Cylindrical Roller Bearings

High axial load carrying capacity due to optimized rib contact
Full complement INA cylindrical roller bearings
+ FAG cylindrical roller bearings with cages
= Solutions for every application

With its two strong product brands, INA and FAG, Schaeffler has one of the most comprehensive ranges of cylindrical roller bearings in the world. This product range is sophisticated, comprising more than 4500 basic designs including everything from the smallest bearing measuring just 20 mm in diameter to our largest with an outside diameter of 4.25 meters, used in a tunnel driving machine. This means we are now able to serve almost every conventional application in more than 60 industrial sectors.

**There is nothing that cannot be improved ...**

“Classic” cylindrical roller bearings have extremely high radial load carrying capacity and high rigidity. In addition to high radial loads, cylindrical roller bearings can also support axial loads if they are used as semi-locating or locating bearings. Whereas radial loads are transferred via the raceways, axial loads are transferred via the rolling element end faces and ribs, which, of course, limits the axial load. And this is precisely where Schaeffler gets to work...
We developed the TB roller to significantly increase the bearing operating life under axial load. The special torus-shaped curvature of the end faces of this roller enables loads to be distributed across a significantly greater surface area. This reduced surface pressure provides a number of benefits:

- The permissible axial load for semi-locating and locating bearings is increased by a factor of 1.5 compared with standard bearings (now Fa / Fr ≤ 0.6 compared with Fa / Fr ≤ 0.4 previously)
- Lower bearing temperatures, since the frictional torque under axial load is reduced by up to 50%
- Significantly less wear on the rollers under axial load due to improved lubricant film formation
- Bearings have a longer operating life under axial load

New design
+ improved roller contact
= Improved performance and longer operating life

Customer benefits

- High overall equipment efficiency
- New design possibilities
- Lower operating costs due to reduced energy consumption
- Lower maintenance costs
FAG Cylindrical Roller Bearings with Cage

Customer benefits

• Increased axial load carrying capacity allows new bearing support concepts and design possibilities (downsizing)
• A higher level of energy efficiency due to the reduced frictional torque
• Lower operating costs due to reduced energy consumption
• Increased performance while maintaining the same costs
• Suitable for very high speeds

Up to 50% less friction under axial load

TB roller

Optimized rib contact

Brass cage
FAG large-size bearings with cages in the new TB design

We supply our new TB bearings with our proven two-piece brass cage M1 as standard; our new MPAX cage is also optionally available. We have completely revised the bearing design for all series with MPAX cages, which means the benefits of the TB roller really come into their own. The dimensions and tolerances of these new cage bearings correspond with DIN 5412. The following series are already available with MPAX cage:

<table>
<thead>
<tr>
<th>Designs</th>
<th>Series</th>
<th>From bore code</th>
<th>From bore diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>2E</td>
<td>48</td>
<td>240</td>
</tr>
<tr>
<td>NJ</td>
<td>22E</td>
<td>44</td>
<td>220</td>
</tr>
<tr>
<td>NU</td>
<td>3E</td>
<td>34</td>
<td>170</td>
</tr>
<tr>
<td>NUP</td>
<td>23E</td>
<td>34</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>80</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>600</td>
<td>600</td>
</tr>
</tbody>
</table>

Our single-piece MPAX solid brass cage is a further development of FAG cage types MPA and MP1A and will replace these types successively. It has greater durability with regard to shock loads and vibrations than its predecessors and is especially well suited for applications involving high loads.

Advantages of the MPAX cage

- Significantly higher rigidity in radial direction
- Fatigue effects occur only when large forces are applied
- Higher load carrying capacity with regard to radial centrifugal forces
- Lower stress maximum on the pocket corner radii
INA Full-Complement Cylindrical Roller Bearings

**Customer benefits**

- Increased axial load carrying capacity allows new bearing support concepts and design possibilities (downsizing)
- A higher level of energy efficiency due to the reduced frictional torque
- Lower operating costs due to reduced energy consumption
- Increased performance while maintaining the same costs
- Suitable for extremely high radial loads

**TB roller**

**Optimized rib contact**

**Axial load up to 60% of the radial load**
INA cylindrical roller bearings with optimized rib contact

Our full-complement INA cylindrical roller bearings are true star performers when it comes to load carrying capacity and rigidity. What most people don’t know is that they support unusually high axial loads – up to 60 percent of the radial load in fact, where others only manage around 40 percent.

This is X-life. These bearings have a significantly longer life under axial loads and also have reduced friction thanks to the improved contact between the rollers and the ribs. This is certainly an interesting combination if you’re considering downsizing and saving energy, for example in gearboxes, rolling mills, and cranes.

More load carrying capacity – less friction

Cylindrical roller bearings with optimized rib contact can be operated at significantly higher speeds under increasing axial loads.

<table>
<thead>
<tr>
<th>Series</th>
<th>Dimension series</th>
<th>From bore code</th>
<th>From bore diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSL 19</td>
<td>23</td>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>ZSL 19</td>
<td>23</td>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>SL 19</td>
<td>23</td>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>SL 18</td>
<td>18</td>
<td>92</td>
<td>460</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>28</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>36</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>36</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>36</td>
<td>180</td>
</tr>
</tbody>
</table>