---|
| Normal | – | Minimum standard for all SKF ball and roller bearings. |
| Class 6 | P6 | Tighter tolerances than Normal. |
| Class 5 | P5 | Tighter tolerances than class 6. |

## 7 ROLLING ELEMENTS

Requirements for the cylindrical roller bearing shall be as specified in IS 9202.

## 8 MATERIAL OF RACES AND ROLLERS

The material used, must fulfil the requirements for the fatigue strength, wear resistance, hardness, toughness, and structural stability. Generally, a low alloy, through hardening bearing steel is consider

sufficient for general use. If there are considerable shock load in the application, then the use of case hardening steel is recommended based on the agreement between supplier and purchaser.

Shall be as specified in IS 17111 or IS 4398**.**

## 9 CAGE

The pressed sheet cages are widely used. Material specified in IS 4397 or IS 513. In some cases, alternate material could be used such as brass and polyamide in case cases there be agreement between the supplier and purchaser is required.

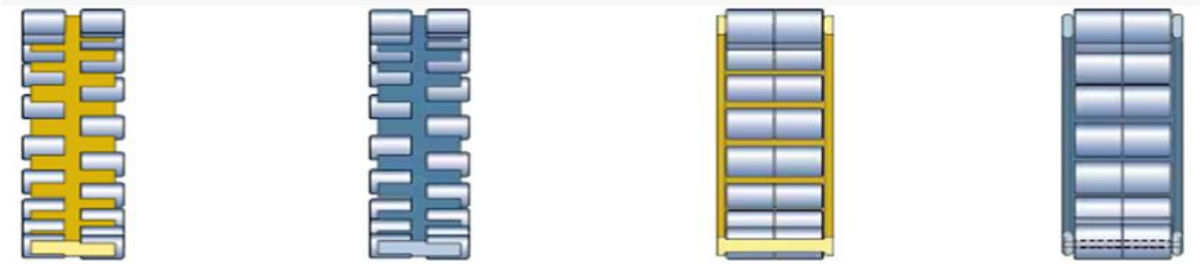


FIG. 19

| | | | | |
|---|---|---|---|---|
| **Cage type** | Double prong-type, roller centred | Double prong-type, roller centred | Window-type, roller centred | Pin-type, pierced rollers |
| **Material** | Machined brass (standard??) | Machined steel | Machined brass | Machined steel |
| **No. per bearing** | 1 | 1 | 1 | 1 |

## 10 RADIAL CLEARANCE

Radial internal clearance is arithmetical mean of the radial distances through which one of the rings may be displaced relative to the other, from one eccentric extreme position to the diametrically opposite extreme position, in different angular directions and without being subjected to any external load.

Radial clearance shall be as specified in IS 5935.

**Table 2 Radial internal clearance of cylindrical roller bearings with a cylindrical bore**
(*Clause*)

| **Bore diameter** | | **Radial internal clearance** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **d** | | **C2** | | **Normal** | | **C3** | | **C4** | | **C5** | |
| **>** | **≤** | **min.** | **max.** | **min.** | **max.** | **min.** | **max.** | **min.** | **max.** | **min.** | **max.** |
| **mm** | | **µm** | | | | | | | | | |
| – | 24 | 0 | 25 | 20 | 45 | 35 | 60 | 50 | 75 | 65 | 90 |
| 24 | 30 | 0 | 25 | 20 | 45 | 35 | 60 | 50 | 75 | 70 | 95 |
| 30 | 40 | 5 | 30 | 25 | 50 | 45 | 70 | 60 | 85 | 80 | 105 |
| 40 | 50 | 5 | 35 | 30 | 60 | 50 | 80 | 70 | 100 | 95 | 125 |
| 50 | 65 | 10 | 40 | 40 | 70 | 60 | 90 | 80 | 110 | 110 | 140 |
| 65 | 80 | 10 | 45 | 40 | 75 | 65 | 100 | 90 | 125 | 130 | 165 |
| 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 | 690 | 810 |
| 560 | 630 | 140 | 260 | 260 | 380 | 380 | 500 | 500 | 620 | 780 | 900 |
| 630 | 710 | 145 | 285 | 285 | 425 | 425 | 565 | 565 | 705 | 865 | 1 005 |
| 710 | 800 | 150 | 310 | 310 | 470 | 470 | 630 | 630 | 790 | 975 | 1 135 |
| 800 | 900 | 180 | 350 | 350 | 520 | 520 | 690 | 690 | 860 | 1 095 | 1 265 |
| 900 | 1 000 | 200 | 390 | 390 | 580 | 580 | 770 | 770 | 960 | 1 215 | 1 405 |
| 1 000 | 1 120 | 220 | 430 | 430 | 640 | 640 | 850 | 850 | 1 060 | 1 355 | 1 565 |
| 1 120 | 1 250 | 230 | 470 | 470 | 710 | 710 | 950 | 950 | 1 190 | 1 510 | 1 750 |
| 1 250 | 1 400 | 270 | 530 | 530 | 790 | 790 | 1 050 | 1 050 | 1 310 | 1 680 | 1 940 |
| 1 400 | 1 600 | 330 | 610 | 610 | 890 | 890 | 1 170 | 1 170 | 1 450 | 1 920 | 2 200 |
| 1 600 | 1 800 | 380 | 700 | 700 | 1 020 | 1 020 | 1 340 | 1 340 | 1 660 | 2 160 | 2 480 |
| 1 800 | 2 000 | 400 | 760 | 760 | 1 120 | 1 120 | 1 480 | 1 480 | 1 840 | 2 390 | 2 760 |

## 11 DESIGNATION

### 11.1 Basic Designation System for Standard Metric Ball and Roller Bearings

The designations of most rolling bearings follow a system that may consist of a basic designation with or without one or more prefixes and/or suffixes.

**11.1.1** An example and the applicable options for double row cylindrical roller bearings are given below.

Typical examples :-

| **1** | **2** | **3** | **4** | **5** | / | **6.1** | **6.2** | **6.3** | **6.4** | **6.5** | **6.6** |
|---|---|---|---|---|---|---|---|---|---|---|---|

**NNU 41/1000 K30M/W33**

Where,

| | | |
|---|---|---|
| NNU 41/1000 | = | 2 |
| K30 | = | 4 |
| M | = | 5 |
| W33 | = | 6.5 |

Applicable options

**1** **Prefixes (n.a.)**
**2** **Basic designation**

| | |
|---|---|
| **3** | **Suffixes - Internal design** |
| **A, B, C** | Deviating or modified internal design |
| **4** | **Suffixes - External design (seals, snap ring groove , etc.)** |
| **G** | Helical groove in inner ring bore |
| **K** | Tapered bore, taper 1:12 |
| **K30** | Tapered bore, taper 1:30 |
| **5** | **Suffixes - Cage design** |
| **F** | Machined steel cage, roller centred |
| **M** | Machined brass cage, roller centred |
| **6.1** | **Suffixes - Materials, heat treatment** |
| **HA1** | Case-hardened inner and outer rings |
| **HA4** | Case-hardened inner and outer rings and rollers |
| **HA5** | Case-hardened rollers |
| **HB1** | Bainite-hardened inner and outer rings |
| **6.2** | **Suffixes - Accuracy, clearance, preload, quiet running** |
| **CN** | Normal radial internal clearance; only used together with an additional letter that identifies a reduced or displaced clearance range<br>• H = Reduced clearance range corresponding to the upper half of the actual clearance range<br>• L = Reduced clearance range corresponding to the lower half of the actual clearance range<br>• M = Reduced clearance range corresponding to the middle half of the actual clearance range<br>• P = Displaced clearance range comprising the upper half of the actual clearance range plus the lower half of the next larger clearance range<br>The above letters are also used together with the clearance classes C2, C3, C4 and C5, e.g. C2H |
| **C2** | Radial internal clearance smaller than Normal |
| **C3** | Radial internal clearance greater than Normal |
| **C4** | Radial internal clearance greater than C3 |
| **C5** | Radial internal clearance greater than C4 |
| **6.3** | **Suffixes - Bearing sets, matched bearings** |
| **DR** | Set of two matched bearings |
| **TR** | Set of three matched bearings |
| **QR** | Set of four matched bearings |
| **6.4** | **Suffixes – Stabilization** |
| **S1** | Bearing rings heat stabilized for operating temperatures ≤ 200 °C (390 °F) |
| **S2** | Bearing rings heat stabilized for operating temperatures ≤ 250 °C (480 °F) |
| **6.5** | **Suffixes - Lubrication** |
| **W20** | Lubrication holes in the outer ring |
| **W33(X)** | Annular groove and lubrication holes in the outer ring |
| | Suffixes - Other variants (n.a.) |