

7

## Needle roller bearings



# 7 Needle roller bearings

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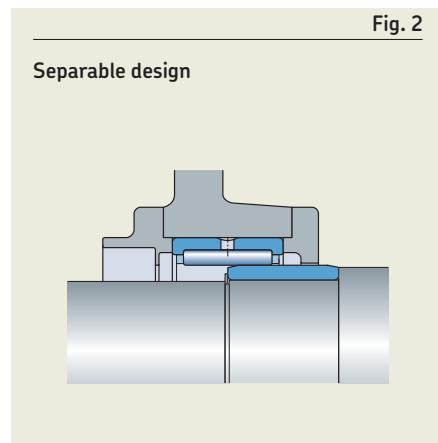
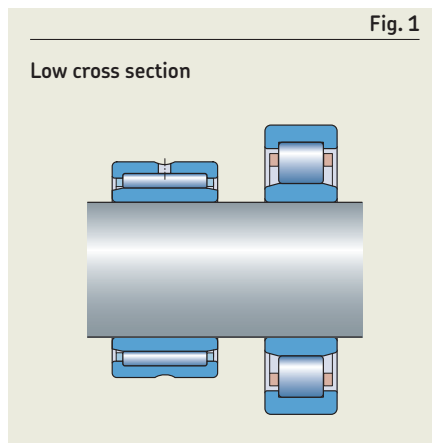
SKF needle roller bearings are bearings with cylindrical rollers that are small in diameter relative to their length. The modified roller/raceway profile prevents stress peaks to extend bearing service life.

SKF supplies needle roller bearings in many different designs, series and in a wide range of sizes, which make them appropriate for a wide variety of operating conditions and applications.

### Bearing features

- **Low cross section**  
In applications where less space is available, needle roller bearings offer a very compact solution (fig. 1), and drawn cup needle roller bearings enable downsizing.
- **High load carrying capacity**  
Owing to their large number of rollers, needle roller bearings have a high load carrying capacity.
- **High stiffness**  
Because of their large number of small-diameter rollers, needle roller bearings have high stiffness.

- **Separable design**  
The possibility of assembling inner and outer rings separately permits interference fits for shaft and housing and also enables easy maintenance inspections (fig. 2).
- **Accommodate axial displacement**  
Except for bearings with flanges on both the inner and outer rings, needle roller bearings with machined rings can accommodate axial displacement (fig. 3).
- **Accommodate static misalignment**  
Alignment needle roller bearings are self-aligning up to 3° of static misalignment.
- **Locating bearing arrangement**  
Combined needle roller bearings accommodate combined radial and axial loads in one or both directions.



# Designs and variants

## Needle roller and cage assemblies

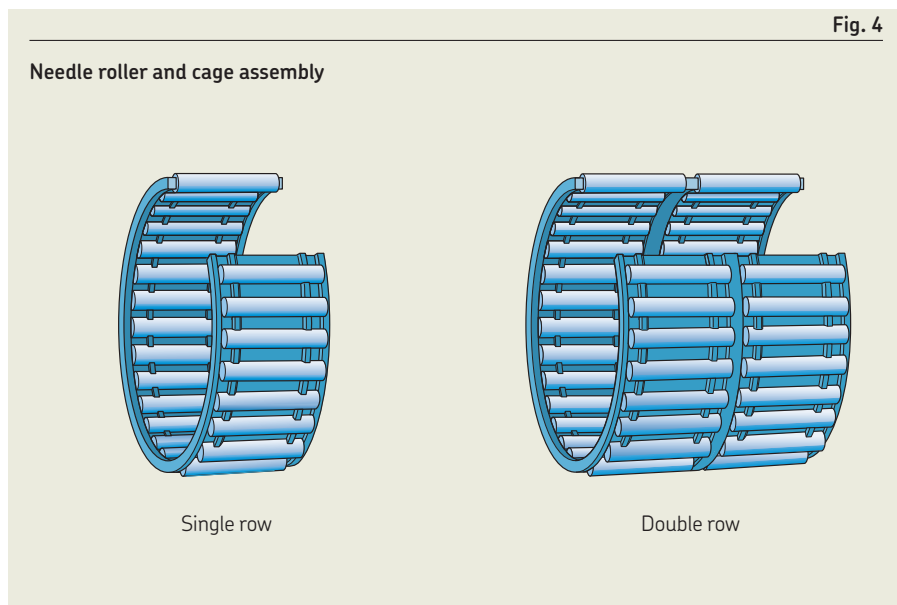
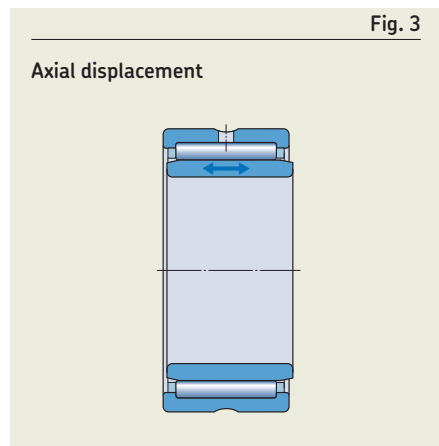
SKF needle roller and cage assemblies are self-contained, ready-to-mount bearings. In applications where the shaft and housing bore can serve as raceways, the assemblies can be used to create bearing arrangements that require minimal radial space.

### Basic design bearings

- are identified by the series designation K
- are available as (fig. 4):
  - single row design (no designation suffix)
  - double row design (designation suffix ZW)

They are characterized by the following properties:

- simple to mount and robust
- accurate roller guidance in the cage pockets
- good running performance



## Other needle roller and cage assemblies

Needle roller and cage assemblies with a split cage can be used where raceways are recessed in the shaft (fig. 5).

Special needle roller and cage assemblies are used for the gudgeon (wrist) pin (fig. 6) and crankpin (crankshaft journal) (fig. 7) for connecting rods of internal combustion engines and compressors. They provide excellent service in spite of rapid accelerations, elevated temperatures, unfavourable load, and poor lubrication conditions.

For additional information about special sizes and designs, which are available on request, contact SKF.

## Drawn cup needle roller bearings

SKF drawn cup needle roller bearings have a deep drawn, thin-walled outer ring. Drawn cup needle roller bearings are typically used in applications where the housing bore cannot be used as a raceway for a needle roller and cage assembly, but where a very compact and economical bearing arrangement is required. These bearings are mounted with a tight interference fit in the housing. This enables a simple and economic design of the housing bore, as shoulders or snap rings are not required to locate the bearing axially.

The drawn cup of hardened steel and the needle roller and cage assembly of these bearings form a non-separable unit.

## SKF standard assortment

SKF supplies a wide assortment of drawn cup needle roller bearings. This includes:

- bearings with open ends (fig. 8)
- bearings with a closed end (fig. 9)
- full complement bearings with open ends (fig. 10)

SKF drawn cup needle roller bearings:

- are supplied without an inner ring
- are generally designed with one needle roller and cage assembly – except wide sizes, which incorporate two needle roller and cage assemblies immediately adjacent to each other, with a lubrication hole in the outer ring (fig. 11).

Fig. 5

Needle roller and cage assemblies with a split cage

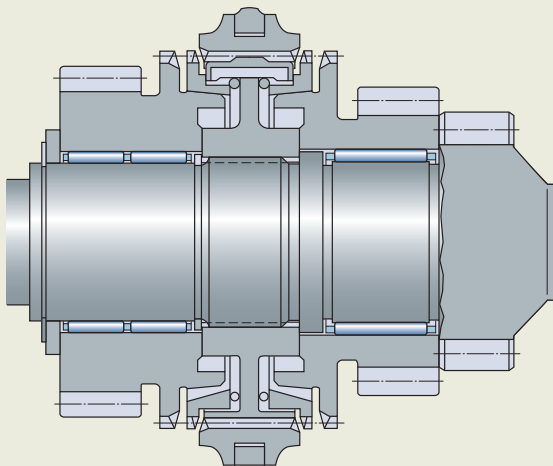


Fig. 6

Special needle roller and cage assembly for the gudgeon (wrist) pin

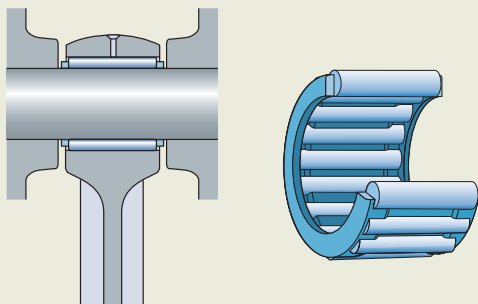
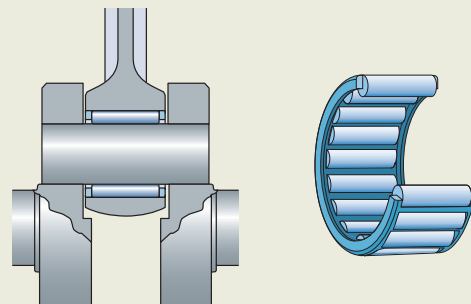


Fig. 7

Special needle roller and cage assembly for the crankpin (crankshaft journal)



## Basic design bearings

- Drawn cup needle roller bearings with open ends** (series designation HK, [fig. 8](#))
  - are available open (without seals) or sealed on one or both sides (*Sealing solutions*, [page 594](#))
- Drawn cup needle roller bearings with a closed end** (series designation BK, [fig. 9](#))
  - are available open or sealed (*Sealing solutions*)
  - are suitable for bearing arrangements where they are situated at the end of a shaft
  - accommodate small axial guidance forces, because of the profiled design of their closed end
- Full complement bearings with open ends** (series designation HN, [fig. 10](#))
  - are suitable for very heavy radial loads at moderate speeds
  - are available with open ends and without seals only

Full complement drawn cup needle roller bearings are supplied with a special grease to secure the rollers during transport. However, SKF recommends relubricating after mounting. Depending on the required grade, SKF recommends SKF LGEP 2 or SKF LGWM 1 grease for relubrication. The technical specifications of the initial grease fill and the relubrication greases are listed in [table 1](#).

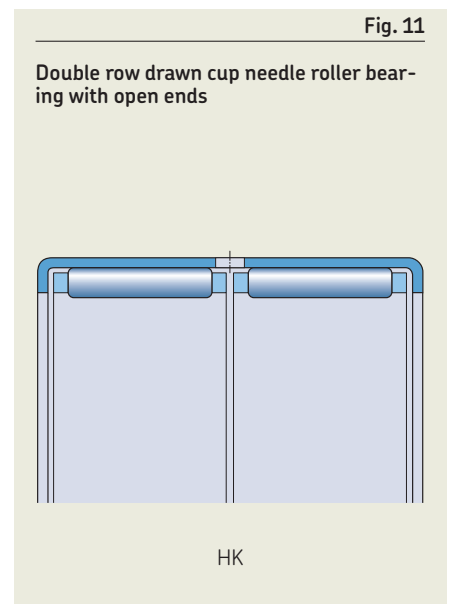
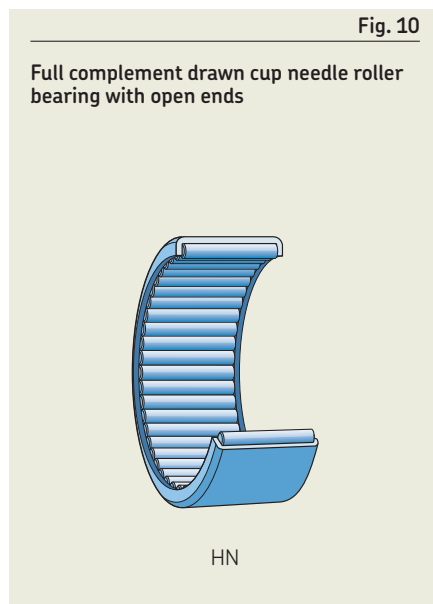
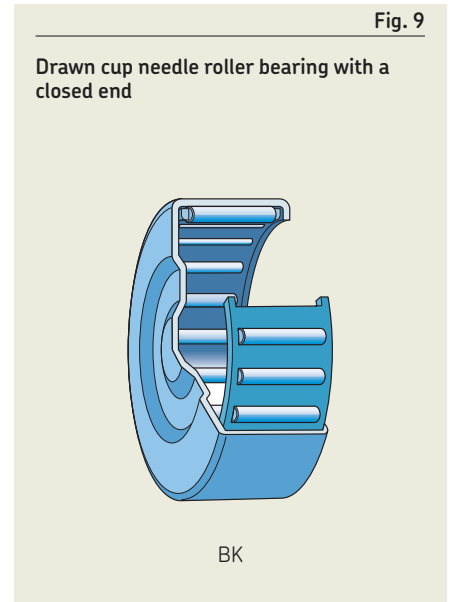
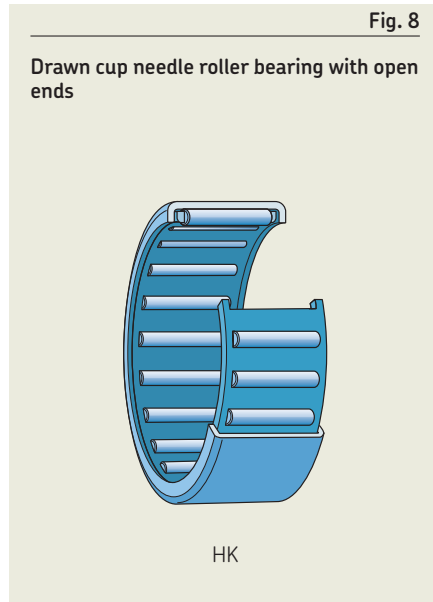


Table 1

Technical specifications of SKF standard greases for full complement drawn cup needle roller bearings

| Grease              | Temperature range <sup>1)</sup> |   |    |     |     |     |     | Thickener    | Base oil type | NLGI grade | Base oil viscosity [mm <sup>2</sup> /s] |                    |
|---------------------|---------------------------------|---|----|-----|-----|-----|-----|--------------|---------------|------------|---|--------------------|
|                     | -50                             | 0 | 50 | 100 | 150 | 200 | 250 |              |               |            | at 40 °C (105 °F)                       | at 100 °C (210 °F) |
| Initial grease fill |                                 |   |    |     |     |     |     | Lithium soap | Mineral       | 1-2        | 200                                     | 18,7               |
| LGEP 2              |                                 |   |    |     |     |     |     | Lithium soap | Mineral       | 2          | 200                                     | 16                 |
| LGWM 1              |                                 |   |    |     |     |     |     | Lithium soap | Mineral       | 1          | 200                                     | 16                 |

-60 30 120 210 300 390 480 °F

<sup>1)</sup> Refer to the SKF traffic light concept ([page 117](#)).

## Arrangements with components and other bearings

- Generally, drawn cup needle roller bearings run directly on a shaft. However, in applications where the shaft cannot be hardened and ground, bearings should be combined with an inner ring ([fig. 12](#), and *Needle roller bearing inner rings*, [page 593](#)).
- Drawn cup needle roller bearings with wide inner rings ([fig. 12](#) and *Needle roller bearing inner rings*) provide an excellent counterface for the lips of external G or SD design seals ([skf.com/seals](#)).
- Certain sizes of drawn cup needle roller bearings can be combined with a needle roller thrust bearing with a centring flange, AXW series ([fig. 13](#) and *Needle roller thrust bearings*, [page 895](#)), to accommodate combined radial and axial loads.

## Needle roller bearings with machined rings

SKF needle roller bearings with machined rings are made of carbon chromium bearing steel. SKF supplies these bearings with or without flanges on the outer ring, in a wide range of series and sizes. SKF also supplies them with or without an inner ring.

### Needle roller bearings with machined inner and outer rings

- are used for applications where the shaft cannot be hardened and ground ([fig. 14](#))
- have limited permissible axial displacement of the shaft relative to the housing ([fig. 3](#), [page 583](#) and [product table](#), [page 636](#)), which can be extended, if needed, by using a wide inner ring (*Needle roller bearing inner rings*, [page 593](#))

### Needle roller bearings with a machined outer ring, without an inner ring

- are an excellent choice for compact bearing arrangements if the shaft can be hardened and ground ([fig. 15](#))
- enable a larger shaft diameter and a stiffer bearing arrangement compared to arrangements with bearings with inner rings

Axial displacement of the shaft relative to the housing is only limited by the width of the raceway on the shaft. By machining the shaft raceways to the appropriate dimensional and geometrical tolerances, it is possible to obtain bearing arrangements with tighter geometrical tolerances. For additional information, refer to *Raceways on shafts and in housings*, [page 179](#).

Fig. 12

Drawn cup needle roller bearing

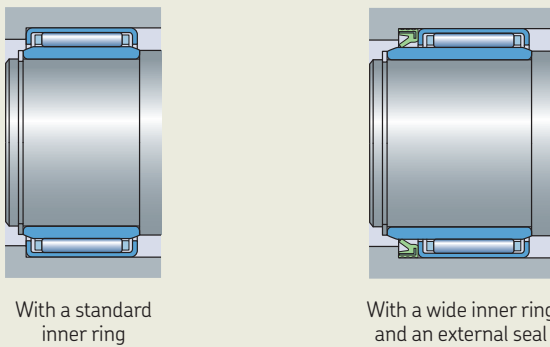


Fig. 13

Drawn cup needle roller bearing combined with a needle roller thrust bearing

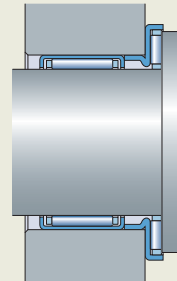


Fig. 14

Needle roller bearing with machined rings

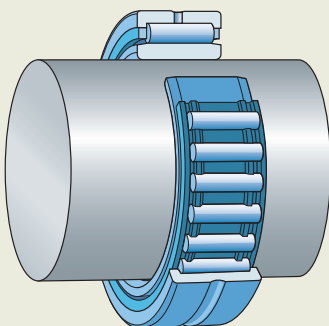


Fig. 15

Needle roller bearing with a machined outer ring

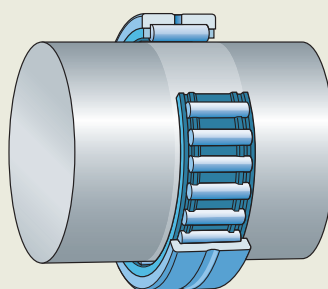
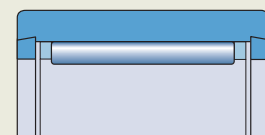


Fig. 16

Needle roller bearing with non-separable closure rings



NK ( $F_w \leq 10 \text{ mm}$ )

## Basic design bearings

### Needle roller bearings with machined rings, with flanges

- are available open (without seals) or sealed on one or both sides
- are available with or without an inner ring
- with  $D \leq 17 \text{ mm}$  ( $F_w \leq 10 \text{ mm}$ ), are available with non-separable closure rings that act as flanges (fig. 16)

The flanges on larger bearings are an integral part of the outer ring, and the bearings have an annular groove and one or more lubrication holes in the outer ring (fig. 17).

- are generally designed as single row bearings, with the exception of RNA 69 (fig. 18) and NA 69 series double row bearings with  $D \geq 52 \text{ mm}$  ( $F_w \geq 40 \text{ mm}$ )

The roller and cage assembly and outer ring of a needle roller bearing with flanges form a non-separable unit.

### Needle roller bearings with machined rings, without flanges

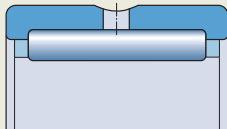
- are separable, i.e. the outer ring, needle roller and cage assembly, and inner ring, can all be mounted separately (fig. 19)
  - Needle roller and cage assemblies can, depending on the arrangement design, either be mounted:
    - together with the outer ring
    - together with the shaft
    - together with the inner ring
    - between the outer ring and shaft or inner ring as the final step
  - However, needle roller and cage assemblies and bearing outer rings must always be kept together as supplied.
- are generally designed with one needle roller and cage assembly
  - However, wide sizes incorporate two needle roller and cage assemblies immediately adjacent to each other and have an annular groove and a lubrication hole in the outer ring (fig. 20).

### Arrangements with other bearings

To accommodate combined radial and axial loads, needle roller bearings with machined rings can be combined with a needle roller thrust bearing with a centring flange, AXW series, if the outside diameter  $D$  of the radial bearing is equal to the flange diameter  $D_1$  of the thrust bearing (fig. 21, and *Needle roller thrust bearings*, page 895).

Fig. 17

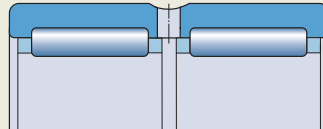
Needle roller bearing with integral flanges in the outer ring



NK ( $F_w \geq 12 \text{ mm}$ )  
 NKS  
 RNA 48, RNA 49  
 RNA 69 ( $F_w \leq 35 \text{ mm}$ )

Fig. 18

Double row needle roller bearing with flanges



RNA 69 ( $F_w \geq 40 \text{ mm}$ )

Fig. 19

Separable design

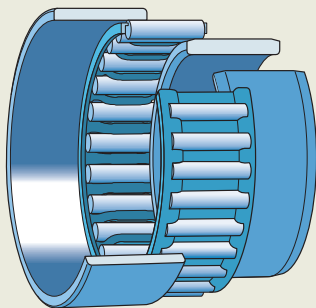


Fig. 20

Double row needle roller bearing without flanges

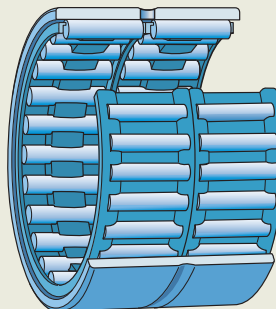
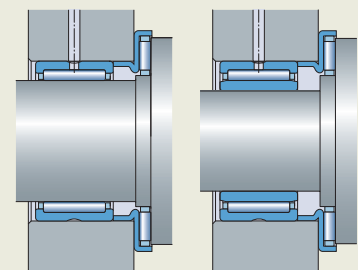


Fig. 21

Needle roller bearing with a needle roller thrust bearing



Without an inner ring

With an inner ring



## Alignment needle roller bearings

SKF alignment needle roller bearings have an outer ring with a sphered (convex) outside surface. Two polymer seating rings with a sphered (concave) inside surface are encased in a drawn sheet steel sleeve and fitted over the outer ring.

SKF supplies alignment needle roller bearings with or without an inner ring (fig. 22).

### Bearings with an inner ring

- should be used in applications where the shaft cannot be hardened and ground
- have limited permissible axial displacement of the shaft relative to the housing (product table, page 650), which can be extended, if needed, by using a wide inner ring (Needle roller bearing inner rings, page 593)

### Bearings without an inner ring

- are an excellent choice for compact bearing arrangements, if the shaft can be hardened and ground.

## Combined needle roller bearings

SKF combined needle roller bearings consist of a radial needle roller bearing combined with a thrust bearing. They can accommodate both radial and axial loads. They are particularly suitable for applications where other types of locating bearing arrangements occupy too much space, or where the axial loads are too heavy, the speeds are too high, or the lubricant is inadequate for arrangements with simple thrust washers. SKF supplies combined needle roller bearings in the following basic designs:

- needle roller / angular contact ball bearing
- needle roller / thrust ball bearing
- needle roller / cylindrical roller thrust bearing

Relubrication intervals for the radial and thrust part of the bearing must be calculated separately. The shorter of the two intervals should be used. For additional information about lubrication, refer to *Lubrication*, page 110.

## Needle roller / angular contact ball bearings

SKF supplies needle roller / angular contact ball bearings without seals in two series (fig. 23):

- NKIA 59 series bearings can accommodate axial loads in one direction
- NKIB 59 series bearings can accommodate axial loads in both directions

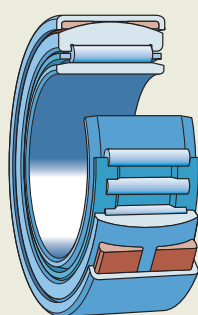
These combined bearings:

- consist of a radial needle roller bearing and an angular contact ball bearing
- accommodate heavy radial loads, carried exclusively by the needle roller bearing
- accommodate light axial loads, carried exclusively by the angular contact ball bearing
- are low cross section bearings
- can operate at high speeds
- are separable, i.e. the inner ring can be mounted separately from the outer ring and rolling element and cage assemblies
- can be grease or oil lubricated, depending on the application

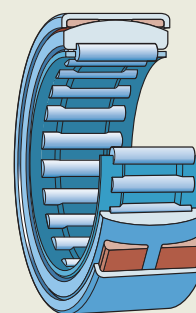
In the case of grease lubrication, both the needle roller and angular contact ball bearings should be filled with the same lubricant prior to mounting.

Fig. 22

### Alignment needle roller bearing



With an inner ring, PNA



Without an inner ring, RPNA

### NKIA series bearings

- can accommodate axial loads in one direction and, therefore, locate the shaft in one direction only
- can be mounted back-to-back (fig. 24), for short shafts and where changes in length due to thermal expansion are relatively minor

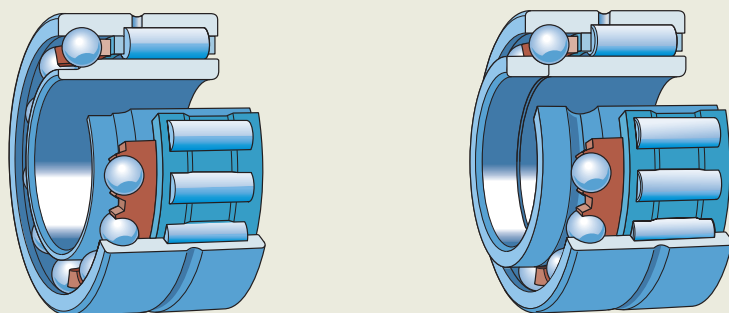
### NKIB series bearings

- can locate the shaft in both directions
- have axial clearance, between 0,08 and 0,25 mm
- have a two-piece inner ring to facilitate mounting
 

When mounting the inner ring, it is important that the two pieces are axially clamped to one another.
- have inner rings, which are not interchangeable with those from another seemingly identical bearing (keep together as supplied)

Fig. 23

Needle roller / angular contact ball bearing

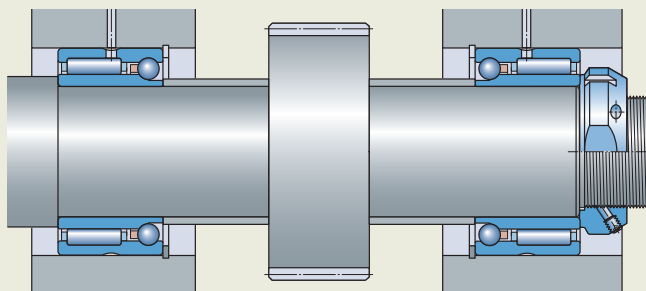


NKIA 59

NKIB 59

Fig. 24

NKIA series bearings arranged back-to-back



## 7 Needle roller bearings

### Needle roller / thrust ball bearings

SKF supplies needle roller / thrust ball bearings in two series (fig. 25):

- NX series with a full complement thrust ball bearing
- NKX series with a thrust ball bearing with a cage

These combined bearings:

- consist of a radial needle roller bearing and a thrust ball bearing
- are supplied without an inner ring
- can be combined with an inner ring (fig. 26), where the shaft cannot be hardened and ground (product tables, page 654 and page 656, must be ordered separately)
- can accommodate axial loads in one direction and, therefore, locate the shaft in one direction only

- can be mounted back-to-back (fig. 27), for short shafts and where changes in length due to thermal expansion are relatively minor

For these types of arrangements, SKF recommends preloading the thrust ball bearings with Belleville washers (cup springs). This preload helps to prevent the balls from skidding if one of the thrust bearings becomes unloaded. Preload also improves performance of the thrust ball bearings while reducing noise levels.

### NX series bearings

- consist of a radial needle roller bearing and a full complement thrust ball bearing (fig. 28)
- are suitable for applications where there are moderate radial loads and lighter, single direction axial loads
- have low cross-sectional height, which enables shaft centrelines to be positioned close together like for multi-spindle drills
- can be mounted with a snap ring, or against a shoulder in the housing bore, for axial support

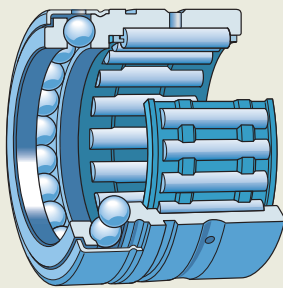
The snap ring groove in the outer ring provides a cost-effective and axially space-saving solution (fig. 29 and product tables, 7.8, page 654).

- are most often oil lubricated and therefore supplied without grease
- have a stamped steel cover that
  - extends over the shaft washer of the full complement thrust ball bearing
  - is firmly attached to the radial needle roller bearing
  - makes these bearings non-separable
  - has lubrication holes as standard
  - has no lubrication holes for bearings with designation suffix Z (fig. 28)

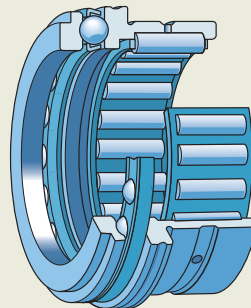
These bearings can be grease lubricated.

Fig. 25

#### Needle roller / thrust ball bearing



Full complement thrust bearing, NX



Thrust bearing with a cage, NKX

Fig. 26

#### NX series bearing with an inner ring

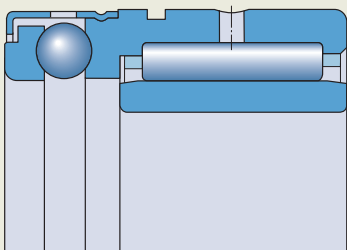
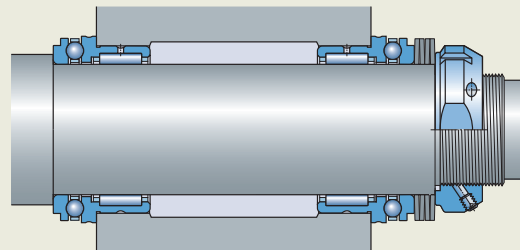


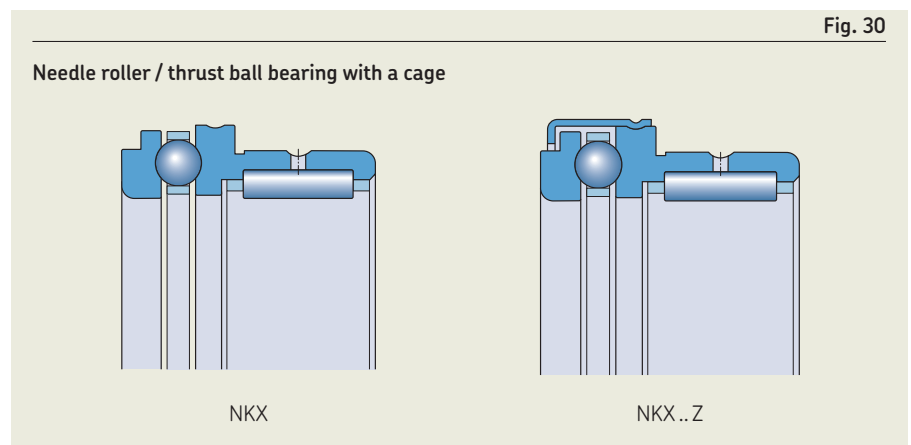
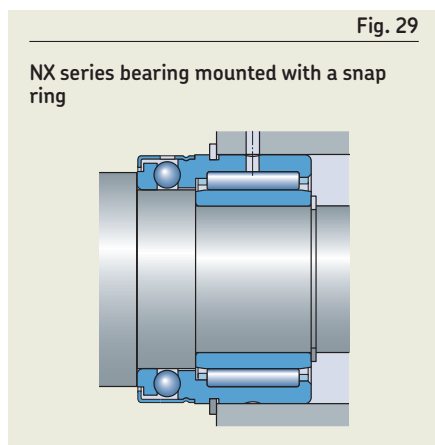
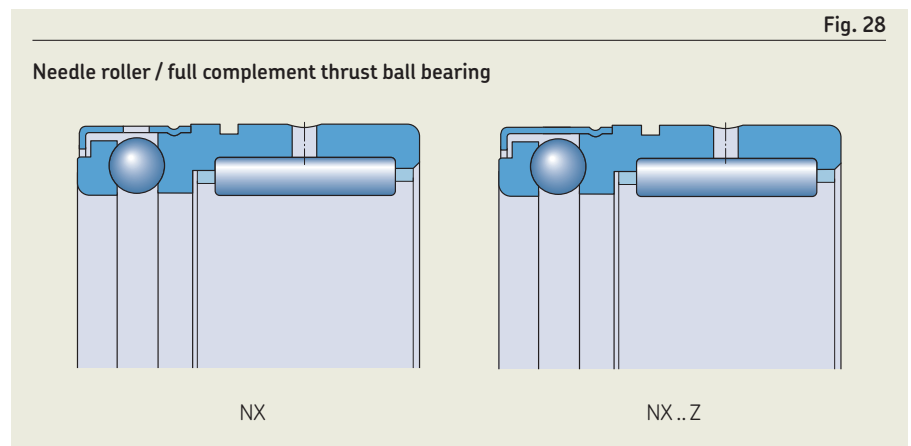
Fig. 27

#### NKX series bearings arranged back-to-back, incorporating Belleville washers



### NKX series bearings with a cage

- consist of a radial needle roller bearing and a thrust ball bearing with a ball and cage thrust assembly identical to the 511 series (fig. 30)
- permit relatively high-speed operation
- are located axially in one direction by the outer ring flange
- can be mounted separately from both the ball and cage assembly and shaft washer
- should be oil lubricated, as there is no cover that retains the grease in the bearing
- have no stamped steel cover, as standard
- have a stamped steel cover for bearings with designation Z (fig. 30) that
  - has no lubrication holes
  - extends over the shaft washer of the thrust ball bearing
  - is firmly attached to the housing washer that is integral to the needle roller bearing outer ring
  - makes these bearings non-separable



## 7 Needle roller bearings

### Needle roller / cylindrical roller thrust bearings

SKF supplies needle roller / cylindrical roller thrust bearings in the NKXR series (fig. 31).

These combined bearings:

- consist of a radial needle roller bearing and a cylindrical roller thrust bearing
- The cylindrical roller and cage thrust assembly is identical to the 811 series.
- are supplied without an inner ring
- can be combined with an inner ring (fig. 32), where the shaft cannot be hardened and ground (product table, page 658, must be ordered separately)
- can accommodate axial loads in one direction
- can locate the shaft in one direction only
- can be mounted back-to-back (fig. 33) for short shafts and where changes in length due to thermal expansion are relatively minor

For these types of arrangements, SKF recommends preloading the thrust ball bearings with Belleville washers (cup springs). This elastic preload helps to prevent the balls from skidding if one of the thrust bearings becomes unloaded. Preload also improves performance of the thrust ball bearings while reducing noise levels.

### NKXR series bearings

- are separable
  - can be mounted separately from both the cylindrical roller and cage thrust assembly and the shaft washer
  - should be oil lubricated, as oil facilitates an adequate supply of lubricant to the bearing
  - have no stamped steel cover, as standard
- have a stamped steel cover for bearings with designation suffix Z (fig. 34) that
    - has no lubrication holes
    - extends over the shaft washer of the cylindrical roller thrust bearing
    - is firmly attached to the housing washer that is integral to the needle roller bearing outer ring
    - makes these bearings non-separable

Fig. 31

Needle roller / cylindrical roller thrust bearing

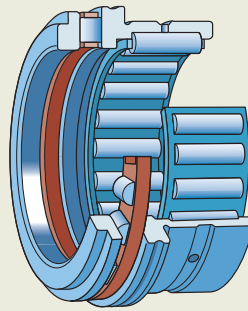


Fig. 32

NKXR .. Z bearing with an inner ring

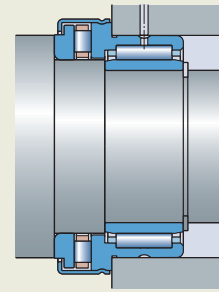


Fig. 33

NKXR series bearings arranged back-to-back, incorporating Belleville washers

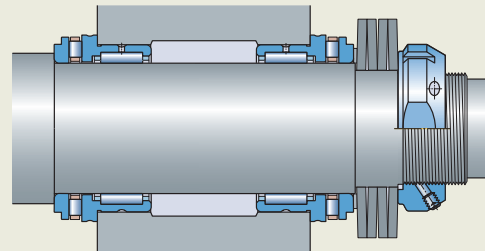
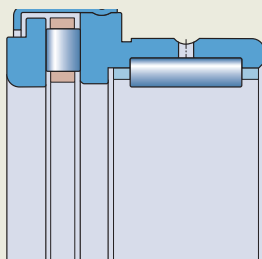


Fig. 34

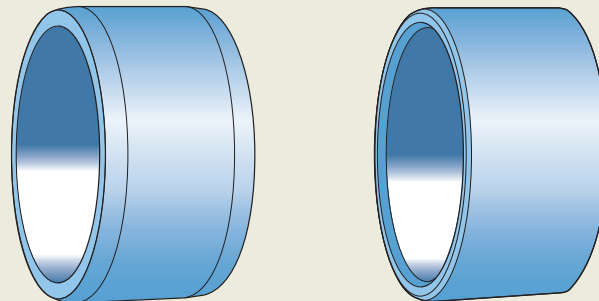
Needle roller / cylindrical roller thrust bearing



NKXR .. Z

Fig. 35

Inner rings



IR

LR

# Needle roller bearing components

## Needle roller bearing inner rings

SKF supplies inner rings for needle roller bearings separately. They are typically combined with needle roller and cage assemblies (page 583) or drawn cup needle roller bearings (page 584) in applications where the shaft cannot be hardened and ground.

Inner rings are available in two series (fig. 35):

- IR series
  - with or without a lubrication hole
  - with or without a machining allowance
- LR series

Both inner ring series:

- are also available in different widths
- permit greater axial displacement of the shaft, relative to the housing, when they are wider than standard
  - provide an excellent counterface for the lips of contact seals (fig. 12, page 586)
- should be located on both sides to prevent axial movement (regardless of whether the ring has an interference or loose fit)
  - one side can be located against a shoulder
  - the other side can be located by either a snap ring, a distance ring or a nut

## IR series inner rings

- are the standard SKF inner rings for needle roller bearings
- are hardened and ground
- have a precision ground raceway surface with a lead-in chamfer on both sides

The chamfers facilitate assembly and protect the seal lips from damage during the mounting process.

- are available in some sizes with a lubrication hole (designation suffix IS1, fig. 36)

Inner rings with additional lubrication holes are available on request.

- are available on request with a pre-ground raceway and a machining allowance (designation suffix VGS, table 2)

They can be finish ground after mounting on a shaft in applications where extremely tight geometrical tolerances are required.

## LR series inner rings

- are hardened, and the bore and raceway diameter are ground
- side faces are turned and the edges are smoothed
- can be used to provide a cost-effective bearing arrangement for applications where the larger run-out and width tolerances are less important

## Needle rollers

Needle rollers can be used to design full complement bearing arrangements for low-speed or oscillating applications. These compact bearing arrangements have a very high load carrying capacity when compared to bearings with a cage and are economical, provided the shaft and housing bore can serve as raceways (*Raceways on shafts and in housings*, page 179).

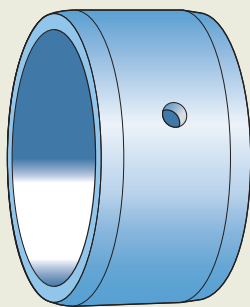
Needle rollers:

- are not listed in this catalogue, but can be found online at [skf.com/go/17000-7-12](http://skf.com/go/17000-7-12)
- are made of carbon chromium steel
- have a hardness of 58 to 65 HRC
- have a precision ground surface

For assistance in designing full complement bearing arrangements or to calculate performance data for these bearing arrangements, contact the SKF application engineering service.

Fig. 36

Inner ring with a lubrication hole



IR .. IS1

Table 2

Machining allowance of inner ring raceway diameter

| Raceway diameter<br>F | Machining allowance<br>z | Pre-ground raceway diameter<br>F <sub>VGS</sub> |
|-----------------------|--------------------------|---|
| >      ≤              |                          |   |
| mm                    | mm                       | mm  |
| –                     | 50                       | 0,10  |
| 50                    | 80                       | 0,15  |
| 80                    | 180                      | 0,20  |
| 180                   | 250                      | 0,25  |
| 250                   | 315                      | 0,30  |
| 315                   | 400                      | 0,35  |
| 400                   | 500                      | 0,40  |

F<sub>VGS</sub> = F + z  
(tolerance class h7(ⓔ))

## Sealing solutions

### Associated external seals

- can be used for needle roller bearing arrangements (fig. 12, page 586)
- can be supplied in various sizes, as listed in the product tables:
  - Needle roller and cage assemblies, page 614
  - Drawn cup needle roller bearings, page 618
  - Needle roller bearings with machined rings with flanges, without an inner ring, page 624

For information about associated power transmission seals, refer to [skf.com/seals](http://skf.com/seals).

### Capped bearings

SKF supplies certain needle roller bearings capped with a seal or steel cover. The assortment of capped bearings includes:

- drawn cup needle roller bearings, sealed on one or both sides
- needle roller bearings with machined rings in the (R)NA 49 series, sealed on one or both sides
- combined needle roller bearings, capped with a steel cover over the thrust part of the bearing

When capped bearings must operate under certain conditions, such as very high speeds or high temperatures, some grease may leak. For bearing arrangements where this would be detrimental, appropriate actions could be taken.

### Sealed drawn cup needle roller bearings

For applications where a sufficiently effective seal is not available, or cannot be used for space reasons, SKF supplies certain drawn cup needle roller bearings as sealed bearings. The assortment includes:

- drawn cup needle roller bearings with open ends (fig. 37)
  - available for  $8 \leq F_w \leq 50$  mm
  - sealed on one side (designation suffix RS)
  - sealed on both sides (designation suffix .2RS)
- sealed drawn cup needle roller bearings with a closed end (designation suffix RS, fig. 38)
  - available for  $10 \leq F_w \leq 25$  mm

These integral contact seals are made of PUR, FKM or NBR. Sealed drawn cup needle roller bearings are, under normal conditions and with appropriate counterface, an extremely cost-effective solution to exclude solid contaminants and moisture, and retain the lubricant in the bearing.

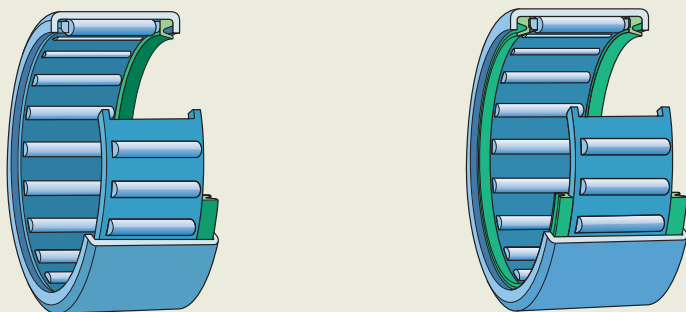
### ⚠ WARNING

Seals made of FKM (fluoro rubber) exposed to an open flame or temperatures above 300 °C (570 °F) are a health and environmental hazard! They remain dangerous even after they have cooled.

Read and follow the safety precautions on page 197.

Fig. 37

Sealed drawn cup needle roller bearing with open ends

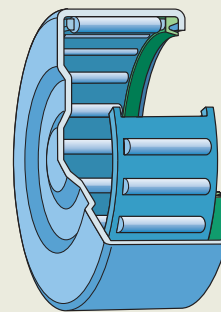


HK .. RS

HK ...2RS

Fig. 38

Sealed drawn cup needle roller bearing with a closed end



BK .. RS

### Sealed needle roller bearings with machined rings

- are available in the (R)NA 49 series with a contact seal made of NBR (effective at keeping the lubricant in and contaminants out of the bearing) on one (designation suffix RS) or both sides (designation suffix .2RS) (fig. 39)
- have an inner ring that is 1 mm wider than the outer ring, which maintains the effectiveness of the seals and simplifies the bearing arrangements even when small axial displacements occur

### Capped combined needle roller bearings

SKF supplies certain combined needle roller bearings capped with a stamped steel cover over the thrust part of the bearing (designation suffix Z). The cover, which has no lubrication holes, forms a gap-type seal to retain

the grease in the bearing. The assortment includes:

- needle roller / full complement thrust ball bearings (fig. 28, page 591)
- needle roller / thrust ball bearings (fig. 30, page 591)
- needle roller / cylindrical roller thrust bearings (fig. 34, page 592)

### Greases for capped bearings

Needle roller bearings with one or two seals are supplied greased. The thrust part of combined needle roller bearings with the designation suffix Z is also supplied greased. They are filled with high-quality grease (table 3) under clean conditions.

The relatively large quantity of grease in the bearings means they can be operated for long periods before relubrication is required. SKF recommends SKF LGWA 2 grease (table 3), if relubrication is required.

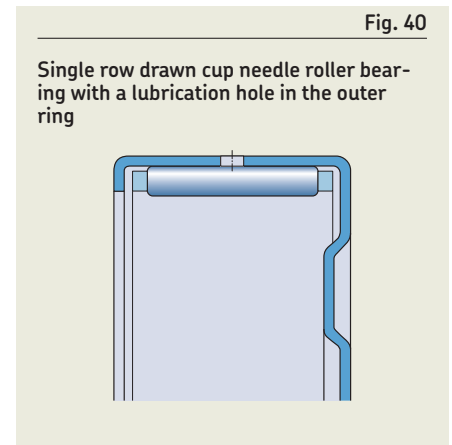
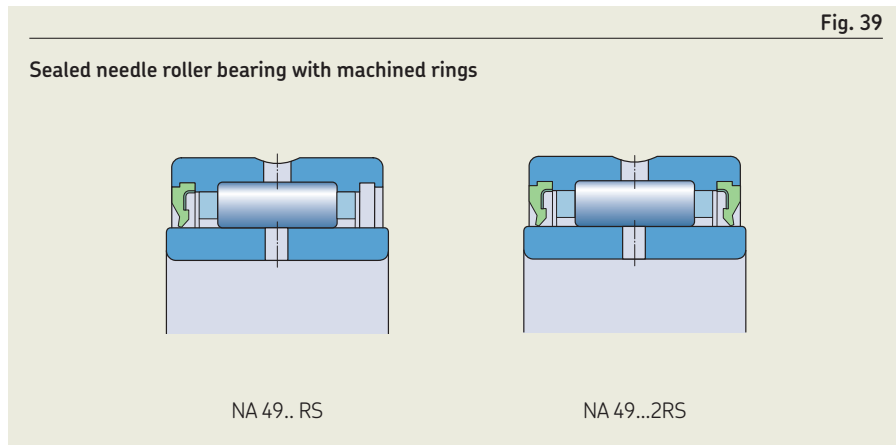
## Relubrication features

SKF supplies needle roller bearings with different features to facilitate effective lubrication and relubrication.

### Drawn cup needle roller bearings

All double row drawn cup needle roller bearings have one lubrication hole in the outer ring (fig. 11, page 585), as standard.

On request, SKF can supply any single row drawn cup needle roller bearing for inside diameters under the rollers  $F_w \geq 7$  mm with a lubrication hole in the outer ring (fig. 40).



**Table 3**

**Technical specifications of greases for capped needle roller bearings**

| Grease              | Temperature range <sup>1)</sup> |   |    |     |     |     |     |    | Thickener            | Base oil type | NLGI grade | Base oil viscosity [mm <sup>2</sup> /s] |                    |
|---------------------|---------------------------------|---|----|-----|-----|-----|-----|----|----------------------|---------------|------------|---|--------------------|
|                     | -50                             | 0 | 50 | 100 | 150 | 200 | 250 | °C |                      |               |            | at 40 °C (105 °F)                       | at 100 °C (210 °F) |
| Initial grease fill |                                 |   |    |     |     |     |     |    | Lithium complex soap | Mineral       | 2          | 160                                     | 15,5               |
| LGWA 2              |                                 |   |    |     |     |     |     |    | Lithium complex soap | Mineral       | 2          | 185                                     | 15                 |

<sup>1)</sup> Refer to the SKF traffic light concept (page 117).



## 7 Needle roller bearings

### Needle roller bearings with machined rings

- with flanges and  $D \geq 19$  mm ( $F, F_w \geq 12$  mm) have an annular groove and, depending on the bearing size, one or more lubrication holes in the outer ring (fig. 17, page 587)
- with seal(s) have an additional lubrication hole in the inner ring (fig. 39, page 595)
- double row and without flanges have an annular groove with one lubrication hole in the outer ring (fig. 20, page 587)
- without flanges and with an inner ring have one lubrication hole in the inner ring for certain sizes (product table, page 636)

### Combined needle roller bearings

The needle roller bearing used in combined bearings has an annular groove with one lubrication hole in the outer ring.

Needle roller / full complement thrust ball bearings in the NX series without the designation suffix Z have a cover with lubrication holes over the thrust part of the bearing (fig. 28, page 591). Most often they are oil lubricated and, therefore, SKF supplies these bearings without grease.

## Cages

SKF needle roller bearings are fitted with one of the cage designs shown in table 4.

When used at high temperatures, some lubricants can have a detrimental effect on polyamide cages. For additional information about the suitability of cages, refer to *Cages*, page 187.

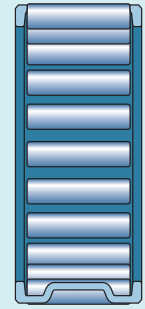
### Double row needle roller bearings

Double row needle roller and cage assemblies have a double row cage in the same design as a single row cage (fig. 4, page 583).

Other double row needle roller bearings are fitted with two cage assemblies (fig. 11, page 585, and fig. 18, page 587).

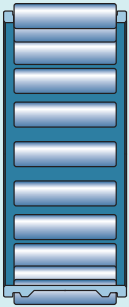
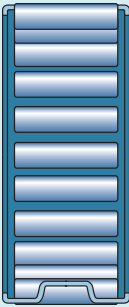
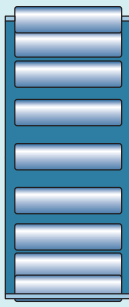

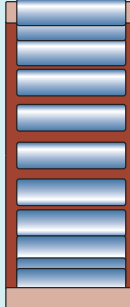

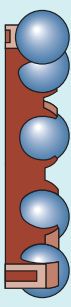

#### Cages for needle roller bearings

##### Cages for radial bearings



|  |                               |
|--|-------------------------------|
| Cage type  | Window-type                   |
| Material   | Sheet steel or machined steel |
| Suffix   | –                             |
| Bearing types                                      |                               |
| Needle roller and cage assemblies                  | Standard                      |
| Drawn cup needle roller bearings                   | –                             |
| Needle roller bearings with machined rings         | –                             |
| Alignment needle roller bearings                   | –                             |
| Needle roller / angular contact ball bearings      | –                             |
| Needle roller / thrust ball bearings               | –                             |
| Needle roller / cylindrical roller thrust bearings | –                             |

Table 4

|   |   |   |   |   | Cages for thrust bearings   |   |   |
|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |
| Window-type   | Window-type   | Window-type   | Window-type   | Window-type   | Window-type   | Snap-type   | Window-type   |
| Sheet steel or machined steel   | Sheet steel   | Sheet steel   | Sheet steel or machined steel   | Glass fibre reinforced PA66   | Sheet steel   | Glass fibre reinforced PA66   | Glass fibre reinforced PA66   |
| -   | -   | -   | -   | TN  | -   | -   | -   |
| -   | Standard  | -   | -   | Standard  | -   | -   | -   |
| -   | -   | Standard  | -   | Standard  | -   | -   | -   |
| Standard  | -   | -   | Standard  | Standard  | -   | -   | -   |
| Standard  | -   | -   | Standard  | -   | -   | -   | -   |
| Standard  | -   | -   | Standard  | -   | -   | Standard  | -   |
| Standard  | -   | -   | Standard  | Standard  | Standard  | -   | -   |
| Standard  | -   | -   | Standard  | -   | -   | -   | Standard  |

# Bearing data

|   | Needle roller and cage assemblies   | Drawn cup needle roller bearings   |
|---|---|--|
| <b>Dimension standards</b>                              | ISO 3030 when $F_w \leq 100$ mm, as far as standardized   | Boundary dimensions:<br>ISO 3245, as far as standardized   |
| <b>Tolerances</b>                                       | <ul style="list-style-type: none"> <li>• rollers: ISO 3096 Grade 2 (grade G2)               <ul style="list-style-type: none"> <li>– tolerance of each gauge 2 <math>\mu\text{m}</math></li> <li>– standard gauges (<a href="#">table 5, page 601</a>)</li> <li>– specific gauge to be stated when ordering</li> </ul> </li> <li>• U: ISO 3030, as far as standardized (<math>-0,2/-0,8</math> mm)</li> </ul> | ISO 3245, as far as standardized <ul style="list-style-type: none"> <li>• <math>F_w \approx</math> within F8 (<a href="#">table 8, page 602</a>)<br/>Measuring of <math>F_w</math>:               <ul style="list-style-type: none"> <li>– bearing must be pressed into a thick-walled ring gauge, bore diameter listed in <a href="#">table 8</a></li> <li>– check deviation of <math>F_w</math> with measuring mandrel</li> </ul> </li> <li>• C: <math>0/-0,3</math> mm</li> </ul> |
| For additional information<br>→ <a href="#">page 35</a> |   | Dimensional tolerances can be checked only if bearings are mounted.  |
| <b>Operating clearance</b>                              | Range of C2 to Normal if: <ul style="list-style-type: none"> <li>• fitted with standard gauge rollers (<a href="#">table 5, page 601</a>)</li> <li>• recommended raceway tolerances (<a href="#">table 6, page 601</a>) applied</li> <li>• normal operating conditions</li> </ul>   | Range of C2 to C3 if recommended tolerances ( <a href="#">table 17, page 610</a> ) applied   |
| <b>Internal clearance</b>                               | Specific ranges: <a href="#">table 7, page 602</a>  | –  |
| <b>Permissible misalignment</b>                         | $\approx 1$ minute of arc<br><br>Misalignment increases bearing noise and reduces bearing service life, ...   | $\approx 1$ minute of arc  |

| Needle roller bearings with machined rings  | Alignment needle roller bearings  |
|---|---|
| Boundary dimensions:<br>ISO 1206 for bearings in the (R)NA 48, (R)NA 49 and (R)NA 69 series   | d, D: ISO 15<br>D ≤ 47 mm → diameter series 0<br>D ≥ 55 mm → diameter series 9  |
| <p>Normal<br/>P6 or P5 on request</p> <ul style="list-style-type: none"> <li>F<sub>w</sub>: F6 (table 9, page 603)<br/>Values are valid for unmounted bearings when rollers are in contact with the outer ring raceway.</li> </ul> <p>Tighter tolerance for inside diameter under the rollers on request (designation suffix H followed by two numbers that identify the tolerance limit, e.g. H+24+20).</p> <p>Values: ISO 492 (table 2, page 38, to table 4, page 40)</p> | <ul style="list-style-type: none"> <li>Normal for the inner ring and the outer ring with sphered outside surface</li> <li>C of the external drawn sheet steel sleeve: ± 0,5 mm</li> <li>F<sub>w</sub>: F6 (table 9, page 603)<br/>Values are valid for unmounted bearings and when rollers are in contact with the outer ring raceway.</li> </ul> <p>Values: ISO 492 (table 2, page 38)</p> |
| <p><b>Bearings without an inner ring</b><br/>Suitable ranges (table 10, page 603) where:</p> <ul style="list-style-type: none"> <li>recommended shaft tolerance classes applied</li> <li>housing bore tolerance not tighter than K7<sup>Ⓔ</sup></li> </ul>  | <p><b>Bearings without an inner ring</b><br/>Range of C2 to C3 if recommended tolerances (table 17, page 610) applied</p>   |
| <p>Normal (bearings with an inner ring)<br/>Check availability of C2, C3 or C4 clearance classes</p> <p>Values: ISO 5753-1 (table 11, page 603)<br/>Values are valid for unmounted bearings under zero measuring load.</p>  |   |
| <p>≈ 1 minute of arc</p>  | <p>≤ 3° static misalignment<br/>No dynamic misalignment</p>   |

... and when it exceeds the guideline value these effects become particularly noticeable.

Bearing data, continued

|                                      | Needle roller / angular contact ball bearings  | Needle roller / thrust ball bearings   | Needle roller / cylindrical roller thrust bearings |
|--------------------------------------|--|--|--|
| <b>Dimension standards</b>           | Boundary dimensions:<br>ISO 15 – dimension series 59, except for following inner ring parameters in the NKIB 59 series: <ul style="list-style-type: none"> <li>• extended width on one side</li> <li>• slightly larger bore diameter of the narrow part</li> </ul> | Boundary dimensions:<br>DIN 5429-1, except for NX and NX..Z series bearings (not standardized)   | Boundary dimensions:<br>DIN 5429-1                 |
| <b>Tolerances</b>                    | Normal, except for width of the complete inner ring in the NKIB 59 series: 0/−0,3 mm<br><br>Values: ISO 492 (table 2, page 38)   | D: Normal<br>F <sub>w</sub> : F6 (table 9, page 603)<br>d: E8 (table 9)<br>C: 0/−0,25 mm<br>C <sub>1</sub> (applicable to NKX(R) series only): 0/−0,2 mm<br><br>Values:<br>Radial bearings → ISO 492 (table 2, page 38)<br>Thrust bearings → ISO 199 (table 10, page 46) |  |
| For additional information → page 35 |  |  |  |
| <b>Operating clearance</b>           | –  | <b>Bearings without an inner ring</b><br>Range slightly less than Normal if recommended tolerances (table 17, page 610) applied  |  |
| <b>Internal clearance</b>            | Normal (bearings with an inner ring)<br>Check availability of C2, C3 or C4 clearance classes<br><br>Values: ISO 5753-1 (table 11, page 603)<br>Values are valid for unmounted bearings under zero measuring load.  | –  |  |
| <b>Permissible misalignment</b>      | Misalignment increases bearing noise and reduces bearing service life.   | Cannot tolerate any misalignment.  |  |

| Bearing data, continued   |  |  |   |
|---|--|--|---|
|   | Needle roller bearing inner rings  |  | Needle rollers  |
|   | IR series  | LR series  |   |
| <b>Dimension standards</b>  | –  |  | ISO 3096, except for RN-2x6.3 BF/G2 that is not standardized  |
| <b>Tolerances</b><br>For additional information → <a href="#">page 35</a> | Normal<br>Values: ISO 492 ( <a href="#">table 2, page 38</a> ), except for raceway tolerances ( <a href="#">table 12, page 604</a> ) | F: h6<br>B: h12<br>d: K6<br>Values: <a href="#">table 13, page 604</a> | ISO 3096 Grade 2 for flat end needle rollers<br>Available tolerances ( <a href="#">table 14, page 604</a> ) |
| <b>Operating clearance</b>  | Depends on the bearing type with which the inner ring is combined.   |  | –   |
| <b>Internal clearance</b>   | Depends on the bearing type with which the inner ring is combined.   |  | –   |



Table 5

| Needle roller gauges |   |
|----------------------|---|
| Gauge type           | Gauge   |
| –                    | μm  |
| Standard gauges      | 0/–2<br>–1/–3<br>–2/–4<br>–3/–5<br>–4/–6<br>–5/–7 |

For additional gauges available on request, contact SKF.

Table 6

| Raceway tolerance classes for needle roller and cage assemblies |     |   |                |                |
|---|-----|---|----------------|----------------|
| Shaft<br>Nominal diameter                                       |     | Housing/shaft tolerance classes for operating clearance <sup>1)</sup> |                |                |
| >   | ≤   | lower side  | medium         | higher side    |
| mm  |     | –   |                |                |
| –   | 80  | G6/f5<br>H6/h5  | G6/h5<br>H6/g5 | G6/g6<br>H6/f6 |
| 80  | 120 | G6/h5   | G6/g5          | G6/f6          |
| 120   | –   | G6/h5<br>–  | G6/g5<br>H6/f5 | G6/f6<br>H6/e6 |

<sup>1)</sup> The envelope requirement (symbol  $\text{E}$  from ISO 14405-1) is not shown but applies to all tolerance classes.

Table 7

## Mounting scheme – example

Needle roller and cage assembly: K 16x22x12  
 Housing bore diameter: 22H6 $\text{Ⓢ}$  [mm], deviation 0/+13  $\mu\text{m}$   
 Shaft diameter: 16h5 $\text{Ⓢ}$  [mm], deviation 0/-8  $\mu\text{m}$

| Shaft diameter<br>Deviation group | Housing bore diameter      |                           |                            |                           |                            |                           |                            |                           |
|-----------------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
|                                   | 0 to +3                    |                           | +3 to +6                   |                           | +6 to +9                   |                           | +9 to +13                  |                           |
|                                   | Needle roller gauge limits | Radial internal clearance | Needle roller gauge limits | Radial internal clearance | Needle roller gauge limits | Radial internal clearance | Needle roller gauge limits | Radial internal clearance |
| $\mu\text{m}$                     | $\mu\text{m}$              |                           |                            |                           |                            |                           |                            |                           |
| <b>0 to -3</b>                    |                            |                           |                            |                           | -5/-7                      | 18-24                     | -3/-5                      | 17-24                     |
| <b>-3 to -6</b>                   |                            |                           | -5/-7                      | 18-24                     | -3/-5<br>-4/-6             | 17-25                     | -2/-4                      | 18-25                     |
| <b>-6 to -8</b>                   | -5/-7<br>-6/-8             | 18-25                     | -3/-5<br>-4/-6             | 17-24                     | -2/-4<br>-3/-5             | 18-25                     | 0/-2<br>-1/-3              | 17-25                     |

The mean value of the needle roller gauge should be used to calculate the internal clearance, e.g. -6  $\mu\text{m}$  for the gauge -5 to -7  $\mu\text{m}$ .

Table 8

## Tolerances for drawn cup needle roller bearings

| Bearing Inside diameter $F_w$ | Outside diameter D | Ring gauge Bore diameter (measured) | Deviations from nominal inside diameter |     | Bearing Inside diameter $F_w$ | Outside diameter D | Ring gauge Bore diameter (measured) | Deviations from nominal inside diameter |     |
|-------------------------------|--------------------|-------------------------------------|---|-----|-------------------------------|--------------------|-------------------------------------|---|-----|
|                               |                    |                                     | U                                       | L   |                               |                    |                                     | U                                       | L   |
| mm                            | mm                 | mm                                  | $\mu\text{m}$                           |     | mm                            | mm                 | mm                                  | $\mu\text{m}$                           |     |
| <b>3</b>                      | 6,5                | 6,484                               | +24                                     | +6  | <b>18</b>                     | 24                 | 23,976                              | +34                                     | +16 |
| <b>4</b>                      | 8                  | 7,984                               | +28                                     | +10 | <b>20</b>                     | 26                 | 25,976                              | +41                                     | +20 |
| <b>5</b>                      | 9                  | 8,984                               | +28                                     | +10 | <b>22</b>                     | 28                 | 27,976                              | +41                                     | +20 |
| <b>6</b>                      | 10                 | 9,984                               | +28                                     | +10 | <b>25</b>                     | 32                 | 31,972                              | +41                                     | +20 |
| <b>7</b>                      | 11                 | 10,980                              | +31                                     | +13 | <b>28</b>                     | 35                 | 34,972                              | +41                                     | +20 |
| <b>8</b>                      | 12                 | 11,980                              | +31                                     | +13 | <b>30</b>                     | 37                 | 36,972                              | +41                                     | +20 |
| <b>9</b>                      | 13                 | 12,980                              | +31                                     | +13 | <b>32</b>                     | 39                 | 38,972                              | +50                                     | +25 |
| <b>10</b>                     | 14                 | 13,980                              | +31                                     | +13 | <b>35</b>                     | 42                 | 41,972                              | +50                                     | +25 |
| <b>12</b>                     | 16                 | 15,980                              | +34                                     | +16 | <b>40</b>                     | 47                 | 46,972                              | +50                                     | +25 |
| <b>12</b>                     | 18                 | 17,980                              | +34                                     | +16 | <b>45</b>                     | 52                 | 51,967                              | +50                                     | +25 |
| <b>13</b>                     | 19                 | 18,976                              | +34                                     | +16 | <b>50</b>                     | 58                 | 57,967                              | +50                                     | +25 |
| <b>14</b>                     | 20                 | 19,976                              | +34                                     | +16 | <b>55</b>                     | 63                 | 62,967                              | +60                                     | +30 |
| <b>15</b>                     | 21                 | 20,976                              | +34                                     | +16 | <b>60</b>                     | 68                 | 67,967                              | +60                                     | +30 |
| <b>16</b>                     | 22                 | 21,976                              | +34                                     | +16 |                               |                    |                                     |   |     |
| <b>17</b>                     | 23                 | 22,976                              | +34                                     | +16 |                               |                    |                                     |   |     |

Table 9

| ISO tolerance classes |     |                              |     |                              |     |
|-----------------------|-----|------------------------------|-----|------------------------------|-----|
| Nominal diameter      |     | E8 <sup>Ⓔ</sup><br>Deviation |     | F6 <sup>Ⓔ</sup><br>Deviation |     |
| >                     | ≤   | U                            | L   | U                            | L   |
| mm                    |     | μm                           |     | μm                           |     |
| –                     | 3   | –                            | –   | +12                          | +6  |
| 3                     | 6   | –                            | –   | +27                          | +10 |
| 6                     | 10  | +47                          | +25 | +33                          | +13 |
| 10                    | 18  | +59                          | +32 | +27                          | +16 |
| 18                    | 30  | +73                          | +40 | +33                          | +20 |
| 30                    | 50  | +89                          | +50 | +41                          | +25 |
| 50                    | 80  | +106                         | +60 | +49                          | +30 |
| 80                    | 120 | –                            | –   | +58                          | +36 |
| 120                   | 180 | –                            | –   | +68                          | +43 |
| 180                   | 250 | –                            | –   | +79                          | +50 |
| 250                   | 315 | –                            | –   | +88                          | +56 |
| 315                   | 400 | –                            | –   | +98                          | +62 |
| 400                   | 500 | –                            | –   | +108                         | +68 |

Table 10

| Shaft tolerance classes for machined needle roller bearings without an inner ring |     |  |        |             |
|---|-----|--|--------|-------------|
| Nominal inside diameter   |     | Shaft tolerance classes <sup>1)</sup> for shaft raceways to give operating clearance |        |             |
| F <sub>w</sub>  |     | lower side   | medium | higher side |
| >   | ≤   |  |        |             |
| mm  |     | –  |        |             |
| –   | 65  | k5   | h5     | g6          |
| 65  | 80  | k5   | h5     | f6          |
| 80  | 160 | k5   | g5     | f6          |
| 160   | 180 | k5   | g5     | e6          |
| 180   | 200 | j5   | g5     | e6          |
| 200   | 250 | j5   | f6     | e6          |
| 250   | 315 | h5   | f6     | d6          |
| 315   | 400 | g5   | f6     | d6          |

<sup>1)</sup> The envelope requirement (symbol <sup>Ⓔ</sup> from ISO 14405-1) is not shown but applies to all tolerance classes.

Table 11

| Radial internal clearance for needle roller bearings |     |                           |      |        |      |      |      |      |      |
|--|-----|---------------------------|------|--------|------|------|------|------|------|
| Bore diameter  |     | Radial internal clearance |      |        |      |      |      |      |      |
| d  |     | C2                        |      | Normal |      | C3   |      | C4   |      |
| >  | ≤   | min.                      | max. | min.   | max. | min. | max. | min. | max. |
| mm   |     | μm                        |      |        |      |      |      |      |      |
| –  | 30  | 0                         | 25   | 20     | 45   | 35   | 60   | 50   | 75   |
| 30   | 40  | 5                         | 30   | 25     | 50   | 45   | 70   | 60   | 85   |
| 40   | 50  | 5                         | 35   | 30     | 60   | 50   | 80   | 70   | 100  |
| 50   | 65  | 10                        | 40   | 40     | 70   | 60   | 90   | 80   | 100  |
| 65   | 80  | 10                        | 45   | 40     | 75   | 65   | 100  | 90   | 125  |
| 80   | 100 | 15                        | 50   | 50     | 85   | 75   | 110  | 105  | 140  |
| 100  | 120 | 15                        | 55   | 50     | 90   | 85   | 125  | 125  | 165  |
| 120  | 140 | 15                        | 60   | 60     | 105  | 100  | 145  | 145  | 190  |
| 140  | 160 | 20                        | 70   | 70     | 120  | 115  | 165  | 165  | 215  |
| 160  | 180 | 25                        | 75   | 75     | 125  | 120  | 170  | 170  | 220  |
| 180  | 200 | 35                        | 90   | 90     | 145  | 140  | 195  | 195  | 250  |
| 200  | 225 | 45                        | 105  | 105    | 165  | 160  | 220  | 220  | 280  |
| 225  | 250 | 45                        | 110  | 110    | 175  | 170  | 235  | 235  | 300  |
| 250  | 280 | 55                        | 125  | 125    | 195  | 190  | 260  | 260  | 330  |
| 280  | 315 | 55                        | 130  | 130    | 205  | 200  | 275  | 275  | 350  |
| 315  | 355 | 65                        | 145  | 145    | 225  | 225  | 305  | 305  | 385  |
| 355  | 400 | 100                       | 190  | 190    | 280  | 280  | 370  | 370  | 460  |





Table 12

Inner ring raceway tolerances

| Nominal diameter |     | F   |     | $t_{\Delta F_{mp}}$<br>for CN and EGS |      |
|------------------|-----|-----|-----|---------------------------------------|------|
| >                | ≤   | >   | ≤   | U                                     | L    |
| mm               |     | mm  |     | μm                                    |      |
| –                | 3   | 3   | 6   | –10                                   | –27  |
| 3                | 6   | 6   | 10  | –7                                    | –23  |
| 6                | 10  | 6   | 10  | –7                                    | –23  |
| 6                | 18  | 10  | 18  | –4                                    | –18  |
| 10               | 24  | 18  | 30  | 0                                     | –12  |
| 18               | 24  | 30  | 50  | 5                                     | –4   |
| 24               | 30  | 24  | 30  | 0                                     | –12  |
| 24               | 30  | 30  | 50  | 5                                     | –4   |
| 30               | 40  | 30  | 50  | 0                                     | –9   |
| 40               | 50  | 40  | 50  | –5                                    | –19  |
| 40               | 50  | 50  | 80  | 0                                     | –11  |
| 50               | 65  | 50  | 80  | –10                                   | –21  |
| 65               | 80  | 65  | 80  | –10                                   | –26  |
| 65               | 80  | 80  | 120 | –4                                    | –17  |
| 80               | 100 | 80  | 120 | –14                                   | –27  |
| 100              | 120 | 100 | 120 | –14                                   | –32  |
| 100              | 120 | 120 | 180 | –7                                    | –22  |
| 120              | 140 | 120 | 180 | –17                                   | –37  |
| 140              | 160 | 140 | 180 | –27                                   | –52  |
| 160              | 180 | 160 | 180 | –32                                   | –57  |
| 160              | 180 | 180 | 250 | –25                                   | –46  |
| 180              | 200 | 180 | 250 | –40                                   | –66  |
| 200              | 225 | 200 | 250 | –55                                   | –86  |
| 225              | 250 | 250 | 315 | –54                                   | –87  |
| 250              | 280 | 250 | 315 | –69                                   | –107 |
| 280              | 315 | 315 | 400 | –68                                   | –107 |
| 315              | 335 | 315 | 400 | –83                                   | –127 |
| 355              | 400 | 355 | 400 | –128                                  | –182 |
| 355              | 400 | 400 | 500 | –122                                  | –172 |

Table 13

ISO tolerance classes for LR series inner rings

| Nominal diameter |    | h6 <sup>Ⓔ</sup> |     | h12 <sup>Ⓔ</sup> |      | K6 <sup>Ⓔ</sup> |     |
|------------------|----|-----------------|-----|------------------|------|-----------------|-----|
| >                | ≤  | U               | L   | U                | L    | U               | L   |
| mm               |    | μm              |     | μm               |      | μm              |     |
| 6                | 10 | 0               | –9  | –                | –    | +2              | –7  |
| 10               | 18 | 0               | –11 | 0                | –180 | +2              | –9  |
| 18               | 30 | 0               | –13 | 0                | –210 | +2              | –11 |
| 30               | 50 | 0               | –16 | 0                | –250 | +3              | –13 |
| 50               | 80 | 0               | –19 | –                | –    | –               | –   |

Table 14

Dimensional and geometrical tolerances of SKF needle rollers, grade G2

| Diameter $D_w$ |       | Gauge tolerance | Gauge limits  | Roundness (max. circularity deviation in accordance with ISO 3096) | Length $L_w$ Tolerance class |
|----------------|-------|-----------------|---|--|------------------------------|
| Deviation      | $D_w$ |                 |   |  |                              |
| U              | L     |                 |   |  |                              |
| μm             |       |                 |   |  | –                            |
| 0              | –10   | 2               | 0/–2<br>–1/–3<br>–2/–4<br>–3/–5<br>–4/–6<br>–5/–7<br>–6/–8<br>–7/–9<br>–8/–10 | 1  | h13 <sup>Ⓔ</sup>             |

Preferred diameter deviations range from 0 to –7 μm.  
Each gauge is packed separately and marked with the gauge limits, e.g. N/M2 or M2/M4, where M signifies minus and N zero. For a needle roller with a 2 mm nominal diameter and gauge limits M2/M4, the actual diameter is between 1,998 mm and 1,996 mm.





# Loads

|   | Needle rollers and cage assemblies  | Drawn cup needle roller bearings | Needle roller bearings with machined rings | Alignment needle roller bearings |
|---|---|----------------------------------|--|----------------------------------|
| <b>Minimum load</b><br><br>For additional information<br>→ <a href="#">page 106</a>                   | $F_{rm} = 0,02 C$   |                                  |  |                                  |
| <b>Equivalent dynamic bearing load</b><br><br>For additional information<br>→ <a href="#">page 91</a> | $P = F_r$   |                                  |  |                                  |
| <b>Equivalent static bearing load</b><br><br>For additional information<br>→ <a href="#">page 105</a> | $P_0 = F_r$<br><br>For drawn cup needle roller bearings, SKF recommends applying a static safety factor $s_0 \geq 3$ , i.e. $s_0 = C_0/P_0 \geq 3$ .  |                                  |  |                                  |
|   | <b>Symbols</b><br><br>A minimum load factor ( <a href="#">product tables</a> )<br>C basic dynamic load rating [kN] ( <a href="#">product tables</a> )<br>C <sub>0</sub> basic static load rating [kN] ( <a href="#">product tables</a> )<br>d <sub>m</sub> bearing mean diameter [mm]<br>= 0,5 (d + D)<br>F <sub>a</sub> axial load [kN]<br>F <sub>am</sub> minimum axial load [kN]<br>F <sub>r</sub> radial load [kN]<br>F <sub>rm</sub> minimum radial load [kN]<br>n rotational speed [r/min]<br>P equivalent dynamic bearing load [kN]<br>P <sub>0</sub> equivalent static bearing load [kN]<br>s <sub>0</sub> static safety factor |                                  |  |                                  |



| <b>Combined needle roller bearings</b>  |  |  |
|---|--|--|
| Thrust part   |  |  |
| Angular contact ball bearing  | Thrust ball bearing                            | Cylindrical roller thrust bearing                            |
| $F_{am} = 0,25 \frac{C_0}{1\ 000} \left( \frac{n\ d_m}{100\ 000} \right)^2$                   | $F_{am} = A \left( \frac{n}{1\ 000} \right)^2$ | $F_{am} = 0,0005\ C_0 + A \left( \frac{n}{1\ 000} \right)^2$ |
| <p><math>P = F_a</math></p> <p><math>F_a</math> must not exceed <math>0,25\ F_r</math>.</p>   | $P = F_a$                                      | $P = F_a$  |
| <p><math>P_0 = F_a</math></p> <p><math>F_a</math> must not exceed <math>0,25\ F_r</math>.</p> | $P_0 = F_a$                                    | $P_0 = F_a$  |

# Temperature limits

The permissible operating temperature for needle roller bearings can be limited by:

- the dimensional stability of the bearing rings and rolling elements
- the cages
- the seals
- the seating rings
- the lubricant

Where temperatures outside the permissible range are expected, contact SKF.

## Bearing rings and rolling elements

SKF needle roller bearings, and roller and cage assemblies are heat stabilized up to 120 °C (250 °F).

Drawn cup needle roller bearings are heat stabilized up to 140 °C (285 °F).

## Cages

Steel cages can be used at the same operating temperatures as the bearing rings and rolling elements. For temperature limits of polymer cages, refer to *Polymer cages*, [page 188](#).

## Seals

The permissible operating temperature for seals depends on the seal material:

- NBR: -40 to +100 °C (-40 to +210 °F)  
Temperatures up to 120 °C (250 °F) can be tolerated for brief periods.
- PUR: -30 to +100 °C (-20 to +210 °F)
- FKM: -30 to +200 °C (-20 to +390 °F)  
Temperatures up to 230 °C (445 °F) can be tolerated for brief periods.

Typically, temperature peaks are at the seal lip.

## Seating rings

The permissible operating temperature for seating rings is -30 to +100 °C (-20 to +210 °F).

## Lubricants

Temperature limits for greases used in capped needle roller bearings are provided in [table 3, page 595](#), and for full complement drawn cup needle roller bearings in [table 1, page 585](#). For temperature limits of other SKF greases, refer to *Selecting a suitable SKF grease*, [page 116](#).

When using lubricants not supplied by SKF, temperature limits should be evaluated according to the SKF traffic light concept ([page 117](#)).

# Permissible speed

The speed ratings in the **product tables** indicate:

- the **reference speed**, which enables a quick assessment of the speed capabilities from a thermal frame of reference
- the **limiting speed**, which is a mechanical limit that should not be exceeded unless the bearing design and the application are adapted for higher speeds

For additional information, refer to *Operating temperature and speed*, [page 129](#).

# Design considerations

For general information, refer to *Bearing interfaces*, page 140.

## Abutment dimensions

### Needle roller and cage assemblies

Appropriate abutment diameters are provided in [table 15](#).

Recommendations for surfaces of adjacent machine components that guide needle roller and cage assemblies axially:

- fine turned and polished
- hardened and ground for high-speed operations
- no interruptions

For less demanding applications, snap rings can be used. Otherwise, use an intermediate ring, e.g. a spring steel washer, between the snap ring and the cage assembly.

### Needle roller bearings with machined rings, without flanges

Appropriate abutment diameters are listed in the [product tables](#).

Recommendations for surfaces of adjacent machine components that guide the cage of needle roller bearings without flanges axially:

- fine turned and polished
- hardened and ground for high-speed operations
- no interruptions

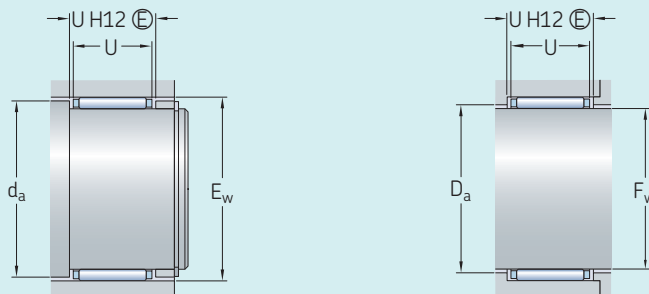
For less demanding applications, snap rings can be used. Otherwise, use an intermediate ring, e.g. a spring steel washer, between the snap ring and the cage assembly.

### Combined needle roller bearings

The diameter of the thrust bearing support surface in the housing should be at least 0,5 mm larger than the dimension  $D_1$  or  $D_2$  ([fig. 41](#) and product tables of *Needle roller / thrust ball bearings*, page 656, and *Needle roller / cylindrical roller thrust bearings*, page 658).

Table 15

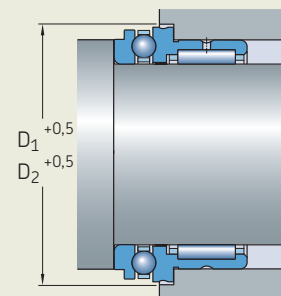
Abutment dimensions for needle roller and cage assemblies



| Needle roller and cage assembly |       | Shaft abutment | Housing abutment |
|---------------------------------|-------|----------------|------------------|
| Inside diameter                 |       | $d_a$          | $D_a$            |
| $F_w$                           | $E_w$ |                |                  |
| >                               | ≤     |                |                  |
| mm                              |       | mm             | mm               |
| –                               | 25    | $E_w - 0,3$    | $F_w + 0,4$      |
| 25                              | 65    | $E_w - 0,5$    | $F_w + 0,5$      |
| 65                              | –     | $E_w - 1$      | $F_w + 1$        |

Fig. 41

Abutment dimensions, combined needle roller bearing



## Shaft and housing tolerances

The following tables provide tolerance classes to obtain suitable fits and an appropriate operating clearance (page 598) for the following bearings:

- drawn cup needle roller bearings
- needle roller bearings with machined rings
- alignment needle roller bearings
- combined needle roller bearings

Shaft and housing raceway tolerances significantly influence the operating clearance of needle roller and cage assemblies and needle roller bearings with a machined outer ring (without an inner ring) and, therefore, are provided under *Operating clearance*, page 598.

For additional information about raceways, refer to *Raceways on shafts and in housings*, page 179.

### Drawn cup needle roller bearings

Suitable tolerance classes for the housing bore and shaft for bearings with or without an inner ring are provided in table 16.

### Needle roller bearings with machined rings

- Suitable tolerance classes for the shaft for bearings with machined inner and outer rings are provided in table 18.
- Housing seat tolerances for standard conditions are provided in table 8, page 151.

### Alignment needle roller bearings

Suitable tolerance classes for the housing bore and shaft for bearings with or without an inner ring are provided in table 16.

### Combined needle roller bearings

Suitable tolerance classes for the housing bore and shaft for bearings with or without an inner ring are provided in table 17.

Table 16

#### Shaft and housing tolerance classes for drawn cup and alignment needle roller bearings

| Housing material <sup>1)</sup> | Tolerance classes <sup>2)</sup> |  | Raceway on the shaft | Shaft inner ring seat |
|--------------------------------|---------------------------------|--|----------------------|-----------------------|
|                                | Housing bore seat <sup>3)</sup> |  |                      |                       |
| Steel, cast iron               | N6                              |  | h5                   | k5                    |
| Light alloy                    | R6                              |  | h5                   | k5                    |

<sup>1)</sup> For housings that are not rigid, determine the shaft tolerance by trial and error.

<sup>2)</sup> The envelope requirement (symbol  $\text{E}$  from ISO 14405-1) is not shown but applies to all tolerance classes.

<sup>3)</sup> The geometrical tolerance in accordance with ISO 1101 for the housing bore of drawn cup needle roller bearings must correspond to IT5/2 tolerance grade.

Table 17

#### Shaft and housing tolerance classes for combined needle roller bearings

| Thrust part                       | Tolerance class <sup>1)</sup> |                                     |
|-----------------------------------|-------------------------------|-------------------------------------|
|                                   | Housing bore seat             | Shaft (raceway and inner ring seat) |
| Angular contact ball bearing      | M6                            | k5                                  |
| Thrust ball bearing               | K6 <sup>2)</sup>              | k5                                  |
| Cylindrical roller thrust bearing | K6 <sup>2)</sup>              | k5                                  |

<sup>1)</sup> The envelope requirement (symbol  $\text{E}$  from ISO 14405-1) is not shown but applies to all tolerance classes.

<sup>2)</sup> For stiff bearing arrangements, SKF recommends an M6  $\text{E}$  housing bore tolerance class.

# Mounting

Drawn cup and alignment needle roller bearings should be pressed into the housing bore using a mounting dolly (fig. 42). An O-ring provides a simple means of retaining the bearing on the mounting dolly. The stamped side (side face with the designation) should abut the flange of the mounting dolly.

Special care should be taken to prevent the bearing from skewing or tilting when it is being pressed into the housing. Otherwise the rollers and raceways could easily be damaged.

For grease lubricated bearings, the bearing should be lubricated prior to mounting.

# Paired mounting

If bearings are to be mounted immediately adjacent to each other, the load should be shared equally by both bearings. Therefore, the following need to be considered:

- Full complement needle roller arrangements should incorporate rollers of the same gauge.
- Needle roller and cage assemblies should incorporate rollers of the same gauge
- Drawn cup needle roller bearings should have the same deviations from the nominal inside diameter  $F_w$ .

A delivery of needle rollers of the same nominal diameter may contain packages of one or more gauges. The gauge limits are also printed on the package.

For needle roller and cage assemblies, the deviation from the nominal dimensions of the fitted needle rollers is printed on the package.

For additional information about gauges and inside diameter, refer to *Tolerances*, page 598.

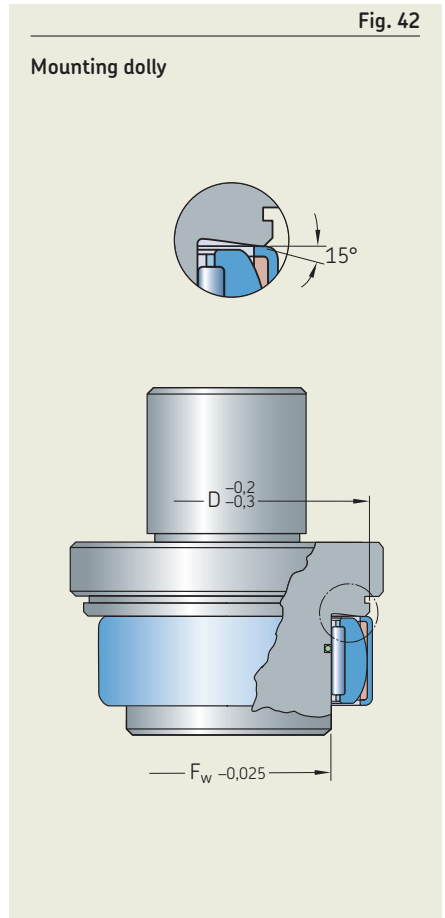


Table 18

Shaft tolerance classes for needle roller bearings with machined inner and outer rings on solid steel shafts

| Conditions   | Shaft diameter | Dimensional tolerance <sup>1)</sup> | Total radial run-out tolerance <sup>2)</sup> | Ra  |
|--|----------------|-------------------------------------|--|-----|
| –  | mm             | –                                   | –  | µm  |
| <b>Rotating inner ring load or direction of load indeterminate</b> |                |                                     |  |     |
| <b>Light and variable loads</b><br>( $P \leq 0,05 C$ )             |                |                                     |  |     |
|  | ≤ 10           | k5                                  | IT5/2  | 0,4 |
|  | > 10 to 25     | k6                                  | IT5/2  | 0,8 |
|  | > 25 to 100    | m6                                  | IT5/2  | 0,8 |
| <b>Normal to heavy loads</b><br>( $0,05 C < P \leq 0,1 C$ )        |                |                                     |  |     |
|  | ≤ 25           | k5                                  | IT5/2  | 0,4 |
|  | > 25 to 60     | m6                                  | IT5/2  | 0,8 |
|  | > 60 to 100    | n6                                  | IT5/2  | 0,8 |
|  | > 100 to 400   | p6 <sup>3)</sup>                    | IT5/2  | 1,6 |
| <b>Heavy to very heavy loads</b><br>( $P > 0,1 C$ )                |                |                                     |  |     |
|  | > 50 to 100    | n6 <sup>3)</sup>                    | IT5/2  | 0,8 |
|  | > 100 to 200   | p6 <sup>3)</sup>                    | IT5/2  | 1,6 |
|  | > 200          | r6 <sup>3)</sup>                    | IT5/2  | 1,6 |
| <b>Stationary inner ring load</b>                                  |                |                                     |  |     |
| Easy axial displacement of the inner ring on the shaft desirable   |                | g6                                  | IT5/2  | 1,6 |
| Easy axial displacement of the inner ring on the shaft unnecessary |                | h6                                  | IT5/2  | 1,6 |

<sup>1)</sup> The envelope requirement (symbol  $\text{Ⓢ}$  from ISO 14405-1) is not shown but applies to all tolerance classes.

<sup>2)</sup> Values listed are for bearings to Normal tolerances.

<sup>3)</sup> Bearings with radial internal clearance greater than Normal may be necessary.



# Designation system



**Prefixes**

R Bearing without an inner ring

**Basic designation**

- BK** Drawn cup needle roller bearing with a closed end
- HK** Drawn cup needle roller bearing with open ends
- HN** Drawn cup needle roller bearing with open ends, full complement
- IR** Needle roller bearing inner ring
- K** Needle roller and cage assembly
- LR** Needle roller bearing inner ring
- NA 48,**  
**NA 49,**  
**NA 69** Needle roller bearing with machined rings, with flanges, with an inner ring
- NAO** Needle roller bearing with machined rings, without flanges, with an inner ring
- NK, NKS** Needle roller bearing with machined rings, with flanges, without an inner ring
- NKI, NKIS** Needle roller bearing with machined rings, with flanges, with an inner ring
- NKIA 59,**  
**NKIB 59** Needle roller / angular contact ball bearing
- NKX** Needle roller / thrust ball bearing
- NKXR** Needle roller / cylindrical roller thrust bearing
- NX** Needle roller / full complement thrust ball bearing
- PNA** Alignment needle roller bearing
- RN** Needle roller

**Suffixes**

**Group 1: Internal design**

- BF** Needle roller with flat ends
- D** Deviating or modified internal design with the same boundary dimensions.  
Example: K 40x45x17 D (Needle roller and cage assembly with a double split cage)
- DS** Single split needle roller and cage assembly
- EGS** Inner ring with a non-directionally ground raceway
- VGS** Inner ring with a pre-ground raceway and a machining allowance
- ZW** Double row needle roller and cage assembly (double row cage)

**Group 2: External design (seals, snap ring groove, etc.)**

- AS..** Outer ring with lubrication hole(s), the number following indicates the number of holes
- ASR..** Outer ring with annular groove and lubrication hole(s), the number following indicates the number of holes
- IS..** Inner ring with lubrication hole(s), the number following indicates the number of holes
- ISR..** Inner ring with annular groove and lubrication hole(s), the number following indicates the number of holes
- RS, .2RS** Contact seal on one or both sides, respectively
  - NBR or FKM or PUR for a drawn cup needle roller bearing
  - NBR for a machined needle roller bearing
- Z** Combined needle roller bearing, factory greased thrust bearing with a cover without lubrication holes over the outside diameter

**Group 3: Cage design**

TN Glass fibre reinforced PA66 cage



| Group 4 |     |     |     |     |     |
|---------|-----|-----|-----|-----|-----|
| 4.1     | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 |

**Group 4.6: Other variants**

**VG052** Single split PES (polyethersulfone) cage

**Group 4.5: Lubrication**

**SM..** Special grease, two numbers following identify the grease

**Group 4.4: Stabilization**

**S0** Bearing or inner ring heat stabilized for operating temperatures  $\leq 150\text{ }^{\circ}\text{C}$  ( $300\text{ }^{\circ}\text{F}$ )

**S1** Bearing or inner ring heat stabilized for operating temperatures  $\leq 200\text{ }^{\circ}\text{C}$  ( $390\text{ }^{\circ}\text{F}$ )

**S2** Bearing or inner ring heat stabilized for operating temperatures  $\leq 250\text{ }^{\circ}\text{C}$  ( $480\text{ }^{\circ}\text{F}$ )

**S3** Bearing or inner ring heat stabilized for operating temperatures  $\leq 300\text{ }^{\circ}\text{C}$  ( $570\text{ }^{\circ}\text{F}$ )

**Group 4.3: Bearing sets, matched bearings**

**..S** Matched bearings for an equal load distribution. The number preceding indicates the number of bearings, e.g. NK 50/25 TN/2S

**Group 4.2: Accuracy, clearance, preload, quiet running**

**/SORT..** Tolerance grade of needle rollers of a needle roller and cage assembly, the numbers following identify the actual limits in  $\mu\text{m}$ , e.g. /SORT-2-4

**CN** Normal radial internal clearance; only used together with an additional letter that identifies a reduced or displaced clearance range

**H** Reduced clearance range corresponding to the upper half of the actual clearance range

**L** Reduced clearance range corresponding to the lower half of the actual clearance range

**M** Reduced clearance range corresponding to the two middle quarters of the actual clearance range

**P** Displaced clearance range comprising the upper half of the actual clearance range plus the lower half of the next larger clearance range

**R** Normal clearance range in accordance with the withdrawn DIN 620-4

The above letters H, L, M and P are also used together with the clearance classes C2, C3, C4.

**C2** Radial internal clearance smaller than Normal

**C3** Radial internal clearance greater than Normal

**C4** Radial internal clearance greater than C3

**G2** Needle roller in accordance with ISO 3096 Grade 2

**H..** Bearing without an inner ring and reduced inside diameter (under rollers) tolerance, the numbers following indicate the tolerance limits in  $\mu\text{m}$ , e.g. H+27+20

**M../M..** Diameter tolerance of needle rollers, e.g. M2/M4 indicates diameter tolerance  $-2$  to  $-4\text{ }\mu\text{m}$

**N/M..** Diameter tolerance of needle rollers, e.g. N/M2 indicates diameter tolerance  $0$  to  $-2\text{ }\mu\text{m}$

**P5** Dimensional and geometrical tolerances to class P5

**P6** Dimensional and geometrical tolerances to class P6

**P62** P6 + C2

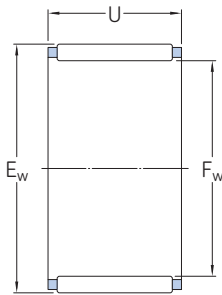
**P63** P6 + C3

**P6CNR** P6 + CNR

**Group 4.1: Materials, heat treatment**

## 7.1 Needle roller and cage assemblies

$F_w$  3 – 30 mm



| Principal dimensions |       |    | Basic load ratings |       | Fatigue load limit | Speed ratings   |                | Mass | Designation     | Associated radial shaft seals <sup>1)</sup> |            |
|----------------------|-------|----|--------------------|-------|--------------------|-----------------|----------------|------|-----------------|---|------------|
| $F_w$                | $E_w$ | U  | C                  | $C_0$ | $P_u$              | Reference speed | Limiting speed |      |                 | Single lip                                  | Double lip |
| mm                   |       |    | kN                 |       | kN                 | r/min           |                | g    | –               | –   |            |
| 3                    | 5     | 7  | 1,51               | 1,34  | 0,134              | 40 000          | 45 000         | 0,3  | K 3x5x7 TN      | –   | –          |
|                      | 5     | 9  | 1,68               | 1,53  | 0,153              | 40 000          | 45 000         | 0,4  | ► K 3x5x9 TN    | –   | –          |
| 4                    | 7     | 7  | 1,72               | 1,32  | 0,137              | 36 000          | 43 000         | 0,5  | K 4x7x7 TN      | –   | –          |
|                      | 7     | 10 | 2,29               | 1,9   | 0,204              | 36 000          | 43 000         | 0,7  | K 4x7x10 TN     | –   | –          |
| 5                    | 8     | 8  | 2,29               | 2     | 0,212              | 36 000          | 40 000         | 0,7  | K 5x8x8 TN      | –   | –          |
|                      | 8     | 10 | 2,92               | 2,7   | 0,29               | 36 000          | 40 000         | 0,9  | ► K 5x8x10 TN   | –   | –          |
| 6                    | 9     | 8  | 2,55               | 2,36  | 0,25               | 34 000          | 38 000         | 0,8  | K 6x9x8 TN      | –   | –          |
|                      | 9     | 10 | 3,3                | 3,2   | 0,345              | 34 000          | 38 000         | 1,1  | K 6x9x10 TN     | –   | –          |
| 7                    | 10    | 8  | 2,81               | 2,75  | 0,29               | 32 000          | 36 000         | 0,9  | K 7x10x8 TN     | –   | –          |
|                      | 10    | 10 | 3,58               | 3,75  | 0,415              | 32 000          | 36 000         | 1    | K 7x10x10 TN    | –   | –          |
| 8                    | 11    | 10 | 3,8                | 4,25  | 0,465              | 32 000          | 36 000         | 1,2  | K 8x11x10 TN    | –   | –          |
|                      | 11    | 13 | 5,01               | 5,85  | 0,67               | 32 000          | 36 000         | 1,7  | K 8x11x13 TN    | –   | –          |
|                      | 12    | 10 | 4,84               | 4,75  | 0,54               | 30 000          | 34 000         | 2    | K 8x12x10 TN    | G 8x12x3                                    | –          |
| 9                    | 12    | 10 | 4,4                | 5,2   | 0,57               | 30 000          | 34 000         | 1,5  | K 9x12x10 TN    | –   | –          |
| 10                   | 13    | 10 | 4,57               | 5,7   | 0,63               | 28 000          | 32 000         | 1,6  | ► K 10x13x10 TN | –   | –          |
|                      | 13    | 13 | 5,94               | 8     | 0,9                | 28 000          | 32 000         | 2,3  | K 10x13x13 TN   | –   | –          |
|                      | 14    | 10 | 5,61               | 6,1   | 0,695              | 28 000          | 32 000         | 2,5  | K 10x14x10 TN   | G 10x14x3                                   | –          |
|                      | 14    | 13 | 7,21               | 8,5   | 0,98               | 28 000          | 32 000         | 4,6  | K 10x14x13 TN   | G 10x14x3                                   | –          |
| 12                   | 15    | 10 | 4,73               | 6,2   | 0,695              | 26 000          | 30 000         | 2,9  | K 12x15x10 TN   | –   | –          |
|                      | 15    | 13 | 6,16               | 8,65  | 0,98               | 26 000          | 30 000         | 2,3  | K 12x15x13 TN   | –   | –          |
| 14                   | 17    | 13 | 9,13               | 10,4  | 1,22               | 26 000          | 30 000         | 4,9  | K 12x17x13 TN   | –   | –          |
|                      | 18    | 12 | 9,52               | 10    | 1,18               | 26 000          | 30 000         | 6    | K 12x18x12 TN   | G 12x18x3                                   | SD 12x18x3 |
| 14                   | 18    | 10 | 6,93               | 8,65  | 1                  | 24 000          | 28 000         | 4    | K 14x18x10      | –   | –          |
|                      | 18    | 13 | 7,92               | 10,2  | 1,18               | 24 000          | 28 000         | 6,5  | K 14x18x13      | –   | –          |
|                      | 18    | 15 | 9,13               | 12,5  | 1,46               | 24 000          | 28 000         | 5    | K 14x18x15 TN   | –   | –          |
|                      | 18    | 17 | 10,5               | 14,6  | 1,7                | 24 000          | 28 000         | 8    | K 14x18x17      | –   | –          |
| 15                   | 19    | 13 | 8,25               | 11,2  | 1,29               | 24 000          | 28 000         | 7    | ► K 15x19x13    | –   | –          |
|                      | 19    | 17 | 10,8               | 15,6  | 1,86               | 24 000          | 28 000         | 9,5  | ► K 15x19x17    | –   | –          |
|                      | 21    | 15 | 13,8               | 16,3  | 2                  | 24 000          | 26 000         | 11   | K 15x21x15      | G 15x21x3                                   | SD 15x21x3 |
|                      | 21    | 21 | 18,7               | 24,5  | 3                  | 24 000          | 26 000         | 17   | K 15x21x21      | G 15x21x3                                   | SD 15x21x3 |

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<sup>1)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

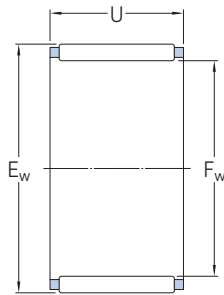
| Principal dimensions |                |    | Basic load ratings |                          | Fatigue load limit<br>P <sub>u</sub> | Speed ratings      |                   | Mass<br>g | Designation   | Associated radial shaft seals <sup>1)</sup> |            |
|----------------------|----------------|----|--------------------|--------------------------|--------------------------------------|--------------------|-------------------|-----------|---------------|---|------------|
| F <sub>w</sub>       | E <sub>w</sub> | U  | dynamic<br>C       | static<br>C <sub>0</sub> |                                      | Reference<br>speed | Limiting<br>speed |           |               | Single lip                                  | Double lip |
| mm                   |                |    | kN                 |                          | kN                                   | r/min              |                   |           | –             | –   |            |
| 16                   | 20             | 10 | 7,48               | 10                       | 1,16                                 | 24 000             | 26 000            | 5,5       | K 16x20x10    | –   | –          |
|                      | 20             | 13 | 8,58               | 12                       | 1,37                                 | 24 000             | 26 000            | 7,5       | K 16x20x13    | –   | –          |
|                      | 20             | 17 | 11,2               | 17                       | 2                                    | 24 000             | 26 000            | 10        | K 16x20x17    | –   | –          |
|                      | 22             | 12 | 11                 | 12,5                     | 1,5                                  | 22 000             | 26 000            | 10        | K 16x22x12    | G 16x22x3                                   | SD 16x22x3 |
|                      | 22             | 16 | 14,2               | 17,6                     | 2,12                                 | 22 000             | 26 000            | 12        | K 16x22x16    | G 16x22x3                                   | SD 16x22x3 |
|                      | 22             | 20 | 17,6               | 22,8                     | 2,8                                  | 22 000             | 26 000            | 17        | K 16x22x20    | G 16x22x3                                   | SD 16x22x3 |
|                      | 24             | 20 | 20,5               | 23,6                     | 2,9                                  | 22 000             | 24 000            | 22        | K 16x24x20    | G 16x24x3                                   | SD 16x24x3 |
| 17                   | 21             | 10 | 7,81               | 10,8                     | 1,22                                 | 22 000             | 26 000            | 5,5       | K 17x21x10    | –   | –          |
| 18                   | 24             | 12 | 12,1               | 15                       | 1,8                                  | 20 000             | 24 000            | 12        | K 18x24x12    | G 18x24x3                                   | SD 18x24x3 |
| 19                   | 23             | 13 | 9,13               | 13,7                     | 1,6                                  | 20 000             | 24 000            | 8         | K 19x23x13    | –   | –          |
| 20                   | 24             | 10 | 8,58               | 12,9                     | 1,46                                 | 20 000             | 22 000            | 6,5       | K 20x24x10    | –   | –          |
|                      | 24             | 13 | 9,52               | 14,6                     | 1,66                                 | 20 000             | 22 000            | 9         | K 20x24x13    | –   | –          |
|                      | 24             | 17 | 12,5               | 20,8                     | 2,4                                  | 20 000             | 22 000            | 12        | K 20x24x17    | –   | –          |
|                      | 26             | 17 | 18,3               | 26                       | 3,2                                  | 19 000             | 22 000            | 16        | K 20x26x17    | G 20x26x4                                   | SD 20x26x4 |
|                      | 26             | 20 | 20,1               | 29                       | 3,6                                  | 19 000             | 22 000            | 19        | ▶ K 20x26x20  | G 20x26x4                                   | SD 20x26x4 |
|                      | 28             | 20 | 22,9               | 28,5                     | 3,45                                 | 18 000             | 20 000            | 27        | K 20x28x20    | G 20x28x4                                   | SD 20x28x4 |
|                      | 28             | 25 | 29,2               | 39                       | 4,9                                  | 18 000             | 20 000            | 32        | ▶ K 20x28x25  | G 20x28x4                                   | SD 20x28x4 |
|                      | 30             | 30 | 34,1               | 41,5                     | 5,2                                  | 17 000             | 20 000            | 49        | K 20x30x30    | –   | –          |
| 21                   | 25             | 13 | 9,68               | 15,3                     | 1,76                                 | 19 000             | 22 000            | 9         | K 21x25x13    | –   | –          |
| 22                   | 26             | 10 | 8,8                | 13,7                     | 1,56                                 | 18 000             | 20 000            | 7,5       | ▶ K 22x26x10  | –   | –          |
|                      | 26             | 13 | 10,1               | 16,3                     | 1,86                                 | 18 000             | 20 000            | 9,5       | K 22x26x13    | –   | –          |
|                      | 26             | 17 | 13,2               | 22,8                     | 2,7                                  | 18 000             | 20 000            | 12        | K 22x26x17    | –   | –          |
|                      | 28             | 17 | 18,3               | 27                       | 3,25                                 | 17 000             | 20 000            | 18        | K 22x28x17    | G 22x28x4                                   | SD 22x28x4 |
|                      | 29             | 16 | 19,4               | 25,5                     | 3,05                                 | 17 000             | 19 000            | 16        | K 22x29x16    | –   | –          |
|                      | 30             | 15 | 19                 | 23,6                     | 2,8                                  | 17 000             | 19 000            | 18        | K 22x30x15 TN | G 22x30x4                                   | SD 22x30x4 |
| 23                   | 35             | 16 | 24,2               | 23,2                     | 2,9                                  | 15 000             | 17 000            | 29        | K 23x35x16 TN | –   | –          |
| 24                   | 28             | 10 | 9,35               | 15                       | 1,73                                 | 17 000             | 19 000            | 8,5       | K 24x28x10    | –   | –          |
|                      | 28             | 13 | 10,6               | 18                       | 2,08                                 | 17 000             | 19 000            | 10        | K 24x28x13    | –   | –          |
|                      | 30             | 17 | 18,7               | 27,5                     | 3,4                                  | 16 000             | 18 000            | 19        | K 24x30x17    | –   | –          |
| 25                   | 29             | 10 | 9,52               | 15,6                     | 1,8                                  | 16 000             | 18 000            | 8,5       | K 25x29x10    | –   | –          |
|                      | 29             | 13 | 10,8               | 18,6                     | 2,16                                 | 16 000             | 18 000            | 11        | K 25x29x13    | –   | –          |
|                      | 30             | 17 | 17,9               | 30,5                     | 3,6                                  | 16 000             | 18 000            | 16        | K 25x30x17    | –   | –          |
|                      | 30             | 20 | 20,9               | 36,5                     | 4,4                                  | 16 000             | 18 000            | 18        | K 25x30x20    | –   | –          |
|                      | 32             | 16 | 19,8               | 27,5                     | 3,35                                 | 15 000             | 17 000            | 21        | K 25x32x16    | G 25x32x4                                   | –          |
|                      | 33             | 20 | 27,5               | 38                       | 4,65                                 | 15 000             | 17 000            | 33        | K 25x33x20    | G 25x33x4                                   | SD 25x33x4 |
|                      | 35             | 30 | 44,6               | 62                       | 7,8                                  | 15 000             | 17 000            | 65        | ▶ K 25x35x30  | G 25x35x4                                   | SD 25x35x4 |
| 26                   | 30             | 13 | 11,2               | 19,6                     | 2,28                                 | 16 000             | 18 000            | 11        | K 26x30x13    | –   | –          |
| 28                   | 33             | 13 | 14,7               | 24,5                     | 2,85                                 | 14 000             | 16 000            | 13        | K 28x33x13    | –   | –          |
|                      | 33             | 17 | 19                 | 33,5                     | 4,05                                 | 14 000             | 16 000            | 17        | K 28x33x17    | –   | –          |
| 30                   | 35             | 13 | 15,1               | 25,5                     | 3                                    | 13 000             | 15 000            | 14        | K 30x35x13    | –   | –          |
|                      | 35             | 17 | 18,7               | 34                       | 4,05                                 | 13 000             | 15 000            | 19        | K 30x35x17    | –   | –          |
|                      | 35             | 27 | 29,2               | 60                       | 7,35                                 | 13 000             | 15 000            | 30        | K 30x35x27    | –   | –          |
|                      | 37             | 18 | 25,1               | 39                       | 4,65                                 | 13 000             | 15 000            | 30        | K 30x37x18    | G 30x37x4                                   | SD 30x37x4 |
|                      | 40             | 30 | 46,8               | 69,5                     | 8,65                                 | 12 000             | 14 000            | 73        | K 30x40x30    | G 30x40x4                                   | SD 30x40x4 |

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<sup>1)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

## 7.1 Needle roller and cage assemblies

$F_w$  32 – 100 mm



| Principal dimensions |       |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass | Designation   | Associated radial shaft seals <sup>1)</sup> |            |
|----------------------|-------|----|--------------------|--------|--------------------|-----------------|----------------|------|---------------|---|------------|
| $F_w$                | $E_w$ | U  | dynamic            | static |                    | Reference speed | Limiting speed |      |               | Single lip                                  | Double lip |
| mm                   |       |    | kN                 |        | kN                 | r/min           |                | g    | –             | –   | –          |
| 32                   | 37    | 13 | 14,7               | 25,5   | 3                  | 13 000          | 14 000         | 18   | K 32x37x13    | –   | –          |
|                      | 37    | 17 | 19                 | 35,5   | 4,25               | 13 000          | 14 000         | 19   | K 32x37x17    | –   | –          |
|                      | 38    | 20 | 25,1               | 45     | 5,6                | 12 000          | 14 000         | 30   | K 32x38x20    | –   | –          |
|                      | 40    | 25 | 35,8               | 58,5   | 7,2                | 12 000          | 14 000         | 49   | K 32x40x25    | –   | –          |
| 35                   | 40    | 13 | 15,4               | 28     | 3,25               | 12 000          | 13 000         | 19   | K 35x40x13    | –   | –          |
|                      | 40    | 17 | 19,8               | 39     | 4,65               | 12 000          | 13 000         | 21   | K 35x40x17    | –   | –          |
|                      | 40    | 27 | 23,8               | 49     | 6                  | 12 000          | 13 000         | 39   | K 35x40x27 TN | –   | –          |
|                      | 42    | 16 | 23,3               | 37,5   | 4,5                | 11 000          | 13 000         | 34   | K 35x42x16    | G 35x42x4                                   | SD 35x42x4 |
|                      | 42    | 18 | 26,4               | 44     | 5,3                | 11 000          | 13 000         | 34   | K 35x42x18    | G 35x42x4                                   | SD 35x42x4 |
|                      | 45    | 20 | 35,2               | 50     | 6,2                | 11 000          | 12 000         | 56   | K 35x45x20    | G 35x45x4                                   | SD 35x45x4 |
| 37                   | 42    | 17 | 21,6               | 43     | 5,2                | 11 000          | 13 000         | 22   | K 37x42x17    | –   | –          |
| 38                   | 43    | 17 | 19,8               | 39     | 4,65               | 11 000          | 12 000         | 29   | K 38x43x17    | –   | –          |
|                      | 46    | 32 | 52,3               | 100    | 12,5               | 10 000          | 12 000         | 76   | K 38x46x32    | –   | –          |
| 40                   | 45    | 17 | 20,5               | 41,5   | 5                  | 10 000          | 12 000         | 31   | K 40x45x17    | –   | –          |
|                      | 45    | 27 | 31,4               | 73,5   | 9                  | 10 000          | 12 000         | 46   | K 40x45x27    | –   | –          |
|                      | 48    | 20 | 34,7               | 58,5   | 7,35               | 10 000          | 11 000         | 49   | ► K 40x48x20  | –   | –          |
| 42                   | 47    | 17 | 20,9               | 43     | 5,2                | 10 000          | 11 000         | 32   | K 42x47x17    | –   | –          |
|                      | 50    | 20 | 33,6               | 57     | 7,1                | 9 500           | 11 000         | 53   | K 42x50x20    | –   | –          |
| 43                   | 48    | 17 | 20,9               | 43     | 5,2                | 9 500           | 11 000         | 30   | K 43x48x17    | –   | –          |
| 45                   | 50    | 17 | 21,6               | 46,5   | 5,6                | 9 000           | 10 000         | 34   | K 45x50x17    | –   | –          |
|                      | 50    | 27 | 33                 | 81,5   | 10                 | 9 000           | 10 000         | 52   | K 45x50x27    | –   | –          |
|                      | 53    | 28 | 49,5               | 98     | 12,2               | 9 000           | 10 000         | 81   | K 45x53x28    | –   | –          |
| 47                   | 52    | 17 | 22,4               | 49     | 6                  | 9 000           | 10 000         | 35   | K 47x52x17    | –   | –          |
| 50                   | 55    | 20 | 25,5               | 60     | 7,2                | 8 500           | 9 500          | 43   | ► K 50x55x20  | –   | –          |
|                      | 55    | 30 | 37,4               | 98     | 12                 | 8 500           | 9 500          | 65   | K 50x55x30    | –   | –          |
|                      | 57    | 18 | 31,9               | 64     | 7,8                | 8 000           | 9 000          | 47   | K 50x57x18    | –   | –          |
|                      | 58    | 25 | 41,8               | 81,5   | 10,2               | 8 000           | 9 000          | 90   | K 50x58x25    | G 50x58x4                                   | SD 50x58x4 |
| 55                   | 60    | 20 | 27                 | 67     | 8,15               | 7 500           | 8 500          | 40   | K 55x60x20    | –   | –          |
|                      | 60    | 30 | 39,6               | 108    | 13,4               | 7 500           | 8 500          | 71   | K 55x60x30    | –   | –          |
|                      | 62    | 18 | 34,1               | 71     | 8,5                | 7 500           | 8 500          | 52   | K 55x62x18    | –   | –          |
|                      | 63    | 32 | 59,4               | 129    | 16,3               | 7 500           | 8 500          | 102  | K 55x63x32    | G 55x63x5                                   | –          |

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<sup>1)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

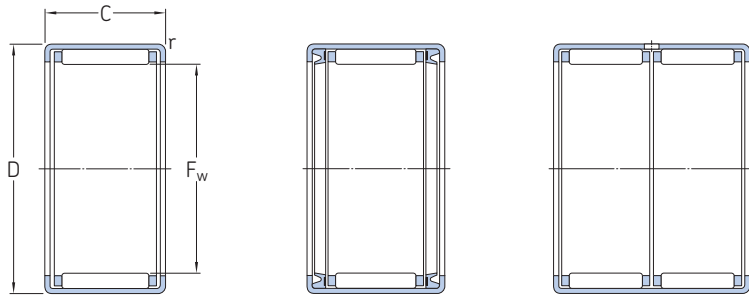
| Principal dimensions |                |    | Basic load ratings |                          | Fatigue load limit<br>P <sub>u</sub> | Speed ratings      |                   | Mass | Designation         | Associated radial shaft seals <sup>1)</sup> |            |
|----------------------|----------------|----|--------------------|--------------------------|--------------------------------------|--------------------|-------------------|------|---------------------|---|------------|
| F <sub>w</sub>       | E <sub>w</sub> | U  | dynamic<br>C       | static<br>C <sub>0</sub> |                                      | Reference<br>speed | Limiting<br>speed |      |                     | Single lip                                  | Double lip |
| mm                   |                |    | kN                 |                          | kN                                   | r/min              |                   | g    | –                   | –   | –          |
| <b>60</b>            | 65             | 20 | 28,1               | 72                       | 8,8                                  | 7 000              | 8 000             | 52   | <b>K 60x65x20</b>   | –   | –          |
|                      | 68             | 25 | 51,2               | 112                      | 14                                   | 6 700              | 7 500             | 89   |                     | <b>K 60x68x25</b>                           | –          |
| <b>65</b>            | 73             | 30 | 53,9               | 125                      | 15,6                                 | 6 300              | 7 000             | 141  | ▶ <b>K 65x73x30</b> | –   | –          |
| <b>70</b>            | 76             | 20 | 34,1               | 86,5                     | 10,6                                 | 6 000              | 6 700             | 71   | <b>K 70x76x20</b>   | –   | –          |
|                      | 78             | 30 | 57,2               | 137                      | 17                                   | 6 000              | 6 700             | 148  |                     | <b>K 70x78x30</b>                           | G 70x78x5  |
| <b>75</b>            | 83             | 23 | 47,3               | 110                      | 13,7                                 | 5 300              | 6 300             | 124  | <b>K 75x83x23</b>   | –   | –          |
| <b>80</b>            | 88             | 30 | 68,2               | 176                      | 22                                   | 5 000              | 6 000             | 138  | <b>K 80x88x30</b>   | –   | –          |
| <b>85</b>            | 92             | 20 | 42,9               | 108                      | 13,2                                 | 4 800              | 5 600             | 102  | <b>K 85x92x20</b>   | –   | –          |
| <b>90</b>            | 97             | 20 | 42,9               | 114                      | 13,7                                 | 4 500              | 5 300             | 109  | <b>K 90x97x20</b>   | –   | –          |
|                      | 98             | 30 | 64,4               | 173                      | 21,6                                 | 4 500              | 5 300             | 172  |                     | <b>K 90x98x30</b>                           | –          |
| <b>95</b>            | 103            | 30 | 66                 | 180                      | 22,8                                 | 4 300              | 5 000             | 165  | <b>K 95x103x30</b>  | –   | –          |
| <b>100</b>           | 108            | 27 | 55                 | 143                      | 17,6                                 | 4 000              | 4 800             | 185  | <b>K 100x108x27</b> | –   | –          |

▶ Popular item

<sup>1)</sup> For additional information → [skf.com/seals](https://skf.com/seals)

## 7.2 Drawn cup needle roller bearings

$F_w$  3–17 mm



HK

HK ...2RS

HK (double row)

| Principal dimensions |     |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass | Designation             |
|----------------------|-----|----|--------------------|--------|--------------------|-----------------|----------------|------|-------------------------|
| $F_w$                | D   | C  | dynamic            | static |                    | Reference speed | Limiting speed |      |                         |
| mm                   |     |    | C                  | $C_0$  | $P_u$              | r/min           |                | g    | –                       |
| 3                    | 6,5 | 6  | 1,23               | 0,88   | 0,088              | 24 000          | 26 000         | 1    | ▶ HK 0306 TN            |
| 4                    | 8   | 8  | 1,76               | 1,37   | 0,14               | 22 000          | 26 000         | 2    | ▶ HK 0408               |
| 5                    | 9   | 9  | 2,38               | 2,08   | 0,22               | 22 000          | 24 000         | 2    | ▶ HK 0509               |
| 6                    | 10  | 8  | 2,01               | 1,73   | 0,18               | 20 000          | 22 000         | 2,1  | ▶ HK 0608               |
|                      | 10  | 9  | 2,81               | 2,7    | 0,285              | 20 000          | 22 000         | 2,5  | ▶ HK 0609               |
| 7                    | 11  | 9  | 3,03               | 3,05   | 0,325              | 20 000          | 22 000         | 2,6  | ▶ HK 0709               |
| 8                    | 12  | 8  | 2,7                | 2,75   | 0,285              | 19 000          | 22 000         | 2,7  | ▶ HK 0808               |
|                      | 12  | 10 | 3,69               | 4,05   | 0,44               | 19 000          | 22 000         | 3    | ▶ HK 0810               |
|                      | 12  | 12 | 2,7                | 2,75   | 0,285              | –               | 13 000         | 3,3  | ▶ HK 0812.2RS           |
| 9                    | 13  | 8  | 3,52               | 3,9    | 0,415              | 18 000          | 20 000         | 3    | ▶ HK 0908               |
|                      | 13  | 10 | 4,13               | 4,8    | 0,53               | 18 000          | 20 000         | 4    | ▶ HK 0910               |
|                      | 13  | 12 | 5,12               | 6,4    | 0,72               | 18 000          | 20 000         | 4,6  | ▶ HK 0912               |
| 10                   | 14  | 10 | 4,29               | 5,3    | 0,57               | 18 000          | 20 000         | 4,1  | ▶ HK 1010               |
|                      | 14  | 12 | 5,39               | 6,95   | 0,78               | 18 000          | 20 000         | 4,8  | ▶ HK 1012               |
|                      | 14  | 14 | 4,29               | 5,3    | 0,57               | –               | 12 000         | 4,6  | ▶ HK 1014.2RS           |
|                      | 14  | 15 | 6,6                | 9      | 1,02               | 18 000          | 20 000         | 6    | ▶ HK 1015               |
| 12                   | 16  | 10 | 4,84               | 6,4    | 0,71               | 16 000          | 18 000         | 4,6  | ▶ HK 1210               |
|                      | 18  | 12 | 6,27               | 7,35   | 0,85               | 16 000          | 18 000         | 9,5  | ▶ HK 1212               |
|                      | 18  | 16 | 6,27               | 7,35   | 0,85               | –               | 10 000         | 11   | ▶ HK 1216.2RS           |
| 13                   | 19  | 12 | 6,6                | 8      | 0,915              | 16 000          | 17 000         | 10,5 | ▶ HK 1312               |
| 14                   | 20  | 12 | 6,82               | 8,65   | 0,98               | 15 000          | 17 000         | 10,5 | ▶ HK 1412               |
| 15                   | 21  | 12 | 7,65               | 9,5    | 1,08               | 15 000          | 16 000         | 11   | ▶ HK 1512               |
|                      | 21  | 16 | 10,1               | 14,6   | 1,7                | 15 000          | 16 000         | 15   | ▶ HK 1516               |
|                      | 21  | 22 | 13                 | 20     | 2,28               | 15 000          | 16 000         | 20   | ▶ HK 1522 <sup>1)</sup> |
| 16                   | 22  | 12 | 7,37               | 9,8    | 1,12               | 14 000          | 16 000         | 12   | ▶ HK 1612               |
|                      | 22  | 16 | 10,5               | 15,6   | 1,8                | 14 000          | 16 000         | 16   | ▶ HK 1616               |
|                      | 22  | 20 | 10,5               | 15,6   | 1,8                | –               | 9 000          | 18   | ▶ HK 1620.2RS           |
|                      | 22  | 22 | 12,8               | 19,6   | 2,24               | 14 000          | 16 000         | 24   | ▶ HK 1622 <sup>1)</sup> |
| 17                   | 23  | 12 | 7,65               | 10,6   | 1,2                | 14 000          | 15 000         | 13   | ▶ HK 1712               |

▶ Popular item

<sup>1)</sup> Double row, outer ring with a lubrication hole.

| Dimensions     |           | Associated inner rings <sup>1)</sup> |               | Associated radial shaft seals <sup>2)</sup> |            |
|----------------|-----------|--------------------------------------|---------------|---|------------|
| F <sub>w</sub> | r<br>min. | IR series                            | LR series     | Single lip                                  | Double lip |
| mm             |           | –                                    |               | –   |            |
| 3              | 0,3       | –                                    | –             | –   | –          |
| 4              | 0,3       | –                                    | –             | G 4x8x2 S                                   | –          |
| 5              | 0,4       | –                                    | –             | G 5x9x2 S                                   | –          |
| 6              | 0,4       | –                                    | –             | G 6x10x2 S                                  | –          |
|                | 0,4       | –                                    | –             | G 6x10x2 S                                  | –          |
| 7              | 0,4       | –                                    | –             | G 7x11x2 S                                  | –          |
| 8              | 0,4       | –                                    | –             | G 8x12x3                                    | –          |
|                | 0,4       | IR 5x8x12                            | –             | G 8x12x3                                    | –          |
|                | 0,4       | –                                    | –             | –   | –          |
| 9              | 0,4       | –                                    | –             | G 9x13x3                                    | –          |
|                | 0,4       | –                                    | –             | G 9x13x3                                    | –          |
|                | 0,4       | IR 6x9x12                            | –             | G 9x13x3                                    | –          |
| 10             | 0,4       | IR 7x10x10.5                         | LR 7x10x10.5  | G 10x14x3                                   | –          |
|                | 0,4       | IR 7x10x12                           | –             | G 10x14x3                                   | –          |
|                | 0,4       | –                                    | –             | –   | –          |
|                | 0,4       | IR 7x10x16                           | –             | G 10x14x3                                   | –          |
| 12             | 0,4       | IR 8x12x10.5                         | LR 8x12x10.5  | G 12x16x3                                   | –          |
|                | 0,8       | IR 8x12x12.5                         | LR 8x12x12.5  | G 12x18x3                                   | SD 12x18x3 |
|                | 0,8       | –                                    | –             | –   | –          |
| 13             | 0,8       | IR 10x13x12.5                        | LR 10x13x12.5 | G 13x19x3                                   | –          |
| 14             | 0,8       | IR 10x14x13                          | –             | G 14x20x3                                   | SD 14x20x3 |
| 15             | 0,8       | IR 12x15x12.5                        | LR 12x15x12.5 | G 15x21x3                                   | SD 15x21x3 |
|                | 0,8       | IR 12x15x16.5                        | LR 12x15x16.5 | G 15x21x3                                   | SD 15x21x3 |
|                | 0,8       | IR 12x15x22.5                        | LR 12x15x22.5 | G 15x21x3                                   | SD 15x21x3 |
| 16             | 0,8       | IR 12x16x13                          | –             | G 16x22x3                                   | SD 16x22x3 |
|                | 0,8       | IR 12x16x16                          | –             | G 16x22x3                                   | SD 16x22x3 |
|                | 0,8       | –                                    | –             | –   | –          |
|                | 0,8       | IR 12x16x22                          | –             | G 16x22x3                                   | SD 16x22x3 |
| 17             | 0,8       | –                                    | –             | G 17x23x3                                   | SD 17x23x3 |

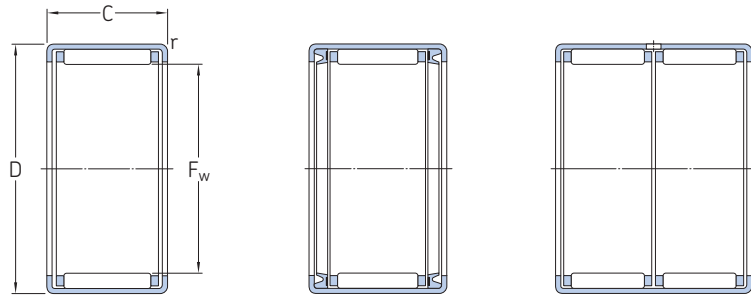
<sup>1)</sup> For additional information → *Needle roller bearing inner rings*, page 593

<sup>2)</sup> For additional information → [skf.com/seals](http://skf.com/seals)



## 7.2 Drawn cup needle roller bearings

$F_w$  18 – 30 mm



HK

HK ...2RS

HK (double row)

| $F_w$ | Principal dimensions |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass | Designation             |
|-------|----------------------|----|--------------------|--------|--------------------|-----------------|----------------|------|-------------------------|
|       | D                    | C  | dynamic            | static |                    | Reference speed | Limiting speed |      |                         |
| mm    |                      |    | C                  | $C_0$  | $P_u$              | r/min           |                | g    | –                       |
| 18    | 24                   | 12 | 7,92               | 11,2   | 1,27               | 13 000          | 15 000         | 13   | ▶ HK 1812               |
|       | 24                   | 16 | 7,92               | 11,2   | 1,27               | –               | 8 500          | 15   | ▶ HK 1816.2RS           |
|       | 24                   | 16 | 11,2               | 17,6   | 2,04               | 13 000          | 15 000         | 18   | ▶ HK 1816               |
| 20    | 26                   | 10 | 6,16               | 8,5    | 0,93               | 12 000          | 14 000         | 12   | ▶ HK 2010               |
|       | 26                   | 12 | 8,42               | 12,5   | 1,4                | 12 000          | 14 000         | 14   | ▶ HK 2012               |
|       | 26                   | 16 | 8,42               | 12,5   | 1,4                | –               | 8 000          | 18   | ▶ HK 2016.2RS           |
| 22    | 26                   | 16 | 12,3               | 20,4   | 2,36               | 12 000          | 14 000         | 19   | ▶ HK 2016               |
|       | 26                   | 20 | 12,3               | 20,4   | 2,36               | –               | 8 000          | 23   | ▶ HK 2020.2RS           |
|       | 26                   | 20 | 15,1               | 26,5   | 3,15               | 12 000          | 14 000         | 24   | ▶ HK 2020               |
|       | 26                   | 30 | 20,9               | 40,5   | 4,75               | 12 000          | 14 000         | 35   | ▶ HK 2030 <sup>1)</sup> |
| 25    | 28                   | 10 | 7,21               | 10,6   | 1,2                | 11 000          | 12 000         | 13   | ▶ HK 2210               |
|       | 28                   | 12 | 8,8                | 13,7   | 1,56               | 11 000          | 12 000         | 15   | ▶ HK 2212               |
|       | 28                   | 16 | 8,8                | 13,7   | 1,56               | –               | 7 500          | 18   | ▶ HK 2216.2RS           |
|       | 28                   | 16 | 13                 | 22,4   | 2,6                | 11 000          | 12 000         | 21   | ▶ HK 2216               |
|       | 28                   | 20 | 13                 | 22,4   | 2,6                | –               | 7 500          | 23   | ▶ HK 2220.2RS           |
|       | 28                   | 20 | 15,7               | 29     | 3,45               | 11 000          | 12 000         | 26   | ▶ HK 2220               |
| 28    | 32                   | 12 | 10,5               | 15,3   | 1,76               | 9 500           | 11 000         | 20   | ▶ HK 2512               |
|       | 32                   | 16 | 10,5               | 15,3   | 1,76               | –               | 6 700          | 27   | ▶ HK 2516.2RS           |
|       | 32                   | 16 | 15,1               | 24     | 2,85               | 9 500           | 11 000         | 25   | ▶ HK 2516               |
|       | 32                   | 20 | 15,1               | 24     | 2,85               | –               | 6 700          | 31   | ▶ HK 2520.2RS           |
|       | 32                   | 20 | 19                 | 32,5   | 4                  | 9 500           | 11 000         | 33   | ▶ HK 2520               |
|       | 32                   | 26 | 24,2               | 45     | 5,5                | 9 500           | 11 000         | 44   | ▶ HK 2526               |
|       | 32                   | 30 | 24,2               | 45     | 5,5                | –               | 6 700          | 47   | ▶ HK 2530.2RS           |
| 30    | 32                   | 38 | 33                 | 65,5   | 8                  | 9 500           | 11 000         | 64   | ▶ HK 2538 <sup>1)</sup> |
|       | 35                   | 16 | 15,7               | 26,5   | 3,15               | 9 000           | 9 500          | 26,5 | ▶ HK 2816               |
|       | 35                   | 20 | 15,7               | 26,5   | 3,15               | –               | 6 300          | 34   | ▶ HK 2820.2RS           |
| 30    | 35                   | 20 | 20,1               | 36,5   | 4,4                | 9 000           | 9 500          | 36   | ▶ HK 2820               |
|       | 37                   | 12 | 11,7               | 18,3   | 2,12               | 8 000           | 9 000          | 23   | ▶ HK 3012               |
|       | 37                   | 16 | 11,7               | 18,3   | 2,12               | –               | 5 600          | 31   | ▶ HK 3016.2RS           |
| 30    | 37                   | 16 | 16,5               | 29     | 3,4                | 8 000           | 9 000          | 31   | ▶ HK 3016               |
|       | 37                   | 20 | 20,9               | 40     | 4,75               | 8 000           | 9 000          | 38   | ▶ HK 3020               |
|       | 37                   | 26 | 27                 | 54     | 6,55               | 8 000           | 9 000          | 51   | ▶ HK 3026               |
|       | 37                   | 38 | 35,8               | 80     | 9,5                | 8 000           | 9 000          | 76   | ▶ HK 3038 <sup>1)</sup> |

▶ Popular item

<sup>1)</sup> Double row, outer ring with a lubrication hole.

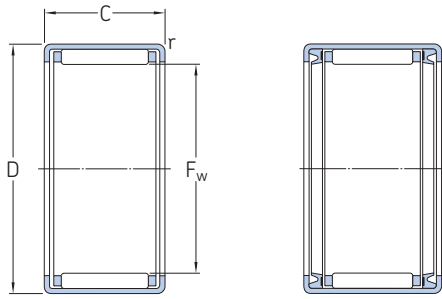
| Dimensions |           | Associated inner rings <sup>1)</sup> |               | Associated radial shaft seals <sup>2)</sup> |            |
|------------|-----------|--------------------------------------|---------------|---|------------|
| $F_w$      | r<br>min. | IR series                            | LR series     | Single lip                                  | Double lip |
| mm         |           | -                                    |               | -   |            |
| 18         | 0,8       | -                                    | LR 15x18x12.5 | G 18x24x3                                   | SD 18x24x3 |
|            | 0,8       | IR 15x18x16.5                        | LR 15x18x16.5 | -   | -          |
|            | 0,8       | IR 15x18x16.5                        | LR 15x18x16.5 | G 18x24x3                                   | SD 18x24x3 |
| 20         | 0,8       | -                                    | -             | G 20x26x4                                   | SD 20x26x4 |
|            | 0,8       | IR 15x20x13                          | -             | G 20x26x4                                   | SD 20x26x4 |
|            | 0,8       | IR 17x20x16.5                        | LR 17x20x16.5 | -   | -          |
|            | 0,8       | IR 17x20x16.5                        | LR 17x20x16.5 | G 20x26x4                                   | SD 20x26x4 |
|            | 0,8       | IR 17x20x20.5                        | LR 17x20x20.5 | -   | -          |
|            | 0,8       | IR 17x20x20.5                        | LR 17x20x20.5 | G 20x26x4                                   | SD 20x26x4 |
| 22         | 0,8       | IR 17x20x30.5                        | LR 17x20x30.5 | G 20x26x4                                   | SD 20x26x4 |
|            | 0,8       | -                                    | -             | G 22x28x4                                   | SD 22x28x4 |
|            | 0,8       | IR 17x22x13                          | -             | G 22x28x4                                   | SD 22x28x4 |
| 25         | 0,8       | IR 17x22x23                          | -             | -   | -          |
|            | 0,8       | IR 17x22x23                          | -             | G 22x28x4                                   | SD 22x28x4 |
|            | 0,8       | IR 17x22x23                          | -             | G 22x28x4                                   | SD 22x28x4 |
|            | 0,8       | -                                    | LR 20x25x12.5 | G 25x32x4                                   | -          |
|            | 0,8       | IR 20x25x17                          | LR 20x25x16.5 | -   | -          |
|            | 0,8       | IR 20x25x17                          | LR 20x25x16.5 | G 25x32x4                                   | -          |
| 28         | 0,8       | IR 20x25x20.5                        | LR 20x25x20.5 | -   | -          |
|            | 0,8       | IR 20x25x20.5                        | LR 20x25x20.5 | G 25x32x4                                   | -          |
|            | 0,8       | IR 20x25x26.5                        | LR 20x25x26.5 | G 25x32x4                                   | -          |
|            | 0,8       | IR 20x25x30                          | -             | -   | -          |
|            | 0,8       | IR 20x25x38.5                        | LR 20x25x38.5 | G 25x32x4                                   | -          |
|            | 0,8       | IR 22x28x17                          | -             | G 28x35x4                                   | SD 28x35x4 |
| 30         | 0,8       | IR 22x28x20.5                        | LR 22x28x20.5 | -   | -          |
|            | 0,8       | IR 22x28x20.5                        | LR 22x28x20.5 | G 28x35x4                                   | SD 28x35x4 |
|            | 0,8       | -                                    | LR 25x30x12.5 | G 30x37x4                                   | SD 30x37x4 |
| 30         | 0,8       | IR 25x30x17                          | LR 25x30x16.5 | -   | -          |
|            | 0,8       | IR 25x30x17                          | LR 25x30x16.5 | G 30x37x4                                   | SD 30x37x4 |
|            | 0,8       | IR 25x30x20.5                        | LR 25x30x20.5 | G 30x37x4                                   | SD 30x37x4 |
|            | 0,8       | IR 25x30x26.5                        | LR 25x30x26.5 | G 30x37x4                                   | SD 30x37x4 |
|            | 0,8       | IR 25x30x38.5                        | LR 25x30x38.5 | G 30x37x4                                   | SD 30x37x4 |
|            | 0,8       | IR 25x30x38.5                        | LR 25x30x38.5 | G 30x37x4                                   | SD 30x37x4 |

<sup>1)</sup> For additional information → Needle roller bearing inner rings, page 593

<sup>2)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

## 7.2 Drawn cup needle roller bearings

$F_w$  35 – 60 mm



HK

HK...2RS

| $F_w$ | Principal dimensions |    | Basic load ratings |        | Fatigue load limit<br>$P_u$ | Speed ratings   |                | Mass | Designation                           |
|-------|----------------------|----|--------------------|--------|-----------------------------|-----------------|----------------|------|---------------------------------------|
|       | D                    | C  | dynamic            | static |                             | Reference speed | Limiting speed |      |                                       |
| mm    |                      |    | C                  | $C_0$  | kN                          | kN              | r/min          | g    | –                                     |
| 35    | 42                   | 12 | 12,5               | 21,6   | 2,45                        | 7 000           | 8 000          | 27   | ▶ HK 3512<br>▶ HK 3516<br>HK 3520.2RS |
|       | 42                   | 16 | 17,9               | 34     | 4                           | 7 000           | 8 000          | 36   |                                       |
|       | 42                   | 20 | 17,9               | 34     | 4                           | –               | 5 000          | 41   |                                       |
|       | 42                   | 20 | 22,9               | 46,5   | 5,6                         | 7 000           | 8 000          | 44   | ▶ HK 3520                             |
| 40    | 47                   | 12 | 13,4               | 24,5   | 2,8                         | 6 300           | 7 000          | 30   | ▶ HK 4012<br>HK 4016.2RS<br>▶ HK 4016 |
|       | 47                   | 16 | 14,5               | 27,5   | 3,15                        | –               | 4 500          | 37   |                                       |
|       | 47                   | 16 | 19                 | 39     | 4,55                        | 6 300           | 7 000          | 39   |                                       |
|       | 47                   | 20 | 19                 | 39     | 4,55                        | –               | 4 500          | 48   | HK 4020.2RS                           |
|       | 47                   | 20 | 24,2               | 53     | 6,4                         | 6 300           | 7 000          | 54   | ▶ HK 4020                             |
| 45    | 52                   | 12 | 14,2               | 27,5   | 3,2                         | 5 600           | 6 300          | 33   | HK 4512<br>▶ HK 4516<br>HK 4520.2RS   |
|       | 52                   | 16 | 20,5               | 43     | 5,1                         | 5 600           | 6 300          | 47   |                                       |
|       | 52                   | 20 | 20,5               | 43     | 5,1                         | –               | 4 000          | 54   |                                       |
|       | 52                   | 20 | 26                 | 60     | 7,2                         | 5 600           | 6 300          | 56   | ▶ HK 4520                             |
| 50    | 58                   | 20 | 29,2               | 63     | 7,8                         | 5 000           | 5 600          | 70   | ▶ HK 5020<br>HK 5024.2RS<br>▶ HK 5025 |
|       | 58                   | 24 | 29,2               | 63     | 7,8                         | –               | 3 600          | 81   |                                       |
|       | 58                   | 25 | 36,9               | 85     | 10,6                        | 5 000           | 5 600          | 85   |                                       |
| 55    | 63                   | 20 | 30,3               | 67     | 8,3                         | 4 500           | 5 000          | 74   | ▶ HK 5520<br>HK 5528                  |
|       | 63                   | 28 | 41,8               | 104    | 12,9                        | 4 500           | 5 000          | 105  |                                       |
| 60    | 68                   | 12 | 17,6               | 32     | 3,8                         | 4 300           | 4 800          | 49   | HK 6012<br>HK 6020<br>HK 6032         |
|       | 68                   | 20 | 31,9               | 75     | 9,3                         | 4 300           | 4 800          | 81   |                                       |
|       | 68                   | 32 | 51,2               | 137    | 17                          | 4 300           | 4 800          | 136  |                                       |

7.2



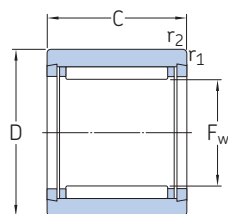
| Dimensions     |           | Associated inner rings <sup>1)</sup> |               | Associated radial shaft seals <sup>2)</sup> |            |
|----------------|-----------|--------------------------------------|---------------|---|------------|
|                |           | IR series                            | LR series     | Single lip                                  | Double lip |
| F <sub>w</sub> | r<br>min. |                                      |               |   |            |
| mm             |           |                                      |               |   |            |
| 35             | 0,8       | –                                    | LR 30x35x12.5 | G 35x42x4                                   | SD 35x42x4 |
|                | 0,8       | IR 30x35x17                          | LR 30x35x16.5 | G 35x42x4                                   | SD 35x42x4 |
|                | 0,8       | IR 30x35x20.5                        | LR 30x35x20.5 | –   | –          |
|                | 0,8       | IR 30x35x20.5                        | LR 30x35x20.5 | G 35x42x4                                   | SD 35x42x4 |
| 40             | 0,8       | –                                    | LR 35x40x12.5 | G 40x47x4                                   | SD 40x47x4 |
|                | 0,8       | IR 35x40x20                          | LR 35x40x16.5 | –   | –          |
|                | 0,8       | IR 35x40x20                          | LR 35x40x16.5 | G 40x47x4                                   | SD 40x47x4 |
|                | 0,8       | IR 35x40x20.5                        | LR 35x40x20.5 | –   | –          |
|                | 0,8       | IR 35x40x20.5                        | LR 35x40x20.5 | G 40x47x4                                   | SD 40x47x4 |
| 45             | 0,8       | –                                    | –             | G 45x52x4                                   | SD 45x52x4 |
|                | 0,8       | IR 40x45x17                          | LR 40x45x16.5 | G 45x52x4                                   | SD 45x52x4 |
|                | 0,8       | IR 40x45x20.5                        | LR 40x45x20.5 | –   | –          |
|                | 0,8       | IR 40x45x20.5                        | –             | G 45x52x4                                   | SD 45x52x4 |
| 50             | 0,8       | –                                    | LR 45x50x20.5 | G 50x58x4                                   | SD 50x58x4 |
|                | 0,8       | IR 45x50x25.5                        | LR 45x50x25.5 | –   | –          |
|                | 0,8       | IR 45x50x25.5                        | LR 45x50x25.5 | G 50x58x4                                   | SD 50x58x4 |
| 55             | 0,8       | –                                    | LR 50x55x20.5 | G 55x63x5                                   | –          |
|                | 0,8       | –                                    | –             | G 55x63x5                                   | –          |
| 60             | 0,8       | –                                    | –             | –   | –          |
|                | 0,8       | –                                    | –             | –   | –          |
|                | 0,8       | –                                    | –             | –   | –          |

<sup>1)</sup> For additional information → *Needle roller bearing inner rings*, page 593

<sup>2)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

### 7.3 Needle roller bearings with machined rings with flanges, without an inner ring

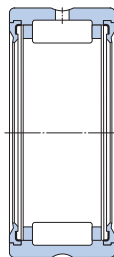
$F_w$  5–19 mm



NK ( $F_w \leq 10$  mm)



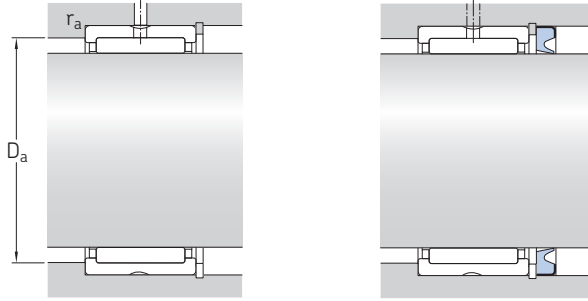
NK ( $F_w \geq 12$  mm)  
RNA 49  
RNA 69



RNA 49 ...2RS

| Principal dimensions |    |      | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass   | Designation  |
|----------------------|----|------|--------------------|--------|--------------------|-----------------|----------------|--------|--|
| $F_w$                | D  | C    | dynamic            | static |                    | Reference speed | Limiting speed |        |  |
| mm                   |    |      | C                  | $C_0$  | $P_u$              | r/min           |                | kg     | –  |
| 5                    | 10 | 10   | 2,29               | 2      | 0,212              | 36 000          | 40 000         | 0,0031 | ▶ NK 5/10 TN<br>▶ NK 5/12 TN   |
|                      | 10 | 12   | 2,92               | 2,7    | 0,29               | 36 000          | 40 000         | 0,0037 |  |
| 6                    | 12 | 10   | 2,55               | 2,36   | 0,25               | 34 000          | 38 000         | 0,0047 | ▶ NK 6/10 TN<br>▶ NK 6/12 TN   |
|                      | 12 | 12   | 3,3                | 3,2    | 0,345              | 34 000          | 38 000         | 0,0057 |  |
| 7                    | 14 | 10   | 2,81               | 2,75   | 0,29               | 32 000          | 36 000         | 0,0069 | NK 7/10 TN<br>NK 7/12 TN   |
|                      | 14 | 12   | 3,58               | 3,75   | 0,415              | 32 000          | 36 000         | 0,0082 |  |
| 8                    | 15 | 12   | 3,8                | 4,25   | 0,465              | 32 000          | 36 000         | 0,0087 | ▶ NK 8/12 TN<br>▶ NK 8/16 TN   |
|                      | 15 | 16   | 5,01               | 5,85   | 0,67               | 32 000          | 36 000         | 0,012  |  |
| 9                    | 16 | 12   | 4,4                | 5,2    | 0,57               | 30 000          | 34 000         | 0,01   | ▶ NK 9/12 TN<br>NK 9/16 TN   |
|                      | 16 | 16   | 5,72               | 7,2    | 0,815              | 30 000          | 34 000         | 0,013  |  |
| 10                   | 17 | 12   | 4,57               | 5,7    | 0,63               | 28 000          | 32 000         | 0,01   | ▶ NK 10/12 TN<br>▶ NK 10/16 TN   |
|                      | 17 | 16   | 5,94               | 8      | 0,9                | 28 000          | 32 000         | 0,013  |  |
| 12                   | 19 | 12   | 6,71               | 8,15   | 0,965              | 26 000          | 30 000         | 0,012  | ▶ NK 12/12<br>▶ NK 12/16   |
|                      | 19 | 16   | 9,13               | 12     | 1,43               | 26 000          | 30 000         | 0,016  |  |
| 14                   | 22 | 13   | 7,37               | 8,15   | 0,965              | –               | 12 000         | 0,016  | ▶ RNA 4900.2RS<br>▶ RNA 4900<br>▶ NK 14/16<br><br>▶ NK 14/20               |
|                      | 22 | 13   | 8,8                | 10,4   | 1,22               | 24 000          | 28 000         | 0,017  |  |
|                      | 22 | 16   | 10,2               | 12,5   | 1,5                | 24 000          | 28 000         | 0,021  |  |
|                      | 22 | 20   | 12,8               | 16,6   | 2                  | 24 000          | 28 000         | 0,026  |  |
| 15                   | 23 | 16   | 11                 | 14     | 1,66               | 24 000          | 26 000         | 0,022  | ▶ NK 15/16<br>▶ NK 15/20   |
|                      | 23 | 20   | 13,8               | 18,3   | 2,2                | 24 000          | 26 000         | 0,027  |  |
| 16                   | 24 | 13   | 8,09               | 9,65   | 1,14               | –               | 11 000         | 0,018  | ▶ RNA 4901.2RS<br>▶ RNA 4901<br>▶ NK 16/16<br><br>▶ NK 16/20<br>▶ RNA 6901 |
|                      | 24 | 13   | 9,9                | 12,2   | 1,46               | 22 000          | 26 000         | 0,017  |  |
|                      | 24 | 16   | 11,7               | 15,3   | 1,8                | 22 000          | 26 000         | 0,022  |  |
|                      | 24 | 20   | 14,5               | 20     | 2,4                | 22 000          | 26 000         | 0,028  |  |
| 17                   | 24 | 22   | 16,1               | 23,2   | 2,75               | 22 000          | 26 000         | 0,031  |  |
|                      | 25 | 16   | 12,1               | 16,6   | 1,96               | 22 000          | 26 000         | 0,024  | ▶ NK 17/16<br>▶ NK 17/20   |
| 25                   | 20 | 15,1 | 22                 | 2,65   | 22 000             | 26 000          | 0,03           |        |  |
| 18                   | 26 | 16   | 12,8               | 17,6   | 2,12               | 22 000          | 24 000         | 0,025  | ▶ NK 18/16<br>▶ NK 18/20   |
|                      | 26 | 20   | 16,1               | 23,6   | 2,85               | 22 000          | 24 000         | 0,031  |  |
| 19                   | 27 | 16   | 13,4               | 19     | 2,28               | 20 000          | 24 000         | 0,026  | ▶ NK 19/16<br>NK 19/20   |
|                      | 27 | 20   | 16,5               | 25,5   | 3,05               | 20 000          | 24 000         | 0,032  |  |

▶ Popular item

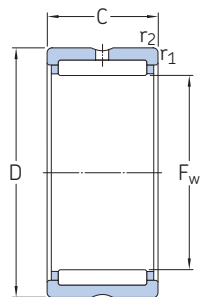


| Dimensions     |                          | Abutment and fillet dimensions |                        | Associated radial shaft seals <sup>1)</sup> |            | Spring loaded lip |
|----------------|--------------------------|--------------------------------|------------------------|---|------------|-------------------|
| F <sub>w</sub> | r <sub>1,2</sub><br>min. | D <sub>a</sub><br>max.         | r <sub>a</sub><br>max. | Single lip                                  | Double lip |                   |
| mm             |                          | mm                             |                        | -   |            |                   |
| 5              | 0,15                     | 8,8                            | 0,1                    | G 5x10x2 S                                  | -          | -                 |
|                | 0,15                     | 8,8                            | 0,1                    | G 5x10x2 S                                  | -          | -                 |
| 6              | 0,15                     | 10,8                           | 0,1                    | G 6x12x2 S                                  | -          | -                 |
|                | 0,15                     | 10,8                           | 0,1                    | G 6x12x2 S                                  | -          | -                 |
| 7              | 0,3                      | 12                             | 0,3                    | G 7x14x2                                    | -          | -                 |
|                | 0,3                      | 12                             | 0,3                    | G 7x14x2                                    | -          | -                 |
| 8              | 0,3                      | 13                             | 0,3                    | G 8x15x3                                    | SD 8x15x3  | -                 |
|                | 0,3                      | 13                             | 0,3                    | G 8x15x3                                    | SD 8x15x3  | -                 |
| 9              | 0,3                      | 14                             | 0,3                    | G 9x16x3                                    | -          | -                 |
|                | 0,3                      | 14                             | 0,3                    | G 9x16x3                                    | -          | -                 |
| 10             | 0,3                      | 15                             | 0,3                    | G 10x17x3                                   | SD 10x17x3 | -                 |
|                | 0,3                      | 15                             | 0,3                    | G 10x17x3                                   | SD 10x17x3 | -                 |
| 12             | 0,3                      | 17                             | 0,3                    | G 12x19x3                                   | SD 12x19x3 | -                 |
|                | 0,3                      | 17                             | 0,3                    | G 12x19x3                                   | SD 12x19x3 | -                 |
| 14             | 0,3                      | 20                             | 0,3                    | -   | -          | -                 |
|                | 0,3                      | 20                             | 0,3                    | G 14x22x3                                   | SD 14x22x3 | -                 |
|                | 0,3                      | 20                             | 0,3                    | G 14x22x3                                   | SD 14x22x3 | -                 |
|                | 0,3                      | 20                             | 0,3                    | G 14x22x3                                   | SD 14x22x3 | -                 |
| 15             | 0,3                      | 21                             | 0,3                    | G 15x23x3                                   | SD 15x23x3 | -                 |
|                | 0,3                      | 21                             | 0,3                    | G 15x23x3                                   | SD 15x23x3 | -                 |
| 16             | 0,3                      | 22                             | 0,3                    | -   | -          | -                 |
|                | 0,3                      | 22                             | 0,3                    | G 16x24x3                                   | SD 16x24x3 | -                 |
|                | 0,3                      | 22                             | 0,3                    | G 16x24x3                                   | SD 16x24x3 | -                 |
|                | 0,3                      | 22                             | 0,3                    | G 16x24x3                                   | SD 16x24x3 | -                 |
| 17             | 0,3                      | 23                             | 0,3                    | G 17x25x3                                   | SD 17x25x3 | -                 |
|                | 0,3                      | 23                             | 0,3                    | G 17x25x3                                   | SD 17x25x3 | -                 |
| 18             | 0,3                      | 24                             | 0,3                    | G 18x26x4                                   | SD 18x26x4 | -                 |
|                | 0,3                      | 24                             | 0,3                    | G 18x26x4                                   | SD 18x26x4 | -                 |
| 19             | 0,3                      | 25                             | 0,3                    | G 19x27x4                                   | SD 19x27x4 | -                 |
|                | 0,3                      | 25                             | 0,3                    | G 19x27x4                                   | SD 19x27x4 | -                 |

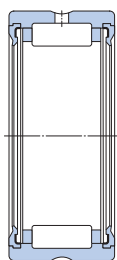
<sup>1)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

### 7.3 Needle roller bearings with machined rings with flanges, without an inner ring

$F_w$  20 – 29 mm



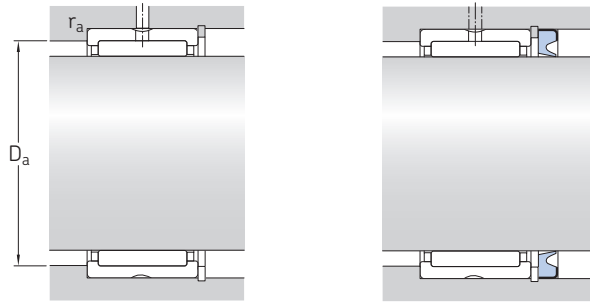
NK(S)  
RNA 49  
RNA 69



RNA 49 ...2RS

| Principal dimensions |    |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass  | Designation                                |
|----------------------|----|----|--------------------|--------|--------------------|-----------------|----------------|-------|--|
| $F_w$                | D  | C  | dynamic            | static |                    | Reference speed | Limiting speed |       |  |
| mm                   |    |    | C                  | $C_0$  | $P_u$              | r/min           |                | kg    | –  |
| 20                   | 28 | 13 | 9,13               | 12     | 1,43               | –               | 9 500          | 0,022 | ▶ RNA 4902.2RS<br>▶ RNA 4902<br>▶ NK 20/16 |
|                      | 28 | 13 | 11,2               | 15,3   | 1,83               | 19 000          | 22 000         | 0,022 |  |
|                      | 28 | 16 | 13,2               | 19,3   | 2,28               | 19 000          | 22 000         | 0,027 |  |
|                      | 28 | 20 | 16,5               | 25,5   | 3,05               | 19 000          | 22 000         | 0,034 | ▶ NK 20/20<br>▶ RNA 6902<br>▶ NKS 20       |
|                      | 28 | 23 | 17,2               | 27     | 3,35               | 19 000          | 22 000         | 0,04  |  |
|                      | 32 | 20 | 23,3               | 27     | 3,25               | 18 000          | 20 000         | 0,049 |  |
| 21                   | 29 | 16 | 13,8               | 20,4   | 2,45               | 19 000          | 22 000         | 0,028 | NK 21/16<br>NK 21/20                       |
|                      | 29 | 20 | 17,2               | 27     | 3,35               | 19 000          | 22 000         | 0,035 |  |
| 22                   | 30 | 13 | 9,52               | 12,9   | 1,53               | –               | 9 000          | 0,023 | RNA 4903.2RS<br>▶ RNA 4903<br>▶ NK 22/16   |
|                      | 30 | 13 | 11,4               | 16,3   | 1,96               | 18 000          | 20 000         | 0,022 |  |
|                      | 30 | 16 | 14,2               | 21,6   | 2,6                | 18 000          | 20 000         | 0,03  |  |
|                      | 30 | 20 | 17,9               | 29     | 3,55               | 18 000          | 20 000         | 0,037 | ▶ NK 22/20<br>▶ RNA 6903                   |
|                      | 30 | 23 | 18,7               | 30,5   | 3,75               | 18 000          | 20 000         | 0,042 |  |
|                      | 30 | 23 | 18,7               | 30,5   | 3,75               | 18 000          | 20 000         | 0,042 |  |
| 24                   | 32 | 16 | 15,4               | 24,5   | 2,9                | 16 000          | 19 000         | 0,032 | ▶ NK 24/16<br>▶ NK 24/20<br>NKS 24         |
|                      | 32 | 20 | 19                 | 32,5   | 4                  | 16 000          | 19 000         | 0,04  |  |
|                      | 37 | 20 | 26                 | 33,5   | 4                  | 15 000          | 17 000         | 0,066 |  |
| 25                   | 33 | 16 | 15,1               | 24,5   | 2,9                | 16 000          | 18 000         | 0,033 | ▶ NK 25/16<br>▶ NK 25/20<br>▶ RNA 4904.2RS |
|                      | 33 | 20 | 19                 | 32,5   | 4                  | 16 000          | 18 000         | 0,042 |  |
|                      | 37 | 17 | 19,4               | 22,4   | 2,65               | –               | 7 500          | 0,056 |  |
|                      | 37 | 17 | 21,6               | 28     | 3,35               | 15 000          | 17 000         | 0,052 | ▶ RNA 4904<br>▶ RNA 6904<br>▶ NKS 25       |
|                      | 37 | 30 | 35,2               | 53     | 6,55               | 15 000          | 17 000         | 0,1   |  |
|                      | 38 | 20 | 27,5               | 36     | 4,4                | 15 000          | 17 000         | 0,068 |  |
| 26                   | 34 | 16 | 15,7               | 26     | 3,1                | 15 000          | 17 000         | 0,034 | ▶ NK 26/16<br>▶ NK 26/20                   |
|                      | 34 | 20 | 19,4               | 34,5   | 4,25               | 15 000          | 17 000         | 0,042 |  |
| 28                   | 37 | 20 | 22                 | 36,5   | 4,55               | 14 000          | 16 000         | 0,052 | ▶ NK 28/20<br>▶ NK 28/30<br>RNA 49/22      |
|                      | 37 | 30 | 31,9               | 60     | 7,5                | 14 000          | 16 000         | 0,082 |  |
|                      | 39 | 17 | 23,3               | 32     | 3,9                | 14 000          | 15 000         | 0,05  |  |
|                      | 39 | 30 | 36,9               | 57     | 7,2                | 14 000          | 15 000         | 0,098 | RNA 69/22<br>NKS 28                        |
|                      | 42 | 20 | 28,6               | 39     | 4,75               | 13 000          | 15 000         | 0,084 |  |
|                      | 42 | 20 | 28,6               | 39     | 4,75               | 13 000          | 15 000         | 0,084 |  |
| 29                   | 38 | 20 | 24,6               | 42,5   | 5,2                | 14 000          | 15 000         | 0,05  | NK 29/20 TN<br>NK 29/30                    |
|                      | 38 | 30 | 31,9               | 60     | 7,5                | 14 000          | 15 000         | 0,084 |  |

▶ Popular item



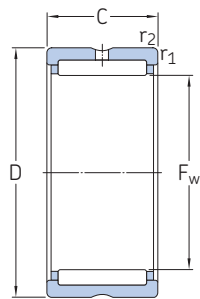
| Dimensions     |                       | Abutment and fillet dimensions |                     | Associated radial shaft seals <sup>1)</sup> |            | Spring loaded lip |
|----------------|-----------------------|--------------------------------|---------------------|---|------------|-------------------|
| F <sub>w</sub> | r <sub>1,2</sub> min. | D <sub>a</sub> max.            | r <sub>a</sub> max. | Single lip                                  | Double lip |                   |
| mm             |                       | mm                             |                     | -   |            |                   |
| 20             | 0,3                   | 26                             | 0,3                 | -   | -          | -                 |
|                | 0,3                   | 26                             | 0,3                 | G 20x28x4                                   | SD 20x28x4 | -                 |
|                | 0,3                   | 26                             | 0,3                 | G 20x28x4                                   | SD 20x28x4 | -                 |
|                | 0,3                   | 26                             | 0,3                 | G 20x28x4                                   | SD 20x28x4 | -                 |
|                | 0,3                   | 26                             | 0,3                 | G 20x28x4                                   | SD 20x28x4 | -                 |
|                | 0,6                   | 28                             | 0,6                 | -   | -          | 20x32x7 HMS5 RG   |
| 21             | 0,3                   | 27                             | 0,3                 | G 21x29x4                                   | -          | -                 |
|                | 0,3                   | 27                             | 0,3                 | G 21x29x4                                   | -          | -                 |
| 22             | 0,3                   | 28                             | 0,3                 | -   | -          | -                 |
|                | 0,3                   | 28                             | 0,3                 | G 22x30x4                                   | SD 22x30x4 | -                 |
|                | 0,3                   | 28                             | 0,3                 | G 22x30x4                                   | SD 22x30x4 | -                 |
|                | 0,3                   | 28                             | 0,3                 | G 22x30x4                                   | SD 22x30x4 | -                 |
|                | 0,3                   | 28                             | 0,3                 | G 22x30x4                                   | SD 22x30x4 | -                 |
|                | 0,3                   | 28                             | 0,3                 | G 22x30x4                                   | SD 22x30x4 | -                 |
| 24             | 0,3                   | 30                             | 0,3                 | G 24x32x4                                   | SD 24x32x4 | -                 |
|                | 0,3                   | 30                             | 0,3                 | G 24x32x4                                   | SD 24x32x4 | -                 |
|                | 0,6                   | 33                             | 0,6                 | -   | -          | 24x37x7 HMS5 RG   |
| 25             | 0,3                   | 31                             | 0,3                 | G 25x33x4                                   | SD 25x33x4 | -                 |
|                | 0,3                   | 31                             | 0,3                 | G 25x33x4                                   | SD 25x33x4 | -                 |
|                | 0,3                   | 35                             | 0,3                 | -   | -          | -                 |
|                | 0,3                   | 35                             | 0,3                 | -   | -          | 25x37x5 HMS5 RG   |
|                | 0,3                   | 35                             | 0,3                 | -   | -          | 25x37x5 HMS5 RG   |
|                | 0,6                   | 34                             | 0,6                 | -   | -          | 25x38x7 HMS5 RG   |
| 26             | 0,3                   | 32                             | 0,3                 | G 26x34x4                                   | SD 26x34x4 | -                 |
|                | 0,3                   | 32                             | 0,3                 | G 26x34x4                                   | SD 26x34x4 | -                 |
| 28             | 0,3                   | 35                             | 0,3                 | G 28x37x4                                   | -          | -                 |
|                | 0,3                   | 35                             | 0,3                 | G 28x37x4                                   | -          | -                 |
|                | 0,3                   | 37                             | 0,3                 | -   | -          | -                 |
|                | 0,3                   | 37                             | 0,3                 | -   | -          | -                 |
|                | 0,3                   | 37                             | 0,3                 | -   | -          | -                 |
|                | 0,6                   | 38                             | 0,6                 | -   | -          | 28x42x7 HMS5 RG   |
| 29             | 0,3                   | 36                             | 0,3                 | G 29x38x4                                   | -          | -                 |
|                | 0,3                   | 36                             | 0,3                 | G 29x38x4                                   | -          | -                 |

<sup>1)</sup> For additional information → [skf.com/seals](http://skf.com/seals)



### 7.3 Needle roller bearings with machined rings with flanges, without an inner ring

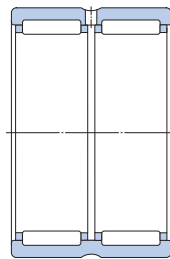
$F_w$  30 – 43 mm



NK(S)  
RNA 49  
RNA 69 ( $F_w \leq 38$  mm)



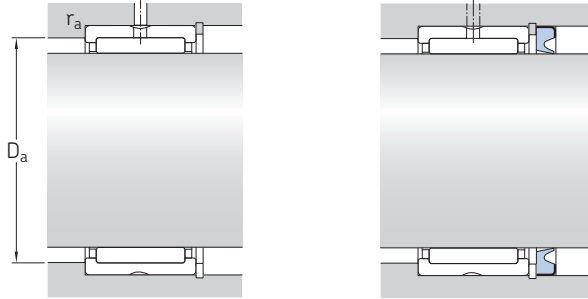
RNA 49 ...2RS



RNA 69 ( $F_w \geq 40$  mm)

| $F_w$ | Principal dimensions |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass   | Designation                                      |                                      |
|-------|----------------------|----|--------------------|--------|--------------------|-----------------|----------------|--------|--|--------------------------------------|
|       | D                    | C  | dynamic            | static |                    | Reference speed | Limiting speed |        |  |                                      |
| mm    |                      |    | C                  | $C_0$  | $P_u$              | r/min           |                | kg     | –  |                                      |
| 30    | 40                   | 20 | 25,1               | 44     | 5,5                | 13 000          | 15 000         | 0,061  | ▶ NK 30/20 TN<br>▶ NK 30/30 TN<br>▶ RNA 4905.2RS |                                      |
|       | 40                   | 30 | 36,9               | 72     | 9                  | 13 000          | 15 000         | 0,092  |  |                                      |
|       | 42                   | 17 | 21,6               | 27,5   | 3,25               | –               | 6 300          | 0,06   |  |                                      |
|       | 32                   | 42 | 17                 | 24,2   | 34,5               | 4,15            | 13 000         | 15 000 | 0,061  | ▶ RNA 4905<br>▶ RNA 6905<br>▶ NKS 30 |
|       |                      | 42 | 30                 | 38     | 62                 | 7,65            | 13 000         | 15 000 | 0,11   |                                      |
|       |                      | 45 | 22                 | 31,9   | 43                 | 5,3             | 12 000         | 14 000 | 0,1  |                                      |
| 45    |                      | 30 | 39,6               | 65,5   | 8,3                | 12 000          | 14 000         | 0,14   |  |                                      |
| 35    | 45                   | 20 | 26,4               | 48     | 6                  | 12 000          | 14 000         | 0,064  | ▶ NK 32/20 TN<br>NK 32/30<br>RNA 49/28           |                                      |
|       | 45                   | 30 | 34,1               | 65,5   | 8,3                | 12 000          | 14 000         | 0,1    |  |                                      |
|       | 47                   | 17 | 25,1               | 36,5   | 4,4                | 12 000          | 14 000         | 0,073  |  |                                      |
|       | 47                   | 30 | 42,9               | 75     | 9,3                | 11 000          | 13 000         | 0,13   |  |                                      |
|       | 50                   | 22 | 35,2               | 50     | 6,2                | 11 000          | 12 000         | 0,12   |  |                                      |
|       | 50                   | 30 | 40,2               | 85     | 10,6               | 11 000          | 13 000         | 0,11   |  |                                      |
| 37    | 47                   | 20 | 27,5               | 52     | 6,55               | 11 000          | 13 000         | 0,069  | ▶ NK 35/20 TN<br>▶ NK 35/30 TN<br>▶ RNA 4906.2RS |                                      |
|       | 47                   | 30 | 36,9               | 76,5   | 9,5                | 11 000          | 12 000         | 0,11   |  |                                      |
|       | 52                   | 22 | 36,9               | 54     | 6,55               | 10 000          | 12 000         | 0,12   |  |                                      |
|       | 47                   | 17 | 25,5               | 39     | 4,65               | 11 000          | 13 000         | 0,069  |  |                                      |
|       | 47                   | 30 | 42,9               | 75     | 9,3                | 11 000          | 13 000         | 0,13   |  |                                      |
|       | 50                   | 22 | 35,2               | 50     | 6,2                | 11 000          | 12 000         | 0,12   |  |                                      |
| 38    | 47                   | 20 | 25,1               | 46,5   | 5,85               | 11 000          | 12 000         | 0,077  | NK 37/20<br>NK 37/30<br>NKS 37                   |                                      |
|       | 47                   | 30 | 36,9               | 76,5   | 9,5                | 11 000          | 12 000         | 0,11   |  |                                      |
|       | 52                   | 22 | 36,9               | 54     | 6,55               | 10 000          | 12 000         | 0,12   |  |                                      |
| 40    | 48                   | 20 | 25,5               | 49     | 6,1                | 11 000          | 12 000         | 0,079  | ▶ NK 38/20<br>NK 38/30                           |                                      |
|       | 48                   | 30 | 37,4               | 80     | 10                 | 11 000          | 12 000         | 0,12   |  |                                      |
|       | 50                   | 20 | 29,7               | 60     | 7,5                | 10 000          | 11 000         | 0,078  |  |                                      |
| 42    | 50                   | 30 | 38                 | 83     | 10,4               | 10 000          | 11 000         | 0,13   | ▶ NK 40/20 TN<br>▶ NK 40/30<br>▶ RNA 49/32       |                                      |
|       | 52                   | 20 | 30,8               | 51     | 6,3                | 10 000          | 11 000         | 0,089  |  |                                      |
|       | 52                   | 36 | 47,3               | 90     | 10,8               | 10 000          | 11 000         | 0,16   |  |                                      |
|       | 55                   | 22 | 38                 | 57     | 7,1                | 9 500           | 11 000         | 0,13   |  |                                      |
|       | 52                   | 20 | 27                 | 53     | 6,55               | 9 500           | 11 000         | 0,086  |  |                                      |
|       | 52                   | 30 | 39,1               | 86,5   | 10,8               | 9 500           | 11 000         | 0,13   |  |                                      |
| 43    | 55                   | 20 | 27                 | 43     | 5,3                | –               | 4 800          | 0,11   | ▶ NK 42/20<br>NK 42/30<br>RNA 4907.2RS           |                                      |
|       | 55                   | 36 | 48,4               | 93     | 11,4               | 9 500           | 11 000         | 0,19   |  |                                      |
|       | 55                   | 20 | 31,9               | 54     | 6,7                | 9 500           | 11 000         | 0,11   |  |                                      |
|       | 55                   | 36 | 48,4               | 93     | 11,4               | 9 500           | 11 000         | 0,19   |  |                                      |
|       | 53                   | 20 | 27,5               | 55     | 6,8                | 9 500           | 11 000         | 0,086  |  |                                      |
|       | 53                   | 30 | 40,2               | 90     | 11,2               | 9 500           | 11 000         | 0,13   |  |                                      |
| 43    | 58                   | 22 | 39,1               | 61     | 7,5                | 9 000           | 10 000         | 0,14   | RNA 4907<br>RNA 6907                             |                                      |
|       | 58                   | 22 | 39,1               | 61     | 7,5                | 9 000           | 10 000         | 0,14   |  |                                      |

▶ Popular item

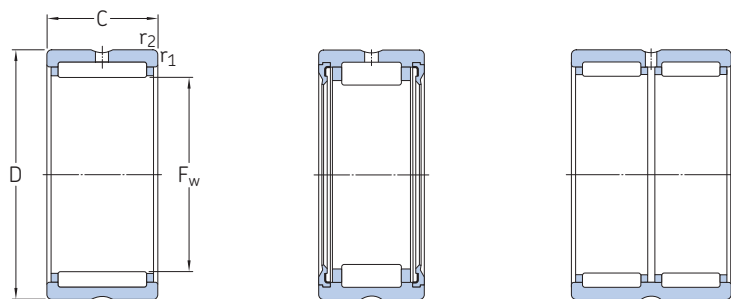


| Dimensions     |                       | Abutment and fillet dimensions |                     | Associated radial shaft seals <sup>1)</sup> |            | Spring loaded lip |
|----------------|-----------------------|--------------------------------|---------------------|---|------------|-------------------|
| F <sub>w</sub> | r <sub>1,2</sub> min. | D <sub>a</sub> max.            | r <sub>a</sub> max. | Single lip                                  | Double lip |                   |
| mm             |                       | mm                             |                     | -   |            |                   |
| 30             | 0,3                   | 38                             | 0,3                 | G 30x40x4                                   | SD 30x40x4 | -                 |
|                | 0,3                   | 38                             | 0,3                 | G 30x40x4                                   | SD 30x40x4 | -                 |
|                | 0,3                   | 40                             | 0,3                 | -   | -          | -                 |
|                | 0,3                   | 40                             | 0,3                 | -   | -          | 30x42x6 HMS5 RG   |
|                | 0,3                   | 40                             | 0,3                 | -   | -          | 30x42x6 HMS5 RG   |
|                | 0,6                   | 41                             | 0,6                 | -   | -          | 30x45x7 HMS5 RG   |
| 32             | 0,3                   | 40                             | 0,3                 | G 32x42x4                                   | SD 32x42x4 | -                 |
|                | 0,3                   | 40                             | 0,3                 | G 32x42x4                                   | SD 32x42x4 | -                 |
|                | 0,3                   | 43                             | 0,3                 | G 32x45x4                                   | -          | -                 |
|                | 0,3                   | 43                             | 0,3                 | G 32x45x4                                   | -          | -                 |
|                | 0,6                   | 43                             | 0,6                 | -   | -          | 32x47x6 HMS5 RG   |
|                | 0,6                   | 43                             | 0,6                 | -   | -          | 32x47x6 HMS5 RG   |
| 35             | 0,3                   | 43                             | 0,3                 | G 35x45x4                                   | SD 35x45x4 | -                 |
|                | 0,3                   | 43                             | 0,3                 | G 35x45x4                                   | SD 35x45x4 | -                 |
|                | 0,3                   | 45                             | 0,3                 | -   | -          | -                 |
|                | 0,3                   | 45                             | 0,3                 | -   | -          | 35x47x6 HMS5 RG   |
|                | 0,3                   | 45                             | 0,3                 | -   | -          | 35x47x6 HMS5 RG   |
|                | 0,6                   | 46                             | 0,6                 | -   | -          | 35x50x7 HMS5 RG   |
| 37             | 0,3                   | 45                             | 0,3                 | G 37x47x4                                   | SD 37x47x4 | -                 |
|                | 0,3                   | 45                             | 0,3                 | G 37x47x4                                   | SD 37x47x4 | -                 |
|                | 0,6                   | 48                             | 0,6                 | -   | -          | 37x52x8 HMS4 R    |
| 38             | 0,3                   | 46                             | 0,3                 | G 38x48x4                                   | SD 38x48x4 | -                 |
|                | 0,3                   | 46                             | 0,3                 | G 38x48x4                                   | SD 38x48x4 | -                 |
| 40             | 0,3                   | 48                             | 0,3                 | G 40x50x4                                   | SD 40x50x4 | -                 |
|                | 0,3                   | 48                             | 0,3                 | G 40x50x4                                   | SD 40x50x4 | -                 |
|                | 0,6                   | 48                             | 0,6                 | G 40x52x5                                   | SD 40x52x5 | -                 |
|                | 0,6                   | 48                             | 0,6                 | G 40x52x5                                   | SD 40x52x5 | -                 |
|                | 0,6                   | 51                             | 0,6                 | -   | -          | 40x55x7 HMS5 RG   |
|                | 0,6                   | 51                             | 0,6                 | -   | -          | 40x55x7 HMS5 RG   |
| 42             | 0,3                   | 50                             | 0,3                 | G 42x52x4                                   | SD 42x52x4 | -                 |
|                | 0,3                   | 50                             | 0,3                 | G 42x52x4                                   | SD 42x52x4 | -                 |
|                | 0,6                   | 51                             | 0,6                 | -   | -          | -                 |
|                | 0,6                   | 51                             | 0,6                 | -   | -          | 42x55x7 HMS5 RG   |
|                | 0,6                   | 51                             | 0,6                 | -   | -          | 42x55x7 HMS5 RG   |
|                | 0,6                   | 51                             | 0,6                 | -   | -          | 42x55x7 HMS5 RG   |
| 43             | 0,3                   | 51                             | 0,3                 | G 43x53x4                                   | -          | -                 |
|                | 0,3                   | 51                             | 0,3                 | G 43x53x4                                   | -          | -                 |
|                | 0,6                   | 53                             | 0,6                 | -   | -          | -                 |

<sup>1)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

### 7.3 Needle roller bearings with machined rings with flanges, without an inner ring

$F_w$  45 – 70 mm



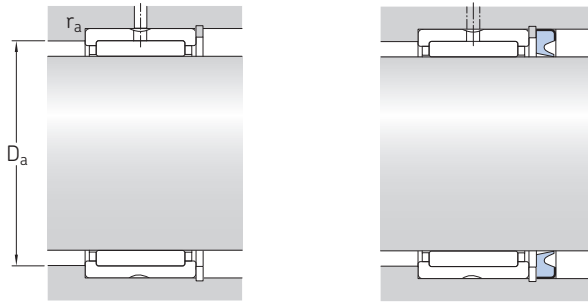
NK(S)  
RNA 49

RNA 49 ...2RS

RNA 69

| Principal dimensions |    |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass  | Designation                                |
|----------------------|----|----|--------------------|--------|--------------------|-----------------|----------------|-------|--|
| $F_w$                | D  | C  | dynamic            | static |                    | Reference speed | Limiting speed |       |  |
| mm                   |    |    | C                  | $C_0$  | $P_u$              | r/min           |                | kg    | –  |
| 45                   | 55 | 20 | 31,4               | 65,5   | 8,3                | 9 000           | 10 000         | 0,085 | ▶ NK 45/20 TN<br>▶ NK 45/30 TN<br>▶ NKS 45 |
|                      | 55 | 30 | 45,7               | 108    | 13,7               | 9 000           | 10 000         | 0,13  |  |
|                      | 60 | 22 | 40,2               | 64     | 8                  | 8 500           | 10 000         | 0,15  |  |
| 47                   | 57 | 20 | 29,2               | 61     | 7,65               | 8 500           | 10 000         | 0,095 | NK 47/20<br>▶ NK 47/30                     |
|                      | 57 | 30 | 41,8               | 98     | 12,5               | 8 500           | 10 000         | 0,14  |  |
| 48                   | 62 | 22 | 36,9               | 58,5   | 7,1                | –               | 4 000          | 0,15  | RNA 4908.2RS<br>▶ RNA 4908<br>▶ RNA 6908   |
|                      | 62 | 22 | 42,9               | 71     | 8,8                | 8 000           | 9 500          | 0,14  |  |
|                      | 62 | 40 | 67,1               | 125    | 15,3               | 8 000           | 9 500          | 0,26  |  |
| 50                   | 62 | 25 | 42,9               | 91,5   | 11,2               | 8 000           | 9 000          | 0,15  | ▶ NK 50/25 TN<br>▶ NK 50/35 TN<br>NKS 50   |
|                      | 62 | 35 | 58,3               | 137    | 17                 | 8 000           | 9 000          | 0,21  |  |
|                      | 65 | 22 | 42,9               | 72     | 8,8                | 8 000           | 9 000          | 0,16  |  |
| 52                   | 68 | 22 | 39,1               | 64     | 7,8                | –               | 3 800          | 0,16  | RNA 4909.2RS<br>RNA 4909<br>▶ RNA 6909     |
|                      | 68 | 22 | 45,7               | 78     | 9,65               | 7 500           | 8 500          | 0,18  |  |
|                      | 68 | 40 | 70,4               | 137    | 17                 | 7 500           | 8 500          | 0,34  |  |
| 55                   | 68 | 25 | 40,2               | 88     | 10,8               | 7 500           | 8 500          | 0,18  | ▶ NK 55/25<br>NK 55/35<br>▶ NKS 55         |
|                      | 68 | 35 | 52,3               | 122    | 15,3               | 7 500           | 8 500          | 0,25  |  |
|                      | 72 | 22 | 44,6               | 78     | 9,8                | 7 000           | 8 000          | 0,22  |  |
| 58                   | 72 | 22 | 40,2               | 69,5   | 8,5                | –               | 3 400          | 0,16  | ▶ RNA 4910.2RS<br>▶ RNA 4910<br>▶ RNA 6910 |
|                      | 72 | 22 | 47,3               | 85     | 10,6               | 7 000           | 8 000          | 0,16  |  |
|                      | 72 | 40 | 73,7               | 150    | 18,6               | 7 000           | 8 000          | 0,31  |  |
| 60                   | 72 | 25 | 46,8               | 110    | 13,4               | 6 700           | 7 500          | 0,17  | NK 60/25 TN<br>▶ NK 60/35<br>▶ NKS 60      |
|                      | 72 | 35 | 55                 | 134    | 17                 | 6 700           | 7 500          | 0,26  |  |
|                      | 80 | 28 | 62,7               | 104    | 13,2               | 6 300           | 7 500          | 0,34  |  |
| 63                   | 80 | 25 | 57,2               | 106    | 13,2               | 6 300           | 7 000          | 0,26  | ▶ RNA 4911<br>▶ RNA 6911                   |
|                      | 80 | 45 | 89,7               | 190    | 23,2               | 6 300           | 7 000          | 0,47  |  |
| 65                   | 78 | 25 | 44                 | 104    | 12,7               | 6 300           | 7 000          | 0,22  | ▶ NK 65/25<br>▶ NK 65/35<br>NKS 65         |
|                      | 78 | 35 | 58,3               | 146    | 18,3               | 6 300           | 7 000          | 0,31  |  |
|                      | 85 | 28 | 66                 | 114    | 14,6               | 6 000           | 6 700          | 0,36  |  |
| 68                   | 82 | 25 | 44                 | 95     | 11,8               | 6 000           | 6 700          | 0,24  | NK 68/25<br>NK 68/35<br>▶ RNA 4912         |
|                      | 82 | 35 | 60,5               | 146    | 18,3               | 6 000           | 6 700          | 0,34  |  |
|                      | 85 | 25 | 60,5               | 114    | 14,3               | 6 000           | 6 700          | 0,28  |  |
|                      | 85 | 45 | 93,5               | 204    | 25                 | 6 000           | 6 700          | 0,49  | ▶ RNA 6912                                 |
| 70                   | 85 | 25 | 44,6               | 98     | 12,2               | 6 000           | 6 700          | 0,26  | ▶ NK 70/25<br>▶ NK 70/35<br>▶ NKS 70       |
|                      | 85 | 35 | 61,6               | 150    | 19                 | 6 000           | 6 700          | 0,37  |  |
|                      | 90 | 28 | 68,2               | 120    | 15,3               | 5 600           | 6 300          | 0,38  |  |

▶ Popular item

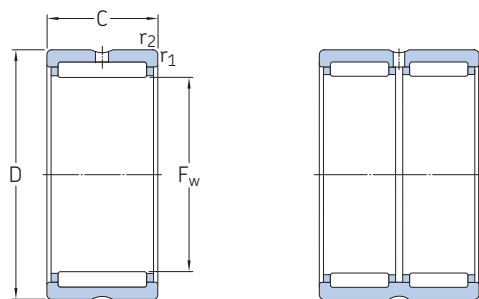


| Dimensions     |                          | Abutment and fillet dimensions |                        | Associated radial shaft seals <sup>1)</sup> |            | Spring loaded lip |
|----------------|--------------------------|--------------------------------|------------------------|---|------------|-------------------|
| F <sub>w</sub> | r <sub>1,2</sub><br>min. | D <sub>a</sub><br>max.         | r <sub>a</sub><br>max. | Single lip                                  | Double lip |                   |
| mm             |                          | mm                             |                        | -   |            |                   |
| 45             | 0,3                      | 53                             | 0,3                    | G 45x55x4                                   | SD 45x55x4 | -                 |
|                | 0,3                      | 53                             | 0,3                    | G 45x55x4                                   | SD 45x55x4 | -                 |
|                | 0,6                      | 56                             | 0,6                    | -   | -          | 45x60x7 HMS5 RG   |
| 47             | 0,3                      | 55                             | 0,3                    | -   | -          | -                 |
|                | 0,3                      | 55                             | 0,3                    | -   | -          | -                 |
| 48             | 0,6                      | 58                             | 0,6                    | -   | -          | -                 |
|                | 0,6                      | 58                             | 0,6                    | -   | -          | 48x62x8 HMS5 RG   |
|                | 0,6                      | 58                             | 0,6                    | -   | -          | 48x62x8 HMS5 RG   |
| 50             | 0,6                      | 58                             | 0,6                    | G 50x62x5                                   | SD 50x62x5 | -                 |
|                | 0,6                      | 58                             | 0,6                    | G 50x62x5                                   | SD 50x62x5 | -                 |
|                | 1                        | 60                             | 1                      | -   | -          | 50x65x8 HMS5 RG   |
| 52             | 0,6                      | 64                             | 0,6                    | -   | -          | -                 |
|                | 0,6                      | 64                             | 0,6                    | -   | -          | 52x68x8 HMS5 RG   |
|                | 0,6                      | 64                             | 0,6                    | -   | -          | 52x68x8 HMS5 RG   |
| 55             | 0,6                      | 64                             | 0,6                    | -   | -          | 55x68x8 HMS5 RG   |
|                | 0,6                      | 64                             | 0,6                    | -   | -          | 55x68x8 HMS5 RG   |
|                | 1                        | 67                             | 1                      | -   | -          | 55x72x8 HMS5 RG   |
| 58             | 0,6                      | 68                             | 0,6                    | -   | -          | -                 |
|                | 0,6                      | 68                             | 0,6                    | -   | -          | 58x72x8 HMS5 RG   |
|                | 0,6                      | 68                             | 0,6                    | -   | -          | 58x72x8 HMS5 RG   |
| 60             | 0,6                      | 68                             | 0,6                    | -   | -          | 60x72x8 HMS5 RG   |
|                | 0,6                      | 68                             | 0,6                    | -   | -          | 60x72x8 HMS5 RG   |
|                | 1,1                      | 73,5                           | 1                      | -   | -          | 60x80x8 HMS5 RG   |
| 63             | 1                        | 75                             | 1                      | -   | -          | 63x80x8 CRW1 R    |
|                | 1                        | 75                             | 1                      | -   | -          | 63x80x8 CRW1 R    |
| 65             | 0,6                      | 74                             | 0,6                    | -   | -          | -                 |
|                | 0,6                      | 74                             | 0,6                    | -   | -          | -                 |
|                | 1,1                      | 78,5                           | 1                      | -   | -          | 65x85x8 HMS5 RG   |
| 68             | 0,6                      | 78                             | 0,6                    | -   | -          | -                 |
|                | 0,6                      | 78                             | 0,6                    | -   | -          | -                 |
|                | 1                        | 80                             | 1                      | -   | -          | -                 |
| 70             | 1                        | 80                             | 1                      | -   | -          | 68x85x8 CRW1 R    |
|                | 0,6                      | 81                             | 0,6                    | -   | -          | 70x85x8 HMS5 RG   |
|                | 0,6                      | 81                             | 0,6                    | -   | -          | 70x85x8 HMS5 RG   |
|                | 1,1                      | 83,5                           | 1                      | -   | -          | 70x90x10 HMS5 RG  |

<sup>1)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

### 7.3 Needle roller bearings with machined rings with flanges, without an inner ring

$F_w$  72 – 105 mm

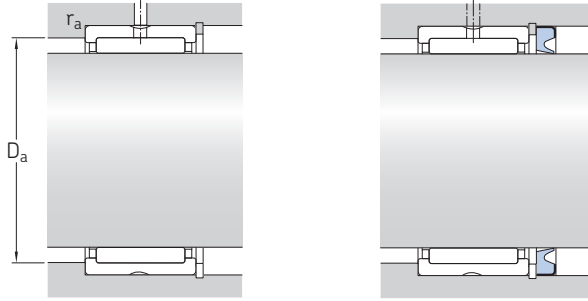


NK(S)  
RNA 49

RNA 69

| Principal dimensions |     |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass | Designation |
|----------------------|-----|----|--------------------|--------|--------------------|-----------------|----------------|------|-------------|
| $F_w$                | D   | C  | dynamic            | static |                    | Reference speed | Limiting speed |      |             |
| mm                   |     |    | C                  | $C_0$  | $P_u$              | r/min           |                | kg   | –           |
| <b>72</b>            | 90  | 25 | 61,6               | 120    | 14,6               | 5 600           | 6 300          | 0,31 | RNA 4913    |
|                      | 90  | 45 | 95,2               | 212    | 26                 | 5 600           | 6 300          | 0,58 | ▶ RNA 6913  |
| <b>73</b>            | 90  | 25 | 52,8               | 106    | 13,2               | 5 600           | 6 300          | 0,3  | NK 73/25    |
|                      | 90  | 35 | 73,7               | 163    | 20,4               | 5 600           | 6 300          | 0,43 | NK 73/35    |
| <b>75</b>            | 92  | 25 | 53,9               | 110    | 13,7               | 5 300           | 6 000          | 0,32 | NK 75/25    |
|                      | 92  | 35 | 74,8               | 170    | 21,2               | 5 300           | 6 000          | 0,45 | ▶ NK 75/35  |
|                      | 95  | 28 | 70,4               | 132    | 16,6               | 5 300           | 6 000          | 0,4  | NKS 75      |
| <b>80</b>            | 95  | 25 | 56,1               | 127    | 15,6               | 5 000           | 5 600          | 0,3  | ▶ NK 80/25  |
|                      | 95  | 35 | 76,5               | 190    | 24                 | 5 000           | 5 600          | 0,43 | ▶ NK 80/35  |
|                      | 100 | 30 | 84,2               | 163    | 20,8               | 5 000           | 5 600          | 0,46 | ▶ RNA 4914  |
| <b>85</b>            | 100 | 54 | 128                | 285    | 36                 | 5 000           | 5 600          | 0,86 | ▶ RNA 6914  |
|                      | 105 | 25 | 69,3               | 132    | 16,6               | 4 800           | 5 300          | 0,43 | ▶ NK 85/25  |
|                      | 105 | 30 | 84,2               | 170    | 21,6               | 4 800           | 5 300          | 0,49 | RNA 4915    |
|                      | 105 | 35 | 96,8               | 200    | 26                 | 4 800           | 5 300          | 0,6  | ▶ NK 85/35  |
| <b>90</b>            | 105 | 54 | 130                | 290    | 37,5               | 4 800           | 5 300          | 0,94 | RNA 6915    |
|                      | 110 | 25 | 72,1               | 140    | 18                 | 4 500           | 5 000          | 0,45 | ▶ NK 90/25  |
|                      | 110 | 30 | 88                 | 183    | 23,2               | 4 500           | 5 000          | 0,52 | ▶ RNA 4916  |
|                      | 110 | 35 | 101                | 216    | 28                 | 4 500           | 5 000          | 0,63 | ▶ NK 90/35  |
| <b>95</b>            | 110 | 54 | 134                | 315    | 40                 | 4 500           | 5 000          | 0,99 | ▶ RNA 6916  |
|                      | 115 | 26 | 73,7               | 146    | 18,6               | 4 300           | 4 800          | 0,49 | NK 95/26    |
|                      | 115 | 36 | 105                | 232    | 30                 | 4 300           | 4 800          | 0,68 | NK 95/36    |
| <b>100</b>           | 120 | 26 | 76,5               | 156    | 19,6               | 4 000           | 4 500          | 0,52 | ▶ NK 100/26 |
|                      | 120 | 35 | 108                | 250    | 31                 | 4 000           | 4 500          | 0,66 | RNA 4917    |
|                      | 120 | 36 | 108                | 250    | 31                 | 4 000           | 4 500          | 0,72 | ▶ NK 100/36 |
|                      | 120 | 63 | 165                | 425    | 53                 | 4 000           | 4 500          | 1,2  | ▶ RNA 6917  |
| <b>105</b>           | 125 | 26 | 78,1               | 166    | 20,4               | 3 800           | 4 300          | 0,54 | NK 105/26   |
|                      | 125 | 35 | 112                | 265    | 32,5               | 3 800           | 4 300          | 0,75 | RNA 4918    |
|                      | 125 | 36 | 112                | 265    | 32,5               | 3 800           | 4 300          | 0,71 | NK 105/36   |
|                      | 125 | 63 | 172                | 450    | 55                 | 3 800           | 4 300          | 1,35 | RNA 6918    |

▶ Popular item

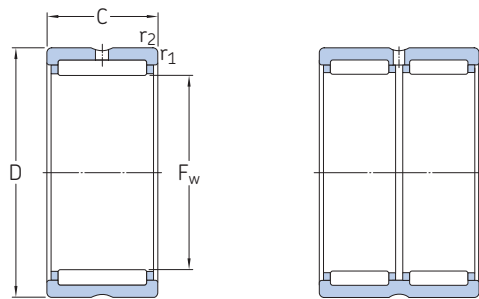


| Dimensions     |                          | Abutment and fillet dimensions |                        | Associated radial shaft seals <sup>1)</sup> |            | Spring loaded lip  |
|----------------|--------------------------|--------------------------------|------------------------|---|------------|--------------------|
| F <sub>w</sub> | r <sub>1,2</sub><br>min. | D <sub>a</sub><br>max.         | r <sub>a</sub><br>max. | Single lip                                  | Double lip |                    |
| mm             |                          | mm                             |                        | -   |            |                    |
| 72             | 1                        | 85                             | 1                      | -   | -          | 72x90x10 HMS5 RG   |
|                | 1                        | 85                             | 1                      | -   | -          | 72x90x10 HMS5 RG   |
| 73             | 1                        | 85                             | 1                      | -   | -          | -                  |
|                | 1                        | 85                             | 1                      | -   | -          | -                  |
| 75             | 1                        | 87                             | 1                      | -   | -          | 73x92x11.1 CRWH1 R |
|                | 1                        | 87                             | 1                      | -   | -          | 73x92x11.1 CRWH1 R |
|                | 1,1                      | 88,5                           | 1                      | -   | -          | 75x95x10 HMS5 RG   |
| 80             | 1                        | 90                             | 1                      | -   | -          | 80x95x10 HMS5 RG   |
|                | 1                        | 90                             | 1                      | -   | -          | 80x95x10 HMS5 RG   |
|                | 1                        | 95                             | 1                      | -   | -          | 80x100x10 HMS5 RG  |
|                | 1                        | 95                             | 1                      | -   | -          | 80x100x10 HMS5 RG  |
| 85             | 1                        | 100                            | 1                      | -   | -          | 85x105x12 HMS5 RG  |
|                | 1                        | 100                            | 1                      | -   | -          | 85x105x12 HMS5 RG  |
|                | 1                        | 100                            | 1                      | -   | -          | 85x105x12 HMS5 RG  |
|                | 1                        | 100                            | 1                      | -   | -          | 85x105x12 HMS5 RG  |
| 90             | 1                        | 105                            | 1                      | -   | -          | 90x110x10 HMS5 RG  |
|                | 1                        | 105                            | 1                      | -   | -          | 90x110x10 HMS5 RG  |
|                | 1                        | 105                            | 1                      | -   | -          | 90x110x10 HMS5 RG  |
|                | 1                        | 105                            | 1                      | -   | -          | 90x110x10 HMS5 RG  |
| 95             | 1                        | 110                            | 1                      | -   | -          | 95x115x12 HMS5 RG  |
|                | 1                        | 110                            | 1                      | -   | -          | 95x115x12 HMS5 RG  |
| 100            | 1                        | 115                            | 1                      | -   | -          | 100x120x10 HMS5 RG |
|                | 1,1                      | 113,5                          | 1                      | -   | -          | 100x120x10 HMS5 RG |
|                | 1                        | 115                            | 1                      | -   | -          | 100x120x10 HMS5 RG |
|                | 1,1                      | 113,5                          | 1                      | -   | -          | 100x120x10 HMS5 RG |
| 105            | 1                        | 120                            | 1                      | -   | -          | 105x125x13 HMS4 R  |
|                | 1,1                      | 118,5                          | 1                      | -   | -          | 105x125x13 HMS4 R  |
|                | 1                        | 120                            | 1                      | -   | -          | 105x125x13 HMS4 R  |
|                | 1,1                      | 118,5                          | 1                      | -   | -          | 105x125x13 HMS4 R  |

<sup>1)</sup> For additional information → [skf.com/seals](https://skf.com/seals)

### 7.3 Needle roller bearings with machined rings with flanges, without an inner ring

$F_w$  110 – 330 mm

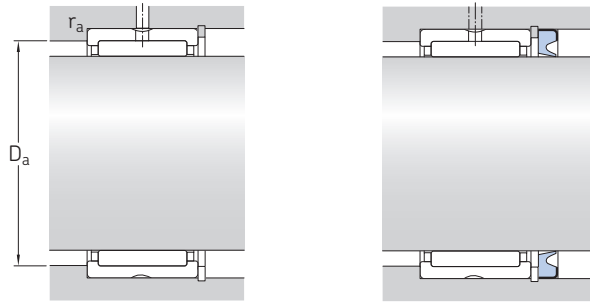


NK  
RNA 48  
RNA 49

RNA 69

| Principal dimensions |     |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass | Designation                            |
|----------------------|-----|----|--------------------|--------|--------------------|-----------------|----------------|------|--|
| $F_w$                | D   | C  | dynamic            | static |                    | Reference speed | Limiting speed |      |  |
| mm                   |     |    | C                  | $C_0$  | $P_u$              | r/min           |                | kg   | –                                      |
| <b>110</b>           | 130 | 30 | 96,8               | 220    | 27                 | 3 600           | 4 000          | 0,65 | ▶ NK 110/30<br>RNA 4919<br>▶ NK 110/40 |
|                      | 130 | 35 | 114                | 270    | 33,5               | 3 600           | 4 000          | 0,72 |  |
|                      | 130 | 40 | 123                | 305    | 37,5               | 3 600           | 4 000          | 0,83 |  |
|                      | 130 | 63 | 172                | 465    | 56                 | 3 600           | 4 000          | 1,45 | ▶ RNA 6919                             |
| <b>115</b>           | 140 | 40 | 125                | 280    | 34                 | 3 400           | 4 000          | 1,15 | RNA 4920                               |
| <b>120</b>           | 140 | 30 | 93,5               | 232    | 27                 | 3 400           | 3 800          | 0,66 | ▶ RNA 4822                             |
| <b>125</b>           | 150 | 40 | 130                | 300    | 35,5               | 3 200           | 3 600          | 1,25 | RNA 4922                               |
| <b>130</b>           | 150 | 30 | 99                 | 255    | 29                 | 3 200           | 3 600          | 0,73 | ▶ RNA 4824                             |
| <b>135</b>           | 165 | 45 | 176                | 405    | 49                 | 3 000           | 3 400          | 1,85 | ▶ RNA 4924                             |
| <b>145</b>           | 165 | 35 | 119                | 325    | 36,5               | 2 800           | 3 200          | 0,99 | RNA 4826                               |
| <b>150</b>           | 180 | 50 | 198                | 480    | 57                 | 2 600           | 3 000          | 2,2  | RNA 4926                               |
| <b>155</b>           | 175 | 35 | 121                | 345    | 37,5               | 2 600           | 3 000          | 0,97 | ▶ RNA 4828                             |
| <b>160</b>           | 190 | 50 | 205                | 510    | 60                 | 2 400           | 2 800          | 2,35 | RNA 4928                               |
| <b>165</b>           | 190 | 40 | 147                | 415    | 46,5               | 2 400           | 2 800          | 1,6  | RNA 4830                               |
| <b>175</b>           | 200 | 40 | 157                | 450    | 49                 | 2 200           | 2 600          | 1,7  | ▶ RNA 4832                             |
| <b>185</b>           | 215 | 45 | 179                | 520    | 56                 | 2 200           | 2 400          | 2,55 | RNA 4834                               |
| <b>195</b>           | 225 | 45 | 190                | 570    | 60                 | 2 000           | 2 400          | 2,7  | RNA 4836                               |
| <b>210</b>           | 240 | 50 | 220                | 710    | 73,5               | 1 900           | 2 200          | 3,2  | ▶ RNA 4838                             |
| <b>220</b>           | 250 | 50 | 224                | 735    | 75                 | 1 800           | 2 000          | 3,35 | RNA 4840                               |
| <b>240</b>           | 270 | 50 | 238                | 815    | 81,5               | 1 700           | 1 900          | 3,6  | ▶ RNA 4844                             |
| <b>265</b>           | 300 | 60 | 347                | 1 120  | 112                | 1 500           | 1 700          | 5,4  | RNA 4848                               |
| <b>285</b>           | 320 | 60 | 358                | 1 200  | 118                | 1 400           | 1 500          | 5,8  | RNA 4852                               |
| <b>305</b>           | 350 | 69 | 429                | 1 320  | 129                | 1 300           | 1 400          | 9,3  | RNA 4856                               |
| <b>330</b>           | 380 | 80 | 594                | 1 800  | 173                | 1 100           | 1 300          | 12,5 | RNA 4860                               |

▶ Popular item



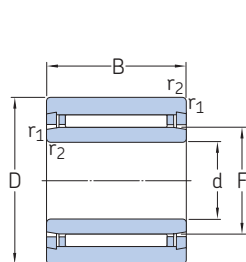
| Dimensions     |                       | Abutment and fillet dimensions |                     | Associated radial shaft seals <sup>1)</sup> |            | Spring loaded lip    |
|----------------|-----------------------|--------------------------------|---------------------|---|------------|----------------------|
| F <sub>w</sub> | r <sub>1,2</sub> min. | D <sub>a</sub> max.            | r <sub>a</sub> max. | Single lip                                  | Double lip |                      |
| mm             |                       | mm                             |                     | –   |            |                      |
| 110            | 1,1                   | 123,5                          | 1                   | –   | –          | 110x130x12 HMS5 RG   |
|                | 1,1                   | 123,5                          | 1                   | –   | –          | 110x130x12 HMS5 RG   |
|                | 1,1                   | 123,5                          | 1                   | –   | –          | 110x130x12 HMS5 RG   |
|                | 1,1                   | 123,5                          | 1                   | –   | –          | 110x130x12 HMS5 RG   |
| 115            | 1,1                   | 133,5                          | 1                   | –   | –          | 115x140x12 HMS5 RG   |
| 120            | 1                     | 135                            | 1                   | –   | –          | 120x140x12 HMS5 RG   |
| 125            | 1,1                   | 143,5                          | 1                   | –   | –          | 125x150x12 HMS5 RG   |
| 130            | 1                     | 145                            | 1                   | –   | –          | 130x150x10 CRSA1 R   |
| 135            | 1,1                   | 158,5                          | 1                   | –   | –          | 135x165x14 HMSA7 R   |
| 145            | 1,1                   | 158,5                          | 1                   | –   | –          | –                    |
| 150            | 1,5                   | 172                            | 1,5                 | –   | –          | 150x180x12 HMS5 RG   |
| 155            | 1,1                   | 168,5                          | 1                   | –   | –          | –                    |
| 160            | 1,5                   | 182                            | 1,5                 | –   | –          | 160x190x15 HMS5 RG   |
| 165            | 1,1                   | 183,5                          | 1                   | –   | –          | 165x190x15 HMS5 RG   |
| 175            | 1,1                   | 193,5                          | 1                   | –   | –          | 175x200x15 HMS5 RG   |
| 185            | 1,1                   | 208,5                          | 1                   | –   | –          | 185x215x15 HMS42 R   |
| 195            | 1,1                   | 218,5                          | 1                   | –   | –          | –                    |
| 210            | 1,5                   | 232                            | 1,5                 | –   | –          | 210x240x15 HMS5 RG   |
| 220            | 1,5                   | 242                            | 1,5                 | –   | –          | 220x250x15 HMS5 RG   |
| 240            | 1,5                   | 262                            | 1,5                 | –   | –          | 240x270x15 HMS5 RG   |
| 265            | 2                     | 291                            | 2                   | –   | –          | Available on request |
| 285            | 2                     | 311                            | 2                   | –   | –          | 285x320x16 HDS2 R    |
| 305            | 2                     | 341                            | 2                   | –   | –          | Available on request |
| 330            | 2,1                   | 369                            | 2                   | –   | –          | Available on request |

<sup>1)</sup> For additional information → [skf.com/seals](http://skf.com/seals)

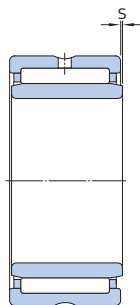


## 7.4 Needle roller bearings with machined rings with flanges, with an inner ring

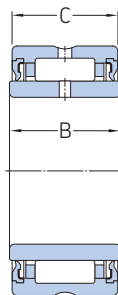
d 5 – 17 mm



NKI (d ≤ 7 mm)



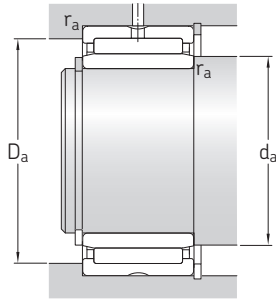
NKI(S) (d ≥ 9 mm)  
NA 49  
NA 69



NA 49 ...2RS

| Principal dimensions |    |    |      | Basic load ratings |                | Fatigue load limit | Speed ratings   |                | Mass  | Designation  |
|----------------------|----|----|------|--------------------|----------------|--------------------|-----------------|----------------|-------|--|
| d                    | D  | B  | C    | dynamic            | static         |                    | Reference speed | Limiting speed |       |  |
| mm                   |    |    |      | C                  | C <sub>0</sub> | P <sub>u</sub>     | r/min           |                | kg    | –  |
| 5                    | 15 | 12 | –    | 3,8                | 4,25           | 0,465              | 32 000          | 36 000         | 0,012 | ▶ NKI 5/12 TN<br>NKI 5/16 TN   |
|                      | 15 | 16 | –    | 5,01               | 5,85           | 0,67               | 32 000          | 36 000         | 0,015 |  |
| 6                    | 16 | 12 | –    | 4,4                | 5,2            | 0,57               | 30 000          | 34 000         | 0,014 | ▶ NKI 6/12 TN<br>▶ NKI 6/16 TN   |
|                      | 16 | 16 | –    | 5,72               | 7,2            | 0,815              | 30 000          | 34 000         | 0,017 |  |
| 7                    | 17 | 12 | –    | 4,57               | 5,7            | 0,63               | 28 000          | 32 000         | 0,014 | NKI 7/12 TN<br>NKI 7/16 TN   |
|                      | 17 | 16 | –    | 5,94               | 8              | 0,9                | 28 000          | 32 000         | 0,018 |  |
| 9                    | 19 | 12 | –    | 6,71               | 8,15           | 0,965              | 26 000          | 30 000         | 0,017 | ▶ NKI 9/12<br>▶ NKI 9/16   |
|                      | 19 | 16 | –    | 9,13               | 12             | 1,43               | 26 000          | 30 000         | 0,022 |  |
| 10                   | 22 | 13 | –    | 8,8                | 10,4           | 1,22               | 24 000          | 28 000         | 0,024 | ▶ NA 4900<br>▶ NA 4900.2RS<br>▶ NKI 10/16<br>▶ NKI 10/20                           |
|                      | 22 | 14 | 13   | 7,37               | 8,15           | 0,965              | –               | 12 000         | 0,025 |  |
|                      | 22 | 16 | –    | 10,2               | 12,5           | 1,5                | 24 000          | 28 000         | 0,029 |  |
|                      | 22 | 20 | –    | 12,8               | 16,6           | 2                  | 24 000          | 28 000         | 0,037 |  |
| 12                   | 24 | 13 | –    | 9,9                | 12,2           | 1,46               | 22 000          | 26 000         | 0,026 | ▶ NA 4901<br>▶ NA 4901.2RS<br>▶ NKI 12/16<br>▶ NKI 12/20<br>▶ NA 6901              |
|                      | 24 | 14 | 13   | 8,09               | 9,65           | 1,14               | –               | 11 000         | 0,028 |  |
|                      | 24 | 16 | –    | 11,7               | 15,3           | 1,8                | 22 000          | 26 000         | 0,033 |  |
|                      | 24 | 20 | –    | 14,5               | 20             | 2,4                | 22 000          | 26 000         | 0,042 |  |
| 15                   | 27 | 16 | –    | 13,4               | 19             | 2,28               | 20 000          | 24 000         | 0,039 | ▶ NKI 15/16<br>▶ NKI 15/20<br>▶ NA 4902<br>▶ NA 4902.2RS<br>▶ NA 6902<br>NKIS 15   |
|                      | 27 | 20 | –    | 16,5               | 25,5           | 3,05               | 20 000          | 24 000         | 0,049 |  |
|                      | 28 | 13 | –    | 11,2               | 15,3           | 1,83               | 19 000          | 22 000         | 0,034 |  |
|                      | 28 | 14 | 13   | 9,13               | 12             | 1,43               | –               | 9 500          | 0,037 |  |
| 17                   | 28 | 23 | –    | 17,2               | 27             | 3,35               | 19 000          | 22 000         | 0,064 | ▶ NKI 17/16<br>▶ NKI 17/20<br>▶ NA 4903<br>▶ NA 4903.2RS<br>▶ NA 6903<br>▶ NKIS 17 |
|                      | 35 | 20 | –    | 24,6               | 30             | 3,65               | 16 000          | 19 000         | 0,092 |  |
|                      | 29 | 16 | –    | 13,8               | 20,4           | 2,45               | 19 000          | 22 000         | 0,042 |  |
|                      | 29 | 20 | –    | 17,2               | 27             | 3,35               | 19 000          | 22 000         | 0,053 |  |
|                      | 30 | 13 | –    | 11,4               | 16,3           | 1,96               | 18 000          | 20 000         | 0,038 |  |
|                      | 30 | 14 | 13   | 9,52               | 12,9           | 1,53               | –               | 9 000          | 0,04  |  |
| 30                   | 23 | –  | 18,7 | 30,5               | 3,75           | 18 000             | 20 000          | 0,072          |       |  |
| 37                   | 20 | –  | 26   | 33,5               | 4              | 15 000             | 17 000          | 0,098          |       |  |

▶ Popular item

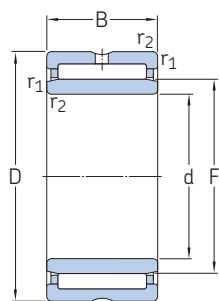


| Dimensions |    |                          |           | Abutment and fillet dimensions |                        |                        |
|------------|----|--------------------------|-----------|--------------------------------|------------------------|------------------------|
| d          | F  | r <sub>1,2</sub><br>min. | s<br>max. | d <sub>a</sub><br>min.         | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. |
| mm         |    |                          |           | mm                             |                        |                        |
| 5          | 8  | 0,3                      | 1,5       | 7                              | 13                     | 0,3                    |
|            | 8  | 0,3                      | 2         | 7                              | 13                     | 0,3                    |
| 6          | 9  | 0,3                      | 1,5       | 8                              | 14                     | 0,3                    |
|            | 9  | 0,3                      | 2         | 8                              | 14                     | 0,3                    |
| 7          | 10 | 0,3                      | 1,5       | 9                              | 15                     | 0,3                    |
|            | 10 | 0,3                      | 2         | 9                              | 15                     | 0,3                    |
| 9          | 12 | 0,3                      | 1,5       | 11                             | 17                     | 0,3                    |
|            | 12 | 0,3                      | 2         | 11                             | 17                     | 0,3                    |
| 10         | 14 | 0,3                      | 0,5       | 12                             | 20                     | 0,3                    |
|            | 14 | 0,3                      | 0,5       | 12                             | 20                     | 0,3                    |
|            | 14 | 0,3                      | 0,5       | 12                             | 20                     | 0,3                    |
|            | 14 | 0,3                      | 0,5       | 12                             | 20                     | 0,3                    |
| 12         | 16 | 0,3                      | 0,5       | 14                             | 22                     | 0,3                    |
|            | 16 | 0,3                      | 0,5       | 14                             | 22                     | 0,3                    |
|            | 16 | 0,3                      | 0,5       | 14                             | 22                     | 0,3                    |
|            | 16 | 0,3                      | 0,5       | 14                             | 22                     | 0,3                    |
| 15         | 19 | 0,3                      | 0,5       | 17                             | 25                     | 0,3                    |
|            | 19 | 0,3                      | 0,5       | 17                             | 25                     | 0,3                    |
|            | 20 | 0,3                      | 0,5       | 17                             | 26                     | 0,3                    |
|            | 20 | 0,3                      | 0,5       | 17                             | 26                     | 0,3                    |
| 17         | 20 | 0,3                      | 0,5       | 17                             | 26                     | 0,3                    |
|            | 20 | 0,3                      | 1         | 17                             | 26                     | 0,3                    |
|            | 22 | 0,6                      | 0,5       | 19                             | 31                     | 0,6                    |
|            | 22 | 0,6                      | 0,5       | 19                             | 31                     | 0,6                    |
| 17         | 21 | 0,3                      | 0,5       | 19                             | 27                     | 0,3                    |
|            | 21 | 0,3                      | 0,5       | 19                             | 27                     | 0,3                    |
|            | 22 | 0,3                      | 0,5       | 19                             | 28                     | 0,3                    |
|            | 22 | 0,3                      | 0,5       | 19                             | 28                     | 0,3                    |
| 17         | 22 | 0,3                      | 0,5       | 19                             | 28                     | 0,3                    |
|            | 22 | 0,3                      | 1         | 19                             | 28                     | 0,3                    |
|            | 24 | 0,6                      | 0,5       | 21                             | 33                     | 0,6                    |
|            | 24 | 0,6                      | 0,5       | 21                             | 33                     | 0,6                    |

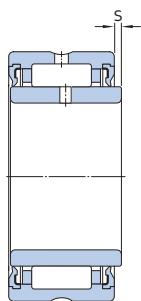


## 7.4 Needle roller bearings with machined rings with flanges, with an inner ring

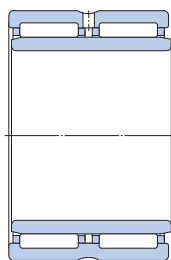
d 20 – 32 mm



NKI(S)  
NA 49  
NA 69 (d ≤ 30 mm)



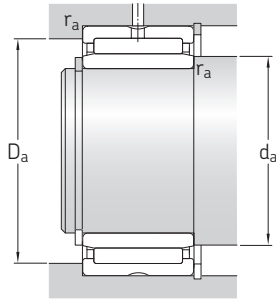
NA 49 ...2RS



NA 69 (d ≥ 32 mm)

| Principal dimensions |    |    |    | Basic load ratings |                | Fatigue load limit | Speed ratings   |                | Mass  | Designation    |
|----------------------|----|----|----|--------------------|----------------|--------------------|-----------------|----------------|-------|----------------|
| d                    | D  | B  | C  | dynamic            | static         |                    | Reference speed | Limiting speed |       |                |
| mm                   |    |    |    | C                  | C <sub>0</sub> | P <sub>u</sub>     | r/min           |                | kg    | –              |
| 20                   | 32 | 16 | –  | 15,4               | 24,5           | 2,9                | 16 000          | 19 000         | 0,048 | ▶ NKI 20/16    |
|                      | 32 | 20 | –  | 19                 | 32,5           | 4                  | 16 000          | 19 000         | 0,06  | ▶ NKI 20/20    |
|                      | 37 | 17 | –  | 21,6               | 28             | 3,35               | 15 000          | 17 000         | 0,075 | ▶ NA 4904      |
|                      | 37 | 18 | 17 | 19,4               | 22,4           | 2,65               | –               | 7 500          | 0,08  | ▶ NA 4904.2RS  |
| 22                   | 37 | 30 | –  | 35,2               | 53             | 6,55               | 15 000          | 17 000         | 0,14  | ▶ NA 6904      |
|                      | 42 | 20 | –  | 28,6               | 39             | 4,75               | 13 000          | 15 000         | 0,13  | ▶ NKIS 20      |
|                      | 34 | 16 | –  | 15,7               | 26             | 3,1                | 15 000          | 17 000         | 0,052 | ▶ NKI 22/16    |
|                      | 34 | 20 | –  | 19,4               | 34,5           | 4,25               | 15 000          | 17 000         | 0,065 | ▶ NKI 22/20    |
| 25                   | 39 | 17 | –  | 23,3               | 32             | 3,9                | 14 000          | 15 000         | 0,08  | ▶ NA 49/22     |
|                      | 39 | 30 | –  | 36,9               | 57             | 7,2                | 14 000          | 15 000         | 0,15  | ▶ NA 69/22     |
|                      | 38 | 20 | –  | 24,6               | 42,5           | 5,2                | 14 000          | 15 000         | 0,08  | ▶ NKI 25/20 TN |
|                      | 38 | 30 | –  | 31,9               | 60             | 7,5                | 14 000          | 15 000         | 0,12  | ▶ NKI 25/30    |
| 28                   | 42 | 17 | –  | 24,2               | 34,5           | 4,15               | 13 000          | 15 000         | 0,088 | ▶ NA 4905      |
|                      | 42 | 18 | 17 | 21,6               | 27,5           | 3,25               | –               | 6 300          | 0,09  | ▶ NA 4905.2RS  |
|                      | 42 | 30 | –  | 38                 | 62             | 7,65               | 13 000          | 15 000         | 0,16  | ▶ NA 6905      |
|                      | 47 | 22 | –  | 34,1               | 46,5           | 5,7                | 12 000          | 13 000         | 0,16  | ▶ NKIS 25      |
| 30                   | 42 | 20 | –  | 26,4               | 48             | 6                  | 12 000          | 14 000         | 0,092 | ▶ NKI 28/20 TN |
|                      | 42 | 30 | –  | 34,1               | 65,5           | 8,3                | 12 000          | 14 000         | 0,14  | ▶ NKI 28/30    |
|                      | 45 | 17 | –  | 25,1               | 36,5           | 4,4                | 12 000          | 14 000         | 0,098 | ▶ NA 49/28     |
|                      | 45 | 30 | –  | 39,6               | 65,5           | 8,3                | 12 000          | 14 000         | 0,18  | ▶ NA 69/28     |
| 32                   | 45 | 20 | –  | 27,5               | 52             | 6,55               | 11 000          | 13 000         | 0,11  | ▶ NKI 30/20 TN |
|                      | 45 | 30 | –  | 40,2               | 85             | 10,6               | 11 000          | 13 000         | 0,17  | ▶ NKI 30/30 TN |
|                      | 47 | 17 | –  | 25,5               | 39             | 4,65               | 11 000          | 13 000         | 0,1   | ▶ NA 4906      |
|                      | 47 | 18 | 17 | 23,3               | 32             | 3,8                | –               | 5 600          | 0,1   | ▶ NA 4906.2RS  |
| 32                   | 47 | 30 | –  | 42,9               | 75             | 9,3                | 11 000          | 13 000         | 0,19  | ▶ NA 6906      |
|                      | 52 | 22 | –  | 36,9               | 54             | 6,55               | 10 000          | 12 000         | 0,18  | ▶ NKIS 30      |
|                      | 47 | 20 | –  | 25,1               | 46,5           | 5,85               | 11 000          | 12 000         | 0,11  | ▶ NKI 32/20    |
|                      | 47 | 30 | –  | 36,9               | 76,5           | 9,5                | 11 000          | 12 000         | 0,17  | ▶ NKI 32/30    |
| 32                   | 52 | 20 | –  | 30,8               | 51             | 6,3                | 10 000          | 11 000         | 0,16  | ▶ NA 49/32     |
|                      | 52 | 36 | –  | 47,3               | 90             | 10,8               | 10 000          | 11 000         | 0,29  | ▶ NA 69/32     |

▶ Popular item

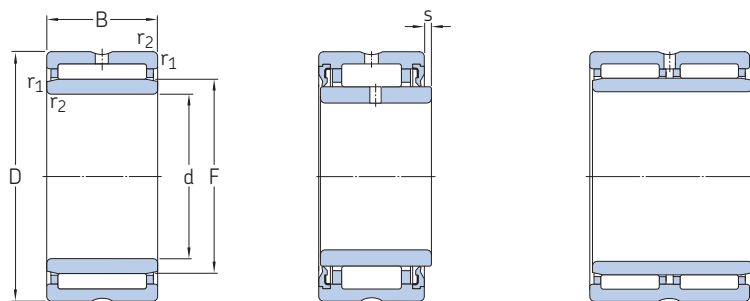


| Dimensions |    |                          |           | Abutment and fillet dimensions |                        |                        |     |
|------------|----|--------------------------|-----------|--------------------------------|------------------------|------------------------|-----|
| d          | F  | r <sub>1,2</sub><br>min. | s<br>max. | d <sub>a</sub><br>min.         | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. |     |
| mm         |    |                          |           | mm                             |                        |                        |     |
| 20         | 24 | 0,3                      | 0,5       | 22                             | 30                     | 0,3                    |     |
|            | 24 | 0,3                      | 0,5       | 22                             | 30                     | 0,3                    |     |
|            | 25 | 0,3                      | 0,8       | 22                             | 35                     | 0,3                    |     |
| 25         | 25 | 0,3                      | 0,5       | 22                             | 35                     | 0,3                    |     |
|            | 25 | 0,3                      | 1         | 22                             | 35                     | 0,3                    |     |
|            | 28 | 0,6                      | 0,5       | 24                             | 38                     | 0,6                    |     |
| 22         | 26 | 0,3                      | 0,5       | 24                             | 32                     | 0,3                    |     |
|            | 26 | 0,3                      | 0,5       | 24                             | 32                     | 0,3                    |     |
|            | 28 | 0,3                      | 0,8       | 24                             | 37                     | 0,3                    |     |
| 28         | 28 | 0,3                      | 0,5       | 24                             | 37                     | 0,3                    |     |
|            | 25 | 29                       | 0,3       | 1                              | 27                     | 36                     | 0,3 |
|            |    | 29                       | 0,3       | 1,5                            | 27                     | 36                     | 0,3 |
| 30         |    | 0,3                      | 0,8       | 27                             | 40                     | 0,3                    |     |
| 30         | 30 | 0,3                      | 0,5       | 27                             | 40                     | 0,3                    |     |
|            | 30 | 0,3                      | 1         | 27                             | 40                     | 0,3                    |     |
|            | 32 | 0,6                      | 1         | 29                             | 43                     | 0,6                    |     |
| 28         | 32 | 0,3                      | 1         | 30                             | 40                     | 0,3                    |     |
|            | 32 | 0,3                      | 1,5       | 30                             | 40                     | 0,3                    |     |
|            | 32 | 0,3                      | 0,8       | 30                             | 43                     | 0,3                    |     |
| 32         | 32 | 0,3                      | 1         | 30                             | 43                     | 0,3                    |     |
|            | 30 | 35                       | 0,3       | 0,5                            | 32                     | 43                     | 0,3 |
|            |    | 35                       | 0,3       | 1                              | 32                     | 43                     | 0,3 |
| 35         |    | 0,3                      | 0,8       | 32                             | 45                     | 0,3                    |     |
| 35         | 35 | 0,3                      | 0,5       | 32                             | 45                     | 0,3                    |     |
|            | 35 | 0,3                      | 1         | 32                             | 45                     | 0,3                    |     |
|            | 37 | 0,6                      | 1         | 34                             | 48                     | 0,6                    |     |
| 37         | 37 | 0,3                      | 0,5       | 34                             | 45                     | 0,3                    |     |
|            | 37 | 0,3                      | 1         | 34                             | 45                     | 0,3                    |     |
|            | 40 | 0,6                      | 0,8       | 36                             | 48                     | 0,6                    |     |
| 40         | 40 | 0,6                      | 0,5       | 36                             | 48                     | 0,6                    |     |



## 7.4 Needle roller bearings with machined rings with flanges, with an inner ring

d 35 – 55 mm



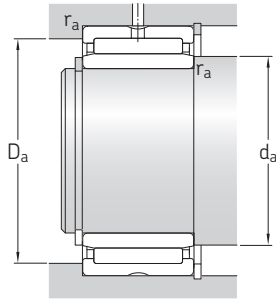
NKI(S)  
NA 49

NA 49 ...2RS

NA 69

| Principal dimensions |    |    |    | Basic load ratings |                | Fatigue load limit | Speed ratings   |                | Mass | Designation    |  |
|----------------------|----|----|----|--------------------|----------------|--------------------|-----------------|----------------|------|----------------|--|
| d                    | D  | B  | C  | dynamic            | static         |                    | Reference speed | Limiting speed |      |                |  |
|                      |    |    |    | C                  | C <sub>0</sub> | P <sub>u</sub>     |                 |                |      |                |  |
| mm                   |    |    |    | kN                 |                | kN                 | r/min           |                | kg   | –              |  |
| 35                   | 50 | 20 | –  | 29,7               | 60             | 7,5                | 10 000          | 11 000         | 0,12 | ▶ NKI 35/20 TN |  |
|                      | 50 | 30 | –  | 38                 | 83             | 10,4               | 10 000          | 11 000         | 0,19 | ▶ NKI 35/30    |  |
|                      | 55 | 20 | –  | 31,9               | 54             | 6,7                | 9 500           | 11 000         | 0,17 | ▶ NA 4907      |  |
| 38                   | 55 | 21 | 20 | 27                 | 43             | 5,3                | –               | 4 800          | 0,18 | ▶ NA 4907.2RS  |  |
|                      | 55 | 36 | –  | 48,4               | 93             | 11,4               | 9 500           | 11 000         | 0,31 | ▶ NA 6907      |  |
|                      | 58 | 22 | –  | 39,1               | 61             | 7,5                | 9 000           | 10 000         | 0,22 | NKIS 35        |  |
| 40                   | 53 | 20 | –  | 27,5               | 55             | 6,8                | 9 500           | 11 000         | 0,13 | NKI 38/20      |  |
|                      | 53 | 30 | –  | 40,2               | 90             | 11,2               | 9 500           | 11 000         | 0,21 | ▶ NKI 38/30    |  |
| 40                   | 55 | 20 | –  | 31,4               | 65,5           | 8,3                | 9 000           | 10 000         | 0,14 | ▶ NKI 40/20 TN |  |
|                      | 55 | 30 | –  | 45,7               | 108            | 13,7               | 9 000           | 10 000         | 0,22 | ▶ NKI 40/30 TN |  |
|                      | 62 | 22 | –  | 42,9               | 71             | 8,8                | 8 000           | 9 500          | 0,23 | ▶ NA 4908      |  |
| 42                   | 62 | 23 | 22 | 36,9               | 58,5           | 7,1                | –               | 4 000          | 0,25 | ▶ NA 4908.2RS  |  |
|                      | 62 | 40 | –  | 67,1               | 125            | 15,3               | 8 000           | 9 500          | 0,43 | ▶ NA 6908      |  |
|                      | 65 | 22 | –  | 42,9               | 72             | 8,8                | 8 000           | 9 000          | 0,28 | NKIS 40        |  |
| 42                   | 57 | 20 | –  | 29,2               | 61             | 7,65               | 8 500           | 10 000         | 0,14 | NKI 42/20      |  |
|                      | 57 | 30 | –  | 41,8               | 98             | 12,5               | 8 500           | 10 000         | 0,22 | NKI 42/30      |  |
| 45                   | 62 | 25 | –  | 42,9               | 91,5           | 11,2               | 8 000           | 9 000          | 0,22 | ▶ NKI 45/25 TN |  |
|                      | 62 | 35 | –  | 58,3               | 137            | 17                 | 8 000           | 9 000          | 0,31 | ▶ NKI 45/35 TN |  |
|                      | 68 | 22 | –  | 45,7               | 78             | 9,65               | 7 500           | 8 500          | 0,27 | ▶ NA 4909      |  |
| 45                   | 68 | 23 | 22 | 39,1               | 64             | 7,8                | –               | 3 800          | 0,29 | ▶ NA 4909.2RS  |  |
|                      | 68 | 40 | –  | 70,4               | 137            | 17                 | 7 500           | 8 500          | 0,5  | ▶ NA 6909      |  |
|                      | 72 | 22 | –  | 44,6               | 78             | 9,8                | 7 000           | 8 000          | 0,34 | ▶ NKIS 45      |  |
| 50                   | 68 | 25 | –  | 40,2               | 88             | 10,8               | 7 500           | 8 500          | 0,26 | ▶ NKI 50/25    |  |
|                      | 68 | 35 | –  | 52,3               | 122            | 15,3               | 7 500           | 8 500          | 0,36 | ▶ NKI 50/35    |  |
|                      | 72 | 22 | –  | 47,3               | 85             | 10,6               | 7 000           | 8 000          | 0,27 | ▶ NA 4910      |  |
| 50                   | 72 | 23 | 22 | 40,2               | 69,5           | 8,5                | –               | 3 400          | 0,3  | ▶ NA 4910.2RS  |  |
|                      | 72 | 40 | –  | 73,7               | 150            | 18,6               | 7 000           | 8 000          | 0,52 | ▶ NA 6910      |  |
|                      | 80 | 28 | –  | 62,7               | 104            | 13,2               | 6 300           | 7 500          | 0,52 | ▶ NKIS 50      |  |
| 55                   | 72 | 25 | –  | 46,8               | 110            | 13,4               | 6 700           | 7 500          | 0,26 | ▶ NKI 55/25 TN |  |
|                      | 72 | 35 | –  | 55                 | 134            | 17                 | 6 700           | 7 500          | 0,36 | ▶ NKI 55/35    |  |
|                      | 80 | 25 | –  | 57,2               | 106            | 13,2               | 6 300           | 7 000          | 0,39 | ▶ NA 4911      |  |
| 55                   | 80 | 45 | –  | 89,7               | 190            | 23,2               | 6 300           | 7 000          | 0,78 | ▶ NA 6911      |  |
|                      | 85 | 28 | –  | 66                 | 114            | 14,6               | 6 000           | 6 700          | 0,56 | NKIS 55        |  |

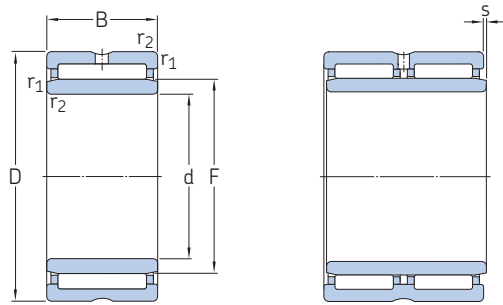
▶ Popular item



| Dimensions |    |                   | Abutment and fillet dimensions |               |               |               |
|------------|----|-------------------|--------------------------------|---------------|---------------|---------------|
| d          | F  | $r_{1,2}$<br>min. | s<br>max.                      | $d_a$<br>min. | $D_a$<br>max. | $r_a$<br>max. |
| mm         |    |                   | mm                             |               |               |               |
| 35         | 40 | 0,3               | 0,5                            | 37            | 48            | 0,3           |
|            | 40 | 0,3               | 1                              | 37            | 48            | 0,3           |
|            | 42 | 0,6               | 0,8                            | 39            | 51            | 0,6           |
|            | 42 | 0,6               | 0,5                            | 39            | 51            | 0,6           |
|            | 43 | 0,6               | 0,5                            | 39            | 53            | 0,6           |
| 38         | 43 | 0,3               | 0,5                            | 40            | 51            | 0,3           |
|            | 43 | 0,3               | 1                              | 40            | 51            | 0,3           |
| 40         | 45 | 0,3               | 0,5                            | 42            | 53            | 0,3           |
|            | 45 | 0,3               | 1                              | 42            | 53            | 0,3           |
|            | 48 | 0,6               | 1                              | 44            | 58            | 0,6           |
|            | 48 | 0,6               | 0,5                            | 44            | 58            | 0,6           |
|            | 50 | 1                 | 0,5                            | 45            | 60            | 1             |
| 42         | 47 | 0,3               | 0,5                            | 44            | 55            | 0,3           |
|            | 47 | 0,3               | 1                              | 44            | 55            | 0,3           |
| 45         | 50 | 0,6               | 1,5                            | 49            | 58            | 0,6           |
|            | 50 | 0,6               | 2                              | 49            | 58            | 0,6           |
|            | 52 | 0,6               | 1                              | 49            | 64            | 0,6           |
|            | 52 | 0,6               | 0,5                            | 49            | 64            | 0,6           |
|            | 55 | 1                 | 0,5                            | 50            | 67            | 1             |
| 50         | 55 | 0,6               | 1,5                            | 54            | 64            | 0,6           |
|            | 55 | 0,6               | 2                              | 54            | 64            | 0,6           |
|            | 58 | 0,6               | 1                              | 54            | 68            | 0,6           |
|            | 58 | 0,6               | 0,5                            | 54            | 68            | 0,6           |
|            | 60 | 1,1               | 2                              | 56,5          | 73,5          | 1             |
| 55         | 60 | 0,6               | 1,5                            | 59            | 68            | 0,6           |
|            | 60 | 0,6               | 2                              | 59            | 68            | 0,6           |
|            | 63 | 1                 | 1,5                            | 60            | 75            | 1             |
|            | 63 | 1                 | 1,5                            | 60            | 75            | 1             |
|            | 65 | 1,1               | 2                              | 61,5          | 78,5          | 1             |

## 7.4 Needle roller bearings with machined rings with flanges, with an inner ring

d 60 – 90 mm

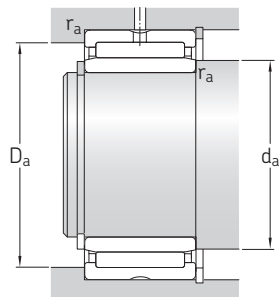


NKI(S)  
NA 49

NA 69

| Principal dimensions |     |    |   | Basic load ratings |                | Fatigue load limit | Speed ratings   |                | Mass | Designation |
|----------------------|-----|----|---|--------------------|----------------|--------------------|-----------------|----------------|------|-------------|
| d                    | D   | B  | C | dynamic            | static         |                    | Reference speed | Limiting speed |      |             |
| mm                   |     |    |   | C                  | C <sub>0</sub> | P <sub>u</sub>     | r/min           |                | kg   | –           |
| 60                   | 82  | 25 | – | 44                 | 95             | 11,8               | 6 000           | 6 700          | 0,39 | ▶ NKI 60/25 |
|                      | 82  | 35 | – | 60,5               | 146            | 18,3               | 6 000           | 6 700          | 0,55 | ▶ NKI 60/35 |
|                      | 85  | 25 | – | 60,5               | 114            | 14,3               | 6 000           | 6 700          | 0,43 | ▶ NA 4912   |
|                      | 85  | 45 | – | 93,5               | 204            | 25                 | 6 000           | 6 700          | 0,81 | ▶ NA 6912   |
|                      | 90  | 28 | – | 68,2               | 120            | 15,3               | 5 600           | 6 300          | 0,56 | ▶ NKIS 60   |
|                      | 90  | 28 | – | 68,2               | 120            | 15,3               | 5 600           | 6 300          | 0,56 | ▶ NKIS 60   |
| 65                   | 90  | 25 | – | 52,8               | 106            | 13,2               | 5 600           | 6 300          | 0,46 | NKI 65/25   |
|                      | 90  | 25 | – | 61,6               | 120            | 14,6               | 5 600           | 6 300          | 0,46 | ▶ NA 4913   |
|                      | 90  | 35 | – | 73,7               | 163            | 20,4               | 5 600           | 6 300          | 0,66 | ▶ NKI 65/35 |
|                      | 90  | 45 | – | 95,2               | 212            | 26                 | 5 600           | 6 300          | 0,83 | ▶ NA 6913   |
|                      | 95  | 28 | – | 70,4               | 132            | 16,6               | 5 300           | 6 000          | 0,64 | ▶ NKIS 65   |
|                      | 95  | 28 | – | 70,4               | 132            | 16,6               | 5 300           | 6 000          | 0,64 | ▶ NKIS 65   |
| 70                   | 95  | 25 | – | 56,1               | 127            | 15,6               | 5 000           | 5 600          | 0,51 | NKI 70/25   |
|                      | 95  | 35 | – | 76,5               | 190            | 24                 | 5 000           | 5 600          | 0,72 | ▶ NKI 70/35 |
|                      | 100 | 30 | – | 84,2               | 163            | 20,8               | 5 000           | 5 600          | 0,73 | ▶ NA 4914   |
|                      | 100 | 54 | – | 128                | 285            | 36                 | 5 000           | 5 600          | 1,35 | ▶ NA 6914   |
|                      | 105 | 25 | – | 69,3               | 132            | 16,6               | 4 800           | 5 300          | 0,64 | ▶ NKI 75/25 |
|                      | 105 | 30 | – | 84,2               | 170            | 21,6               | 4 800           | 5 300          | 0,78 | ▶ NA 4915   |
| 75                   | 105 | 35 | – | 96,8               | 200            | 26                 | 4 800           | 5 300          | 0,91 | ▶ NKI 75/35 |
|                      | 105 | 54 | – | 130                | 290            | 37,5               | 4 800           | 5 300          | 1,45 | ▶ NA 6915   |
|                      | 110 | 25 | – | 72,1               | 140            | 18                 | 4 500           | 5 000          | 0,68 | ▶ NKI 80/25 |
|                      | 110 | 30 | – | 88                 | 183            | 23,2               | 4 500           | 5 000          | 0,88 | ▶ NA 4916   |
|                      | 110 | 35 | – | 101                | 216            | 28                 | 4 500           | 5 000          | 0,96 | ▶ NKI 80/35 |
|                      | 110 | 54 | – | 134                | 315            | 40                 | 4 500           | 5 000          | 1,5  | ▶ NA 6916   |
| 85                   | 115 | 26 | – | 73,7               | 146            | 18,6               | 4 300           | 4 800          | 0,74 | ▶ NKI 85/26 |
|                      | 115 | 36 | – | 105                | 232            | 30                 | 4 300           | 4 800          | 1,05 | ▶ NKI 85/36 |
|                      | 120 | 35 | – | 108                | 250            | 31                 | 4 000           | 4 500          | 1,25 | ▶ NA 4917   |
|                      | 120 | 63 | – | 165                | 425            | 53                 | 4 000           | 4 500          | 2,2  | ▶ NA 6917   |
|                      | 125 | 26 | – | 76,5               | 156            | 19,6               | 4 000           | 4 500          | 0,78 | ▶ NKI 90/26 |
|                      | 125 | 36 | – | 108                | 250            | 31                 | 4 000           | 4 500          | 1,1  | ▶ NKI 90/36 |
| 90                   | 125 | 35 | – | 112                | 265            | 32,5               | 3 800           | 4 300          | 1,3  | ▶ NA 4918   |
|                      | 125 | 63 | – | 172                | 450            | 55                 | 3 800           | 4 300          | 2,3  | ▶ NA 6918   |

▶ Popular item

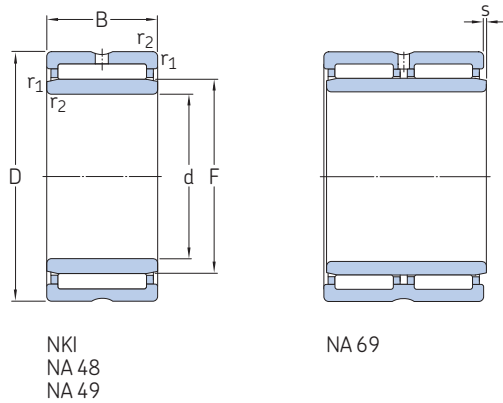


| Dimensions |     |                          |           | Abutment and fillet dimensions |                        |                        |
|------------|-----|--------------------------|-----------|--------------------------------|------------------------|------------------------|
| d          | F   | r <sub>1,2</sub><br>min. | s<br>max. | d <sub>a</sub><br>min.         | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. |
| mm         |     |                          |           | mm                             |                        |                        |
| 60         | 68  | 0,6                      | 1         | 64                             | 78                     | 0,6                    |
|            | 68  | 0,6                      | 1         | 64                             | 78                     | 0,6                    |
|            | 68  | 1                        | 1,5       | 65                             | 80                     | 1                      |
| 60         | 68  | 1                        | 1,5       | 65                             | 80                     | 1                      |
|            | 70  | 1,1                      | 2         | 66,5                           | 83,5                   | 1                      |
| 65         | 73  | 1                        | 1         | 70                             | 85                     | 1                      |
|            | 72  | 1                        | 1,5       | 70                             | 85                     | 1                      |
|            | 73  | 1                        | 1         | 70                             | 85                     | 1                      |
| 65         | 72  | 1                        | 1,5       | 70                             | 85                     | 1                      |
|            | 75  | 1,1                      | 2         | 71,5                           | 88,5                   | 1                      |
| 70         | 80  | 1                        | 0,8       | 75                             | 90                     | 1                      |
|            | 80  | 1                        | 0,8       | 75                             | 90                     | 1                      |
|            | 80  | 1                        | 1,5       | 75                             | 95                     | 1                      |
|            | 80  | 1                        | 1         | 75                             | 95                     | 1                      |
| 75         | 85  | 1                        | 1         | 80                             | 100                    | 1                      |
|            | 85  | 1                        | 1,5       | 80                             | 100                    | 1                      |
|            | 85  | 1                        | 1         | 80                             | 100                    | 1                      |
| 75         | 85  | 1                        | 1         | 80                             | 100                    | 1                      |
|            | 85  | 1                        | 1         | 80                             | 100                    | 1                      |
| 80         | 90  | 1                        | 1         | 85                             | 105                    | 1                      |
|            | 90  | 1                        | 1,5       | 85                             | 105                    | 1                      |
|            | 90  | 1                        | 1         | 85                             | 105                    | 1                      |
|            | 90  | 1                        | 1         | 85                             | 105                    | 1                      |
| 85         | 95  | 1                        | 1,5       | 90                             | 110                    | 1                      |
|            | 95  | 1                        | 1,5       | 90                             | 110                    | 1                      |
|            | 100 | 1,1                      | 1         | 91,5                           | 113,5                  | 1                      |
|            | 100 | 1,1                      | 1         | 91,5                           | 113,5                  | 1                      |
| 90         | 100 | 1                        | 1,5       | 95                             | 115                    | 1                      |
|            | 100 | 1                        | 1,5       | 95                             | 115                    | 1                      |
|            | 105 | 1,1                      | 1         | 96,5                           | 118,5                  | 1                      |
|            | 105 | 1,1                      | 1         | 96,5                           | 118,5                  | 1                      |



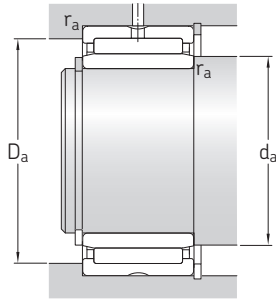
## 7.4 Needle roller bearings with machined rings with flanges, with an inner ring

d 95 – 320 mm



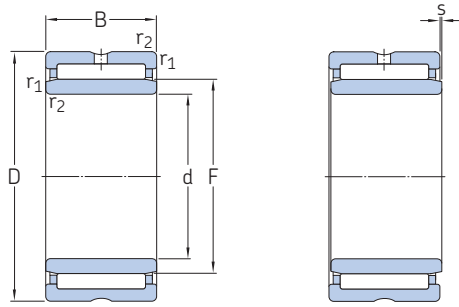
| Principal dimensions |     |    |   | Basic load ratings |                | Fatigue load limit | Speed ratings   |                | Mass | Designation  |
|----------------------|-----|----|---|--------------------|----------------|--------------------|-----------------|----------------|------|--------------|
| d                    | D   | B  | C | dynamic            | static         |                    | Reference speed | Limiting speed |      |              |
| mm                   |     |    |   | C                  | C <sub>0</sub> | P <sub>u</sub>     | r/min           |                | kg   | –            |
| 95                   | 125 | 26 | – | 78,1               | 166            | 20,4               | 3 800           | 4 300          | 0,82 | ▶ NKI 95/26  |
|                      | 125 | 36 | – | 112                | 265            | 32,5               | 3 800           | 4 300          | 1,15 | ▶ NKI 95/36  |
|                      | 130 | 35 | – | 114                | 270            | 33,5               | 3 600           | 4 000          | 1,35 | ▶ NA 4919    |
|                      | 130 | 63 | – | 172                | 465            | 56                 | 3 600           | 4 000          | 2,5  | ▶ NA 6919    |
| 100                  | 130 | 30 | – | 96,8               | 220            | 27                 | 3 600           | 4 000          | 0,99 | ▶ NKI 100/30 |
|                      | 130 | 40 | – | 123                | 305            | 37,5               | 3 600           | 4 000          | 1,35 | ▶ NKI 100/40 |
|                      | 140 | 40 | – | 125                | 280            | 34                 | 3 400           | 4 000          | 1,9  | ▶ NA 4920    |
| 110                  | 140 | 30 | – | 93,5               | 232            | 27                 | 3 400           | 3 800          | 1,1  | ▶ NA 4822    |
|                      | 150 | 40 | – | 130                | 300            | 35,5               | 3 200           | 3 600          | 2,05 | ▶ NA 4922    |
| 120                  | 150 | 30 | – | 99                 | 255            | 29                 | 3 200           | 3 600          | 1,15 | ▶ NA 4824    |
|                      | 165 | 45 | – | 176                | 405            | 49                 | 3 000           | 3 400          | 2,85 | ▶ NA 4924    |
| 130                  | 165 | 35 | – | 119                | 325            | 36,5               | 2 800           | 3 200          | 1,8  | ▶ NA 4826    |
|                      | 180 | 50 | – | 198                | 480            | 57                 | 2 600           | 3 000          | 3,9  | ▶ NA 4926    |
| 140                  | 175 | 35 | – | 121                | 345            | 37,5               | 2 600           | 3 000          | 1,9  | ▶ NA 4828    |
|                      | 190 | 50 | – | 205                | 510            | 60                 | 2 400           | 2 800          | 4,15 | ▶ NA 4928    |
| 150                  | 190 | 40 | – | 147                | 415            | 46,5               | 2 400           | 2 800          | 2,7  | ▶ NA 4830    |
| 160                  | 200 | 40 | – | 157                | 450            | 49                 | 2 200           | 2 600          | 2,85 | ▶ NA 4832    |
| 170                  | 215 | 45 | – | 179                | 520            | 56                 | 2 200           | 2 400          | 3,95 | ▶ NA 4834    |
| 180                  | 225 | 45 | – | 190                | 570            | 60                 | 2 000           | 2 400          | 4,2  | ▶ NA 4836    |
| 190                  | 240 | 50 | – | 220                | 710            | 73,5               | 1 900           | 2 200          | 5,55 | ▶ NA 4838    |
| 200                  | 250 | 50 | – | 224                | 735            | 75                 | 1 800           | 2 000          | 5,8  | ▶ NA 4840    |
| 220                  | 270 | 50 | – | 238                | 815            | 81,5               | 1 700           | 1 900          | 6,35 | ▶ NA 4844    |
| 240                  | 300 | 60 | – | 347                | 1 120          | 112                | 1 500           | 1 700          | 9,9  | ▶ NA 4848    |
| 260                  | 320 | 60 | – | 358                | 1 200          | 118                | 1 400           | 1 500          | 10,5 | ▶ NA 4852    |
| 280                  | 350 | 69 | – | 429                | 1 320          | 129                | 1 300           | 1 400          | 15,5 | ▶ NA 4856    |
| 300                  | 380 | 80 | – | 594                | 1 800          | 173                | 1 100           | 1 300          | 22   | ▶ NA 4860    |
| 320                  | 400 | 80 | – | 605                | 1 900          | 176                | 1 100           | 1 200          | 23   | ▶ NA 4864    |

▶ Popular item

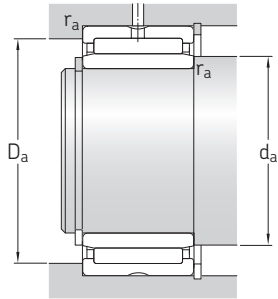


| Dimensions |     |                          |           | Abutment and fillet dimensions |                        |                        |
|------------|-----|--------------------------|-----------|--------------------------------|------------------------|------------------------|
| d          | F   | r <sub>1,2</sub><br>min. | s<br>max. | d <sub>a</sub><br>min.         | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. |
| mm         |     |                          |           | mm                             |                        |                        |
| 95         | 105 | 1                        | 1,5       | 100                            | 120                    | 1                      |
|            | 105 | 1                        | 1,5       | 100                            | 120                    | 1                      |
|            | 110 | 1,1                      | 1         | 101,5                          | 123,5                  | 1                      |
|            | 110 | 1,1                      | 1         | 101,5                          | 123,5                  | 1                      |
| 100        | 110 | 1,1                      | 1,5       | 106,5                          | 123,5                  | 1                      |
|            | 110 | 1,1                      | 2         | 106,5                          | 123,5                  | 1                      |
|            | 115 | 1,1                      | 2         | 106,5                          | 133,5                  | 1                      |
| 110        | 120 | 1                        | 0,8       | 115                            | 135                    | 1                      |
|            | 125 | 1,1                      | 2         | 116,5                          | 143,5                  | 1                      |
| 120        | 130 | 1                        | 0,8       | 125                            | 145                    | 1                      |
|            | 135 | 1,1                      | 2         | 126,5                          | 158,5                  | 1                      |
| 130        | 145 | 1,1                      | 1         | 136,5                          | 158,5                  | 1                      |
|            | 150 | 1,5                      | 1,5       | 138                            | 172                    | 1,5                    |
| 140        | 155 | 1,1                      | 1         | 146,5                          | 168,5                  | 1                      |
|            | 160 | 1,5                      | 1,5       | 148                            | 182                    | 1,5                    |
| 150        | 165 | 1,1                      | 1,5       | 156,5                          | 183,5                  | 1                      |
| 160        | 175 | 1,1                      | 1,5       | 166,5                          | 193,5                  | 1                      |
| 170        | 185 | 1,1                      | 1,5       | 176,5                          | 208,5                  | 1                      |
| 180        | 195 | 1,1                      | 1,5       | 186,5                          | 218,5                  | 1                      |
| 190        | 210 | 1,5                      | 1,5       | 198                            | 232                    | 1,5                    |
| 200        | 220 | 1,5                      | 1,5       | 208                            | 242                    | 1,5                    |
| 220        | 240 | 1,5                      | 1,5       | 228                            | 262                    | 1,5                    |
| 240        | 265 | 2                        | 2         | 249                            | 291                    | 2                      |
| 260        | 285 | 2                        | 2         | 269                            | 311                    | 2                      |
| 280        | 305 | 2                        | 2,5       | 289                            | 341                    | 2                      |
| 300        | 330 | 2,1                      | 2         | 311                            | 369                    | 2                      |
| 320        | 350 | 2,1                      | 2         | 331                            | 389                    | 2                      |

## 7.4 Needle roller bearings with machined rings with flanges, with an inner ring d 340 – 380 mm



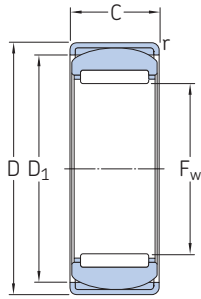
| Principal dimensions |     |     |   | Basic load ratings |                | Fatigue load limit | Speed ratings   |                | Mass | Designation |
|----------------------|-----|-----|---|--------------------|----------------|--------------------|-----------------|----------------|------|-------------|
| d                    | D   | B   | C | dynamic            | static         |                    | Reference speed | Limiting speed |      |             |
| mm                   |     |     |   | C                  | C <sub>0</sub> | P <sub>u</sub>     | r/min           |                | kg   | –           |
| 340                  | 420 | 80  | – | 616                | 1 960          | 183                | 1 000           | 1 200          | 24   | NA 4868     |
| 360                  | 440 | 80  | – | 627                | 2 040          | 186                | 950             | 1 100          | 25,5 | NA 4872     |
| 380                  | 480 | 100 | – | 968                | 3 000          | 270                | 900             | 1 000          | 42,5 | NA 4876     |



| Dimensions |     |                   |           | Abutment and fillet dimensions |               |               |
|------------|-----|-------------------|-----------|--------------------------------|---------------|---------------|
| d          | F   | $r_{1,2}$<br>min. | s<br>max. | $d_a$<br>min.                  | $D_a$<br>max. | $r_a$<br>max. |
| mm         |     |                   |           | mm                             |               |               |
| 340        | 370 | 2,1               | 2         | 351                            | 409           | 2             |
| 360        | 390 | 2,1               | 2         | 371                            | 429           | 2             |
| 380        | 415 | 2,1               | 2         | 391                            | 469           | 2             |

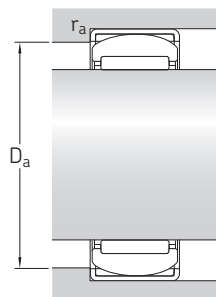
## 7.5 Alignment needle roller bearings, without an inner ring

$F_w$  15 – 45 mm



| Principal dimensions |    |    | Basic load ratings |        | Fatigue load limit | Speed ratings   |                | Mass  | Designation  |
|----------------------|----|----|--------------------|--------|--------------------|-----------------|----------------|-------|--------------|
| $F_w$                | D  | C  | dynamic            | static |                    | Reference speed | Limiting speed |       |              |
| mm                   |    |    | C                  | $C_0$  | $P_u$              | r/min           |                | kg    | –            |
| 15                   | 28 | 12 | 7,37               | 9,15   | 1,08               | 24 000          | 28 000         | 0,032 | RPNA 15/28   |
| 18                   | 32 | 16 | 12,8               | 17,6   | 2,12               | 22 000          | 24 000         | 0,052 | RPNA 18/32   |
| 20                   | 35 | 16 | 13,2               | 19,3   | 2,28               | 19 000          | 22 000         | 0,062 | ▶ RPNA 20/35 |
| 25                   | 42 | 20 | 19                 | 32,5   | 4                  | 16 000          | 18 000         | 0,11  | ▶ RPNA 25/42 |
| 30                   | 47 | 20 | 22,9               | 38     | 4,8                | 13 000          | 15 000         | 0,13  | ▶ RPNA 30/47 |
| 35                   | 52 | 20 | 24,6               | 45     | 5,6                | 11 000          | 13 000         | 0,13  | ▶ RPNA 35/52 |
| 40                   | 55 | 20 | 26,4               | 51     | 6,3                | 10 000          | 11 000         | 0,14  | RPNA 40/55   |
| 45                   | 62 | 20 | 27,5               | 57     | 7,1                | 9 000           | 10 000         | 0,18  | ▶ RPNA 45/62 |

▶ Popular item



**Dimensions**

**Abutment and fillet dimensions**

| $F_w$ | $D_1$ | $r_{\text{min.}}$ | $D_a_{\text{min.}}$ | $D_a_{\text{max.}}$ | $r_a_{\text{max.}}$ |
|-------|-------|-------------------|---------------------|---------------------|---------------------|
|-------|-------|-------------------|---------------------|---------------------|---------------------|

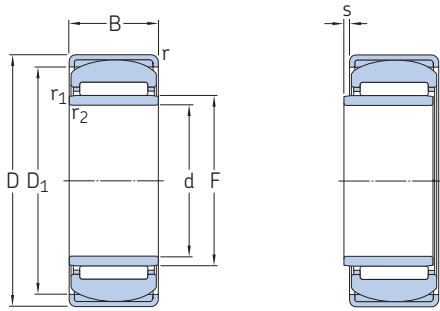
mm

mm

|    |      |     |      |      |     |
|----|------|-----|------|------|-----|
| 15 | 24,5 | 0,8 | 23,5 | 24,5 | 0,8 |
| 18 | 27   | 0,8 | 26   | 27   | 0,8 |
| 20 | 30,5 | 0,8 | 29,5 | 30,5 | 0,8 |
| 25 | 36,5 | 0,8 | 35   | 37   | 0,8 |
| 30 | 42   | 0,8 | 41   | 42   | 0,8 |
| 35 | 47,5 | 0,8 | 46,5 | 47,5 | 0,8 |
| 40 | 50,5 | 0,8 | 49,5 | 50,5 | 0,8 |
| 45 | 58   | 0,8 | 57   | 58   | 0,8 |

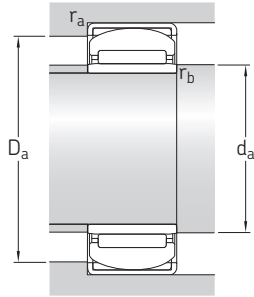
## 7.6 Alignment needle roller bearings, with an inner ring

d 12 – 40 mm



| Principal dimensions |    |    | Basic load ratings |                | Fatigue load limit | Speed ratings   |                | Mass  | Designation |
|----------------------|----|----|--------------------|----------------|--------------------|-----------------|----------------|-------|-------------|
| d                    | D  | B  | dynamic            | static         |                    | Reference speed | Limiting speed |       |             |
| mm                   |    |    | C                  | C <sub>0</sub> | P <sub>u</sub>     | r/min           |                | kg    | –           |
| 12                   | 28 | 12 | 7,37               | 9,15           | 1,08               | 24 000          | 28 000         | 0,037 | PNA 12/28   |
| 15                   | 32 | 16 | 12,8               | 17,6           | 2,12               | 22 000          | 24 000         | 0,062 | ► PNA 15/32 |
| 17                   | 35 | 16 | 13,2               | 19,3           | 2,28               | 19 000          | 22 000         | 0,073 | ► PNA 17/35 |
| 20                   | 42 | 20 | 19                 | 32,5           | 4                  | 16 000          | 18 000         | 0,14  | ► PNA 20/42 |
| 22                   | 44 | 20 | 22                 | 36,5           | 4,55               | 14 000          | 16 000         | 0,15  | PNA 22/44   |
| 25                   | 47 | 20 | 22,9               | 38             | 4,8                | 13 000          | 15 000         | 0,16  | PNA 25/47   |
| 30                   | 52 | 20 | 24,6               | 45             | 5,6                | 11 000          | 13 000         | 0,18  | ► PNA 30/52 |
| 35                   | 55 | 20 | 26,4               | 51             | 6,3                | 10 000          | 11 000         | 0,18  | ► PNA 35/55 |
| 40                   | 62 | 20 | 27,5               | 57             | 7,1                | 9 000           | 10 000         | 0,23  | ► PNA 40/62 |

7.6

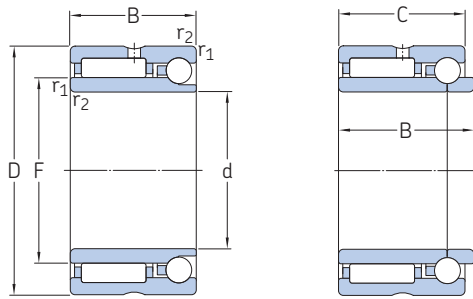


| Dimensions |    |                |        |                       |        | Abutment and fillet dimensions |                     |                     |                     |                     |
|------------|----|----------------|--------|-----------------------|--------|--------------------------------|---------------------|---------------------|---------------------|---------------------|
| d          | F  | D <sub>1</sub> | r min. | r <sub>1,2</sub> min. | s max. | d <sub>a</sub> min.            | D <sub>a</sub> min. | D <sub>a</sub> max. | r <sub>a</sub> max. | r <sub>b</sub> max. |
| mm         |    |                |        |                       |        | mm                             |                     |                     |                     |                     |
| 12         | 15 | 24,5           | 0,8    | 0,3                   | 0,5    | 14                             | 23,5                | 24,5                | 0,8                 | 0,3                 |
| 15         | 18 | 27             | 0,8    | 0,3                   | 0,5    | 17                             | 26                  | 27                  | 0,8                 | 0,3                 |
| 17         | 20 | 30,5           | 0,8    | 0,3                   | 0,5    | 19                             | 29,5                | 30,5                | 0,8                 | 0,3                 |
| 20         | 25 | 36,5           | 0,8    | 0,3                   | 0,5    | 22                             | 35                  | 37                  | 0,8                 | 0,3                 |
| 22         | 28 | 38,5           | 0,8    | 0,3                   | 0,5    | 24                             | 37,5                | 39                  | 0,8                 | 0,3                 |
| 25         | 30 | 42             | 0,8    | 0,3                   | 0,5    | 25                             | 41                  | 42                  | 0,8                 | 0,3                 |
| 30         | 35 | 47,5           | 0,8    | 0,3                   | 0,5    | 32                             | 46,5                | 47,5                | 0,8                 | 0,3                 |
| 35         | 40 | 50,5           | 0,8    | 0,3                   | 0,5    | 37                             | 49,5                | 50,5                | 0,8                 | 0,3                 |
| 40         | 45 | 58             | 0,8    | 0,3                   | 0,5    | 42                             | 57                  | 58                  | 0,8                 | 0,3                 |



## 7.7 Needle roller / angular contact ball bearings

d 12 – 70 mm

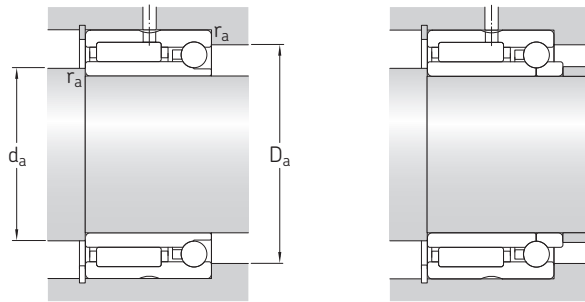


NKIA

NKIB

| Principal dimensions |     |      |    | Basic load ratings |                       |                 |                       | Fatigue load limit    |                      | Speed ratings   |                | Mass  | Designation  |
|----------------------|-----|------|----|--------------------|-----------------------|-----------------|-----------------------|-----------------------|----------------------|-----------------|----------------|-------|--------------|
| d                    | D   | B    | C  | radial dynamic C   | static C <sub>0</sub> | axial dynamic C | static C <sub>0</sub> | radial P <sub>u</sub> | axial P <sub>u</sub> | Reference speed | Limiting speed | kg    |              |
| mm                   |     |      |    | kN                 |                       |                 |                       | kN                    |                      | r/min           |                | kg    | –            |
| 12                   | 24  | 16   | –  | 8,09               | 9,65                  | 2,07            | 1,92                  | 1,14                  | 0,083                | 22 000          | 26 000         | 0,04  | ▶ NKIA 5901  |
|                      | 24  | 17,5 | 16 | 8,09               | 9,65                  | 2,07            | 1,92                  | 1,14                  | 0,083                | 22 000          | 26 000         | 0,043 | ▶ NKIB 5901  |
| 15                   | 28  | 18   | –  | 11,2               | 15,3                  | 2,27            | 2,37                  | 1,83                  | 0,099                | 19 000          | 22 000         | 0,05  | ▶ NKIA 5902  |
|                      | 28  | 20   | 18 | 11,2               | 15,3                  | 2,27            | 2,37                  | 1,83                  | 0,099                | 19 000          | 22 000         | 0,052 | ▶ NKIB 5902  |
| 17                   | 30  | 18   | –  | 11,4               | 16,3                  | 2,24            | 2,74                  | 1,96                  | 0,116                | 18 000          | 20 000         | 0,056 | ▶ NKIA 5903  |
|                      | 30  | 20   | 18 | 11,4               | 16,3                  | 2,24            | 2,74                  | 1,96                  | 0,116                | 18 000          | 20 000         | 0,058 | ▶ NKIB 5903  |
| 20                   | 37  | 23   | –  | 21,6               | 28                    | 3,79            | 4,21                  | 3,35                  | 0,176                | 15 000          | 17 000         | 0,1   | ▶ NKIA 5904  |
|                      | 37  | 25   | 23 | 21,6               | 28                    | 3,79            | 4,21                  | 3,35                  | 0,176                | 15 000          | 17 000         | 0,11  | ▶ NKIB 5904  |
| 22                   | 39  | 23   | –  | 23,3               | 32                    | 4,14            | 4,93                  | 3,9                   | 0,205                | 14 000          | 15 000         | 0,12  | NKIA 59/22   |
|                      | 39  | 25   | 23 | 23,3               | 32                    | 4,14            | 4,93                  | 3,9                   | 0,205                | 14 000          | 15 000         | 0,12  | ▶ NKIB 59/22 |
| 25                   | 42  | 23   | –  | 24,2               | 34,5                  | 4,24            | 5,26                  | 4,15                  | 0,224                | 13 000          | 15 000         | 0,13  | ▶ NKIA 5905  |
|                      | 42  | 25   | 23 | 24,2               | 34,5                  | 4,24            | 5,26                  | 4,15                  | 0,224                | 13 000          | 15 000         | 0,13  | ▶ NKIB 5905  |
| 30                   | 47  | 23   | –  | 25,5               | 39                    | 4,54            | 6,32                  | 4,65                  | 0,268                | 11 000          | 13 000         | 0,15  | ▶ NKIA 5906  |
|                      | 47  | 25   | 23 | 25,5               | 39                    | 4,54            | 6,32                  | 4,65                  | 0,268                | 11 000          | 13 000         | 0,15  | ▶ NKIB 5906  |
| 35                   | 55  | 27   | –  | 31,9               | 54                    | 5,83            | 8,42                  | 6,7                   | 0,355                | 9 500           | 11 000         | 0,24  | ▶ NKIA 5907  |
|                      | 55  | 30   | 27 | 31,9               | 54                    | 5,83            | 8,42                  | 6,7                   | 0,355                | 9 500           | 11 000         | 0,25  | ▶ NKIB 5907  |
| 40                   | 62  | 30   | –  | 42,9               | 71                    | 7,17            | 10,9                  | 8,8                   | 0,467                | 8 000           | 9 500          | 0,32  | ▶ NKIA 5908  |
|                      | 62  | 34   | 30 | 42,9               | 71                    | 7,17            | 10,9                  | 8,8                   | 0,467                | 8 000           | 9 500          | 0,32  | ▶ NKIB 5908  |
| 45                   | 68  | 30   | –  | 45,7               | 78                    | 7,47            | 12                    | 9,65                  | 0,513                | 7 500           | 8 500          | 0,38  | NKIA 5909    |
|                      | 68  | 34   | 30 | 45,7               | 78                    | 7,47            | 12                    | 9,65                  | 0,513                | 7 500           | 8 500          | 0,38  | ▶ NKIB 5909  |
| 50                   | 72  | 30   | –  | 47,3               | 85                    | 7,74            | 13,7                  | 10,6                  | 0,579                | 7 000           | 8 000          | 0,38  | ▶ NKIA 5910  |
|                      | 72  | 34   | 30 | 47,3               | 85                    | 7,74            | 13,7                  | 10,6                  | 0,579                | 7 000           | 8 000          | 0,39  | ▶ NKIB 5910  |
| 55                   | 80  | 34   | –  | 57,2               | 106                   | 9,27            | 16,7                  | 13,2                  | 0,697                | 6 300           | 7 000          | 0,55  | NKIA 5911    |
|                      | 80  | 38   | 34 | 57,2               | 106                   | 9,27            | 16,7                  | 13,2                  | 0,697                | 6 300           | 7 000          | 0,56  | ▶ NKIB 5911  |
| 60                   | 85  | 34   | –  | 60,5               | 114                   | 9,58            | 18                    | 14,3                  | 0,77                 | 6 000           | 6 700          | 0,59  | ▶ NKIA 5912  |
|                      | 85  | 38   | 34 | 60,5               | 114                   | 9,58            | 18                    | 14,3                  | 0,77                 | 6 000           | 6 700          | 0,6   | ▶ NKIB 5912  |
| 65                   | 90  | 34   | –  | 61,6               | 120                   | 9,96            | 19,2                  | 14,6                  | 0,816                | 5 600           | 6 300          | 0,64  | NKIA 5913    |
|                      | 90  | 38   | 34 | 61,6               | 120                   | 9,96            | 19,2                  | 14,6                  | 0,816                | 5 600           | 6 300          | 0,64  | ▶ NKIB 5913  |
| 70                   | 100 | 40   | –  | 84,2               | 163                   | 13,2            | 25                    | 20,8                  | 1,05                 | 5 000           | 5 600          | 0,98  | NKIA 5914    |
|                      | 100 | 45   | 40 | 84,2               | 163                   | 13,2            | 25                    | 20,8                  | 1,05                 | 5 000           | 5 600          | 0,99  | ▶ NKIB 5914  |

▶ Popular item



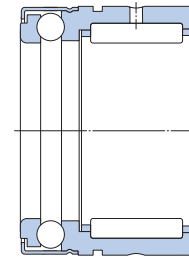
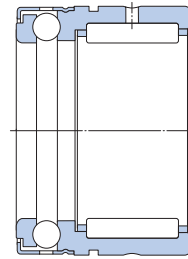
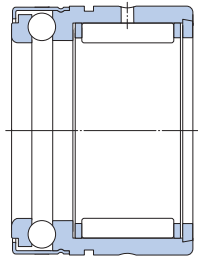
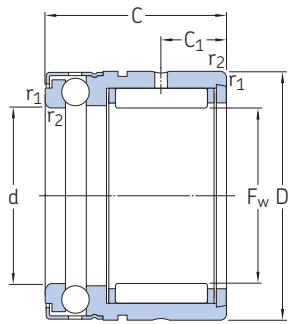
**Dimensions**

**Abutment and fillet dimensions**

| d  | F        | r <sub>1,2</sub><br>min. | d <sub>a</sub><br>min. | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. |
|----|----------|--------------------------|------------------------|------------------------|------------------------|
| mm |          |                          | mm                     |                        |                        |
| 12 | 16<br>16 | 0,3<br>0,3               | 14<br>14               | 22<br>22               | 0,3<br>0,3             |
| 15 | 20<br>20 | 0,3<br>0,3               | 17<br>17               | 26<br>26               | 0,3<br>0,3             |
| 17 | 22<br>22 | 0,3<br>0,3               | 19<br>19               | 28<br>28               | 0,3<br>0,3             |
| 20 | 25<br>25 | 0,3<br>0,3               | 22<br>22               | 35<br>35               | 0,3<br>0,3             |
| 22 | 28<br>28 | 0,3<br>0,3               | 24<br>24               | 37<br>37               | 0,3<br>0,3             |
| 25 | 30<br>30 | 0,3<br>0,3               | 27<br>27               | 40<br>40               | 0,3<br>0,3             |
| 30 | 35<br>35 | 0,3<br>0,3               | 32<br>32               | 45<br>45               | 0,3<br>0,3             |
| 35 | 42<br>42 | 0,6<br>0,6               | 39<br>39               | 51<br>51               | 0,6<br>0,6             |
| 40 | 48<br>48 | 0,6<br>0,6               | 44<br>44               | 58<br>58               | 0,6<br>0,6             |
| 45 | 52<br>52 | 0,6<br>0,6               | 49<br>49               | 64<br>64               | 0,6<br>0,6             |
| 50 | 58<br>58 | 0,6<br>0,6               | 54<br>54               | 68<br>68               | 0,6<br>0,6             |
| 55 | 63<br>63 | 1<br>1                   | 60<br>60               | 75<br>75               | 1<br>1                 |
| 60 | 68<br>68 | 1<br>1                   | 65<br>65               | 80<br>80               | 1<br>1                 |
| 65 | 72<br>72 | 1<br>1                   | 70<br>70               | 85<br>85               | 1<br>1                 |
| 70 | 80<br>80 | 1<br>1                   | 75<br>75               | 95<br>95               | 1<br>1                 |

## 7.8 Needle roller / thrust ball bearings, full complement thrust bearing

$F_w$  7 – 35 mm



NX  
( $F_w = 7$  mm)

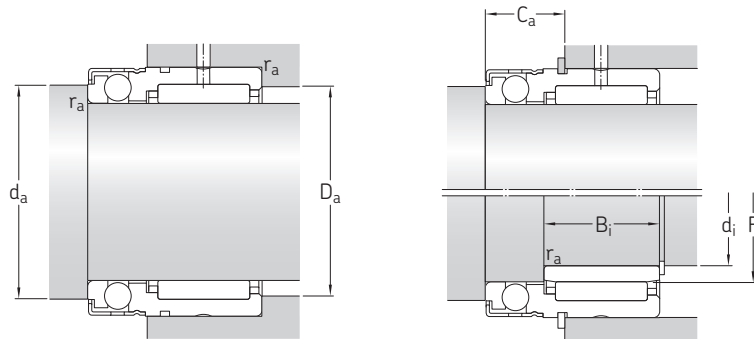
NX..Z  
( $F_w = 7$  mm)

NX  
( $F_w \geq 10$  mm)

NX..Z  
( $F_w \geq 10$  mm)

| Principal dimensions |    |    | Basic load ratings |              |                 |              | Fatigue load limit |             | Minimum load factor | Speed ratings   |                | Mass  | Designation |
|----------------------|----|----|--------------------|--------------|-----------------|--------------|--------------------|-------------|---------------------|-----------------|----------------|-------|-------------|
| $F_w$                | D  | C  | radial dynamic C   | static $C_0$ | axial dynamic C | static $C_0$ | radial $P_u$       | axial $P_u$ | A                   | Reference speed | Limiting speed | kg    |             |
| mm                   |    |    | kN                 |              |                 |              | kN                 |             | –                   | r/min           |                | kg    | –           |
| 7                    | 14 | 18 | 2,81               | 2,75         | 3,45            | 5            | 0,29               | 0,186       | 0,00013             | 10 000          | 6 000          | 0,014 | ► NX 7 ZTN  |
|                      | 14 | 18 | 2,81               | 2,75         | 3,45            | 5            | 0,29               | 0,186       | 0,00013             | 10 000          | 11 000         | 0,014 | NX 7 TN     |
| 10                   | 19 | 18 | 4,95               | 4,55         | 5,07            | 8,5          | 0,53               | 0,31        | 0,00038             | 8 500           | 5 600          | 0,025 | ► NX 10 Z   |
|                      | 19 | 18 | 4,95               | 4,55         | 5,07            | 8,5          | 0,53               | 0,31        | 0,00038             | 8 500           | 9 500          | 0,025 | NX 10       |
| 12                   | 21 | 18 | 5,39               | 5,2          | 5,27            | 9,65         | 0,61               | 0,355       | 0,00048             | 8 000           | 5 300          | 0,028 | ► NX 12 Z   |
|                      | 21 | 18 | 5,39               | 5,2          | 5,27            | 9,65         | 0,61               | 0,355       | 0,00048             | 8 000           | 9 000          | 0,028 | NX 12       |
| 15                   | 24 | 28 | 11                 | 14           | 6,18            | 12,2         | 1,66               | 0,45        | 0,00077             | 7 500           | 5 300          | 0,048 | NX 15 Z     |
|                      | 24 | 28 | 11                 | 14           | 6,18            | 12,2         | 1,66               | 0,45        | 0,00077             | 7 500           | 8 500          | 0,048 | NX 15       |
| 17                   | 26 | 28 | 12,1               | 16,6         | 6,37            | 13,4         | 1,96               | 0,5         | 0,00093             | 7 000           | 5 000          | 0,053 | NX 17 Z     |
|                      | 26 | 28 | 12,1               | 16,6         | 6,37            | 13,4         | 1,96               | 0,5         | 0,00093             | 7 000           | 8 500          | 0,053 | NX 17       |
| 20                   | 30 | 28 | 13,2               | 19,3         | 7,8             | 17,3         | 2,28               | 0,64        | 0,0016              | 6 300           | 4 500          | 0,068 | ► NX 20 Z   |
|                      | 30 | 28 | 13,2               | 19,3         | 7,8             | 17,3         | 2,28               | 0,64        | 0,0016              | 6 300           | 7 500          | 0,068 | NX 20       |
| 25                   | 37 | 30 | 15,1               | 24,5         | 12,4            | 28,5         | 2,9                | 1,06        | 0,0042              | 5 600           | 3 800          | 0,12  | NX 25 Z     |
|                      | 37 | 30 | 15,1               | 24,5         | 12,4            | 28,5         | 2,9                | 1,06        | 0,0042              | 5 600           | 6 300          | 0,12  | NX 25       |
| 30                   | 42 | 30 | 22,9               | 38           | 12,7            | 32,5         | 4,8                | 1,2         | 0,0055              | 5 300           | 3 600          | 0,13  | ► NX 30 Z   |
|                      | 42 | 30 | 22,9               | 38           | 12,7            | 32,5         | 4,8                | 1,2         | 0,0055              | 5 300           | 6 000          | 0,13  | NX 30       |
| 35                   | 47 | 30 | 24,6               | 45           | 13,5            | 38           | 5,6                | 1,4         | 0,0075              | 5 000           | 3 400          | 0,16  | NX 35 Z     |
|                      | 47 | 30 | 24,6               | 45           | 13,5            | 38           | 5,6                | 1,4         | 0,0075              | 5 000           | 5 600          | 0,16  | NX 35       |

► Popular item



| Dimensions     |                |    |                          | Abutment and fillet dimensions |                        |                |                        | Associated inner ring <sup>1)</sup><br>Dimensions |    |                | Designation     | Associated snap ring <sup>2)</sup><br>Designation |
|----------------|----------------|----|--------------------------|--------------------------------|------------------------|----------------|------------------------|---|----|----------------|-----------------|---|
| F <sub>w</sub> | C <sub>1</sub> | d  | r <sub>1,2</sub><br>min. | d <sub>a</sub><br>min.         | D <sub>a</sub><br>max. | C <sub>a</sub> | r <sub>a</sub><br>max. | d <sub>i</sub>                                    | F  | B <sub>i</sub> |                 |   |
| mm             |                |    |                          | mm                             |                        |                |                        | mm  |    |                | -               | -   |
| 7              | 4,7            | 7  | 0,3                      | 9,6                            | 12                     | 10             | 0,3                    | -   | -  | -              | -               | SW 14   |
|                | 4,7            | 7  | 0,3                      | 9,6                            | 12                     | 10             | 0,3                    | -   | -  | -              | -               | SW 14   |
| 10             | 4,7            | 10 | 0,3                      | 14,6                           | 17                     | 10             | 0,3                    | 6   | 10 | 10             | IR 6x10x10 IS1  | SW 19   |
|                | 4,7            | 10 | 0,3                      | 14,6                           | 17                     | 10             | 0,3                    | 6   | 10 | 10             | IR 6x10x10 IS1  | SW 19   |
| 12             | 4,7            | 12 | 0,3                      | 16,6                           | 19                     | 10             | 0,3                    | 8   | 12 | 10             | IR 8x12x10 IS1  | SW 21   |
|                | 4,7            | 12 | 0,3                      | 16,6                           | 19                     | 10             | 0,3                    | 8   | 12 | 10             | IR 8x12x10 IS1  | SW 21   |
| 15             | 8              | 15 | 0,3                      | 19                             | 22                     | 12,2           | 0,3                    | 12  | 15 | 16             | IR 12x15x16     | SW 24   |
|                | 8              | 15 | 0,3                      | 19                             | 22                     | 12,2           | 0,3                    | 12  | 15 | 16             | IR 12x15x16     | SW 24   |
| 17             | 8              | 17 | 0,3                      | 21                             | 24                     | 12,2           | 0,3                    | 14  | 17 | 17             | IR 14x17x17     | SW 26   |
|                | 8              | 17 | 0,3                      | 21                             | 24                     | 12,2           | 0,3                    | 14  | 17 | 17             | IR 14x17x17     | SW 26   |
| 20             | 8              | 20 | 0,3                      | 25                             | 28                     | 12,2           | 0,3                    | 17  | 20 | 16             | IR 17x20x16     | SW 30   |
|                | 8              | 20 | 0,3                      | 25                             | 28                     | 12,2           | 0,3                    | 17  | 20 | 16             | IR 17x20x16     | SW 30   |
| 25             | 8              | 25 | 0,3                      | 31,6                           | 35                     | 14,2           | 0,3                    | 20  | 25 | 16             | IR 20x25x16 IS1 | SW 37   |
|                | 8              | 25 | 0,3                      | 31,6                           | 35                     | 14,2           | 0,3                    | 20  | 25 | 16             | IR 20x25x16 IS1 | SW 37   |
| 30             | 10             | 30 | 0,3                      | 36,5                           | 40                     | 14,2           | 0,3                    | 25  | 30 | 20             | IR 25x30x20     | SW 42   |
|                | 10             | 30 | 0,3                      | 36,5                           | 40                     | 14,2           | 0,3                    | 25  | 30 | 20             | IR 25x30x20     | SW 42   |
| 35             | 10             | 35 | 0,3                      | 40,5                           | 45                     | 14,2           | 0,3                    | 30  | 35 | 20             | IR 30x35x20     | SW 47   |
|                | 10             | 35 | 0,3                      | 40,5                           | 45                     | 14,2           | 0,3                    | 30  | 35 | 20             | IR 30x35x20     | SW 47   |

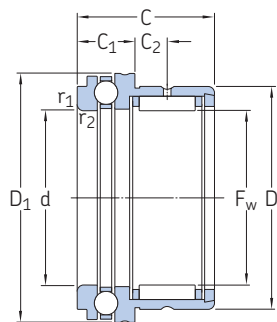
<sup>1)</sup> For additional information → Needle roller bearing inner rings, page 593

<sup>2)</sup> In accordance with DIN 471, not supplied by SKF.

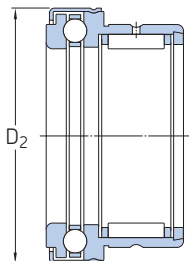


## 7.9 Needle roller / thrust ball bearings, thrust bearing with a cage

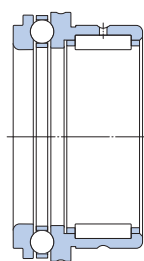
$F_w$  10 – 70 mm



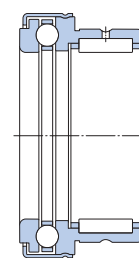
NKX  
( $F_w = 10$  mm)



NKX..Z  
( $F_w = 10$  mm)



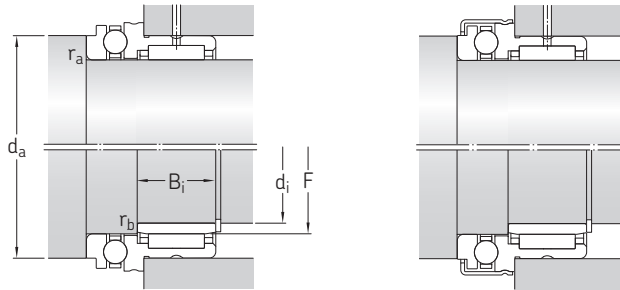
NKX  
( $F_w \geq 12$  mm)



NKX..Z  
( $F_w \geq 12$  mm)

| $F_w$ | Principal dimensions |    | Basic load ratings |              |                 |              | Fatigue load limit |             | Minimum load factor | Speed ratings   |                | Mass  | Designation |
|-------|----------------------|----|--------------------|--------------|-----------------|--------------|--------------------|-------------|---------------------|-----------------|----------------|-------|-------------|
|       | D                    | C  | radial dynamic C   | static $C_0$ | axial dynamic C | static $C_0$ | radial $P_u$       | axial $P_u$ |                     | Reference speed | Limiting speed |       |             |
| mm    |                      |    | kN                 |              |                 |              | kN                 |             | –                   | r/min           |                | kg    | –           |
| 10    | 19                   | 23 | 5,94               | 8            | 9,95            | 15,3         | 0,9                | 0,56        | 0,0012              | 9 500           | 8 000          | 0,036 | NKX 10 ZTN  |
|       | 19                   | 23 | 5,94               | 8            | 9,95            | 15,3         | 0,9                | 0,56        | 0,0012              | 9 500           | 13 000         | 0,034 | ▶ NKX 10 TN |
| 12    | 21                   | 23 | 9,13               | 12           | 10,4            | 16,6         | 1,43               | 0,62        | 0,0014              | 9 000           | 7 500          | 0,04  | ▶ NKX 12 Z  |
|       | 21                   | 23 | 9,13               | 12           | 10,4            | 16,6         | 1,43               | 0,62        | 0,0014              | 9 000           | 13 000         | 0,038 | NKX 12      |
| 15    | 24                   | 23 | 11                 | 14           | 10,6            | 18,3         | 1,66               | 0,67        | 0,0017              | 8 500           | 7 000          | 0,047 | ▶ NKX 15 Z  |
|       | 24                   | 23 | 11                 | 14           | 10,6            | 18,3         | 1,66               | 0,67        | 0,0017              | 8 500           | 12 000         | 0,044 | ▶ NKX 15    |
| 17    | 26                   | 25 | 12,1               | 16,6         | 10,8            | 19,6         | 1,96               | 0,735       | 0,002               | 8 500           | 7 000          | 0,055 | ▶ NKX 17 Z  |
|       | 26                   | 25 | 12,1               | 16,6         | 10,8            | 19,6         | 1,96               | 0,735       | 0,002               | 8 500           | 12 000         | 0,053 | NKX 17      |
| 20    | 30                   | 30 | 16,5               | 25,5         | 14,3            | 27           | 3,05               | 1           | 0,0038              | 7 500           | 6 000          | 0,09  | ▶ NKX 20 Z  |
|       | 30                   | 30 | 16,5               | 25,5         | 14,3            | 27           | 3,05               | 1           | 0,0038              | 7 500           | 10 000         | 0,083 | ▶ NKX 20    |
| 25    | 37                   | 30 | 19                 | 32,5         | 19,5            | 40,5         | 4                  | 1,5         | 0,0085              | 6 300           | 5 500          | 0,13  | ▶ NKX 25 Z  |
|       | 37                   | 30 | 19                 | 32,5         | 19,5            | 40,5         | 4                  | 1,5         | 0,0085              | 6 300           | 9 000          | 0,13  | NKX 25      |
| 30    | 42                   | 30 | 22,9               | 38           | 20,3            | 45,5         | 4,8                | 1,7         | 0,01                | 6 000           | 5 000          | 0,14  | ▶ NKX 30 Z  |
|       | 42                   | 30 | 22,9               | 38           | 20,3            | 45,5         | 4,8                | 1,7         | 0,01                | 6 000           | 8 500          | 0,14  | ▶ NKX 30    |
| 35    | 47                   | 30 | 24,6               | 45           | 21,2            | 51           | 5,6                | 1,9         | 0,013               | 5 600           | 4 500          | 0,17  | ▶ NKX 35 Z  |
|       | 47                   | 30 | 24,6               | 45           | 21,2            | 51           | 5,6                | 1,9         | 0,013               | 5 600           | 7 500          | 0,16  | ▶ NKX 35    |
| 40    | 52                   | 32 | 26,4               | 51           | 27              | 68           | 6,3                | 2,55        | 0,024               | 5 000           | 4 000          | 0,21  | ▶ NKX 40 Z  |
|       | 52                   | 32 | 26,4               | 51           | 27              | 68           | 6,3                | 2,55        | 0,024               | 5 000           | 7 000          | 0,2   | NKX 40      |
| 45    | 58                   | 32 | 27,5               | 57           | 28,1            | 75           | 7,1                | 2,8         | 0,029               | 4 500           | 3 800          | 0,27  | ▶ NKX 45 Z  |
|       | 58                   | 32 | 27,5               | 57           | 28,1            | 75           | 7,1                | 2,8         | 0,029               | 4 500           | 6 300          | 0,25  | NKX 45      |
| 50    | 62                   | 35 | 38                 | 78           | 28,6            | 81,5         | 9,65               | 3,05        | 0,034               | 4 300           | 3 600          | 0,3   | ▶ NKX 50 Z  |
|       | 62                   | 35 | 38                 | 78           | 28,6            | 81,5         | 9,65               | 3,05        | 0,034               | 4 300           | 6 300          | 0,28  | ▶ NKX 50    |
| 60    | 72                   | 40 | 41,8               | 96,5         | 41,6            | 122          | 11,8               | 4,55        | 0,077               | 3 600           | 3 000          | 0,38  | ▶ NKX 60 Z  |
|       | 72                   | 40 | 41,8               | 96,5         | 41,6            | 122          | 11,8               | 4,55        | 0,077               | 3 600           | 5 000          | 0,36  | ▶ NKX 60    |
| 70    | 85                   | 40 | 44,6               | 98           | 43,6            | 137          | 12,2               | 5,1         | 0,097               | 3 400           | 2 700          | 0,52  | ▶ NKX 70 Z  |
|       | 85                   | 40 | 44,6               | 98           | 43,6            | 137          | 12,2               | 5,1         | 0,097               | 3 400           | 4 500          | 0,5   | ▶ NKX 70    |

▶ Popular item

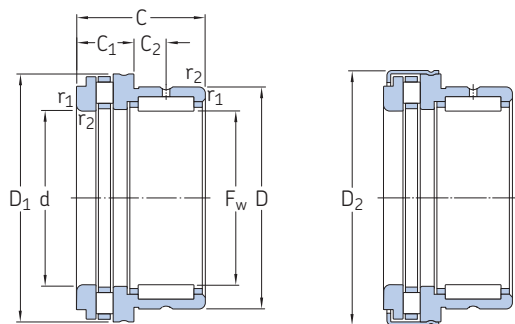


| Dimensions     |                |                | Abutment and fillet dimensions |                |                |                       |                     |                     |                     | Associated inner ring <sup>1)</sup> Dimensions |    |                | Designation |
|----------------|----------------|----------------|--------------------------------|----------------|----------------|-----------------------|---------------------|---------------------|---------------------|--|----|----------------|-------------|
| F <sub>w</sub> | C <sub>1</sub> | C <sub>2</sub> | d                              | D <sub>1</sub> | D <sub>2</sub> | r <sub>1,2</sub> min. | d <sub>a</sub> min. | r <sub>a</sub> max. | r <sub>b</sub> max. | d <sub>i</sub>                                 | F  | B <sub>i</sub> |             |
| mm             |                |                | mm                             |                |                |                       |                     |                     |                     | mm   |    |                | –           |
| 10             | 9              | 6,5            | 10                             | –              | 25,2           | 0,3                   | 19,7                | 0,3                 | 0,3                 | 7  | 10 | 16             | IR 7x10x16  |
|                | 9              | 6,5            | 10                             | 24,1           | –              | 0,3                   | 19,7                | 0,3                 | 0,3                 | 7  | 10 | 16             | IR 7x10x16  |
| 12             | 9              | 6,5            | 12                             | –              | 27,2           | 0,3                   | 21,7                | 0,3                 | 0,3                 | 9  | 12 | 16             | IR 9x12x16  |
|                | 9              | 6,5            | 12                             | 26,1           | –              | 0,3                   | 21,7                | 0,3                 | 0,3                 | 9  | 12 | 16             | IR 9x12x16  |
| 15             | 9              | 6,5            | 15                             | –              | 29,2           | 0,3                   | 23,7                | 0,3                 | 0,3                 | 12   | 15 | 16             | IR 12x15x16 |
|                | 9              | 6,5            | 15                             | 28,1           | –              | 0,3                   | 23,7                | 0,3                 | 0,3                 | 12   | 15 | 16             | IR 12x15x16 |
| 17             | 9              | 8              | 17                             | –              | 31,2           | 0,3                   | 25,7                | 0,3                 | 0,3                 | 14   | 17 | 17             | IR 14x17x17 |
|                | 9              | 8              | 17                             | 30,1           | –              | 0,3                   | 25,7                | 0,3                 | 0,3                 | 14   | 17 | 17             | IR 14x17x17 |
| 20             | 10             | 10,5           | 20                             | –              | 36,2           | 0,3                   | 30,7                | 0,3                 | 0,3                 | 17   | 20 | 20             | IR 17x20x20 |
|                | 10             | 10,5           | 20                             | 35,1           | –              | 0,3                   | 30,7                | 0,3                 | 0,3                 | 17   | 20 | 20             | IR 17x20x20 |
| 25             | 11             | 9,5            | 25                             | –              | 43,2           | 0,6                   | 37,7                | 0,6                 | 0,3                 | 20   | 25 | 20             | IR 20x25x20 |
|                | 11             | 9,5            | 25                             | 42,1           | –              | 0,6                   | 37,7                | 0,6                 | 0,3                 | 20   | 25 | 20             | IR 20x25x20 |
| 30             | 11             | 9,5            | 30                             | –              | 48,2           | 0,6                   | 42,7                | 0,6                 | 0,3                 | 25   | 30 | 20             | IR 25x30x20 |
|                | 11             | 9,5            | 30                             | 47,1           | –              | 0,6                   | 42,7                | 0,6                 | 0,3                 | 25   | 30 | 20             | IR 25x30x20 |
| 35             | 12             | 9              | 35                             | –              | 53,2           | 0,6                   | 47,7                | 0,6                 | 0,3                 | 30   | 35 | 20             | IR 30x35x20 |
|                | 12             | 9              | 35                             | 52,1           | –              | 0,6                   | 47,7                | 0,6                 | 0,3                 | 30   | 35 | 20             | IR 30x35x20 |
| 40             | 13             | 10             | 40                             | –              | 61,2           | 0,6                   | 55,7                | 0,6                 | 0,3                 | 35   | 40 | 20             | IR 35x40x20 |
|                | 13             | 10             | 40                             | 60,1           | –              | 0,6                   | 55,7                | 0,6                 | 0,3                 | 35   | 40 | 20             | IR 35x40x20 |
| 45             | 14             | 9              | 45                             | –              | 66,5           | 0,6                   | 60,5                | 0,6                 | 0,3                 | 40   | 45 | 20             | IR 40x45x20 |
|                | 14             | 9              | 45                             | 65,2           | –              | 0,6                   | 60,5                | 0,6                 | 0,3                 | 40   | 45 | 20             | IR 40x45x20 |
| 50             | 14             | 10             | 50                             | –              | 71,5           | 0,6                   | 65,5                | 0,6                 | 0,6                 | 45   | 50 | 25             | IR 45x50x25 |
|                | 14             | 10             | 50                             | 70,2           | –              | 0,6                   | 65,5                | 0,6                 | 0,6                 | 45   | 50 | 25             | IR 45x50x25 |
| 60             | 17             | 12             | 60                             | –              | 86,5           | 1                     | 80,5                | 1                   | 1                   | 50   | 60 | 25             | IR 50x60x25 |
|                | 17             | 12             | 60                             | 85,2           | –              | 1                     | 80,5                | 1                   | 1                   | 50   | 60 | 25             | IR 50x60x25 |
| 70             | 18             | 11             | 70                             | –              | 96,5           | 1                     | 90,5                | 1                   | 1                   | 60   | 70 | 25             | IR 60x70x25 |
|                | 18             | 11             | 70                             | 95,2           | –              | 1                     | 90,5                | 1                   | 1                   | 60   | 70 | 25             | IR 60x70x25 |

<sup>1)</sup> For additional information → Needle roller bearing inner rings, page 593

## 7.10 Needle roller / cylindrical roller thrust bearings

F<sub>w</sub> 15 – 50 mm

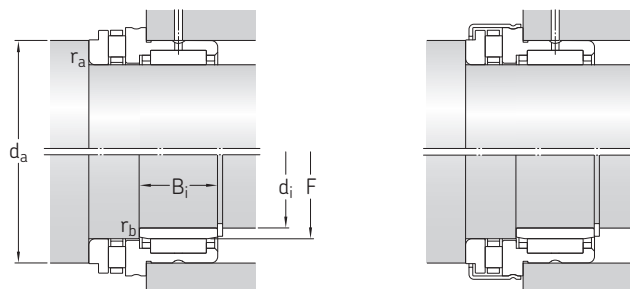


NKXR

NKXR..Z

| Principal dimensions |    |    | Basic load ratings |                       |                 |                       | Fatigue load limit    |                      | Minimum load factor | Speed ratings   |                | Mass  | Designation |
|----------------------|----|----|--------------------|-----------------------|-----------------|-----------------------|-----------------------|----------------------|---------------------|-----------------|----------------|-------|-------------|
| F <sub>w</sub>       | D  | C  | radial dynamic C   | static C <sub>0</sub> | axial dynamic C | static C <sub>0</sub> | radial P <sub>u</sub> | axial P <sub>u</sub> | A                   | Reference speed | Limiting speed | kg    |             |
| mm                   |    |    | kN                 |                       |                 |                       | kN                    |                      | –                   | r/min           |                |       | –           |
| 15                   | 24 | 23 | 11                 | 14                    | 11,2            | 27                    | 1,66                  | 2,45                 | 0,000 058           | 4 300           | 8 500          | 0,042 | NKXR 15     |
|                      | 24 | 23 | 11                 | 14                    | 11,2            | 27                    | 1,66                  | 2,45                 | 0,000 058           | 4 300           | 8 500          | 0,045 | ► NKXR 15 Z |
| 17                   | 26 | 25 | 12,1               | 16,6                  | 12,2            | 31,5                  | 1,96                  | 2,85                 | 0,000 079           | 4 300           | 8 500          | 0,05  | ► NKXR 17   |
|                      | 26 | 25 | 12,1               | 16,6                  | 12,2            | 31,5                  | 1,96                  | 2,85                 | 0,000 079           | 4 300           | 8 500          | 0,053 | ► NKXR 17 Z |
| 20                   | 30 | 30 | 16,5               | 25,5                  | 18,6            | 48                    | 3,05                  | 4,65                 | 0,00018             | 3 800           | 7 500          | 0,08  | ► NKXR 20   |
|                      | 30 | 30 | 16,5               | 25,5                  | 18,6            | 48                    | 3,05                  | 4,65                 | 0,00018             | 3 800           | 7 500          | 0,084 | ► NKXR 20 Z |
| 25                   | 37 | 30 | 19                 | 32,5                  | 25              | 69,5                  | 4                     | 6,8                  | 0,00039             | 3 200           | 6 300          | 0,12  | NKXR 25     |
|                      | 37 | 30 | 19                 | 32,5                  | 25              | 69,5                  | 4                     | 6,8                  | 0,00039             | 3 200           | 6 300          | 0,13  | ► NKXR 25 Z |
| 30                   | 42 | 30 | 22,9               | 38                    | 27              | 78                    | 4,8                   | 7,65                 | 0,00049             | 3 000           | 6 000          | 0,14  | NKXR 30     |
|                      | 42 | 30 | 22,9               | 38                    | 27              | 78                    | 4,8                   | 7,65                 | 0,00049             | 3 000           | 6 000          | 0,14  | ► NKXR 30 Z |
| 35                   | 47 | 30 | 24,6               | 45                    | 29              | 93                    | 5,6                   | 9,15                 | 0,00069             | 2 800           | 5 600          | 0,16  | NKXR 35     |
|                      | 47 | 30 | 24,6               | 45                    | 29              | 93                    | 5,6                   | 9,15                 | 0,00069             | 2 800           | 5 600          | 0,17  | ► NKXR 35 Z |
| 40                   | 52 | 32 | 26,4               | 51                    | 43              | 137                   | 6,3                   | 13,7                 | 0,0015              | 2 400           | 5 000          | 0,2   | NKXR 40     |
|                      | 52 | 32 | 26,4               | 51                    | 43              | 137                   | 6,3                   | 13,7                 | 0,0015              | 2 400           | 5 000          | 0,21  | ► NKXR 40 Z |
| 45                   | 58 | 32 | 27,5               | 57                    | 45              | 153                   | 7,1                   | 15,3                 | 0,0019              | 2 200           | 4 500          | 0,24  | NKXR 45     |
|                      | 58 | 32 | 27,5               | 57                    | 45              | 153                   | 7,1                   | 15,3                 | 0,0019              | 2 200           | 4 500          | 0,26  | ► NKXR 45 Z |
| 50                   | 62 | 35 | 38                 | 78                    | 47,5            | 166                   | 9,65                  | 16,6                 | 0,0022              | 2 200           | 4 300          | 0,27  | NKXR 50     |
|                      | 62 | 35 | 38                 | 78                    | 47,5            | 166                   | 9,65                  | 16,6                 | 0,0022              | 2 200           | 4 300          | 0,29  | ► NKXR 50 Z |

► Popular item



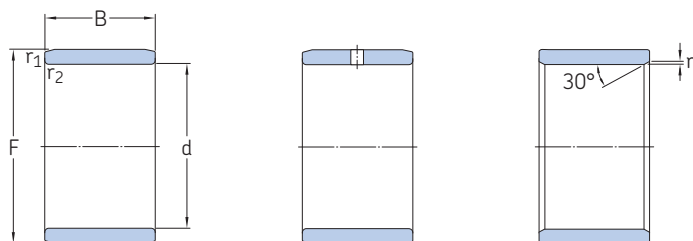
| Dimensions     |                |                |    |                |                | Abutment and fillet dimensions |                     |                     |                     | Associated inner ring <sup>1)</sup> Dimensions |    |                | Designation |
|----------------|----------------|----------------|----|----------------|----------------|--------------------------------|---------------------|---------------------|---------------------|--|----|----------------|-------------|
| F <sub>w</sub> | C <sub>1</sub> | C <sub>2</sub> | d  | D <sub>1</sub> | D <sub>2</sub> | r <sub>1,2</sub> min.          | d <sub>a</sub> min. | r <sub>a</sub> max. | r <sub>b</sub> max. | d <sub>i</sub>                                 | F  | B <sub>i</sub> |             |
| mm             |                |                |    |                |                | mm                             |                     |                     |                     | mm   |    |                | –           |
| 15             | 9              | 6,5            | 15 | 28,1           | –              | 0,3                            | 23,7                | 0,3                 | 0,3                 | 12   | 15 | 16             | IR 12x15x16 |
|                | 9              | 6,5            | 15 | –              | 29,2           | 0,3                            | 23,7                | 0,3                 | 0,3                 | 12   | 15 | 16             | IR 12x15x16 |
| 17             | 9              | 8              | 17 | 30,1           | –              | 0,3                            | 25,7                | 0,3                 | 0,3                 | 14   | 17 | 17             | IR 14x17x17 |
|                | 9              | 8              | 17 | –              | 31,2           | 0,3                            | 25,7                | 0,3                 | 0,3                 | 14   | 17 | 17             | IR 14x17x17 |
| 20             | 10             | 10,5           | 20 | 35,1           | –              | 0,3                            | 30,7                | 0,3                 | 0,3                 | 17   | 20 | 20             | IR 17x20x20 |
|                | 10             | 10,5           | 20 | –              | 36,2           | 0,3                            | 30,7                | 0,3                 | 0,3                 | 17   | 20 | 20             | IR 17x20x20 |
| 25             | 11             | 9,5            | 25 | 42,1           | –              | 0,6                            | 37,7                | 0,6                 | 0,3                 | 20   | 25 | 20             | IR 20x25x20 |
|                | 11             | 9,5            | 25 | –              | 43,2           | 0,6                            | 37,7                | 0,6                 | 0,3                 | 20   | 25 | 20             | IR 20x25x20 |
| 30             | 11             | 9,5            | 30 | 47,1           | –              | 0,6                            | 42,7                | 0,6                 | 0,3                 | 25   | 30 | 20             | IR 25x30x20 |
|                | 11             | 9,5            | 30 | –              | 48,2           | 0,6                            | 42,7                | 0,6                 | 0,3                 | 25   | 30 | 20             | IR 25x30x20 |
| 35             | 12             | 9              | 35 | 52,1           | –              | 0,6                            | 47,7                | 0,6                 | 0,3                 | 30   | 35 | 20             | IR 30x35x20 |
|                | 12             | 9              | 35 | –              | 53,2           | 0,6                            | 47,7                | 0,6                 | 0,3                 | 30   | 35 | 20             | IR 30x35x20 |
| 40             | 13             | 10             | 40 | 60,1           | –              | 0,6                            | 55,7                | 0,6                 | 0,3                 | 35   | 40 | 20             | IR 35x40x20 |
|                | 13             | 10             | 40 | –              | 61,2           | 0,6                            | 55,7                | 0,6                 | 0,3                 | 35   | 40 | 20             | IR 35x40x20 |
| 45             | 14             | 9              | 45 | 65,2           | –              | 0,6                            | 60,6                | 0,6                 | 0,3                 | 40   | 45 | 20             | IR 40x45x20 |
|                | 14             | 9              | 45 | –              | 66,5           | 0,6                            | 60,6                | 0,6                 | 0,3                 | 40   | 45 | 20             | IR 40x45x20 |
| 50             | 14             | 10             | 50 | 70,2           | –              | 0,6                            | 65,5                | 0,6                 | 0,6                 | 45   | 50 | 25             | IR 45x50x25 |
|                | 14             | 10             | 50 | –              | 71,5           | 0,6                            | 65,5                | 0,6                 | 0,6                 | 45   | 50 | 25             | IR 45x50x25 |

<sup>1)</sup> For additional information → Needle roller bearing inner rings, page 593



## 7.11 Needle roller bearing inner rings

d 5 – 75 mm



IR

IR .. IS1

LR

| Dimensions |    |      |                             |     |  | Mass   | Designation      | Dimensions    |      |      |                             |     |       | Mass            | Designation     |               |
|------------|----|------|-----------------------------|-----|--|--------|------------------|---------------|------|------|-----------------------------|-----|-------|-----------------|-----------------|---------------|
| d          | F  | B    | r, r <sub>1,2</sub><br>min. |     |  |        |                  | d             | F    | B    | r, r <sub>1,2</sub><br>min. |     |       |                 |                 |               |
| mm         |    |      |                             |     |  | kg     | –                | mm            |      |      |                             |     |       |                 | kg              | –             |
| 5          | 8  | 12   | 0,3                         |     |  | 0,0028 | IR 5x8x12        | 15            | 18   | 12,5 | 0,3                         |     |       | 0,0072          | LR 15x18x12.5   |               |
|            | 8  | 16   | 0,3                         |     |  | 0,0037 | IR 5x8x16        |               | 18   | 16   | 0,3                         |     |       | 0,0094          | IR 15x18x16     |               |
| 6          | 9  | 12   | 0,3                         |     |  | 0,003  | ▶ IR 6x9x12      | 19            | 19   | 16   | 0,3                         |     |       | 0,013           | IR 15x19x16     |               |
|            | 9  | 16   | 0,3                         |     |  | 0,0043 | IR 6x9x16        |               | 19   | 20   | 0,3                         |     |       | 0,016           | IR 15x19x20     |               |
| 7          | 10 | 10,5 | 0,3                         |     |  | 0,0031 | ▶ IR 7x10x10.5   | 20            | 20   | 13   | 0,3                         |     |       | 0,014           | IR 15x20x13     |               |
|            | 10 | 10,5 | 0,3                         |     |  | 0,0031 | LR 7x10x10.5     |               | 20   | 23   | 0,3                         |     |       | 0,024           | IR 15x20x23     |               |
|            | 10 | 12   | 0,3                         |     |  | 0,0036 | ▶ IR 7x10x12     | 17            |      | 20   | 16                          | 0,3 |       |                 | 0,011           | ▶ IR 17x20x16 |
| 8          | 10 | 16   | 0,3                         |     |  | 0,0049 | IR 7x10x16       |               | 20   | 16,5 | 0,3                         |     |       | 0,011           | ▶ IR 17x20x16.5 |               |
|            | 12 | 10   | 0,3                         |     |  | 0,0048 | ▶ IR 8x12x10 IS1 | 20            | 16,5 | 0,3  |                             |     | 0,011 | LR 17x20x16.5   |                 |               |
|            | 12 | 10,5 | 0,3                         |     |  | 0,005  | IR 8x12x10.5     | 20            | 20   | 0,3  |                             |     | 0,014 | ▶ IR 17x20x20   |                 |               |
|            | 12 | 10,5 | 0,3                         |     |  | 0,005  | LR 8x12x10.5     |               | 20   | 20,5 | 0,3                         |     |       | 0,014           | ▶ IR 17x20x20.5 |               |
| 9          | 12 | 12,5 | 0,3                         |     |  | 0,0059 | ▶ IR 8x12x12.5   | 20            | 20,5 | 0,3  |                             |     | 0,014 | LR 17x20x20.5   |                 |               |
|            | 12 | 12   | 0,3                         |     |  | 0,0044 | IR 9x12x12       | 20            | 30,5 | 0,3  |                             |     | 0,021 | ▶ IR 17x20x30.5 |                 |               |
| 10         | 12 | 16   | 0,3                         |     |  | 0,006  | IR 9x12x16       | 20            | 30,5 | 0,3  |                             |     | 0,021 | LR 17x20x30.5   |                 |               |
|            | 13 | 12,5 | 0,3                         |     |  | 0,0052 | ▶ IR 10x13x12.5  | 22            | 13   | 0,3  |                             |     | 0,015 | ▶ IR 17x22x13   |                 |               |
| 12         | 13 | 12,5 | 0,3                         |     |  | 0,0052 | LR 10x13x12.5    | 22            | 22   | 16   | 0,3                         |     |       | 0,018           | ▶ IR 17x22x16   |               |
|            | 14 | 13   | 0,3                         |     |  | 0,0074 | IR 10x14x13      |               | 22   | 23   | 0,3                         |     |       | 0,027           | ▶ IR 17x22x23   |               |
|            | 14 | 16   | 0,3                         |     |  | 0,0092 | ▶ IR 10x14x16    | 24            | 20   | 0,6  |                             |     | 0,034 | ▶ IR 17x24x20   |                 |               |
| 14         | 14 | 20   | 0,3                         |     |  | 0,012  | IR 10x14x20      | 20            | 24   | 16   | 0,3                         |     |       | 0,015           | IR 20x24x16     |               |
|            | 15 | 12   | 0,3                         |     |  | 0,0057 | IR 12x15x12      |               | 24   | 20   | 0,3                         |     |       | 0,021           | ▶ IR 20x24x20   |               |
| 15         | 15 | 12,5 | 0,3                         |     |  | 0,0061 | ▶ IR 12x15x12.5  | 25            | 12,5 | 0,3  |                             |     | 0,016 | LR 20x25x12.5   |                 |               |
|            | 15 | 12,5 | 0,3                         |     |  | 0,0061 | LR 12x15x12.5    | 25            | 16,5 | 0,3  |                             |     | 0,022 | LR 20x25x16.5   |                 |               |
| 16         | 15 | 16   | 0,3                         |     |  | 0,0076 | ▶ IR 12x15x16    |               | 25   | 17   | 0,3                         |     |       | 0,025           | IR 20x25x17     |               |
|            | 15 | 16,5 | 0,3                         |     |  | 0,0081 | IR 12x15x16.5    | 25            | 20   | 0,3  |                             |     | 0,028 | ▶ IR 20x25x20   |                 |               |
| 17         | 15 | 22,5 | 0,3                         |     |  | 0,011  | IR 12x15x22.5    | 25            | 20,5 | 0,3  |                             |     | 0,027 | ▶ IR 20x25x20.5 |                 |               |
|            | 16 | 13   | 0,3                         |     |  | 0,0085 | ▶ IR 12x16x13    |               | 25   | 20,5 | 0,3                         |     |       | 0,027           | LR 20x25x20.5   |               |
| 18         | 16 | 16   | 0,3                         |     |  | 0,011  | IR 12x16x16      | 25            | 26,5 | 0,3  |                             |     | 0,038 | ▶ IR 20x25x26.5 |                 |               |
|            | 16 | 20   | 0,3                         |     |  | 0,014  | ▶ IR 12x16x20    | 25            | 26,5 | 0,3  |                             |     | 0,038 | LR 20x25x26.5   |                 |               |
| 19         | 16 | 22   | 0,3                         |     |  | 0,015  | IR 12x16x22      |               | 25   | 30   | 0,3                         |     |       | 0,04            | ▶ IR 20x25x30   |               |
|            | 20 | 17   | 17                          | 0,3 |  |        | 0,0095           | ▶ IR 14x17x17 | 25   | 38,5 | 0,3                         |     |       | 0,053           | ▶ IR 20x25x38.5 |               |
| 21         |    | 17   | 17                          | 0,3 |  |        | 0,0095           | ▶ IR 14x17x17 | 28   | 20   | 0,6                         |     |       | 0,045           | IR 20x28x20     |               |

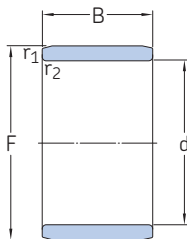
▶ Popular item

| Dimensions |      |      |                             | Mass            | Designation     | Dimensions  |                 |      |                             | Mass          | Designation   |               |
|------------|------|------|-----------------------------|-----------------|-----------------|-------------|-----------------|------|-----------------------------|---------------|---------------|---------------|
| d          | F    | B    | r, r <sub>1,2</sub><br>min. |                 |                 | d           | F               | B    | r, r <sub>1,2</sub><br>min. |               |               |               |
| mm         |      |      |                             | kg              | –               | mm          |                 |      |                             | kg            | –             |               |
| 22         | 26   | 16   | 0,3                         | 0,018           | IR 22x26x16     | 40          | 45              | 16,5 | 0,3                         | 0,041         | LR 40x45x16.5 |               |
|            | 26   | 20   | 0,3                         | 0,023           | IR 22x26x20     |             | 45              | 17   | 0,3                         | 0,043         | IR 40x45x17   |               |
|            | 28   | 17   | 0,3                         | 0,03            | ▶ IR 22x28x17   |             | 45              | 20   | 0,3                         | 0,049         | ▶ IR 40x45x20 |               |
|            | 28   | 20   | 0,3                         | 0,035           | IR 22x28x20     |             | 45              | 20,5 | 0,3                         | 0,052         | IR 40x45x20.5 |               |
|            | 28   | 20,5 | 0,3                         | 0,036           | IR 22x28x20.5   |             | 45              | 20,5 | 0,3                         | 0,052         | LR 40x45x20.5 |               |
|            | 28   | 30   | 0,3                         | 0,054           | IR 22x28x30     |             | 45              | 30   | 0,3                         | 0,084         | ▶ IR 40x45x30 |               |
|            | 25   | 29   | 20                          | 0,3             | 0,026           |             | IR 25x29x20     | 48   | 22                          | 0,6           | 0,092         | ▶ IR 40x48x22 |
|            |      | 29   | 30                          | 0,3             | 0,039           |             | IR 25x29x30     | 48   | 40                          | 0,6           | 0,17          | ▶ IR 40x48x40 |
|            |      | 30   | 12,5                        | 0,3             | 0,02            |             | ▶ LR 25x30x12.5 | 50   | 22                          | 1             | 0,12          | IR 40x50x22   |
|            |      | 30   | 16,5                        | 0,3             | 0,027           |             | LR 25x30x16.5   | 42   | 47                          | 20            | 0,3           | 0,053         |
| 30         |      | 17   | 0,3                         | 0,027           | ▶ IR 25x30x17   | 47          | 30              |      | 0,3                         | 0,081         | IR 42x47x30   |               |
| 30         |      | 20   | 0,3                         | 0,033           | ▶ IR 25x30x20   | 45          | 50              | 20,5 | 0,3                         | 0,059         | LR 45x50x20.5 |               |
| 30         |      | 20,5 | 0,3                         | 0,033           | ▶ IR 25x30x20.5 |             | 50              | 25   | 0,6                         | 0,071         | ▶ IR 45x50x25 |               |
| 30         |      | 20,5 | 0,3                         | 0,033           | LR 25x30x20.5   |             | 50              | 25,5 | 0,3                         | 0,075         | IR 45x50x25.5 |               |
| 30         |      | 26,5 | 0,3                         | 0,046           | ▶ IR 25x30x26.5 | 50          | 50              | 25,5 | 0,3                         | 0,075         | LR 45x50x25.5 |               |
| 30         |      | 26,5 | 0,3                         | 0,046           | LR 25x30x26.5   |             | 50              | 35   | 0,6                         | 0,1           | ▶ IR 45x50x35 |               |
| 30         | 30   | 0,3  | 0,053                       | ▶ IR 25x30x30   | 52              |             | 22              | 0,6  | 0,089                       | ▶ IR 45x52x22 |               |               |
| 30         | 32   | 0,3  | 0,056                       | IR 25x30x32     | 50              | 52          | 40              | 0,6  | 0,16                        | IR 45x52x40   |               |               |
| 30         | 38,5 | 0,3  | 0,065                       | ▶ IR 25x30x38.5 |                 | 55          | 22              | 1    | 0,13                        | ▶ IR 45x55x22 |               |               |
| 30         | 38,5 | 0,3  | 0,065                       | LR 25x30x38.5   |                 | 50          | 55              | 20,5 | 0,6                         | 0,064         | LR 50x55x20.5 |               |
| 32         | 22   | 0,6  | 0,053                       | IR 25x32x22     | 55              |             | 25              | 0,6  | 0,078                       | ▶ IR 50x55x25 |               |               |
| 28         | 32   | 17   | 0,3                         | 0,025           | IR 28x32x17     |             | 55              | 35   | 0,6                         | 0,11          | ▶ IR 50x55x35 |               |
|            | 32   | 20   | 0,3                         | 0,029           | IR 28x32x20     | 58          | 22              | 0,6  | 0,12                        | IR 50x58x22   |               |               |
|            | 32   | 30   | 0,3                         | 0,044           | IR 28x32x30     |             | 58              | 40   | 0,6                         | 0,21          | IR 50x58x40   |               |
| 30         | 35   | 12,5 | 0,3                         | 0,023           | LR 30x35x12.5   |             | 60              | 25   | 1                           | 0,16          | ▶ IR 50x60x25 |               |
|            | 35   | 13   | 0,3                         | 0,025           | ▶ IR 30x35x13   | 60          | 28              | 1,1  | 0,18                        | IR 50x60x28   |               |               |
|            | 35   | 16   | 0,3                         | 0,034           | IR 30x35x16     |             | 55              | 60   | 25                          | 0,6           | 0,086         | ▶ IR 55x60x25 |
|            | 35   | 17   | 0,3                         | 0,036           | ▶ IR 30x35x17   |             |                 | 60   | 35                          | 0,6           | 0,12          | ▶ IR 55x60x35 |
|            | 35   | 20   | 0,3                         | 0,039           | ▶ IR 30x35x20   | 63          |                 | 25   | 1                           | 0,14          | IR 55x63x25   |               |
|            | 35   | 20,5 | 0,3                         | 0,04            | IR 30x35x20.5   | 63          | 45              | 1    | 0,26                        | IR 55x63x45   |               |               |
|            | 35   | 20,5 | 0,3                         | 0,04            | LR 30x35x20.5   |             | 65              | 28   | 1,1                         | 0,2           | ▶ IR 55x65x28 |               |
|            | 35   | 26   | 0,3                         | 0,05            | ▶ IR 30x35x26   |             | 60              | 68   | 25                          | 1             | 0,15          | IR 60x68x25   |
|            | 35   | 30   | 0,3                         | 0,059           | ▶ IR 30x35x30   | 68          |                 | 35   | 0,6                         | 0,21          | ▶ IR 60x68x35 |               |
|            | 37   | 22   | 0,6                         | 0,062           | IR 30x37x22     | 68          |                 | 45   | 1                           | 0,28          | ▶ IR 60x68x45 |               |
| 32         | 37   | 20   | 0,3                         | 0,042           | IR 32x37x20     | 70          | 70              | 25   | 1                           | 0,2           | ▶ IR 60x70x25 |               |
|            | 37   | 30   | 0,3                         | 0,062           | ▶ IR 32x37x30   |             | 70              | 28   | 1,1                         | 0,22          | ▶ IR 60x70x28 |               |
|            | 40   | 20   | 0,6                         | 0,068           | IR 32x40x20     |             | 65              | 72   | 25                          | 1             | 0,14          | ▶ IR 65x72x25 |
| 40         | 36   | 0,6  | 0,12                        | ▶ IR 32x40x36   | 72              | 45          |                 | 1    | 0,26                        | IR 65x72x45   |               |               |
| 35         | 40   | 12,5 | 0,3                         | 0,027           | LR 35x40x12.5   | 73          |                 | 35   | 1                           | 0,23          | IR 65x73x35   |               |
|            | 40   | 16,5 | 0,3                         | 0,037           | LR 35x40x16.5   | 75          | 28              | 1,1  | 0,23                        | ▶ IR 65x75x28 |               |               |
|            | 40   | 17   | 0,3                         | 0,038           | IR 35x40x17     |             | 70              | 80   | 25                          | 1             | 0,22          | ▶ IR 70x80x25 |
|            | 40   | 20   | 0,3                         | 0,044           | ▶ IR 35x40x20   |             |                 | 80   | 30                          | 1             | 0,27          | IR 70x80x30   |
|            | 40   | 20,5 | 0,3                         | 0,046           | ▶ IR 35x40x20.5 | 80          |                 | 35   | 1                           | 0,31          | ▶ IR 70x80x35 |               |
|            | 40   | 20,5 | 0,3                         | 0,046           | LR 35x40x20.5   | 80          | 54              | 1    | 0,49                        | ▶ IR 70x80x54 |               |               |
|            | 40   | 30   | 0,3                         | 0,067           | ▶ IR 35x40x30   |             | 75              | 85   | 25                          | 1             | 0,24          | IR 75x85x25   |
|            | 42   | 36   | 0,6                         | 0,12            | ▶ IR 35x42x36   |             |                 | 85   | 35                          | 1             | 0,34          | ▶ IR 75x85x35 |
|            | 43   | 22   | 0,6                         | 0,082           | IR 35x43x22     | 85          |                 | 54   | 1                           | 0,53          | ▶ IR 75x85x54 |               |
|            | 38   | 43   | 20                          | 0,3             | 0,048           | IR 38x43x20 |                 |      |                             |               |               |               |
| 43         |      | 30   | 0,3                         | 0,074           | IR 38x43x30     |             |                 |      |                             |               |               |               |

▶ Popular item

## 7.11 Needle roller bearing inner rings

d 80 – 240 mm



| Dimensions |     |    |                             | Mass | Designation     |
|------------|-----|----|-----------------------------|------|-----------------|
| d          | F   | B  | r, r <sub>1,2</sub><br>min. |      |                 |
| mm         |     |    |                             | kg   | –               |
| 80         | 90  | 25 | 1                           | 0,25 | ▶ IR 80x90x25   |
|            | 90  | 30 | 1                           | 0,3  | ▶ IR 80x90x30   |
|            | 90  | 35 | 1                           | 0,36 | ▶ IR 80x90x35   |
|            | 90  | 54 | 1                           | 0,56 | ▶ IR 80x90x54   |
| 85         | 95  | 26 | 1                           | 0,28 | ▶ IR 85x95x26   |
|            | 95  | 36 | 1                           | 0,39 | IR 85x95x36     |
|            | 100 | 35 | 1,1                         | 0,58 | ▶ IR 85x100x35  |
|            | 100 | 63 | 1,1                         | 1,05 | IR 85x100x63    |
| 90         | 100 | 26 | 1                           | 0,29 | ▶ IR 90x100x26  |
|            | 100 | 30 | 1                           | 0,34 | IR 90x100x30    |
|            | 100 | 36 | 1                           | 0,41 | ▶ IR 90x100x36  |
|            | 105 | 35 | 1,1                         | 0,61 | ▶ IR 90x105x35  |
| 95         | 105 | 26 | 1                           | 0,31 | IR 95x105x26    |
| 100        | 110 | 40 | 1,1                         | 0,51 | ▶ IR 100x110x40 |
|            | 115 | 40 | 1,1                         | 0,8  | ▶ IR 100x115x40 |
| 110        | 120 | 30 | 1                           | 0,41 | ▶ IR 110x120x30 |
|            | 125 | 40 | 1,1                         | 0,84 | ▶ IR 110x125x40 |
| 120        | 130 | 30 | 1                           | 0,44 | ▶ IR 120x130x30 |
|            | 135 | 45 | 1,1                         | 1,05 | ▶ IR 120x135x45 |
| 130        | 145 | 35 | 1,1                         | 0,86 | ▶ IR 130x145x35 |
|            | 150 | 50 | 1,5                         | 1,7  | ▶ IR 130x150x50 |
| 140        | 155 | 35 | 1,1                         | 0,92 | ▶ IR 140x155x35 |
|            | 160 | 50 | 1,5                         | 1,8  | ▶ IR 140x160x50 |
| 150        | 165 | 40 | 1,1                         | 1,1  | ▶ IR 150x165x40 |
| 160        | 175 | 40 | 1,1                         | 1,2  | ▶ IR 160x175x40 |
| 170        | 185 | 45 | 1,1                         | 1,45 | ▶ IR 170x185x45 |
| 180        | 195 | 45 | 1,1                         | 1,5  | ▶ IR 180x195x45 |
| 190        | 210 | 50 | 1,5                         | 2,4  | ▶ IR 190x210x50 |

| Dimensions |     |    |                             | Mass | Designation     |
|------------|-----|----|-----------------------------|------|-----------------|
| d          | F   | B  | r, r <sub>1,2</sub><br>min. |      |                 |
| mm         |     |    |                             | kg   | –               |
| 200        | 220 | 50 | 1,5                         | 2,5  | ▶ IR 200x220x50 |
| 220        | 240 | 50 | 1,5                         | 2,75 | ▶ IR 220x240x50 |
| 240        | 265 | 60 | 2                           | 4,6  | IR 240x265x60   |

7.11



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