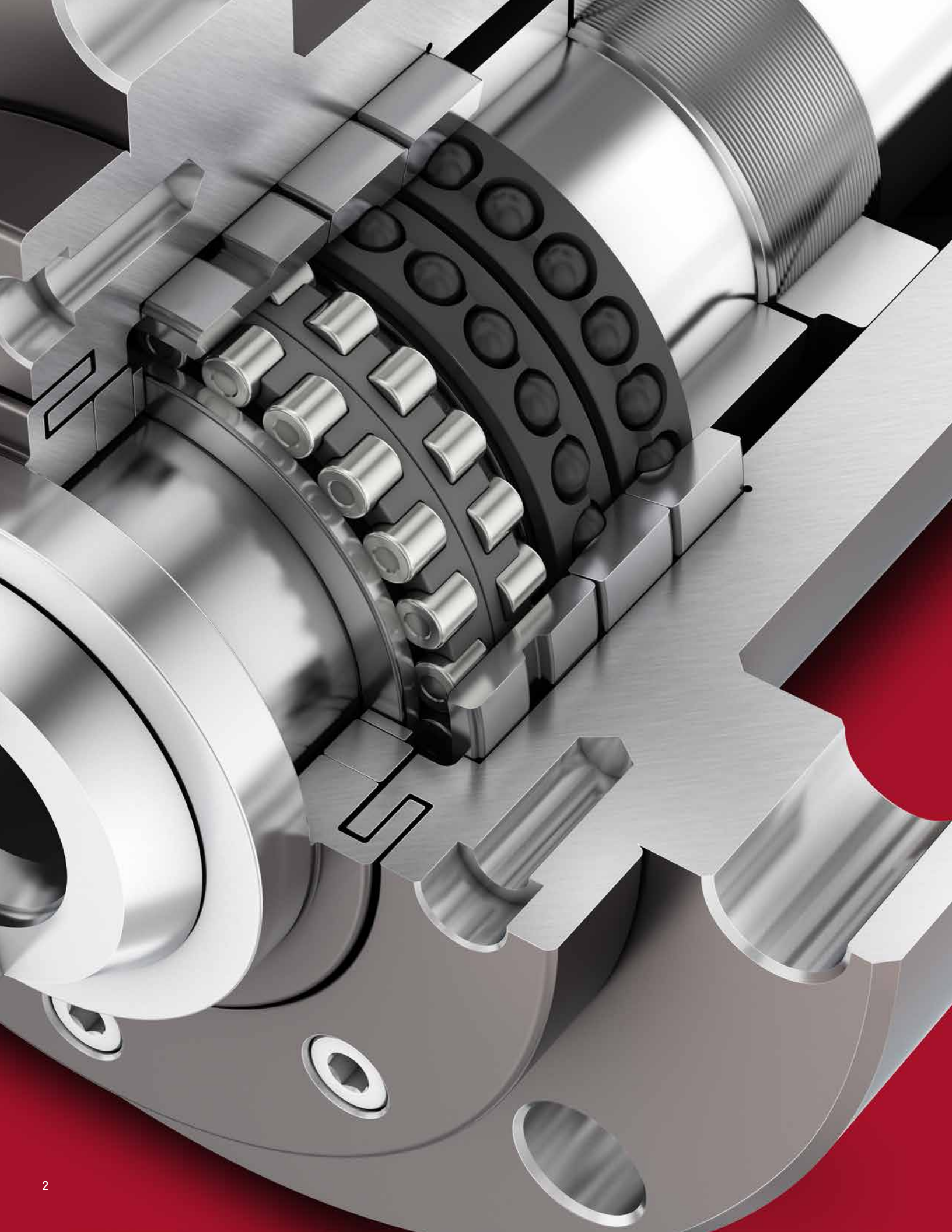
APTSURF™ CYLINDRICAL ROLLER BEARINGS

LOWER VIBRATION AND LONGER BEARING LIFE IN MAIN SPINDLES

STAY IN MOTION. STAY IN CONTROL.

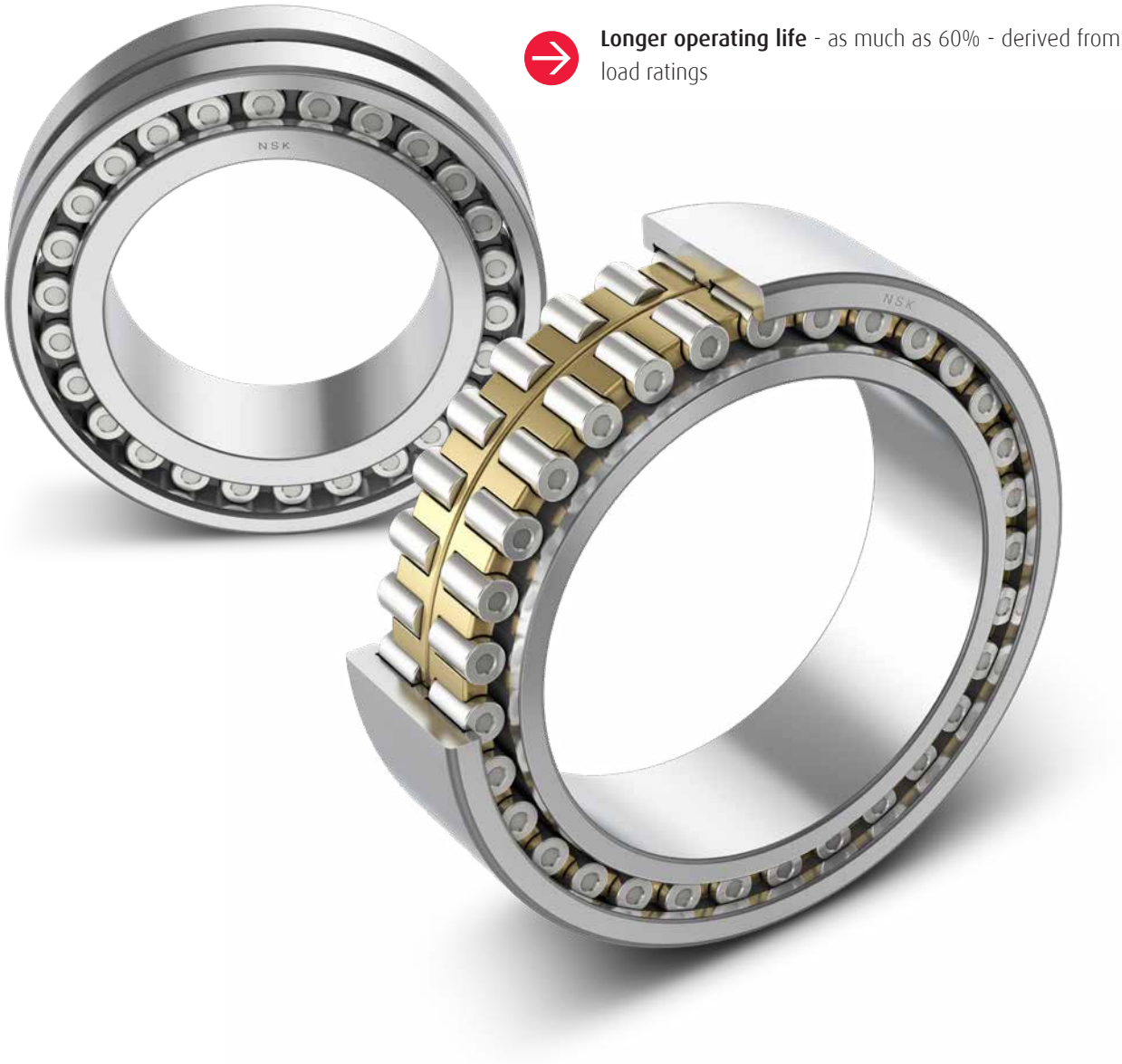


DELIVERING UNRIVALED MACHINING AND PART QUALITY

High rigidity, high capacity and precise running accuracy are essential characteristics for bearings that support the main spindles of CNC machines. Particularly in lathes and turning centers, where precise control of a workpiece or tool path is critical to finished part quality.

NSK APTSURF™ double row cylindrical roller bearings are optimized to deliver higher machining quality and stable operation over a longer operating life with:

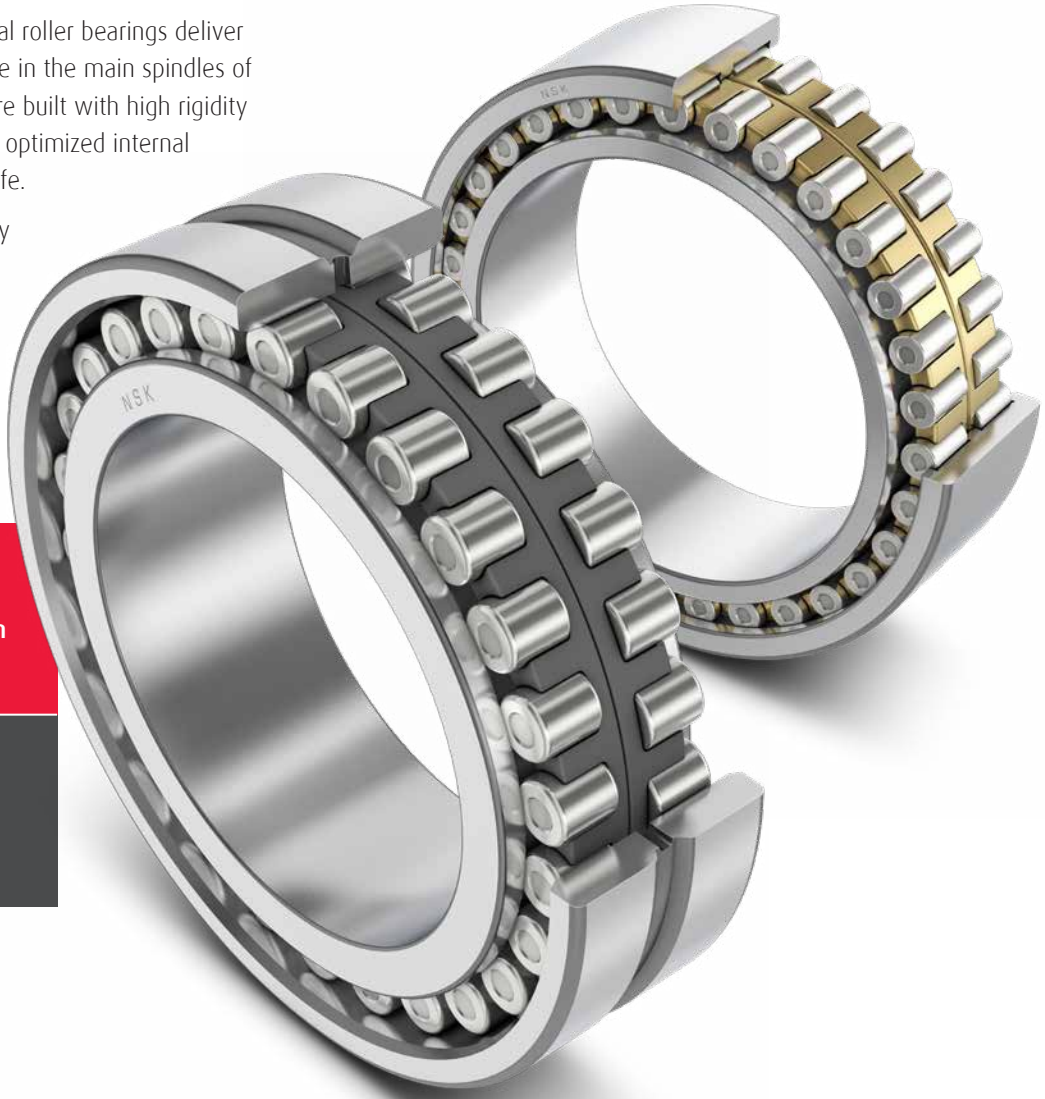
- **Low rotational vibration** with 55% reduction in RMS (root mean square) vibration values
- **Higher load capacity** with an optimized internal design yielding 15% higher dynamic capacity compared to conventional designs
- **Longer operating life** - as much as 60% - derived from higher load ratings



HIGH CAPACITY. HIGH ACCURACY. LONG LIFE.

NSK APTSURF double row cylindrical roller bearings deliver superlative machining performance in the main spindles of lathes and turning centers. They are built with high rigidity and high capacity, bolstered by an optimized internal design that also extends bearing life.

Stringent control of higher accuracy bearing components has dramatically reduced rotational vibration, directly reflected in the surface finish quality of machined parts.



APTSURF
reduces RMS vibration as much as 55%

NSKHPS
extends bearing life as much as 60%

DESIGN FEATURES

- **Low vibration APTSURF specification** achieves higher accuracy of roller, raceway and dimensional surface geometries
- **NSKHPS optimized internal design** delivers higher dynamic capacity and longer bearing life
- Equipped with machined brass cage as standard
- **Advanced PPS engineered resin cage** supports higher limiting speeds with high rigidity, low heat generation and reduced wear
- **Low heat generation NN-Z types** for high speeds also available, specifically for free-end bearing applications
- **For series NN30, NN39, NN49, NNU49** for bore diameters ranging from 40 to 260 mm
- Cylindrical or tapered bore types
- Outer ring lubrication groove / holes option (for NN type)
- With P2, P4 and P4Y dimensional accuracy

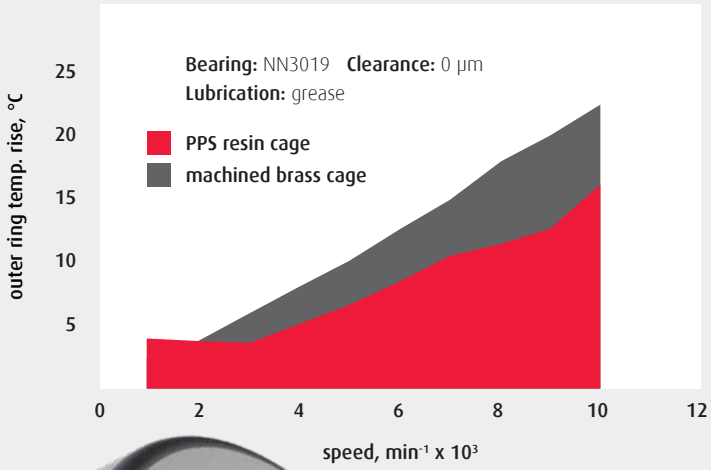
Lower wear, longer grease life - PPS resin cage

NSK engineered polymer cages are optimized to support the ultra-high speeds of next-generation machining requirements. They are lighter (1/6 the weight of brass cages), self-lubricating and have a low coefficient of friction.

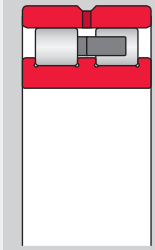
NSK APTSURF cylindrical roller bearings equipped with high-strength / highly rigid PPS resin cages generate less heat in operation, resulting in low wear and longer grease life.

Available for APTSURF double row cylindrical roller bearing series NN30 and NN30(Z) in bore diameters ranging from 40 to 160 mm.

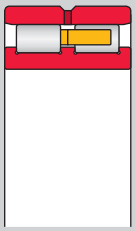
Comparison of temperature rise

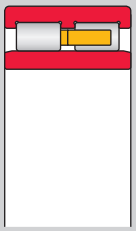


APTSURF range of availability - types, dimension series and features


NN30


NN39

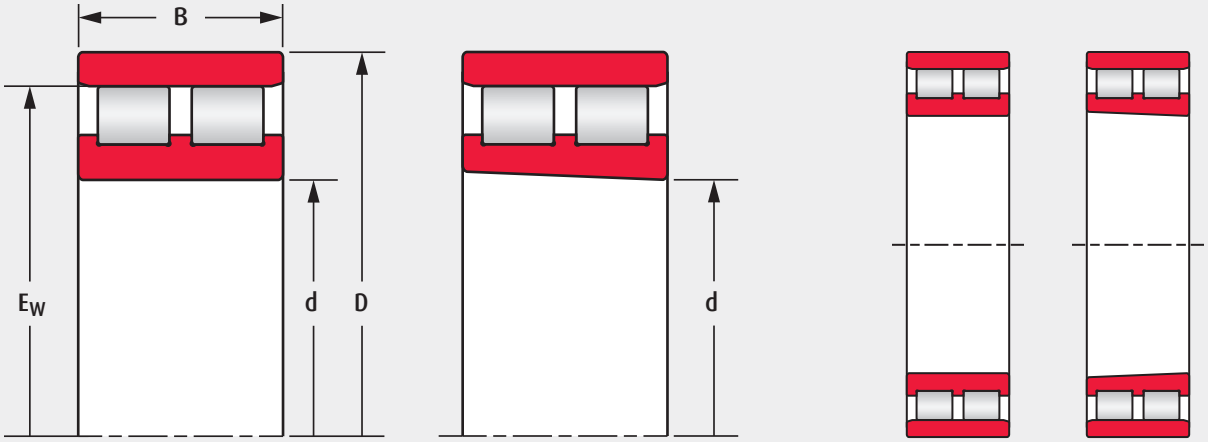

NN49


NNU49

PPS resin cage	NN30(Z)	bore diameters 40 to 160 mm
Machined brass cage	NN30	bore diameters 40 to 240 mm
	NN39	bore diameters 100 to 260 mm
	NN49	bore diameters 100 to 260 mm
	NNU49	bore diameters 100 to 260 mm
Bore specifications		cylindrical and/or 1:12 tapered bore
Lubrication feature option		outer ring lubrication groove, holes

BEARING DIMENSIONS AND OPERATING VALUES

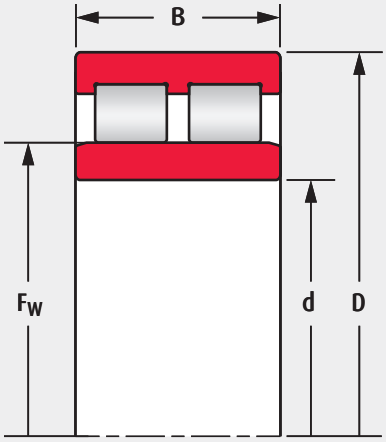
BORE DIAMETER: 40 - 95 MM



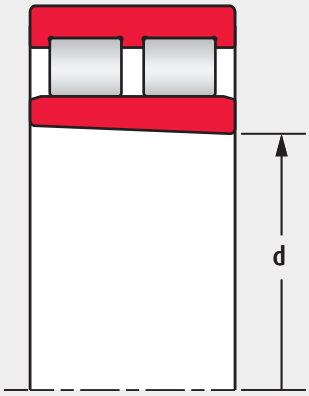
cylindrical bore, NN | tapered bore, NN | NN | NN-KR

BOUNDARY DIMENSIONS mm				BASIC BEARING No.	BASIC LOAD RATINGS N		LIMITING SPEED, min^{-1}	
d	D	B	E_W / F_W		Dynamic	Static	Grease	Oil
40	68	21	61	**NN 3008 MBKR**	50 000	55 500	13 900	16 700
	68	21	61	**NN 3008 TBKR**	50 000	55 500	15 800	18 600
	68	21	61	**NN 3008 ZTBKR**	29 600	27 700	16 600	22 000
45	75	23	67.5	**NN 3009 MBKR**	59 500	68 500	12 500	15 000
	75	23	67.5	**NN 3009 TBKR**	57 500	65 500	14 200	16 700
	75	23	67.5	**NN 3009 ZTBKR**	34 000	32 500	14 900	19 800
50	80	23	72.5	**NN 3010 MBKR**	61 000	72 500	11 600	13 900
	80	23	72.5	**NN 3010 TBKR**	61 000	72 500	13 100	15 400
	80	23	72.5	**NN 3010 ZTBKR**	36 500	36 500	13 800	18 300
55	90	26	81	**NN 3011 MBKR**	79 500	96 500	10 400	12 500
	90	26	81	**NN 3011 TBKR**	79 500	96 500	11 800	13 800
	90	26	81	**NN 3011 ZTBKR**	47 500	48 500	12 400	16 400
60	95	26	86.1	**NN 3012 MBKR**	84 500	106 000	9 700	11 700
	95	26	86.1	**NN 3012 TBKR**	84 500	106 000	11 000	13 000
	95	26	86.1	**NN 3012 ZTBKR**	50 000	53 000	11 600	15 400
65	100	26	91	**NN 3013 MBKR**	88 500	116 000	9 100	11 000
	100	26	91	**NN 3013 TBKR**	88 500	116 000	10 400	12 200
	100	26	91	**NN 3013 ZTBKR**	52 500	58 000	10 900	14 500

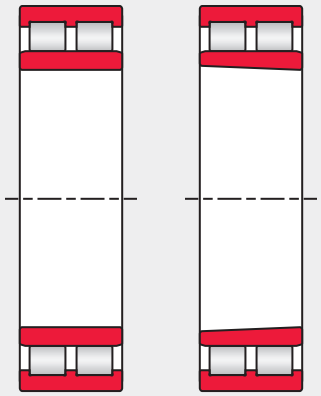
Designations listed are suffixed with **KR** to indicate 1:12 tapered bores. For cylindrical bore bearings, omit this suffix.
For a complete explanation of designations, including internal design and cage features, refer to **page 14.**



cylindrical bore, NNU



tapered bore, NNU

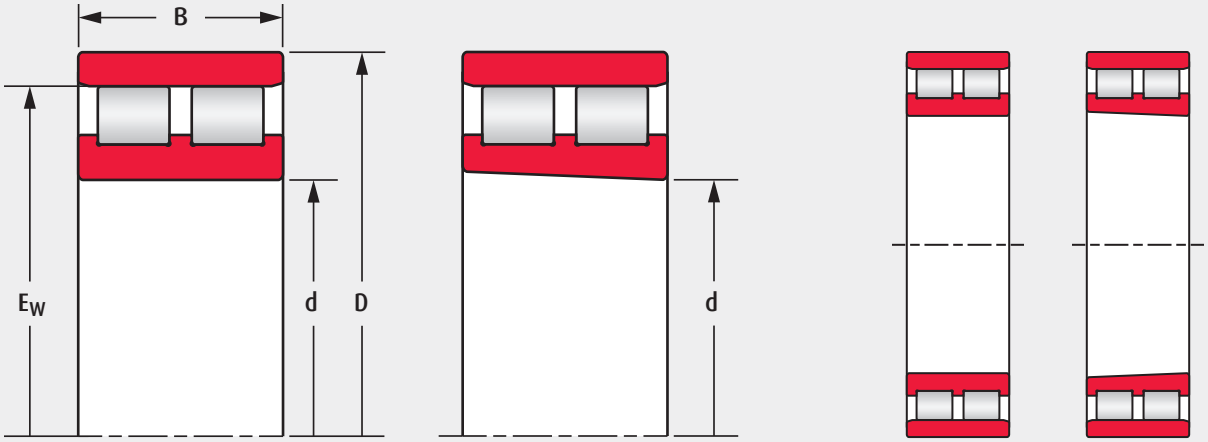


NNU NNU-KR

BOUNDARY DIMENSIONS mm				BASIC BEARING No.	BASIC LOAD RATINGS N		LIMITING SPEED, min^{-1}	
d	D	B	E_W / F_W		Dynamic	Static	Grease	Oil
70	110	30	100	**NN 3014 MBKR**	112 000	148 000	8 000	10 000
	110	30	100	**NN 3014 TBKR**	112 000	148 000	9 500	11 200
	110	30	100	**NN 3014 ZTBKR**	66 500	74 000	9 900	13 200
75	115	30	105	**NN 3015 MBKR**	111 000	149 000	7 900	9 500
	115	30	105	**NN 3015 TBKR**	111 000	149 000	9 000	10 600
	115	30	105	**NN 3015 ZTBKR**	66 000	74 500	9 400	12 500
80	125	34	113	**NN 3016 MBKR**	137 000	186 000	7 400	8 800
	125	34	113	**NN 3016 TBKR**	137 000	186 000	8 300	9 800
	125	34	113	**NN 3016 ZTBKR**	81 500	93 000	8 800	11 700
85	130	34	118	**NN 3017 MBKR**	144 000	201 000	7 000	8 400
	130	34	118	**NN 3017 TBKR**	144 000	201 000	8 000	9 400
	130	34	118	**NN 3017 ZTBKR**	85 500	101 000	8 400	11 100
90	140	37	127	**NN 3018 MBKR**	164 000	228 000	6 600	7 900
	140	37	127	**NN 3018 TBKR**	164 000	228 000	7 400	8 700
	140	37	127	**NN 3018 ZTBKR**	97 500	114 000	7 800	10 300
95	145	37	132	**NN 3019 MBKR**	173 000	246 000	6 300	7 500
	145	37	132	**NN 3019 TBKR**	173 000	246 000	7 100	8 400
	145	37	132	**NN 3019 ZTBKR**	103 000	123 000	7 500	9 900

BEARING DIMENSIONS AND OPERATING VALUES

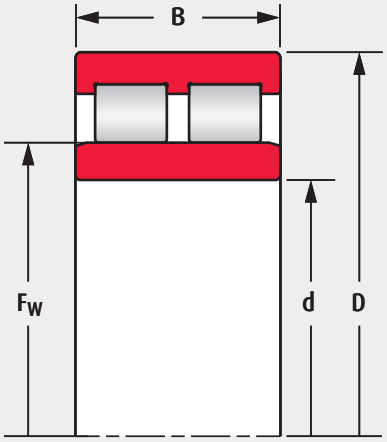
BORE DIAMETER: 100 - 140 MM



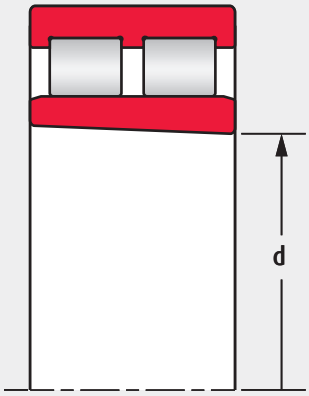
cylindrical bore, NN | tapered bore, NN | NN | NN-KR

BOUNDARY DIMENSIONS mm				BASIC BEARING No.	BASIC LOAD RATINGS N		LIMITING SPEED, min^{-1}	
d	D	B	E_W / F_W		Dynamic	Static	Grease	Oil
100	140	30	130	**NN 3920 MBKR**	122 000	182 000	6 300	7 500
	140	40	130	**NN 4920 MBKR**	178 000	295 000	6 300	7 500
	140	40	112	**NNU 4920 MBKR**	178 000	295 000	6 300	7 500
	150	37	137	**NN 3020 MBKR**	180 000	265 000	6 000	7 200
	150	37	137	**NN 3020 TBKR**	180 000	265 000	6 800	8 000
	150	37	137	**NN 3020 ZTBKR**	107 000	133 000	7 200	9 500
105	145	40	135	**NN 4921 MBKR**	185 000	315 000	6 000	7 200
	145	40	117	**NNU 4921 MBKR**	185 000	315 000	6 000	7 200
	160	41	146	**NN 3021 MBKR**	228 000	320 000	5 700	6 800
	160	41	146	**NN 3021 TBKR**	228 000	320 000	6 500	7 600
	160	41	146	**NN 3021 ZTBKR**	135 000	161 000	6 800	9 000
110	150	30	140	**NN 3922 MBKR**	131 000	207 000	5 800	7 000
	150	40	140	**NN 4922 MBKR**	192 000	335 000	5 800	7 000
	150	40	122	**NNU 4922 MBKR**	192 000	335 000	5 800	7 000
	170	45	155	**NN 3022 MBKR**	263 000	375 000	5 400	6 500
	170	45	155	**NN 3022 TBKR**	263 000	375 000	6 100	7 200
	170	45	155	**NN 3022 ZTBKR**	156 000	188 000	6 400	8 500

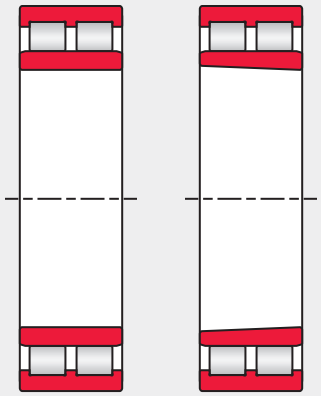
Designations listed are suffixed with **KR** to indicate 1:12 tapered bores. For cylindrical bore bearings, omit this suffix.
For a complete explanation of designations, including internal design and cage features, refer to **page 14.**



cylindrical bore, NNU



tapered bore, NNU

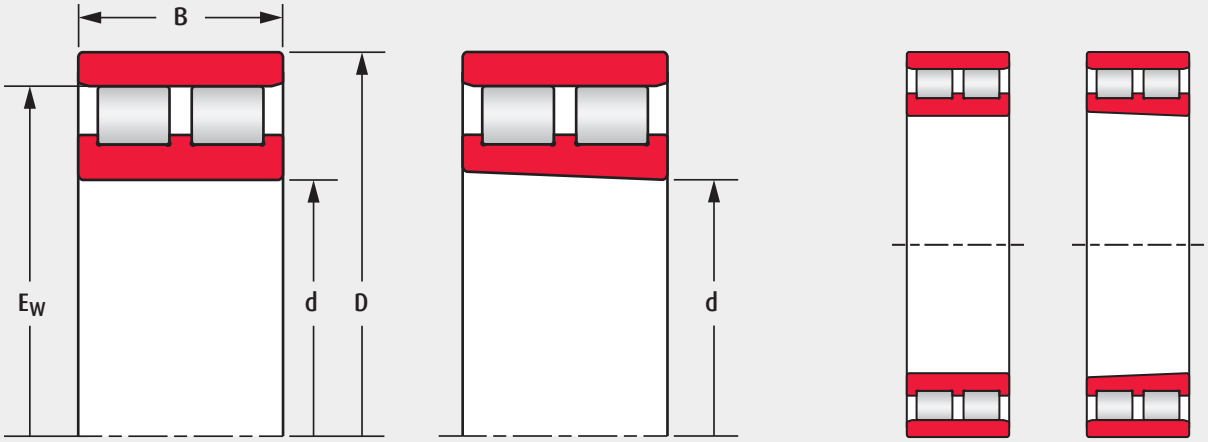


NNU NNU-KR

BOUNDARY DIMENSIONS mm				BASIC BEARING No.	BASIC LOAD RATINGS N		LIMITING SPEED, min^{-1}	
d	D	B	E_W / F_W		Dynamic	Static	Grease	Oil
120	165	34	153.5	**NN 3924 MBKR**	158 000	251 000	5 300	6 400
	165	45	153.5	**NN 4924 MBKR**	211 000	360 000	5 300	6 400
	165	45	133.5	**NNU 4924 MBKR**	211 000	360 000	5 300	6 400
	180	46	165	**NN 3024 MBKR**	275 000	405 000	5 000	6 000
	180	46	165	**NN 3024 TBKR**	275 000	405 000	5 700	6 700
	180	46	165	**NN 3024 ZTBKR**	164 000	203 000	6 000	7 900
130	180	37	167	**NN 3926 MBKR**	199 000	325 000	4 900	5 900
	180	50	168	**NN 4926 MBKR**	315 000	545 000	4 900	5 900
	180	50	144	**NNU 4926 MBKR**	315 000	545 000	4 900	5 900
	200	52	182	**NN 3026 MBKR**	325 000	475 000	4 600	5 500
	200	52	182	**NN 3026 TBKR**	325 000	475 000	5 200	6 100
	200	52	182	**NN 3026 ZTBKR**	195 000	238 000	5 500	7 200
140	190	37	178	**NN 3928 MBKR**	232 000	375 000	4 600	5 500
	190	50	178	**NN 4928 MBKR**	325 000	585 000	4 600	5 500
	190	50	154	**NNU 4928 MBKR**	325 000	585 000	4 600	5 500
	210	53	192	**NN 3028 MBKR**	345 000	515 000	4 300	5 200
	210	53	192	**NN 3028 TBKR**	345 000	515 000	4 900	5 700
	210	53	192	**NN 3028 ZTBKR**	204 000	258 000	5 200	6 800

BEARING DIMENSIONS AND OPERATING VALUES

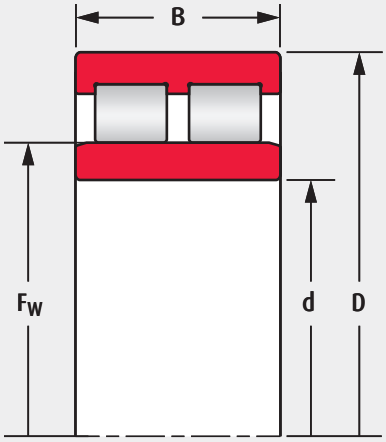
BORE DIAMETER: 150 - 200 MM



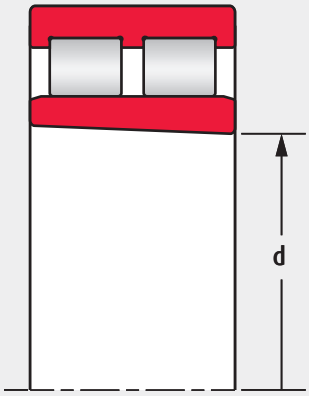
cylindrical bore, NN | tapered bore, NN | NN | NN-KR

BOUNDARY DIMENSIONS mm				BASIC BEARING No.	BASIC LOAD RATINGS N		LIMITING SPEED, min^{-1}	
d	D	B	E_W / F_W		Dynamic	Static	Grease	Oil
150	210	45	195	**NN 3930 MBKR**	300 000	490 000	4 200	5 000
	210	60	195	**NN 4930 MBKR**	405 000	715 000	4 200	5 000
	210	60	167	**NNU 4930 MBKR**	405 000	715 000	4 200	5 000
	225	56	206	**NN 3030 MBKR**	385 000	585 000	4 000	4 800
	225	56	206	**NN 3030 TBKR**	385 000	585 000	4 500	5 300
	225	56	206	**NN 3030 ZTBKR**	229 000	294 000	4 800	6 300
160	220	45	205	**NN 3932 MBKR**	310 000	520 000	4 000	4 800
	220	60	205	**NN 4932 MBKR**	420 000	760 000	4 000	4 800
	220	60	177	**NNU 4932 MBKR**	420 000	760 000	4 000	4 800
	240	60	219	**NN 3032 MBKR**	430 000	660 000	3 800	4 500
	240	60	219	**NN 3032 TBKR**	430 000	660 000	4 300	5 000
	240	60	219	**NN 3032 ZTBKR**	255 000	330 000	4 500	6 000
170	230	45	215	**NN 3934 MBKR**	320 000	550 000	3 800	4 500
	230	60	215	**NN 4934 MBKR**	435 000	805 000	3 800	4 500
	230	60	187	**NNU 4934 MBKR**	435 000	805 000	3 800	4 500
	260	67	236	**NN 3034 MBKR**	520 000	805 000	3 500	4 200

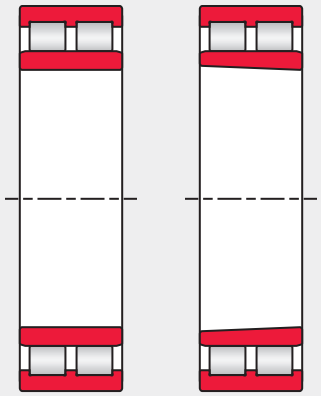
Designations listed are suffixed with **KR** to indicate 1:12 tapered bores. For cylindrical bore bearings, omit this suffix.
For a complete explanation of designations, including internal design and cage features, refer to **page 14.**



cylindrical bore, NNU



tapered bore, NNU

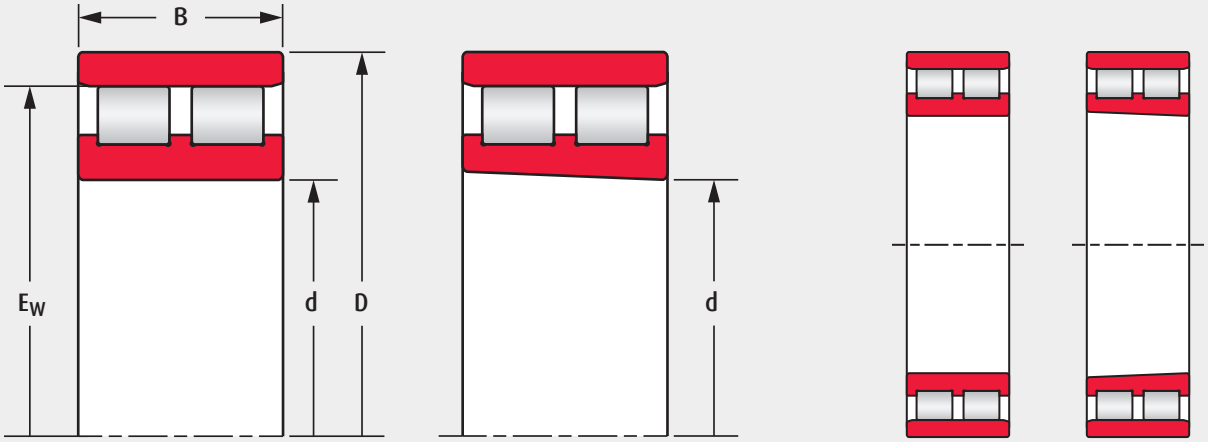


NNU NNU-KR

BOUNDARY DIMENSIONS mm				BASIC BEARING No.	BASIC LOAD RATINGS N		LIMITING SPEED, min^{-1}	
d	D	B	E_W / F_W		Dynamic	Static	Grease	Oil
180	250	52	232	**NN 3936 MBKR**	390 000	655 000	3 500	4 200
	250	69	232	**NN 4936 MBKR**	550 000	1 020 000	3 500	4 200
	250	69	200	**NNU 4936 MBKR**	550 000	1 020 000	3 500	4 200
	280	74	255	**NN 3036 MBKR**	650 000	995 000	3 300	4 000
190	260	52	243.5	**NN 3938 MBKR**	395 000	680 000	3 400	4 000
	260	69	243.5	**NN 4938 MBKR**	555 000	1 060 000	3 400	4 000
	260	69	211.5	**NNU 4938 MBKR**	555 000	1 060 000	3 400	4 000
	290	75	265	**NN 3038 MBKR**	685 000	1 080 000	3 200	3 800
200	280	60	259	**NN 3940 MBKR**	480 000	815 000	3 200	3 800
	280	80	259	**NN 4940 MBKR**	655 000	1 220 000	3 200	3 800
	280	80	223	**NNU 4940 MBKR**	655 000	1 220 000	3 200	3 800
	310	82	282	**NN 3040 MBKR**	750 000	1 170 000	3 000	3 600

BEARING DIMENSIONS AND OPERATING VALUES

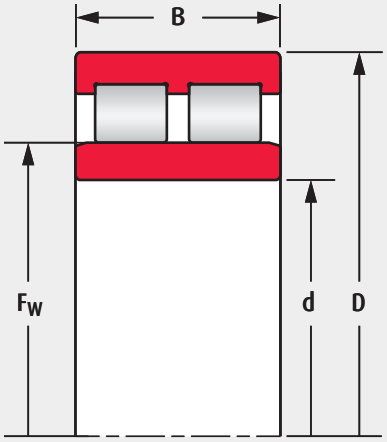
BORE DIAMETER: 220 - 260 MM



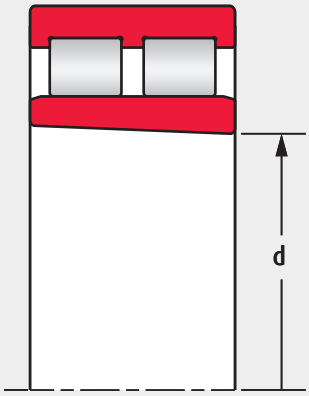
cylindrical bore, NN | tapered bore, NN | NN | NN-KR

BOUNDARY DIMENSIONS mm				BASIC BEARING No.	BASIC LOAD RATINGS N		LIMITING SPEED, min^{-1}	
d	D	B	E_W / F_W		Dynamic	Static	Grease	Oil
220	300	60	279	**NN 3944 MBKR**	505 000	895 000	2 500	3 100
	300	80	279	**NN 4944 MBKR**	690 000	1 330 000	2 500	3 100
	300	80	243	**NNU 4944 MBKR**	690 000	1 330 000	2 500	3 100
	340	90	310	**NN 3044 MBKR**	940 000	1 480 000	2 400	2 900
240	320	60	300	**NN 3948 MBKR**	525 000	975 000	2 400	2 900
	320	80	300	**NN 4948 MBKR**	720 000	1 450 000	2 400	2 900
	320	80	263	**NNU 4948 MBKR**	720 000	1 450 000	2 400	2 900
	360	92	330	**NN 3048 MBKR**	980 000	1 600 000	2 200	2 700

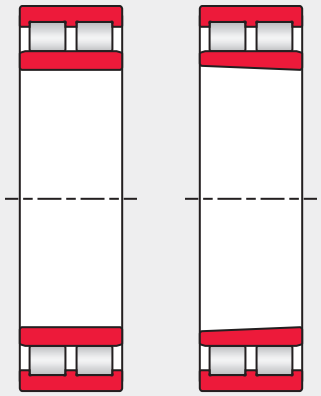
Designations listed are suffixed with **KR** to indicate 1:12 tapered bores. For cylindrical bore bearings, omit this suffix.
For a complete explanation of designations, including internal design and cage features, refer to **page 14.**



cylindrical bore, NNU



tapered bore, NNU

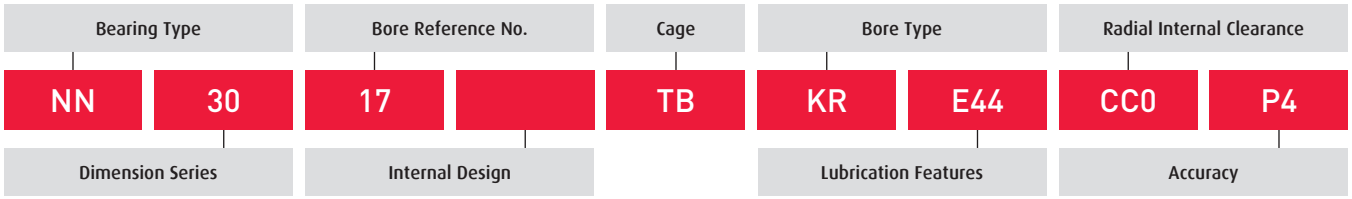


NNU NNU-KR

BOUNDARY DIMENSIONS				BASIC BEARING No.	BASIC LOAD RATINGS		LIMITING SPEED, min^{-1}	
mm					N			
d	D	B	E_W / F_W		Dynamic	Static	Grease	Oil
260	360	75	335	**NN 3952 MBKR**	775 000	1 380 000	2 100	2 600
	360	100	335	**NN 4952 MBKR**	1 070 000	2 100 000	2 100	2 600
	360	100	289	**NNU 4952 MBKR**	1 070 000	2 100 000	2 100	2 600
	400	104	364	**NN 3052KR**	1 030 000	1 920 000	2 000	2 500

DESIGNATION SYSTEM

APTSURF DOUBLE ROW CYLINDRICAL ROLLER BEARINGS



DESIGNATION		ATTRIBUTE
Bearing type	NN	double row with inner ring ribs
	NNU	double row with outer ring ribs
Dimension series	30	30 series
	39	39 series
	49	49 series
Bore reference no.		multiply x 5 for bore diameter in mm
Internal design	blank	standard type
	Z	low heat generation type
Cage	TB	roller guided PPS resin cage
	MB	roller guided brass cage
Bore type	blank	cylindrical bore
	KR/K	tapered bore, 1:12

DESIGNATION		ATTRIBUTE
Lubrication features	blank	no lubrication features
	E44	outer ring lubrication groove and holes
Radial internal clearance	CC0	standard for tapered bore
	CC1	standard for cylindrical bore
	CCG	special radial clearance
Accuracy	P2	ISO class 2
	P4	ISO class 4
	P4Y	special dimensional accuracy with ISO class 4 running accuracy

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