Super Precision Cylindrical Roller Bearings N10 and NN30 in X-life Design

Bore diameter up to 120 mm

SCHAEFFLER

Super precision cylindrical roller bearings in X-life design

Figure 1: N1022-D-K-TVP-SP-XL
Single row X-life super precision cylindrical roller bearings on new telescope box

New X-life standard:

- longer life
- improved machining performance
- higher accuracy.

Schaeffler has made considerable improvements to its proven precision cylindrical roller bearings N10 and NN30. Through the use of state of the art manufacturing technologies and an optimised internal construction, the load carrying capacity of the rolling contact has been optimised. This leads to a significant increase in bearing rating life. In combination with a newly developed plastic cage (available up to bore code 24), friction is reduced.

Lower friction leads to the following advantages:

- lower noise level
- running temperatures up to 12 K lower
- less strain on the lubricant
- longer grease operating life
- limiting speeds up to 35% higher
- higher basic load ratings.

Higher basic load ratings C, longer rating life L_{10}

As a result of these technical modifications, the basic dynamic load ratings C are up to 19% higher than those of the previous bearing designs and the basic bearing rating life L_{10} is up to 65% longer than the previous standard, *Figure 2*.

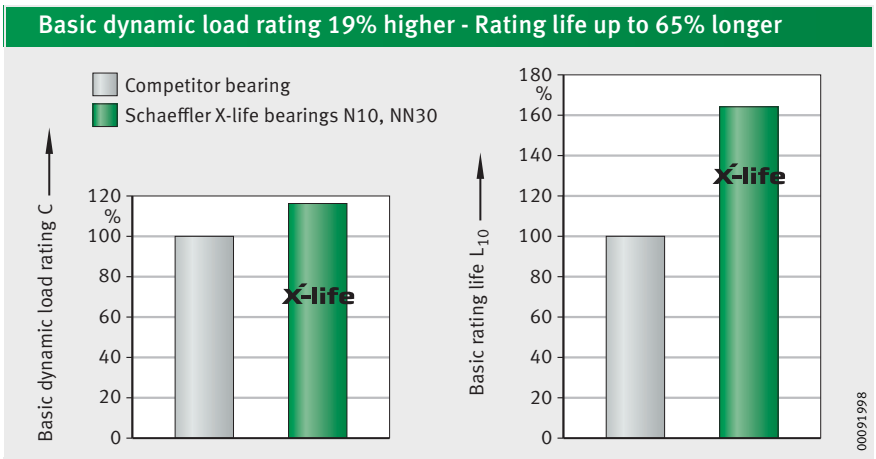


Figure 2: Increase in basic rating life due to higher basic dynamic load ratings – comparison

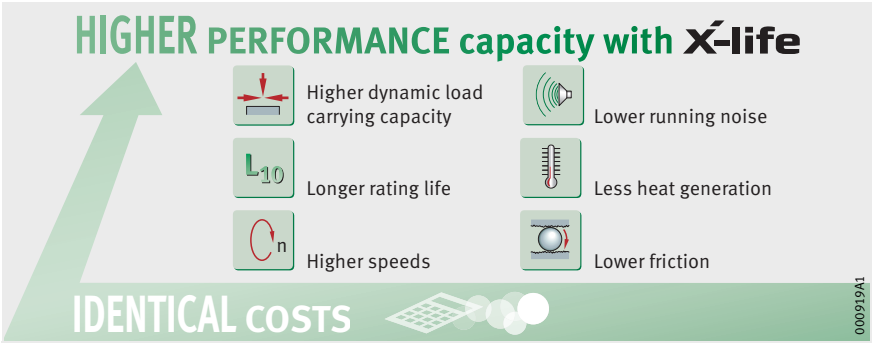


Figure 3: Higher performance at the same price; Schaeffler X-life bearings make a winning argument with their increased performance density

Expanded design possibilities

As a result of the increase in the basic rating life L_{10}, this gives a longer operating life of the bearings under the same operating conditions. If the rating life values are maintained, alternatively, higher loads can be applied to the bearing arrangement.

This gives the designer additional degrees of freedom and design possibilities for the design of the bearing arrangement. Depending on requirements, he can now choose between a longer rating life or a higher load.

Higher limiting speeds

For the X-life cylindrical roller bearings N10 and NN30, Schaeffler is relying on a newly developed polyamide cage with optimised friction (type TVP).

The reduced friction and the associated lower level of heat generation allow higher limiting speeds in comparison with the brass cage previously in use.

For the new X-life super precision cylindrical roller bearings N10..-XL and NN30..-XL, the limiting speeds of bearings with grease or oil lubrication have been increased by up to 35%.

Due to the higher limiting speeds, the X-life cylindrical roller bearings facilitate designs with significantly higher performance. This is especially the case in combination with high speed axial bearings BAX, *Figure 5*.

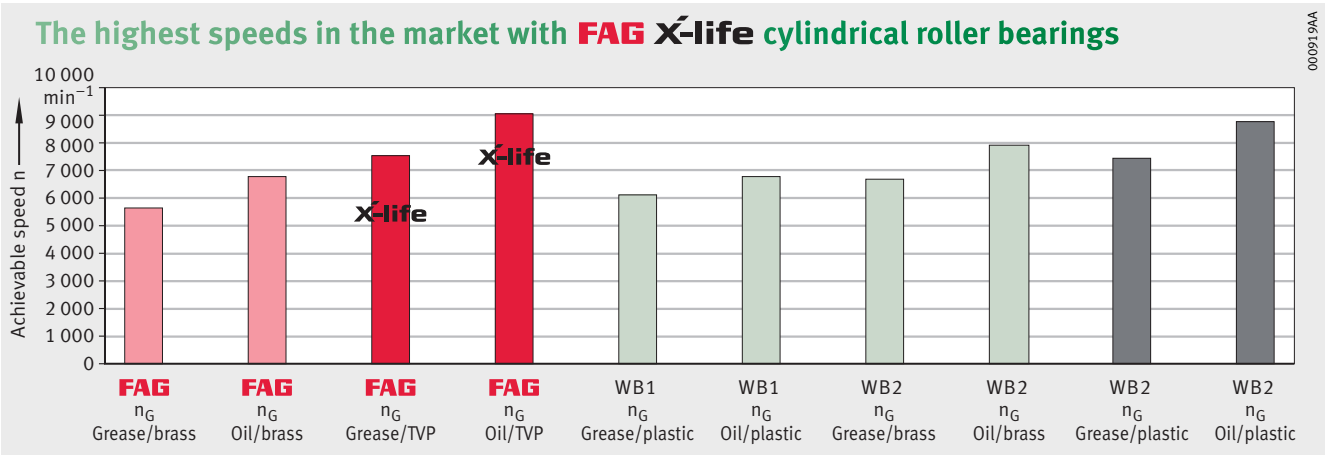
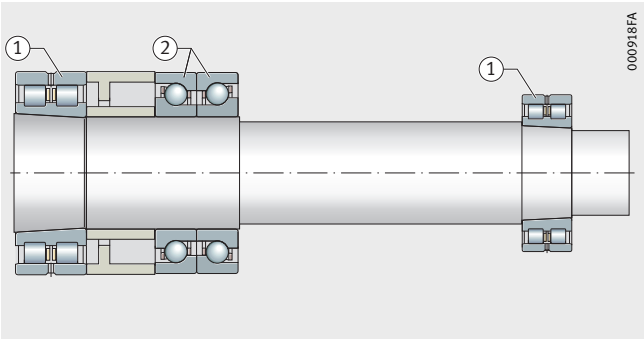


Figure 4: FAG X-life cylindrical roller bearings are well ahead compared to the competition (example: NN3018)



Designation	Limiting speed n_G min^{-1}	
	Previous	X-life
BAX100	6 300	6 300
NN3018	5 600	6 700
NN3020	5 300	6 300
Limiting speed of bearing combination	5 300	**6 300**

Figure 5: Higher spindle performance in a bearing combination for a turning spindle:
① FAG X-life super precision cylindrical roller bearing
② FAG BAX axial bearing

Would you like to know more about Schaeffler bearing solutions for main spindles?

Visit our Media Library, using the search term “Super Precision Bearings” or “SP1”: **http://medien.schaeffler.com**

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