

BEARING DIMENSIONS AND DESIGNATIONS

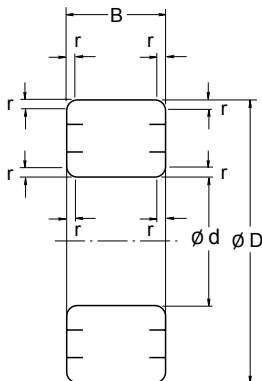
Parameters for dimensions and structure of bearing designations

The dimensions of bearings (bore, outer diameter, width) are internationally standardized.

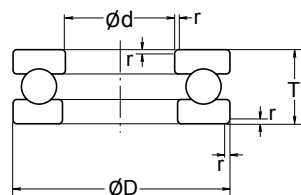
BEARING DIMENSIONS

The size of a bearing has to be known for its installation on a shaft and in a housing. This is determined by the dimensions of the outer geometry of the bearing and includes:

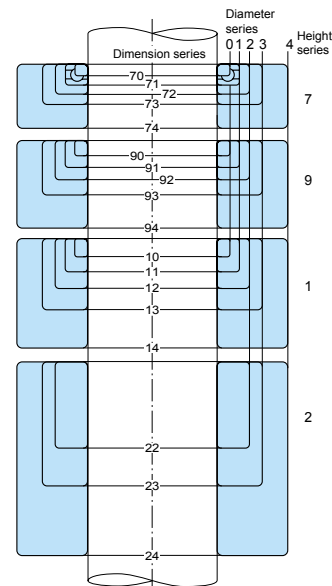
- › Diameter of the bearing bore d
- › Outer diameter D
- › Nominal width B
- › Height of the bearing T
- › Corner chamfer r



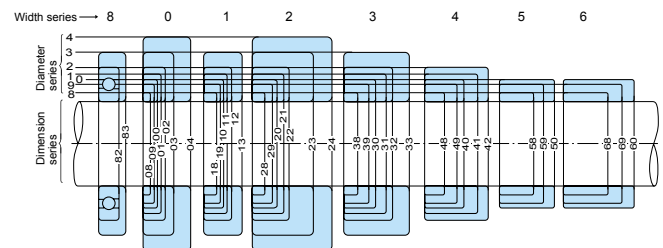
Boundary dimension of radial ball and roller bearings



Boundary dimensions of single-direction thrust ball bearings



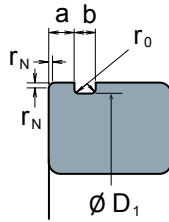
Comparison of the cross sections of thrust bearings (except diameter series 5) for various dimension series



Comparison of the cross sections of radial bearings (except tapered roller bearings) for various dimension series

BEARING DIMENSIONS AND DESIGNATIONS

The dimensions of snap ring grooves in the outer bearing rings are defined by ISO 464 and DIN 616. The snap rings are defined according to ISO 464 and DIN 5417.



Dimensions for snap ring grooves and snap rings

BEARING DIMENSIONS

The designations of the bearings consist of a combination of numbers and letters. They identify the following parameters:

- > Bearing type
- > Dimensions
- > Dimensional and running accuracy
- > Bearing clearance
- > Further details

The bearing designations of standard bearings are defined by JIS B 1513 and DIN 623. NSK also uses supplementary designations for a further classification.

BREAKDOWN OF A BEARING DESIGNATION

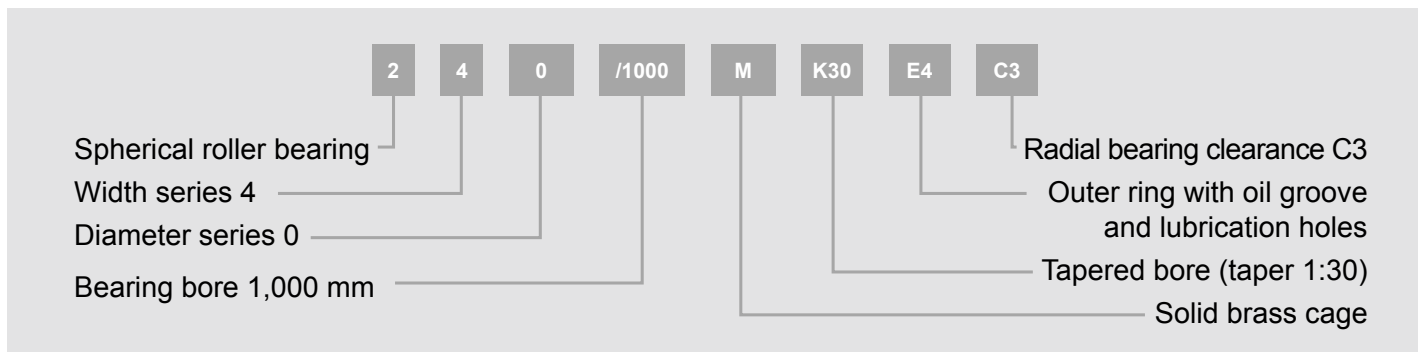
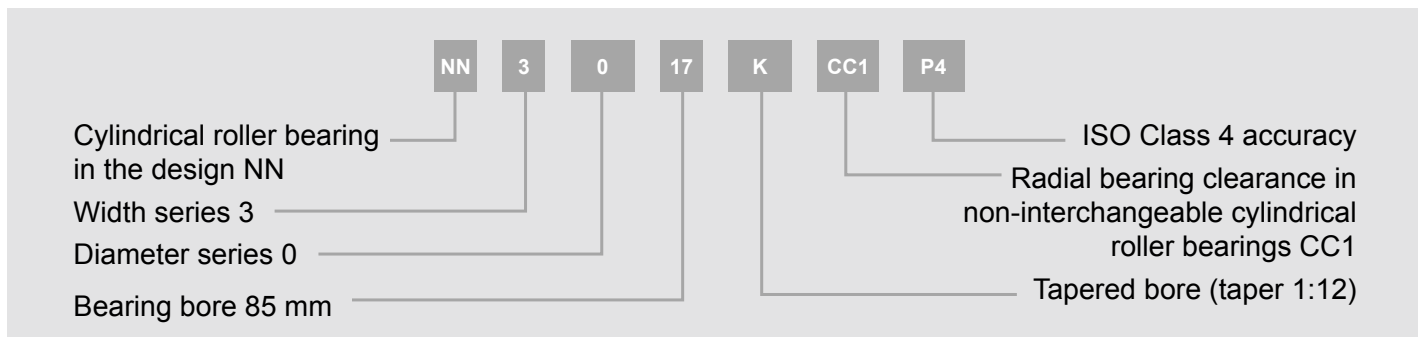
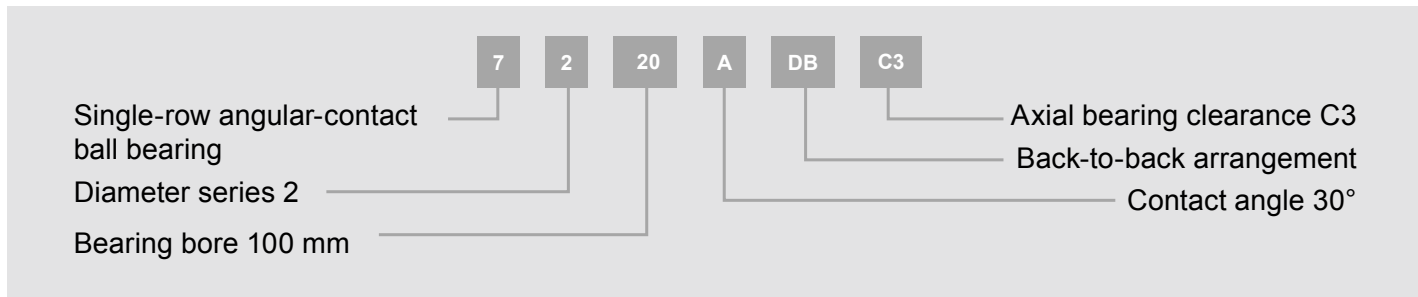


Examples:

HR	313	09	J
F	60	8	MC3

BEARING DIMENSIONS AND DESIGNATIONS

EXAMPLES OF BEARING DESIGNATIONS



COMPOSITION OF BEARING DESIGNATIONS

Basic numbers				Auxiliary symbols									
Bearing series symbols		Bore number		Contact angle symbol		Internal design symbol		Material symbol		Cage symbol		Seals, shields symbol	
Symbol	Meaning	Symbol	Meaning	Symbol	Meaning	Symbol	Meaning	Symbol	Meaning	Symbol	Meaning	Symbol	Meaning
68	Single-row	1	1mm			A	Angular-contact ball bearings	g	Case-hardened steel used in rings, rolling elements	M	Machined brass cage	Z	Shield on one side only
69	deep-groove ball bearings	2	2									ZS	Shield on one side only
70	Single-row angular-contact ball bearings	3	3	A	Contact angle of 30°	J	Smaller diameter of outer ring raceway, contact angle and outer ring width of tapered roller bearings conform to ISO 355	h	Stainless steel used in rings, rolling elements	W	Pressed-steel cage	ZZ	Shields on both sides
72		9	9							T	Synthetic-resin cage	ZZS	Shields on both sides
73	Self-aligning ball bearings	00	10	A5	Standard contact angle of 25°					V	Without cage	DU	Contact rubber seal on one side only
12		01	12										
13		02	15										
22		03	17										
NU10	Cylindrical roller bearings	/22	22	B	Standard contact angle of 40°							DDU	Contact rubber seals on both sides
NJ 2		/28	28										
N 3		/32	32										
NN 30		04 ⁽¹⁾	20	C	Standard contact angle of 15°								
NA48	Needle roller bearings	05	25										
NA49		06	30										
NA69													
320	Tapered roller bearings	88	440										
322		92	460										
323		96	480										
230	Spherical roller bearings	/500	500										
222		/530	530										
223		/560	560										
511	Thrust ball bearings with flat seats	/2 360	2,360										
512		/2 500	2,500	(8)	Standard contact angle of 17°								
513													
292	Thrust spherical roller bearings												
293													
294													
HR ⁽²⁾	High-capacity tapered roller bearings												
Designations correspond to JIS ⁽³⁾							NSK code					NSK code	
Marked on bearings										Not marked on bearings		Normally marked on bearings	

Notes: ⁽¹⁾ For bearing bore numbers 04 to 96, five times the bore number gives the bore size (mm) -except for double-direction thrust ball bearings.

⁽²⁾ HR is prefix to bearing series symbols and it is NSK's original prefix.

⁽³⁾ JIS : Japanese Industrial Standards.

BEARING DIMENSIONS AND DESIGNATIONS



Auxiliary symbols													
Symbol for design of rings		Arrangement symbol		Internal clearance symbol and preload symbol		Tolerance class symbol		Heat Treatment		Spacer or sleeve symbol		Lubrication Symbol	
Symbol	Meaning	Sym-bol	Meaning	Symbol	Meaning	Symbol	Meaning	Sym-bol	Meaning	Sym-bol	Meaning	Sym-bol	Meaning
K	Tapered bore of inner ring (taper 1:12)	DB	Back-to-back arrangement	C1	For all radial bearings Clearance less than C2	(6)	ISO Normal		Bearings treated for dimensional stabilization	+K	Bearings with outer ring spacers	AS2	Shell Alvania grease S2
				C2		P6	ISO Class 6						
K30	Tapered bore of inner ring (taper 1:30)	DF	Face-to-face arrangement	(8)	For all radial bearings Clearance less than CN	P6X	ISO Class 6X	X26	Working temperature lower than 150 °C	+L	Bearings with inner ring spacers	ENS	ENS grease
				C3		P5	ISO Class 5						
E	Notch or lubricating groove in ring	DT	Tandem arrangement	C4	For all radial bearings Clearance greater than CN	P4	ISO Class 4	X28	Working temperature lower than 200 °C	+KL	Bearing with both inner and outer ring spacers	NS7	NS Hi-Lube
				C5		P2	ISO Class 2						
E4	Lubricating groove in outside surface and holes in outer ring			CC1	For non-interchangeable cylindrical roller bearings Clearance less than CC2	X29	Working temperature lower than 250 °C	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	H	Adapter designation	PS2	Multemp PS No. 2
				CC2									
N	Snap ring groove in outer ring			CC	For non-interchangeable cylindrical roller bearings Normal clearance	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	AH	Withdrawal sleeve designation	HJ	Thrust collar designation
				CC3									
NR	Snap ring groove with snap ring in outer ring			CC4	For non-interchangeable cylindrical roller bearings Clearance greater than CC3	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	AH	Withdrawal sleeve designation	HJ	Thrust collar designation
				CC5									
NR	Snap ring groove with snap ring in outer ring			MC1	For extra small and miniature bearings Clearance less than MC2	(6)	Class 4	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	AH	Withdrawal sleeve designation	HJ	Thrust collar designation
				MC2									
NR	Snap ring groove with snap ring in outer ring			MC3	For extra small and miniature bearings Normal clearance	PN2	Class 2	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	AH	Withdrawal sleeve designation	HJ	Thrust collar designation
				MC4									
NR	Snap ring groove with snap ring in outer ring			MC5	For extra small and miniature bearings Clearance greater than MC4	PN3	Class 3	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	AH	Withdrawal sleeve designation	HJ	Thrust collar designation
				MC6									
NR	Snap ring groove with snap ring in outer ring			CM	For extra small and miniature bearings Clearance in deep-groove ball bearings for electric motors	PN0	Class 0	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	AH	Withdrawal sleeve designation	HJ	Thrust collar designation
				CT									
NR	Snap ring groove with snap ring in outer ring			EL	For extra small and miniature bearings Extra light preload	PN00	Class 00	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	AH	Withdrawal sleeve designation	HJ	Thrust collar designation
				L									
NR	Snap ring groove with snap ring in outer ring			M	For extra small and miniature bearings Medium preload	PN00	Class 00	S11	Dimensional stabilizing treatment working temperature lower than 200 °C	AH	Withdrawal sleeve designation	HJ	Thrust collar designation
				H									
Partially the same as JIS ⁽³⁾		Same as JIS ⁽³⁾		NSK symbol	Partially the same as JIS ⁽³⁾ / BAS ⁽⁴⁾	Same as JIS ⁽³⁾		NSK symbol, partially the same as JIS ⁽³⁾					
In principle, marked on bearings										Not marked on bearings			

Notes: ⁽³⁾ JIS : Japanese Industrial Standards.

⁽⁴⁾ BAS: The Japan Bearing Industrial Association Standard.

⁽⁵⁾ ABMA: The American Bearing Manufacturers Association.

⁽⁶⁾ Without suffix.