
# Cylindrical Roller Bearings

## High axial load carrying capacity due to optimized rib contact

SCHAEFFLER GROUP
INDUSTRIAL

# Significantly higher axial load carrying capacity

**Properties of cylindrical roller bearings**

Cylindrical roller bearings have been used as non-locating bearings, semi-locating bearings and locating bearings for many decades. They consist of bearing rings, rolling elements and a cage, depending on the design. Their design means that they have an extremely high radial load carrying capacity and high rigidity. They are especially suitable for compact designs. In addition to high radial loads, cylindrical roller bearings can also support axial loads if they are used as semi-locating or locating bearings.

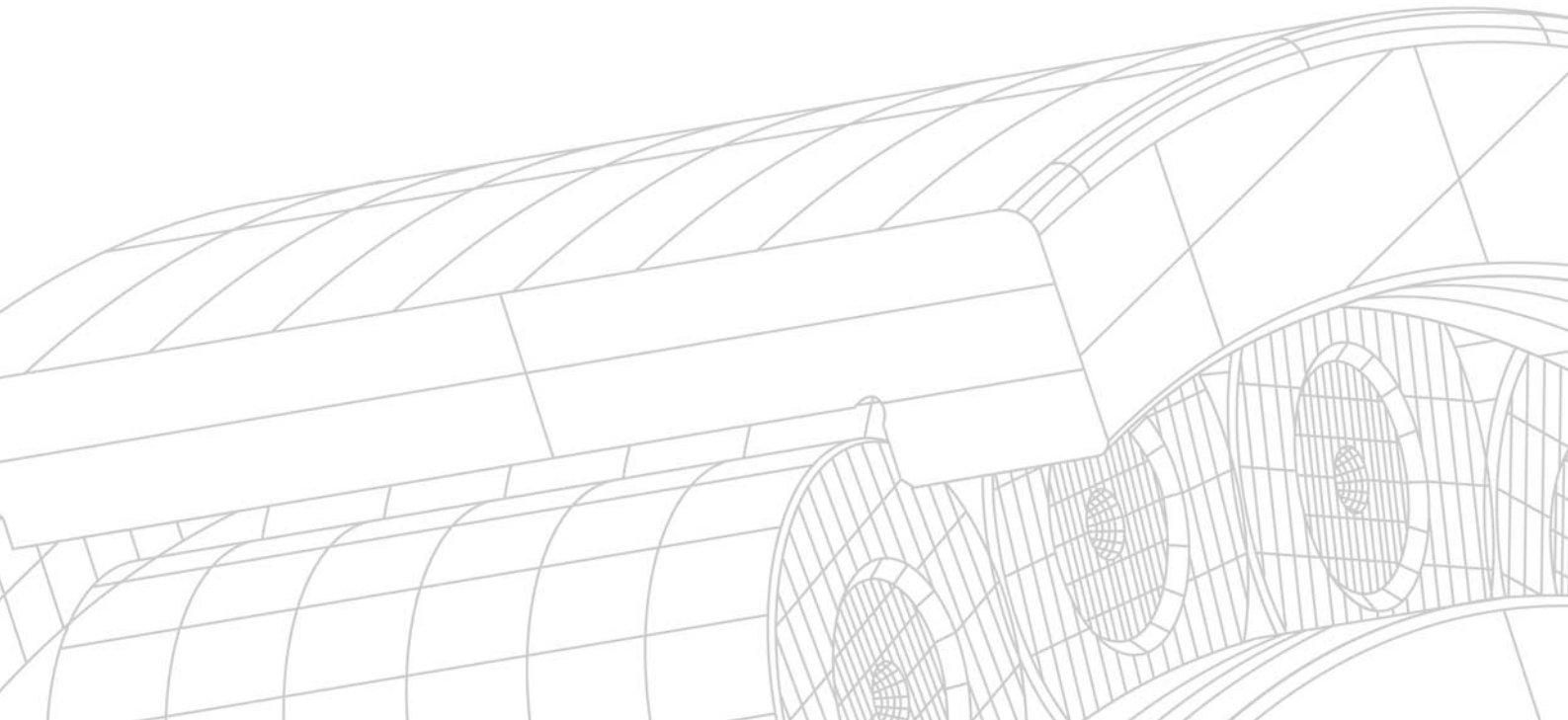
In principle, the friction values and therefore heat generation are higher in the case of sliding friction compared with rolling friction. This is why the axial load carrying capacity of cylindrical roller bearings is usually limited. Due to the distribution of forces inside the bearing, this limit is dependent on radial loads.

Cylindrical roller bearings SL183040-TB

The permissible axial load is therefore limited to 40 % of the radial load according to the current state of the art (Fa/Fr = 0.4). Measures for increasing the permissible axial load therefore involve improving the lubrication in the sliding contact and/or reducing the contact pressure in the contact between the rib and the roller.

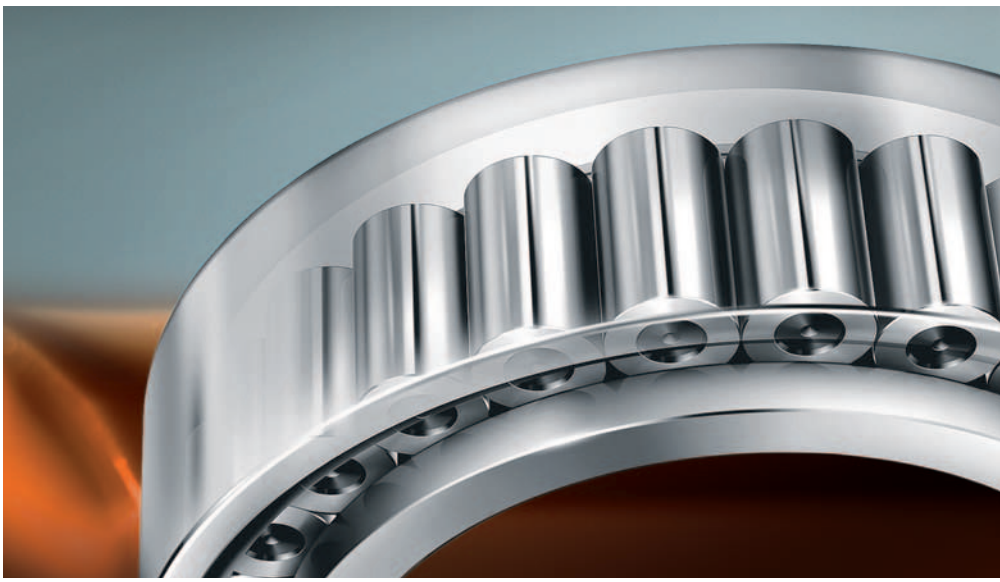
**INA cylindrical roller bearings with optimized rib contact**

In future, the axial load can be up to 60 % of the radial load with the new INA cylindrical roller bearings with optimized rib contact (Fa/Fr = 0.6).



The contact points between the roller end faces and the bearing ribs were improved by using newly developed calculation methods and manufacturing processes. The frictional torque in the bearing is reduced by up to 50%. The bearing temperature during operation is thereby lower. The operating life of the bearings under axial loads is now significantly longer.

The following series will be converted to the new design from mid 2007.



Cylindrical roller bearing SL183040-TB

Ordering example: LSL192330-TB

| Series in TB design | From bore diameter |
|---|---|
| LSL1923 | 90 mm |
| SL1923 | |
| ZSL1923 | |
| SL1818 | 460 mm |
| SL1822 | 140 mm |
| SL1828 | 600 mm |
| SL1829 | 300 mm |
| SL1830 | 180 mm |
| SL1850 | 180 mm |

- Longer operating life of the bearing under axial loads
- Significantly higher axial load carrying capacity compared with standard bearings (the axial load can be up to 60% of the radial load)
- Reduced contact pressure due to optimized contact geometry
- No roller wear under axial loads due to improved lubricant film formation
- Lower bearing temperature due to reduced friction (the frictional torque under axial load is reduced by up to 50%)

- High overall equipment efficiency
- New design possibilities (downsizing)
- Lower operating costs due to reduced energy consumption
- Low maintenance costs

# Optimized contact geometry

The special curvature of the roller end faces means that the contact geometry between the roller end face and the rib has been optimized, thereby reducing the maximum contact pressure. This enables the formation of a stable lubrication film – the end faces and ribs are separated by the lubricant. Under axial loads, the rollers slide on the lubricant film. This considerably reduces the risk of mixed friction conditions. This optimization completely avoids wear on the ribs and the roller end faces.

In future, the axial load can be up to 60 % of the radial load with the new INA cylindrical roller bearings with optimized rib contact (Fa/Fr = 0.6).

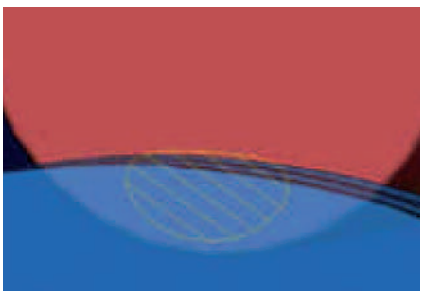
Cylindrical roller with optimized roller end face profile

The operating life of the bearing under axial load is significantly increased due to improved roller geometry.

**Cylindrical roller with optimized roller end faces**

The axial load is distributed on a significantly larger surface area.

- Lower contact pressure
- Higher axial load carrying capacity
- More favorable lubricant film formation



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Benefit from the combined expertise of two brands with a worldwide reputation – in every area of application covering automotive, machine building and precision engineering.

INA and FAG have combined their strengths to give a new dimension in quality:

**X-life.**
**Higher cost-effectiveness.**
**Higher operational reliability.**

**What X-life offers:**

X-life offers excellent product quality that far exceeds previous standards.

Furthermore, X-life optimizes all the parameters that are decisive for a problem-free production cycle. This includes correct mounting and dismantling, maintenance intervals matched to the specific application and the selection of lubricants matched to operating conditions.

A further convincing advantage of X-life is product characteristics that fulfill your specific requirements and offer additional benefits: for example, particularly low-noise, maintenance-friendly or high load capacity system solutions.

**Your X-life advantages at a glance**

- Product characteristics far above the norm
- Lasting quality assurance and control
- Extremely high reliability
- Even greater security in planning and systems
- Optimum availability
- Smooth-running work processes
- Reduced energy consumption
- Very high cost-effectiveness
- Maximum possible level of service and support

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