



# HANDBOOK

Our industrial products  
and services at a glance







Dear **NTN** partner,

We have been working successfully for years to set up and improve our collaboration towards our common goal, satisfaction of the final customer.

As a leading manufacturer of rolling bearings and linear technology, we accompany our partners through challenges imposed by the market.

We are proud of the global offer made up of our brands **NTN** and **SNR**. We continuously improve our offer thanks to new products, responding to technical criteria for highly demanding applications, or economic criteria for very competitive markets and standard applications. We want to constantly satisfy our ever-changing market. Whatever the challenge, we generally have the solution.

This **NTN** manual has been created by **NTN** sales, marketing and engineering teams and integrates our partners' feedback. It is a practical approach to help you, as an **NTN** partner, to feel comfortable with our wide range of products and services.

This **NTN** manual focuses on what you really need in your day-to-day business. It is a silent companion which will give you quick help and many answers about our company and products.

In parallel, we hope that through our regular communication, you will have the full picture of who we are: our range, our expertise, and our proximity. You are our ambassadors, and you help convince the final customer. We count on you to convey our philosophy and spirit.

We look forward to your feedback on this manual at any time.

Yours sincerely,

**Eric MALAVASI**  
VP of NTN-SNR ROULEMENTS  
Responsible for Industrial Business Unit Europe and Africa region



## Let's make the world move forward



We are **NTN** in EUROPE and we make the world **NAMERAKA**.  
We are people at the service of movement.  
We design & offer high added value mechanical products.  
Our expertise makes us a reference.  
We believe in a fluid, mobile & harmonious society.  
We are driven by our willingness to cooperate.  
We continuously build positive mobility.

# ○ SUMMARY

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# ○ COMPANY



# INNOVATION DRIVING YOUR PRODUCTION

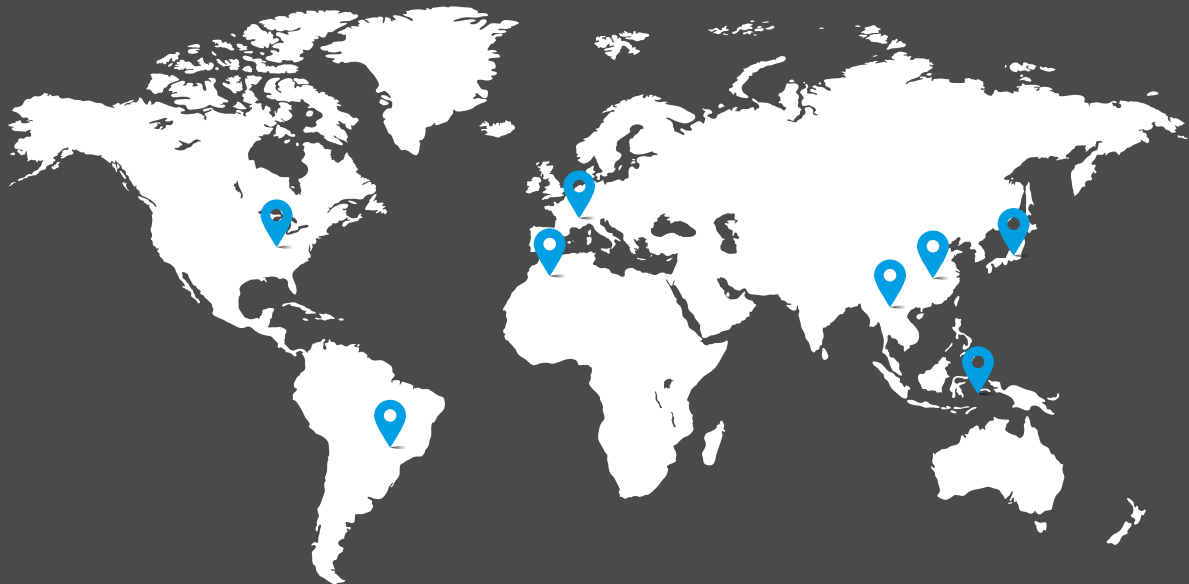
**Movement. It is constantly changing. It is analysed, brought under control, guided and mastered with the aim of deriving maximum benefit. It is more than merely a concept. It is the very essence of our commitment, namely designing and innovating to deliver the perfect solutions to the issues and constraints of today and tomorrow.**

There are thousands of us around the world masterminding and developing solutions to raise the bar on your production performance. Our world-leading brands (**NTN**, **BCA**, **BOWER** and **SNR**) are marketed worldwide and deliver the best-fit solutions for working together and building a more environmentally-friendly society. Follow our lead and use interaction, anticipation and adaptation as the keys to guiding and shaping the future of the manufacturing, automotive and aviation markets.

**€ 4.3 BILLION\***  
turnover

**23,000\***  
employees

**The local service of an international partner**



**118**  
Sales  
offices

**73**  
Production  
sites

**15**  
R&D  
centres

\*March 2021



DEDICATED TO SECTORS SUCH AS AGRICULTURE, PACKAGING, MINING, QUARRY, CEMENT, FOOD-PROCESSING, ENERGY, WATER, CONSTRUCTION MACHINERY, AUTOMOTIVE ETC.



NTN





Customer satisfaction is the key to success; it requires a daily commitment to contribute to performance objectives. That is why **NTN** offers innovative solutions and technical expertise to serve your business.

## Our brands



With high-tech products resulting from advanced R&D and design, the **NTN** brand offers a wide range of solutions adapted to your most demanding technical requirement and high-end premium quality requirements.



Simply smart, **SNR** products have been designed to make their user's life easier. The range is made of a combination of indispensable premium quality products that answer your needs efficiently.



BCA & BOWER are both trademarks of **NTN** Corporation. These brands are mainly sold in the North American market.

# Industry market offer for Europe

| PRODUCT GROUP   |                                | BRAND |      |
|---|--------------------------------|-------|------|
|   |                                | NTN®  | SNR® |
|    | BALL BEARING                   | ✓     | ✓    |
|    | CYLINDRICAL ROLLER BEARING     | ✓     |      |
|    | TAPERED ROLLER BEARING         | ✓     | ✓    |
|   | SPHERICAL ROLLER BEARING*      | ✓     | ✓    |
|  | NEEDLE ROLLER BEARING          | ✓     |      |
|  | BEARING UNIT**                 | ✓     | ✓    |
|  | SPLIT PLUMMER BLOCK HOUSING*** | ✓     | ✓    |
|  | LINEAR MOTION                  |       | ✓    |
|  | SERVICES                       |       | ✓    |

\* A part of the range of **SNR** spherical roller bearings is currently being converted to the **NTN** brand.

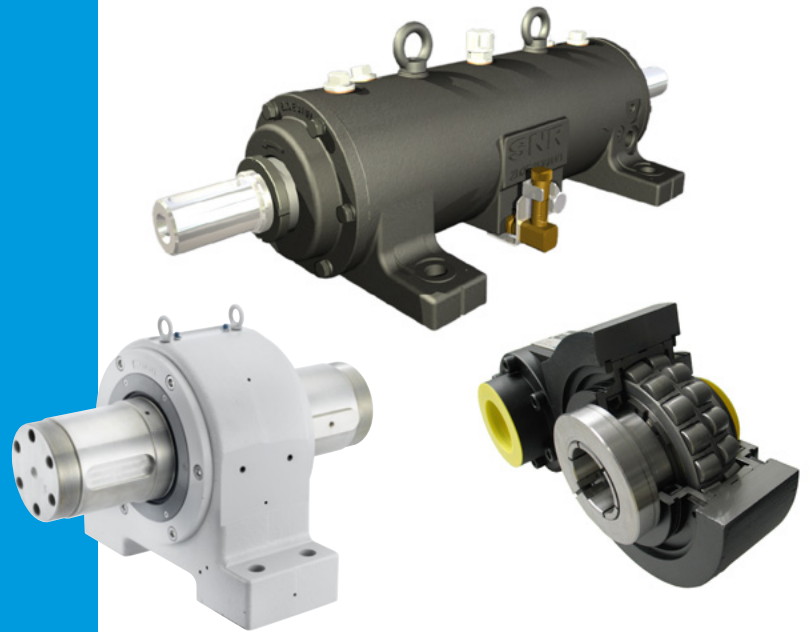
**NTN** spherical roller bearings are, like the **SNR** products, mainly in the E design with optimised performance.

\*\* In Europe, we propose mainly the **SNR** bearing unit range which is available from stock both in European and Asian designs.

\*\*\*In Europe, we propose mainly the **SNR** split plummer block housing.

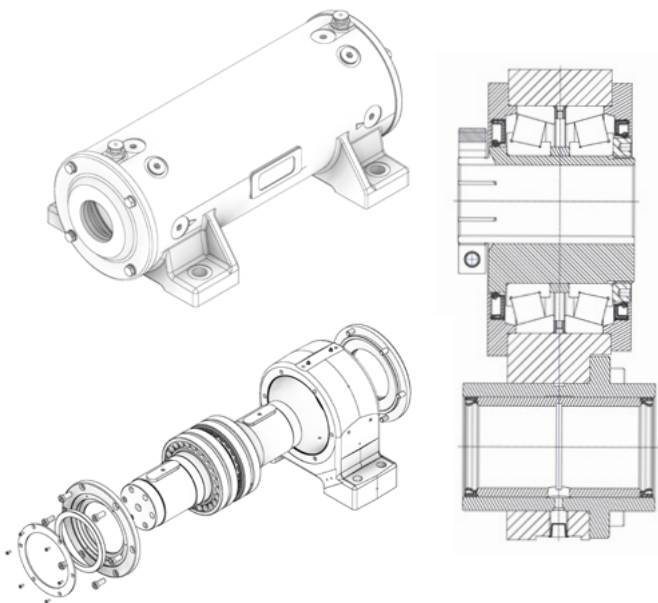


# ZOOM ON SOME TECHNICAL PRODUCTS: THE CUSTOMISED MODULES



Customer-specific,  
ready to install mounted units

The european **NTN** team will  
develop, together with you,  
individual mounted  
units according to  
your requirements



← Enquiry form available at the end  
of the dedicated brochure

Questions?... [cmd@ntn-snr.de](mailto:cmd@ntn-snr.de)

You can find more information in page 106 of this  
handbook and on our dedicated brochure



**NTN,  
YOUR  
ENGINEERING  
PARTNER**



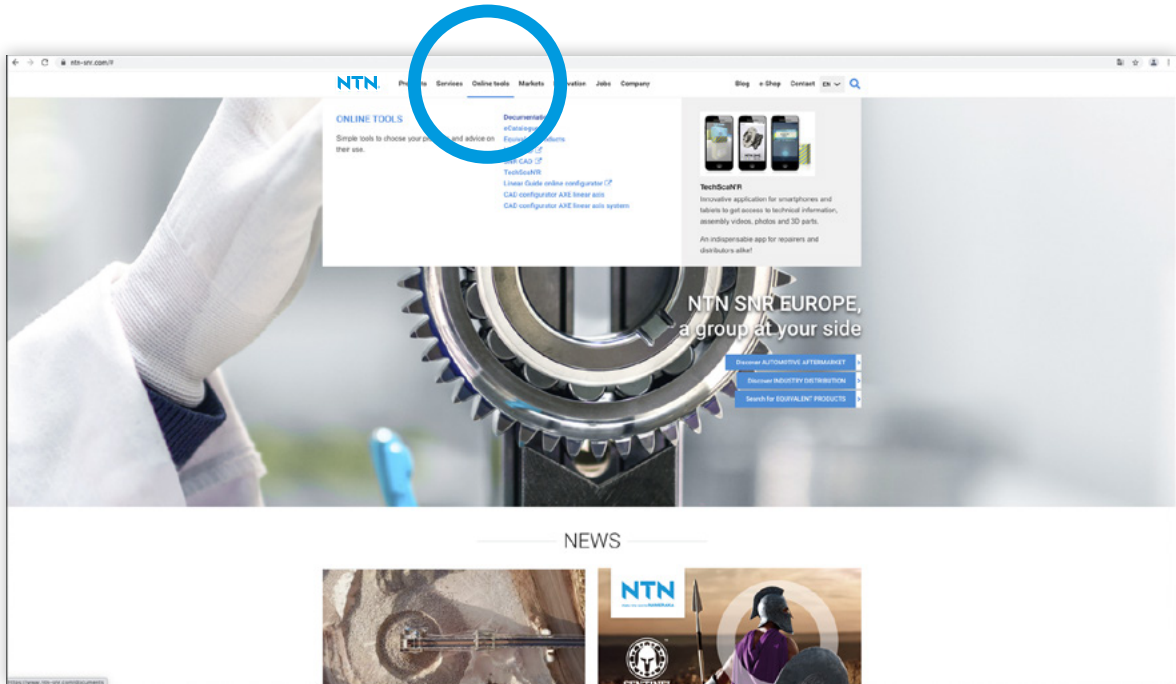
# ○ E-TOOLS

# Digital flyers and catalogues

ACCESS TO OUR WEBSITE: [www.ntn-snr.com](http://www.ntn-snr.com)

Information about our products and services

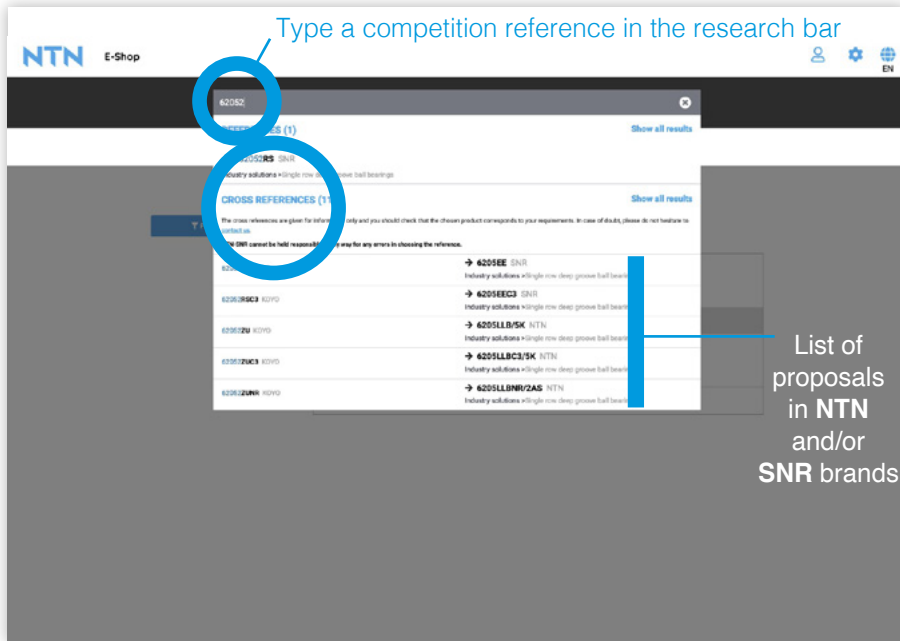
Download catalogues and flyers in the menu "OnlineTools" > "Documentation"



# E-platform

ACCESS TO OUR E-SHOP: [www.eshop.ntn-snr.com](http://www.eshop.ntn-snr.com)

## Convert products to NTN and/or SNR



### TIP

If an article is not found, you should vary slightly with the input of the suffix.

Example: 62052RSR

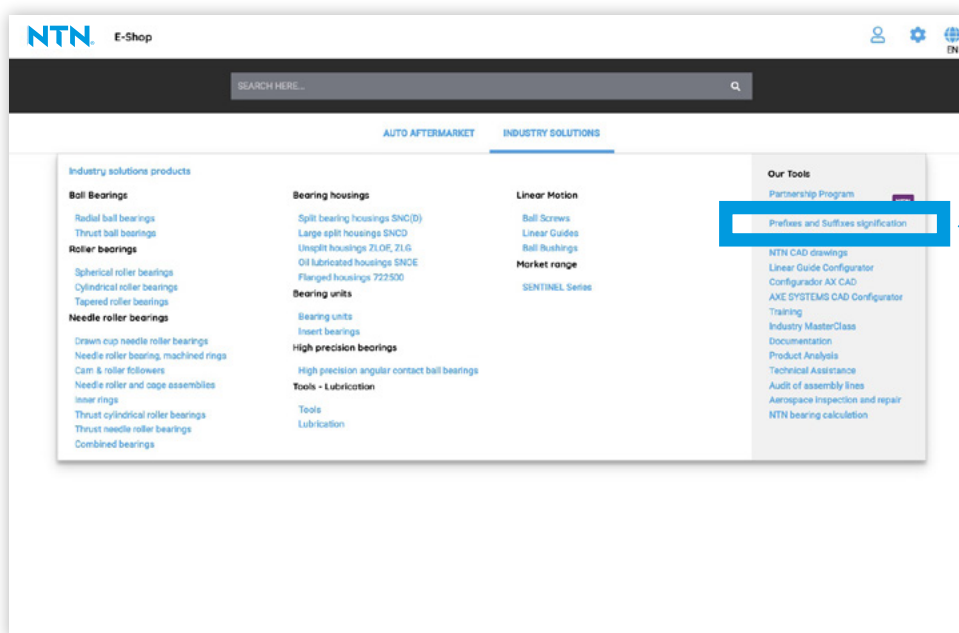
= 6205 2RSR

= 6205-2RSR

....

## Prefix and suffix (tabular)

An extensive overview can be found in the e-shop (even without being logged in) on the left of the website in the "Our tools" menu → "Prefixes and suffixes signification". It is important to first select the right tab "Prefix or Suffix".



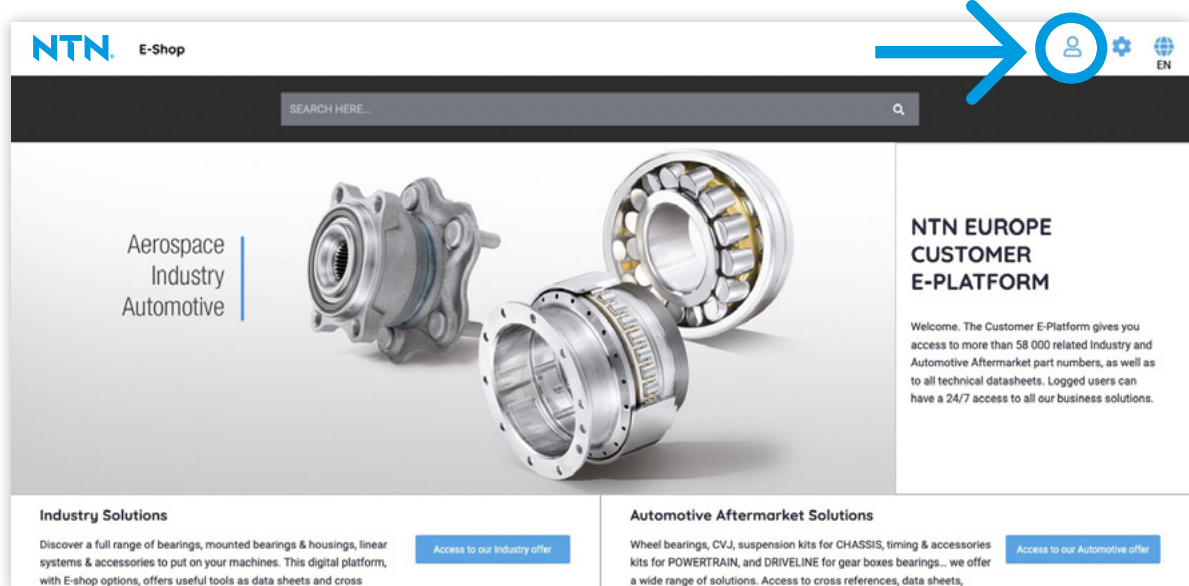
Note: More detailed conversion tables for our self-aligning bearing units and needle bearing ranges are also available as a separate document or desk pad. Don't hesitate to contact us.



## Orders and access to information

When you are logged in, you have many options, such as configuring goods from our company or viewing order and delivery documents afterwards.

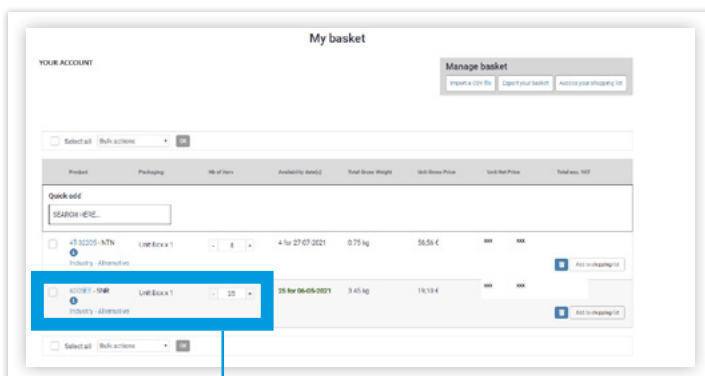
If you haven't already done so, simply apply for online access to our e-shop. Please do not hesitate to speak to your contact person in sales.



In the task bar at the top right of the e-shop you will find the corresponding menu items to make specific entries or to request information. On the right, for example, you will find the overview menu, which gives you access to all information regarding your offers, orders or deliveries. You can also configure your desired views under "Settings".

## Shopping cart

Here you will find all information about your selected types once again bundled. You can also import and export complete lists.



| Product                             | Package       | Qty of items | Availability (order) | Total Gross Weight | Unit Gross Price | Unit Net Price | Subtotal (Net) |
|-------------------------------------|---------------|--------------|----------------------|--------------------|------------------|----------------|----------------|
| 63205 NTN<br>Industry - Alternative | Unit: Ecx x 1 | 1            | 4 for 27 07 2021     | 0.75 kg            | 58,54 €          | 58,54 €        | 58,54 €        |
| 63205 NTN<br>Industry - Alternative | Unit: Ecx x 1 | 25           | 25 for 06-09-2021    | 3.45 kg            | 64,55 €          | 1613,75 €      | 1613,75 €      |

### TIP

By clicking on "Industry Alternative", you will be able to identify alternatives to requested product, with information on price and availability!

# ○ BEARING TECHNOLOGY





# BALL BEARINGS



# Deep groove ball bearings enjoy the silence



**NTN** has enhanced the quality of its offer in the field of deep-groove ball bearings. CM internal clearance, with reduced tolerance, is now the new standard for the **NTN** brand. This upgrade is proof that **NTN** is determined to make the very best of Japanese technology available to you.

**The comfort of reduced noise levels is now within your reach!**

**NTN**®



# NTN - Deep groove ball bearings

Deep groove ball bearings are very common. The inner and outer rings have deep raceways, enabling them to support radial and axial loads in both directions, as well as combined loads resulting from the combination of all forces. Deep groove ball bearings are also suitable for high-speed applications.

**NTN**  
The highly technical brand

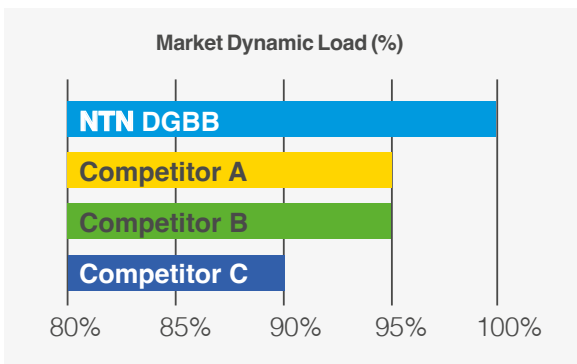


The NTN brand offers you a wide range of deep groove ball bearings combining the best solutions for sealing, radial clearance and lubrication for an optimum response to the requirements of your activity.

## Technical features

- High-end premium quality
- Very wide range with a strong sealing offer (see next page)
- CM tolerances as standard (normal internal clearance) at no extra charge
- Standard grease "5K" (Multemp SRL) suitable for temperatures from -40°C up to 150°C
- Suitable solutions for almost all applications

## A WIDE RANGE OF DEEP GROOVE BALL BEARINGS OFFERING THE BEST PERFORMANCES IN THE MARKET



NTN bearings ensure **optimum performance and service life.**

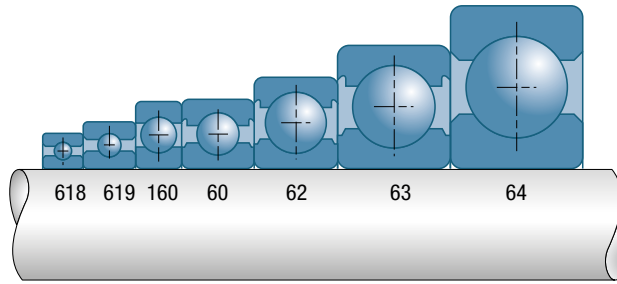
Study carried out in 2021, based on the 3 main European market player catalogues

### GOOD TO KNOW!

5K lubrication benefits from an eco-label in its country of origin (Japan) and is more than 60% biodegradable (28 days).

## Standard cage type and range overview

| Cage design        | Series |        |        |        |          |          |        |         |
|--------------------|--------|--------|--------|--------|----------|----------|--------|---------|
|                    | 60XX   | 62XX   | 63XX   | 64XX   | 68XX     | 69XX     | 67XX   | 160XX   |
| Pressed steel cage | 6000   | 6200   | 6300   | 6403   | 6800     | 6900     | 6700   | 16001   |
|                    | ~ 6052 | ~ 6244 | ~ 6344 | ~ 6416 | ~ 6834   | ~ 6934   | ~ 6706 | ~ 16052 |
| Machined cage      | 6056   | -      | -      | -      | 6836     | 6936     | -      | 16052   |
|                    | ~ 6084 | -      | -      | -      | ~ 68-600 | ~ 69-500 | -      | ~ 16072 |



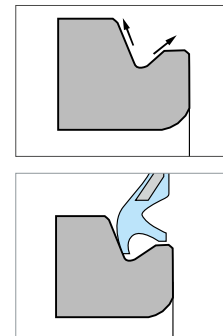
Note:  
618XX = NTN 68XX  
619XX = NTN 69XX

## Sealing concept

### Basic concept

All deep groove ball bearings, irrespective of size, are manufactured with a "V"-shaped groove in the inner ring, which, depending on the design, acts as a labyrinth seal in conjunction with the seal.

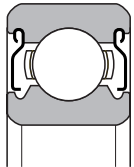
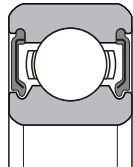
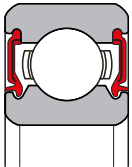
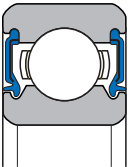
During the operating cycle of the bearing, the reduction of interference from the inner lip gradually brings the outer lip into contact with the inner ring.



### Benefits

- Particles are kept away or evacuated
- Grease is pressed inwards
- High performance for long-lasting protection

### Overview of NTN standard seals

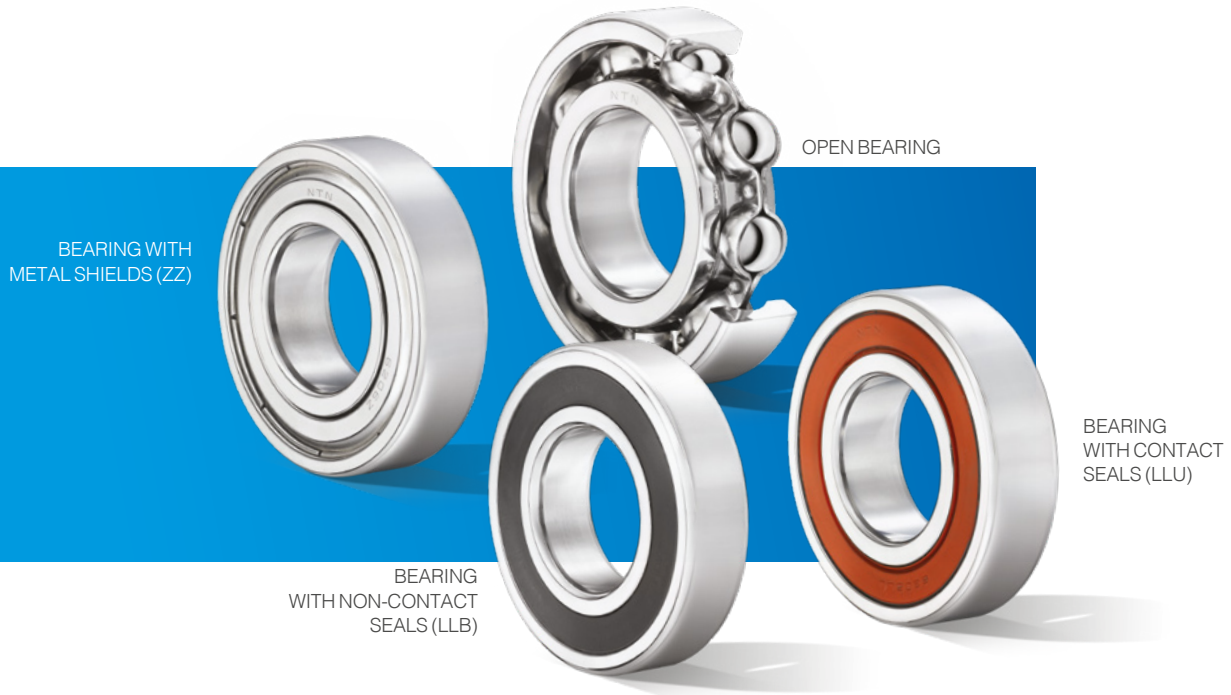
| Types and codes        |                                      | Shielded type  |   | Sealed type   |  |
|------------------------|--------------------------------------|--|---|---|--|
|                        |                                      | Non-contact type ZZ  | Non-contact type LLB  | Contact type LLU  | Low torque type LLH  |
| Construction           |                                      |                               |    |                                        |   |
|                        |                                      | Metal shield plate is fixed to the outside ring; the inner ring incorporates a V-groove and labyrinth clearance. | The outer ring incorporates synthetic rubber molded to a steel plate; seal edge is aligned with V-groove along inner ring surface with labyrinth clearance. | The outer ring incorporates synthetic rubber molded to a steel plate; seal edge contacts V-groove along inner ring surface. | Basic construction is the same as LLU type, but a specially designed lip on the edge of the seal prevents foreign matter penetration; low torque construction. |
| Performance comparison | Torque                               | Small  | Small   | Higher  | Medium   |
|                        | Dust proofing                        | Good   | Better than ZZ-type   | Excellent   | Much better than LLB-type  |
|                        | Water proofing                       | Poor   | Poor  | Very good   | Good   |
|                        | High speed capacity                  | Same as open type  | Same as open type   | Limited by contact seals  | Much better than LLU-type  |
|                        | Allowable temp. range <sup>(1)</sup> | Depends on lubricant   | -25 to 120°C  | -25 to 110°C  | -25 to 120°C   |

1) Please consult NTN Engineering about applications which exceed the allowable temperature range of products listed on this table. Note: This chart lists double shielded and double sealed bearings, but single shielded (Z) and single sealed (LB, LU, LH) are also available. Grease lubrication should be used with single shielded and single sealed bearings.

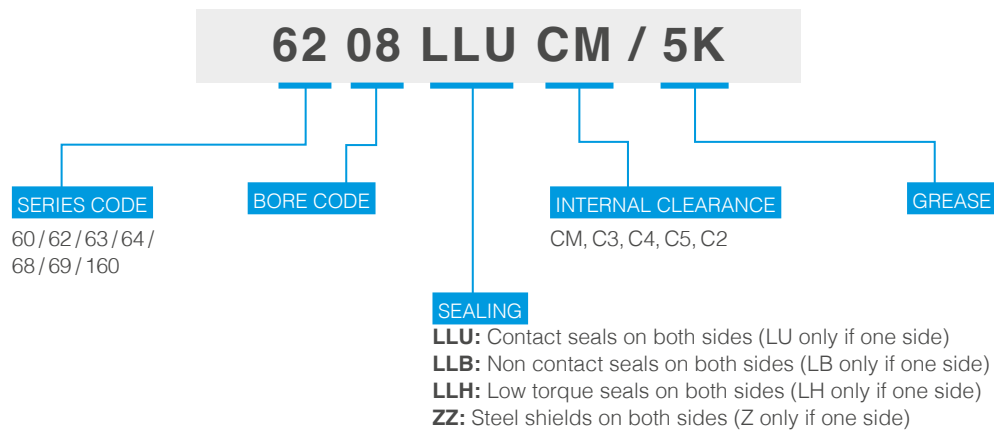
For more information, check online **NTN Ball & Roller Bearings catalogue** on [www.ntn-snr.com/documents](http://www.ntn-snr.com/documents)

## CM tolerance for low-noise performance

- Standard: reduced bearing clearance tolerances reduce vibrations and decrease the noise level
- CM radial clearance available for entire **NTN** standard 6xxx deep groove ball bearing range
- Available for open, shielded and sealed versions (-ZZ, -LLU and -LLB)



### Designations



More info about prefix, suffix & interchange table? Check from page 42

# Focus on NTN electrically insulated bearings: MEGAOHM™

## Technical features

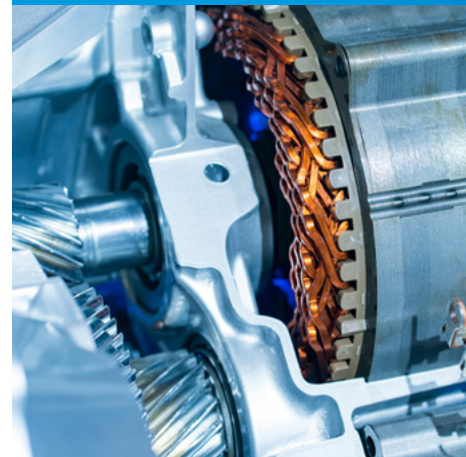
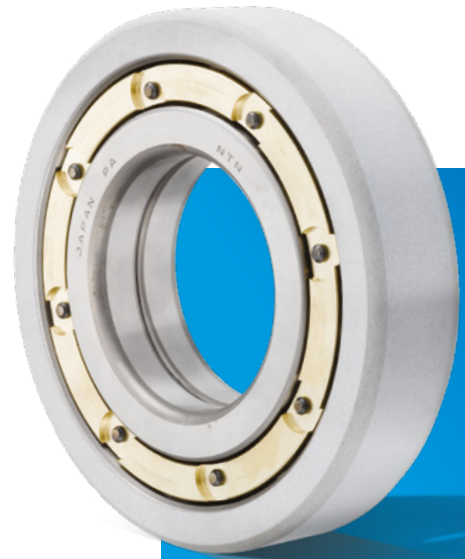
- Withstanding up to 3 000 VDC as standard
- Ceramic layer on outer ring
- In accordance with standards ISO 492, DIN 620 and JIS 1514

## Range overview

- Massive brass cage available from stock (L1B Suffix)
- Steel cage on request
- C3 internal clearance as standard available from stock
- C4 internal clearance on request

## Benefits

- Avoid premature damage due to current leakage
- Strength thanks to the brass cage
- Ensured interchangeability
- Available stock for most popular references (Deep groove ball bearings in 62xx & 63xx series)

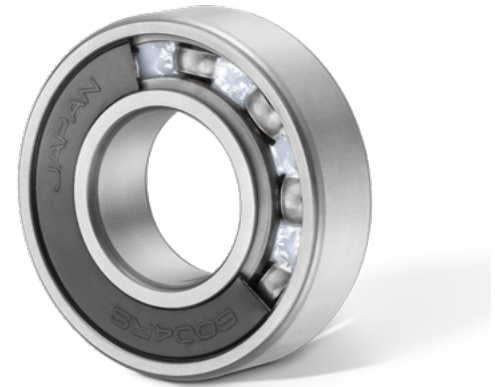


| Series         | Bore diameter code |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------------|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                | 10                 | 12 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 22 | 24 | 26 | 28 | 30 |
| 7MC3-62XXL1BC3 |                    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7MC3-63XXL1BC3 |                    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7MC3-63XXL1BC4 |                    |    |    |    |    |    |    |    |    |    |    |    |    |    |

For more information, check online brochures [www.ntn-snr.com/documents/megaohm](http://www.ntn-snr.com/documents/megaohm)

## SENTINEL™ series

NTN stainless steel deep groove ball bearing with spot-pack solid grease (LP09) as lubricant is the best opportunity to mix security for food/beverage industries and sustainability for the production equipment.



### Technical features

- 440C stainless steel bearing, 304 stainless steel cage
- Specific nitrile seal reinforced
- **NTN** spot-pack solid grease (LP09), NSF approval / H1 category code
- Operating temperature: from -10°C to +80°C (100°C peak)

### Benefits

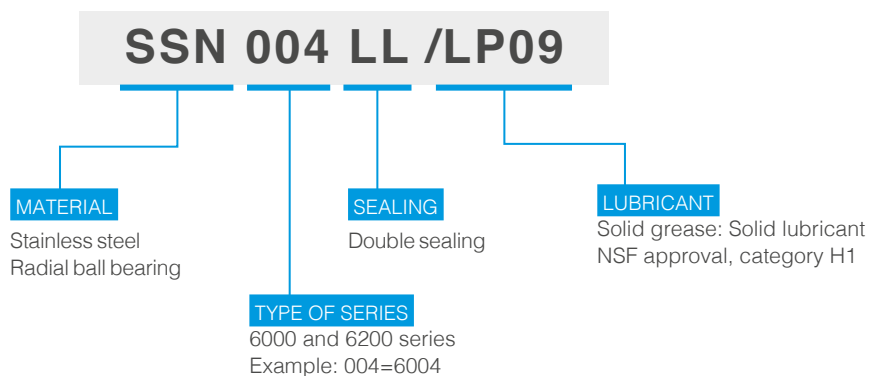
- 440C material is the best compromise between load rating capacity and corrosion resistance
- Solid grease reduced lubricant leakage even when bearing is subjected to high vibration and centrifugal force
- Compare with general-purpose food grease lubricant, solid grease is less prone to emulsification and leakage due to water penetration
- Solid grease with spot-pack application offer a good level of speed rotation while maintaining solid lubricant advantages

### Range overview

Code bore P/Ns

- From 000 to 008 (6000 to 6008)
- From 200 to 208 (6200 to 6208)

### Designations



# SNR - Deep groove ball bearings



## The simply smart brand

NTN proposes the **SNR** simply smart range of deep groove ball bearings. It is a compact range that contains the indispensable sizes and offers standard sealing options with premium brand quality.



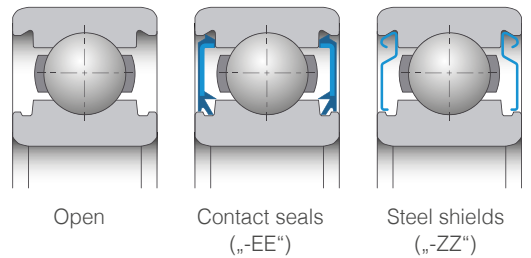
### Technical features

- Normal internal clearance and C3
- **SNR** deep groove ball bearings are designed with a steel cage as standard - options on request
- Sealed versions are already greased. The maximum operating temperature is +120°C
- Suitable solutions for almost all applications



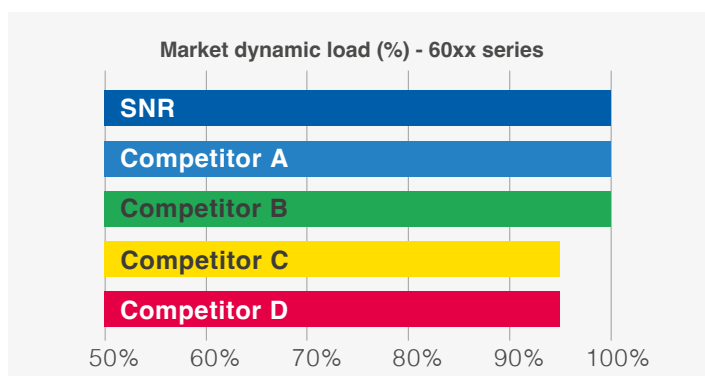
### Range overview

| Series                           | 60X   | 62X   | 63X   | 60XX   | 62XX   | 63XX   |
|----------------------------------|-------|-------|-------|--------|--------|--------|
| Dim.                             | 607   | 623   | 634   | 6000   | 6200   | 6300   |
|                                  | ~ 609 | ~ 629 | ~ 635 | ~ 6028 | ~ 6226 | ~ 6322 |
| INTERNAL CLEARANCE: normal, C3   |       |       |       |        |        |        |
| OPEN / SHIELDED -ZZ / SEALED -EE |       |       |       |        |        |        |

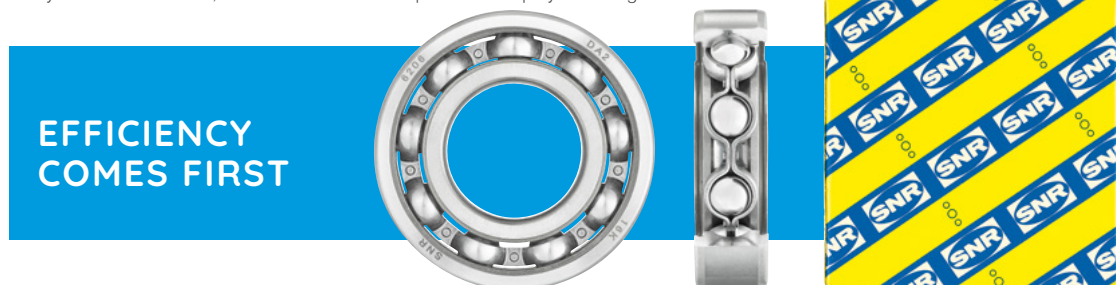


More info about prefix, suffix and Interchange table  
Check from page 42

A range with continuous technical improvement to meet the needs of your application



Study carried out in 2022, based on the main European market player catalogues



**EFFICIENCY  
COMES FIRST**





# Double-row deep groove ball bearings

Double row deep groove ball bearings are designed to accept higher loads than a single row ball bearing.

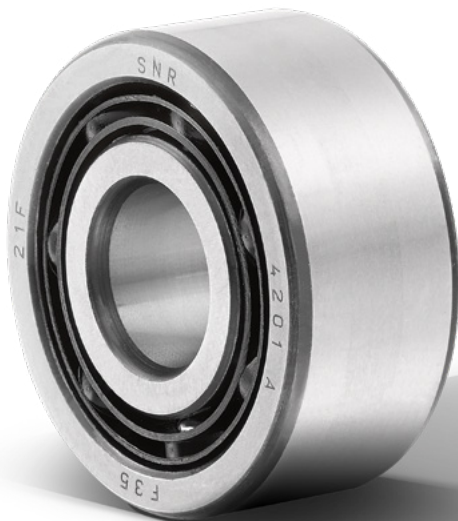
They have identical outside diameters and bores but are slightly wider, thus having a much higher load capacity.

## Technical features

- Polyamide cage as standard (no suffix)
- Without filling slot (suffix A)
- Normal internal clearance
- Open type

## Range overview

|       | Bore diameter code |    |    |    |    |    |    |    |    |    |    |
|-------|--------------------|----|----|----|----|----|----|----|----|----|----|
| Serie | 00                 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| 42xxA |                    |    |    |    |    |    |    |    |    |    |    |



Easy to work

Premium quality

Competitiveness booster

# EMTR

## Focus on our ball bearing range dedicated to electric motors

- Deep groove ball bearings of series 6000, 6200 and 6300
- For applications with specific temperatures or speed requirements

Are you looking for higher reliability and quality, with the lowest noise level, without compromising on price?

The new EMTR bearing range with optimised design for electric motors brings you the solution.

### Technical features

- C3 internal clearance
  - Special low noise grease
    - Up to 150°C usage: no suffix in the designation
    - High temperature usage (up to 200°C): D189 suffix
  - Precision Class P6 (ISO 492) and improved grade for balls (G10) with special vibration check
  - Benefit:
    - Raceway roughness: improved by 25%\*
    - Raceway roundness: improved by 20%\*
- \* Compared to **SNR's** standard tolerance



### Benefits

**Low noise**

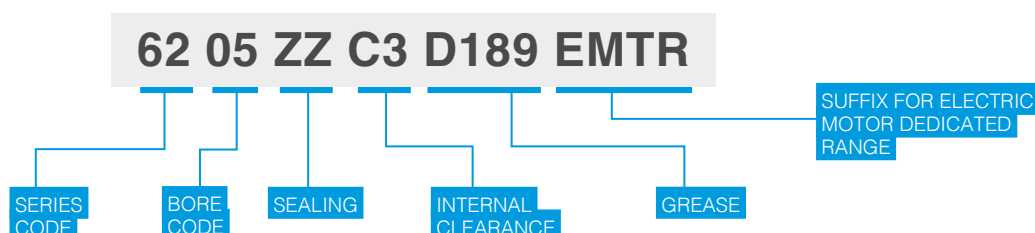
**High service life**

**High competitiveness**

### Range overview

**6201 >> 6206 + 6304**

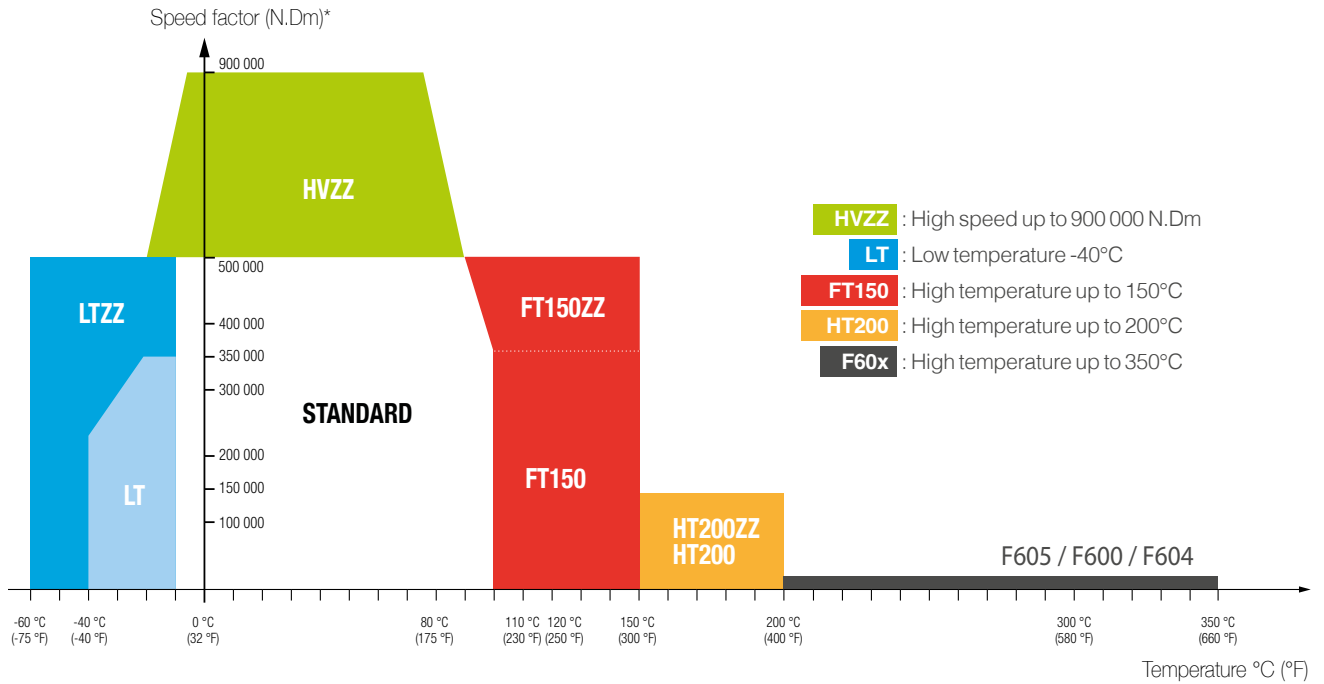
### Designations



The unique range of ball bearings dedicated to extreme applications.

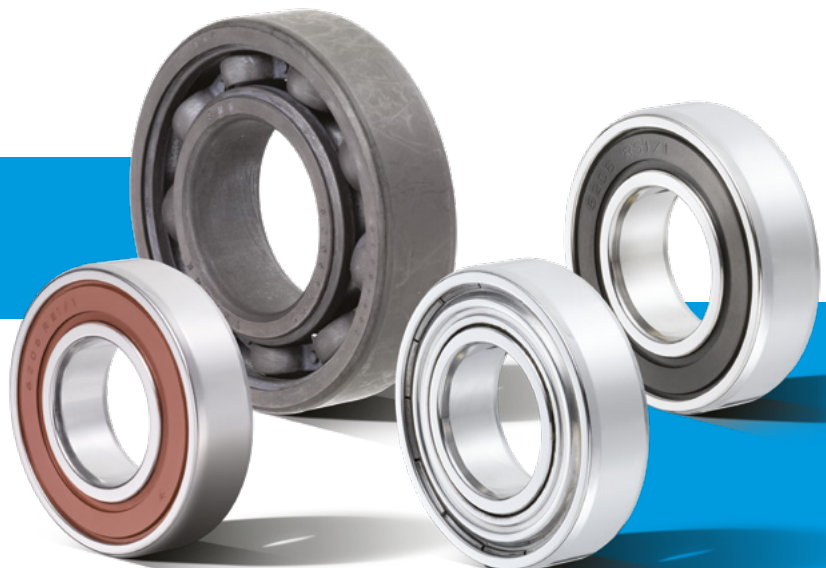
Deep groove ball bearings of series 6000, 6200 and 6300.

For applications with specific temperatures or speed requirements.



- High availability to solve problems quickly
- A unique product range from a premium brand
- A ready to use range for specific applications
- Wide selection of bore diameters for the 6000, 6200 and 6300 series
- Technically optimised products: cage, internal clearance, lubricant and seals
- The technical support from our teams

“A bearing for each specific use”



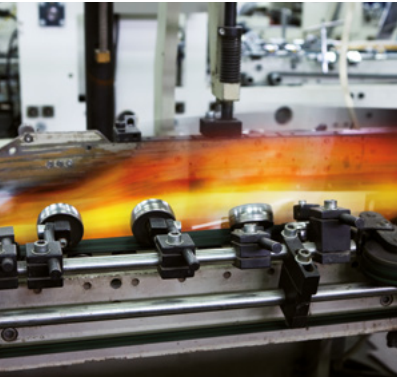
\* N.Dm is a speed factor where N is the speed of rotation in rpm and Dm is the average diameter of the bearing  $(d + D)/2$



**TOPLINE**  
 The unique range of ball bearings dedicated to extreme applications



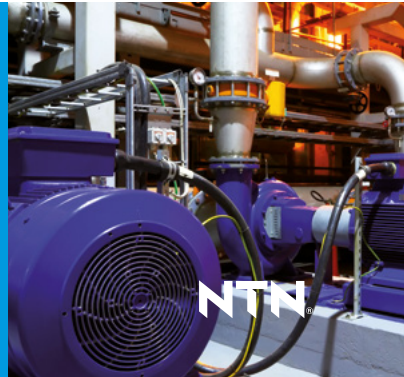
| Products         | Cage                                 | Internal clearance | Grease  | Sealing  | Other   | Temperature range  |
|------------------|--------------------------------------|--------------------|---|--|---|--|
| HVZZ             | Glass fibre reinforced polyamide 6.6 | C3                 | Superior quality. Lithium thickener + synthetic base oil              | Steel shields  | Precision P6, P5. High-precision balls (<= Class 10)              | -20°C to +120°C  |
| LT<br>LTZZ       | Steel                                | C3                 | Suited to low temperatures. Lithium thickener + synthetic base oil    | Nitrile rubber seals (NBR) or steel shields  | -   | LT: -40°C to +100°C<br>LTZZ: -60°C to +120°C                       |
| FT150<br>FT150ZZ | Steel                                | C3                 | Adapted to high temperatures. Polyurea thickener + synthetic base oil | Fluoroelastomer seals (FKM) or steel shields                                       | -   | -30°C to +150°C  |
| HT200<br>HT200ZZ | Steel                                | C4                 | Adapted to high temperatures. PTFE solid lubricant and PFPE oil       | Fluoroelastomer seals (FKM) or steel shields                                       | Specific heat treatment   | -40°C to +200°C  |
| F605             | Steel                                | Multiple of C5*    | **  | -  | Brand is stamped  | Temperature range between +200°C and +350°C (continuous or cyclic) |
| F600             | Steel                                | Multiple of C5*    |   | -  | Specific surface treatment (phosphatisation + MoS2 deposition)*** |  |
| F604             | Steel                                | Multiple of C5*    |   | Suitable for very high temperatures. Polyalkylene glycol base oil + solid additive | Steel shields   |  |



\* Significantly increased internal clearance to offset the material's expansion effects.

\*\* In case of F600 and F605, if additional lubrication is required, an appropriate amount of grease may be introduced into the bearing. Contact **NTN** for more information.

\*\*\* Surface treatment for greater oxidation resistance and improved lubrication. Caution: F600 and F604 products must be used with care in damp environments, since MoS2 may react with water to produce sulphuric acid.





# NTN - Angular contact ball bearings

NTN

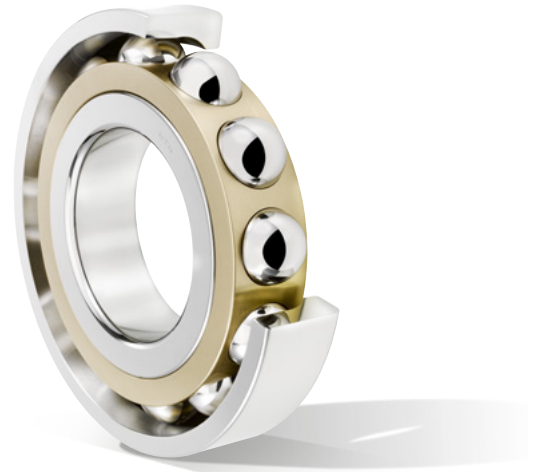
## NTN - Single row angular contact ball bearings

The single row angular contact ball bearing is designed to withstand combined loads with a predominant axial component. Installed in opposition with another bearing of the same type, it guarantees high mounting rigidity.

A wide range for standard industry applications.

### Technical features

- Contact angle 30° (without suffix) or angle 40° (B suffix)
- Pressed steel cage (without suffix) or massive brass cage (L1)
- Single row series: 7000, 7200, 7300
- Universal pairing available (G suffix: Flush ground\*)
- Clearance as standard
- Preload on demand



NTN

## NTN - Four point contact bearings (QJ-bearings)

Four-point contact ball bearings are single row radial angular contact ball bearings with raceways designed to withstand axial loads in both directions.

### Technical features

- Standard contact angle: 30°
- Massive steel cage as standard
- Split inner ring
- Available series: QJ2xx and QJ3xx



More info about prefix, suffix & interchange table check from page 42

\* "Flush ground" is the name given to the finishing method where the offset of the front and back faces of the bearing are ground to the same value. This allows a designated clearance or preload value to be achieved when using bearings with identical codes in DB or DF orientations. DT series bearings can also be used in various arrangements to achieve uniform load distribution.

# NTN and SNR - Double-row angular contact ball bearings

NTN

SNR

Double-row angular contact ball bearings have a similar configuration as two angular contact ball bearings but have the advantage of a smaller space requirement. These bearings support axial and radial loads in both directions.

NTN and SNR: two brands to offer you a full range of possibilities.



## Technical features

- Two cage variants: pressed steel (suffix S in **NTN**) or polyamide (suffix A or G15 in **SNR**)
- Open or sealed with steel shields (-ZZ) or seals (-LL in **NTN** or -EE in **SNR**)
- Careful:
  - Contact angle 25° without filling slot ► **NTN** or **SNR**
  - Contact angle 32° with filling slot ► only **NTN**

## Standard cage type and range overview

### SUFFIXES FOR OPEN SERIES

| SERIE | NTN | SNR | TYPE  |
|-------|-----|-----|---|
| 3XXX  | S   | -   | 32° contact angle with filling slot<br>Pressed steel cage<br>Ungreased    |
|       | -   | A   | 25° contact angle without filling slot<br>Polyamide cage<br>Greased       |
| 5XXX  | S   | -   | 25° contact angle without filling slot<br>Pressed steel cage<br>Ungreased |

### SUFFIXES FOR SEALED SERIES WITH SHIELDS

| SERIE | NTN  | SNR   | TYPE  |
|-------|------|-------|---|
| 5xxx  | SCZZ | -     | 25° contact angle without filling slot<br>Pressed steel cage<br>Greased |
|       | -    | ZZG15 | 25° contact angle without filling slot<br>Polyamide cage<br>Greased     |

### SUFFIXES FOR SEALED SERIES WITH SEALS

| SERIE | NTN   | SNR   | TYPE  |
|-------|-------|-------|---|
| 5xxx  | SCLLD | -     | 25° contact angle without filling slot<br>Pressed steel cage<br>Greased |
|       | -     | EEG15 | 25° contact angle without filling slot<br>Polyamide cage<br>Greased     |

Note:

Be careful with cross references on this product type. Some important discrepancies exist on series number.

Example:

FAG 3201-B-2RS-TVH corresponds to **SNR** 5201EEG15

In **NTN** and **SNR** ranges:

3XXX row is open (note contact angle if necessary)

5XXX is usually sealed (-ZZ or -EE / -LL)

# NTN and SNR - Self-aligning ball bearings

Self-aligning ball bearings have two rows of balls, their outer ring raceway forms a spherical surface and their inner ring has two raceways. The balls, cage and inner ring of these bearings are capable of shifting to compensate for a certain degree of misalignment with the outer ring. Consequently, these bearings are able to align themselves and compensate for shaft / housing finishing unevenness, bearing fitting error and other sources of misalignment. These bearings are designed to support radial loads and are not suitable for applications with heavy axial loads.

## Technical features

- Contact angle bearing
- Steel cage (**NTN**) or polyamide cage (**SNR** – G14 / G15 suffix)
- Clearance: normal, C3, C4
- Cylindrical or tapered bore
- Sealed products available in **SNR** brand for 22xx & 23xx series (-EE suffix)
- Wider inner ring range available in **SNR** brand (112xx & 113xx series)



## Standard cage type and range overview

| NTN                            | Series             |          |  |          |
|--------------------------------|--------------------|----------|--|----------|
|                                | 12xx               | 13xx     | 22xx   | 23xx     |
| Cylindrical bore               | 1200S              | 1300S    | 2200S  | 2300S    |
|                                | ~ 1222S            | ~ 1322S  | ~ 2222S  | ~ 2322S  |
| Tapered bore                   | 1204SK             | 1304SK   | 2204SK   | 2304SK   |
|                                | ~ 1222SK           | ~ 1322SK | ~ 2222SK   | ~ 2322SK |
| Cage material                  | Pressed steel cage |          | Pressed steel cage<br>Machined cage: 2321S,<br>2322S |          |
| INTERNAL CLEARANCE: normal, C3 |                    |          |  |          |

| SNR                                | Series                           |         |                                       |                                       |                 |                 |
|------------------------------------|----------------------------------|---------|---------------------------------------|---------------------------------------|-----------------|-----------------|
|                                    | 12xx                             | 13xx    | 22xx                                  | 23xx                                  | 112xx           | 113xx           |
| Cylindrical bore                   | 1201                             | 1302    | 2201                                  | 2302                                  | 11204           | 11305           |
|                                    | ~ 1222                           | ~ 1320  | ~ 2220                                | ~ 2318                                | ~ 11212         | ~ 11310         |
| Tapered bore                       | 1205K                            | 1305K   | 2204K                                 | 2305K                                 | -               | -               |
|                                    | ~ 1222K                          | ~ 1317K | ~ 2220K                               | ~ 2315K                               |                 |                 |
| Cage material                      | Pressed steel or Polyamide (G15) |         | Pressed steel or Polyamide (G15/G14)  |                                       | Polyamide (G15) | Polyamide (G15) |
| Sealing                            |                                  |         | 2201 ~ 2212<br>EE with polyamide cage | 2303 ~ 2310<br>EE with polyamide cage |                 |                 |
| INTERNAL CLEARANCE: normal, C3, C4 |                                  |         |                                       |                                       |                 |                 |



# NTN and SNR - Thrust ball bearings

NTN

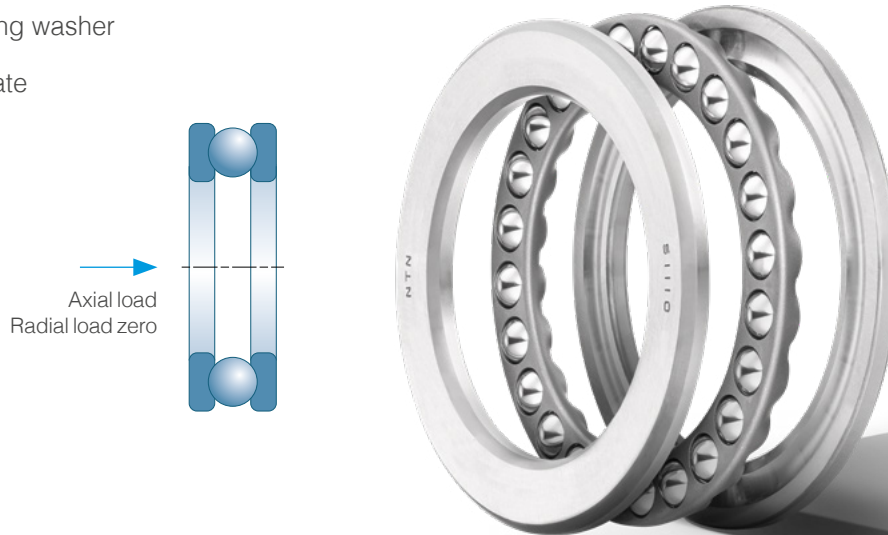
SNR

Thrust ball bearings are designed to support axial loads. Single direction thrust ball bearings support the axial load of a shaft in only one direction.

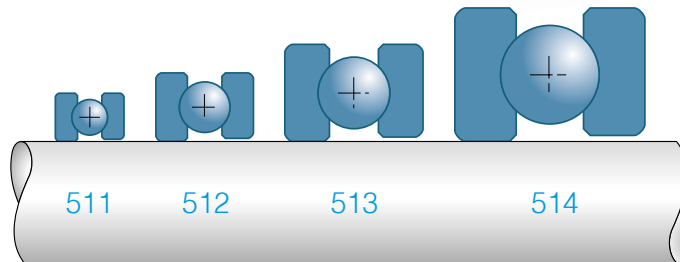
## Technical features

Thrust ball bearings consist of separable elements:

- Shaft locating washer
- Housing plate
- Ball-ring



## Standard cage type and range overview



| NTN                | Series    |         |         |         |
|--------------------|-----------|---------|---------|---------|
|                    | 511       | 512     | 513     | 514     |
| Polyamide cage     | 51100     | 51200   | -       | -       |
|                    | ~ 51107   | ~ 51207 | -       | -       |
| Pressed steel cage | 51108     | 51208   | 51305   | 51405   |
|                    | ~ 51152   | ~ 51224 | ~ 51320 | ~ 51415 |
| Solid brass cage   | 51156     | 51226   | 51322   | 51416   |
|                    | ~ 511/530 | ~ 51260 | ~ 51340 | ~ 51420 |

| SNR                | Series  |         |         |         |
|--------------------|---------|---------|---------|---------|
|                    | 511     | 512     | 513     | 514     |
| Polyamide cage     | -       | -       | -       | -       |
|                    | -       | -       | -       | -       |
| Pressed steel cage | 51100   | 51202   | 51305   | 51405   |
|                    | ~ 51132 | ~ 51217 | ~ 51313 | ~ 51415 |
| Solid brass cage   | -       | -       | -       | -       |
|                    | -       | -       | -       | -       |

# NTN - High precision bearings

Precision rolling bearings, which are generally also referred to as spindle bearings, are primarily used in machine tools. Generally, the optimal bearing must be selected to suit the nature of the machine, the area within the machine, the spindle specification, bearing type, lubrication system and drive system of the intended machine through considerations of the design life, precision, rigidity and critical speed of the bearing.

## Offer

- Standard, open
- Standard, sealed
- High-speed, open
- High-speed, sealed
- All bearings are also available with ceramic balls ("5S")



**ULTAGE™**

## ULTAGE™ performance

Stock of pairable universal bearing called 'Flush ground' bearings ("G") with normal preload ("GN").

Sets and bearings with restricted tolerances can be offered individually (O-, X-, tandem etc.).

## Designations

**5S- 70 08 UC T1A LLB G / GL P42 / L749**

| BALL MATERIAL |               |
|---------------|---------------|
| <b>5S-</b>    | Ceramic balls |
| -             | Steel balls   |

**ULTAGE™**  
(will not be used for sealed bearings)

| DIMENSION SERIES |  |
|------------------|--|
| 70, 79           |  |

| CONTACT ANGLE |              |
|---------------|--------------|
| Code          | Angle        |
| <b>C</b>      | 15° (Open)   |
| <b>CD</b>     | 15° (Sealed) |
| <b>AD</b>     | 25°          |
| -             | 30° (Open)   |

| BEARING ARRANGEMENT |   |
|---------------------|---|
| <b>G</b>            | Single universal bearing 'Flush ground' |
| <b>GD2</b>          | Duplex universal bearing                |
| <b>GD3</b>          | Triplex universal bearing               |
| <b>GD4</b>          | Quadruplex universal bearing            |
| <b>DB</b>           | O-Arrangement < >                       |
| <b>DBT</b>          | Tandem-O-Arrangement << >               |
| <b>DTBT</b>         | Tandem-O-Tandem-Arrangement << >>       |

| ACCURACY     |  |
|--------------|--|
| <b>P5</b>    | ISO Class 5  |
| <b>P4</b>    | ISO Class 4  |
| <b>P42</b>   | Dimensional accuracy ISO Class 4, Running accuracy Class 2 |
| <b>P2</b>    | ISO Class 2  |
| <b>UP-xx</b> | Special accuracy   |

| BORE CODE    |           |
|--------------|-----------|
| Bore         | Dimension |
| <b>00</b>    | 10 mm     |
| <b>01</b>    | 12 mm     |
| <b>02</b>    | 15 mm     |
| <b>03</b>    | 17 mm     |
| <b>04*5</b>  | 20 mm     |
| <b>05*5</b>  | 25 mm     |
| <b>...*5</b> | etc       |

| CAGE       |                                  |
|------------|----------------------------------|
| -          | Polyamide cage, ball guided      |
| <b>T1A</b> | Phenolic cage, outer ring guided |
| <b>T1B</b> | Phenolic cage, ball guides       |

| SEAL       |                   |
|------------|-------------------|
| <b>LLB</b> | Non contact seals |

| PRELOAD     |                   |
|-------------|-------------------|
| <b>GL</b>   | Light preload     |
| <b>GN</b>   | Normal preload    |
| <b>GM</b>   | Medium preload    |
| <b>GH</b>   | High preload      |
| <b>Gxx</b>  | Special preload   |
| <b>Csxx</b> | Special clearance |

| GREASE      |  |
|-------------|--|
| -           | Without grease filling                     |
| <b>L749</b> | SE-1 Grease                                |
| <b>L448</b> | MP-1                                       |
| <b>15K</b>  | NBU 15                                     |
| <b>Lxx</b>  | Please get in contact with NTN engineering |

You can find more information in our catalogue or on demand.

## Table for translation

|  |  | NTN                                 | SNR                               | FAG                       | NSK                               | SKF                          |
|--|--|-------------------------------------|-----------------------------------|---------------------------|-----------------------------------|------------------------------|
| Bearing series<br>(sorted by size)             |  | 78                                  |                                   | B718                      | 78                                | 718                          |
|  |  | 79U                                 | 719                               | B719                      | 79                                | 719                          |
|  |  | 70U                                 | 70                                | B70                       | 70                                | 70                           |
|  |  | 72                                  | 72                                | B72                       | 72                                | 72                           |
| Contact angle                                  |  | 15° (-C)<br>25° (-AD)<br>30° ("'-") | 15° (-C)<br>25° (-H)<br>-         | 15° (-C)<br>25° (-E)<br>- | 15° (-C)<br>25° (-A5)<br>30° (-A) | 15° (-CD)<br>25° (-ACD)<br>- |
| Cage   | Polyamide<br>(Ball guided)                 | No suffix                           | -                                 | -                         | -TYN                              | -                            |
|  | Phenolic resin cage<br>(Outer ring guided) | -T1A                                | V (Serie 719-70)<br>G1 (Serie 72) | -T                        | -TR                               | No suffix                    |
| Universal bearing 'Flush ground'<br>(pairable) |  | -G                                  | -U                                | -U                        | -SU                               | -G                           |
| Preload  | Light                                      | -GL                                 | -                                 | -                         | -EL                               | -                            |
|  | Normal                                     | -GN                                 | 7                                 | -L                        | -L                                | -GA                          |
|  | Medium                                     | -GM                                 | 8                                 | -M                        | -M                                | -GB                          |
|  | High                                       | -GH                                 | 9                                 | -H                        | -H                                | -GC                          |
| Precision (Standard)                           |  | P42                                 | 4<br>4S (Serie ML-MLE)            | P4S                       | P3                                | P4A                          |

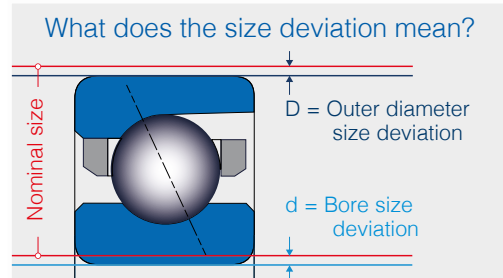
The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.



## Universal matching of NTN high precision bearings

Angular contact ball bearings are often combined in different arrangements for special purposes. Thanks to the flush grinding technique, the face height difference between the inner and outer rings is equal on both faces of a universal bearing (G suffix). Thus, you can assemble various bearing arrangements and achieve the specified preload:

### 1 Bore and outer diameter deviation shown on the boxes label:



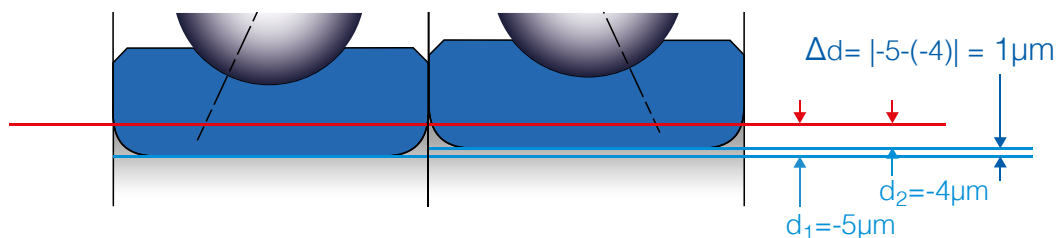
### 2 $\Delta d$ and $\Delta D$ permissible values for matched bearings set:

| 7000 series* | Maximum permissible $\Delta d$ in $\mu\text{m}$ | Maximum permissible $\Delta D$ in $\mu\text{m}$ | 7900 series* | Maximum permissible $\Delta d$ in $\mu\text{m}$ | Maximum permissible $\Delta D$ in $\mu\text{m}$ |
|--------------|---|---|--------------|---|---|
| 7000 ▶ 7015  | 2   | 2   | 7900 ▶ 7917  | 2   | 2   |
| 7016 ▶ 7024  | 2   | 3   | 7918 ▶ 7924  | 2   | 3   |
| 7025 ▶ 7026  | 3   | 3   | 7925 ▶ 7926  | 3   | 3   |

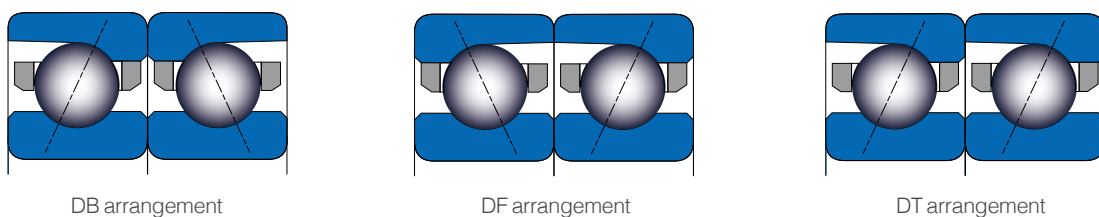
\*For P4, P42 precision

### 3 Determination of $\Delta d$ and $\Delta D$ :

$\Delta d$  = bore size difference in a matched set ( $\mu\text{m}$ ) =  $|d_1 - d_2|$   
 $\Delta D$  = OD size difference in a matched set ( $\mu\text{m}$ ) =  $|D_1 - D_2|$



### 4 Example of duplex arrangement:



# SNR - High precision bearings



Machline is a complete line of precision bearings. It combines high rotation speed and increased load capacity to meet the ever-increasing requirements of your machines.

The ML and CH ranges have been specially designed to withstand very high rotation speeds.

The sealed MLE range has lifetime lubrication and thus eliminates periodic greasing.

All Machline spindle bearings are produced to the P4S precision specification, which incorporates ISO 4 (ABEC 7) dimensional tolerances and ISO 2 (ABEC 9) dynamic tolerances.

## Offer

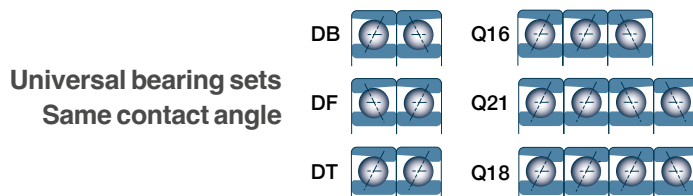
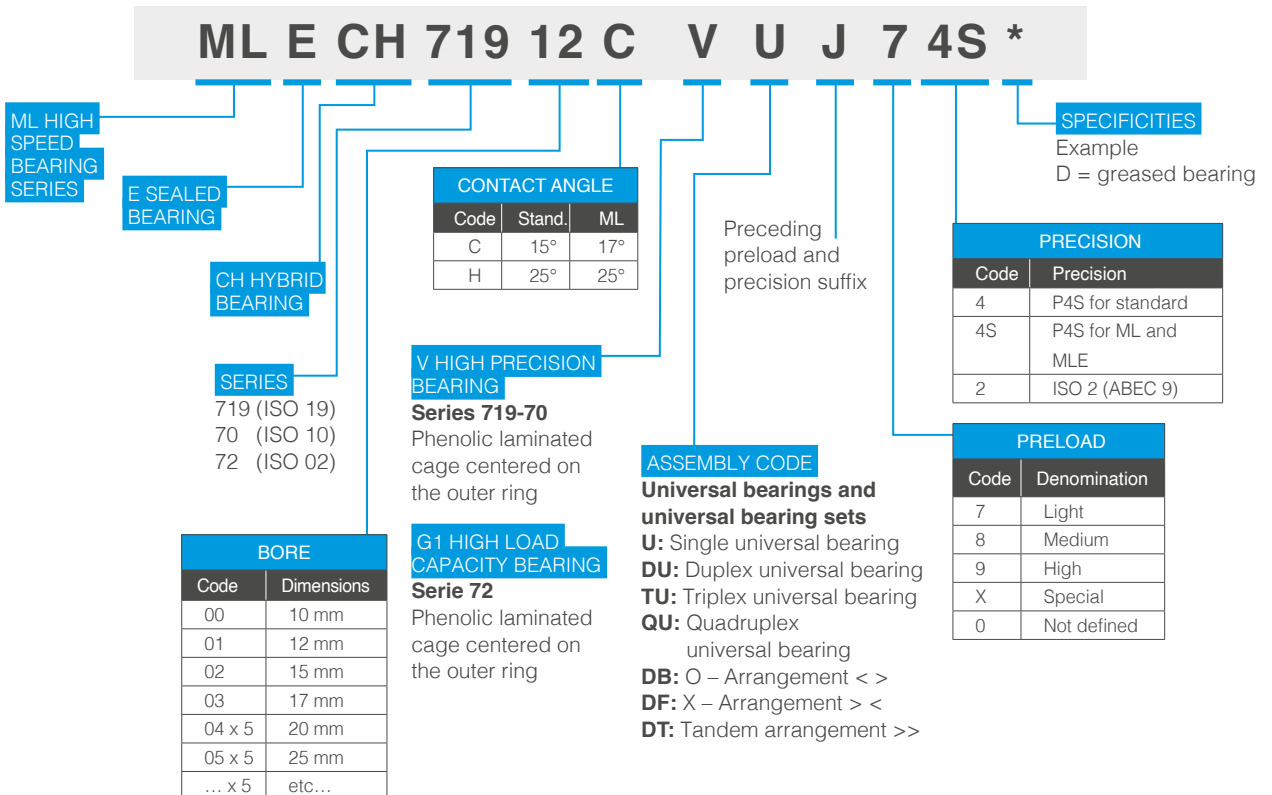
- Machline high precision: standard
- Machline ML: high Speed
- Machline MLE: sealed
- Machline CH: hybrid (available in all ranges)

All Machline bearings are available in the universal version (U), as a universal bearing set (DU, TU) and a matched bearing set (DB, DF, DT...).



**machline**

## Designations





# Interchange table

|  | TYPE OF BEARING  | TECHNICAL SPECIFICATION                                    | NTN          | SNR          | FAG                      | SKF          | NSK          |
|--|--|--|--------------|--------------|--------------------------|--------------|--------------|
| <b>DEEP GROOVE BALL BEARINGS</b>                           | 600<br>6700<br>6800 (61800)<br>6900 (61900)<br>6000 / 6200<br>6300 / 6400<br>16000 / 16100 | 1 or 2 pressed steel shields                               | Z / ZZ       | Z / ZZ       | Z / ZZ                   | Z / ZZ       | Z / ZZ       |
|  |  | 1 or 2 contact seals                                       | LU / LLU     | E / EE       | HRS / 2HRS               | RS1 / 2RS1   | DU / DDU     |
|  |  | 1 or 2 non contact seals                                   | LB / LLB     | -            | RSR / 2RSR<br>BRS / 2BRS | RZ / 2RZ     | V / VV       |
|  |  | Groove without/with retaining ring                         | N / NR       | N / NR       | N / NR                   | N / NR       | N / NR       |
|  |  | Internal clearance (if diff. from normal radial clearance) | C2 / C3 etc. | C2 / C3 etc. | C2 / C3 etc.             | C2 / C3 etc. | C2 / C3 etc. |
| <b>DOUBLE ROW DEEP GROOVE BALL BEARINGS</b>                | 4200-4300  | Polyamide cage   | -            | No suffix    | TVH                      | TN9          | T            |
|  |  | Without filling slot                                       | -            | A            | -                        | A            | B            |
|  |  | Internal clearance (if diff. from normal radial clearance) | -            | -            | -                        | C2 / C3 etc. | C2 / C3 etc. |
| <b>ANGULAR CONTACT BALL BEARINGS</b>                       | 7000 / 7200/<br>7300 / 7400<br>7800 (71800)<br>7900 (71900)                                | Contact angle 30°  | No suffix    | -            | -                        | A            | A            |
|  |  | Contact angle 40°  | B            | B            | B                        | B            | B            |
|  |  | Polyamide cage   | T2           | A            | TVP                      | P            | T85 / TYN    |
|  |  | Pressed steel cage   | No suffix    | -            | -                        | J            | W            |
|  |  | Solid brass cage   | L1           | M            | M                        | M / MB       | No suffix    |
|  |  | Universal design   | G            | G            | UA / UO / UL*            | CB / G       | G / SU       |
| <b>DOUBLE ROW SELF-ALIGNING BALL BEARINGS</b>              | 1200 / 1300<br>2200 / 2300<br>11200 / 11300  | Pressed steel cage   | J            | No suffix    | -                        | J1           | No suffix    |
|  |  | Polyamide cage   | T2           | G15          | TVH                      | TN9          | T            |
|  |  | 2 contact seals  | -            | EE           | 2RS                      | 2RS1         | DDU          |
|  |  | Internal clearance (if diff. from normal radial clearance) | C2 / C3 etc. | C2 / C3 etc. | C2 / C3 etc.             | C2 / C3 etc. | C2 / C3 etc. |
|  |  | Tapered bore 1:12  | K            | K            | K                        | K            | K            |
| <b>DOUBLE ROW ANGULAR CONTACT BALL BEARINGS</b>            | 3200-3300<br>5200-5300   | Contact angle 32° to 35° with slot                         | 3xxxS        | 3xxxB        | No suffix                | No suffix    | No suffix    |
|  |  | Contact angle 25° to 30° without slot                      | 5xxxS        | 3xxxA        | B                        | A            | B            |
|  |  | Polyamide cage   | T2           | G15          | TVH / TVP                | TN9          | T            |
|  |  | Pressed steel cage   | No suffix    | No suffix    | No suffix                | No suffix    | J            |
|  |  | 1 or 2 pressed steel shields                               | 5xxxSCZZ     | 5xxx ZZ      | Z / ZZ                   | Z / ZZ       | Z / ZZ       |
|  |  | 1 or 2 contact sealed type                                 | 5xxxSCLLD    | 5xxx EE      | HRS / 2HRS               | RS1 / 2RS1   | RSR / 2RSR   |
|  |  | 1 or 2 non contact seals                                   | 5xxxSCLLM    | -            | RSR / 2RSR               | -            | ZR / 2ZR     |
| Internal clearance (if diff. from normal radial clearance) | C2 / C3 etc.   | C2 / C3 etc.   | C2 / C3 etc. | C2 / C3 etc. | C2 / C3 etc.             |              |              |
| <b>THRUST BALL BEARINGS</b>                                | 51100-51200<br>51300-51400   | Pressed steel cage   | J            | No suffix    | No suffix                | No suffix    | No suffix    |
|  |  | Solid brass cage   | -            | -            | M, MP                    | M            | M            |
|  |  | Polyamide cage   | T2           | -            | -                        | -            | -            |
| <b>FOUR-POINT CONTACT BALL BEARINGS</b>                    | QJ200 - QJ300  | Polyamide cage   | T2X          | -            | TVP                      | -            | -            |
|  |  | Solid cage   | L1           | MA           | MPA                      | MA           | No suffix    |
|  |  | Internal clearance (if diff. from normal radial clearance) | C2 / C3 etc. | C2 / C3 etc. | C2 / C3 etc.             | C2 / C3 etc. | C2 / C3 etc. |

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

\*Several specific internal clearances on universal design.

For **NTN** alternative products, please contact us.

# Prefixes & suffixes

| PREFIXES FOR BALL BEARINGS |       |   |
|----------------------------|-------|---|
| MATERIAL                   |       |   |
| Prefix                     | Brand | Description   |
| F-                         | NTN   | Stainless steel ball bearing  |
| S                          | SNR   | Stainless steel ball bearing  |
| S-                         | NTN   | Material in ceramic   |
| TA- / TAB-                 | NTN   | Nitrided steel  |
| TM- / TMB-                 | NTN   | Special heat treatment  |
| TS2-                       | NTN   | Special heat treatment up to 160 °C                                     |
| TS3-                       | NTN   | Special heat treatment up to 200 °C                                     |
| TS4-                       | NTN   | Special heat treatment up to 250 °C                                     |
| COMPONENT                  |       |   |
| 2-                         | NTN   | Only applies to inner and outer ring                                    |
| 5-                         | NTN   | Concerns balls only   |
| DIMENSION                  |       |   |
| W-                         | NTN   | Modified width  |
| R-                         | NTN   | Inch dimensions   |
| SPECIAL RANGE              |       |   |
| U-RSH                      | NTN   | Sensor bearing  |
| 7MC3-                      | NTN   | Outer ring with ceramic coating   |
| 7MP-                       | NTN   | Plastic-vulcanised outer ring   |
| AC-                        | NTN   | Anti-rotation protection  |
| EC-                        | NTN   | Expansion compensation for general purposes                             |
| EC1-                       | NTN   | Expansion compensation for high temperatures (max. 150 °C)              |
| EC2-                       | NTN   | Expansion compensation for particularly high temperatures (max. 180 °C) |

| SUFFIXES FOR BALL BEARINGS |       |   |
|----------------------------|-------|---|
| COMPONENT                  |       |   |
| Prefix                     | Brand | Description   |
| /2AS                       | NTN   | Standard Grease   |
| /5K                        | NTN   | Standard Grease   |
| 2RS                        | SNR   | Contact seal on both sides - Only for stainless steel deep groove ball bearings |
| A                          | NTN   | Polyacryl material for the seal   |
| A1                         | NTN   | Fluorine material for the seal  |
| A2                         | NTN   | Silicon material for the seal   |
| Dxxx                       | SNR   | Grease type if non standard   |
| E                          | SNR   | Contact seal on one side  |
| EE                         | SNR   | Contact seals on both sides   |
| F1                         | NTN   | Machined steel cage   |
| F2                         | NTN   | Machined stainless steel cage   |
| FG1                        | SNR   | Food grade LUBSOLID™  |
| G14                        | SNR   | Polyamide 6.6 cage  |
| G15                        | SNR   | Polyamide 6.6 cage with glass fibers  |
| J                          | NTN   | Pressed steel cage  |
| JR                         | NTN   | Pressed rivet cage  |
| JR2                        | NTN   | Cage with reinforced type of pressed steel                                      |
| L1                         | NTN   | Machined brass cage   |
| L1B                        | NTN   | Machined brass cage centered on balls   |
| LB, LLB                    | NTN   | Nitrile non-friction seal   |
| LH, LLH                    | NTN   | Nitrile low torque seal   |
| LP03                       | NTN   | Standard solid grease   |

| SUFFIXES FOR BALL BEARINGS |         |   |
|----------------------------|---------|---|
| COMPONENT                  |         |   |
| Prefix                     | Brand   | Description   |
| LP09                       | NTN     | Food grade solid grease   |
| LU, LLU                    | NTN     | Nitrile double lip contact seal   |
| M                          | SNR     | Massive brass cage, centered on balls   |
| MA                         | SNR     | Massive brass cage, outer ring guided   |
| MB                         | SNR     | Massive brass cage, centered on inner ring  |
| QT                         | NTN     | More than 50% grease filling rate   |
| T2                         | NTN     | Polyamide resin molded cage   |
| T2X                        | NTN     | Polyamide 6.6 + glass fiber 25%   |
| U                          | NTN     | Open bearing with existing groove to put seal afterwards  |
| Y                          | NTN     | Pressed brass cage  |
| Z, ZZ                      | NTN/SNR | Steel shield  |
| Z1, ZZ1                    | NTN     | Stainless steel shield  |
| DESIGN                     |         |   |
| /GH                        | NTN     | Heavy preload   |
| /GL                        | NTN     | Light preload   |
| /GM                        | NTN     | Medium preload  |
| /GN                        | NTN     | Normal preload  |
| A                          | SNR     | Double row angular contact ball bearings: PA66 + glass fiber cage; 25° contact angle; no filling slot<br>Double row deep groove ball bearings: PA66 + glass fiber cage; no filling slot |
| B                          | NTN     | Single row angular contact: 40° contact angle   |
| BG                         | NTN     | 40° contact angle, universal design   |
| C2                         | NTN/SNR | Radial internal clearance, C2 class   |
| C3                         | NTN/SNR | Radial internal clearance, C3 class   |
| C4                         | NTN/SNR | Radial internal clearance, C4 class   |
| C5                         | NTN/SNR | Radial internal clearance, C5 class   |
| CM                         | NTN     | Special normal radial internal clearance with tighten tolerances  |
| CSnn-n                     | NTN     | Special clearance   |
| K                          | NTN/SNR | Tapered bore, taper 1:12  |
| N                          | NTN/SNR | Groove for snap ring on outer ring  |
| N2                         | SNR     | Anti-rotation slots on outer ring   |
| NR                         | NTN/SNR | Groove and snap ring on outer ring  |
| P2                         | NTN/SNR | Tolerance class 2   |
| P4                         | NTN/SNR | Tolerance class 4   |
| P5                         | NTN/SNR | Tolerance class 5   |
| P6                         | NTN/SNR | Tolerance class 6   |
| P63E                       | NTN     | P6 precision class + C3 internal clearance; electric motor quality  |
| S                          | SNR     | Spherical outer diameter  |
| W, W-1                     | NTN     | Slot or knock out hole on ring  |
| X1, X2, Xn...              | NTN     | Chamfer modification  |
| SPECIAL RANGES             |         |   |
| EMTR                       | SNR     | Electric motor product range  |
| F6xx                       | SNR     | TOPLINE range for very high temperature - Maximum 350°C   |
| FT150, FT150ZZ             | SNR     | TOPLINE range for high temperature - Maximum 150°C  |
| HT200, HT200ZZ             | SNR     | TOPLINE range for high temperature - Maximum 200°C  |
| HVZZ                       | SNR     | TOPLINE range- High speed bearings with shields on both sides   |
| LT, LTZZ                   | SNR     | TOPLINE range for low temperature   |





# CYLINDRICAL ROLLER BEARINGS



**ULTAGE** NO TIME OUT



## Cylindrical roller bearings

Defined according to ultimate design rules, the **NTN ULTAGE™** cylindrical roller bearings set the new performance benchmark for your industrial equipment and machines.

Our high-resistance polyamide cage technology, a unique solution on the market, extends the field of use of **NTN** bearings to demanding applications.

Check out a reliable solution for minimising your maintenance operations.

**ULTAGE™**, setting the standard for supreme performance

**NTN**®

# NTN - Single-row cylindrical roller bearings

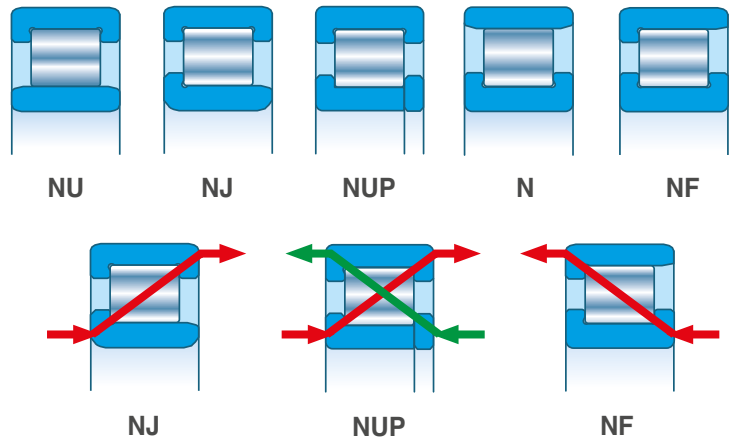
Thanks to their rolling elements with line contact on the raceways, the cylindrical roller bearings can support high radial loads. The rollers are guided by shoulders on the outer and/or inner ring and are therefore suitable for high speed applications. Cylindrical roller bearings are separable, allowing them to be easily mounted and disassembled even when interference fits are required.



## Technical features

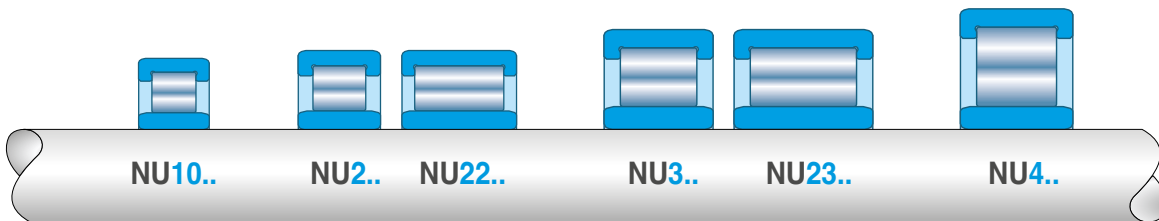
**5 configurations of ring shoulders are available:**

- NU & N are non locating bearings and can't support any axial load
- NJ, NF & NUP are locating bearings. NJ & NF provide an axial guidance through the bearing in one direction; in the two directions for the NUP design



**6 main ISO dimensions series:**

From the lightest 10.. to the heaviest 4..

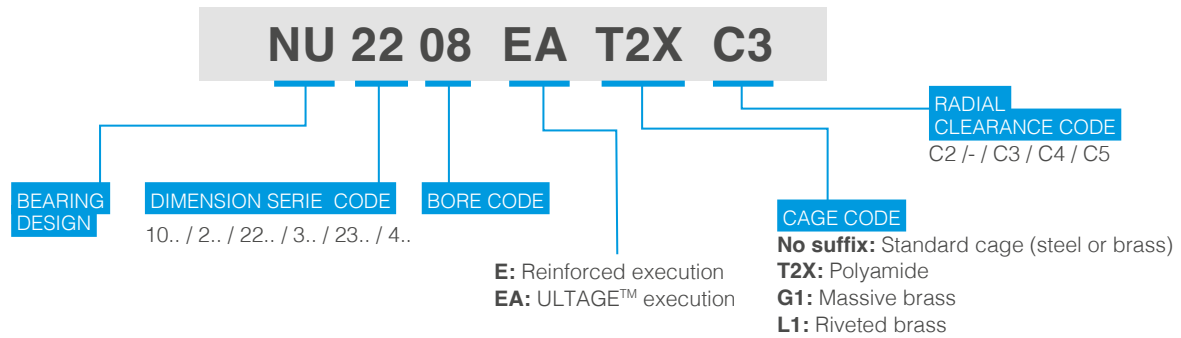


**3 technologies of cage:**

- Polyamide (T2X), standard type: economic, light weight and quiet operation
- Pressed steel (no suffix), standard type for non E design
- Brass cage (massive G1 or riveted L1) for the largest series and demanding applications



## Designations



ULTAGE™ offer

# ULTAGE™

**ULTAGE™ performance series for NU, NJ, NUP, N and NF types in the ISO dimension series 2.., 22.., 3.. and 23..**

- Rollers with advanced profile, for an optimal contact stress distribution on the raceways and reduction of edge stresses
- Optimised internal specification for lower operating temperature and improved allowable rotation speed
- High performance glass-fibre reinforced polyamide, for high rotation speed and long grease service life as well as quiet operation

**Benefits from using ULTAGE™ (compared to previous design):**

- Higher level of dynamic load Cr, one of the highest on the market
- Operation under larger misalignment, up to 2 mrad
- Longer service life
- Lower operating temperature for higher rotation speed, under oil lubrication



**A step ahead with quality**



**+7%**  
DYNAMIC LOAD CAPACITY CR



**+20%**  
SERVICE LIFE



**+20%**  
ALLOWABLE SPEED

Previous designation

New designation

**NU 208 E T2X C3**

**NU 208 EA T2X C3**

## Range overview

| Bore code             |        | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 22  |
|-----------------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Bore diameter Ød [mm] |        | 20  | 25  | 30  | 35  | 40  | 45  | 50  | 55  | 60  | 65  | 70  | 75  | 80  | 85  | 90  | 95  | 100 | 110 |
| Dimension series      | 2..EA  | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | G1* | G1* |
|                       | 22..EA | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | G1  | G1  | G1  |
|                       | 3..EA  | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | G1  | G1  | G1  | G1  | G1  | G1  |
|                       | 23..EA | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | T2X | G1  | G1  | G1  | G1  | G1  | G1  |

(\*): T2X polyamide cage is the standard cage except for bore codes 20 and 22, with massive brass G1

# NTN - Double-row cylindrical roller bearings

Double row cylindrical roller bearings are designed for very heavy loaded applications. With cages, they offer the best compromise for moderate to high rotation speed; without cage (full complement type), they incorporate the maximum number of rollers for the maximum load capacity.



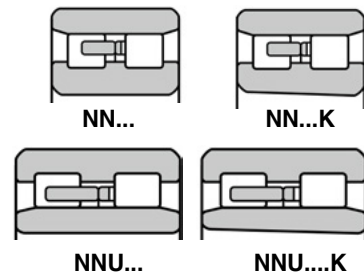
## With cages

### Non locating bearing

NN49..(K) and NNU49..(K) Bore diameter  $\varnothing d = 100 \text{ mm} - 500 \text{ mm}$

NN30..(K) Bore diameter  $\varnothing d = 25 \text{ mm} - 460 \text{ mm}$

For heavy loaded applications, under moderate to high rotation speed.



## Full complement type

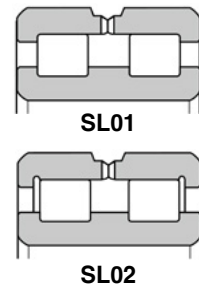
### Locating bearing

SL01-48.. and SL01-49.. Bore diameter  $\varnothing d = 50 \text{ mm} - 400 \text{ mm}$

### Semi-locating bearing

SL02-48.. and SL02-49.. Bore diameter  $\varnothing d = 50 \text{ mm} - 380 \text{ mm}$

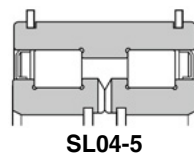
For extremely loaded applications, under low to moderate speed (large construction machinery, steel industry machinery...).



## Full complement type - Bearing for sheave

SL04-5.. Bore diameter  $\varnothing d = 40 \text{ mm} - 440 \text{ mm}$

- Locating bearing
- Outer ring phosphate coated
- With or without snap rings on outer ring
- With seals or shields
- With or without relubrication on outer ring



# NTN - Four-row cylindrical roller bearings

## 4R series for roll necks of steel rolling mill

- Bore diameter  $\varnothing d = 100 \text{ mm} - 1\,030 \text{ mm}$
- Plain rollers or hollow rollers with pin cage for the highest load rating
- Through hardened or case hardened steel for better crack and shock resistance
- Corrosion resistance with phosphate coatings
- Various configuration of seals, ring designs, bores (tapered bore, circulating oil groove, ...)





# Interchange table, prefixes & suffixes

| Technical Specification                                   | NTN                    | SNR                    | INA/FAG                | SKF                    | NSK                    |
|---|------------------------|------------------------|------------------------|------------------------|------------------------|
| <b>DESIGNATION</b>  |                        |                        |                        |                        |                        |
| NU / NJ / NUP / N / NF                                    | NU / NJ / NUP / N / NF | NU / NJ / NUP / N / NF | NU / NJ / NUP / N / NF | NU / NJ / NUP / N / NF | NU / NJ / NUP / N / NF |
| NU without inner ring                                     | RUS..                  | RNU..                  | RNU..                  | RNU..                  | RNU.../RUS...          |
| N without outer ring                                      | RNH..                  | RN..                   | RN..                   | RN..                   | RN..                   |
| 2 row full complement series                              | SL01- ...              | -                      | SL01...                | NNC...                 | RS-...                 |
|   | SL02-...               | -                      | SL02-...               | NNCF/ NNCL             | RSF-...                |
| 2 row full complement for sheaves                         | SL04-5..               | -                      | SL045..                | NNF5..                 | RS-5..                 |
| <b>CAGE</b>   |                        |                        |                        |                        |                        |
| Polyamide cage  | T2X                    | G15                    | TVP2                   | P                      | T                      |
| Pressed steel cage  | without suffix         | -                      | JP3                    | J                      | W                      |
| Brass cage  | G1, L1                 | M                      | M1, M1A, MPAX          | M, ML                  | M, MA1, MBR, MR        |
| <b>EXECUTION</b>  |                        |                        |                        |                        |                        |
| Increased load design                                     | E, EA                  | E                      | E                      | EC                     | E                      |
| Radial clearance (deviating from normal radial clearance) | C2, C3, C4             | C2, C3, C4             | C2, C3, C4             | C2, C3, C4             | C2, C3, C4             |

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

| PREFIXES FOR CYLINDRICAL ROLLER BEARINGS |            |                 |  |
|--|------------|-----------------|--|
| Prefix                                   | Brand      | Characteristics | Description  |
| TS2-                                     | <b>NTN</b> | Heat treatment  | Heat stabilisation for use up to 160 °C, for rings and rollers |
| 2TS2-                                    | <b>NTN</b> | Heat treatment  | Heat stabilisation for use up to 160 °C, for rings only        |
| TS3-                                     | <b>NTN</b> | Heat treatment  | Heat stabilisation for use up to 200 °C, for rings and rollers |
| 2TS3-                                    | <b>NTN</b> | Heat treatment  | Heat stabilisation for use up to 200 °C, for rings only        |
| E-                                       | <b>NTN</b> | Material        | Carburising steel, for all components                          |
| HL-                                      | <b>NTN</b> | Execution       | HL- treatment for rollers, for improved lubrication            |
| 7MC3-                                    | <b>NTN</b> | Execution       | Ceramic coating on the outer ring for electric insulation      |
| 6MX-                                     | <b>NTN</b> | Execution       | Phosphate coating on inner ring                                |
| MX50-                                    | <b>NTN</b> | Execution       | Phosphate coating "RUSTGUARD" on rings and rollers             |

| SUFFIXES FOR CYLINDRICAL ROLLER BEARINGS |            |                 |  |
|--|------------|-----------------|--|
| Suffix                                   | Brand      | Characteristics | Description  |
| T2X                                      | <b>NTN</b> | Component       | PA46 glass fibre reinforced polyamide cage               |
| G1                                       | <b>NTN</b> | Component       | Massive brass cage, outer ring guided for NU, NJ and NUP |
| L1                                       | <b>NTN</b> | Material        | Riveted brass cage, outer ring guided                    |
| N  | <b>NTN</b> | Execution       | Groove on outer diameter of outer ring                   |
| NR                                       | <b>NTN</b> | Execution       | Groove on outer diameter of outer ring + snap ring       |
| HT                                       | <b>NTN</b> | Execution       | For high axial thrust load                               |
| K  | <b>NTN</b> | Execution       | Tapered bore   |





# TAPERED ROLLER BEARINGS



# RESISTS ALL, EXCEEDS COMPARISON



Inch or metric, the range of **NTN** tapered roller bearings covers all of your needs and will bring you the highest reliability whatever the conditions of use.

Available in our logistics center dedicated to distribution, our offer has been designed to achieve one goal: your satisfaction!

# NTN®



# NTN and SNR - Tapered roller bearings

The tapered roller bearing consists of 2 loose elements: the inner ring (cone) with tapered rolling elements + the cage (we could also say “the mounted cone”) and the outer ring (cup).

This is the best bearing solution for supporting combined axial & radial heavy loads.

The single row type is usually used by pair, the operating clearance or preload is adjusted during the mounting of the bearings.

A set of preloaded tapered roller bearings offers, in addition to a high load capacity, the necessary high rigidity required inside the gearboxes or transmission.



## Benefits

A complete range of tapered roller bearings from the world's second largest manufacturer (approx. 100 million units/year), with ISO metric and ABMA inch series.

- Under **NTN** brand, **complete ranges of metric and inch series**, with high technology products
  - A metric range that covers all the market needs
  - A numerous inch range (>270 series), that is the best alternative to the market leader
  - High quality steels, with case hardened steel and through hardened steel
  - The larger sizes under the label ULTAGE™, with the highest performance on the market
  - 2 and 4 rows for specific applications
- Under **SNR** brand, **a compact range of metric series** that covers the **essential needs** with all the **benefits of a premium brand** without any technical compromise
  - An “Easy to Work” range, with only 1 bearing part number per dimension
  - New opportunities of competitiveness in the European market
  - High quality products, a range approved by many major European OE customers

**NTN** and **SNR** ranges represent approximately 1900 part numbers in the European gross price list, to meet the market needs with the adequate tapered roller bearing.

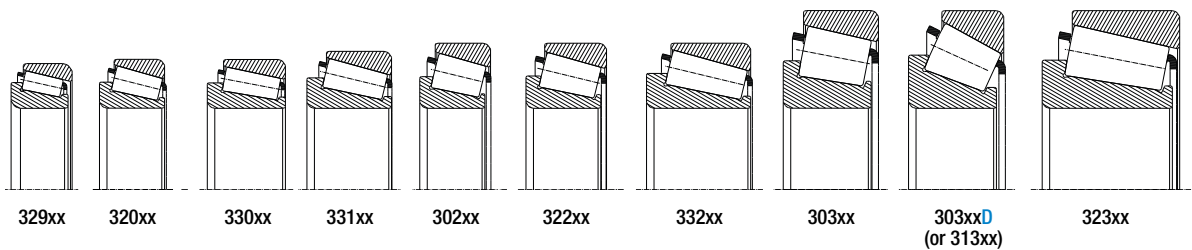


## Metric series range overview

### NTN metric tapered roller bearings, the complete range



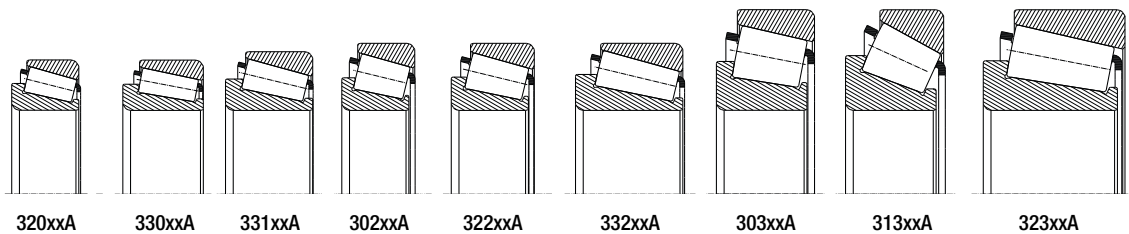
- 10 standard metric series, including 1 steeper angle series with suffix D (= 313xx in Europe)
- 3 additional steeper angle series 322xxC, 323xxC (suffix C **NTN** = suffix B in Europe) and T7FCxxx
- Bore diameter from 15 mm to 850 mm (440 mm in catalog)
- Case hardened steel (prefix "4T-") or through hardened steel (suffix "U"), interchangeability for both
- Pressed steel cage
- Tolerance: ISO492 normal class
- Designation:
  - For case hardened steel: **4T-32006X**
  - For through hardened steel: **32018XU**



### SNR metric tapered roller bearings, the simply smart range



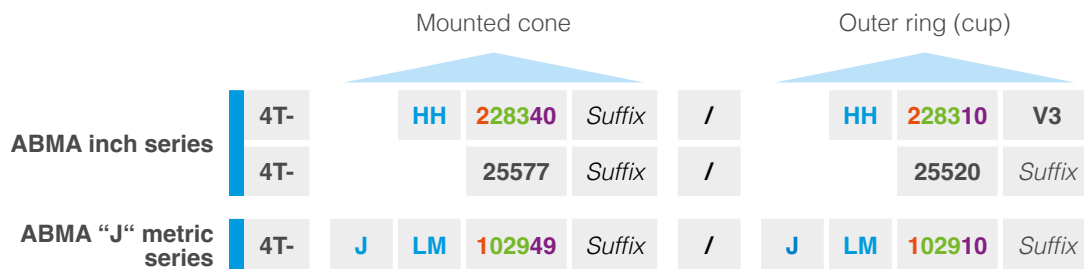
- 9 most popular metric series, including 1 steeper angle series 313xxA
- Outer diameter < 200 mm
- High grade through hardened steel
- Pressed steel cage
- Tolerance: ISO492 normal class
- Easy to work range: designation with only 1 suffix A → **32014A**



# Inch series range overview

NTN inch series tapered roller bearings, the best alternative to the market leader

- >270 series defined according to ABMA standard
- Bore diameter from 12.7 mm to 1270 mm
- 100% case hardened steel, with the prefix “4T-“
- Pressed steel cage
- Tolerance: ANSI/ABMA std 19 class 4 or ANSI/ABMA std 19.1 class K or N for metric J series
- Designation:



| Duty class prefix                   | Code     | Included cup angle             | Series number  | Component number                               |
|-------------------------------------|----------|--------------------------------|----------------|--|
| <b>EH</b> Extra Heavy series        | <b>1</b> | 0 to 23°59'59.99"              | <b>0-9</b>     | Cone -> <b>30 to 49</b> (and <b>20 to 29</b> ) |
| <b>EL</b> Extra Light series        | <b>2</b> | 24° to 25°29'59.99"            | <b>00-99</b>   | Cup -> <b>10 to 19</b> (and <b>20 to 29</b> )  |
| <b>H</b> Heavy series               | <b>3</b> | 25°30' to 26°29'59.99"         | <b>000-999</b> |  |
| <b>HH</b> Heavier than Heavy series | <b>4</b> | 27° to 28°29'59.99"            |                |  |
| <b>HM</b> Heavy-Medium series       | <b>5</b> | 28°30' to 30°29'59.99"         |                |  |
| <b>L</b> Light series               | <b>6</b> | 30°30' to 32°29'59.99"         |                |  |
| <b>LL</b> Lighter than Light series | <b>7</b> | 32°30' to 35°59'59.99"         |                |  |
| <b>LM</b> Lighter-Medium series     | <b>8</b> | 36° to 44°59'59.99"            |                |  |
| <b>M</b> Medium series              | <b>9</b> | 45° and over, excluding thrust |                |  |

- Cone and cup can be managed separately, each cone of the same series could be associated with one cup of the series
- Interchangeability is guaranteed. It is recommended to not mix cones and cups from different origins, for optimal performance after assembly
- A reduced stock allows to generate many bearing combinations:

Example: **25500 series**

|                |          |               |          |                                |       |
|----------------|----------|---------------|----------|--------------------------------|-------|
| 4T- 25572      | +        | 4T- 25519     | =        | 4T- 25572                      | 25520 |
| 4T- 25577      |          | 4T- 25520     |          | 4T- 25577                      | 25520 |
| 4T- 25578      |          | 4T- 25522     |          | 4T- 25578                      | 25520 |
| 4T- 25580      |          | 4T- 25526     |          | 4T- 25580                      | 25520 |
| 4T- 25582      |          |               |          | 4T- 25582                      | 25520 |
| 4T- 25584      |          |               |          | 4T- 25584                      | 25520 |
| 4T- 25590      |          |               |          | ...                            |       |
| 4T- 25592      |          |               |          | ...                            |       |
| <b>8 cones</b> | <b>+</b> | <b>4 cups</b> | <b>=</b> | <b>32 bearing combinations</b> |       |



# High performance steel

## 2 technologies of steel, used as standard

### Carburised (case hardened) steel

Carburising hardens the steel from the surface to the proper depth, leaving a relatively soft core. This provides hardness and toughness, making the material suitable for impact loads.

Case hardened steel is applied to rollers and both rings and could be identified by the prefix "4T-". It is the standard material for all inch series.

**Through hardened steel** is obtained from high grade carbon chromium bearing steel. It is applied to larger **NTN** bearings from metric series and to all **SNR** range.

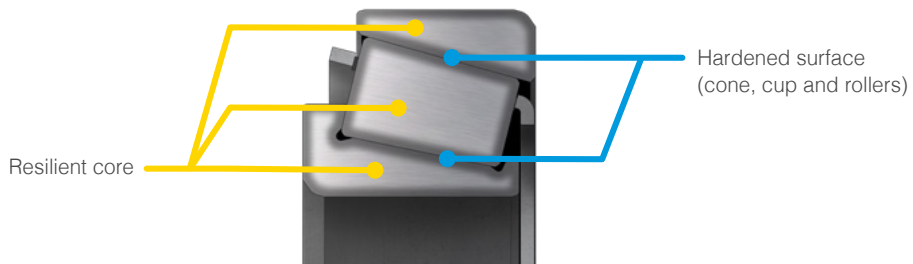
| NTN    | BEARING SIZE |        |       |
|--------|--------------|--------|-------|
|        | Small        | Medium | Large |
| Inch   |              |        |       |
| Metric |              |        |       |

● Case hardened steel 4T-   
 ● Through hardened steel U

## 2 technologies of NTN steel offer the same basic rating life

### Case hardened steel offers additional benefits such as:

- **Better resistance to cracks**, especially in case of high tight fit condition
- **Better resistance to shocks loads**, thanks to its resilient core



Cross-section of a bearing made of case hardened steel



### GOOD TO KNOW!

Inch and metric tolerance systems are not defined in the same way for diameters: in the inch tolerance system, diameters are defined to positive whereas in the metric tolerance system, they are defined to negative (versus nominal diameter).

A special attention has to be put on the shaft diameter definition!!!

Example: Inch bore diam. (in mm) ▶  $\text{Ø } 111.125 \begin{matrix} +0,025 \\ 0 \end{matrix}$

Metric bore diam. (in mm) ▶  $\text{Ø } 105 \begin{matrix} 0 \\ -0,020 \end{matrix}$

ULTAGE™ large size metric series (OD ≥ Ø270mm) deliver longer life, higher load ratings, and higher speed capabilities.

Developed as the new standard of NTN bearings, the ULTAGE™ series will contribute to improvements in industrial machinery today and into the future.

Technical features

ULTAGE™ offers the highest level of reliability, thanks to:

**Optimised crowning on rollers**, for a better load distribution on raceways.

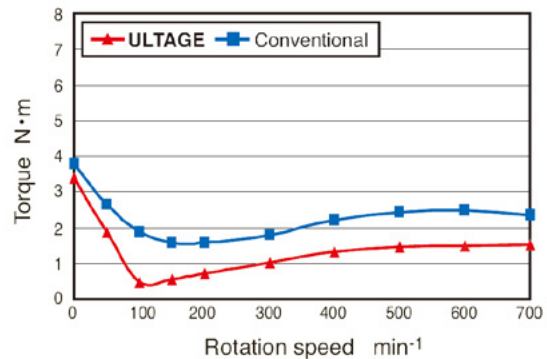
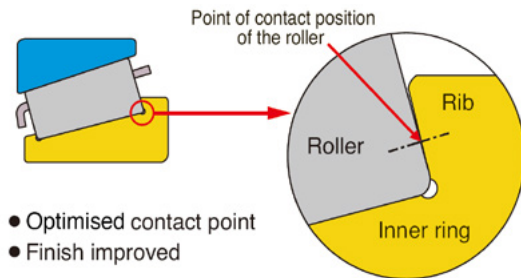
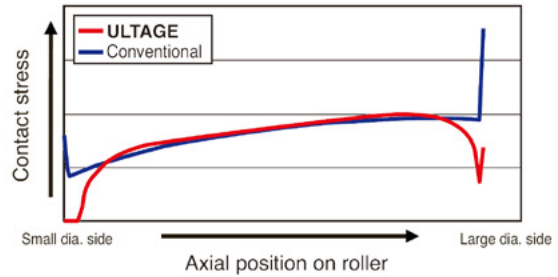
- Basic load rating **Cr**: **+30%** larger than conventional bearings
- Service life: **x3 longer** than conventional bearings
- **Higher allowable misalignment**: 0.0017 rad (6') is achievable for 0.27Cr, with a minimum required load 0.04Cor.

**Improved allowable rotation speed**, resulting from an optimized design between the roller large face and the cone large rib.

- Lower torque and lower temperature rise.
- Higher rotation speed, **up to +10%**

**Improved dimensional stability over time**, with a special heat-treatment to the bearing steel, for a better dimensional stability over time and less dimensional changes during operation:

- 1/10 compared with standard through hardened steel
- 1/4 compared with case hardened steel



Benefits

|             |           |             |                  |
|-------------|-----------|-------------|------------------|
|             |           |             | DIMENSION CHANGE |
| <b>+30%</b> | <b>x3</b> | <b>+10%</b> | <b>1/10</b>      |

Designation of ULTAGE™ TRB:

**Additional suffix "UTG" → 30328 U **UTG****

# Interchange tables, prefixes & suffixes

NTN

SNR

| PREFIXES   | NTN           | SNR | TIMKEN              | FAG     | SKF               | KOYO<br>JTEKT |
|--|---------------|-----|---------------------|---------|-------------------|---------------|
| <b>MATERIAL</b>  |               |     |                     |         |                   |               |
| Case-hardened steel (inner ring, outer ring and rolling elements)  | E-            | -   |                     |         | Suffix "/<br>HA4" |               |
| Case-hardened steel (inner and outer rings)  | 2E-           | -   |                     |         | Suffix "/<br>HA1" |               |
| Case-hardened steel (inner ring and rollers)   | 3E-           | -   |                     |         | -                 |               |
| Case-hardened steel (rollers only)   | 5E-           | -   |                     |         | Suffix "/<br>HA5" |               |
| Case-hardened steel (inner ring only)  | 6E-           | -   |                     | W209B   | Suffix "/<br>HA3" |               |
| Case-hardened steel + carbonitriding (inner and outer rings, rollers)  | EA-           | -   |                     |         |                   | KE            |
| Through-hardening steel + interchangeability   | T-            | -   | -                   | -       | -                 | -             |
| Case-hardened steel 4T- + interchangeability   | 4T-           | -   |                     |         |                   |               |
| High quality grade case-hardened steel + interchangeability  | ET-           | -   |                     |         |                   |               |
| High quality grade case hardened steel + carbonitriding + interchangeability   | ETA-          | -   |                     |         |                   | KE            |
| ECO Top series (ETA steel + Optimised inner geometry) + interchangeability   | ECO-          | -   |                     |         |                   | KE            |
| NTN Fine Austenite Strengthening Treatment   | FA-           | -   | -                   | -       | -                 | -             |
| <b>EXECUTION</b>   |               |     |                     |         |                   |               |
| Flanged outer ring (metric series)   | FL            | -   |                     |         | Suffix "R"        |               |
| HL- treatment for rollers, for improved lubrication  | HL-           | -   | -                   | -       | -                 | -             |
| <b>HEAT STABILISATION</b>  |               |     |                     |         |                   |               |
| Heat stabilisation up to 160 °C for rings and rollers  | TS2-          | -   | -                   | -       | -                 | -             |
| Heat stabilisation up to 160 °C for inner and outer ring   | 2TS2-         | -   | -                   | -       | -                 | -             |
| Heat stabilisation up to 200 °C for rings and rollers  | TS3-          | -   |                     | S1      | S1                | S1            |
| Heat stabilisation up to 200 °C for inner and outer ring   | 2TS3-         | -   |                     | -       | -                 | -             |
| Heat stabilisation up to 250 °C for rings and rollers  | TS4-          | -   |                     | S2      | S2                | S2            |
| <b>DESIGNATION</b>   |               |     |                     |         |                   |               |
| Single row tapered roller bearing with special dimensions  | CR            | -   | -                   | -       | -                 | -             |
| Double row tapered roller bearing with special dimensions, back-to-back arrangement  | CRI           | -   |                     |         |                   |               |
| Four row tapered roller bearing  | CRO           | -   |                     |         |                   |               |
| Sealed four-row tapered roller bearing for roll-necks rolling mill, ULTAGE™ range  | CROU...<br>LL | -   |                     |         |                   |               |
| Thrust tapered roller bearing  | CRT           | -   | T, TT               |         |                   |               |
| "J-Line metric series, according to ABMA standard. Can be used with all others ABMA prefixes (EL, EH, H, HH, HM, M, LM, L, LL)." | J             | J   | J                   | KJ      | J                 | J             |
| Extra Light series (according to ABMA)   | EL            | EL  | EL                  | KEL     | EL                | EL            |
| Lighter than Light series (according to ABMA)  | LL            | LL  | LL                  | KLL     | LL                | LL            |
| Light series (according to ABMA)   | L             | L   | L                   | KL      | L                 | L             |
| Light Medium series (according to ABMA)  | LM            | LM  | LM                  | KLM     | LM                | LM            |
| Medium series (according to ABMA)  | M             | M   | M                   | KM      | M                 | M             |
| Heavy series (according to ABMA)   | H             | H   | H                   | KH      | H                 | H             |
| Heavy Medium series (according to ABMA)  | HM            | HM  | HM                  | KHM     | HM                | HM            |
| Heavier than Heavy series (according to ABMA)  | HH            | HH  | HH                  | KHH     | HH                | HH            |
| Extra Heavy series (according to ABMA)   | EH            | EH  | EH                  | KEH     | EH                | EH            |
| T7FC metric series (according to ISO355)   | T7FC...       | -   | JW...49/<br>JW...10 | T7FC... | T7FC...           | T7FC...       |
| T4CB metric series (according to ISO355)   | T4CB...       | -   | JP...49/<br>JP...10 | T4CB... | T4CB...           | T4CB...       |
| T2EE metric series (according to ISO355)   | T2EE..        | -   | JF...49/<br>JF...10 | T2EE..  | T2EE..            | T2EE..        |

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

| SUFFIXES   | NTN           | SNR | TIMKEN     | FAG       | SKF                | KOYO<br>JTEKT    |
|--|---------------|-----|------------|-----------|--------------------|------------------|
| <b>MATERIAL</b>  |               |     |            |           |                    |                  |
| Bore diameter deviation from standard type (inch)  | A             | A   | A          |           |                    | A                |
| Deviating dimensions, for width or radius versus standard type (inch)                          | AS            | AS  | AS         |           |                    |                  |
| <b>Flanged outer ring (inch series)</b>  | B             | -   | B          |           |                    | B                |
| Change of internal construction  | CA            | -   | CA         |           |                    |                  |
| Steeper contact angle for 323xx series (only for metric dimensions)                            | C             | -   | B          | B         | B                  | C                |
| Average axial clearance of xxx μm (for double row tapered roller bearings)                     | CSxxx         | -   |            | Axxx-xxx  | Cxxx               | CSxxx            |
| Double outer ring (cup) with groove & oil holes. One hole counter-bored for locking pin        | CD            | -   | CD         |           |                    |                  |
| Steeper contact angle (European series 313xx = Japanese series 303xxD)                         | D             | -   | 313xx      | 313xx     | 313xx              | D                |
| Double inner ring (cone) or double outer ring (cup)  | D             | -   | D          | D         | D                  | D                |
| Lubricating holes on spacer  | D1            | -   |            |           |                    |                  |
| Raceways with optimised profile for heavy loads  | EW            | -   | -          | -         | -                  | -                |
| Matched bearings in "O" arrangement (back to back)   | DB            | DB  | DB         | DB        | /DB                |                  |
| Matched bearings in "X" arrangement (face to face)   | DF            | DF  | DF         | DF        | /DF                |                  |
| Tandem arrangement   | DT            | DT  |            | DT        | /DT                |                  |
| Double cup with centering hole, without lubrication groove                                     | DC            | -   | DC         |           | DC                 |                  |
| Double inner ring (cone) or double outer ring (cup) with lubrication groove and keyway or slot | DW            | -   | DW         |           |                    |                  |
| Only inner ring (cone), for metric   | -G            | -   | Prefix "X" |           |                    |                  |
| Only outer ring (cup), for metric  | #G            | -   | Prefix "Y" |           |                    |                  |
| Seal on inner ring (cone)  | L             | -   | LA, LB     |           | Designation "JK0S" |                  |
| Tolerance class 6X   | P6X           | P6X | 6X         | P6X       | CLN                | 6X               |
| Tolerance class K (ABMA, J inch series, inch series)   | PK            | -   |            | Prefix K  |                    | PK               |
| Special tolerance  | PX1, PX2,...  | -   | -          | -         | -                  | -                |
| Non-interchangeable with bearings of the same basic p/n, for metric series                     | R             | -   | R          |           |                    |                  |
| Non-interchangeable with bearings of the same basic p/n, for inch series                       | S             | -   | S          |           |                    | S                |
| Specification for quick adjustment of the preload  | SA            | -   | -          | -         | -                  | -                |
| Low torque specification   | ST            | -   |            | QCL7C     |                    | LFT              |
| Double inner ring (double cone) with tapered bore  | TD            | -   | TD         |           |                    |                  |
| Double outer ring (double cup) with tapered outer diameter                                     | TD            | -   | DT         |           |                    |                  |
| Polyamide cage   | T2            | -   | F          | TVP / TVH | TN9                |                  |
| Through-hardened steel SUJ2/100Cr6 + interchangeability (according to ISO355)                  | U             | A   | M          |           |                    | J, JR            |
| ULTAGE™ execution  | UTG           | -   | -          | Explorer  | XL (X-Life)        | -                |
| Special chamfer (n = serial number)  | X1, X2, Xn... | -   | -          | -         | -                  | YA1, YA2, YAn... |
| <b>Special specification</b>   | V1, V2, Vn    | -   | -          | -         | -                  | -                |
| Special groove in the inner ring (for double row tapered roller bearings)                      | W6            | -   | DGW        |           | G                  | SG               |
| Bearing dimensions according to ISO  | X             | -   | X          | X         | X                  | J, JR            |

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.







# SPHERICAL ROLLER BEARINGS



By offering you the most extensive range of spherical roller bearings on the market, we can now fulfill the needs of all your applications. Working in our modern factories in Europe and Japan, our experts design and manufacture bearings with bores from 25 to 1400 mm.

Our new catalogue presents our full product range, including our exclusive KIZEI®.

The quality of the selected materials, our high manufacturing standards and our unique designs deliver the highest level of performance.

**An unrivalled extensive product range!**

**NTN®**

# NTN and SNR - Spherical roller bearings

Spherical roller bearings are engineered to offer excellent resistance to high temperatures and loads, meaning that they are capable of withstanding the harshest applications:

- Misalignment
- Shock & vibration
- Pollution
- Performance and wear resistance

A wide range of spherical roller bearings is available, offering the best performances on the market.



## Benefits

**+24%**  
LOAD  
CAPACITY

**x2**  
SERVICE  
LIFE

**+20%**  
SPEED  
LIMITS

Less downtime,  
more profit!

### High quality material

- High quality grade steel – excellent inclusion property

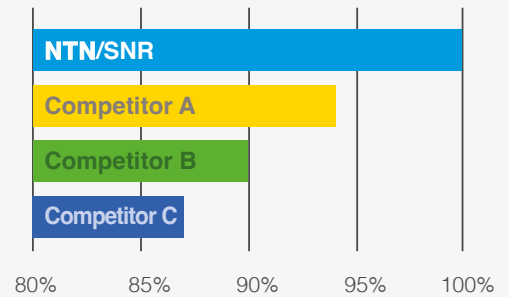
### Mastery of heat treatment

- Better wear resistance
- Dimensional stability up to 200°C

### Internal design

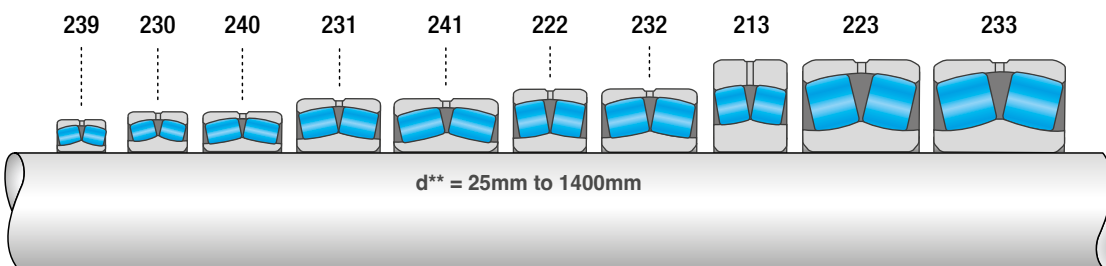
- Optimised number and geometry of rollers
- Improved surface roughness
- Surface treated cages

Market dynamic load (%)



Study carried out in 2021, based on the 3 main European market player catalogues

## Range overview



\* NTN W33 design and SNR design vs conventional design

\*\* d = bore diameter

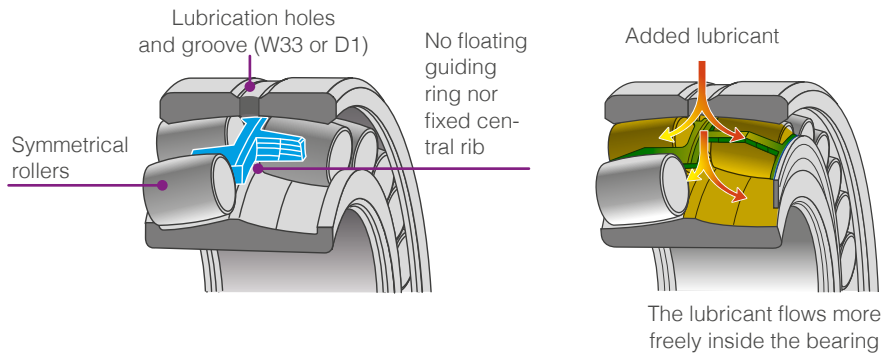
## Technical features

55% of bearing failures are due to lubrication defects, meaning that lubrication plays a major role in ensuring peak performance.

NTN

SNR

### E DESIGN TYPE

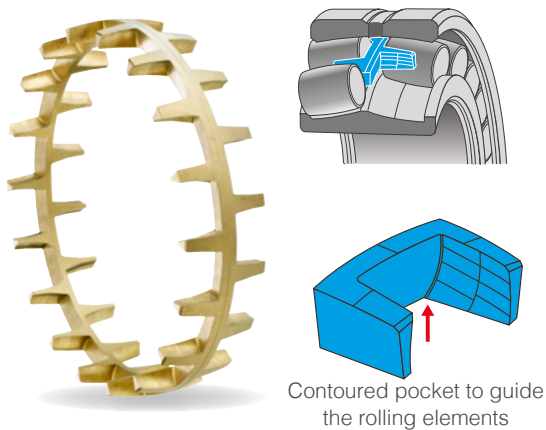


An improved design for better lubrication

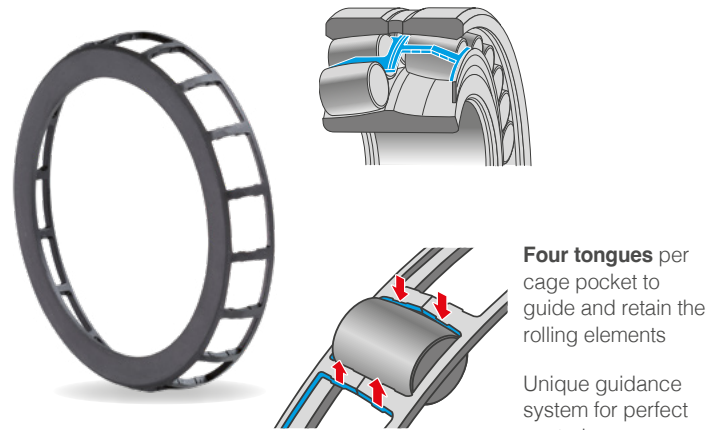
- **No central shoulder section:** higher volume available and lubricant can flow more freely, meaning all parts are constantly lubricated
- **Wider lubrication holes and grooves:** design feature simplifies maintenance and relubrication
- **Improved cage materials and design**

### E CAGE DESIGNS

Optimised guidance precision for kinematic property maximisation



EM – Machined solid brass cage



EA – Drawn steel cage

This successful design eliminates the need for a central guide ring, offering you many advantages:

- Less friction and heating in service
- Increased rigidity and stability of the assembly
- Longer life





# SNR - EF800 series for high-vibration applications

The EF800 series is equipped with a solid brass cage and is particularly recommended for use in heavy-duty applications and vibration systems.



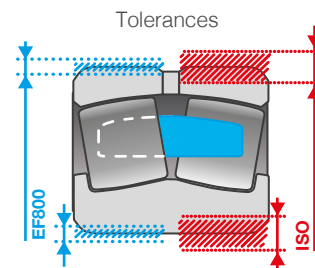
Enhanced efficiency of your screeners!

## Benefits

- Increased service life
- Wider maintenance intervals
- Greater operational profitability

## Technical features

- Bearing with symmetrical rollers and machined brass one-piece cage centred on the rolling elements
- No floating guide ring or fixed central shoulder section to avoid any risk of a cage/ring seizure in the event of thermal expansion
- Special tolerances for the outer diameter and bore
- Reduced internal radial clearance: The C4 internal clearance of the EF800 series is reduced to 2/3 of the standard C4 internal clearance in order to obtain improved running properties during operation.



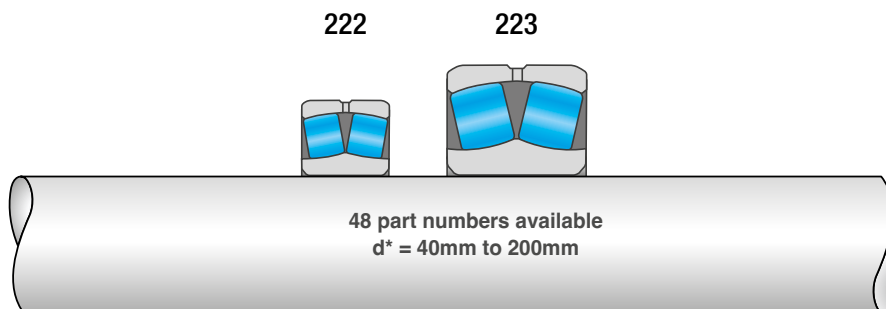
Reduced bore tolerances for cylindrical, tapered and for the outer diameters compared with tolerance ranges of standard series, guaranteeing perfect ring adjustment.

| Clearance       | 22220   |         | Clearance in microns |     |     |     |     |     |     |     |     |     |     |     |  |
|-----------------|---------|---------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|                 | Minimum | Maximum | 130                  | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 |  |
| C4              | 135     | 180     |                      |     |     |     |     |     |     |     |     |     |     |     |  |
| Clearance EF800 | 150     | 180     |                      |     |     |     |     |     |     |     |     |     |     |     |  |

EF800 series = C4 with reduced tolerance  
E.g. EF800 clearance value compared to the clearance value of group C4

## Range overview

Further dimensions are possible upon request.

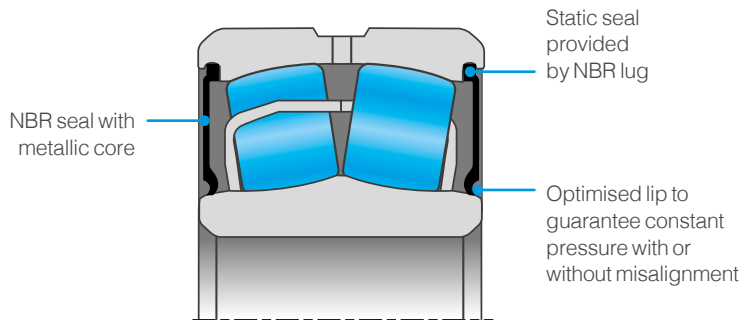


\*d = bore diameter



# SNR - Sealed spherical roller bearings

To prevent contamination if bearings are used in hostile environments, such as outdoors or in dusty conditions, you are advised to use sealed bearings.

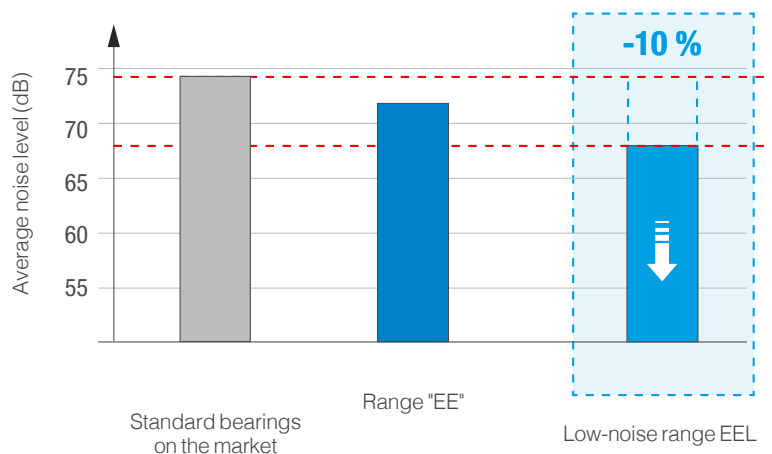


Seals have been tested under the most extreme conditions to guarantee their reliability and performance for your applications

## Benefits

- Increased service life
- Wider maintenance intervals
- Greater operational profitability
- Environment protection
- Same load ratings as open spherical roller bearings
- Identical internal design to the open bearings with the EA design
- Non-ISO width with a minimal increase in order to integrate seals, "10X" prefix and the suffix "EE"
- Specially designed NBR seal to guarantee impermeability by means of constant contact pressure of the lip, even in the event of misalignment
- Pre-filled bearing with a quantity and quality of lubricant suited to high loads; no relubrication is required for applications below 70°C

## Optionally also available in the low-noise version ("-EEL")

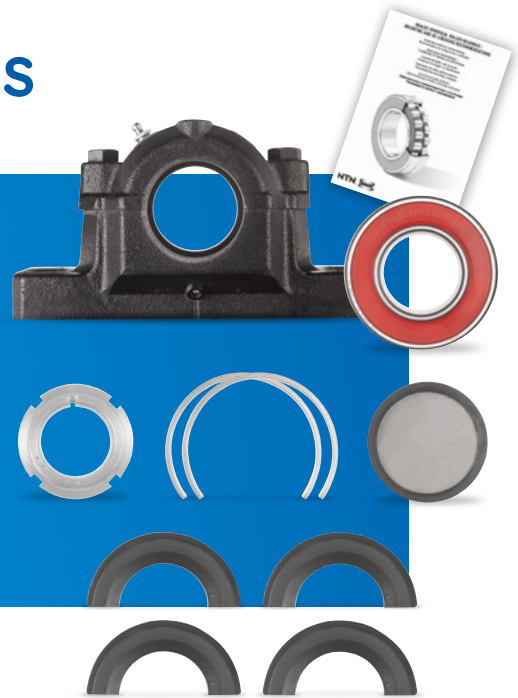


The Low Noise grade significantly reduces the bearing's acoustic impact



**ALL-IN-ONE,**  
make your life easier!

**Choose the Spherical  
Roller Bearing KITS**



## Peace of mind

### Offering you an optimal level of service

- **Only one** reference to order (to manage) instead of several
- Kits are composed of specific components to avoid the risk of errors and omissions
- **Fixed or floating** mounting are possible with 1 KIT reference
- Maintenance people **save time** looking for required components. One storage place in the warehouse

## Productivity

### Improve the performance of your activity

- Economic gain: KIT **cheaper** than retail components
- Sealed spherical bearing KITS: **ECO Friendly!** (vs a standard open bearing)
  - Reduced grease consumption
  - Maintenance interval increased by 3
  - Service life extended by 3

## Have a look at our KIT brochure

- Find all range references and component detail
- Multi-market application examples which benefit from kits





# [KIZEI]<sup>®</sup>

## ISO SPHERICAL ROLLER BEARING WITH SHIELDS



**NTN** is launching an unprecedented solution to extend your bearing service life time! A bearing protected by steel shields on both sides, KIZEI<sup>®</sup> is 100% interchangeable with standard open spherical roller bearings thanks to ISO dimensions. Mounting elements and procedures are identical to that of a standard bearing. This exclusive **SNR** product will dramatically reduce your maintenance costs and improve your equipment reliability!

**Armoured to face the dirt!**



Brand of **NTN** corporation





# SNR - KIZEI® Spherical roller bearings



## THE FIRST SPHERICAL ROLLER BEARING WITH METALLIC SHIELDS

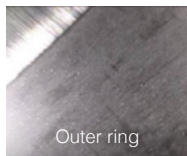
NTN Europe's R&D department has pioneered an unprecedented solution to increase the service life of your spherical roller bearings.



### Benefits

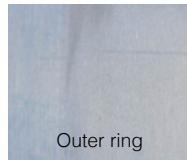
#### Improved production performance with longer service life

**INITIAL BEARING**  
1,100 hours in service



Outer ring

**[KIZEI]®**  
**2,200 hours in service**



Outer ring



**Less deterioration** to the bearing after a service life lasting **twice as long**

#### • Reduced maintenance costs

|                     | Open spherical roller bearing | [KIZEI]      |
|---------------------|-------------------------------|--------------|
| Life duration       | 1 month                       | 3 months     |
| Production downtime | 12 times/year                 | 4 times/year |
| Maintenance costs   | 100                           | 30           |



**Maintenance costs can be reduced by a factor of 3**

#### • Easy to use

##### ISO dimensions



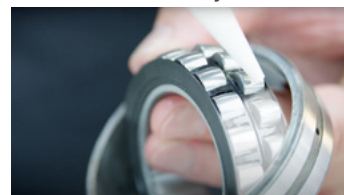
- Same dimensions as an open spherical roller bearing

##### Easy mounting process



- Standard accessories
- Possible clearance measurement of K bores

##### Regreasing frequency divided by 3



- Compared to an open spherical bearing

### Range overview and designations

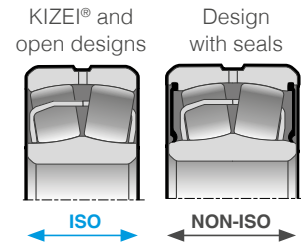
- 60 part numbers available
  - d = 40mm to 140mm
  - From 22208 to 22228
  - Tapered "K" or cylindrical bores
  - Internal radial clearance CN or C3
- Further dimensions and clearances are possible upon request

**DESIGNATION**

**22208EAKW33ZZ**

## Technical features

- **Same load ratings and speed limits** as open spherical roller bearings
- **ISO dimensions:** 100% interchangeable with an open spherical roller bearing
- **Premium quality nitrided steel plate cage and shields**  
Maximised shock and optimised corrosion resistance
- **Extensive range of operating temperatures** from -40°C to +200°C  
Dimensional stability up to +200°C
- **KIZEI® is supplied ungreased:** the initial lubrication process is similar to an open spherical roller bearing; 30% of the free volume must be filled with the appropriate grease. The bearing can be lubricated while in service via the dedicated holes and grooves on the outer ring
- **Optimal misalignment**
- **Internal inspection possible** for easier maintenance
- **Easy mounting process:** no special tools are required and the clearance can be checked after mounting



## The widest range on the market

|                          | OPEN            | [KIZEI]         | SEALED          |
|--------------------------|-----------------|-----------------|-----------------|
| Dimensions               | ISO             | ISO             | Special         |
| Protection               | 0               | +*              | ++              |
| Grease retention         | 0               | +               | ++              |
| Temperature range        | -40°C to +200°C | -40°C to +200°C | -10°C to +120°C |
| Limiting speed           | ++              | ++              | +               |
| Load capacity            | +++             | +++             | +++             |
| Clearance inspection     | Yes             | Yes             | No              |
| Internal control         | Yes             | Yes             | No              |
| Sleeve and nut           | Standard        | Standard        | Special         |
| Supplied already greased | No              | No              | Yes             |

\*Valid against solid contamination - Not suitable for liquids





# NTN and SNR - Thrust spherical roller bearings

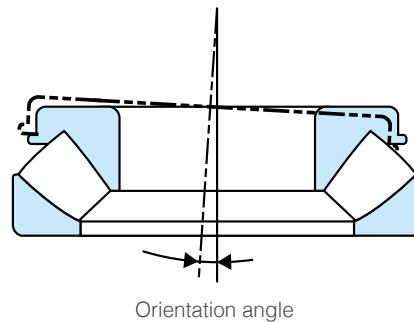
Thrust spherical roller bearings are intended for heavy applications, generating large axial loads: injection presses, cranes, pumps, mines, quarries, turbines and equipment for energy.



## Technical features

- ISO dimensions: 100% interchangeable
- Drawn steel cage
- Optimised number and geometry of rollers
- Accept radial load up to 50% of axial load
- Maximum misalignment up to 2%

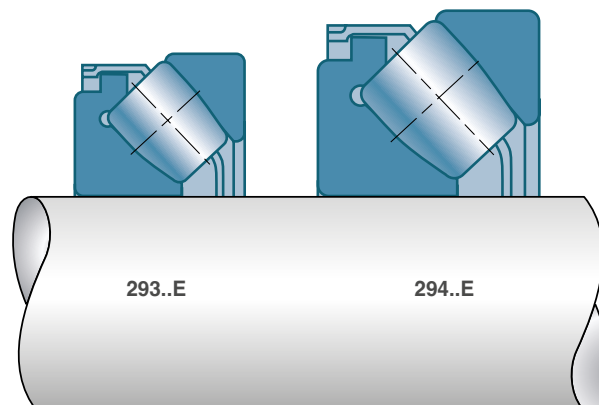
Allowable misalignments



**Lubrication:** thrust spherical roller bearings are usually heavily loaded and must be lubricated with oil. Due to the internal construction of these bearings, grease lubrication is only possible at low speeds and with limited loads.

## Range overview

Thrust spherical roller bearings with drawn steel cage.



# Interchange table, prefixes & suffixes

NTN

SNR

| PREFIXES                                       | NTN/SNR | SKF | FAG | TIMKEN |
|--|---------|-----|-----|--------|
| Non-ISO ring width for LL sealed version (NTN) | WA      | BS2 | WS2 |        |
| Non-ISO ring width for EE sealed version (SNR) | 10X     | BS2 | WS2 |        |

| SUFFIXES INTERNAL CONSTRUCTION / CAGE DESIGN   | NTN/SNR     | SKF              | FAG                       | TIMKEN    |
|--|-------------|------------------|---------------------------|-----------|
| <b>DESIGN</b>  |             |                  |                           |           |
| Increased capacity design, symmetrical rollers   | E DESIGN    | E "EXPLORER"     | E1 "X-LIFE"               | E         |
| Standard internal design, symmetrical rollers  | V           |                  |                           | C, VSC, Y |
| Optimised internal design, asymmetrical rollers  | B           |                  |                           |           |
| <b>CAGE</b>  |             |                  |                           |           |
| Drawn steel cage, inner ring guided  | A           | No suffix, C, CC | No suffix, BE             | EJ        |
| KIZEI® range: Nitrided metal shields on both sides of the bearing  | ZZ          |                  |                           |           |
| One-piece machined brass cage centered on rollers  | M           | CA, CAC          | E1A, BEA, B-MB, M, MA, MB | EM        |
| One-piece machined brass cage centered on rollers, for high vibration applications, special C4 / C3 internal clearance | F800 / F801 | VA405            | T41A, T41D                | W800      |
| Two glass fibre-reinforced polyamide cages   | G15         |                  | TVPB (BI)                 |           |
| Asymmetrical rollers, two solid machined brass cages centered on inner ring  | L1          | CA, CAC          | E1A, BEA, B-MB, M, MA, MB | EM        |
| Solid steel cage. Inner ring guided  | F1          |                  |                           |           |
| <b>SEALING</b>   |             |                  |                           |           |
| Reinforced seal properties (NBR) on both sides of the bearing. 30% grease-filled (SNR)                                 | EE          | 2CS, 2RS         | 2RSR                      |           |
| Low-noise version (EE sealed parts only)   | L           |                  |                           |           |
| Reinforced seal properties (NBR) on both sides of the bearing (NTN)  | LLS         | 2CS, 2RS         | 2RSR                      |           |
| <b>GROOVE AND HOLES</b>  |             |                  |                           |           |
| Lubrication groove and holes on the outer ring   | D1 / W33    | No suffix, W33   | No suffix, S              | W33       |
| Lubrication holes on inner ring (no re-greasing groove)  | W34         | W26              | HA40AB                    | W94       |
| Groove for stop segment on outer ring  | N           |                  |                           |           |
| <b>SUFFIXES BORE TYPE</b>  |             |                  |                           |           |
| Cylindrical bore (No suffix)   | -           | -                | -                         | -         |
| Tapered bore / taper 1:12  | K           | K                | K                         | K         |
| Tapered bore / taper 1:30  | K30         | K30              | K30                       | K30       |

| SUFFIXES BEARING CLEARANCE / TOLERANCES | NTN/SNR | SKF | FAG   | TIMKEN |
|---|---------|-----|-------|--------|
| Clearance < C2                          | C1      |     |       |        |
| Clearance < standard                    | C2      | C2  | C2    | C2     |
| Standard clearance (No suffix)          | CN      | CN  | CN    | CN     |
| Clearance > standard                    | C3      | C3  | C3    | C3     |
| Clearance > C3                          | C4      | C4  | C4    | C4     |
| Clearance > C4                          | C5      | C5  | C5    | C5     |
| Special clearance                       | CSxx    |     |       |        |
| P5 rotation precision                   | P5      | P5  | P5    | P5     |
| P6 rotation precision                   | P6      | P6  | P6    | P6     |
| P5 rotation precision between IR / OR   | PX50    | C08 | T52BW | C08    |

## Conversion table – Thrust Spherical Roller Bearings

| TYPE OF BEARING  | Technical Specification   | NTN/SNR   | FAG       | SKF           | NSK       |
|--|---------------------------|-----------|-----------|---------------|-----------|
| Thrust spherical roller bearings<br>Series 29300-29400 | Drawn steel cage          | No suffix | No suffix | E, EF         | No suffix |
|  | Massive brass cage        | -         | MB        | No suffix, EM | M         |
|  | Increased capacity design | E         | E1        | E             | E         |

SKF "Explorer", FAG "X-life" and NSK "HPS" bearings are trademarks registered by their respective companies

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.



# NEEDLE ROLLER BEARINGS

# THE RANGE **MADE IN JAPAN** PREMIUM QUALITY AT YOUR DOOR



## NEEDLE ROLLER BEARINGS

NTN provides the widest range of solutions to meet your requirements for needle roller bearings. Premium steel, sturdy design and Japanese manufacturing guarantee optimum reliability and service life. Because our European logistic and technical support teams are close to you, they can provide you with enhanced reactivity.

**With its available and competitive wide range, NTN concentrates all its energy on its key concern: you!**

# NTN®



# NTN - Needle roller bearings

Needle roller bearings are compact bearing solutions, with various designs, able to support very high radial load in a reduced envelope.

## Benefits

- High radial rigidity
- Low inertia
- Suitable for oscillating movements
- Easy mounting
- Cost competitive technology
- Compact dimensions
- High load capacity

## Advantages

- Comprehensive range of needle roller bearings, thrust needle and roller bearings, cam and roller followers and individual parts
- More than 50 years of experience for design and manufacturing
- Undisputed market leadership in Japan and No. 2 worldwide for industrial applications
- > 80% coverage of the market leader's range
- Many well-known references from the automotive and industrial sectors rely on **NTN's** needle roller bearing range
- Metric and inch needle roller bearings from one supplier: > 2,300 p/n inside the public price list
- Over 320 million bearings produced every year



## DID YOU KNOW?

What is the definition of a needle?  
 A needle is a roller that fulfils the 2 following conditions:  
 An outer diameter  $D_w < 5 \text{ mm}$   
 A ratio "Length  $L_w$  / Diameter  $D_w$ " between 3 and 10.



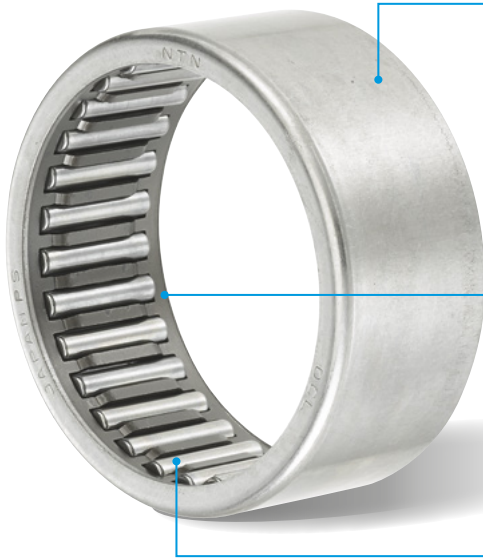
$$3 \leq \frac{L_w}{D_w} \leq 10$$

A step ahead  
with quality





## Focus on “HK-F” new generation drawn cup



### OUTER RING

#### Carburised Chrome Molybdenum steel

Higher hardness ▶ higher static loads (So<sub>2</sub>, was So<sub>3</sub>)

**Redesigned ribs** ▶ improved oil flow inside bearing

#### Optimal outer ring shape (chamfer and surface)

▶ smooth press fitting inside the housing

### CAGE

#### V-form of the cage

Improved oil flow inside and better stability ▶ increased reliability

#### Case hardened and tempered or soft nitrided

Reduction of wear ▶ increased reliability

### NEEDLES

#### Special heat treatment

Special carbonitriding ▶ proven extended service life

#### Optimised crowning

Better distribution of contact stresses ▶ extended service life

## Designations

**HK1512 F M**

HK-F TYPE

PRE-BENT PROCESS



### ENHANCED MANUFACTURING PROCESS

#### No deformation of the outer ring after heat treatment

(« Pre-bent » process, with additional « M » suffix)

▶ both sides could be used for mounting

### CUSTOMER BENEFITS

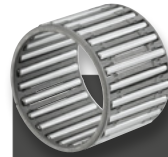
- Improved lifetime: 3x longer
- Higher static loads (with lower So): 1.5x greater
- Easier mounting

# Interchange tables



## DRAWN CUP NEEDLE ROLLER BEARINGS

|        | NTN       | INA     | IKO     | SKF     | KOYO     | NADELLA |
|--------|-----------|---------|---------|---------|----------|---------|
| metric | HK        | HK      | TLA...Z | HK      | BTM      | HK      |
|        | HK..T2    | HK..TV  |         |         | BFNM     | HK..TN  |
|        | HK..L     | HK..RS  |         | HK..RS  | BTM..U   | HK..RS  |
|        | HK..LL    | HK..2RS | TLA..UU | HK..2RS | BTM..UU  | HK..2RS |
|        | HK..ZWD   | HK..ZW  | TLAW..Z | HK..ZW  |          |         |
|        | HK..D     | HK..AS1 |         |         | BTM..OH  |         |
|        | HMK       |         | TAW..Z  |         | BHTM     |         |
|        | HMK..L    |         | w       |         | BHTM..U  |         |
|        | HMK..L/LL |         |         |         | BHTM..UU |         |
|        | HMK..ZWD  |         | TAW..Z  |         |          |         |
|        | HKS       |         | TA..Z   |         |          |         |
|        | HCK       |         | TAW     |         |          |         |
|        | BK        | BK      | TLAM    | BK      | MKM      | BK      |
|        | BK..T2    | BK..TV  |         | BK..TN  |          |         |
|        | BK..L     | BK..RS  |         |         |          | BK..RS  |
|        | BK..ZWD   | BK..ZW  | TLAMW   |         |          |         |
|        | BKS       |         | TAM     |         |          |         |



## NEEDLE ROLLER AND CAGE ASSEMBLIES

|        | NTN    | INA   | IKO | SKF   | KOYO         | NADELLA |
|--------|--------|-------|-----|-------|--------------|---------|
| metric | K      | K     | KT  | K     | K, RS..R, RP | K       |
|        | K..T2  | K..TV | KTN | K..TN | K..TN        |         |
|        | K..ZW  | K..ZW | KTW | K..ZW | K..ZW        | K..ZW   |
|        | KMJ    |       |     |       | V.VS, RV     |         |
|        | KMJ..S |       |     |       |              |         |
|        | KJ..S  |       |     |       |              |         |
| inch   | GK     |       |     |       | RFNU         |         |
|        | PCJ    | C     |     |       | WJ, WJC      |         |



## NEEDLE ROLLER BEARINGS WITH SOLID RINGS

|        | NTN               | INA         | IKO       | SKF        | KOYO  | NADELLA  |  |
|--------|-------------------|-------------|-----------|------------|-------|----------|--|
| metric | NK..NK..R         | NK          | TAF       | NK         | NQ,NK | NK       |  |
|        | NK..T2            | NK..TV      |           | NK..TN     |       |          |  |
|        | NK+1R, NK..R+1R   | NKI         | TRI/TAFI  | NKI        | NQI   |          |  |
|        | NKS+IR            | NKIS        |           | NKIS       |       |          |  |
|        | NK..T2+1R         | NK1..TV     |           | NK1..TN    | NQI   |          |  |
|        | RNA48             | RNA48       | RNA48     | RNA48      |       | RNA1000  |  |
|        | NKS               | NKS         | TR        | NKS        | NQS   | NKS      |  |
|        | NKZ               |             | TR        |            |       |          |  |
|        | RNA49, RNA49..R   | RNA49       | RNA49     | RNA49      | RNA49 |          |  |
|        | RNA49..L          | RNA49..RSR  | RNA49..U  | RNA49..RS  |       |          |  |
|        | RNA49..LL         | RNA49..2RSR | RNA49..UU | RNA49..2RS |       |          |  |
|        | RNA59             |             |           |            | RNA59 | RNA2000  |  |
|        | RNA69, RNA69..R   | RNA69       | RNA69     | RNA69      | RNA69 | RNA22000 |  |
|        | NA48              | NA48        | NA48      | NA48       |       | NA1000   |  |
|        | NA49,NA49..R      | NA49        | NA49      | NA49       |       | NA2000   |  |
|        | NA49..L           | NA49..RSR   | NA49..U   | NA49..RS   |       |          |  |
|        | NA49..LL          | NA49..2RSR  | NA49..UU  | NA49..2RS  |       |          |  |
|        | NA59              |             |           |            |       |          |  |
|        | NA69, NA69..R     | NA69        | NA69      | NA69       |       | NA2200   |  |
|        | NA69 (double row) | NA69..ZW    |           |            |       |          |  |
|        | inch              | MR          | NCS       | BR         |       |          |  |
|        |                   | MR+MI       | NCS+PI    | BRI        |       |          |  |



## INNER RINGS

|        | NTN        | INA     | IKO | SKF     | KOYO | NADELLA |
|--------|------------|---------|-----|---------|------|---------|
| metric | 1R         | IR      | IRT | IR      | IM   | JR      |
|        | 1R..D      | IR..IS1 |     | IR..IS1 |      |         |
| inch   | MI (pouce) | PI, LR  | IRB | LR      |      |         |



## CAGE ASSEMBLY FOR CONNECTING ROD

|        | NTN   | INA | IKO     | SKF | KOYO        | NADELLA |
|--------|-------|-----|---------|-----|-------------|---------|
| metric | KBK   | KBK | KTV..EG |     | R..P, UR..P |         |
|        | KV..S |     |         |     | VP,VPS      |         |
|        | PK    | KZK | KT..EG  |     | VS..P,VE    |         |
|        | GPK   |     |         |     | RFNU        | MB      |
|        | H     |     |         |     |             |         |



## NEEDLE ROLLER BEARINGS, SEPARABLE TYPE

|        | NTN      | INA           | IKO     | SKF      | KOYO | NADELLA |
|--------|----------|---------------|---------|----------|------|---------|
| metric | RNAO     | RNAO          | RNAF    | RNAO     |      |         |
|        | RNAO..T2 | RNAO..TV      | RNAF..N | RNAO..TN |      |         |
|        | RNAO..ZW | RNAO..ZW-ASR1 | RNAFW   | RNAO     |      |         |
|        | NAO      | NAO           | NAF     | NAO      |      |         |
|        | NAO..T2  | NAO..TV       | NAF..N  | NAO..TN  |      |         |
|        | NAO..ZW  | NAO..ZW-ASR1  | NAFW    | NAO      |      |         |
|        | RNA49..S | PNA           |         | PNA      |      |         |
|        | NA49..S  |               |         |          |      |         |



## COMPLEX BEARINGS

|        | NTN        | INA        | IKO     | SKF     | KOYO | NADELLA |
|--------|------------|------------|---------|---------|------|---------|
| metric | ARN        | ZARN       |         |         |      | AXNA    |
|        | AXN        |            | IRB     |         |      | AXNB    |
|        | NKX        | NKX        | NAX     | NKX     |      |         |
|        | NKX..Z     | NKX..Z     | NAX...Z | NKX..Z  |      |         |
|        | NKX+IR     | NKXR+IR    | NAXI    |         |      |         |
|        | NKX..Z+IR  | NKXR..Z+IR | NAXI..Z |         |      |         |
|        | NKXR       | NKXR       | NBX     | NKXR    |      | RAXZ    |
|        | NKXR..Z    | NKXR..Z    | NBX...Z | NKXR..Z |      |         |
|        | NKXR..+IR  | NKXR..+IR  | NBXI    |         |      |         |
|        | NKXR..Z+IR | NKXR..Z+IR | NBXI..Z |         |      |         |
|        | NKIA59     | NKIA       | NATA59  | NKIA    |      |         |
|        | NKIB59..R  | NKIB       | NATB59  | NKIB    |      |         |

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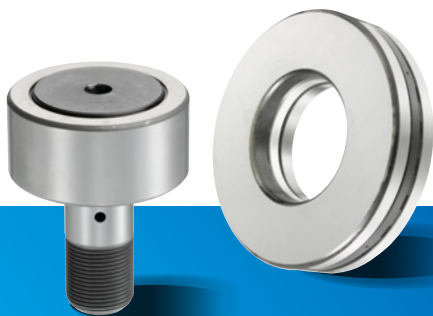
### ROLLER FOLLOWERS

|        | NTN        | INA            | IKO        | SKF         | KOYO          | NADELLA |
|--------|------------|----------------|------------|-------------|---------------|---------|
| metric | RNAB2      | RSTO           | RNAST..R   | RSTO        | RSTO          | RNA..B  |
|        | RNAB2..X   | RSTO..XX       | RNAST      |             | RSTO..DZ      |         |
|        | RNA22..LL  | RNA22..-2RSR   |            | RNA22..2RSX |               |         |
|        | RNA22..XLL | RNA22..-2RSR-X |            | RNA22..2RS  |               |         |
|        | NAB2       | STO            | NAST..R    | STO         | STO           |         |
|        | NAB2..X    | STO..X         | NAST       | STO..X      | STO..DZ       |         |
|        | NA22..LL   | NA22..-2RSR    |            | NA..2RS     | NA22..2RS     |         |
|        | NA22..XLL  | NA22..-2RSR-X  |            | NA..2RSX    |               |         |
|        | NATR       | NATR           | NART..R    | NATR        | CXM..R, NATR  |         |
|        | NATR..X    | NATR..X        | NART       | NATR..X     | CXM, NATR..DZ |         |
|        | NATR..LL   | NATR..-PP      |            | NATR..PPA   | CXM..UUR      |         |
|        | NATR..XLL  | NATR..XPP      |            | NATR..PP    | CXM..UU       |         |
| inch   | NATV       | NATV           | NART..VR   | NATV        | CYM..R        | FG      |
|        | NATV..X    | NATV..X        |            | NATV..X     | CYM           | FGL     |
|        | NATV..LL   | NATV..PP       | NART..VUUR | NATV..PPA   | CYM..UUR      | FG..EE  |
|        | NATV..XLL  | NATV..PPX      |            |             |               | FGL..EE |
|        | NUTR       | NUTR           | NURT       | NUTR        | NUTR          | FGU     |
|        | NUTR..X    | NUTR..X        | NURT..DZ   | NUTR..X     |               | FGUL    |
|        | NUTW       |                |            |             |               |         |
|        | NUTW..X    |                |            |             |               |         |
|        | NACV       | RF..Y          | CRY..VR    |             |               |         |
|        | NACV..X    | RF             | CRY..V     |             |               |         |
|        | NACV..LL   | RF..YPP        | CRY..VUUR  |             |               |         |
|        | NACV..XLL  | RF..PP         | CRY..VUU   |             |               |         |



### NEEDLE AND ROLLER THRUST BEARINGS

|        | NTN                                   | INA                                   | IKO | SKF      | KOYO    | NADELLA |  |
|--------|---------------------------------------|---------------------------------------|-----|----------|---------|---------|--|
| metric | AXK (steel)                           | AXK                                   | NTB | AXK      | TP, AXK |         |  |
|        | AXK (brass)                           | AXK                                   | NTB | AXK      | TP      |         |  |
|        | K811                                  | K811                                  | AZK | K811     | K811    |         |  |
|        | K811..T2                              | K811..-TV                             |     | K811..TN |         |         |  |
|        | K811..JW                              |                                       |     |          |         |         |  |
|        | K812                                  | K812                                  | AZK | K812     | K812    |         |  |
|        | K812..T2                              | K812..-TV                             |     | K812..TN |         |         |  |
|        | K812..JW                              |                                       |     |          |         |         |  |
|        | K874                                  | K893                                  |     | K893     |         |         |  |
|        | K893                                  | K894                                  |     | K894     |         |         |  |
|        | AS11                                  | AS                                    | AS  | AS       | W, AS   | CP      |  |
|        | WS811/<br>WS812 /<br>WS874 /<br>WS893 | WS811/<br>WS812 /<br>WS874 /<br>WS893 | WS  | WS       | WS      |         |  |
|        | GS811/GS812<br>/GS874 /<br>GS893      | GS811/GS812<br>/GS893 /<br>GS894      | GS  | GS       | GS      |         |  |
|        | 811                                   | 811                                   | AZ  | 811      | 811     |         |  |
|        | 812                                   | 812                                   |     | 812      | 812     |         |  |
|        | 874                                   | 893                                   |     | 893      |         |         |  |
|        | 893                                   | 894                                   |     | 894      |         |         |  |
|        | inch                                  | NTC                                   | TC  |          |         |         |  |
|        |                                       | NWA                                   | TWA |          |         |         |  |
|        |                                       | NWB                                   | TWB |          |         |         |  |



### CAM FOLLOWERS

|           | NTN       | INA                     | IKO        | SKF       | KOYO                | NADELLA   |
|-----------|-----------|-------------------------|------------|-----------|---------------------|-----------|
| metric    | KR        | KR                      | CF..R      | KR        | KM..R, KR           |           |
|           | KR..X     | KR..X                   | CF         | KR..X     | KM, KR..DZ          |           |
|           | KR..H     | KR..SK                  | CF..BR     | KR..SK    |                     |           |
|           | KR..XH    | KR..X, KR..SKX          | CF..B      |           |                     |           |
|           | KR..LL    | KR..PP                  | CF..UUR    | KR..PPA   | KM..UUR,<br>KR..2RS |           |
|           | KR..LLH   | KR..PP, KR..PPSK        | CF..BUUR   | KR..PPSK  |                     |           |
|           | KR..XLL   | KR..XPP                 | CF..UU     | KR..XPP   | KR..DZ, 2RS         |           |
|           | KR..XLLH  | KR..-X-PPSK             | CF..BUU    |           | KM..UU              |           |
|           | KRT       |                         | CF..RU1    |           |                     |           |
|           | KRT..X    |                         |            |           |                     |           |
|           | KRT..LL   |                         |            |           |                     |           |
|           | KRT..XLL  |                         |            |           |                     |           |
|           | KRV       | KRV                     | CF..VR     | KRV       | CM..R               | GC        |
|           | KRV..X    | KRV..X                  | CF..VR     | KRV..X    |                     | GCL       |
|           | KRV..H    |                         | CF..VBR    | KRV..SK   |                     |           |
|           | KRV..LL   | KRV..-PP                | CF..VUUR   | KRV..PPA  | CM..UUR             | GC..EE    |
|           | KRV..XLL  | KRV..XPP                | CF..VUU    | KRV..XPP  | CM..UU              | GCL..EE   |
|           | KRV..LLH  | KRV..PPSK,<br>KRV..PP   | CF..VBUUR  | KRV..PPSK |                     |           |
|           | KRV..XLLH | KRV..XPPSK,<br>KRV..XPP | CF..VBUU   |           |                     |           |
|           | KRVT      |                         |            |           |                     |           |
|           | KRVT..LL  |                         |            |           |                     |           |
|           | KRVT..XLL |                         |            |           |                     |           |
|           | KRU       |                         | CFES..R    |           |                     |           |
|           | KRU..X    |                         | CFES       |           |                     |           |
|           | KRU..LL   |                         | CFES..UUR  |           |                     |           |
|           | KRU..XLL  |                         | CFES..UU   |           |                     |           |
|           | KRVU      |                         | CFES..V    |           |                     |           |
|           | KRVU..X   |                         | CFES..VR   |           |                     |           |
|           | KRVU..XLL |                         | CFES..VUU  |           |                     |           |
|           | KRVU..LL  |                         | CFES..VUUR |           |                     |           |
|           | KRMV..XH  |                         | CFS..V     |           |                     |           |
|           | KRM..XH   |                         | CFS        |           |                     |           |
|           | KRX       |                         | CF..SFU    |           |                     |           |
|           | NUKR      | NUKR                    | NUCF..R    | NUKR      | DKM..R              | NUKR..2SK |
|           | NUKR..X   |                         |            |           | DKM..DZ             |           |
|           | NUKR..XH  |                         |            |           |                     |           |
|           | NUKRT     |                         |            |           |                     |           |
|           | NUKRT..X  |                         |            |           |                     |           |
|           | NUKRU     |                         |            |           |                     |           |
|           | NUKRU..X  |                         |            |           |                     |           |
| inch      | CR        |                         | CR..R      |           |                     |           |
|           | CR..X     |                         | CR         |           |                     |           |
|           | CR..H     |                         | CR..BR     |           |                     |           |
|           | CR..XH    |                         | CR..B      |           |                     |           |
|           | CR..LL    |                         | CR..UUR    |           |                     |           |
|           | CR..XLL   |                         | CR..UU     |           |                     |           |
|           | CR..LLH   |                         | CR..BUUR   |           |                     |           |
|           | CR..XLLH  |                         | CR..BUU    |           |                     |           |
|           | CRV       | CF                      | CR..VR     |           |                     |           |
|           | CRV..X    |                         | CR..V      |           | CR                  |           |
|           | CRV..H    |                         | CR..VBR    |           |                     |           |
|           | CRV..XH   |                         | CR..VB     |           |                     |           |
| CRV..LL   | CF..-PP   | CR..VUUR                |            |           |                     |           |
| CRV..XLL  | CF..-X-PP | CR..VUU                 |            |           |                     |           |
| CRV..LLH  |           | CR..VBUUR               |            |           |                     |           |
| CRV..XLLH |           | CR..VBUU                |            |           |                     |           |



### ACCESSORIES

|        | NTN               | INA | IKO | SKF    | KOYO | NADELLA |
|--------|-------------------|-----|-----|--------|------|---------|
| metric | <b>Needles</b>    |     |     |        |      |         |
|        | F                 | NRB | F   | RN..BF | LF   | BP      |
|        | A                 |     | A   | RN..B  | A    | BR      |
|        | <b>Snap rings</b> |     |     |        |      |         |
|        | WR                | WR  | WR  | SW     |      |         |
|        | BR                | BR  | AR  | BR     |      |         |
|        | <b>Seals</b>      |     |     |        |      |         |
|        | G                 | G   | OS  | GS     |      |         |
|        | GD                | GR  | DS  | SD     |      |         |

# Prefixes & suffixes

| PREFIX | Brand | Characteristics | Description   |
|--------|-------|-----------------|---|
| 7E-    | NTN   | Material        | Case-hardened outer ring                              |
| 8E-    | NTN   | Component       | Case-hardened cage                                    |
| 8Q-    | NTN   | Component       | Nitrided cage   |
| HL-    | NTN   | Material        | HL- treatment on needles, for an improved lubrication |

| SUFFIX        | Brand | Characteristics | Description   |
|---------------|-------|-----------------|---|
| A, B, C       | NTN   | Execution       | Modified internal construction  |
| C             | NTN   | Execution       | Special thread for cam followers, for interchangeability with European types                        |
| CT            | NTN   | Other           | Welded cage + special heat treatment of the outer ring to increase the service life                 |
| D             | NTN   | Execution       | Relubrication hole  |
| D0            | NTN   | Execution       | No relubrication hole (cam followers)   |
| D1            | NTN   | Execution       | Relubrication hole + Relubrication groove   |
| F             | NTN   | Component       | Specially reinforced cage (cam followers with or without axle)                                      |
| F             | NTN   | Component       | Increased service life (up to 3 times) and simplified assembly for drawn cup needle roller bearings |
| F1            | NTN   | Component       | Machined steel cage   |
| FM            | NTN   | Execution       | Special heat treatment of the outer ring, to increase service life                                  |
| H             | NTN   | Execution       | Hexagon socket (cam followers)  |
| J, JW         | NTN   | Component       | Special steel sheet cage  |
| L             | NTN   | Component       | One seal  |
| L1            | NTN   | Component       | Massive brass cage  |
| L3            | NTN   | Component       | Aluminium cage  |
| LL            | NTN   | Component       | 2 seals   |
| S             | NTN   | Component       | Welded steel sheet cage   |
| T2            | NTN   | Component       | Polyamide cage  |
| X1, X2, Xn... | NTN   | Execution       | Modified chamfer  |
| ZW            | NTN   | Component       | 2 rows cage   |
| /2AS          | NTN   | Component       | Shell Alvania 2 grease  |
| /3AS          | NTN   | Component       | Shell Alvania 3 grease  |
| /5K           | NTN   | Component       | Multemp SRL grease  |
| /8A           | NTN   | Component       | Alvania EP2 grease  |
| /L588         | NTN   | Component       | Pyronoc Universal N6C grease  |
| /LP03         | NTN   | Component       | Solidlub grease   |









# SOLID LUBRICATION

# Solid lubrication

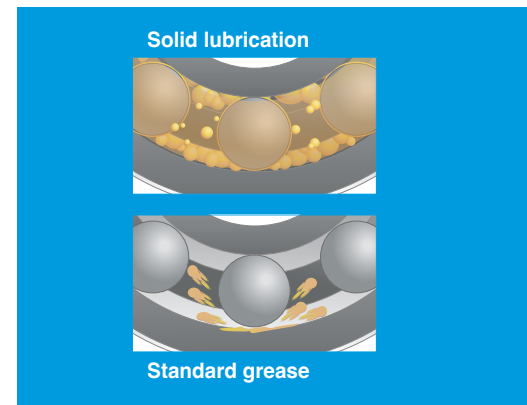
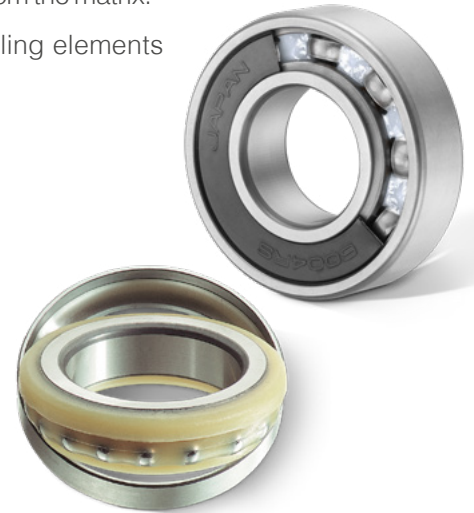
NTN

SNR

A lubrication solution, developed to provide permanent feeding of the rolling elements.

A big quantity of lubricating oil is stored inside a porous polymer matrix. Under the effect of thermal and mechanical stresses, the oil is slowly released from the matrix.

The solid consistency prevents grease ejection and feeds all rolling elements continuously.



THE STRENGTH OF A GROUP TO BENEFIT FROM THE MOST ADVANCED TECHNOLOGIES

|         | Oscillations | Centrifugation | High pollution | Speed             | High pressure washing |
|---------|--------------|----------------|----------------|-------------------|-----------------------|
| INSERTS | FULL PACK    |                | FULL PACK      | SPOT PACK*<br>NTN | FULL PACK             |
| DGBB    | FULL PACK    |                | FULL PACK      |                   | FULL PACK             |
| NRB     |              | FULL PACK      |                |                   |                       |
| SRB     |              |                |                |                   |                       |
| CRB     | FULL PACK    | FULL PACK      | FULL PACK      |                   | FULL PACK             |

**Suitable for:**

- General purposes
- Food grade (NSFH1 certification)

\*Spot pack: the matrix is filled by pockets between each rolling elements, thereby providing constant lubrication while maintaining a good level of rotation speed





# BEARING UNITS





## Self-Aligning Bearing Units

High quality and value, availability, adaptability... This is the motivation behind the development of our bearing unit range. We know that it is important to optimise your investments. Our products, which are ideally suited to your applications, have an exceptional value for money. You can rely on our extensive experience to find a solution which meets your requirements.

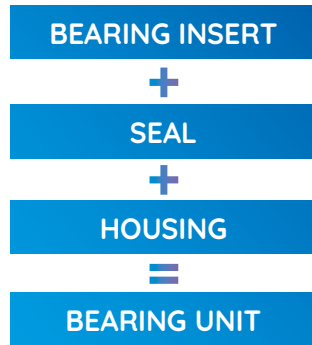
### Accessible quality



Brand of NTN corporation

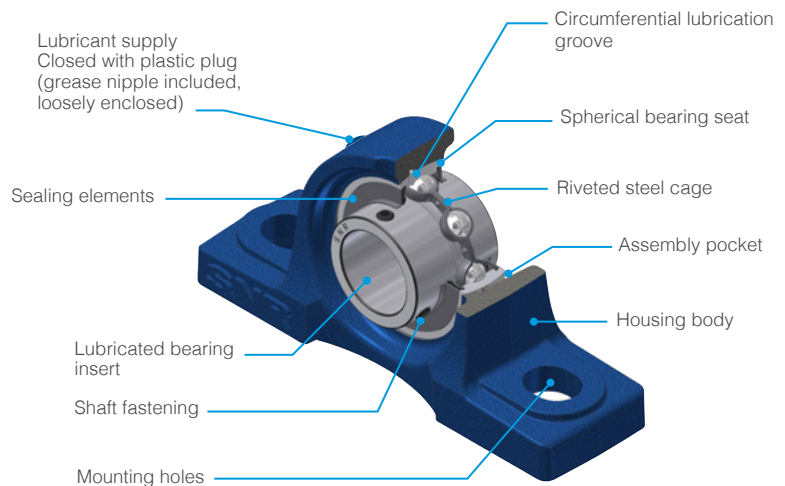
# SNR - Bearing units with cast iron housings

Sealed deep grooved ball bearing, which can be mounted to a housing by means of its spherical outer ring.



## Technical features

- Easy assembly / disassembly
- Robust design
- Universally applicable
- Lubricated and sealed for life
- Quickly ready for operation
- Cost effective
- Compensation of shaft misalignments
- Powder-coated cast iron housings



## Benefits

### One stop shop for all your bearing unit needs

- Save time and money
- Find everything that you need in our comprehensive range of quality products from JIS- and ISO- standards

### Improve your reactivity thanks to short lead times

- Control emergency situations
- A high level of product availability in our European Distribution Centre allows you to manage all situations

### Optimise the output of your machines with our complete product expertise

- Define the best suitable bearing unit combinations
- Benefit from the advice of our highly skilled engineering team for your specific applications



## EX FL 213 CCE

### BEARING INSERT

- UC..G2:** Chrome steel bearing insert with shaft fastening with socket set screws, wide design
- US..G2:** Chrome steel bearing insert with shaft fastening with socket set screws, narrow design
- EX..G2:** Chrome steel bearing insert with shaft fastening with eccentric locking collar, wide design
- ES..G2:** Chrome steel bearing insert with shaft fastening with eccentric locking collar, narrow design
- UK..G2H:** Chrome steel bearing insert with shaft fastening with adapter sleeve, wide design
- LK..G2H:** Chrome steel bearing insert with shaft fastening with adapter sleeve, narrow design
- CS:** Chrome steel bearing insert with shaft fastening with interference fit

For customised solutions, combine the cast housings with suitable bearing inserts series:  
**T20, T04, L3, L4, AGR**

### HOUSING

- PE** } Pillow block regular design
- PLE** }
- P** }
- PH:** Pillow block high design
- PAE** } Tap base pillow block
- PG** }
- PA** }
- FE** } Four-bolt flange, square design
- F** }
- FCE** } Four-bolt flange with centering rim, round design
- FC** }
- FEE** }
- FTE:** Three-bolt flange, triangular design
- FLE** } Two-bolt flange, oval design
- FL** }
- FLZ:** Two-bolt flange with centering rim, oval design
- FD:** Two-bolt flange, oval narrow design
- FAE** } Two-bolt flange with long hole for shaft adjustment, oval design
- FA** }
- FS:** Four-bolt flange with centering rim, square design
- T:** Take-up unit
- T+WB:** Take-up unit with frame
- SP:** Tensioner unit
- C:** Cartridge unit
- EHE:** Hanger unit

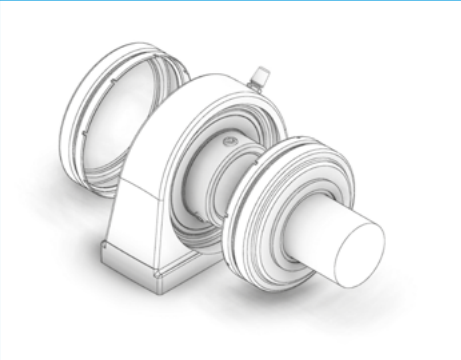
### BORE CODE

- Series 200**  
201 to 218  
(bore- Ø 12 – 90 mm)
- Series 300**  
305 to 328  
(bore- Ø 20 – 140 mm)

### PROTECTIVE COVER

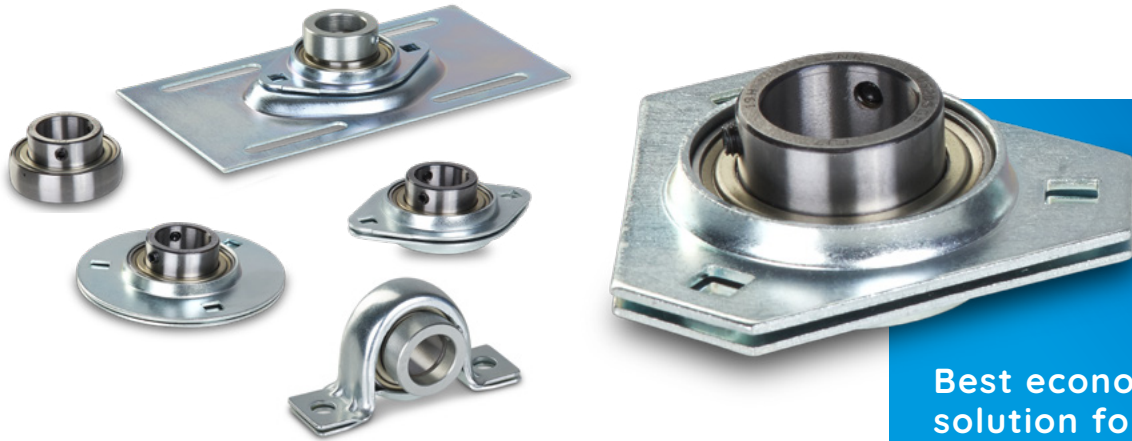
- For use with UC, US, UK, LK, CS**
- SCO:** Open cover
- SCC:** Closed cover
- For use with EX, ES**
- SCOE:** Open cover
- SCCE:** Closed cover
- Housing prepared for cover installation: **N**

The **protective covers** are fixed in housing grooves. For units that are to be fitted with protective covers, housings with suffix **N** must be ordered. Units already ordered with cover(s) are automatically delivered with grooved housings.





# SNR - Bearing units with pressed steel housings



Best economical solution for lightweight constructions

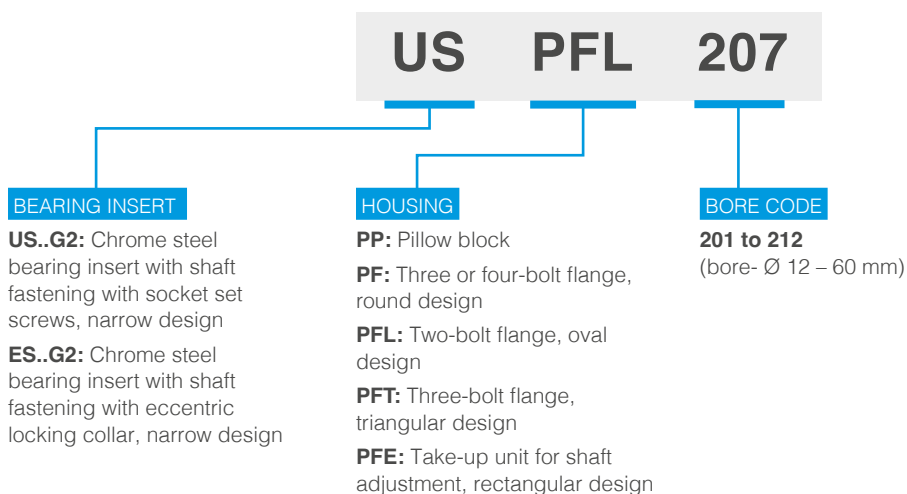
## Benefits

- Particularly used in applications where weight is a major constraint

## Technical features

- Two-piece housing made from zinc coated sheet steel
- Available as pillow block, flanged or take-up unit
- Suitable for narrow ball bearing inserts set screw type US..G2, eccentric locking collar type ES..G2 and type CS with interference fit
- Made for low to moderate loads & speeds

## Designations



# SNR - Bearing units with stainless steel housings



## Benefits

### Premium line

- Optimum performance with a strong focus on protection from oxidation, mould, bacteria and chemical cleaning agents
- High performance lubricant
- High-quality stainless steel
- Relubrication facility on all housings

### Resilient

- Excellent mount stability and impact resistance
- Recess-free housing contact surface to prevent deposits of the process material
- Designed to withstand aggressive cleaning and corrosive environments
- Open or closed protective covers from stainless steel available for all housings

### Less downtime, more profitability

- Protective covers for units provide additional protection during high pressure washdown

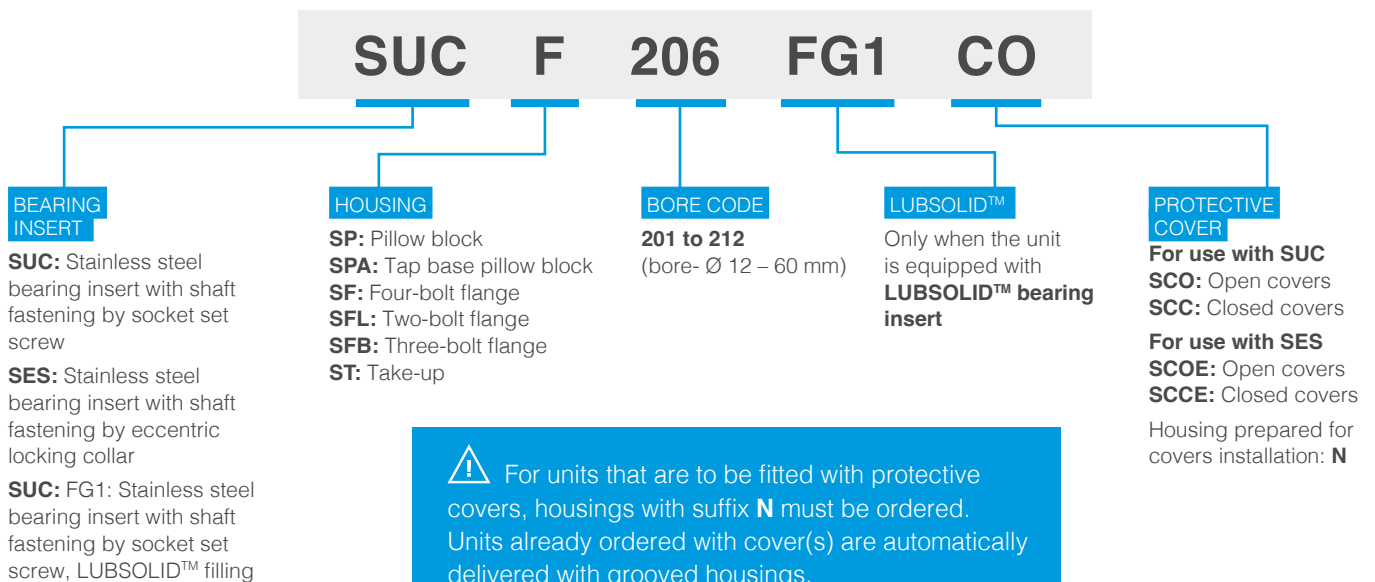
## Technical features

- 100% stainless steel resistant to corrosion: will never chip and contaminate the end product
- Food-grade seal with additional slinger (SUC)
- USDA H1 grease fully compliant with FDA regulations
- Shaft fastening by set screw or eccentric locking collar
- Metal cage
- The protective covers are fixed in housing grooves



SUITABLE FOR THE USE OF LUBSOLID™ BEARING INSERTS

## Designations





# SNR - Bearing units with thermoplastic housings



## Benefits

### Easy to clean

- Resistant to numerous chlorine-containing and corrosive cleaning solutions
- Insensitive to bacteria formation
- Recess-free housing contact surface to prevent deposits of the process material
- Protective caps for units to provide additional protection against regular wash downs
- Smooth surfaces

### Resilient

- Good friction and wear properties
- Mounting holes reinforced with metal bushings
- Equipped with bearing inserts from stainless steel

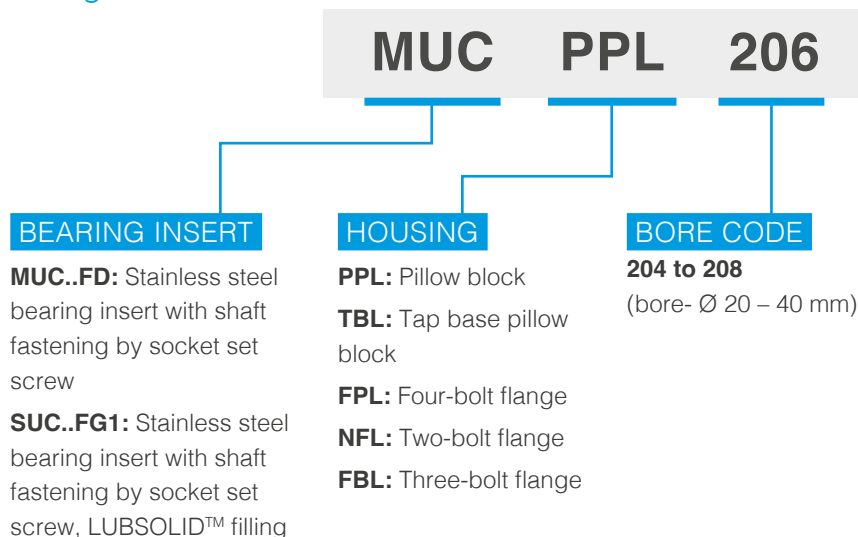
## Technical features

- 100% stainless steel bearing inserts resistant to corrosion: will never chip and contaminate the end product
- All metallic components made of high-quality stainless steel
- Food-grade seal with additional slinger
- High performance lubricant according to NSF H1
- Metal cage

## Specific features

- Relubrication facility on all housings
- Additional protection through open or closed end covers (tool-free installation)
- Can optionally be combined with food-grade solid grease bearing insert

## Designations



SUITABLE FOR THE USE OF LUBSOLID™ BEARING INSERTS



### PROTECTIVE CAP

All housings are equipped with appropriate grooves where caps can snap into place

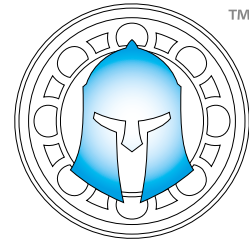
- CV:** Open cap
- CF:** Closed cap



Protective caps must be ordered separately.

# SNR - SENTINEL™ series

SNR stainless steel insert with full-pack LUBSOLID™ (FG1) as lubricant for bearing unit application (thermoplastic or stainless steel housings) is the best opportunity to mix security for food/beverage industries and sustainability for the production equipment.



**SENTINEL**  
SERIES

## Technical features

- 440C stainless steel bearing, 302 stainless steel cage and slingers
- Specific silicone seals with 302 stainless steel reinforced
- Anti-rotation pin on outer diameter
- **SNR** full-pack LUBSOLID™ (FG1), NSF approval / H1 category code
- Operating temperature: from -10°C to +80°C (100°C peak)

## Benefits

- 440C material is the best compromise between load rating capacity and corrosion resistance
- LUBSOLID™ avoid leakage even when bearings are subjected to high vibration and centrifugal force
- Compare with general-purpose food grease lubricant, solid grease is less prone to emulsification and leakage due to water penetration
- LUBSOLID™ with full-pack application confer an additional barrier against pollution



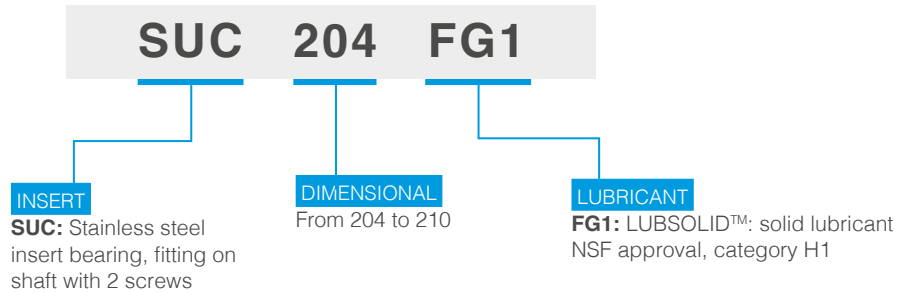




## Range overview

- Code bore P/N inserts from 204 to 210 (Shaft diameter 20 to 50 mm)
  - Thermoplastic housings: 5 designs
  - Stainless steel housings: 6 designs
- For housing information, see previous pages about stainless steel and thermoplastic bearing unit

## Designations



**SENTINEL**  
SERIES

## THE ULTIMATE SHIELD AGAINST CONTAMINATION

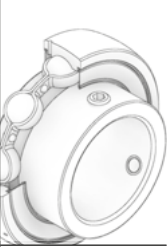
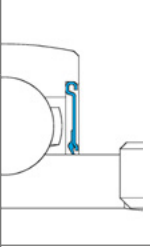

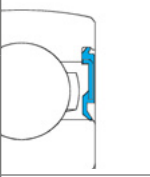
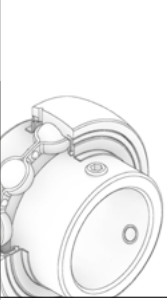
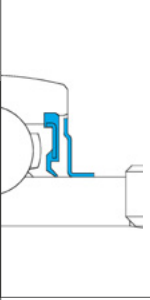

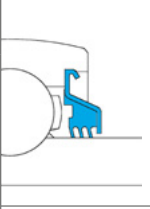

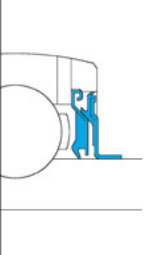

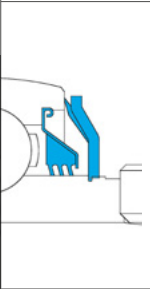


A commercial success for the past 5 years in America, the SENTINEL™ range is finally coming to Europe! A real revolution in the food-processing market, all bearing units and ball bearings in this series are sealed and equipped with solid lubrication. Resistance to water infiltration and various contaminants, elimination of grease leaks and reduced maintenance interventions make this range the perfect recipe for meeting your environmental, safety and productivity requirements.

**SENTINEL™ SERIES, the ultimate shield against contamination.**



**NTN**®

# Sealing solutions

| Seals for insert bearings   |   | References   | Technical characteristics   | Benefits   |
|---|---|--|---|--|
|    |    | <b>One-lip seal with protective edge</b><br>US..G2, US..G1N, US..G2T04, US..G2T20, CUS, ES..G2, ES..G1N, ES..G2T04, ES..G2T20, SES, CES, LK..G2H | Zinc-coated sheet steel retainer* with vulcanised seal. The axially preloaded seal lip from NBR** is located behind a protective edge.<br>* Stainless steel for SES<br>Black-oxide-coated for T20<br>** Silicon for SES and design T20  | <ul style="list-style-type: none"> <li>• Normal environmental conditions</li> <li>• Medium to high rotation speeds</li> </ul>  |
|    |    | <b>One-lip seal</b><br>CS  | Sheet steel retainer over-moulded with NBR material. Axially preloaded seal lip.  | <ul style="list-style-type: none"> <li>• Normal environmental conditions</li> <li>• Medium to high rotation speeds</li> </ul>  |
|   |   | <b>One-lip seal with slinger</b><br>UC..G2, UC..G2T04, SUC, MUC..FD, EX..G2, EX..G2T04, CEX, UK..G2H   | Zinc-coated sheet steel retainer* over-moulded with NBR and axially preloaded seal lip** + preconnected, zinc-coated sheet steel slinger* for improved protection against mechanical impacts.<br>* Stainless steel for SUC<br>** Silicon for SUC / Food grade NBR for MUC..FD   | <ul style="list-style-type: none"> <li>• Additional protection against particles</li> <li>• Medium to high rotation speeds</li> </ul>  |
|  |  | <b>Triple lip seal</b><br>UC..G2L3, EX..G2L3   | Zinc-coated sheet steel retainer with vulcanised triple lip seal. The lips from NBR are axially preloaded and angled outwards. The protective edge of the retainer serves as a safeguard against mechanical impacts.  | <ul style="list-style-type: none"> <li>• For medium to heavily polluted environments</li> <li>• Lower rotation speed</li> <li>• Higher friction</li> </ul>   |
|  |  | <b>Multiple seal system</b><br>UC..G2L4, EX..G2L4  | Two zinc-coated steel sheet elements with vulcanised seal lips from NBR. The internal retainer is equipped with a radial seal to the inner ring, while the external slinger has a radial seal to the outer ring. A third seal lip is intermediate and acts axially.   | <ul style="list-style-type: none"> <li>• For medium to heavily polluted environments</li> <li>• Medium rotation speeds</li> <li>• Lower friction</li> <li>• Suitable for pressure washing</li> </ul>                       |
|  |  | <b>High-performance seal system</b><br>UC..AGR, EX..AGR  | Zinc-coated steel sheet retainer with vulcanised triple lip seal. The lips from NBR are axially preloaded and angled outwards. The triple lip seal is completely covered by a massive steel protector. The zinc-coated impact shield is additionally equipped with a lip seal and strongly secured on a knurled seat. | <ul style="list-style-type: none"> <li>• For extremely polluted environments</li> <li>• Shock resistant</li> <li>• Low rotation speeds</li> <li>• Suitable for high-pressure washing</li> <li>• Higher friction</li> </ul> |
|  |  | <b>High temperature non-contact seal</b><br>UC..T20, EX.. T20  | Labyrinth seal from two black-oxide-coated steel sheet slinger in parallel arrangement.   | <ul style="list-style-type: none"> <li>• For high temperature use</li> <li>• Very low friction</li> </ul>  |

# Combination overview

## Cast iron housings with chrome steel bearing inserts

| BEARING INSERTS                         |  |                   |               |                   |               |          |                     | Suitable protective covers for combination with (available for shaft-Ø 12-65mm)* |                   |               |
|---|--|-------------------|---------------|-------------------|---------------|----------|---------------------|--|-------------------|---------------|
|   |  | UC2..G2 / UC3..G2 | US2..G2       | EX2..G2 / EX3..G2 | ES2..G2       | LK2..G2H | UK2..G2H / UK3..G2H | UC2..G2 / US2..G2 / LK2..G2H / UK2..G2H  | EX2..G2 / ES2..G2 |               |
| HOUSINGS                                |  |                   |               |                   |               |          |                     |  |                   |               |
| Pillow blocks                           |  | <b>PE2</b>        | UCPE2         | USPE2             | EXPE2         | ESPE2    | LKPE2+H             | UKPE2+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>PLE2</b>       | UCPLE2        | USPLE2            | EXPLE2        | ESPLE2   | LKPLE2+H            | UKPLE2+H   | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>P2 / P3</b>    | UCP2 / UCP3   | USP2              | EXP2 / EXP3   | ESP2     | LKP2+H              | UKP2+H / UKP3+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>PH2</b>        | UCPH2         | USPH2             | EXPH2         | ESPH2    | LKPH2+H             | UKPH2+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>PAE2</b>       | UCPAE2        | USPAE2            | EXPAE2        | ESPAE2   | LKPAE2+H            | UKPAE2+H   | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>PG2</b>        | UCPG2         | USPG2             | EXPG2         | ESPG2    | LKPG2+H             | UKPG2+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>PA2</b>        | UCPA2         | USPA2             | EXPA2         | ESPA2    | LKPA2+H             | UKPA2+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
| Flanged units                           |  | <b>FE2</b>        | UCFE2         | USFE2             | EXFE2         | ESFE2    | LKFE2+H             | UKFE2+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>F2 / F3</b>    | UCF2 / UCF3   | USF2              | EXF2 / EXF3   | ESF2     | LKF2+H              | UKF2+H / UKF3+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>FCE2</b>       | UCFCE2        | USFCE2            | EXFCE2        | ESFCE2   | LKFCE2+H            | UKFCE2+H   | -                 | -             |
|   |  | <b>FC2</b>        | UCFC2         | USFC2             | EXFC2         | ESFC2    | LKFC2+H             | UKFC2+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>FEE2</b>       | -             | USFEE2            | -             | ESFEE2   | -                   | -  | -                 | -             |
|   |  | <b>FTE2</b>       | -             | USFTE2            | -             | ESFTE2   | -                   | -  | -                 | -             |
|   |  | <b>FLE2</b>       | UCFLE2        | USFLE2            | EXFLE2        | ESFLE2   | LKFLE2+H            | UKFLE2+H   | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>FL2 / FL3</b>  | UCFL2 / UCFL3 | USFL2             | EXFL2 / EXFL3 | ESFL2    | LKFL2+H             | UKFL2+H / UKFL3+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>FLZ2</b>       | UCFLZ2        | USFLZ2            | EXFLZ2        | ESFLZ2   | LKFLZ2+H            | UKFLZ2+H   | -                 | -             |
|   |  | <b>FD2</b>        | -             | USFD2             | -             | ESFD2    | -                   | -  | -                 | -             |
|   |  | <b>FAE2</b>       | -             | USFAE2            | -             | ESFAE2   | -                   | -  | -                 | -             |
|   |  | <b>FA2</b>        | UCFA2         | USFA2             | EXFA2         | ESFA2    | LKFA2+H             | UKFA2+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>FS3</b>        | UCFS3         | -                 | EXFS3         | -        | -                   | UKFS3+H  | -                 | -             |
| Tensioner- / Hang up- / Cartridge Units |  | <b>T2 / T3</b>    | UCT2 / UCT3   | UST2              | EXT2 / EXT3   | EST2     | LKT2+H              | UKT2+H / UKT3+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>T2+WB</b>      | UCT2+WB       | UST2+WB           | EXT2+WB       | EST2+WB  | LKT2+H+WB           | UKT2+H+WB  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>SP2</b>        | UCSP2         | USSP2             | EXSP2         | ESSP2    | LKSP2+H             | UKSP2+H  | SCC2 / SCO2       | SCCE2 / SCOE2 |
|   |  | <b>C2 / C3</b>    | UCC2 / UCC3   | USC2              | EXC2 / EXC3   | ESC2     | LKC2+H              | UKC2+H / UKC3+H  | -                 | -             |
|   |  | <b>EHE2</b>       | UCEHE2        | USEHE2            | EXEHE2        | ESEHE2   | LKEHE2+H            | UKEHE2+H   | -                 | -             |

\* The protective covers are fixed in housing grooves. For units that are to be fitted with protective covers, housings with suffix N must be ordered. Units already ordered with cover(s) are automatically delivered with grooved housings.

## Pressed steel housings with chrome steel bearing inserts

| HOUSINGS \ BEARING INSERTS |      |         |         |
|----------------------------|------|---------|---------|
|                            |      | US2..G2 | ES2..G2 |
|                            | PP2  | USPP2   | ESPP2   |
|                            | PF2  | USPF2   | ESPF2   |
|                            | PFL2 | USPFL2  | ESPFL2  |
|                            | PFT2 | USPFT2  | ESPFT2  |
|                            | PFE2 | USPFE2  | ESPFE2  |

## Stainless steel housings with stainless steel bearing inserts

| HOUSINGS \ BEARING INSERTS |      |        |             |        | Suitable protective covers for combination with (available for shaft-Ø 12-60mm)* |               |
|----------------------------|------|--------|-------------|--------|--|---------------|
|                            |      | SUC2   | SUC2..FG1** | SES2   | SUC2 / SUC2..FG1**   | SES2          |
|                            | SP2  | SUCP2  | SUCP2..FG1  | SESP2  | SCC2 / SCO2  | SCCE2 / SCOE2 |
|                            | SPA2 | SUCPA2 | SUCPA2..FG1 | SESPA2 | SCC2 / SCO2  | SCCE2 / SCOE2 |
|                            | SF2  | SUCF2  | SUCF2..FG1  | SESF2  | SCC2 / SCO2  | SCCE2 / SCOE2 |
|                            | SFL2 | SUCFL2 | SUCFL2..FG1 | SESFL2 | SCC2 / SCO2  | SCCE2 / SCOE2 |
|                            | SFB2 | SUCFB2 | SUCFB2..FG1 | SESF2  | SCC2 / SCO2  | SCCE2 / SCOE2 |
|                            | ST2  | SUCT2  | SUCT2..FG1  | SEST2  | SCC2 / SCO2  | SCCE2 / SCOE2 |

## Thermoplastic housings with stainless steel bearing inserts

| HOUSINGS \ BEARING INSERTS |      |          |              | Suitable protective caps (available for shaft-Ø 15-40 mm) |
|----------------------------|------|----------|--------------|---|
|                            |      | MUC2..FD | SUC2..FG1**  |   |
|                            | PPL2 | MUCPPL2  | SUCPPL2..FG1 | CV2 / CF2   |
|                            | TBL2 | MUCTBL2  | SUCTBL2..FG1 | CV2 / CF2   |
|                            | FPL2 | MUCFPL2  | SUCFPL2..FG1 | CV2 / CF2   |
|                            | NFL2 | MUCNFL2  | SUCNFL2..FG1 | CV2 / CF2   |
|                            | FBL2 | MUCFBL2  | SUCFBL2..FG1 | CV2 / CF2   |

\* The protective covers are fixed in housing grooves. For units that are to be fitted with protective covers, housings with suffix N must be ordered. Units already ordered with cover(s) are automatically delivered with grooved housings.

\*\* LUBSOLID™ filling.

# Protective caps & covers

## Benefits

- Improvement of safety characteristics (safety at work)
- Protection of the bearing from external influences such as impact loads, dust, dirt or moisture ingress
- Protection against lubricant leakage (especially for covers)
- Can be used for shaft-end or through-shafts

## Stainless steel covers for bearing units series

| SUFFIX | Description  | Cover type | Suitable in combination with bearing insert type: | Design |
|--------|--|------------|---|--------|
| CC     | Bearing unit with narrow cover (closed version)                  | SCC        | Set screw, adapter sleeve, Fit                    |        |
| CO     | Bearing unit with narrow cover for metric shaft (open version)   | SCO        |   |        |
| COU    | Bearing unit with narrow cover for imperial shaft (open version) | SCOU       |   |        |
| CCE    | Bearing unit with wide cover (closed version)                    | SCCE       | Eccentric locking collar                          |        |
| COE    | Bearing unit with wide cover for metric shaft (open version)     | SCOE       |   |        |
| COEU   | Bearing unit with wide cover for imperial shaft (open version)   | SCOEU      |   |        |
| N      | Unit / Housing prepared for cover(s) installation                | -          | /   |        |

Bearing units that are ordered with cover(s) include the housings with grooves. If you want to install the protective covers later, housings with suffix N must be ordered (for example: P210N).

## Protective caps for bearing units series

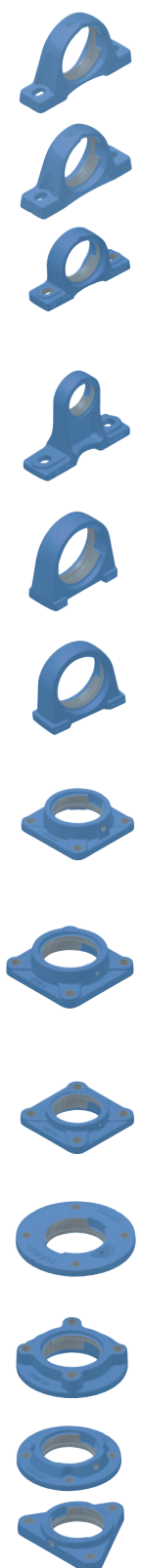
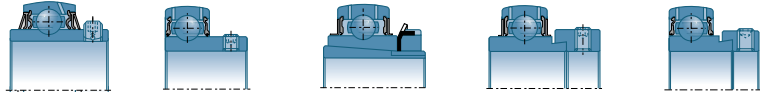
| CAP TYPE / SUFFIX | Description  | Suitable in combination with bearing insert type: | Design Open / Closed | Notice  |
|-------------------|--|---|----------------------|---|
| PCO               | Protective cap for bearing inserts type G1N (open version)   | US..G1N / ES..G1N                                 |                      | Protective caps have to be ordered separately from the bearing units. |
| PCC               | Protective cap for bearing inserts type G1N (closed version) |   |                      |   |
| CV                | Protective cap for thermoplastic series (open version)       | MUC..FD   |                      |   |
| CF                | Protective cap for thermoplastic series (closed version)     |   |                      |   |
| -G1N              | Bearing insert with groove in the outer ring                 |   |                      |   |

- The installation of protective caps can be done tool free. For mounting the yellow pressed steel caps bearing insert series G1N must be installed to the bearing unit. These bearings have a special groove machined in their outer rings in which the protector can snap into place (for example: US206G1N).
- All thermoplastic housings are equipped with appropriate grooves where caps can snap into place.



# Interchange tables

## Cast iron self-aligning bearing units

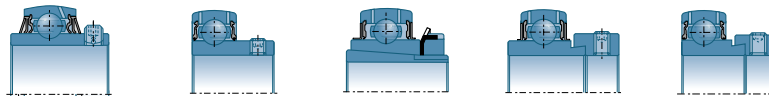


|            |                    |                  |                         |                     |                  |
|------------|--------------------|------------------|-------------------------|---------------------|------------------|
| <b>SNR</b> | <b>UCPE</b>        | <b>USPE</b>      | <b>UKPE..H</b>          | <b>EXPE</b>         | <b>ESPE</b>      |
| INA        | RASEY              | PASEY            | -                       | RASE..N             | PASE..N          |
| SKF        | SY..TF             | -                | SYJ..KF                 | SY..WF              | SY..FM           |
| RHP        | NP                 | NP..A            | NP10..-..K              | NP..DEC             | NP..EC           |
| <b>SNR</b> | <b>UCPLE</b>       | <b>USPLE</b>     | <b>UKPLE..H</b>         | <b>EXPLE</b>        | <b>ESPLE</b>     |
| RHP        | SL                 | SL..A            | -                       | SL..DEC             | SL..EC           |
| <b>NTN</b> | <b>UCP..D1*</b>    | <b>ASP</b>       | <b>UKP..D1;H23..X*</b>  | <b>UEL..D1W3**</b>  | <b>AELP..D1</b>  |
| <b>SNR</b> | <b>UCP**</b>       | <b>USP</b>       | <b>UKP..H**</b>         | <b>EXP**</b>        | <b>ESP</b>       |
| NSK        | UCP                | -                | UKP..D1;H23..X          | UEL..D1W3**         | AELP..D1W3       |
| ASAHI      | UCP                | BP               | UKP..+H23..             | -                   | KHP              |
| FAG        | UCP..-J7           | -                | UKP..-J7                | -                   | -                |
| KOYO/JTEKT | UCP                | -                | UKP..+H23..X            | NAP                 | SAP              |
| <b>NTN</b> | <b>UCHP..D1</b>    | -                | -                       | <b>UELPHP..D1W3</b> | -                |
| <b>SNR</b> | <b>UCPH</b>        | <b>USPH</b>      | <b>UKPH..H</b>          | <b>EXPH</b>         | <b>ESPH</b>      |
| NSK        | UCHP..D1           | -                | -                       | UELHP..D1W3         | -                |
| ASAHI      | UCPH               | -                | -                       | -                   | -                |
| KOYO/JTEKT | UCPH               | -                | -                       | -                   | -                |
| <b>SNR</b> | <b>UCPAE</b>       | <b>USPAE</b>     | <b>UKPAE..H</b>         | <b>EXPAE</b>        | <b>ESPAE</b>     |
| INA        | RSHEY              | PSHEY            | -                       | RSHE                | PSHE             |
| SKF        | SYF..TF            | -                | -                       | -                   | SYF..FM          |
| RHP        | SNP                | SNP..A           | -                       | SNP..DEC            | SNP..EC          |
| <b>NTN</b> | <b>UCUP..D1</b>    | <b>ASUP</b>      | <b>UKUP..D1;H23..X</b>  | <b>UELUP..D1W3</b>  | <b>AELUP..D1</b> |
| <b>SNR</b> | <b>UCPA/UCPG</b>   | <b>USPA/USPG</b> | <b>UKPA..H/UKPH..H</b>  | <b>EXPA/EXPG</b>    | <b>ESPA/ESPG</b> |
| NSK        | UCPA               | -                | -                       | UELUP..D1W3         | AELUP..D1        |
| ASAHI      | UCPA               | -                | -                       | -                   | -                |
| KOYO/JTEKT | UCPA               | -                | UKPA..+H23..X           | -                   | -                |
| <b>SNR</b> | <b>UCFE</b>        | <b>USFE</b>      | <b>UKFE..H</b>          | <b>EXFE</b>         | <b>ESFE</b>      |
| INA        | RCJY               | PCJY             | -                       | RCJ                 | PCJ              |
| SKF        | FY..TF             | -                | FYJ..KF                 | FY..WF              | FY..FM           |
| RHP        | SF                 | SF..A            | MSF..K                  | SF..DEC             | SF..EC           |
| <b>NTN</b> | <b>UCF..D1*</b>    | <b>ASF..D1</b>   | <b>UKF..D1;H23..X*</b>  | <b>UELF..D1W3**</b> | <b>AELF..D1</b>  |
| <b>SNR</b> | <b>UCF**</b>       | <b>USF</b>       | <b>UKF..H**</b>         | <b>EXF**</b>        | <b>ESF</b>       |
| NSK        | UCF                | ASF..D1/UBF      | UKF..D1;H23..X          | UELF..D1W3          | AELF..D1         |
| ASAHI      | UCF                | BF               | UKF..+H23..             | -                   | KHF              |
| FAG        | UCF..-J7           | -                | UKF..-J7                | -                   | -                |
| KOYO/JTEKT | UCF                | -                | UKF..+H23..X            | NANF                | SAF              |
| <b>NTN</b> | <b>UCFS..D1</b>    | -                | <b>UKFS..D1;H23..X</b>  | <b>UELFS..D1W3</b>  | -                |
| <b>SNR</b> | <b>UCFS</b>        | -                | <b>UKFS..H</b>          | <b>EXFS</b>         | -                |
| NSK        | UCFS..D1           | -                | UKFS..D1;H23..X         | UELFS..D1W3         | -                |
| ASAHI      | UCFS               | -                | -                       | -                   | -                |
| KOYO/JTEKT | UCFS               | -                | UKFS..+H23..X           | -                   | -                |
| <b>SNR</b> | <b>UCFCE</b>       | <b>USFCE</b>     | <b>UKFCE..H</b>         | <b>EXFCE</b>        | <b>ESFCE</b>     |
| INA        | RMEY               | PMEY             | -                       | RME                 | PME              |
| RHP        | FC                 | FC..A            | -                       | FC..DEC             | FC..EC           |
| <b>NTN</b> | <b>UCFC..D1***</b> | <b>ASFC..D1</b>  | <b>UKFCD1;H23..X***</b> | <b>UELFC..D1W3</b>  | <b>AELFC..D1</b> |
| <b>SNR</b> | <b>UCFC</b>        | <b>USFC</b>      | <b>UKFC..H</b>          | <b>EXFC</b>         | <b>ESFC</b>      |
| SKF        | FYC..TF            | -                | -                       | FYC..WF             | FYC..FM          |
| NSK        | UCFC..D1           | -                | UKFC..D1;H23..X         | UELFC..D1W3         | -                |
| ASAHI      | UCFC               | -                | UKFC..+H23..            | -                   | KHFC             |
| KOYO/JTEKT | UCFC               | -                | UKFC..+H23..X           | -                   | -                |
| <b>SNR</b> | -                  | <b>USFEE</b>     | -                       | -                   | <b>ESFEE</b>     |
| INA        | -                  | -                | -                       | -                   | RFE              |
| <b>SNR</b> | -                  | <b>USFTE</b>     | -                       | -                   | <b>ESFTE</b>     |
| INA        | -                  | -                | -                       | -                   | PCFTR            |

\* Also available in 300 and X-Series (medium size) \*\* Also available in 300-Series \*\*\* Also available in X-Series (medium size) (1) For SP, 4 available boxes

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

NTN range available upon request.



| SNR        | UCFLE            | USFLE                  | UKFLE..H                | EXFLE                  | ESFLE              |
|------------|------------------|------------------------|-------------------------|------------------------|--------------------|
| INA        | RCJTY            | PCJTY                  | -                       | RCJT                   | PCJT               |
| SKF        | FYTB..TF         | -                      | FYTJ..KF                | FYTB..WF               | FYTB..FM           |
| RHP        | SFT              | SFT..A                 | MSFT..K                 | SFT..DEC               | SFT..EC            |
| <b>NTN</b> | <b>UCFL..D1*</b> | <b>ASFL..D1</b>        | <b>UKFL..D1;H23..X*</b> | <b>UELFL..D1W3**</b>   | <b>AELFL..D1</b>   |
| <b>SNR</b> | <b>UCFL**</b>    | <b>USFL</b>            | <b>UKFL..H**</b>        | <b>EXFL**</b>          | <b>ESFL</b>        |
| NSK        | UCFL             | ASFL                   | UKFL..D1;H23..X*        | UELFL..D1W3            | AELFL..D1          |
| FAG        | UCFL..-J7        | -                      | UKFL..-J7               | -                      | -                  |
| ASAHI      | UCFL             | BFL                    | UKFL..+H..              | -                      | KHFL               |
| KOYO/JTEKT | UCFL             | -                      | UKFL..+H..X             | NANFL                  | SAFL..FM           |
| <b>SNR</b> | <b>UCFLZ</b>     | <b>USFLZ</b>           | <b>UKFLZ..H</b>         | <b>EXFLZ</b>           | <b>ESFLZ</b>       |
| INA        | -                | -                      | -                       | RCJTZ                  | PCJTZ              |
| <b>NTN</b> | -                | <b>ASFD..D1</b>        | -                       | -                      | <b>AELFD..D1</b>   |
| <b>SNR</b> | -                | <b>USFD</b>            | -                       | -                      | <b>ESFD</b>        |
| INA        | -                | FLCTEY                 | -                       | -                      | GLCTE              |
| NSK        | -                | ASFD                   | -                       | -                      | AELFD              |
| ASAHI      | -                | BLCTE                  | -                       | -                      | KHLCTE             |
| RHP        | -                | LFTC..A                | -                       | -                      | LFTC..EC           |
| <b>SNR</b> | -                | <b>USFAE</b>           | -                       | -                      | <b>ESFAE</b>       |
| INA        | -                | -                      | -                       | -                      | PSFT               |
| <b>NTN</b> | <b>UCFA..D1</b>  | -                      | <b>UKFA..;H23..X</b>    | -                      | <b>AELFA..D1</b>   |
| <b>SNR</b> | <b>UCFA</b>      | <b>USFA</b>            | <b>UKFA..H</b>          | <b>EXFA</b>            | <b>ASFA</b>        |
| NSK        | UCFA..D1         | -                      | -                       | -                      | -                  |
| ASAHI      | UCFA             | -                      | -                       | -                      | -                  |
| KOYO/JTEKT | UCFA             | -                      | -                       | -                      | -                  |
| <b>NTN</b> | <b>UCT..D1*</b>  | <b>AST..D1</b>         | <b>UKT..D1;H23..X*</b>  | <b>UEL..D1W3**</b>     | <b>AELT..D1</b>    |
| <b>SNR</b> | <b>UCT**</b>     | <b>UST</b>             | <b>UKT..H**</b>         | <b>EXT**</b>           | <b>EST</b>         |
| INA        | RTUEY            | PTUEY                  | -                       | RTUE                   | PTUE               |
| SKF        | TUJ..TF          | -                      | -                       | -                      | -                  |
| RHP        | ST               | ST..A                  | MST..K                  | ST..DEC                | ST..EC             |
| NSK        | UCT..D1          | -                      | UKT..D1;H23..X          | UEL..D1W3              | -                  |
| ASAHI      | UCT              | BT                     | UKT..+H..               | -                      | KHT                |
| KOYO/JTEKT | UCT              | -                      | UKT..+H..X              | -                      | -                  |
| <b>SNR</b> | <b>UCT..+WB</b>  | <b>UST..+WB</b>        | <b>UKT..H+WB</b>        | <b>EXT..+WB</b>        | <b>EST..+WB</b>    |
| NSK        | UCT..+WB         | -                      | -                       | -                      | -                  |
| ASAHI      | UCT..+WB         | -                      | -                       | -                      | -                  |
| <b>NTN</b> | -                | <b>ASPT2..-10</b>      | -                       | -                      | <b>AELPT2..-10</b> |
| <b>SNR</b> | <b>UCSP</b>      | <b>USSP</b>            | <b>UKSP..H</b>          | <b>EXSP</b>            | <b>ESSP</b>        |
| RHP        | BT               | BT..A                  | -                       | -                      | BT..EC             |
| <b>SNR</b> | <b>SPR 1</b>     | <b>SPR 11 &amp; 21</b> | <b>SPR 12 &amp; 22</b>  | <b>SPR 14 &amp; 24</b> |                    |
| INA        | -                | HUSE                   | -                       | -                      | -                  |
| RHP        | BT               | -                      | -                       | -                      | -                  |
| <b>NTN</b> | <b>UCHB..D1</b>  |                        |                         |                        |                    |
| <b>SNR</b> | <b>UCEHE</b>     | <b>USEHE</b>           | <b>UKEHE..H</b>         | <b>EXEHE</b>           | <b>ESEHE</b>       |
| RHP        | SCH              | -                      | -                       | -                      | -                  |
| INA        | -                | PHEY                   | -                       | RHE                    | PHE                |
| NSK        | UCEHE            | -                      | -                       | -                      | -                  |
| ASAHI      | UCECH            | -                      | -                       | -                      | -                  |
| <b>NTN</b> | <b>UCC..D1</b>   | <b>ASC..</b>           | <b>UKC..D1;H23..X*</b>  | <b>UEL..D1W3*</b>      | <b>AELC..D1</b>    |
| <b>SNR</b> | <b>UCC</b>       | <b>USC</b>             | <b>UKC..H**</b>         | <b>EXC**</b>           | <b>ESC</b>         |
| NSK        | UCC..D1          | -                      | UKC..D1;H23..X          | UEL..D1W3              | -                  |
| ASAHI      | UCC              | -                      | -                       | -                      | -                  |
| KOYO/JTEKT | UCC              | -                      | UKC..+H23..X            | -                      | -                  |

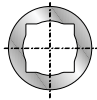
\* Also available in 300 and X-Series (medium size) \*\* Also available in 300-Series

(1) For SP, 4 different installation frames available

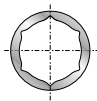
NTN range available upon request.



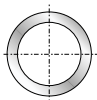
## Special bearings: square, cylindrical and hexagonal bore



| NTN    | 1AS..-(1)             | 3AS..-(1)             |
|--------|-----------------------|-----------------------|
| NBCA   | DS..                  | DS..                  |
| NSK    | W2..PPB../ GW2..PPB.. | W2..PPB../ GW2..PPB.. |
| INA    | VK..KTT-B(-AH...)     | -                     |
| Fafnir | W2..PPB../ GW2..PPB.. | W2..PPB../ GW2..PPB.. |



| NTN    | 1AH..-.. | 2AH..-..   |
|--------|----------|------------|
| NBCA   | HPC..    | HPS..      |
| NSK    | ..KRR..  | ..KRRB..   |
| INA    | -        | SK...KRR-B |
| Fafnir | ..KRR..  | ..KRRB..   |



| NTN    | 1AC..-(1)             | 3AC..-(1)             |
|--------|-----------------------|-----------------------|
| NBCA   | DS..                  | DS..                  |
| NSK    | W2..PPB../ GW2..PPB.. | W2..PPB../ GW2..PPB.. |
| Fafnir | W2..PPB../ GW2..PPB.. | W2..PPB../ GW2..PPB.. |

(1) Other designs on request

## Bearing insert with cylindrical outer ring



| NTN        | UCS2..D1** | UCS2..D1N | UELS2..D1** | UELS2..D1N | AELS2..NW3  | AELS..D1NW3 | ASS2..N | ASS2..D1N |
|------------|------------|-----------|-------------|------------|-------------|-------------|---------|-----------|
| SNR        | -          | CUC2      | -           | CEX2       | CES2        | -           | CUS2    | -         |
| NSK        | -          | UCS2..D1N | -           | UELS2..D1N | -           | AELS..D1NW3 | ASS2..N | ASS2..D1N |
| RHP        | 11..-..    | 11...CG   | 11...DEC    | 11...DECG  | 13...EC     | 13...ECG    | 13...-  | -         |
| KOYO/JTEKT | RB..       | ER..      | -           | -          | -           | -           | -       | -         |
| ASAHI      | -          | SER2..    | -           | -          | KHR2..      | -           | -       | -         |
| INA        | -          | -         | E..KRR      | -          | RAE..NPP NR | RA..NPP NR  | -       | -         |

\*\* : Also available in 300-Series

## Temperature



| NTN   | ..HT2   | ..CT1   |
|-------|---------|---------|
| SNR   | ..T20   | ..T04   |
| INA   | ..FA164 | ..FA101 |
| SKF   | ..VA201 | ..VA201 |
| ASAHI | ..HR5   | ..CR2A  |
| RHP   | -       | ..HLT   |
| NSK   | ..HT2   | ..CT1   |

## Seals



| NTN        | ..LLJ   | -     |
|------------|---------|-------|
| SNR        | ..L3    | ..L4  |
| INA        | ..KTT-B | -     |
| SKF        | -       | ..2RF |
| ASAHI      | -       | -     |
| RHP        | T...-   | ..GFS |
| NSK        | ..LLJ   | -     |
| KOYO/JTEKT | ..L3    | -     |

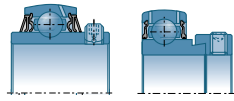
The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

NTN range available upon request.

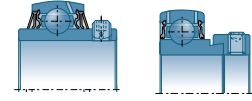
# Interchange tables



## Stainless steel self-aligning bearing units



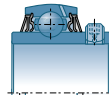
|            |                      |              |
|------------|----------------------|--------------|
| <b>NTN</b> | <b>F-UCPM../LP03</b> | -            |
| <b>SNR</b> | <b>SUCP</b>          | <b>SESP</b>  |
| ASAHI      | MUCP                 | -            |
| DODGE      | P2B-SCEZ             | -            |
| <b>NTN</b> | <b>F-UCFM../LP03</b> | -            |
| <b>SNR</b> | <b>SUCFL</b>         | <b>SESFL</b> |
| ASAHI      | MUCFL                | -            |
| DODGE      | F2B-SCEZ             | -            |
| <b>SNR</b> | <b>SUCPA</b>         | <b>SESPA</b> |
| ASAHI      | MUCPA                | -            |



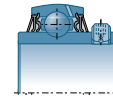
|            |               |               |
|------------|---------------|---------------|
| <b>SNR</b> | <b>SUCF</b>   | <b>SESF</b>   |
| ASAHI      | MUCF          | -             |
| DODGE      | F4B-SCEZ      | -             |
| <b>SNR</b> | <b>SUCT</b>   | <b>SEST</b>   |
| ASAHI      | MUCT          | -             |
| <b>SNR</b> | <b>SUCFBL</b> | <b>SESFBL</b> |
| AMI        | MUCFBL        | -             |
| DODGE      | FB-SCEZ-SHSS  | -             |



## Thermoplastic self-aligning bearing units

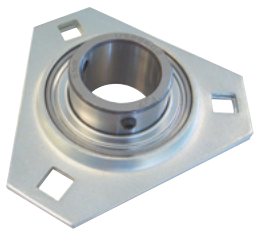


|            |                         |  |
|------------|-------------------------|--|
| <b>NTN</b> | <b>F-UCPR2../LP03**</b> |  |
| <b>SNR</b> | <b>MUCPPL</b>           |  |
| SKF        | SYWK                    |  |
| INA        | SUCPP                   |  |
| NSK-RHP    | PNP..CR                 |  |
| <b>SNR</b> | <b>MUCTBL</b>           |  |
| SKF        | SYFWK                   |  |
| INA        | SUCPPA                  |  |
| NSK-RHP    | -                       |  |
| <b>NTN</b> | <b>F-UCFR2../LP03*</b>  |  |
| <b>SNR</b> | <b>MUCFPL</b>           |  |
| SKF        | FYWK                    |  |
| INA        | SUCPF                   |  |
| NSK-RHP    | PSF..CR                 |  |

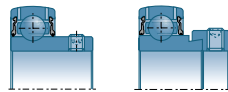


|            |                          |  |
|------------|--------------------------|--|
| <b>NTN</b> | <b>F-UCFLR2../LP03**</b> |  |
| <b>SNR</b> | <b>MUCNFL</b>            |  |
| SKF        | FYTWK                    |  |
| INA        | SUCPFPL                  |  |
| NSK-RHP    | PSFT..CR                 |  |
| <b>SNR</b> | <b>MUCFBL</b>            |  |
| SKF        | FYAWK                    |  |
| INA        | -                        |  |
| NSK-RHP    | -                        |  |

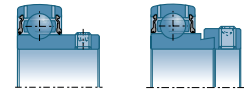
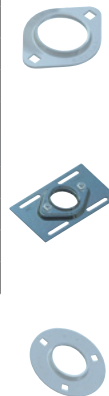
\*: black - \*\*: white or black



## Pressed steel self-aligning bearing units



|            |              |                  |
|------------|--------------|------------------|
| <b>NTN</b> | <b>ASPP</b>  | <b>AELPP..W3</b> |
| <b>SNR</b> | <b>USPP</b>  | <b>ESPP</b>      |
| INA        | PBY          | PB               |
| SKF        | P..RM        | P..FM            |
| RHP        | LPB..A       | LPB..EC          |
| ASAHI      | BPP..-Z2     | KHPP..-Z2        |
| KOYO/JTEKT | SBPP         | SAPP             |
| <b>SNR</b> | <b>USPFT</b> | <b>ESPFT</b>     |
| INA        | RATRY        | RATR             |
| SKF        | PFD..RM      | PFD..FM          |
| RHP        | SLFT..A      | SLFT..EC         |
| ASAHI      | BPFT         | -                |

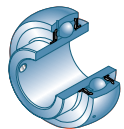
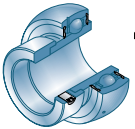
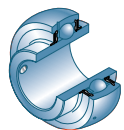
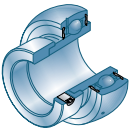
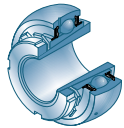
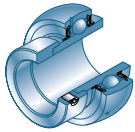
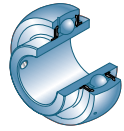


|            |              |                  |
|------------|--------------|------------------|
| <b>NTN</b> | <b>ASPFL</b> | <b>AELPFL</b>    |
| <b>SNR</b> | <b>USPFL</b> | <b>ESPFL</b>     |
| INA        | RATY         | RAT              |
| SKF        | PFT..RM      | PFT..FM          |
| RHP        | SLFL..A      | SLFL..EC         |
| NSK        | ASPFL        | AELPFL           |
| ASAHI      | BPFL         | KHPFL            |
| KOYO/JTEKT | SBPFL        | SAPFL            |
| <b>SNR</b> | <b>USPFE</b> | <b>ESPFE</b>     |
| INA        | -            | MSTU             |
| <b>NTN</b> | <b>ASPF</b>  | <b>AELPF..W3</b> |
| <b>SNR</b> | <b>USPF</b>  | <b>ESPF</b>      |
| INA        | RAY          | RA               |
| SKF        | PF..RM       | PF..FM           |
| RHP        | SLFE..A      | SLFE..EC         |
| NSK        | ASPF         | AELPF..W3        |
| ASAHI      | BPF          | KHPF             |
| KOYO/JTEKT | SBPF         | SAPF             |

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

NTN range available upon request.

# Bearing inserts



|            | Series 200            | Series 300            | X-Series              |
|------------|-----------------------|-----------------------|-----------------------|
| <b>NTN</b> | <b>UC2..D1</b>        | <b>UC3..D1</b>        | <b>UCX..D1</b>        |
| <b>SNR</b> | <b>UC2..G2</b>        | <b>UC3..G2</b>        | <b>UCX..G2</b>        |
| INA        | GYE..-XL-KRR-B        | -                     | -                     |
| SKF        | YAR2..2F              | -                     | -                     |
| RHP        | 10...G                | -                     | -                     |
| NSK        | UC2..D1               | UC3..D1               | UCX..D1               |
| ASAHI      | UC2                   | UC3                   | UCX                   |
| KOYO/JTEKT | UC2                   | UC3                   | UCX                   |
| <b>NTN</b> | <b>UEL2..D1W3</b>     | <b>UEL3..D1W3</b>     | -                     |
| <b>SNR</b> | <b>EX2..G2</b>        | <b>EX3..G2</b>        | -                     |
| INA        | GE..-XL-KRR-B         | GNE..-XL-KRR-B        | -                     |
| SKF        | YEL2..-2F             | -                     | -                     |
| RHP        | 10...DECG             | -                     | -                     |
| NSK        | UEL2..D1W3            | UEL3..D1W3            | -                     |
| ASAHI      | UG2..+ER              | -                     | -                     |
| KOYO/JTEKT | NA2                   | -                     | -                     |
| <b>NTN</b> | <b>UK2..D1;H23..X</b> | <b>UK3..D1;H23..X</b> | <b>UKX..D1;H23..X</b> |
| <b>SNR</b> | <b>UK2..G2H</b>       | <b>UK3..G2H</b>       | -                     |
| SKF        | YSA..-2FK, H23..      | -                     | -                     |
| RHP        | 10..KG, H23..         | -                     | -                     |
| NSK        | UK2..D1;H23..X        | UK3..D1;H23..X        | UKX..D1;H23..X        |
| ASAHI      | UK2..+H23..           | UK3..+H23..           | UKX..+H23..           |
| KOYO/JTEKT | UK2..+H23..X          | UK3..+H23..X          | UKX..+H23..X          |
| <b>SNR</b> | <b>LK2..G2H</b>       | -                     | -                     |
| INA        | GSH..-XL-2RSR-B       | -                     | -                     |
| <b>NTN</b> | <b>AS2..D1</b>        | -                     | -                     |
| <b>SNR</b> | <b>US2..G2</b>        | -                     | -                     |
| INA        | GAY..-XL-NPP-B        | -                     | -                     |
| SKF        | YAT2                  | -                     | -                     |
| RHP        | 12...G                | -                     | -                     |
| NSK        | AS2..D1               | -                     | -                     |
| ASAHI      | B                     | -                     | -                     |
| KOYO/JTEKT | SB2                   | -                     | -                     |
| <b>NTN</b> | <b>AEL2..D1W3</b>     | -                     | -                     |
| <b>SNR</b> | <b>ES2..G2</b>        | -                     | -                     |
| INA        | GRAE..-XL-NPP-B       | -                     | -                     |
| SKF        | YET2a a               | -                     | -                     |
| RHP        | 12...ECG              | -                     | -                     |
| NSK        | AEL2..D1W3            | -                     | -                     |
| ASAHI      | KH2..AE               | -                     | -                     |
| KOYO/JTEKT | SA2                   | -                     | -                     |
| <b>NTN</b> | <b>F-UC2..D1/LP03</b> | -                     | -                     |
| <b>SNR</b> | <b>SUC2</b>           | -                     | -                     |
| DODGE      | SCEZ                  | -                     | -                     |
| ASAHI      | MUC2                  | -                     | -                     |
| KOYO/JTEKT | UC2..S6               | -                     | -                     |
| <b>NTN</b> | -                     | -                     | -                     |
| <b>SNR</b> | <b>SES2</b>           | -                     | -                     |
| INA        | SUG2                  | -                     | -                     |
| <b>NTN</b> | <b>F-UC2..D1/LP03</b> | -                     | -                     |
| <b>SNR</b> | -                     | -                     | -                     |
| SKF        | YAR2..-2RF/HV         | -                     | -                     |
| INA        | GYE..-XL-KRR-B-VA     | -                     | -                     |
| NSK-RHP    | J10...GCR             | -                     | -                     |
| <b>NTN</b> | <b>CS2..LLU</b>       | -                     | -                     |
| <b>SNR</b> | <b>62..SEE</b>        | -                     | -                     |
| INA        | 2..-XL-NPP-B          | -                     | -                     |
| SKF        | 17262..-2RS1          | -                     | -                     |
| RHP        | -                     | -                     | -                     |
| NSK        | CS2..DDU              | -                     | -                     |
| KOYO/JTEKT | CB2                   | -                     | -                     |
| FAG        | 2..-XL-NPP-B          | -                     | -                     |



Suitable for grey cast housings



Suitable for sheet metal housings




Suitable for stainless steel housings

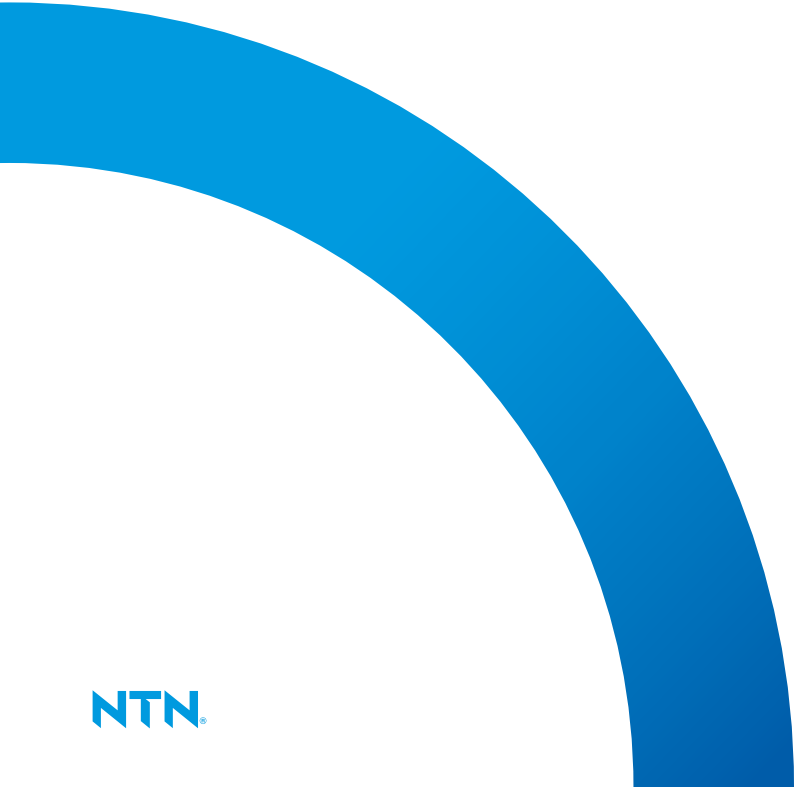


Suitable for thermoplastic housings





SPLIT  
PLUMMER  
BLOCK  
HOUSINGS



ALL INCLUSIVE - PERFORMANCE - INNOVATION

# SNCD



## LARGE PLUMMER BLOCK HOUSINGS

The SNCD large plummer block range has been developed by **NTN** for highly demanding industrial applications. Equipped with spherical roller bearings for a shaft diameter from 115 mm to 500 mm, the SNCD range is perfectly designed to bear heavy loads. Important features such as connectors for temperature and vibration monitoring are already included as standard just like machined stop edges and grease drain holes. Thanks to the use of heavy-duty ductile iron and the innovative design concept, the SNCD split plummer block housings are capable of reducing the stress level of the bearing and increasing its service life.

**All inclusive as standard**



Brand of **NTN corporation**

# SNR - SNCD housings

SNCD housings are made for support spherical roller bearings with tapered or cylindrical bore. The split housings are available for fixed or floating bearing arrangement and can support bearings with shaft diameters from 115 to 500 mm.



## Benefits

### Interchangeable

- Full interchangeable with grey cast
- Compatible with market standards

### More than 400 arrangements possible

- Suitable for 222, 223, 230 and 231 SRB series
- Cylindrical bores or adapter sleeves solutions
- Metric and imperial dimensions

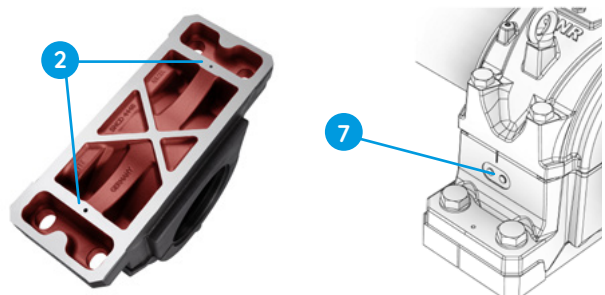
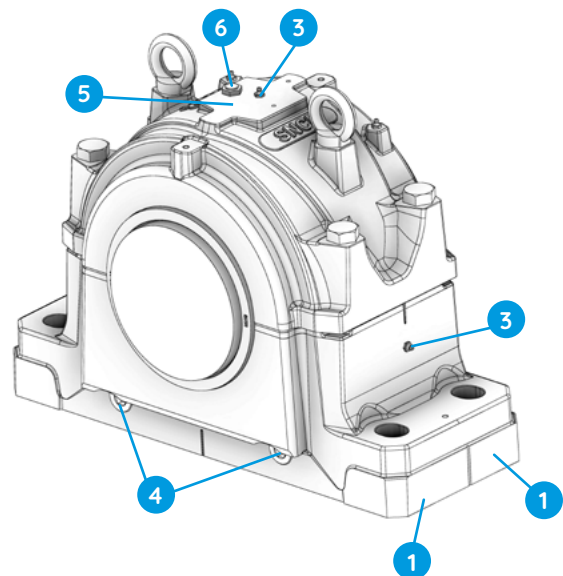
### One global supplier

- Housings, bearings and accessories
- Technical assistance (study and recommendations)
- Service engineering

## Technical features

### All inclusive

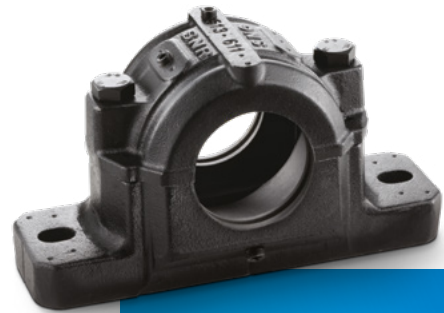
- 1 Machined stop edges
- 2 Housing positioning mounting bores
- 3 Grease nipple connections (grease nipple attached)
- 4 Grease drain holes
- 5 Machined surface for condition monitoring systems
- 6 Ready to use connection for temperature sensor
- 7 Ready to use connection for vibration sensor



# SNR - SNC / SNCD500



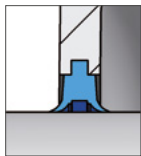
- SN housing according to ISO113-2010 for bearings with a cylindrical or tapered bore
- High stiffness and stability due to special design elements
- Reduced stress in the bearing
- Extended service life and prolonged service intervals
- For shaft diameters from 20 mm to 140 mm
- Housing material: cast iron with flake graphite and/or spheroidal graphite (SNCD500)
- 5 different seal arrangements for a wide range of applications
- User-friendly design features for ease of service and rapid installation



Also available as heavy duty version from spheroidal graphite cast iron and with different mounting bore pattern

## Sealing

### SC...DS



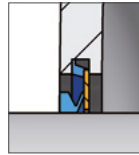
Double leap seal  
Multipurpose seal

### SC...FS / SC...FSS\*



Felt strip seal  
Well suited for higher rotational shaft speed

### SC...SV



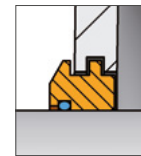
V-Ring seal  
Reduced friction

Optional V-ring for better sealing effect in downtimes



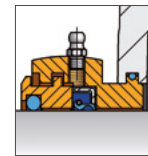
\*With steel retainer

### SC...LA



Labyrinth seal  
Well suited for high temperature applications

### SC...TA



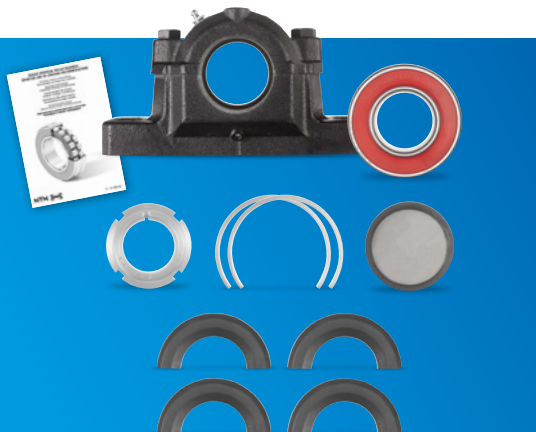
Taconite seal  
Multiple seal for harsh environments

## Multi-market kits

66 kits available in "normal clearance" or "C3 internal clearance" for shaft diameters from 35 mm to 90 mm.



ALL-IN-ONE,  
MAKE YOUR  
LIFE EASIER



### SNC HOUSING SEALED KIT

including a sealed spherical roller bearing and specific accessories



### SNC HOUSING STANDARD KIT

including an open spherical roller bearing with specific accessories and a monopoint greaser

For more information, have a look at page 68!





# CMD CUSTOMISED MODULES

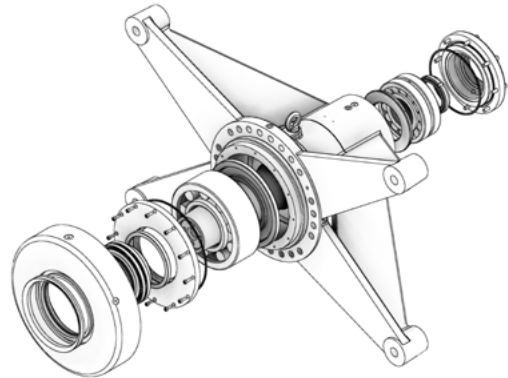


# SNR - CMD customised modules



Ready to be installed  
in your specific application

- The **NTN** team develops individual mounted units together with you according to your requirements
- An optimal design for a robust and sustainable system solution
- Taking into account your application parameters, operational reliability and costs, we define the necessary materials and all components



Example: ready-to-install customised module for industrial washing machine

Individual complete solutions  
for maximum performance

- **Reduce your effort** and rely on system solutions
- **Optimise and complement your team** with our experts



- **Choose a safe and easy installation** thanks to individual and ready-to-install mounted units
- **Operational safety and warranty.** We guarantee security through decades of experience: application knowledge and production know-how in the international network

## Benefits

- One point of contact
- Your application optimised through modifications
- Our quality



Contact us and we will develop your individual solution together! [cmd@ntn-snr.de](mailto:cmd@ntn-snr.de)  
Or use our inquiry form



**NTN**, your  
engineering  
partner

**NTN**

# ○ LINEAR MOTION



Brand of NTN corporation





# CUSTOMISED LINEAR AXES



Brand of NTN corporation





# SNR - Customised linear axes

Our company produces one of the broadest product ranges of linear axes on the market.

## Benefits

### Cost reduction through reduced design and assembly effort

- Simplification of logistical processing
- Avoidance of assembly errors

### Why linear axes?

- Complete systems including guiding and drive system
- Partially closed - optimal protection against dirt
- Reduced effort on the customer side (design, purchasing, assembly)

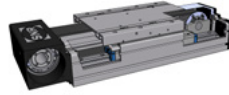
## Range overview



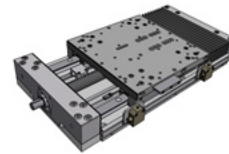
COMPACT AXIS  
**AXC**



COMPACT AXIS  
**AXF**



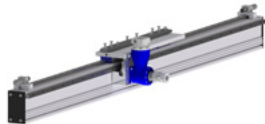
PARALLEL AXIS  
**AXDL**



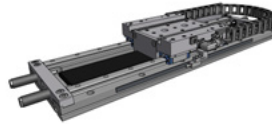
LINEAR TABLES  
**AXLT**



PRECISION AXIS  
**AXBG**



SYSTEM PROGRAM  
**AXS**



LINEAR MOTOR  
**AXLM**



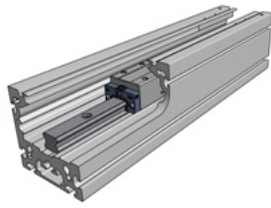
ACCESSORIES and SPECIAL  
SOLUTIONS  
**AX-AC-...**

## Good to know!

There is no uniform standard that regulates the dimensions of linear axes and the determination of their load ratings.

When building linear axes, **NTN** complies with the EU Machinery Directive and the associated standards.

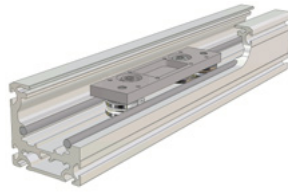
## Guiding systems



LINEAR GUIDES



HIGHER  
LOAD RATINGS



TRACK ROLLER  
GUIDES



MAX. SPEED  
15 M/S

## Drive systems



TOOTHED BELT



SCREW DRIVE



RACK AND PINION



LINEAR MOTOR

## Advantages

### Linear Axis with toothed belt drive:

- Integrated drive + deflection system
- Best ratio of stroke to total length

### Rack and pinion drive:

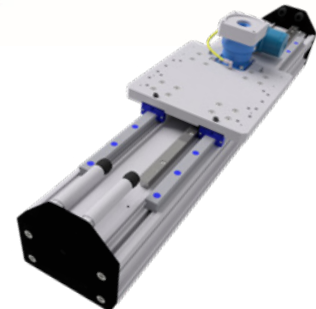
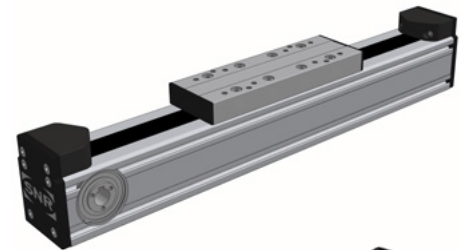
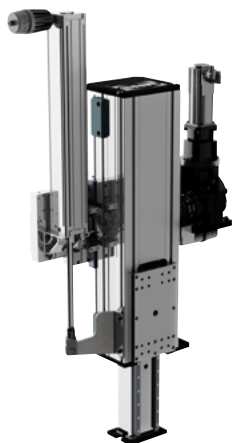
- Several tables can be moved asynchronously

### Systems for every branch

- Can be combined with the entire portfolio
- Including connecting elements, energy chains, switches etc.

### Telescopic Axis

- Versions for horizontal and vertical use



Standard &  
special solutions  
for mechanical  
engineering



# STANDARD LINEAR AXIS

# BUILD YOUR OWN SOLUTION



## STANDARDISED LINEAR AXIS

AXE linear axes are the perfect combination of technical expertise and practical solutions for customer needs.

Thanks to an online configurator based on standard component definition, high quality AXE module design is immediately and easily accessible for all.

Production and logistics managed in Germany guarantee an outstanding delivery lead time for these linear axes.

Our offer includes all the elements required to finalise safe implementation for the customer.

**AXE, thousands of available combinations to build your own solution.**



Brand of NTN corporation

# SNR - Standard linear axis

With the standard AXE Linear Axis, NTN starts the digital selection of linear axes with new internal processes.

## Benefits

- Minimal production time thanks to the modular structure
- All accessories are available as assembling groups

## Why AXE?

- Shortest delivery time (1-2 weeks ex works)
- Standard Multi-Axis system including all connecting elements, energy chains and switches
- Reduced effort on the customer side (design, purchasing, assembly)

## Range overview



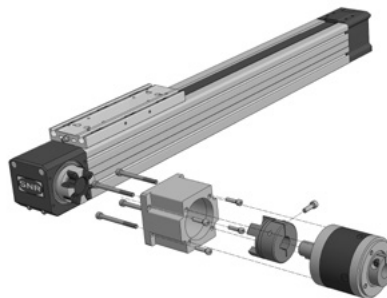
Linear Axis with toothed belt drive  
**AXE-Z**



Standard Multi-Axis systems



Linear Axis with toothed belt /  $\Omega$  drive  
**AXE-A**



Standard accessories

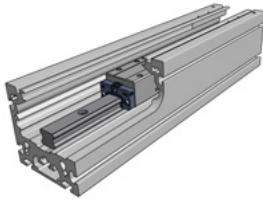
## Good to know!

When building linear axes, **NTN** complies with the EU Machinery Directive and the associated standards.

Interesting industries for linear axes: packaging industry, material handling, automated production and assembly lines, etc..



## Guiding systems



**LINEAR GUIDES**



**HIGH LOAD RATINGS**



**HIGH TOLERANCE  
COMPENSATION CAPACITY**



**LOW MAINTENANCE**

## Drive systems



**TOOTHED BELT DRIVE**



**HIGH DYNAMIC**



**GREAT LENGTH**



**LOW WEAR**



## Advantages

### Online configuration

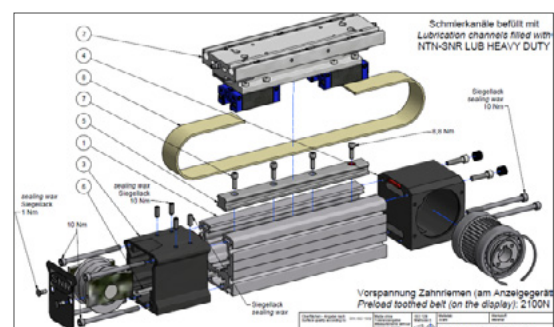
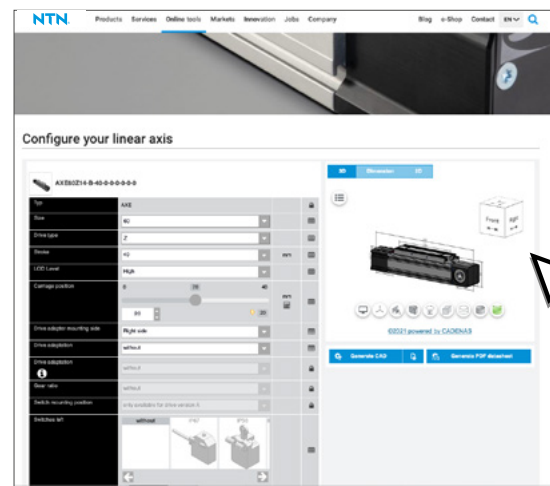
- Inclusive gearbox, drive adaption, switches...
- Part list generation for the selected product

### Shortest delivery time

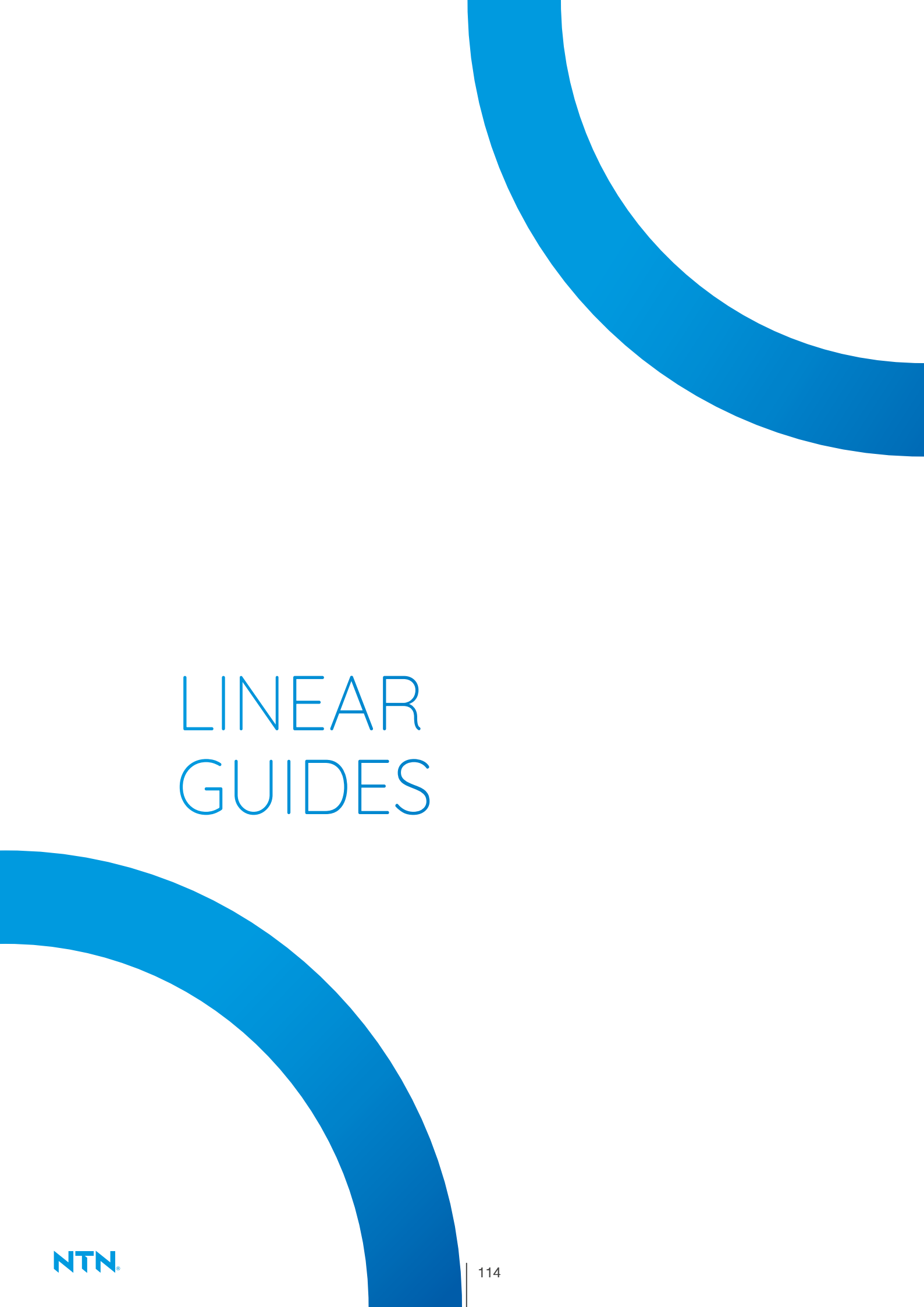
- Standardisation of all components
- Modular design

### Made in Germany

- Single axes
- Standard multi-axe systems



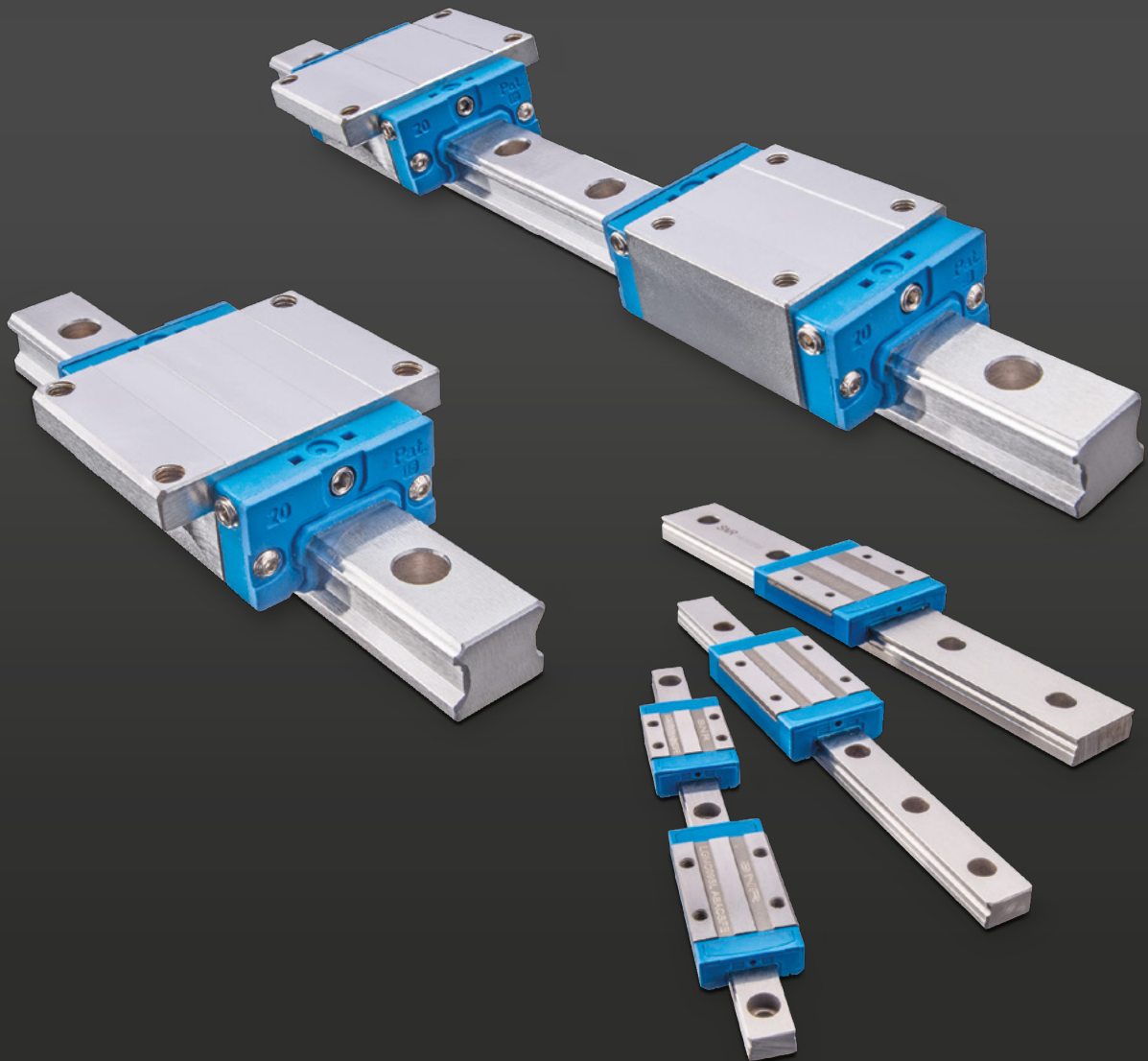
**Standard  
solutions  
for mechanical  
engineering**



# LINEAR GUIDES



Brand of NTN corporation



# SNR - Linear guides

Two technologies - one geometry - one rail per size (modular system).  
According to DIN ISO 12090.

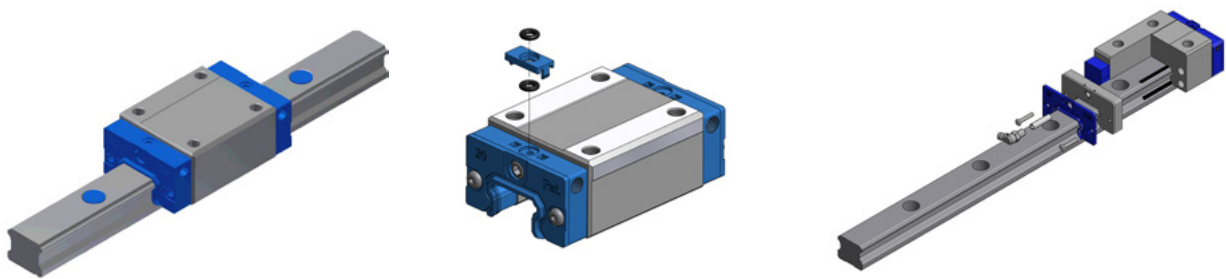
**LGBC...  
(BALL CHAIN TYPE)**

**DF CONFIGURATION**

**LGBX...  
(CONVENTIONAL TYPE)**

## Lubrication options

- Lateral lubrication channels closed with set screws = simply switch between the lubrication points
- Lubrication option from above as standard
- Fixable adapters for high carriage types



## Jointed rail

The rail joint is always marked with a "J" (J = Jointed Rail!)



- No assembly sequence - error prevention!
- Simply replace in case of damage - measure the length, done!
- Easy to extend

## Extension of interchangeability

Separate delivery of carriage and rail up to precision class "P" possible!

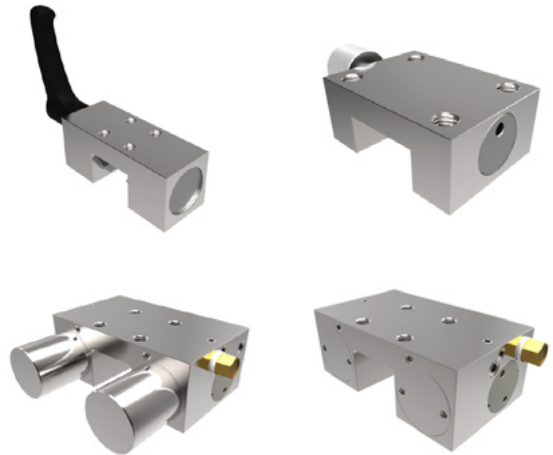
**One step ahead  
with quality for  
over 30 years**

## Maximum lengths

- Standard rails LGBR 15...55 ~ 4.000 mm
- Miniature rails
  - LGMR, narrow 09...15 ~ 2.000 mm
  - LGMW, wide 09...15 ~ 2.000 mm
- Miniature rails LGMR 07 ~ 450 mm

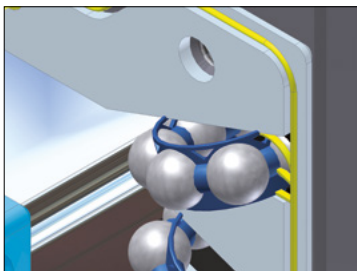
## Accessories

- Clamping elements
- Central lubrication
- Brass caps
- Cover strip
- etc.

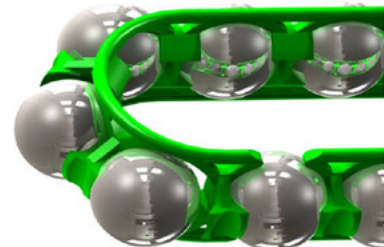


\* available only in certain territories

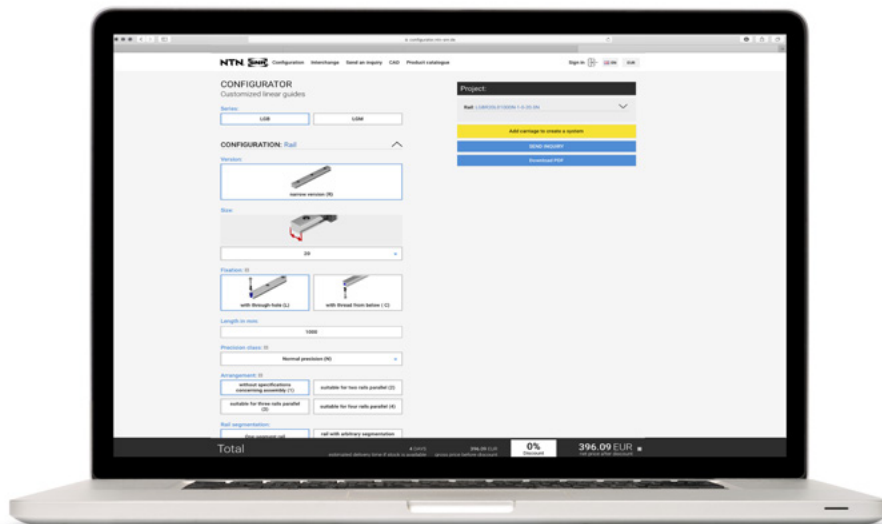
## Extremely powerful ball chain



Spacer ball for smooth ball circulation



## Online configuration







# BALL SCREWS

# The new range of LINEAR MOTION BALL SCREWS



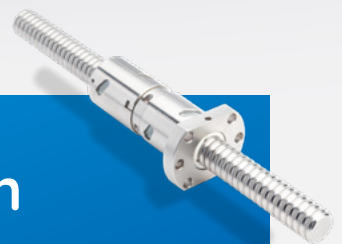
## Handle motion with precision

**SNR** ball screws are high-quality products that are among the most important drive elements for mechanical engineering in linear technology. Our new whirled ball screws offer you an optimal price-performance ratio and meet the highest requirements in terms of precision. Many screw diameters, pitches and nut designs offer a high degree of flexibility for your application.

**Ball screws are precision products designed to meet your needs.**



Brand of NTN corporation



# SNR - Ball screws

We offer all manufacturing technologies:

Rolling, whirling, grinding



## Tolerance classes

- Transport Ball Screws (T10, **T7**, **T5**, T3)
- Positioning Ball Screws (**P5**, P3)  
Blue marking is our standard

## Preload

### To increase the rigidity:

Z0 = axial clearance

Z1 = without axial clearance, without preload

Z2 = light preload (~ 3% Ca)

Z3 = medium preload (~ 5% Ca)

Z4 = high preload (~7% Ca)

**Higher preload normally with double nuts!**

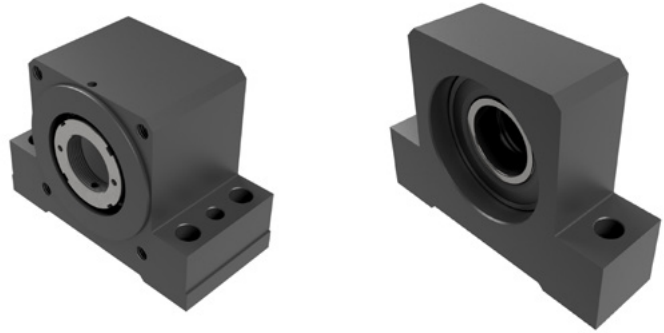
**SNR Ball  
Screws: Easy to  
work with!**

## Fixed and floating bearing units



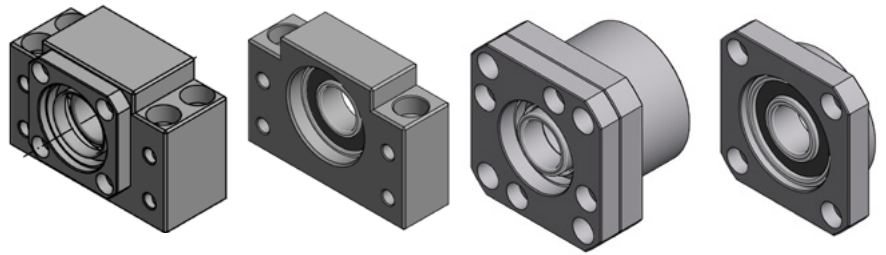
### European range:

Type BSTK / BSTL



### Asian range:

Type BK / EK / FK / BF / EF / FF



## Lubrication

**There is no lifetime lubrication for ball screws!**

**In general, the same greases should be used as for Linear Guides + Bearings.**

Standard &  
special solutions  
for mechanical  
engineering





# BALL BUSHINGS





Brand of NTN corporation



# SNR - Ball bushings

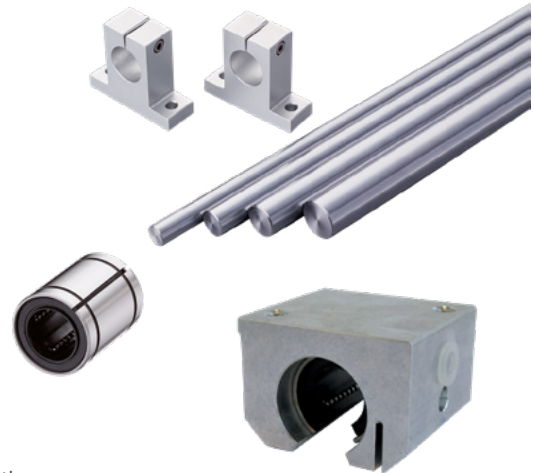
Extensive support from NTN.

ISO standard & JIS standard.

One of the widest product ranges on the market.

## Application

- General engineering
- Wood working industry
- Fitness equipment
- Packaging machines
- Medical equipment



## Why ball bushings?

- Cost-effective implementation of linear movements
- Self-supporting guide, which is clamped at the ends
- Minimised maintenance effort due to low lubricant consumption
- Low friction
- Interchangeable: diameter, length and grooves are standard

## Which ball bushings?

### STANDARD BALL BUSHINGS

- Same dimensions and tolerances as super ball bushings
- $v_{max.} = 1,5m/s$
- Damp or wet environment
- Suitable for vacuum applications
- High temperature versions

### SUPER BALL BUSHINGS

- Same dimensions and tolerances as standard ball bushings
- $v_{max.} = 3m/s$
- Misalignment compensation up to  $\pm 0,5^\circ$
- Higher load ratings
- Smooth running performance
- Same loads ▶ smaller size
- Reduced system costs!

**Ball bushings  
for simple and  
inexpensive  
implementation  
of linear  
movements.**

## Widest product ranges

One of the widest product ranges on the market!



|                           | ISO BALL BUSHINGS |        | BALL SLEEVES |        | JIS BALL BUSHINGS |
|---------------------------|-------------------|--------|--------------|--------|-------------------|
| Closed                    |                   | Closed |              | Closed |                   |
| Open                      |                   | Open   |              |        |                   |
| Adjustable                |                   |        |              |        |                   |
| With flange               |                   |        |              |        |                   |
| Tandem                    |                   |        |              |        |                   |
| Tandem with flange        |                   |        |              |        |                   |
| Tandem with middle flange |                   |        |              |        |                   |

In addition:  
Support rails, shaft supports, clamping elements etc.  
Stainless versions for high temperatures

## Linear units

|                 | SINGLE |                 | TANDEM |        | QUATTRO |
|-----------------|--------|-----------------|--------|--------|---------|
| Closed          |        | Closed          |        | Closed |         |
| Open            |        | Open            |        | Open   |         |
| Open adjustable |        | Open adjustable |        |        |         |

With standard ball bushings and super ball bushings available.

Trust & support  
for common  
success!

# ○ TECHNICAL SERVICES





## SERVICES, OUR OFFER

Because your industrial performance is essential to your future success, **NTN** is committed to increasing the longevity of your equipment while reducing your maintenance costs through a range of services.

Our experts are at your side to offer you assistance and training services, as well as tools and lubrication solutions to maximise the life of your bearings.



Brand of **NTN** corporation





# MAINTENANCE TOOLS



## SmartTEMP Induction Heater

Looking to increase your machine's reliability in order to reduce your operational costs? Discover the SmartTEMP by **SNR**, an innovative induction heater range. With its intelligent heating modes, it maintains the integrity of your sprockets and bearings, to ensure optimal mounting, necessary to achieve your goals.

**The premium heating solution for all your mechanical components.**



Brand of NTN corporation

# SNR - Induction heaters: SmartTemp

The only tool to control the heating of bearings, sprockets, spacer rings...



## Why this new generation of heater is the best on the market?

- **LOW OPERATING COSTS**

Heating bearings and sprockets properly before assembling is crucial to ensure a longer service life of your equipment

- **EFFICIENT**

Best solution on the market to heat mechanical parts with less energy consumption 24 hours a day, 7 days a week, 365 days a year

- **EASY TO USE**

Thanks to its innovative touch screen, set up, monitoring, data extraction are extremely simple

## Technical features

|  | SmartTEMP S   | SmartTEMP M   | SmartTEMP L  | SmartTEMP XL & XL PIVOT   | SmartTEMP XXL   | SmartTEMP XXXL   |
|--|---|---|--|---|---|--|
| Max. weight of workpiece (bearing, sprocket, ring...) (kg) | 50  | 100   | 200  | 400   | 800   | 1600   |
| Min. bore diameter (mm)                                    | 10  | 10  | 20   | 30  | 40  | 85   |
| Max. outer diameter (mm)                                   | 400   | 500   | 600  | 1000  | 1500  | 2000   |
| Power rating (kVa)   | 3   | 3.7   | 8  | 12.8  | 25.2  | 40   |
| Facility power *   | 230V/13A  | 230V/16A  | 400V/20A   | 400V/32A  | 400V/63A  | 400V/100A  |
| Temperature setting range                                  | +40°C to 240°C  | +40°C to 240°C  | +40°C to 240°C   | +40°C to 240°C  | +40°C to 240°C  | +40°C to 240°C   |
| Included   | <ul style="list-style-type: none"> <li>• 3 yokes: 14x14x200 mm, 25x24x200 mm, 40x38x200 mm</li> <li>• 1 temperature sensor</li> <li>• 1 pair of gloves</li> </ul> | <ul style="list-style-type: none"> <li>• 1 pivoting yoke: 50x48x280 mm</li> <li>• 1 temperature sensor</li> <li>• 1 pair of gloves</li> </ul> | <ul style="list-style-type: none"> <li>• 1 pivoting yoke: 70x70x350 mm</li> <li>• 2 temperature sensors</li> <li>• 1 pair of gloves</li> </ul> | <ul style="list-style-type: none"> <li>• 1 yoke (pivoting according to the model): 80x80x490 mm</li> <li>• 2 temperature sensors</li> <li>• 1 pair of gloves</li> </ul> | <ul style="list-style-type: none"> <li>• 1 yoke: 100x100x750 mm</li> <li>• 2 temperature sensors</li> <li>• 1 pair of gloves</li> </ul> | <ul style="list-style-type: none"> <li>• 1 yoke: 150x150x1080 mm</li> <li>• 2 temperature sensors</li> <li>• 1 pair of gloves</li> </ul> |

\* Other voltage on demand

# SNR - Hydraulic nuts

Simple and safe assembly / disassembly of rolling bearings with a taper bore.

Precise and reliable adjustment of the radial internal clearance of rolling bearings with a taper bore.

## Why is this hydraulic nut the best on the market?

- Unique with its patented Back & Forth system (piston moves back automatically)
- Special surface treatment to protect against corrosion
- Knurling on the outside diameter for easy and safe handling
- The “emergency stop function” prevents the piston from falling out
- Extensive standard range in stock



## Applications

- Mines and quarries
- Paper mill
- Wind mill
- Cement factories
- Railway
- Steel industry
- Construction machinery
- Heavy machinery industry and much more

## Interchange

| Thread   | Sizes      | Sizes   | Sizes    | Sizes   | Weight  |
|----------|------------|---------|----------|---------|---------|
| metric   | metric     | metric  | metric   | metric  | kg      |
| G        | <b>SNR</b> | SKF     | FAG new  | FAG old | approx. |
| M 50x1.5 | HMV 10 EBF | HMV 10E | HYDNUT50 | RKP50   | 2.9     |
| M 55x2   | HMV 11 EBF | HMV 11E | HYDNUT55 | RKP55   | 3.0     |

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

# SNR - Other maintenance tools

SNR brand offer also includes a large range of mounting and dismantling tools such as fitting tools, bearing pullers, wrenches...

Bearing pullers



Cold mounting case



Hydraulic pump





# LUBRICATION SOLUTIONS



# SNR - Single point lubricators



**READY – DRIVE – SMART: The ultimate weapon for automatic lubrication.**



## READY booster

Economical and reliable

- Significant savings due to the flexibility of use (1-12 months and stoppable)
- Suitable for tight and restricted areas (Ex proof)
- Ready to use: no assembly and no tools required
- Only one lubricator for all of your applications: inside and outside (-20°C up to 60°C)
- IP68 protection class: reliable lubrication even in extremely moist and dusty areas

Due to its compact size, the Ready Booster can be used in various applications: bearings, plummer block, chains, electrical motors, fans, pumps, conveyors, etc.

## DRIVE booster

Powerful and precise

- Independent with its powerful battery pack
- Powerful: suitable for remote greasing
- Precise: discharge period from 1 to 12 months
- Easy-to-use refill cartridge

For extremely accurate lubrication, independent of temperature and ambient pressure, extremely reliable in use.



## SMART booster

Effective and technical

- Accurate, ergonomic
- Adjustable to the nearest month on the LCD screen
- Constant flow, independent of ambient temperature
- Recyclable: re-usable control unit
- Suitable for use in explosive areas

Effective, precise, flexible lubrication for applications subject to wide variations in temperature or situated in explosive environments.

# Grease options



**UNIVERSAL + HEAVY DUTY +**



**VIB**



**HIGH TEMP MP**



**FOOD**



**FOOD CHAIN OIL**



**CHAIN OIL**

**DESCRIPTION**

|  |   |  |   |  |  |   |
|--|---|--|---|--|--|---|
| General purpose grease for industrial use. | Suitable for very high loads, compatible with many applications, intended for arduous applications. | Parts subject to extensive vibrations or impact. For high-load applications in humid environments. | This grease is ideal for long-term lubrication at high temperatures up to +180°C. | Multi-purpose grease for the food and pharmaceutical industries. Complies with NSF-H1 recommendations. | Food-grade oil for chains designed for the food-processing and pharmaceutical industry. Complying with NSF-H1 recommendations. | Synthetic oils for high temperature chains. |
|--|---|--|---|--|--|---|

**FOR YOUR APPLICATION**

| <b>0</b> limited suitability<br><b>+</b> suitable <b>++</b> very suitable |  | <br>conveyors | <br>electric motors | <br>pumps | <br>blowers / fans |
|---|--|---------------|---------------------|-----------|--------------------|
| <b>READY</b>  |  | +             | +                   | +         | +                  |
| <b>SMART</b>  |  | 0             | +                   | 0         | +                  |
| <b>DRIVE</b>  |  | ++            | ++                  | ++        | ++                 |



# SNR - Multipoint lubrication solution



**POLIPUMP: low cost and easy to implement centralised greasing.**

## Benefits

- **A cost-effective choice**
- **An economical and effective solution**  
Possibility of lubricating 1 to 35 points with the grease of your choice up to a distance of 20 meters
- **Environmentally friendly and easy to implement**  
No technical skills are required for the installation of central lubrication system. Ready to use and easy to refill, this environmentally friendly pump will continue to help reducing your waste

## Applications

- **Industry**  
POLIPUMP can be used for the lubrication of bearings, plain bearings, open gears, chains, ball screws, linear guidance, etc.
- **Vehicles and chassis (agricultural, building, trucks...)**  
A specific version of POLIPUMP has been designed for applications on earth moving equipment, agricultural machinery, trucks, etc.



## Lubrication range

**SNR BRAND OFFERS A SELECTION OF PROFESSIONAL GREASES THAT SHOULD MEET MOST OF YOUR NEEDS.**



# SERVICES

# Training / e-learning

## E-learning program

9 modules and 9 quizzes to reinforce your knowledge about bearings.  
Learn when and where you wish thanks to our E-Learning platform!



## Seminars

With our tailor-made trainings, we respond precisely to your requirements when it comes to the safety of your staff and machines during handling, installation, removal, lubrication of various rolling bearings or linear products.

- Seminar program
- Standard seminars / tailor-made seminars
- At one of our training centres, at your location or online (e.g. web seminars)



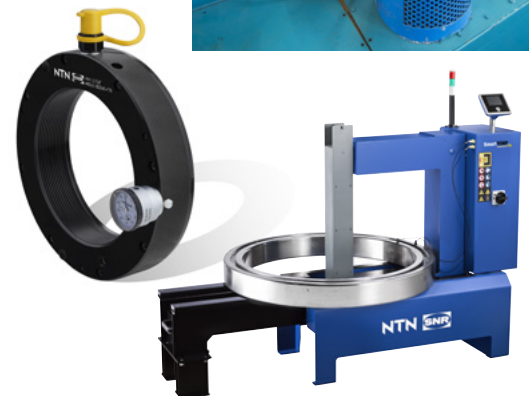
# Technical support and commissioning maintenance

- Assessment of current situations
- Supervising, assembly / disassembly support
- Optimisation of the assembly process
- Support to use new tools
- Assembly method development for specific problems



# Bearing diagnosis

- Initial assessment
- Neutral reports



# Advice on lubrication

- Lubrication systems (single point, centralised pumps)
- Lubricants
- Lubrication intervals and quantities

# Tool rental

- HMV (hydraulic nuts)
- Induction heaters

Experts  
at your service







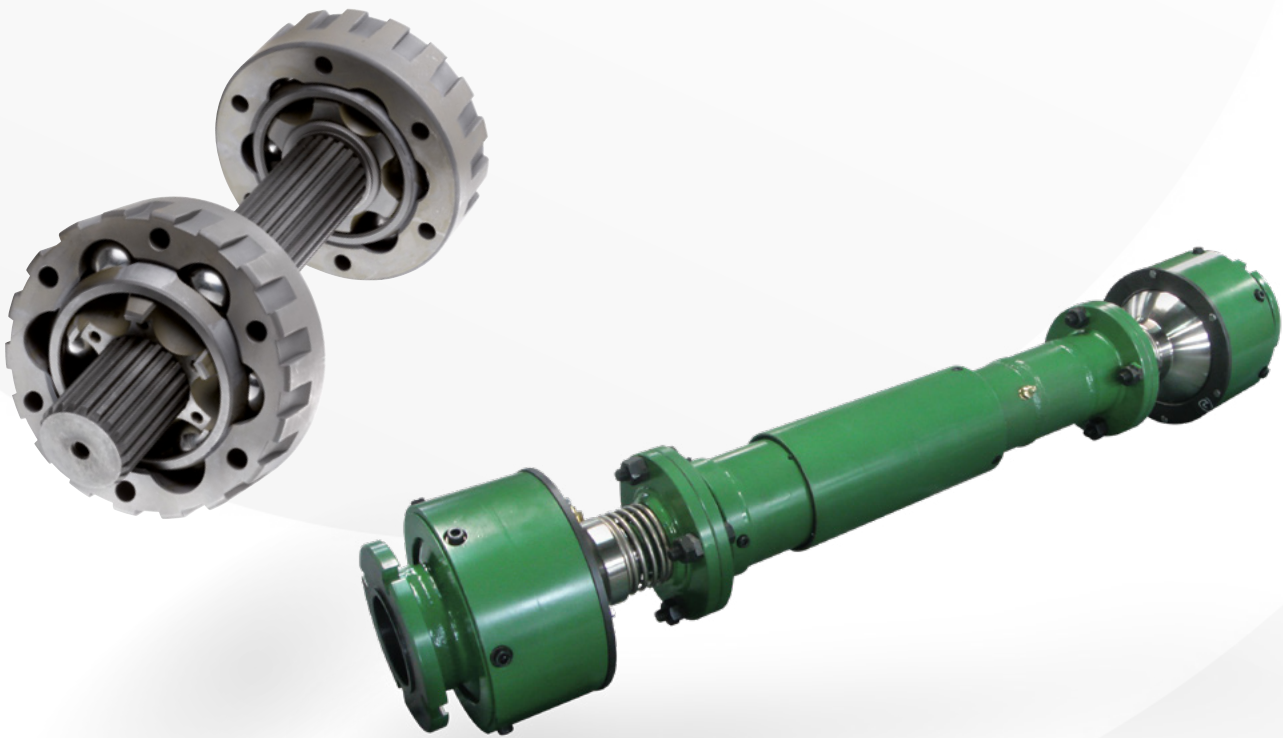
# ADDITIONAL TECHNICAL PRODUCTS



# Constant velocity joints for industrial applications

From **NTN** technical knowledge

- Know-how of the second largest manufacturer on the market
- Jerk-free and vibration-free solutions, even for large angles
- Available as standard as 3-ball joint shafts (TBJ) and as 6-ball joints (BJ)
- Examples of applications: machine tools, glass industry, industrial washing machines, loading machines, steel and iron industry etc.



For more information, please contact us.











# NTN

Make the world **NAMERAKA**

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