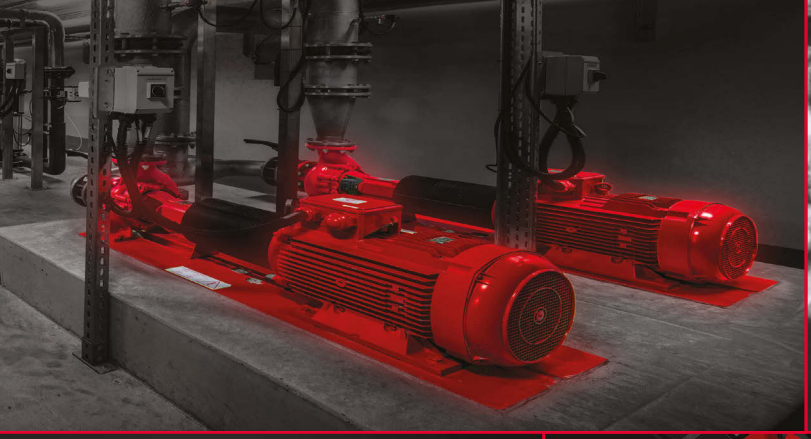
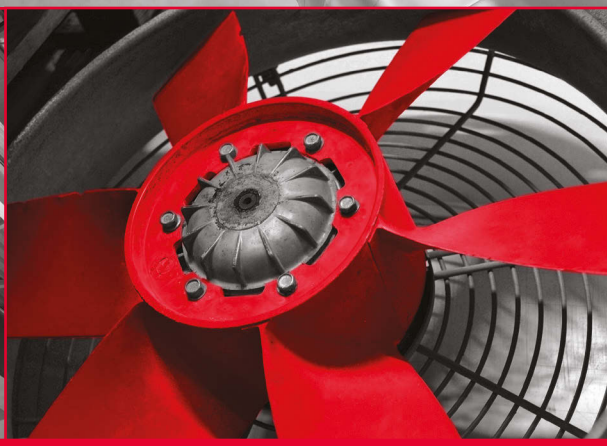
NSKHPS CYLINDRICAL BEARINGS

HIGH PERFORMANCE SERIES

STAY IN MOTION. STAY IN CONTROL.





NSK CYLINDRICAL ROLLER BEARINGS

Electric motors. Pumps and compressors. Machine tool spindles. Material handling equipment. Gearboxes. Wind turbines. Rail vehicles. Rolling mills and Paper mills. Mining and construction machinery.

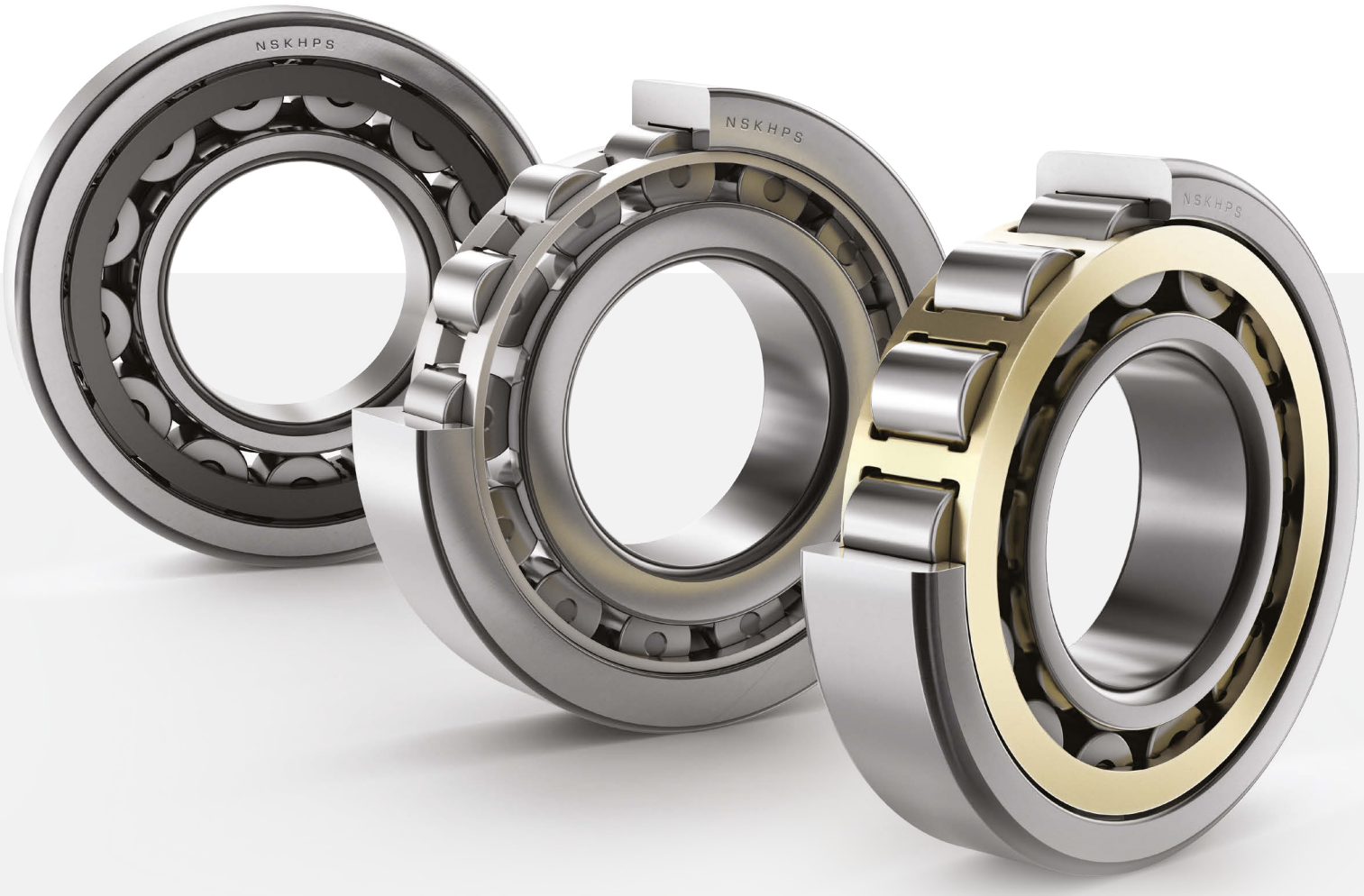
Cylindrical roller bearings are employed in a vast array of applications, operating with high rigidity, high radial load capacity and high-speed performance.

In classic single and double row types with cages, full complement types without cage and special multi-row types, NSK cylindrical roller bearings are universally designed to optimize the performance of machinery and equipment, to assure predictable reliability and to deliver total cost efficiency.

HIGH PERFORMANCE COMES STANDARD – NSKHPS

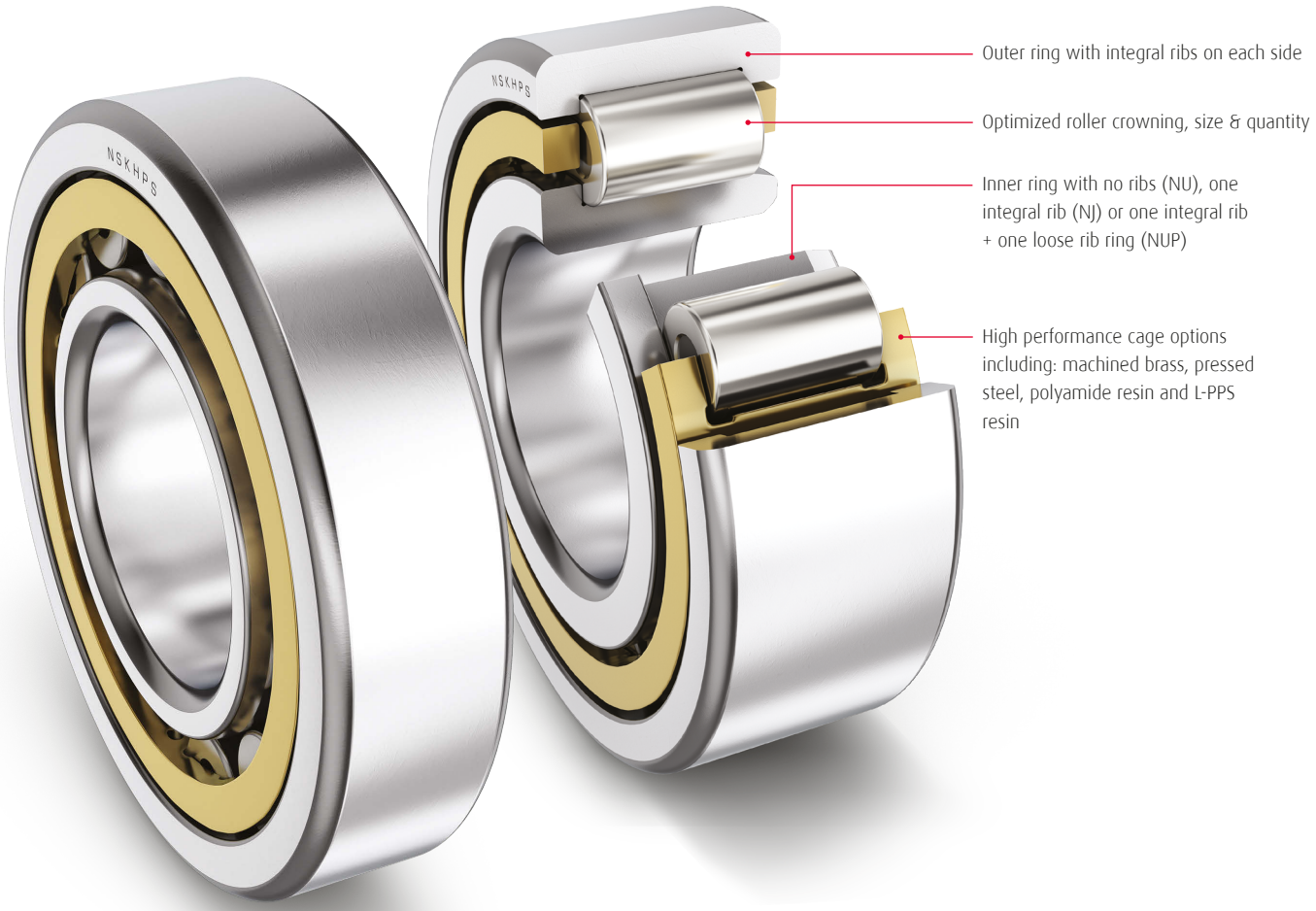
NSKHPS Cylindrical Roller Bearings deliver a high-performance standard for load capacities and operating life. Featuring cage design options to suit a wide range of general to heavy-duty applications, these bearings accommodate high loads and high speeds with superior roller guidance and extra-capacity performance, low running noise and reduced heat generation.

- Dramatically increased bearing life compared to conventional designs, as high as twice among larger sizes
- As much as 23% higher basic load rating
- High strength and maximum rigidity for high loads and high speeds
- Improved lubricant flow promotes lower running temperature and low noise
- Higher permissible misalignment



DESIGN FEATURES AND OPERATING ADVANTAGES

NSKHPS Cylindrical Roller Bearings have an optimized internal design that delivers higher load carrying capacity. Under conventional application conditions this translates into longer operating life with reduced maintenance intervals, but also facilitates downsizing the design envelope for certain applications.



DESIGN FEATURES

- Extra-capacity internal design with optimized size and quantity of rollers
- Available in three standard cylindrical roller bearing types:
  - NU - allows axial displacement in both directionss
  - NJ - locates the shaft axially in one direction
  - NUP - locates the shaft axially in both directions
- Special roller crowning to reduce edge loading
- Cage material options suited to a wide variety of applications
- For dimensional series 2, 22, 3, 23
- Available for bore diameters from 25 to 220 mm
- With C-Normal, C3 and C4 clearance

HIGH PERFORMANCE CAGE OPTIONS

HIGH PERFORMANCE CAGE OPTIONS

Cage selection can have a significant impact on rolling bearing performance. Operating stresses inherent to the application should be carefully considered. For our NSKHPS Cylindrical Roller Bearings, NSK offers cage material options suited to a wide array of applications.

Machined Brass Cage (EM)

- Heavy duty, one-piece, roller guided cage suitable for high loads, high speeds and high temperatures
- Cage pocket profiling relieves stress concentration and achieves accurate roller guidance with low noise and low temperature rise
- Promotes optimal oil film formation and lubricant flow

Pressed Steel Cage (EW)

- High strength, one-piece, window-type cage suitable for high loads, high speeds and high temperatures
- Cage design supports maximum rigidity and low noise in operation

Polyamide Resin Cage (ET)

- Well suited to light / standard duty applications with high speeds
- For operating temperatures ranging from -40 to 120° C

Machined brass cage

Pressed steel cage

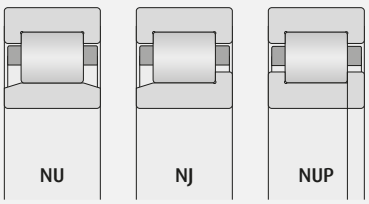
Polyamide resin cage

L-PPS resin cage

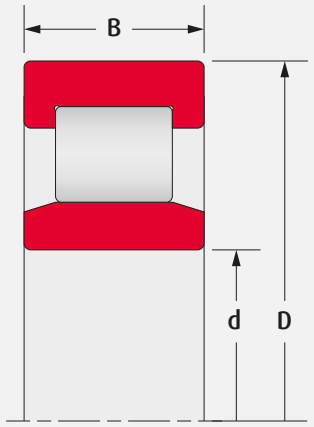
L-PPS Resin Cage (ET7)

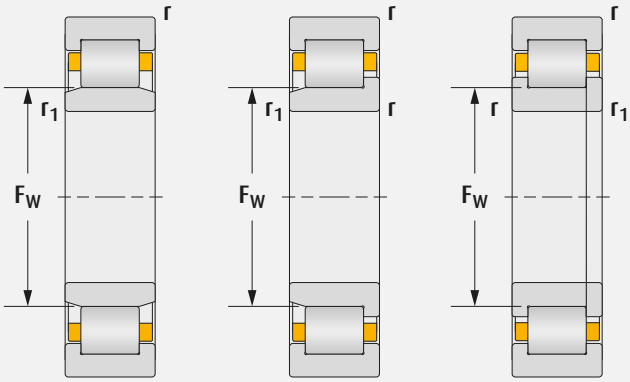
- Ideally developed for scroll and screw compressor applications
- Exceptional resistance to oil and chemicals
- Abrasion resistant
- Dimensional stability at temperatures as high as 200° C

RANGE OF AVAILABILITY - CAGE TYPE

BEARING TYPE	CAGE TYPE	EM	EW	ET	ET7
	Series	Machined Brass	Pressed Steel	Polyamide Resin	L-PPS resin
	200	205 to 244	205 to 213	205 to 219	205 to 218
	2200	2205 to 2240	--	2205 to 2219	2205 to 2218
	300	305 to 332	305 to 311	305 to 316	305 to 316
	2300	2305 to 2330	--	2305 to 2316	2305 to 2316

BEARING DIMENSIONS AND OPERATING VALUES



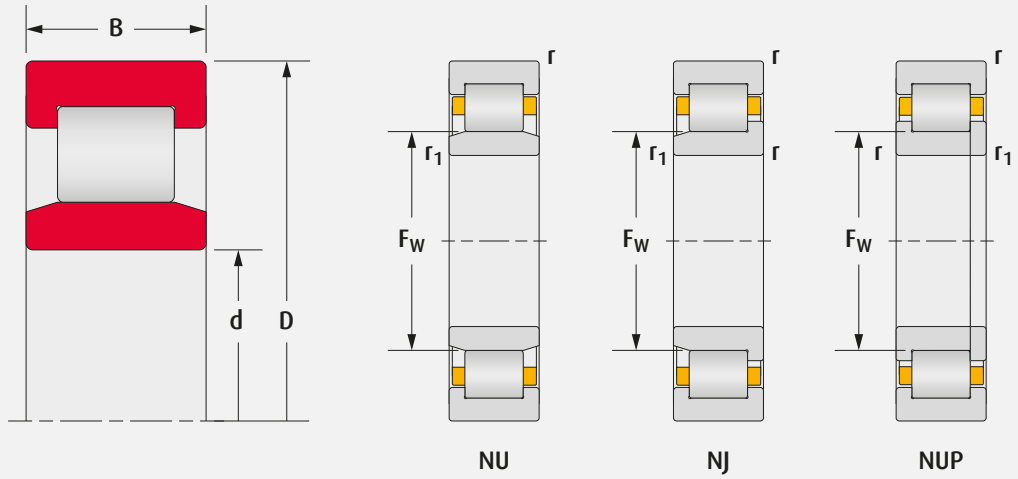


NU NJ NUP

BASIC BEARING NO.					BEARING DIMENSIONS						BASIC LOAD RATINGS		LIMITING SPEEDS	
NU/NJ/NUP	Cage				mm						kN		rpm	
	W	M	T	T7	d	D	B	r (min)	r_1 (min)	F_w	Dynamic	Static	Grease	Oil
205E	●	●	●	●	25	52	15	1.0	0.6	31.5	33.5	27.7	12 000	14 000
2205E		●	●	●		52	18	1.0	0.6	31.5	40.0	34.5	12 000	14 000
305E	●	●	●	●		62	17	1.1	1.1	34.0	48.0	37.5	10 000	12 000
2305E		●	●	●		62	24	1.1	1.1	34.0	65.5	56.0	9 000	11 000
206E	●	●	●	●	30	62	16	1.0	0.6	37.5	45.0	37.5	9 500	12 000
2206E		●	●	●		62	20	1.0	0.6	37.5	56.5	50.0	9 500	12 000
306E	●	●	●	●		72	19	1.1	1.1	40.5	61.0	50.0	8 500	10 000
2306E		●	●	●		72	27	1.1	1.1	40.5	86.0	77.5	8 000	9 500
207E	●	●	●	●	35	72	17	1.1	0.6	44.0	58.0	50.0	8 500	10 000
2207E		●	●	●		72	23	1.1	0.6	44.0	71.0	65.5	8 500	10 000
307E	●	●	●	●		80	21	1.5	1.1	46.2	76.5	65.5	7 500	9 500
2307E		●	●	●		80	31	1.5	1.1	46.2	107.0	101.0	6 700	8 500
208E	●	●	●	●	40	80	18	1.1	1.1	49.5	64.0	55.5	7 500	9 000
2208E		●	●	●		80	23	1.1	1.1	49.5	83.0	77.5	7 500	9 000
308E	●	●	●	●		90	23	1.5	1.5	52.0	95.5	81.5	6 700	8 000
2308E		●	●	●		90	33	1.5	1.5	52.0	131.0	122.0	6 000	7 500
209E	●	●	●	●	45	85	19	1.1	1.1	54.5	72.5	66.5	6 700	8 000
2209E		●	●	●		85	23	1.1	1.1	54.5	87.5	84.5	6 700	8 500
309E	●	●	●	●		100	25	1.5	1.5	58.5	112.0	98.5	6 000	7 500
2309E		●	●	●		100	36	1.5	1.5	58.5	158.0	153.0	5 300	6 700

BASIC BEARING NO.					BEARING DIMENSIONS						BASIC LOAD RATINGS		LIMITING SPEEDS	
NU/NJ/NUP	Cage				mm						kN		rpm	
	W	M	T	T7	d	D	B	r (min)	r_1 (min)	F_w	Dynamic	Static	Grease	Oil
210E	●	●	●	●	50	90	20	1.1	1.1	59.5	79.5	76.5	6 300	7 500
2210E		●	●	●		90	23	1.1	1.1	59.5	96.0	97.0	6 300	8 000
310E	●	●	●	●		110	27	2.0	2.0	65.0	127.0	113.0	5 000	6 000
2310E		●	●	●		110	40	2.0	2.0	65.0	187.0	187.0	5 000	6 300
211E	●	●	●	●	55	100	21	1.5	1.1	66.0	99.0	98.5	5 600	7 100
2211E		●	●	●		100	25	1.5	1.1	66.0	117.0	122.0	5 600	7 100
311E	●	●	●	●		120	29	2.0	2.0	70.5	158.0	143.0	4 500	5 600
2311E		●	●	●		120	43	2.0	2.0	70.5	231.0	233.0	4 500	5 600
212E	●	●	●	●	60	110	22	1.5	1.5	72.0	112.0	107.0	5 300	6 300
2212E		●	●	●		110	28	1.5	1.5	72.0	151.0	157.0	5 300	6 300
312E		●	●	●		130	31	2.1	2.1	77.0	169.0	157.0	4 800	5 600
2312E		●	●	●		130	46	2.1	2.1	77.0	251.0	262.0	4 300	5 300
213E	●	●	●	●	65	120	23	1.5	1.5	78.5	124.0	119.0	4 800	5 600
2213E		●	●	●		120	31	1.5	1.5	78.5	171.0	181.0	4 800	6 000
313E		●	●	●		140	33	2.1	2.1	82.5	204.0	191.0	4 300	5 300
2313E		●	●	●		140	48	2.1	2.1	82.5	263.0	265.0	3 800	4 800
214E		●	●	●	70	125	24	1.5	1.5	83.5	136.0	137.0	5 000	6 300
2214E		●	●	●		125	31	1.5	1.5	83.5	179.0	194.0	4 500	5 600
314E		●	●	●		150	35	2.1	2.1	89.0	231.0	222.0	4 000	5 000
2314E		●	●	●		150	51	2.1	2.1	89.0	310.0	325.0	3 600	4 500
215E		●	●	●	75	130	25	1.5	1.5	88.5	150.0	156.0	4 800	6 000
2215E		●	●	●		130	31	1.5	1.5	88.5	186.0	207.0	4 300	5 300
315E		●	●	●		160	37	2.1	2.1	95.0	271.0	263.0	3 800	4 800
2315E		●	●	●		160	55	2.1	2.1	95.0	370.0	395.0	3 400	4 300
216E		●	●	●	80	140	26	2.0	2.0	95.3	160.0	167.0	4 500	5 300
2216E		●	●	●		140	33	2.0	2.0	95.3	214.0	243.0	4 000	5 000
316E		●	●	●		170	39	2.1	2.1	101.0	289.0	282.0	3 600	4 300
2316E		●	●	●		170	58	2.1	2.1	101.0	400.0	430.0	3 200	4 000
217E		●	●	●	85	150	28	2.0	2.0	100.5	192.0	199.0	4 300	5 000
2217E		●	●	●		150	36	2.0	2.0	100.5	250.0	279.0	3 800	4 500
317E		●				180	41	3.0	3.0	108.0	360.0	330.0	3 400	4 000
2317E		●				180	60	3.0	3.0	108.0	485.0	485.0	3 000	3 800
218E		●	●	●	90	160	30	2.0	2.0	107.0	205.0	217.0	4 000	4 800
2218E		●	●	●		160	40	2.0	2.0	107.0	274.0	315.0	3 600	4 300
318E		●				190	43	3.0	3.0	113.5	390.0	355.0	3 200	3 800
2318E		●				190	64	3.0	3.0	113.5	535.0	535.0	2 800	3 400

BEARING DIMENSIONS AND OPERATING VALUES

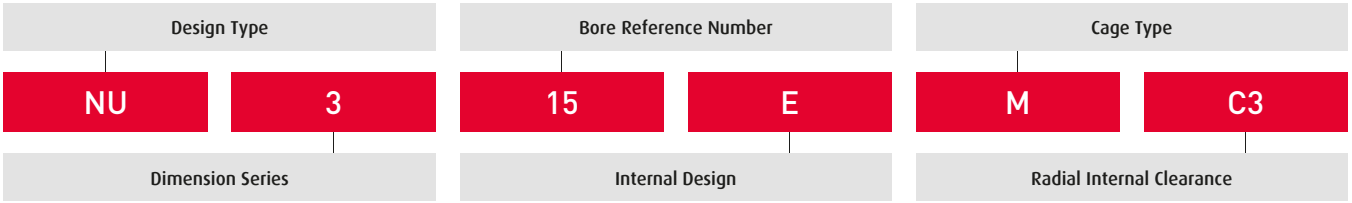


BASIC BEARING NO.					BEARING DIMENSIONS						BASIC LOAD RATINGS		LIMITING SPEEDS	
NU/NJ/NUP	Cage				mm						kN		rpm	
	W	M	T	T7	d	D	B	r (min)	r_1 (min)	F_w	Dynamic	Static	Grease	Oil
219E		●	●		95	170	32	2.1	2.1	112.5	249.0	265.0	3 800	4 500
2219E		●	●			170	43	2.1	2.1	112.5	325.0	370.0	3 400	4 000
319E		●				200	45	3.0	3.0	121.5	410.0	385.0	3 000	3 600
2319E		●				200	67	3.0	3.0	121.5	565.0	585.0	2 600	3 400
220E		●			100	180	34	2.1	2.1	119.0	305.0	305.0	3 600	4 300
2220E		●				180	46	2.1	2.1	119.0	410.0	445.0	3 200	3 800
320E		●				215	47	3.0	3.0	127.5	465.0	425.0	2 800	3 400
2320E		●				215	73	3.0	3.0	127.5	700.0	715.0	2 400	3 000
221E		●			105	190	36	2.1	2.1	125.0	320.0	310.0	3 400	4 000
321E		●				225	49	3.0	3.0	133.0	525.0	480.0	2 600	3 200
222E		●			110	200	38	2.1	2.1	132.5	360.0	365.0	3 200	3 800
2222E		●				200	53	2.1	2.1	132.5	470.0	515.0	2 800	3 400
322E		●				240	50	3.0	3.0	143.0	555.0	525.0	2 600	3 000
2322E		●				240	80	3.0	3.0	143.0	830.0	880.0	2 200	2 800

BASIC BEARING NO.					BEARING DIMENSIONS						BASIC LOAD RATINGS		LIMITING SPEEDS	
NU/NJ/NUP	Cage				mm						kN		rpm	
	W	M	T	T7	d	D	B	r (min)	r_1 (min)	F_w	Dynamic	Static	Grease	Oil
224E		●			120	215	40	2.1	2.1	143.5	410.0	420.0	3 000	3 400
2224E		●				215	58	2.1	2.1	143.5	555.0	620.0	2 600	3 200
324E		●				260	55	3.0	3.0	154.0	650.0	610.0	2 200	2 800
2324E		●				260	86	3.0	3.0	154.0	975.0	1 030.0	2 000	2 600
226E		●			130	230	40	3.0	3.0	153.5	445.0	455.0	2 600	3 200
2226E		●				230	64	3.0	3.0	153.5	650.0	735.0	2 400	3 000
326E		●				280	58	4.0	4.0	167.0	760.0	735.0	2 200	2 600
2326E		●				280	93	4.0	4.0	167.0	1 130.0	1 230.0	1 900	2 400
228E		●			140	250	42	3.0	3.0	169.0	485.0	515.0	2 400	3 000
2228E		●				250	68	3.0	3.0	169.0	675.0	790.0	2 200	2 800
328E		●				300	62	4.0	4.0	180.0	815.0	795.0	2 000	2 400
2328E		●				300	102	4.0	4.0	180.0	1 250.0	1 380.0	1 700	2 200
230E		●			150	270	45	3.0	3.0	182.0	550.0	595.0	2 200	2 800
2230E		●				270	73	3.0	3.0	182.0	780.0	930.0	2 000	2 600
330E		●				320	65	4.0	4.0	193.0	930.0	920.0	1 800	2 200
2330E		●				320	108	4.0	4.0	193.0	1 430.0	1 600.0	1 600	2 000
232E		●			160	290	48	3.0	3.0	195.0	615.0	665.0	2 200	2 600
2232E		●				290	80	3.0	3.0	193.0	995.0	1 190.0	1 900	2 400
332E		●				340	68	4.0	4.0	204.0	1 060.0	1 050.0	1 700	2 000
234E		●			170	310	52	4.0	4.0	207.0	740.0	800.0	2 000	2 400
2234E		●				310	86	4.0	4.0	205.0	1 140.0	1 330.0	1 800	2 200
236E		●			180	320	52	4.0	4.0	217.0	770.0	850.0	1 900	2 200
2236E		●				320	86	4.0	4.0	215.0	1 240.0	1 510.0	1 700	2 000
238E		●			190	340	55	4.0	4.0	230.0	855.0	955.0	1 800	2 200
2238E		●				340	92	4.0	4.0	228.0	1 360.0	1 670.0	1 600	2 000
240E		●			200	360	58	4.0	4.0	243.0	945.0	1 060.0	1 700	2 000
2240E		●				360	98	4.0	4.0	241.0	1 500.0	1 870.0	1 500	1 800
244E		●			220	400	65	4.0	4.0	268.0	1 110.0	1 250.0	1 500	1 800

DESIGNATION SYSTEM - AFTERMARKET

NSKHPS CYLINDRICAL ROLLER BEARINGS



DESIGNATION		ATTRIBUTE
Design Type	NU	no flange on inner ring
	NJ	one flange on inner ring
	NUP	one flange on inner ring + locating ring
Dimensional Series	2	light duty type
	22	light duty type, wide
	3	medium duty type
	23	medium duty type, wide
Bore Reference Number		multiply x 5 for bore diameter in mm available for bore numbers 05 to 44 (20 mm to 220 mm)
Internal Design	E	high capacity design

DESIGNATION		ATTRIBUTE
Cage Type	W	pressed steel
	M	machined brass
	T	polyamide resin
	T7	L-PPS resin
Radial Internal Clearance	blank	normal clearance
	C3	greater than normal clearance
	C4	greater than C3

NSK

NSK

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