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added
competence

FAG high precision cylindrical roller bearings

SCHAEFFLER GROUP
INDUSTRIAL

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Figure 1: FAG high precision cylindrical roller bearing

FAG high precision cylindrical roller bearings are used where very high accuracy is required, Figure 1. Typical areas of application for these bearings include machine tools and printing machinery. They are ideal as non-locating bearings since they allow

unconstrained compensation of changes in length during rotational movement between the rollers and raceways.

Due to their high accuracy with high radial rigidity, cylindrical roller bearings in a high precision variant are also used – in addition to their application as non-locating bearings – where

- high radial rigidity
- high load carrying capacity
- high accuracy.

is required of the bearing arrangement.

The standard series N10 of a single row design and NN30 of a double row design are a firmly established element of the FAG Super Precision range, together with the series N19 and NNU49 of smaller cross-section for smaller centre distances.

The design of all FAG high precision cylindrical roller bearings is identified as standard, Figure 6, by:

- accuracy class SP
- tapered inner ring bore for adjustment of the radial internal clearance and preload (taper 1:12) by axial displacement on the tapered shaft seat (with a cylindrical inner ring bore if required)
- solid brass cage
- radial internal clearance C1.

Due to the high surface quality of the ring raceways and rollers, FAG high precision cylindrical roller bearings are particularly suitable for grease lubrication.

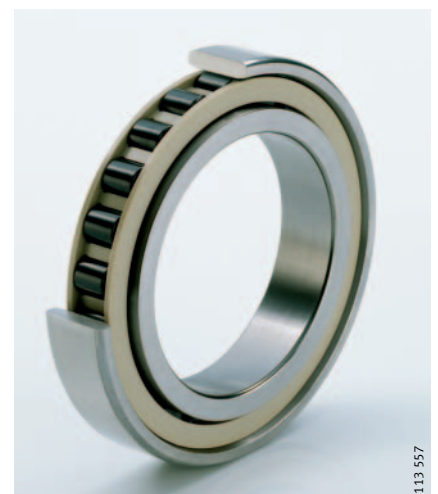


Figure 2: FAG hybrid cylindrical roller bearing

New HIGH SPEED cylindrical roller bearings (N10..-HS..), Figure 3, 60% quicker at lower cost

As a result of logical measures to reduce friction, Schaeffler Group Industrial has succeeded in developing an FAG high precision cylindrical roller bearing with steel rollers that can achieve a significantly higher speed level than conventional cylindrical roller bearings. In comparison with conventional high precision cylindrical roller bearings, the permissible speeds of the new N10..-HS cylindrical roller bearings with grease lubrication are up to 60% higher, while the increase with minimal oil quantity lubrication is up to 50%. The HIGH SPEED cylindrical roller bearing can thus exceed even the speeds achievable by hybrid bearings with a brass cage and its load carrying capacity is only slightly lower. The new FAG high precision cylindrical

roller bearing has an optimised contact geometry and a PEEK cage guided on the outer rib, which gives significantly lower friction than with solid brass cages guided by the rolling elements. Since the lower operating temperatures are lower due to the reduced friction, less strain is placed on the lubricant at the rolling contact. This leads to an increase in the grease operating life. FAG N10..-HS cylindrical roller bearings are available in all common bore diameters.

Cost-effective solution

In applications requiring high speeds and where high load carrying capacity and rigidity are also necessary, the hybrid cylindrical roller bearing was previously the only alternative, Figure 2. With the new FAG HIGH SPEED cylindrical roller bearing, a bearing with steel rollers is now available that can cover a good portion of the speed range that was previously the exclusive preserve of hybrid cylindrical roller bearings. As a result, main spindles in machine tools can with immediate effect venture into very high speed ranges with significantly greater cost-effectiveness than before.



Figure 3: FAG HIGH SPEED cylindrical roller bearing

Even quicker with half the number of rollers (N10..-HS-...-H193)

In accordance with the specification -H193, the HIGH SPEED and hybrid cylindrical roller bearings are manufactured as standard with half the number of rollers, Figure 4. With the reduction in the number of rolling elements, the speed of these cylindrical roller bearings can be increased further by a significant amount. This is of particular interest for those cases where achieving very high speeds and cost factors are of prime importance and a reduction in radial rigidity can be accepted. These extremely quick bearings (N10..-HS-...-H193) are used, like hybrid cylindrical roller bearings (HCN) with half the number of rollers, on the motor side in high speed machine tools.



Figure 4: FAG hybrid cylindrical roller bearing with half the number of rolling elements

Catalogue on high precision bearings

An overview of FAG high precision cylindrical roller bearings giving tolerance data, requirements for adjacent parts, clearance values and comprehensive recommendations on the application and fitting of these non-locating bearings can be found in the catalogue “Super Precision Bearings” (SP 1), Figure 5.



Figure 5: SP 1

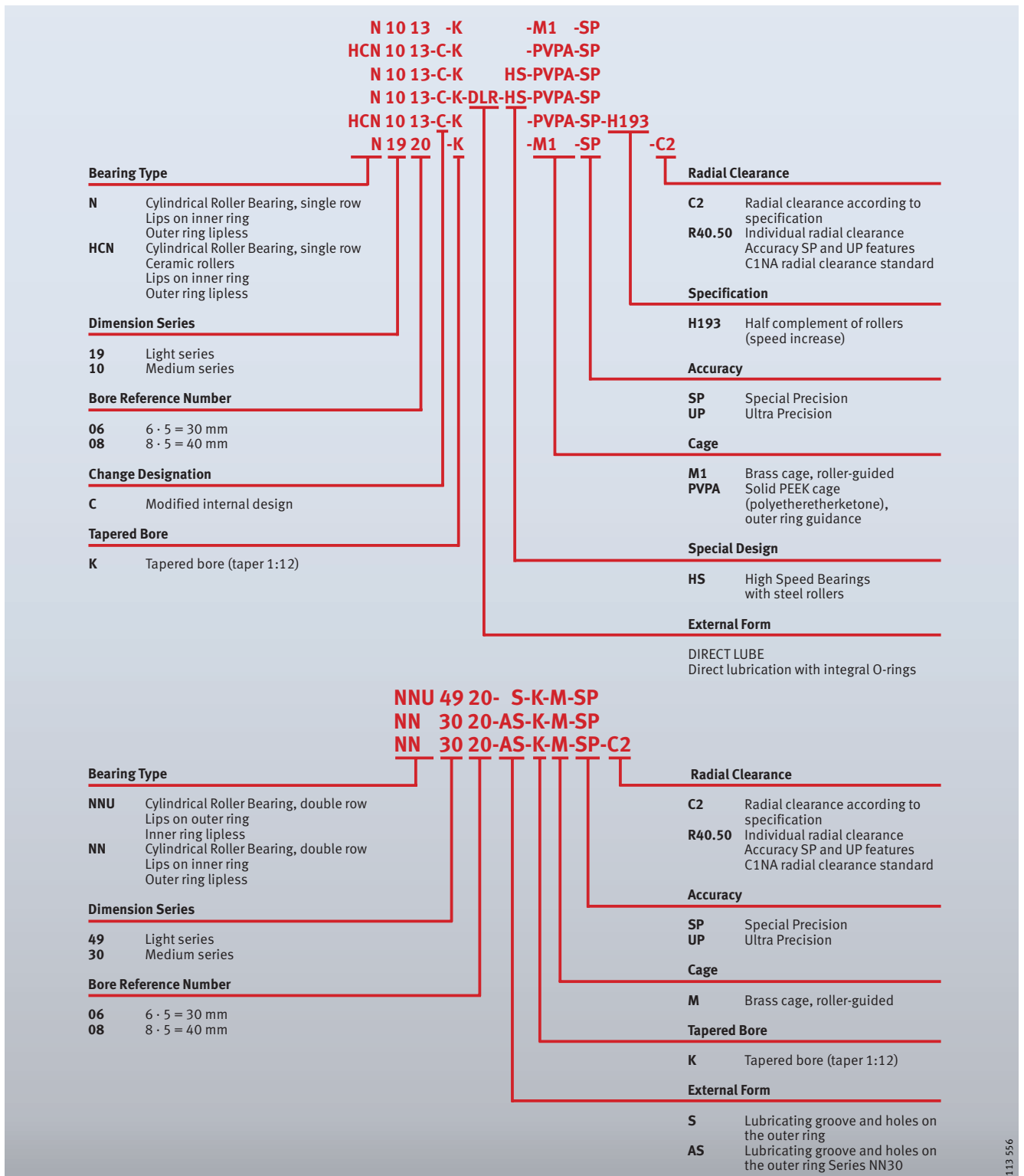


Figure 6: Bearing designation



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