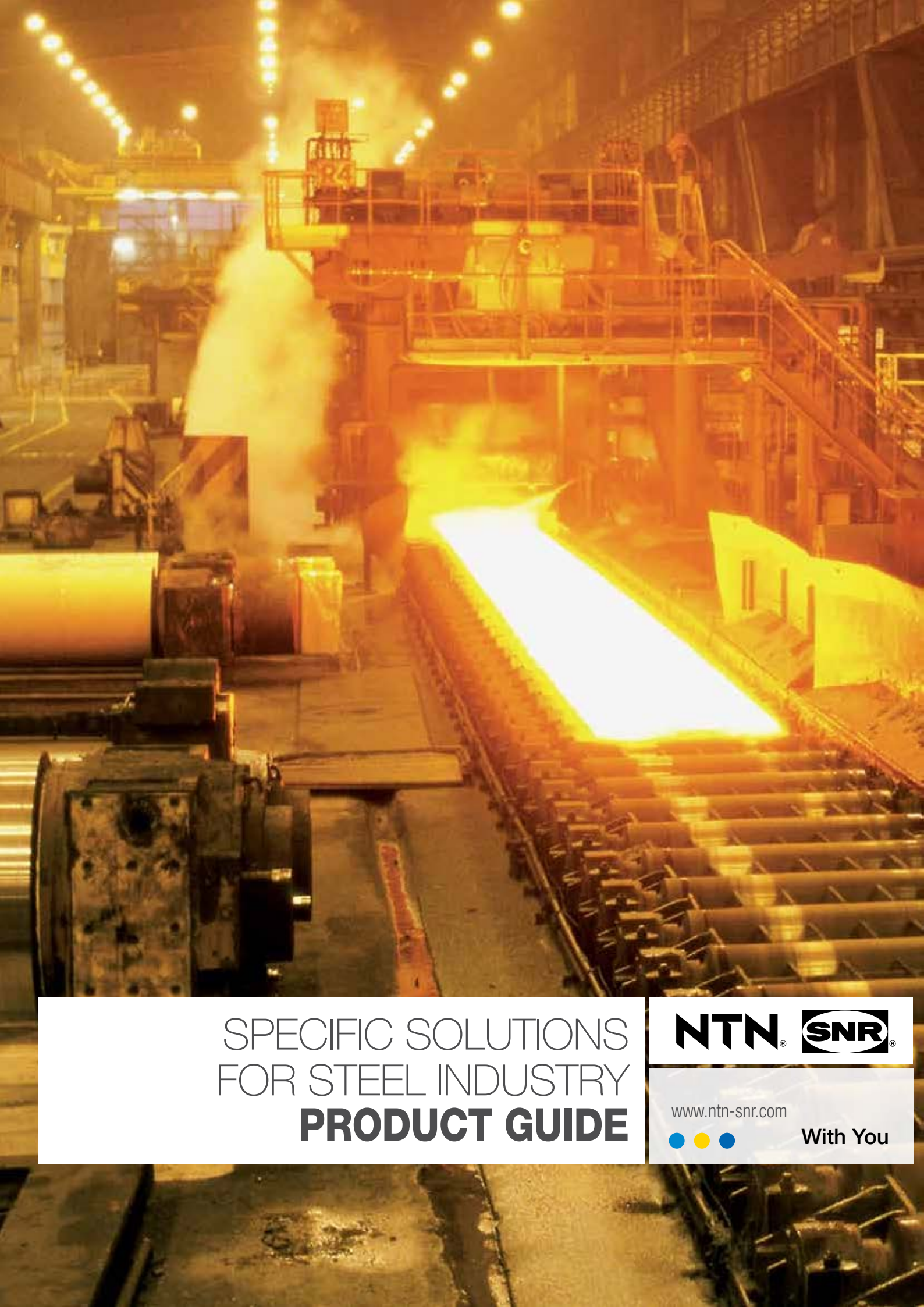




SPECIFIC SOLUTIONS
FOR STEEL INDUSTRY
PRODUCT GUIDE

NTN® **SNR**®

www.ntn-snr.com



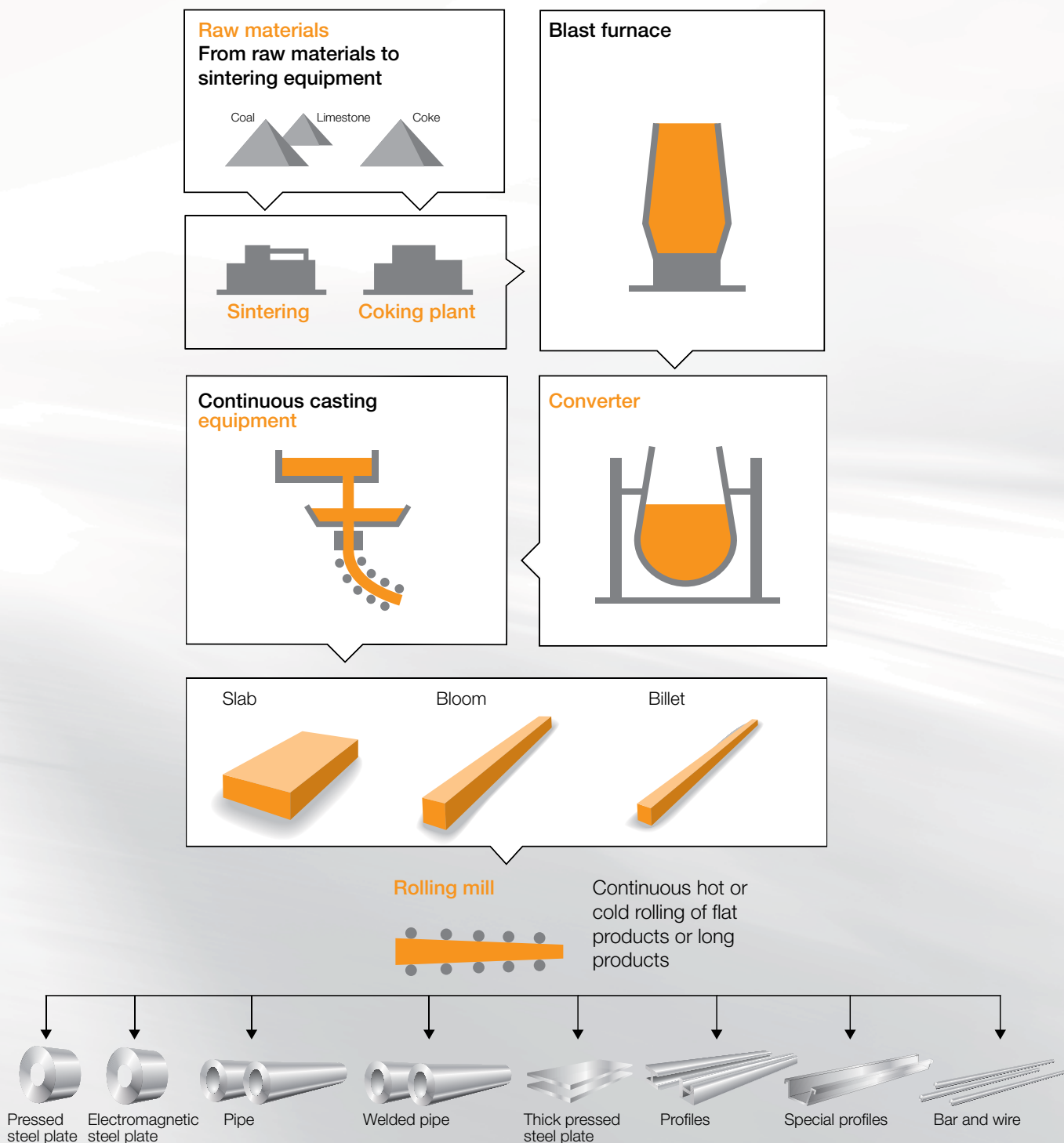
With You



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NTN-SNR IS PRESENT ALL THROUGH THE STEEL MANUFACTURING PROCESS **LONGER MAINTENANCE STEPS - GLOBAL OFFER - CUSTOMER FOCUS AND SERVICE**

NTN-SNR offers you the most efficient products tailored for the operating conditions of your applications, during the entire process of manufacturing steel and steel-based products. A pragmatic approach to your needs allows us to develop high performance products. Our objectives: extend the service life of your equipment, make maintenance intervals longer, avoid unscheduled downtimes and as a result reduce production costs. This allows you to reduce the environmental footprint of your equipment.



RAW MATERIALS

Preparing raw materials for manufacturing steel requires a number of conveying and screening equipment. For this purpose, NTN-SNR has developed a complete range of self-aligning or plummer block units, as well as bearings suitable for harsh pollution and/or vibration conditions.

RAW MATERIALS CONVEYORS

Split plummer block-units



- The design focuses on solidity; made under the strictest quality control.
- Bearings in SN, SD, SNOL range.
- Wide range of seals.



Self-aligning bearing units

- Bearings with standard sealing or reinforced sealing.
- Asian and European range.

DRYER BEARING UNIT



Large-sized split plummer block

This large-sized split plummer block is the largest example of NTN manufacturing.

Outer dimensions:
2,150 (H) x 2,750 (L) x 1,100 mm (W)
Weight: 15,200 kg (bearings) 240/118 OK30

ULTAGE

ULTAGE SPHERICAL ROLLER BEARINGS

NTN-SNR offers a wide range of open or sealed spherical roller bearings (EE).

Sealing to extend service life

- Efficient solution against pollution.
- Pressed steel or machined brass cage.
- Seals suitable for temperatures up to 200°C.
- Cylindrical or taper bore.



Very high resistance to vibration, impact and load

- Machined brass cage.
- Special reduced bore tolerance.
- Special reduced outer diameter tolerance.
- Special clearance tolerance (C4+).
- Optional surface treatment against fretting corrosion on the inner ring

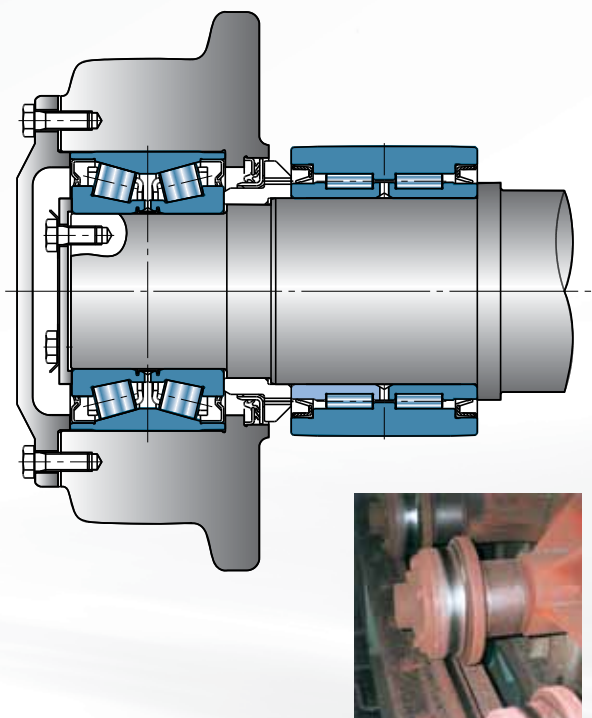


EF800 series

SINTERING

The sinter strand requires carriage rollers with long service life. NTN-SNR has developed specific roller bearings for this application. Spherical roller bearings, one-piece or split, complete the lining of the machine.

SINTER STRAND



Sealed double-row taper roller bearings

- Uses compact complex anti-dust lip seal to achieve both high resistance to dust and high load capacity.
- 2-piece inner ring is non-separable thanks to the fastening ring. Ease of maintenance.

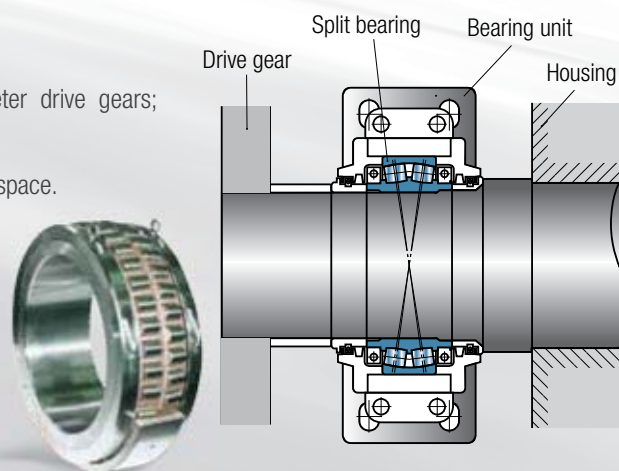
Sealed double-row cylindrical roller bearings

- Uses special seals which prevent sintering powder from penetrating into the bearing.
- Uses case hardened steel.
- Thickness of outer ring allows great resistance.
- 2-piece inner ring is non-separable thanks to the fastening ring. Ease of maintenance.

DRIVE SHAFT

Split double-row spherical roller bearings

- Enables bearings to be changed without removing large diameter drive gears; dramatically reduces cost and time required for changing bearings.
- Split bearings can easily replace one-piece bearings in the existing space.



CONVERTER

NTN-SNR has developed large-sized spherical roller bearings, one-piece or split, specific to this equipment.

CONVERTER AND TRUNNION SUPPORT

Super large-sized split double-row spherical roller bearings



- Using a split bearing between converter and pull gear dramatically reduces time required for changing the bearing. It takes only 1/10 the time it takes to change a one-piece bearing.
- Bearing can be designed to fit existing housing and can be easily modified.

Bearing outer dimensions (see photo):

Ø1120 (inner diameter) x Ø1540 (outer diameter) x 525/355 mm (width)

Max. actual dimensions:

Ø1400 (inner diameter) x Ø1900 (outer diameter) x 880/530 mm (width)

Super large-sized spherical roller bearings



CONTINUOUS CASTING

Continuous casting is used to make semi-finished products. To do so, there should be a transition from liquid phase to solid phase. Continuous casting rollers are therefore subject to high stress (load, temperature, etc.). NTN-SNR's specific products for fixed, free and intermediate bearing units help to meet these severe requirements.

FREE SIDE BEARING OF GUIDE ROLL

Cylindrical roller bearings with self-aligning function

- A double outer ring integrating a sphere allows the self-alignment of the bearing.
- General bearing shape maximises the rated load capacity.
- Allows axial shaft movement to offset heat expansion (used as free side bearing).

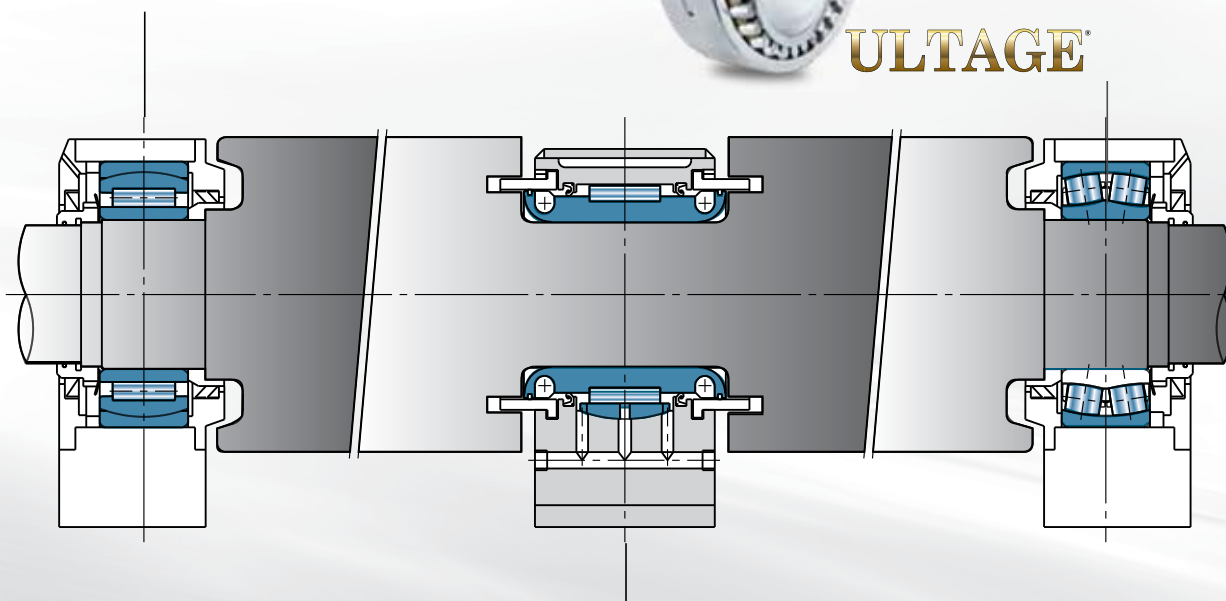
FIXED SIDE

Spherical roller bearings

- Uses ULTAGE bearing for operation at high temperatures (+200°C)
- Uses symmetric rollers to maximise rated load.



ULTAGE®



Split cylindrical roller bearings and water cooling jacket type housing

- Seal construction prevents penetration of water and scale.
- General bearing shape maximises the rated load capacity.
- Allows axial shaft movement to offset heat expansion.
- Uses water-cooled jacket housing to limit temperature rise in the bearing unit.

ROLLING MILL

Steel rolling requires high precision products and complete reliability. Designed for heavy loads, high speeds and/or requiring reinforced sealing, NTN-SNR products provide a tailored solution for each type of rolling mill (cold or hot). A specific processing of the steel along with the heat treatment of these bearings ensures optimal service life.

WORK ROLL

Sealed four-row tapered roller bearings “Large size, long service life EA bearings”

- Three times longer life than standard case hardened steel bearings (continuous hot rolling mill).
- Sealed bearing does not require greasing during operation and effectively reduces the environmental impact (no grease leakage).



BACKUP ROLL



Four-row cylindrical roller bearings

- EA bearings for longer life (optional).
- Can be equipped with pin type cage to maximise rated load capacity and further extend life.

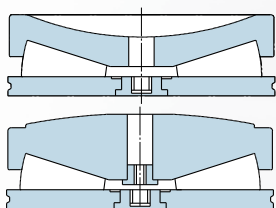
BACKUP ROLL THRUST BEARING

Double-row tapered roller bearings

- Equipped with pin type cage to maximise rated load capacity and further extend life.
- Steep contact angle to maximise performance under axial loads.



PRESSURE SCREW



Tapered roller thrust bearings

- General bearing shape maximises load capacity.
- Inner ring surface is spherical to fit pressure screw shape.

The use of proven sealed or Rust Guard™ surface-treated bearings extends the service life of the bearings and of the rolling mills.

Sealed four-row tapered roller bearings for rolling mill

- High load capacity.
- Extremely compact seal.
- Specific grease as standard.

Specially designed for applications:

- With high loads.
- In highly polluted environments.

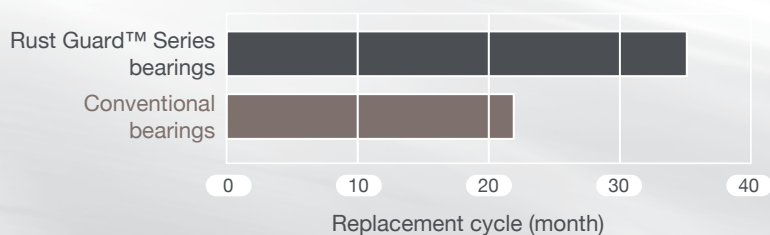
ULTAGE®



Anti-corrosion treatment (Rust Guard™)



- NTN-SNR has developed Rust Guard™ coating, which is a special phosphate coating that does not affect the roughness of the base material during the coating formation process, in order to avoid the premature failure of bearings and down times due to rust.
- Moreover, Rust Guard™ also has good anti-seizure properties thanks to its good grease retention capacity.
- Rust Guard™ coating can be used in addition to version EA.



ROLLING MILL

As essential addition to the range, NTN-SNR has developed high load capacity bearings as well as specific split bearings. The range of NTN industrial constant velocity joints allows the transmission of rotation movement without vibration to your equipment.

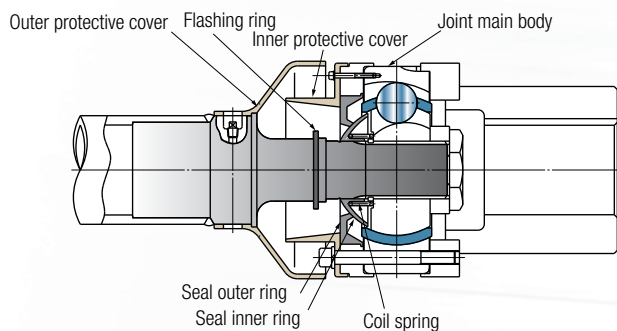


Large-sized four-row tapered roller bearings “pin type cages”

- Equipped with pin type cages to increase the number of rollers, load capacity is maximised.
- EA bearings ensure longer life.

Split cylindrical roller bearings for pilger mill

- By its design, the crankshaft allows only split bearings to be mounted.
- The bearing has a highly resistant cage and a load capacity to withstand operating stress.

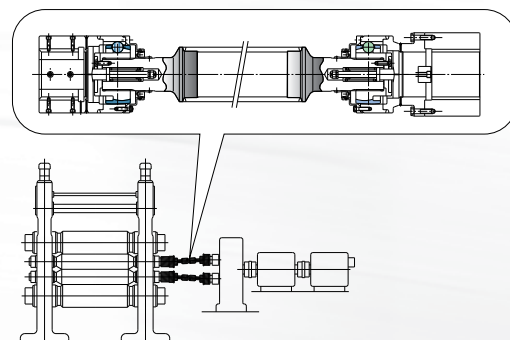


Metal industrial constant velocity joints for rolling mill

Industrial constant velocity joint with mechanical metal seal for demanding environments such as high temperature, water and scale.

Industrial constant velocity joint (large-sized) for reversible rolling mills (Skin Pass)

- Sealed with rubber boots with superior performance, does not require re-lubrication.
- The constant velocity of the joint eliminates shattering marks on rolled surface. (Sizes #250 – 725).



COLD ROLLING SPECIAL

NTN-SNR has developed bearings suitable for "Sendzimir" cold rolling mills. These high precision bearings are available in standard steel or case hardened steel, depending on your needs.



Backing roll bearings for Sendzimir cold strip mill

- Because it is directly used for backup roll, the bearing is stronger and has a thicker outer ring.
- Mutual difference of assembly thickness for bearings mounted on same shaft is controlled to be extremely small.
- This bearing is manufactured for high load capacity and high precision.

Sealed type backing roll bearings for Sendzimir cold strip mill

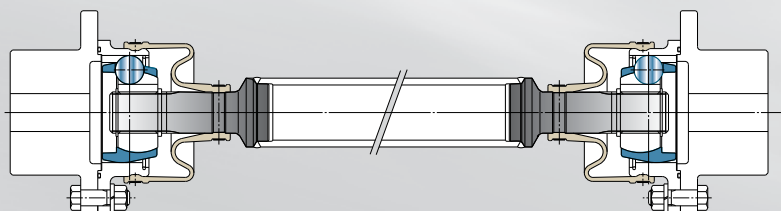
- Seals allow the use of special lubricating oil to maximise service life.
- Enables recovery of waste oil; does not affect rolled materials.
- Enables use of low viscosity rolling oil.



Roller table

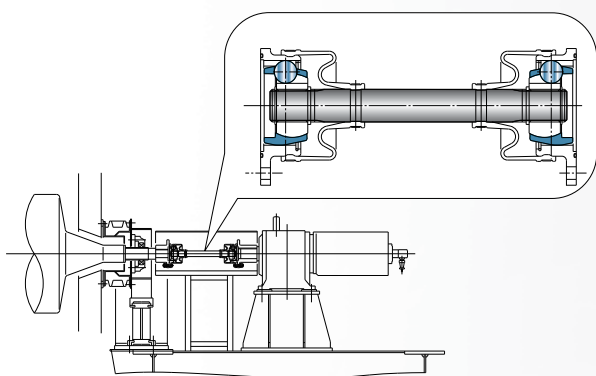
Industrial constant velocity joint (BC coupling type, long shaft series)

- Sealed with rubber boots with superior sealing performance, does not require re-lubrication,
- Uses a corrosion-resistant steel for shafts.



FINISHING

In addition to our range of constant velocity joints, NTN-SNR also offers a range of ready-to-use tension levellers.



Constant velocity universal joints (BC rated load coupling) for drive in furnace roller

- Thermal expansion of furnace roller absorbed by the sliding of the constant velocity joint. (Sizes #75 – 200)
- Contributes to the cleanliness of the environment.
- Sealed with boots with superior sealing performance; does not require re-lubrication.

Tension leveller roll unit

Cartridge unit



- Uses high precision, small-diameter, long rolls; surface roughness has also been reduced.
- Cartridge is fitted with several rows of angular ball bearings to enhance axial load capacity and speed.
- Labyrinth construction and low contact seals ensure both tight sealing and low torque

ULTAGE®

LONG LIFE SPHERICAL ROLLER BEARINGS FOR HIGH TEMPERATURE USE FOR GUIDE ROLL



- Allows operation at temperatures above +200°C.
- Uses symmetric rollers to maximise rated load

NTN-SNR offers a wide range of open or sealed spherical roller bearings (EE).



NTN-SNR products suitable for this sensitive zone in the process help optimise service life. The transmission of movement without vibration allows the final appearance of the rolled product to be maintained.

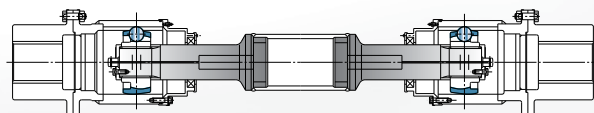


Split plummer block with solid grease

- Sealed with solid grease that does not leak out and get on other parts.
- Does not require re-lubrication.

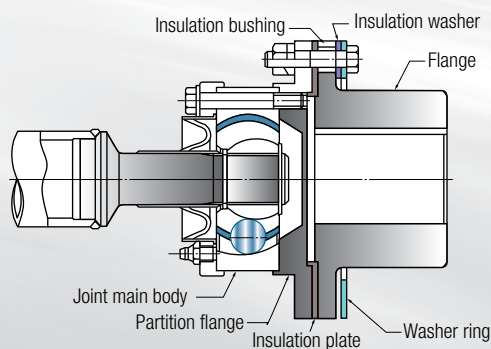
Industrial constant velocity joint (large-sized) for tension reel

- This constant velocity joint can accept a maximum 300 mm stroke in the axial direction. (Sizes: DOJ350 – 625)



Insulated constant velocity joint

- Insulated constant velocity joint for preventing damage due to fault current, with insulation in the joint's main body and flange.
- Facilitates replacement of insulated parts.



FINISHING

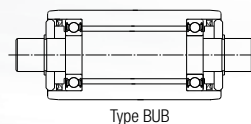
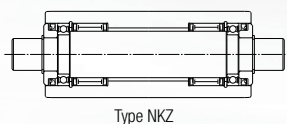
Extend the service life of your applications with the SNC / SNCD bearing range

- Optimised design: excellent toughness, stability and high vibration resistance.
- Improved resistance and heat dissipation characteristics: reduction in stress levels on the bearing and decreased operating temperature of the lubricant.
- Increased service life.
- Also available in spheroidal cast material



Backup roll units

- Labyrinth construction and low contact seals ensure both tight sealing and low torque.
- If even lower torque is necessary, a roll unit (BUB type) that uses deep groove ball bearings only is also available.
- To perform its function optimally, the roll unit's precision and surface roughness are reduced



SNCD31/30 Split plummer block housing, large size

- Made from spheroidal cast material for highest shock resistance and good low temperature behaviour
- Extended life duration through optimised design features
- Superior performance with NTN-SNR spherical roller bearings (Ultage series)
- Designed for cylindrical and tapered bore bearings
- Interchangeable with SD series according ISO 113
- For demanding environments also available with Taconite seal

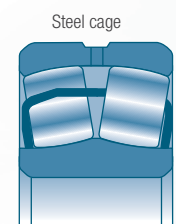


STANDARD RANGE

WITH STEEL CAGE (EA)



- Designed for standard applications
- Material stabilisation treatment 200 °C for inner and outer rings
- Specific cage shape: perfect guidance of rollers avoiding overheating
- uncreased volume between the 2 rows of rollers allows:
 - Greater lubricant reserves.
 - Better circulation of lubricant inside the bearing.
 - Optimised bearing service life



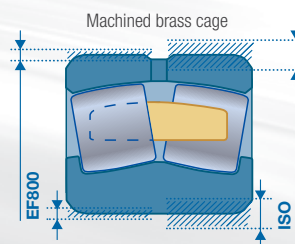
WITH MACHINED CAGE (EM OR B)



- One-piece machined brass cage: excellent impact resistance, great stiffness (type B: one machined brass cage per row).
- Cage centred on rolling elements: no blockage in case of heat expansion.
- Re-lubrication groove and holes (W33)
- Available up to bores of 1120 mm.

EF800 SERIES FOR HIGH-VIBRATION APPLICATIONS

- Designed for particularly severe applications.
- One-piece machined brass cage: optimal stiffness and vibration resistance.
- Cage centred on rolling elements: no blockage in case of heat variations.
- Optimised load capacity to improve bearing service life.
- Optimised assembly: reduced outer diameter and bore tolerances.
- Special radial clearance: C4, positioned at upper 2/3rds of the C4 tolerance range (special clearance also available in C0 and C3 classes).
- Recommended fits:
 - Tight at housing, P6 class.
 - Sliding at shaft, g6 class.



STANDARD RANGE

ULTAGE[®] SEALED (10X.....EE)



- Reduced maintenance operations and increased service life.
- Limits the penetration of impurities into the bearings, which delays the deterioration of the grease and bearings.
- Seals can be mounted on standard bearing units.
- Even a sealed bearing can be re-greased.
- Bearing performance remains high, even when the bearing is misaligned ($\pm 0.5^\circ$).
- Available in large dimensions: < 260 mm.
- Wider than standard bearing;

ANOTHER STANDARD RANGE

NTN-SNR brings you its entire range of standard bearings for your equipment:

- Tapered roller bearings.
- Single- or double-row cylindrical roller bearings (E, SL version).
- Roller thrust bearings (conical, cylindrical or spherical).



CAST IRON SELF-ALIGNING BEARING UNITS



- Several housings (plummer block, flanged, take-up, big-end or cartridge type)
- Supplied pre-assembled, relubricatable or with for life lubricated insert bearing
- Efficient protection against corrosion by passivation
- Sealing solutions for operation in harsh environments
- Optional additional covers, cast iron or pressed steel, with double lip seal to increase tightness and service life
- Bearing inserts for high temperature applications available



BEARINGS WITH SOLID LUBRICATION

LP03: -20°C to +60°C (80 °C max.) / LP05: -20°C to +120°C (100 °C max. continuously)

- Re-lubrication not necessary

Solves maintenance problems when bearings are not accessible.

- Resistant against contamination

Bearings with solid lubrication resist contamination such as dust, humidity.

- No lubricant leakage

Solid lubrication: eliminates soap leakage and grease leakage is very low.
Ensures clean running applications.

- Suitable in cases of centrifugal force and vibrations

The solid mass of the grease ensures an excellent resistance to centrifugal forces and ensures a consistent supply of lubricant to the bearing necessary for effective operation.

At ambient temperature, very low starting torque (compared to “conventional grease lubrication”).



SPW/SFCW BEARING UNITS*



- Quick assembly and interchangeable with SN / SNL / SNH / SNA / SE / SNC assemblies.
- Quick assembly to minimise downtime and maximise productivity.
- Equipped with sealed spherical roller bearings, W222xx series
- Housing in one part.
- Excellent sealing characteristics.
- Components treated with black iron oxide for anti-corrosion protection.

Housing can be used as a fixed or floating bearing unit by adjusting a spring retaining ring.

*Available on request

STANDARD RANGE

SPLIT PLUMMER BLOCK UNITS: SNC / SNCD



- Excellent rigidity and stability under all loading conditions
- Optimised to enhance resistance to vibration
- Improved heat dissipation characteristics
- Reduced stress levels in the bearing
- Extended service life for the bearing
- Comprehensive assortment of sealing options: Taconite, labyrinth, double lip, - felt and V-ring seal
- Ready for use, easy to fit

- Shaft diameter: 20 mm - 160 mm
- Also available in spheroidal cast material

On request, supply of specially tailored designs adapted to your applications

OIL-LUBRICATED ONE-PIECE BEARING UNITS ZLOE



- Equipped with two deep groove ball bearings or a combination of a deep groove ball bearing with a cylindrical roller bearing.
- Suitable for applications with high load capacities combined with high temperatures.
- Adapted for high speed applications (industrial ventilators)
- Lubricant cools the system down.
- Longer service life.
- Equipped with oil-level indicator.
- Shaft diameter: 75 mm - 120 mm.

OIL-LUBRICATED SPLIT PLUMMER BLOCK HOUSINGS SNOE



- Suitable for spherical roller bearings
- Excellent for high operating speeds and loads
- Higher life time due to optimised load distribution
- Material: EN-GJS-600-3 giving the housing a high stiffness and rigidity
- Internal distribution of oil via a ring oiler
- Sealed with labyrinth system
- Equipped with oil-level indicator
- Possible integration of oil cooling or heating device
- Excellent heat dissipation
- Ideally suited for industrial ventilators, hammer crushers
- Maximum shaft dimension: 260 mm

SERVICES DEDICATED TO STEEL INDUSTRY

Experts
& Tools

Good bearing selection, lubrication and maintenance are key factors in increasing the service life of your equipment. In addition to the bearing range, Experts & Tools service offer makes maintenance easier for you and increases the service life of your equipment.

CUSTOMISED SERVICES



- Technical assistance in fitting and removing bearings.
- Renovation of bearings removed from equipment as part of a maintenance programme.
- In-situ training of maintenance teams.
- Diagnostics of damaged bearings.

SUITABLE TOOLS

- Self-centering hydraulic pullers with up to 20 tonne capacity.
- Hydraulic nuts with up to 1000 mm bore diameter as standard (with pump and threaded tip).
- Induction heater (for bearings up to 1200 kg).

These tools are also available for rental.



A COMPLETE LUBRICATION OFFER*

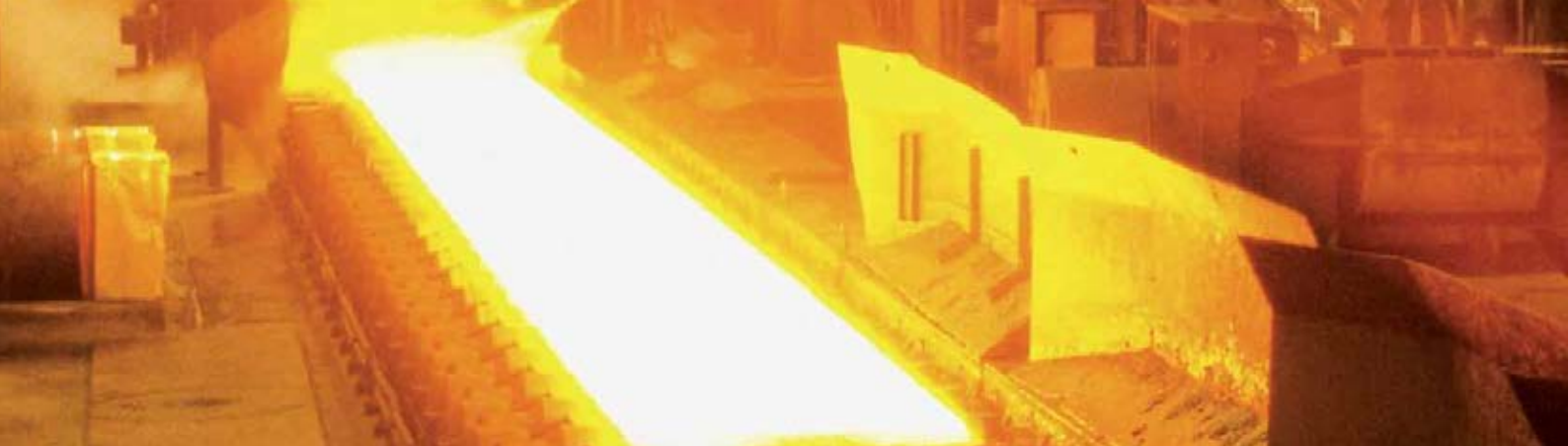


NTN-SNR guides you in everything related to the lubrication of bearings:

- Choice of lubricant, re-lubrication.
- VIB (vibrations & shocks), LUB HEAVY DUTY (very high loads) and HIGH TEMP (high temperatures) greases.
- Automatic lubricators dispensing these same greases.
- Pumps and accessories for centralised lubrication systems up to 1000 points.

Our experts can also provide their know-how to define, or even install, these systems.

*Offer limited to certain areas - Please contact us



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