



## HIGH-CAPACITY ANGULAR CONTACT BALL BEARINGS

FEATURING NSKHPS HIGH PERFORMANCE SERIES



STAY IN MOTION. STAY IN CONTROL.



## OPTIMIZED CAPACITY, ACCURACY AND SPEED

### NSK ANGULAR CONTACT BALL BEARINGS

Smooth running at high speeds under combined loads in pumps, compressors, generators and turbines. High rigidity and accuracy for precision machining in spindles, lathes and milling machines. Reliable, long-life performance in fans and blowers, packaging and assembly machinery.

Angular contact ball bearings are employed in a vast array of industries and applications, owing to their high-performance characteristics and a wide range of design variants - distinguished by rows of rolling elements, dimensional and running accuracies, cages and materials.

Universally, NSK angular contact ball bearings are optimized for capacity, rigidity and speed to extract higher performance and predictable reliability from machinery and equipment.



## HIGH PERFORMANCE STANDARD

NSK high-capacity angular contact ball bearings are optimized by design to deliver utmost performance, accommodating higher loads and higher speeds with precise running accuracy.

For conventional applications this translates into longer operating life as well as unrivalled machinery and equipment performance with:

- ➔ **Higher load capacity**  
derived from an optimized internal design
- ➔ **Longer fatigue life,**  
increased by as much as 90%
- ➔ **Higher limiting speeds,**  
increased by 15 to 20%
- ➔ **High accuracy axial positioning** achieved with high precision tolerances and standard universal duplex arrangements
- ➔ **Lower heat generation, vibration and noise**

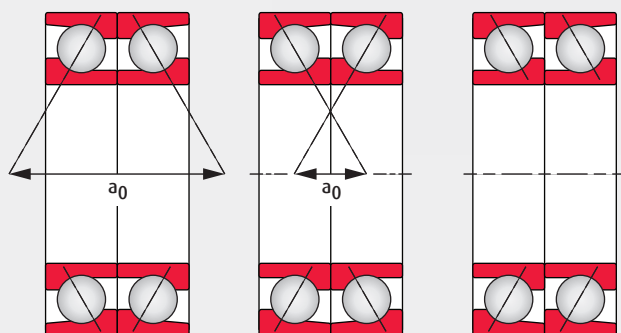


# DESIGN FEATURES AND OPERATING CHARACTERISTICS

## DESIGN FEATURES

- › Manufactured with high-purity steel for superior fatigue strength
- › Optimized internal design delivers higher load capacity and limiting speeds
- › Including NSKHPS range with dimensional accuracy to ISO tolerance Class 6 and running accuracy to ISO tolerance Class 5<sup>1)</sup>
- › Universally matched for mounting in duplex arrangements
- › With 40° contact angle for high rigidity and stability to accommodate axial and combined loads
- › Available with machined brass, pressed steel and polyamide resin cage designs to suit a wide range of operating conditions
- › Special chemical resistant L-PPS resin cages for scroll and screw compressors also available
- › For dimension series 72 and 73
- › Available for bore diameters from 12 to 120 mm

1) Refer to the table on page 5 for the NSKHPS range. Special precision for all other sizes must be specified / confirmed at the time of order



Back-to-Back  
(DB)

Face-to-Face  
(DF)

Tandem  
(DT)

## DUPLEX ARRANGEMENTS AND LOADS

Arrangement	Radial / axial loads	Moment loads
Back-to-Back	both directions	suitable
Face-to-Face	both directions	less suitable
Tandem	heavy, one direction	not suitable

Arrangements and moment loads - suitability to accommodate moment loads is determined by the distance between the effective load centers  $a_0$ .

## 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 high-capacity angular contact ball bearings, NSK offers cage material options engineered to meet a wide array of application and operating challenges.

### Machined Brass Cage MR

- › Heavy-duty design equipped to contend with high loads in chemical, petroleum, pulp and paper applications (API and ANSI pumps)
- › Optimized internal geometry achieved with ball-guided design promotes improved lubricant distribution and reduced heat generation during operation

### Polyamide Resin Cage T85

- › Well-suited to normal duty applications with high speeds
- › For operating temperatures ranging from -40 to 150°C

### Pressed Steel Cage W

- › High strength design, suitable for medium to high loads and medium speeds

### L-PPS Resin Cage T7

- › Exceptional resistance to oil, chemicals and abrasion
- › Dimensional stability at temperatures as high as 200°C



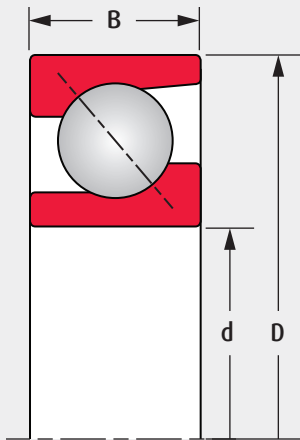
Pictured above, clockwise from top left: machined brass cage MR, polyamide resin cage T85, pressed steel cage W and L-PPS resin cage T7

## RANGE OF AVAILABILITY - CAGE TYPE

Dimension series	Machined brass	Polyamide resin	Pressed steel	L-PPS resin
72 NSKHPS	7206 to 7216	7201 to 7216	--	7203 to 7216
72	7217 to 7224	7217 to 7224	--	7217 to 7224
73 NSKHPS	7304 to 7316	7301 to 7316	--	7304 to 7316
73	7317 to 7324	7317 to 7324	7307 to 7316	7317 to 7324

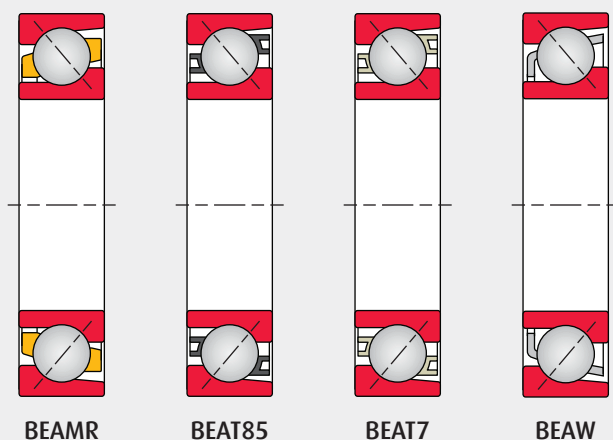
# BEARING DIMENSIONS AND OPERATING VALUES

BORE DIAMETER: 12 - 60 MM



BOUNDARY DIMENSIONS			BASIC BEARING No.	BASIC LOAD RATINGS		LIMITING SPEED, min <sup>-1</sup>	
mm				N			
d	D	B		Dynamic	Static	Grease	Oil
12	32	10	* 7201 BEAT85	8 500	3 750	20 000	30 000
	37	12	* 7301 BEAT85	11 600	4 950	18 000	26 000
15	35	11	* 7202 BEAT85	10 200	4 800	18 000	26 000
	42	13	* 7302 BEAT85	15 000	6 900	16 000	22 000
17	40	12	* 7203 BEAT85 (T7)	12 100	6 100	16 000	22 000
	47	14	* 7303 BEAT85	17 600	8 300	14 000	20 000
20	47	14	* 7204 BEAT85 (T7)	16 300	8 150	13 000	19 000
	52	15	* 7304 BEAMR (T85, T7)	20 800	10 500	13 000	18 000
25	52	15	* 7205 BEAT85 (T7)	18 400	10 200	12 000	17 000
	62	17	* 7305 BEAMR (T85, T7)	28 400	14 900	10 000	15 000
30	62	16	* 7206 BEAMR (T85, T7)	24 900	14 300	10 000	14 000
	72	19	* 7306 BEAMR (T85, T7)	38 000	20 600	9 000	13 000

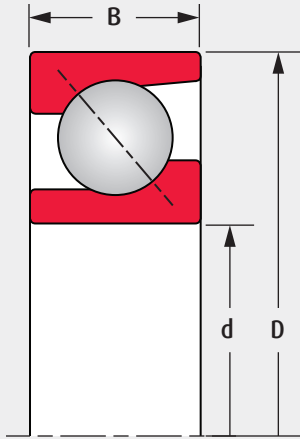
Bearings denoted with an asterisk are NSKHPS high performance series with P5 running accuracy and dimensional accuracy P6.  
For all other sizes, special precision must be specified / confirmed at the time of order.



BOUNDARY DIMENSIONS			BASIC BEARING No.	BASIC LOAD RATINGS		LIMITING SPEED, min <sup>-1</sup>	
mm				N			
d	D	B		Dynamic	Static	Grease	Oil
35	72	17	* 7207 BEAMR (T85, T7)	34 000	19 600	8 500	12 000
	80	21	* 7307 BEAMR (T85, T7)	42 000	24 400	8 000	11 000
	80	21	7307 BEAW	42 000	24 400	5 600	7 500
40	80	18	* 7208 BEAMR (T85, T7)	40 500	24 500	7 500	11 000
	90	23	* 7308 BEAMR (T85, T7)	55 500	33 000	7 100	10 000
	90	23	7308 BEAW	55 500	33 000	5 000	6 700
45	85	19	* 7209 BEAMR (T85, T7)	42 500	27 100	7 100	10 000
	100	25	* 7309 BEAMR (T85, T7)	65 500	39 500	6 300	9 000
	100	25	7309 BEAW	65 500	39 500	4 500	6 000
50	90	20	* 7210 BEAMR (T85, T7)	44 000	29 700	6 300	9 500
	110	27	* 7310 BEAMR (T85, T7)	82 000	50 500	5 600	8 000
	110	27	7310 BEAW	82 000	50 500	4 000	5 600
55	100	21	* 7211 BEAMR (T85, T7)	54 000	37 000	6 000	8 500
	120	29	* 7311 BEAMR (T85, T7)	93 500	58 500	5 000	7 500
	120	29	7311 BEAW	93 500	58 500	3 600	5 000
60	110	22	* 7212 BEAMR (T85, T7)	64 500	45 000	5 300	7 500
	130	31	* 7312 BEAMR (T85, T7)	107 000	68 500	4 800	6 700
	130	31	7312 BEAW	107 000	68 500	3 400	4 500

# BEARING DIMENSIONS AND OPERATING VALUES

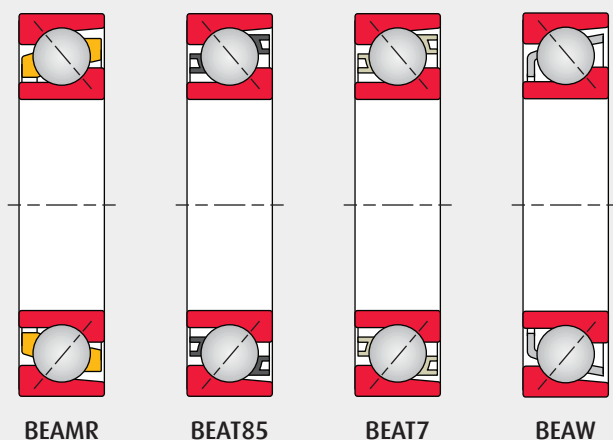
BORE DIAMETER: 65 - 120 MM



BOUNDARY DIMENSIONS			BASIC BEARING No.	BASIC LOAD RATINGS		LIMITING SPEED, min <sup>-1</sup>	
mm				N			
d	D	B		Dynamic	Static	Grease	Oil
65	120	23	* 7213 BEAMR (T85, T7)	73 500	53 500	4 800	7 100
	140	33	* 7313 BEAMR (T85, T7)	119 000	77 000	4 300	6 300
	140	33	7313 BEAW	119 000	77 000	3 200	4 300
70	125	24	* 7214 BEAMR (T85, T7)	79 500	58 500	4 500	6 700
	150	35	* 7314 BEAMR (T85, T7)	129 000	87 500	4 000	6 000
	150	35	7314 BEAW	129 000	87 500	2 800	4 000
75	130	25	* 7215 BEAMR (T85, T7)	82 500	63 500	4 300	6 300
	160	37	* 7315 BEAMR (T85, T7)	140 000	98 500	3 800	5 600
	160	37	7315 BEAW	140 000	98 500	2 800	3 800
80	140	26	* 7216 BEAMR (T85, T7)	92 000	70 000	4 000	6 000
	170	39	* 7316 BEAMR (T85, T7)	151 000	110 000	3 600	5 300
	170	39	7316 BEAW	151 000	110 000	2 600	3 400
85	150	28	7217 BEAMR (T85, T7)	106 000	81 500	3 800	5 600
	180	41	7317 BEAMR (T85, T7)	172 000	133 000	3 400	5 000
90	160	30	7218 BEAMR (T85, T7)	120 000	93 500	3 600	5 300
	190	43	7318 BEAMR (T85, T7)	186 000	146 000	3 200	4 500

Bearings denoted with an asterisk are NSKHPS high performance series with P5 running accuracy and dimensional accuracy P6.  
For all other sizes, special precision must be specified / confirmed at the time of order.





BOUNDARY DIMENSIONS			BASIC BEARING No.	BASIC LOAD RATINGS		LIMITING SPEED, min <sup>-1</sup>	
mm				N			
d	D	B		Dynamic	Static	Grease	Oil
95	170	32	7219 BEAMR (T85, T7)	136 000	107 000	3 400	5 000
	200	45	7319 BEAMR (T85, T7)	198 000	160 000	3 000	4 500
100	180	34	7220 BEAMR (T85, T7)	150 000	122 000	3 200	4 500
	215	47	7320 BEAMR (T85, T7)	222 000	187 000	2 800	4 000
105	190	36	7221 BEAMR (T85, T7)	162 000	133 000	3 000	4 500
	225	49	7321 BEAMR (T85, T7)	235 000	203 000	2 600	4 000
110	200	38	7222 BEAMR (T85, T7)	169 000	144 000	2 800	4 300
	240	50	7322 BEAMR (T85, T7)	249 000	226 000	2 600	3 800
120	215	40	7224 BEAMR (T85, T7)	197 000	177 000	2 600	3 800
	260	55	7324 BEAMR (T85, T7)	261 000	250 000	2 200	3 400

# DESIGNATION SYSTEM AFTERMARKET

## HIGH-CAPACITY ANGULAR CONTACT BALL BEARINGS

Dimension Series		Contact Angle		Cage Type		Axial Internal Clearance	
73	10	B	EA	MR	SU	CNB	P6
Bore Reference Number		Internal Design		Bearing Arrangement		Tolerance Class	

DESIGNATION	ATTRIBUTE	
Dimensional Series	72	light duty type
	73	medium duty type
Bore Reference Number		multiply x 5 for bore diameter in mm
Contact Angle	B	40° contact angle
Internal Design	EA	high-capacity design
Cage Type	MR	machined brass
	T85	polyamide resin
	T7	L-PPS resin
	W	pressed steel

DESIGNATION	ATTRIBUTE	
Bearing Arrangement	SU	single universal matching
Axial Internal <sup>1)</sup> Clearance	CNB	standard axial clearance
	GA	light preload
Tolerance Class <sup>2)</sup>	P5	ISO tolerance class 5
	P6	ISO tolerance class 6

- 1) Refer to table **Matched Measured Axial Clearance** below, applicable for all types with machined brass and resin cages. Bearing types 73BEAW with pressed steel cages have unique axial clearance and preload specifications - contact NSK.
- 2) Special precision for all types and sizes outside of the NSKHPS range must be specified / confirmed at the time of order.

### MATCHED MEASURED AXIAL CLEARANCE

BORE DIAMETER		CNB		GA	
mm		µm		µm	
over	including	min	max	min	max
12	18	17	25		
18	30	20	28	-2	6
30	50	24	32		
50	80	29	41		
80	110	35	47	-3	9
110	120	38	50		





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