

Single Row Needle Roller Bearings



Single row needle roller bearings have needle rollers guided in axial direction by outer ring ribs and the inner ring is smooth as well as by single row cylindrical roller bearings in NU design. That is why these bearings cannot carry axial loads. Single row needle roller bearings have a small height of the cross section and relatively high basic load rating and are especially suitable for arrangements with limited space in radial direction. Bearings have a groove and lubrication holes on the outer ring periphery. Single row needle roller bearings are produced without cage. Bearings without cage (V) have a full complement of cylindrical rollers which results in higher load rating, but smaller limiting rotational speed in comparison with bearings of the same size with cage. Bearings are also delivered without inner ring (R NA). In this case the inner raceway is created directly on the journal.

Boundary Dimensions

Boundary dimensions comply with the standard ISO 15 and are shown in the dimension tables of this publication.

Designation

Bearing designation in standard design is in the dimension tables of this publication. Difference from standard design is designated by additional symbols (section 2.2).

Tolerance

Single row needle roller bearings are commonly produced in normal tolerance class P0 (symbol P0 is not indicated). For special arrangements demanding accuracy, bearings in higher tolerance class P6 are delivered. Delivery of these bearings should be discussed in advance. Limiting values of dimension and running accuracy are shown in table 10.

Radial Clearance

Commonly produced single row needle roller bearings have normal radial clearance which is not indicated. For special arrangements bearings with greater radial clearance (C3) are delivered. Radial clearance values are shown in table 26.

Bearings without Inner Rings

For arrangements with limited mounting space single row needle roller bearings without inner ring are delivered (R NA). Needle rollers of these bearings roll directly on the ground journal. Inner raceways diameter tolerances for single row needle roller bearings without inner ring are shown in following table.

Journal Diameter F_w	Radial Clearance			
	Smaller	Normal to 80 mm	over 80 mm	Greater to 65 mm
mm				
Inner Raceway				
Diameter	k5	h5	g6	g6
Tolerance				f6

Raceway deviations of roundness and cylindricity must not be greater than deviations for tolerance class IT3. Values of basic load ratings C_r and C_{or} shown in dimension tables are valid for bearings without inner ring if inner raceway hardness on the journal will be in the range 59 to 65 HRC. With decreasing raceway hardness also the load rating values decrease and the table value C_r should be multiplied by factor f_t (Table 7). Minimum depth of hardened layer after grinding should be 1 to 3 mm according to bearing dimension and load. Raceway surface roughness for common arrangements $R_a = 0.2$, for less demanding arrangements $R_a = 0.4$.

Misalignment

Mutual ring misalignment of single row needle roller bearings is small. Permissible misalignment values are to Z'.

Radial Equivalent Dynamic Load

$$P_r = F_r \quad [\text{kN}]$$

Radial Equivalent Static Load

$$P_{or} = F_r \quad [\text{kN}]$$



