



SNR Bearings: the strength of steel
for the iron and steel industry.

SNR - Industry



SNR Bearings:

made from steel, built for steel

The work of the iron and steel industry consists of transforming iron ore or scrap metal into steel with specific characteristics. The high temperatures and loads involved in this industry mean that bearings are subjected to higher stresses than any other industrial sector.

There is not just one but many types of steel

Steel is an alloy made up essentially of iron, to which a small quantity of carbon is added (between 0 and 2%). The proportions determine the characteristics of the resulting metal. However, other elements (such as nickel) can be added to the carbon, depending on the end-purpose of the steel.

Steel, from iron ore to the finished product

From the raw material to molten steel
This first step determines the proportions of the different components according to the desired qualities of the steel.

The iron ore is crushed, screened, and loaded with lime and coke in the sintering process. This sintered ore is charged into the blast furnace with coke, whose combustion provides the necessary heat to melt the ore. When steel is produced from scrap metal, the scraps are first sorted, graded and crushed, then melted in the same manner.

The molten pig iron is collected at the bottom of the blast furnace and routed to the steelworks in ladle cars. The impurities in the steel adhere to the lime and are then removed from the oven, to create steel (almost pure iron). Finally, the chemical composition of the steel is adjusted to achieve optimum purity.

Casting: to obtain semi-finished products

The steel is collected in the molten state in a metal ladle lined with refractory material, then transported to the casting site, where casting can be carried out in one of two ways.

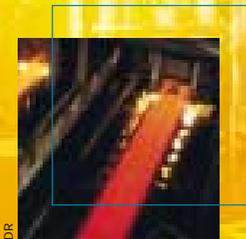
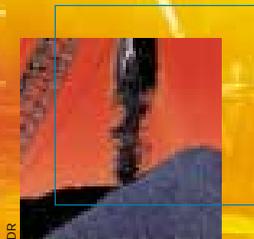
- **Continuous casting.** This is the predominant practice. The molten steel is poured directly into an oscillating tundish to give it its shape, and solidifies on cooling. The steel is then cut into slabs by an oxygen torch.
- **Ingot casting.** The steel is poured into cast iron molds called ingot molds, then left to solidify. Once solidification is complete, the molds are stripped from the ingots and then reheated to 2200°F and flattened in large rolling mills for

transformation into slabs (for sheet or coil finishing) or into billets (for rail, bar, or structural shape finishing).

Rolling: approaching the finished products

This transformation process consists of rolling the semi-finished products between rollers under extreme pressure to achieve the desired dimensions (flat products or long products).

- **Hot rolling.** The process involves feeding the hot metal (ingot or continuously cast product) between two counter-rotating cylinders at temperatures varying from 1500°F to 2200°F to crush it. By repeating this operation several times, the product becomes flatter and flatter, or longer and longer, depending on the desired shape (coils, rails, structural shapes, bars).
- **Cold rolling.** More than half the hot-rolled sheets are then cold-rolled to further reduce their thickness and improve their surface condition before a finishing operation (painting, protective treatment, etc.).

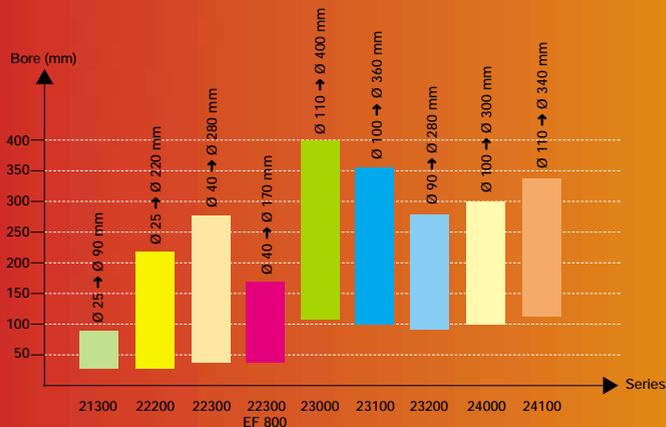


An obstacle course for all types of bearings

The conditions the bearings have to endure vary during the process, but are always highly taxing:

- High temperatures (rolling, casting) causing thermal expansion and misalignment,
- Very high pressures (rolling),
- High loads (conveying, continuous casting bend sections),
- Humidity, vapor (the products exposed to high temperatures are cooled by spraying with water),
- Vibration, impacts (crushing, conveying).

The SNR Line: Spherical Roller Bearings



Crushing



The type of crusher and method of crushing determine the choice of bearing.

- SNR double-row spherical roller bearings from the Series 21300 to 24400
- SNR spherical roller bearings Series EF 800

Continuous casting



Pillow block support for bending and straightening rollers

- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24...
- SNR type SNU or special cast-iron pillow blocks

Casting ladle turret

- SNR cylindrical roller bearings (EM)
- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24... (EM)
- Large-diameter cylindrical roller thrust bearing (heavy load, moderate speed), consult SNR Engineering
- SNR spherical roller thrust bearings Series 29...E (high axial load or combined load, misalignment)

Mold oscillator

- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24... (EM)
- SNR tapered and cylindrical roller bearings (EM)

Conveyors



For slabs

- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24... (EM)
- SNR cast-iron pillow blocks type SNU

For coils, bend rollers

- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24...
- SNR cast-iron pillow blocks type SNU



Sintering



Carrying rollers for carriages and capstans for chain starwheels

- SNR double-row cylindrical roller bearings with shields or seals, type GNU

Oxygen oven

- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24...

Rolling mills



Hot rolling mills

Working and back-up roller support

- SNR multi-row cylindrical roller bearings (small and medium-diameter bore)
- 2- or 4-row tapered roller bearings, consult SNR Engineering

Clamping

- Roller thrust bearings, consult SNR Engineering

Cold rolling mills

Type ZR and SKIN PASS

- SNR cylindrical roller bearings, sealed or shielded type GNU

Roller leveller

- Sealed needle roller bearings, consult SNR Engineering

Working and back-up roller support

- SNR multi-row cylindrical roller bearings (small and medium-diameter bore)
- 2- or 4-row tapered roller bearings, consult SNR Engineering

Winder



- SNR double-row tapered roller bearings
- SNR single-row cylindrical roller bearings:
 - type N-NJ-NU-NUP for normal bearings
 - type GNU for special bearings
- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24...

Gearbox

- SNR tapered roller bearing Series 30...
- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24...
- SNR cylindrical roller bearing:
 - type N-NJ-NU-NUP for normal bearings
 - type GNU for special bearings

For coils, central support

- SNR cylindrical roller bearings type GNU

Descaling

- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24...
- SNR cast-iron pillow blocks type SNU

Clearing table

- SNR double-row spherical roller bearings Series 21..., 22..., 23..., 24...
- SNR cylindrical roller bearings (medium bore):
 - type N-NJ-NU-NUP for normal bearings
 - type GNU for special bearings

The SNR Product Range: a solution for every application

SNR offers bearings that are interchangeable with those in your machines:

- **Either standard SNR Bearings with performance optimized by shields or seals and appropriate clearance and grease.**
- **Or special bearings designed specifically for your needs, with identical dimensions to the bearings currently in place. Consequently no modifications are required.**



SNR special cylindrical or tapered roller bearings for conveyors

Carrier rollers and driving rollers on special cylindrical or tapered roller bearings.

- Withstand impacts and high temperatures.
- Equipped with seals and lubricated for life: they require minimum maintenance.
- Special steels: heat treatment adapted to the application.



SNR cast-iron pillow blocks type SNU

- SNR cast-iron pillow blocks, type SNU, associated with double-row self-aligning ball bearings, Series 12..., 13..., 22..., 23... or double-row spherical roller bearings Series 21..., 22..., 23..., 24...
- SNR cast-iron self-aligning bearing units.



SNR Bearing EF 800

- Designed for particularly harsh applications.
- One-piece machined brass cage: provides high rigidity and resistance to vibration.
- Rolling-element centered cage: lessens the effect of thermal expansion.
- Maximum basic load rating: enhances the bearing life.
- Optimized bearing fitting: with reduced tolerances on the outside diameter and bore.
- Special radial clearance: J40 (C4) category is controlled to the upper two-thirds of the ISO tolerance. This special tolerance is also available in the J30 (C3) clearance category.
- Recommended fits:
 - Interference fit in the housing, class P6.
 - Sliding fit on the shaft, class g6.

SNR EM (Machined Cage) Series double-row spherical roller bearings for casting (bottom section)

- One-piece machined brass cage: excellent resistance to impacts and vibrations.
- Cage centered on the rolling element to prevent cage jamming due to thermal expansion.
- Bearing rings are subject to a specific heat treatment that ensures their dimensional stability at operating temperatures up to 200°C (390°F).

SNR cylindrical roller bearings N-NJ-NU-NUP

- Withstand high loads.
- Accept misalignment.



SNR Bearings for rolling mills

- Cold rolling mills: SNR cylindrical roller bearings, type GNU.
 - High radial load capacity.
 - Resist impacts (outer ring in case-hardened steel).
 - Withstand high temperatures.
 - High precision diameter control.
 - Lubrication groove.
 - Surface profile giving optimized contact.
- Possibility of incorporating seals.
- Special steels with specially adapted heat treatment.
- Hot rolling mills: SNR recommends large tapered roller bearings.
 - Can be supplied with two or four rows of rollers
 - Very high load capacity.



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