Cylindrical Roller Bearings

High axial load carrying capacity due to optimized rib contact

SCHAEFFLER

20 mm to 4,250 mm outside diameter

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 the most comprehensive range of cylindrical roller bearings in the world. This product range is sophisticated, comprising more than 4,500 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. 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 an 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!

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

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. Due to this reduced surface pressure, semi-locating and locating bearings provide a number of benefits:

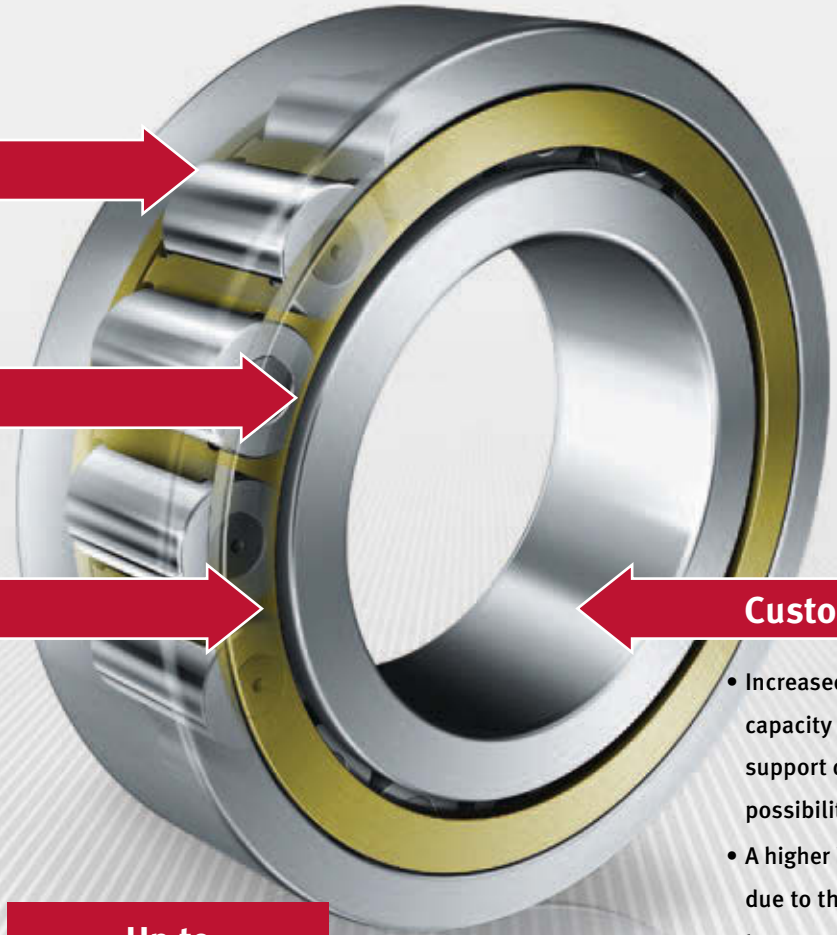
- The permissible axial load is increased by a factor of 1.5 compared with standard bearings (now $F_a / F_r \leq 0.6$ compared with $F_a / F_r \leq 0.4$ previously)
- Lower bearing temperatures, since the frictional torque under axial load is reduced by up to 50 %
- Significantly less wear on the rollers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

The TB design increases the efficiency of non-locating bearings by improving the lubrication in the contact between the rollers and the ribs.

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



TB roller

Optimized rib contact

Brass cage

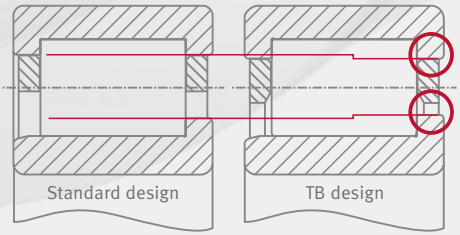
Customer benefits

- 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

Axial load up to
60%
of the radial load

Up to
50%
less friction under axial load

The rib heights of the inner and outer rings changed for the TB roller lead to new cage dimensions.



FAG cylindrical roller bearings with cages in the new TB design

We have completely revised the bearing design for all TB series, which means the benefits of the TB roller really come into their own. FAG cylindrical roller bearings with cages in the TB design are available with the proven split M1 cage guided by rolling elements or the new rib-guided single-piece MPAX cage. The dimensions and tolerances of these new bearings correspond with DIN 5412.

The following series are already available in the TB design:

Designs	Series	From bore code	From bore diameter
N NJ NU NUP	2E	48	240
	22E	44	220
	3E	34	170
	23E	34	170
	10	80	400
	19	600	600

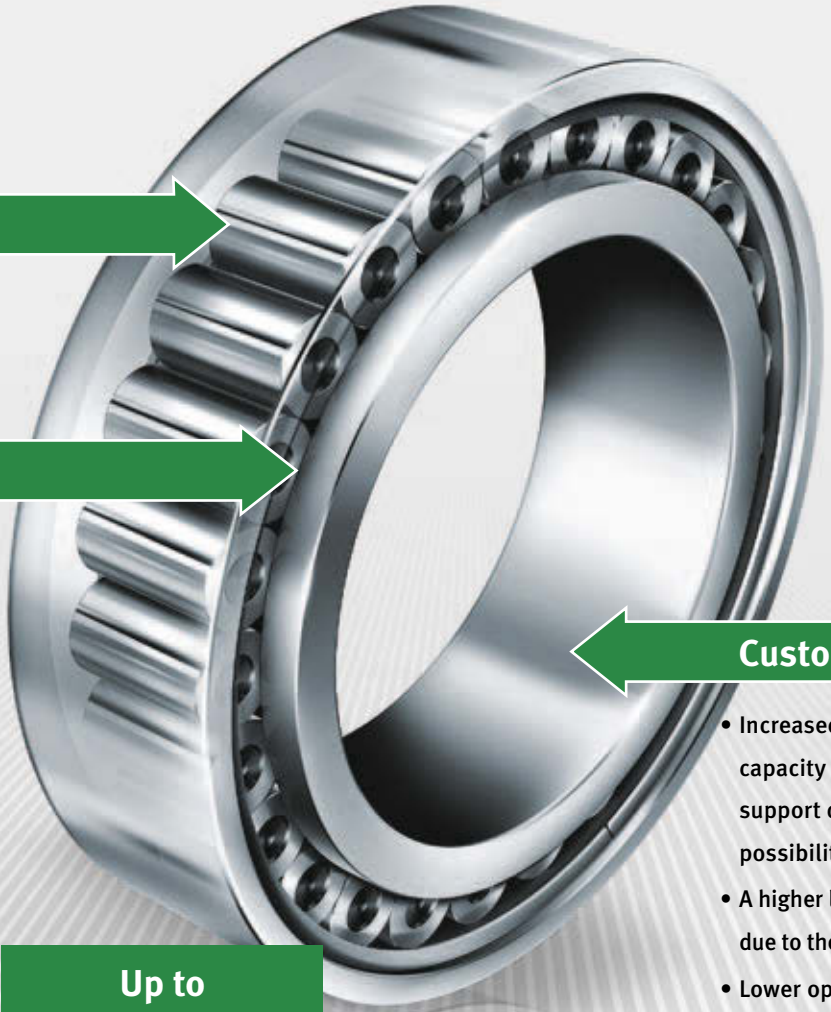
Rib-guided single-piece MPAX cage

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



TB roller

Optimized rib contact

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

Axial load up to
60%
of the radial load

Up to
50%
less friction under axial load

INA cylindrical roller bearings with optimized rib contact

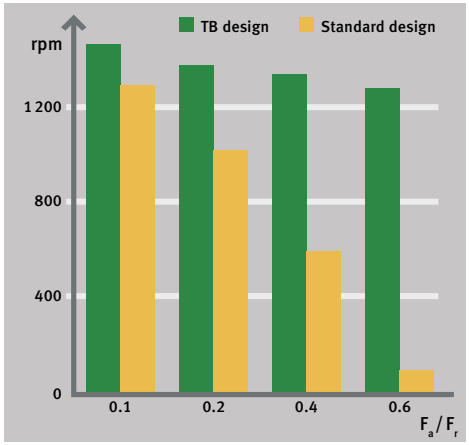
Our full-complement INA cylindrical roller bearings are true star performers when it comes to load carrying capacity and rigidity. What most people don't know is that they support unusually high axial loads – up to 60 percent of the radial load in fact. These bearings have a significantly longer life 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 when considering downsizing and increasing energy efficiency.

The following series are already available in the TB design:

Series	Dimension series	From bore code	From bore diameter
LSL 19 ZSL 19	23 23	18 18	90 90
SL 19	23	18	90
SL 18	18 22 28 29 30 50	92 28 600 60 36 36	460 140 600 300 180 180

More load carrying capacity – less friction

Compared with standard bearings, INA and FAG cylindrical roller bearings in the TB design can be operated at significantly higher speeds under increasing axial loads.



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