# INTERNATIONAL STANDARD ISO 3030

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

# Needle roller bearings — Needle roller and cage assemblies — Metric series — Part I : Radial needle roller and cage assemblies — Boundary dimensions and tolerances

*Roulements à aiguilles — Cages à aiguilles — Séries métriques — Partie I : Cages à aiguilles radiales — Dimensions d'encombrement et tolérances*

**First edition — 1974-04-01**

UDC 621.822.8 —/81

Ref. No. ISO 3030-1974 (E)

**Descriptors :** bearings, rolling bearings, roller bearings, needle bearings, dimensions, dimensional tolerances.



Price based on 4 pages

## FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3030 was drawn up by Technical Committee ISO/TC 4, *Rolling bearings,* and circulated to the Member Bodies in January 1973.

It has been approved by the Member Bodies of the following countries :

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| Australia | India | Sweden |
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| Egypt, Arab Rep. of | Netherlands | United Kingdom |
| France | Poland | U.S.A. |
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This International Standard has also been approved by the International Union of Railways (UIC).

No Member Body expressed disapproval of the document.



Printed in Switzerland

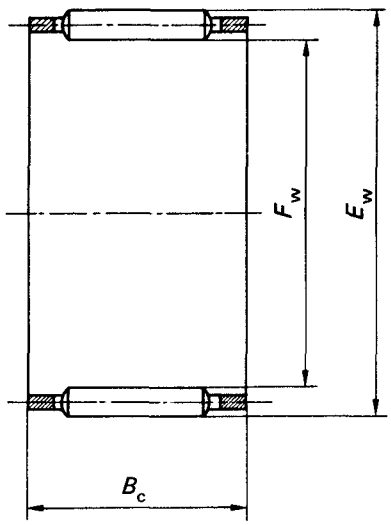
# Needle roller bearings — Needle roller and cage assemblies — Metric series — Part I : Radial needle roller and cage assemblies — Boundary dimensions and tolerances

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard gives a general plan for boundary dimensions for needle roller and cage assemblies, and specifies preferred dimensions to be used.

In addition, it gives the tolerance for the width of cages and method of checking free operation.

## 2 SYMBOLS




$E_w$ = diameter of a circle circumscribed round the roller set, nominal

$F_w$ = diameter of a circle inscribed inside the roller set, nominal

$B_c$ = cage width, nominal

## 3 BOUNDARY DIMENSIONS

### 3.1 General plan

Underlined values are the preferred dimensions shown in tables 3 and 4.

TABLE 1 — **Diameter series 1 C and 2 C**

Dimensions in millimetres

| | Diameter series 1 C | | | | | | | | Diameter series 2 C | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dimension series | | | | | | | | Dimension series | | | | | | |
| $F_w$ | $E_w$ | 11 C | 21 C | 31 C | 41 C | 51 C | 61 C | 71 C | $E_w$ | 12 C | 22 C | 32 C | 42 C | 52 C | 62 C | 72 C |
| | | Width $B_c$ | | | | | | | | Width $B_c$ | | | | | | |
| 4 | 7 | 6 | 8 | 10 | | | | | | | | | | | | |
| 5 | 8 | 6 | 8 | 10 | 13 | | | | 9 | 8 | 10 | 13 | | | | |
| 6 | 9 | 6 | 8 | 10 | 13 | 15 | | | 10 | 8 | 10 | 13 | 15 | | | |
| 7 | 10 | 6 | 8 | 10 | 13 | 15 | 17 | | 11 | 8 | 10 | 13 | 15 | 17 | | |
| 8 | 11 | 6 | 8 | 10 | 13 | 15 | 17 | | 12 | 8 | 10 | 13 | 15 | 17 | 20 | |
| 9 | 12 | 6 | 8 | 10 | 13 | 15 | 17 | | 13 | 8 | 10 | 13 | 15 | 17 | 20 | |
| 10 | 13 | 6 | 8 | 10 | 13 | 15 | 17 | | 14 | 8 | 10 | 13 | 15 | 17 | 20 | |
| 12 | 15 | 6 | 8 | 10 | 13 | 15 | 17 | | 16 | 8 | 10 | 13 | 15 | 17 | 20 | |
| 14 | 18 | 8 | 10 | 13 | 15 | 17 | 20 | 23 | 19 | 10 | 13 | 15 | 17 | 20 | 23 | 27 |
| 15 | 19 | 8 | 10 | 13 | 15 | 17 | 20 | 23 | 20 | 10 | 13 | 15 | 17 | 20 | 23 | 27 |
| 16 | 20 | 8 | 10 | 13 | 15 | 17 | 20 | 23 | 21 | 10 | 13 | 15 | 17 | 20 | 23 | 27 |
| 17 | 21 | 8 | 10 | 13 | 15 | 17 | 20 | 23 | 22 | 10 | 13 | 15 | 17 | 20 | 23 | 27 |
| 18 | 22 | 8 | 10 | 13 | 15 | 17 | 20 | 23 | 23 | 10 | 13 | 15 | 17 | 20 | 23 | 27 |
| 20 | 24 | 8 | 10 | 13 | 15 | 17 | 20 | 23 | 25 | 10 | 13 | 15 | 17 | 20 | 23 | 27 |
| 22 | 26 | 8 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 10 | 13 | 15 | 17 | 20 | 23 | 27 |
| 25 | 29 | 8 | 10 | 13 | 15 | 17 | 20 | 23 | 30 | 10 | 13 | 15 | 17 | 20 | 23 | 27 |
| 28 | 33 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 34 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 30 | 35 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 36 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 32 | 37 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 38 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 35 | 40 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 41 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 38 | 43 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 44 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 40 | 45 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 46 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 42 | 47 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 48 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 45 | 50 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 51 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 50 | 55 | 10 | 13 | 15 | 17 | 20 | 23 | 27 | 56 | 12 | 15 | 17 | 20 | 25 | 30 | 35 |
| 55 | 61 | 12 | 15 | 17 | 20 | 25 | 30 | 35 | 62 | 16 | 20 | 25 | 30 | 35 | 40 | |
| 60 | 66 | 12 | 15 | 17 | 20 | 25 | 30 | 35 | 67 | 16 | 20 | 25 | 30 | 35 | 40 | |
| 65 | 71 | 12 | 15 | 17 | 20 | 25 | 30 | 35 | 72 | 16 | 20 | 25 | 30 | 35 | 40 | |
| 70 | 76 | 12 | 15 | 17 | 20 | 25 | 30 | 35 | 77 | 16 | 20 | 25 | 30 | 35 | 40 | |
| 75 | 81 | 12 | 15 | 17 | 20 | 25 | 30 | 35 | 82 | 16 | 20 | 25 | 30 | 35 | 40 | |
| 80 | 86 | 12 | 15 | 17 | 20 | 25 | 30 | 35 | 87 | 16 | 20 | 25 | 30 | 35 | 40 | |
| 85 | 92 | 16 | 20 | 25 | 30 | 35 | 40 | | 93 | 20 | 25 | 30 | 35 | 40 | 45 | |
| 90 | 97 | 16 | 20 | 25 | 30 | 35 | 40 | | 98 | 20 | 25 | 30 | 35 | 40 | 45 | |
| 95 | 102 | 16 | 20 | 25 | 30 | 35 | 40 | | 103 | 20 | 25 | 30 | 35 | 40 | 45 | |
| 100 | 107 | 16 | 20 | 25 | 30 | 35 | 40 | | 108 | 20 | 25 | 30 | 35 | 40 | 45 | |

TABLE 2 – **Diameter series 3 C, 4 C and 5 C**

Dimensions in millimetres

| $F_w$ | $E_w$ | Diameter series 3 C | | | | | | $E_w$ | Diameter series 4 C | | | | | | $E_w$ | Diameter series 5 C | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dimension series | | | | | | | Dimension series | | | | | | | Dimension series | | | |
| | | 13 C | 23 C | 33 C | 43 C | 53 C | 63 C | | 14 C | 24 C | 34 C | 44 C | 54 C | 64 C | | 15 C | 25 C | 35 C | 45 C |
| | | Width $B_c$ | | | | | | | Width $B_c$ | | | | | | | Width $B_c$ | | | |
| 6 | 11 | 10 | 13 | 15 | | | | | | | | | | | | | | | |
| 7 | 12 | 10 | 13 | 15 | 17 | | | | | | | | | | | | | | |
| 8 | 13 | 10 | 13 | 15 | 17 | 20 | | 14 | 12 | 15 | 17 | 20 | | | | | | | |
| 9 | 14 | 10 | 13 | 15 | 17 | 20 | | 15 | 12 | 15 | 17 | 20 | | | | | | | |
| 10 | 15 | 10 | 13 | 15 | 17 | 20 | | 16 | 12 | 15 | 17 | 20 | | | 17 | 16 | 20 | 25 | |
| 12 | 17 | 10 | 13 | 15 | 17 | 20 | 23 | 18 | 12 | 15 | 17 | 20 | | | 19 | 16 | 20 | 25 | |
| 14 | 20 | 12 | 15 | 17 | 20 | 25 | 30 | 21 | 16 | 20 | 25 | 30 | 35 | | 22 | 20 | 25 | 30 | |
| 15 | 21 | 12 | 15 | 17 | 20 | 25 | 30 | 22 | 16 | 20 | 25 | 30 | 35 | | 23 | 20 | 25 | 30 | |
| 16 | 22 | 12 | 15 | 17 | 20 | 25 | 30 | 23 | 16 | 20 | 25 | 30 | 35 | | 24 | 20 | 25 | 30 | 35 |
| 17 | 23 | 12 | 15 | 17 | 20 | 25 | 30 | 24 | 16 | 20 | 25 | 30 | 35 | | 25 | 20 | 25 | 30 | 35 |
| 18 | 24 | 12 | 15 | 17 | 20 | 25 | 30 | 25 | 16 | 20 | 25 | 30 | 35 | 40 | 26 | 20 | 25 | 30 | 35 |
| 20 | 26 | 12 | 15 | 17 | 20 | 25 | 30 | 27 | 16 | 20 | 25 | 30 | 35 | 40 | 28 | 20 | 25 | 30 | 35 |
| 22 | 28 | 12 | 15 | 17 | 20 | 25 | 30 | 29 | 16 | 20 | 25 | 30 | 35 | 40 | 30 | 20 | 25 | 30 | 35 |
| 25 | 31 | 12 | 15 | 17 | 20 | 25 | 30 | 32 | 16 | 20 | 25 | 30 | 35 | 40 | 33 | 20 | 25 | 30 | 35 |
| 28 | 35 | 16 | 20 | 25 | 30 | 35 | 40 | 36 | 20 | 25 | 30 | 35 | 40 | 45 | 38 | 25 | 30 | 35 | 40 |
| 30 | 37 | 16 | 20 | 25 | 30 | 35 | 40 | 38 | 20 | 25 | 30 | 35 | 40 | 45 | 40 | 25 | 30 | 35 | 40 |
| 32 | 39 | 16 | 20 | 25 | 30 | 35 | 40 | 40 | 20 | 25 | 30 | 35 | 40 | 45 | 42 | 25 | 30 | 35 | 40 |
| 35 | 42 | 16 | 20 | 25 | 30 | 35 | 40 | 43 | 20 | 25 | 30 | 35 | 40 | 45 | 45 | 25 | 30 | 35 | 40 |
| 38 | 45 | 16 | 20 | 25 | 30 | 35 | 40 | 46 | 20 | 25 | 30 | 35 | 40 | 45 | 48 | 25 | 30 | 35 | 40 |
| 40 | 47 | 16 | 20 | 25 | 30 | 35 | 40 | 48 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 25 | 30 | 35 | 40 |
| 42 | 49 | 16 | 20 | 25 | 30 | 35 | 40 | 50 | 20 | 25 | 30 | 35 | 40 | 45 | 52 | 25 | 30 | 35 | 40 |
| 45 | 52 | 16 | 20 | 25 | 30 | 35 | 40 | 53 | 20 | 25 | 30 | 35 | 40 | 45 | 55 | 25 | 30 | 35 | 40 |
| 50 | 57 | 16 | 20 | 25 | 30 | 35 | 40 | 58 | 20 | 25 | 30 | 35 | 40 | 45 | 60 | 25 | 30 | 35 | 40 |
| 55 | 63 | 20 | 25 | 30 | 35 | 40 | 45 | 65 | 25 | 30 | 35 | 40 | 45 | 50 | 70 | 35 | 40 | 45 | 50 |
| 60 | 68 | 20 | 25 | 30 | 35 | 40 | 45 | 70 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 35 | 40 | 45 | 50 |
| 65 | 73 | 20 | 25 | 30 | 35 | 40 | 45 | 75 | 25 | 30 | 35 | 40 | 45 | 50 | 80 | 35 | 40 | 45 | 50 |
| 70 | 78 | 20 | 25 | 30 | 35 | 40 | 45 | 80 | 25 | 30 | 35 | 40 | 45 | 50 | 85 | 35 | 40 | 45 | 50 |
| 75 | 83 | 20 | 25 | 30 | 35 | 40 | 45 | 85 | 25 | 30 | 35 | 40 | 45 | 50 | 90 | 35 | 40 | 45 | 50 |
| 80 | 88 | 20 | 25 | 30 | 35 | 40 | 45 | 90 | 25 | 30 | 35 | 40 | 45 | 50 | 95 | 35 | 40 | 45 | 50 |
| 85 | 95 | 25 | 30 | 35 | 40 | 45 | 50 | 100 | 35 | 40 | 45 | 50 | 60 | | 105 | 45 | 50 | 60 | 70 |
| 90 | 100 | 25 | 30 | 35 | 40 | 45 | 50 | 105 | 35 | 40 | 45 | 50 | 60 | | 110 | 45 | 50 | 60 | 70 |
| 95 | 105 | 25 | 30 | 35 | 40 | 45 | 50 | 110 | 35 | 40 | 45 | 50 | 60 | | 115 | 45 | 50 | 60 | 70 |
| 100 | 110 | 25 | 30 | 35 | 40 | 45 | 50 | 115 | 35 | 40 | 45 | 50 | 60 | | 120 | 45 | 50 | 60 | 70 |