

Needle roller bearings

with and without inner ring, with plastic cage



Additional sizes with
plastic cage

INA machined needle roller bearings NK and NKI are successful machine elements for the design of radially compact bearing arrangements with very high load carrying capacity. They consist of machined bearing rings and needle roller and cage assemblies with cages made from either plastic or deep drawn steel strip. Bearings of series NKI have an inner ring while series NK is supplied without an inner ring. Bearings without an inner ring are most suitable if the shaft can be hardened and ground.

The material for the plastic cages is heat-stabilised, glass fibre-reinforced polyamide 66. This material has high strength and elasticity. Cage friction is low due to the positive sliding characteristics of the plastic on lubricated steel surfaces and the low roughness of the cage surface. This leads to reduced heat generation within the bearing. Since the material density is lower than that of steel cages, the mass inertia forces of the cage are lower. Polyamide cages have good emergency running characteristics, can be produced in the functionally correct form by the injection moulding process and are resistant to organic solvents and diluted alkaline cleaning agents. They also run with very little noise.

New sizes with plastic cage

INA needle roller bearings NK were previously produced up to enveloping circle diameter $F_W = 10$ mm with plastic cages, while needle roller bearings NKI were produced up to a bore diameter of 7 mm with plastic cages. In order to further exploit the advantages of these cages, additional sizes now have plastic cages. The cages are designed to accommodate more rolling elements than steel cages.

Since more rolling elements in the same space give higher load carrying capacity, the new bearings have higher load capacities than comparable bearings with a conventional steel cage.

The new series:

- have proven, high performance plastic cages
- have higher basic dynamic and static load ratings than the previous designs
- allow smaller bearing arrangements, if necessary, under the same load
- have little running noise
- allow very economical bearing arrangements.

Dimension table · Dimensions in mm

Designation	Dimensions F_W	Basic load ratings	
		dyn. C N	stat. C_0 N
NK 29/20 TN	29	24 300	39 000
NK 30/20 TN	30	24 900	41 000
NK 30/30 TN	30	37 500	69 000
NK 32/20 TN	32	26 000	44 500
NK 35/20 TN	35	27 500	48 500
NK 35/30 TN	35	41 000	81 000
NK 40/20 TN	40	29 500	56 000
NK 45/20 TN	45	31 000	62 000
NK 45/30 TN	45	46 000	103 000
NK 50/25 TN	50	42 500	87 000
NK 50/35 TN	50	59 000	132 000
NK 60/25 TN	60	16 500	103 000

Basic load ratings (from Catalogue)

dyn. C N	stat. C_0 N
21 900	34 000
22 600	36 000
33 500	60 000
23 100	37 500
24 300	41 500
36 500	69 000
26 000	47 000
27 500	53 000
41 000	88 000
38 000	74 000
50 000	106 000
42 500	90 000

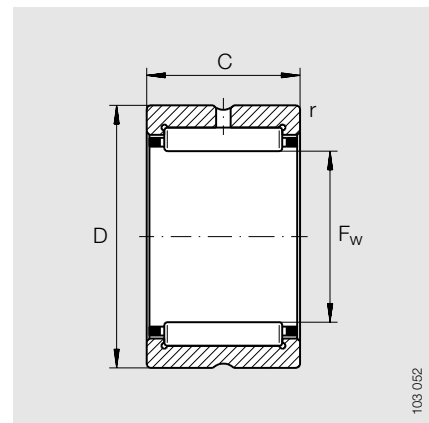
+11%

+18%

Needle roller bearings

without inner ring, with plastic cage


Series NK..TN



NK..TN

Dimension table · Dimensions in mm

Shaft diameter d	Designation ¹⁾²⁾	Mass ≈g	Dimensions				Basic load ratings		Fatigue limit load P _u N	Limiting speed n _G min ⁻¹	Reference speed n _B min ⁻¹
			F _w	D	C	r min.	dyn. C N	stat. C ₀ N			
29	NK 29/20 TN	50	29	38	20	0,3	24 300	39 000	5 600	16 000	10 000
30	NK 30/20 TN	61	30	40	20	0,3	24 900	41 000	5 800	15 000	10 000
	NK 30/30 TN	92,4	30	40	30	0,3	37 500	69 000	10 400	15 000	9 500
32	NK 32/20 TN	64	32	42	20	0,3	26 000	44 500	6 300	14 000	9 000
35	NK 35/20 TN	69,4	35	45	20	0,3	27 500	48 500	6 900	13 000	8 500
	NK 35/30 TN	106	35	45	30	0,3	41 000	81 000	12 300	13 000	8 000
40	NK 40/20 TN	78	40	50	20	0,3	29 500	56 000	8 000	12 000	7 500
45	NK 45/20 TN	85,3	45	55	20	0,3	31 000	62 000	8 800	10 000	7 000
	NK 45/30 TN	132	45	55	30	0,3	46 000	103 000	15 700	10 000	6 500
50	NK 50/25 TN	146	50	62	25	0,6	42 500	87 000	12 000	9 000	6 500
	NK 50/35 TN	207	50	62	35	0,6	59 000	132 000	19 500	9 000	6 000
60	NK 60/25 TN	170	60	72	25	0,6	46 500	103 000	14 200	7 500	5 500

 For the design and lubrication of the bearing arrangement and for fitting of the bearings, follow the guidance in *INA Catalogue 307*.

¹⁾ TN = plastic cage.

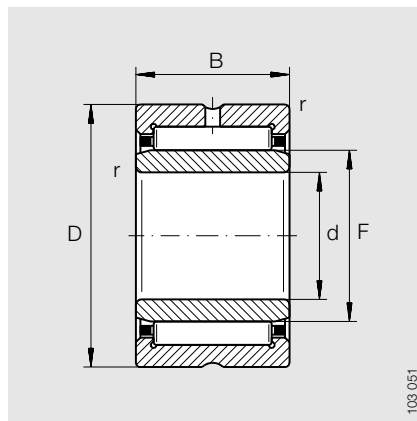
Permissible operating temperature +120 °C (continuous operation).

²⁾ Before using the bearings, check the compatibility of the lubricant used with the cage material (PA66-GF/H).

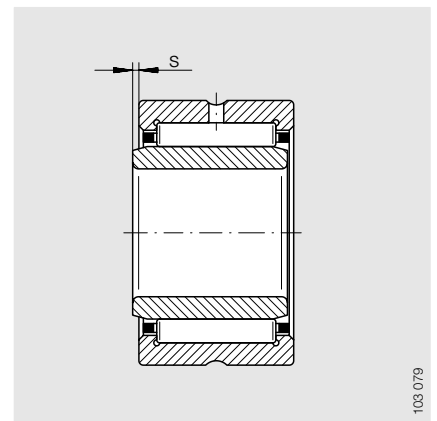
Needle roller bearings

with inner ring, with plastic cage

Series NKL..TN




NKL..TN



Permissible axial displacement "s"

Dimension table · Dimensions in mm													
Shaft diameter d	Designation ¹⁾²⁾	Mass ≈g	Dimensions						Basic load ratings		Fatigue limit load P _u N	Limiting speed n _G min ⁻¹	Reference speed n _B min ⁻¹
			d	F	D	B	r min.	s ³⁾	dyn. C N	stat. C ₀ N			
25	NKI 25/20 TN	75,8	25	29	38	20	0,3	1	24 300	39 000	5 600	16 000	10 000
28	NKI 28/20 TN	92,4	28	32	42	20	0,3	1	26 000	44 500	6 300	14 000	9 000
30	NKI 30/20 TN	108	30	35	45	20	0,3	0,5	27 500	48 500	6 900	13 000	8 500
	NKI 30/30 TN	165	30	35	45	30	0,3	1	41 000	81 000	12 300	13 000	8 000
35	NKI 35/20 TN	122	35	40	50	20	0,3	0,5	29 500	56 000	8 000	12 000	7 500
40	NKI 40/20 TN	136	40	45	55	20	0,3	0,5	31 000	62 000	8 800	10 000	7 000
	NKI 40/30 TN	216	40	45	55	30	0,3	1	46 000	103 000	15 700	10 000	6 500
45	NKI 45/25 TN	217	45	50	62	25	0,6	1,5	42 500	87 000	12 000	9 000	6 500
	NKI 45/35 TN	308	45	50	62	35	0,6	2	59 000	132 000	19 500	9 000	6 000
55	NKI 55/25 TN	255	55	60	72	25	0,6	1,5	46 500	103 000	14 200	7 500	5 500

 For the design and lubrication of the bearing arrangement and for fitting of the bearings, follow the guidance in *INA Catalogue 307*.

¹⁾ TN = plastic cage.

Permissible operating temperature +120 °C (continuous operation).

²⁾ Before using the bearings, check the compatibility of the lubricant used with the cage material (PA66-GF/H).

³⁾ Permissible axial displacement of inner ring from central position with respect to outer ring.



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