

7

Needle roller bearings



Designation system



Prefixes

R Bearing without an inner ring

Basic designation

BK Drawn cup needle roller bearing with a closed end
HK Drawn cup needle roller bearing with open ends
HN Drawn cup needle roller bearing with open ends, full complement
IR Needle roller bearing inner ring
K Needle roller and cage assembly
LR Needle roller bearing inner ring
NA 48,
NA 49,
NA 69 Needle roller bearing with machined rings, with flanges, with an inner ring
NAO Needle roller bearing with machined rings, without flanges, with an inner ring
NK, NKS Needle roller bearing with machined rings, with flanges, without an inner ring
NKI, NKIS Needle roller bearing with machined rings, with flanges, with an inner ring
NKIA 59,
NKIB 59 Needle roller / angular contact ball bearing
NKX Needle roller / thrust ball bearing
NKXR Needle roller / cylindrical roller thrust bearing
NX Needle roller / full complement thrust ball bearing
PNA Alignment needle roller bearing
RN Needle roller

Suffixes

Group 1: Internal design

BF Needle roller with flat ends
D Deviating or modified internal design with the same boundary dimensions.
 Example: K 40x45x17 D (Needle roller and cage assembly with a double split cage)
DS Single split needle roller and cage assembly
EGS Inner ring with a non-directionally ground raceway
VGS Inner ring with a pre-ground raceway and a machining allowance
ZW Double row needle roller and cage assembly (double row cage)

Group 2: External design (seals, snap ring groove, etc.)

AS.. Outer ring with lubrication hole(s), the number following indicates the number of holes
ASR.. Outer ring with annular groove and lubrication hole(s), the number following indicates the number of holes
IS.. Inner ring with lubrication hole(s), the number following indicates the number of holes
ISR.. Inner ring with annular groove and lubrication hole(s), the number following indicates the number of holes
RS, .2RS Contact seal on one or both sides, respectively

- NBR or FKM or PUR for a drawn cup needle roller bearing
- NBR for a machined needle roller bearing

Z Combined needle roller bearing, factory greased thrust bearing with a cover without lubrication holes over the outside diameter

Group 3: Cage design

TN Glass fibre reinforced PA66 cage

Group 4					
4.1	4.2	4.3	4.4	4.5	4.6

Group 4.6: Other variants

VG052 Single split PES (polyethersulfone) cage

Group 4.5: Lubrication

SM.. Special grease, two numbers following identify the grease

Group 4.4: Stabilization

- S0** Bearing or inner ring heat stabilized for operating temperatures ≤ 150 °C (300 °F)
- S1** Bearing or inner ring heat stabilized for operating temperatures ≤ 200 °C (390 °F)
- S2** Bearing or inner ring heat stabilized for operating temperatures ≤ 250 °C (480 °F)
- S3** Bearing or inner ring heat stabilized for operating temperatures ≤ 300 °C (570 °F)

Group 4.3: Bearing sets, matched bearings

..S Matched bearings for an equal load distribution. The number preceding indicates the number of bearings, e.g. NK 50/25 TN/2S

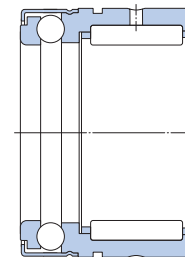
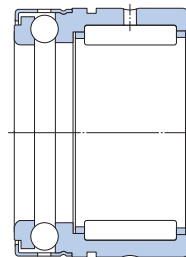
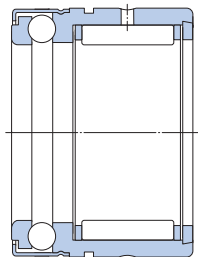
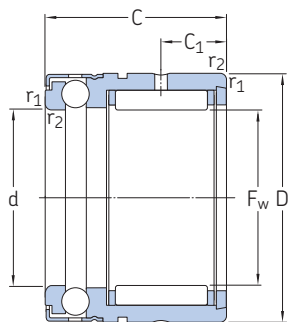
Group 4.2: Accuracy, clearance, preload, quiet running

- /SORT..** Tolerance grade of needle rollers of a needle roller and cage assembly, the numbers following identify the actual limits in µm, e.g. /SORT-2-4
- CN** Normal radial internal clearance; only used together with an additional letter that identifies a reduced or displaced clearance range
 - H** Reduced clearance range corresponding to the upper half of the actual clearance range
 - L** Reduced clearance range corresponding to the lower half of the actual clearance range
 - M** Reduced clearance range corresponding to the two middle quarters of the actual clearance range
 - P** Displaced clearance range comprising the upper half of the actual clearance range plus the lower half of the next larger clearance range
 - R** Normal clearance range in accordance with the withdrawn DIN 620-4
 The above letters H, L, M and P are also used together with the clearance classes C2, C3, C4.
- C2** Radial internal clearance smaller than Normal
- C3** Radial internal clearance greater than Normal
- C4** Radial internal clearance greater than C3
- G2** Needle roller in accordance with ISO 3096 Grade 2
- H..** Bearing without an inner ring and reduced inside diameter (under rollers) tolerance, the numbers following indicate the tolerance limits in µm, e.g. H+27+20
- M../M..** Diameter tolerance of needle rollers, e.g. M2/M4 indicates diameter tolerance -2 to -4 µm
- N/M..** Diameter tolerance of needle rollers, e.g. N/M2 indicates diameter tolerance 0 to -2 µm
- P5** Dimensional and geometrical tolerances to class P5
- P6** Dimensional and geometrical tolerances to class P6
- P62** P6 + C2
- P63** P6 + C3
- P6CNR** P6 + CNR

Group 4.1: Materials, heat treatment

7.8 Needle roller / thrust ball bearings, full complement thrust bearing

F_w 7 – 35 mm



NX
($F_w = 7$ mm)

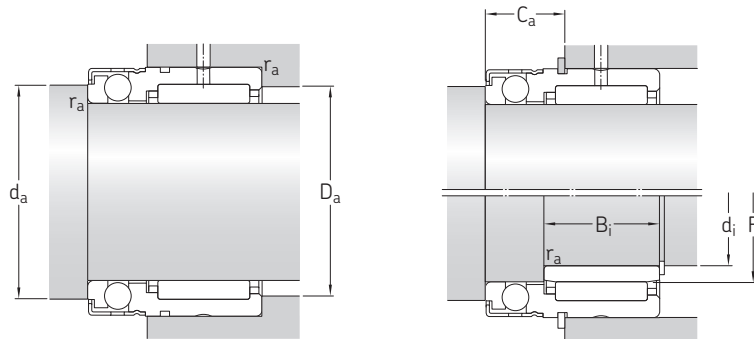
NX..Z
($F_w = 7$ mm)

NX
($F_w \geq 10$ mm)

NX..Z
($F_w \geq 10$ mm)

Principal dimensions			Basic load ratings				Fatigue load limit		Minimum load factor	Speed ratings		Mass	Designation
F_w	D	C	radial dynamic C	static C_0	axial dynamic C	static C_0	radial P_u	axial P_u	A	Reference speed	Limiting speed	kg	
mm			kN				kN		–	r/min		kg	–
7	14	18	2,81	2,75	3,45	5	0,29	0,186	0,00013	10 000	6 000	0,014	► NX 7 ZTN
	14	18	2,81	2,75	3,45	5	0,29	0,186	0,00013	10 000	11 000	0,014	NX 7 TN
10	19	18	4,95	4,55	5,07	8,5	0,53	0,31	0,00038	8 500	5 600	0,025	► NX 10 Z
	19	18	4,95	4,55	5,07	8,5	0,53	0,31	0,00038	8 500	9 500	0,025	NX 10
12	21	18	5,39	5,2	5,27	9,65	0,61	0,355	0,00048	8 000	5 300	0,028	► NX 12 Z
	21	18	5,39	5,2	5,27	9,65	0,61	0,355	0,00048	8 000	9 000	0,028	NX 12
15	24	28	11	14	6,18	12,2	1,66	0,45	0,00077	7 500	5 300	0,048	NX 15 Z
	24	28	11	14	6,18	12,2	1,66	0,45	0,00077	7 500	8 500	0,048	NX 15
17	26	28	12,1	16,6	6,37	13,4	1,96	0,5	0,00093	7 000	5 000	0,053	NX 17 Z
	26	28	12,1	16,6	6,37	13,4	1,96	0,5	0,00093	7 000	8 500	0,053	NX 17
20	30	28	13,2	19,3	7,8	17,3	2,28	0,64	0,0016	6 300	4 500	0,068	► NX 20 Z
	30	28	13,2	19,3	7,8	17,3	2,28	0,64	0,0016	6 300	7 500	0,068	NX 20
25	37	30	15,1	24,5	12,4	28,5	2,9	1,06	0,0042	5 600	3 800	0,12	NX 25 Z
	37	30	15,1	24,5	12,4	28,5	2,9	1,06	0,0042	5 600	6 300	0,12	NX 25
30	42	30	22,9	38	12,7	32,5	4,8	1,2	0,0055	5 300	3 600	0,13	► NX 30 Z
	42	30	22,9	38	12,7	32,5	4,8	1,2	0,0055	5 300	6 000	0,13	NX 30
35	47	30	24,6	45	13,5	38	5,6	1,4	0,0075	5 000	3 400	0,16	NX 35 Z
	47	30	24,6	45	13,5	38	5,6	1,4	0,0075	5 000	5 600	0,16	NX 35

► Popular item



Dimensions				Abutment and fillet dimensions				Associated inner ring ¹⁾ Dimensions			Designation	Associated snap ring ²⁾ Designation
F _w	C ₁	d	r _{1,2} min.	d _a min.	D _a max.	C _a	r _a max.	d _i	F	B _i		
mm				mm				mm			-	-
7	4,7	7	0,3	9,6	12	10	0,3	-	-	-	-	SW 14
	4,7	7	0,3	9,6	12	10	0,3	-	-	-	-	SW 14
10	4,7	10	0,3	14,6	17	10	0,3	6	10	10	IR 6x10x10 IS1	SW 19
	4,7	10	0,3	14,6	17	10	0,3	6	10	10	IR 6x10x10 IS1	SW 19
12	4,7	12	0,3	16,6	19	10	0,3	8	12	10	IR 8x12x10 IS1	SW 21
	4,7	12	0,3	16,6	19	10	0,3	8	12	10	IR 8x12x10 IS1	SW 21
15	8	15	0,3	19	22	12,2	0,3	12	15	16	IR 12x15x16	SW 24
	8	15	0,3	19	22	12,2	0,3	12	15	16	IR 12x15x16	SW 24
17	8	17	0,3	21	24	12,2	0,3	14	17	17	IR 14x17x17	SW 26
	8	17	0,3	21	24	12,2	0,3	14	17	17	IR 14x17x17	SW 26
20	8	20	0,3	25	28	12,2	0,3	17	20	16	IR 17x20x16	SW 30
	8	20	0,3	25	28	12,2	0,3	17	20	16	IR 17x20x16	SW 30
25	8	25	0,3	31,6	35	14,2	0,3	20	25	16	IR 20x25x16 IS1	SW 37
	8	25	0,3	31,6	35	14,2	0,3	20	25	16	IR 20x25x16 IS1	SW 37
30	10	30	0,3	36,5	40	14,2	0,3	25	30	20	IR 25x30x20	SW 42
	10	30	0,3	36,5	40	14,2	0,3	25	30	20	IR 25x30x20	SW 42
35	10	35	0,3	40,5	45	14,2	0,3	30	35	20	IR 30x35x20	SW 47
	10	35	0,3	40,5	45	14,2	0,3	30	35	20	IR 30x35x20	SW 47

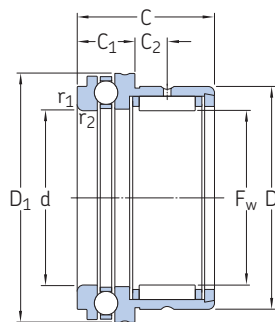
¹⁾ For additional information → Needle roller bearing inner rings, page 593

²⁾ In accordance with DIN 471, not supplied by SKF.

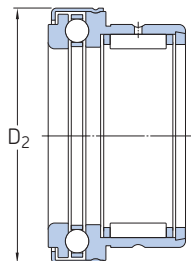


7.9 Needle roller / thrust ball bearings, thrust bearing with a cage

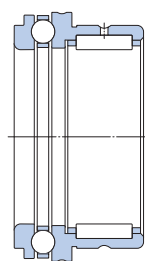
F_w 10 – 70 mm



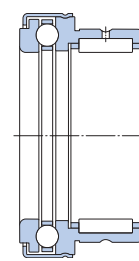
NKX
($F_w = 10$ mm)



NKX..Z
($F_w = 10$ mm)



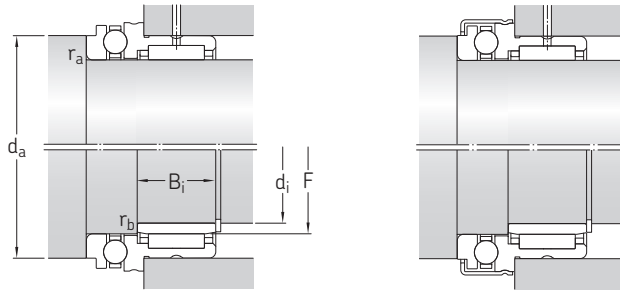
NKX
($F_w \geq 12$ mm)



NKX..Z
($F_w \geq 12$ mm)

F_w	Principal dimensions		Basic load ratings				Fatigue load limit		Minimum load factor	Speed ratings		Mass	Designation
	D	C	radial dynamic C	static C_0	axial dynamic C	static C_0	radial P_u	axial P_u		Reference speed	Limiting speed		
mm			kN				kN		–	r/min		kg	–
10	19	23	5,94	8	9,95	15,3	0,9	0,56	0,0012	9 500	8 000	0,036	NKX 10 ZTN
	19	23	5,94	8	9,95	15,3	0,9	0,56	0,0012	9 500	13 000	0,034	▶ NKX 10 TN
12	21	23	9,13	12	10,4	16,6	1,43	0,62	0,0014	9 000	7 500	0,04	▶ NKX 12 Z
	21	23	9,13	12	10,4	16,6	1,43	0,62	0,0014	9 000	13 000	0,038	NKX 12
15	24	23	11	14	10,6	18,3	1,66	0,67	0,0017	8 500	7 000	0,047	▶ NKX 15 Z
	24	23	11	14	10,6	18,3	1,66	0,67	0,0017	8 500	12 000	0,044	▶ NKX 15
17	26	25	12,1	16,6	10,8	19,6	1,96	0,735	0,002	8 500	7 000	0,055	▶ NKX 17 Z
	26	25	12,1	16,6	10,8	19,6	1,96	0,735	0,002	8 500	12 000	0,053	NKX 17
20	30	30	16,5	25,5	14,3	27	3,05	1	0,0038	7 500	6 000	0,09	▶ NKX 20 Z
	30	30	16,5	25,5	14,3	27	3,05	1	0,0038	7 500	10 000	0,083	▶ NKX 20
25	37	30	19	32,5	19,5	40,5	4	1,5	0,0085	6 300	5 500	0,13	▶ NKX 25 Z
	37	30	19	32,5	19,5	40,5	4	1,5	0,0085	6 300	9 000	0,13	NKX 25
30	42	30	22,9	38	20,3	45,5	4,8	1,7	0,01	6 000	5 000	0,14	▶ NKX 30 Z
	42	30	22,9	38	20,3	45,5	4,8	1,7	0,01	6 000	8 500	0,14	▶ NKX 30
35	47	30	24,6	45	21,2	51	5,6	1,9	0,013	5 600	4 500	0,17	▶ NKX 35 Z
	47	30	24,6	45	21,2	51	5,6	1,9	0,013	5 600	7 500	0,16	▶ NKX 35
40	52	32	26,4	51	27	68	6,3	2,55	0,024	5 000	4 000	0,21	▶ NKX 40 Z
	52	32	26,4	51	27	68	6,3	2,55	0,024	5 000	7 000	0,2	NKX 40
45	58	32	27,5	57	28,1	75	7,1	2,8	0,029	4 500	3 800	0,27	▶ NKX 45 Z
	58	32	27,5	57	28,1	75	7,1	2,8	0,029	4 500	6 300	0,25	NKX 45
50	62	35	38	78	28,6	81,5	9,65	3,05	0,034	4 300	3 600	0,3	▶ NKX 50 Z
	62	35	38	78	28,6	81,5	9,65	3,05	0,034	4 300	6 300	0,28	▶ NKX 50
60	72	40	41,8	96,5	41,6	122	11,8	4,55	0,077	3 600	3 000	0,38	▶ NKX 60 Z
	72	40	41,8	96,5	41,6	122	11,8	4,55	0,077	3 600	5 000	0,36	▶ NKX 60
70	85	40	44,6	98	43,6	137	12,2	5,1	0,097	3 400	2 700	0,52	▶ NKX 70 Z
	85	40	44,6	98	43,6	137	12,2	5,1	0,097	3 400	4 500	0,5	▶ NKX 70

▶ Popular item



Dimensions			Abutment and fillet dimensions							Associated inner ring ¹⁾ Dimensions			Designation
F _w	C ₁	C ₂	d	D ₁	D ₂	r _{1,2} min.	d _a min.	r _a max.	r _b max.	d _i	F	B _i	
mm			mm							mm			-
10	9	6,5	10	-	25,2	0,3	19,7	0,3	0,3	7	10	16	IR 7x10x16
	9	6,5	10	24,1	-	0,3	19,7	0,3	0,3	7	10	16	IR 7x10x16
12	9	6,5	12	-	27,2	0,3	21,7	0,3	0,3	9	12	16	IR 9x12x16
	9	6,5	12	26,1	-	0,3	21,7	0,3	0,3	9	12	16	IR 9x12x16
15	9	6,5	15	-	29,2	0,3	23,7	0,3	0,3	12	15	16	IR 12x15x16
	9	6,5	15	28,1	-	0,3	23,7	0,3	0,3	12	15	16	IR 12x15x16
17	9	8	17	-	31,2	0,3	25,7	0,3	0,3	14	17	17	IR 14x17x17
	9	8	17	30,1	-	0,3	25,7	0,3	0,3	14	17	17	IR 14x17x17
20	10	10,5	20	-	36,2	0,3	30,7	0,3	0,3	17	20	20	IR 17x20x20
	10	10,5	20	35,1	-	0,3	30,7	0,3	0,3	17	20	20	IR 17x20x20
25	11	9,5	25	-	43,2	0,6	37,7	0,6	0,3	20	25	20	IR 20x25x20
	11	9,5	25	42,1	-	0,6	37,7	0,6	0,3	20	25	20	IR 20x25x20
30	11	9,5	30	-	48,2	0,6	42,7	0,6	0,3	25	30	20	IR 25x30x20
	11	9,5	30	47,1	-	0,6	42,7	0,6	0,3	25	30	20	IR 25x30x20
35	12	9	35	-	53,2	0,6	47,7	0,6	0,3	30	35	20	IR 30x35x20
	12	9	35	52,1	-	0,6	47,7	0,6	0,3	30	35	20	IR 30x35x20
40	13	10	40	-	61,2	0,6	55,7	0,6	0,3	35	40	20	IR 35x40x20
	13	10	40	60,1	-	0,6	55,7	0,6	0,3	35	40	20	IR 35x40x20
45	14	9	45	-	66,5	0,6	60,5	0,6	0,3	40	45	20	IR 40x45x20
	14	9	45	65,2	-	0,6	60,5	0,6	0,3	40	45	20	IR 40x45x20
50	14	10	50	-	71,5	0,6	65,5	0,6	0,6	45	50	25	IR 45x50x25
	14	10	50	70,2	-	0,6	65,5	0,6	0,6	45	50	25	IR 45x50x25
60	17	12	60	-	86,5	1	80,5	1	1	50	60	25	IR 50x60x25
	17	12	60	85,2	-	1	80,5	1	1	50	60	25	IR 50x60x25
70	18	11	70	-	96,5	1	90,5	1	1	60	70	25	IR 60x70x25
	18	11	70	95,2	-	1	90,5	1	1	60	70	25	IR 60x70x25

¹⁾ For additional information → Needle roller bearing inner rings, page 593