

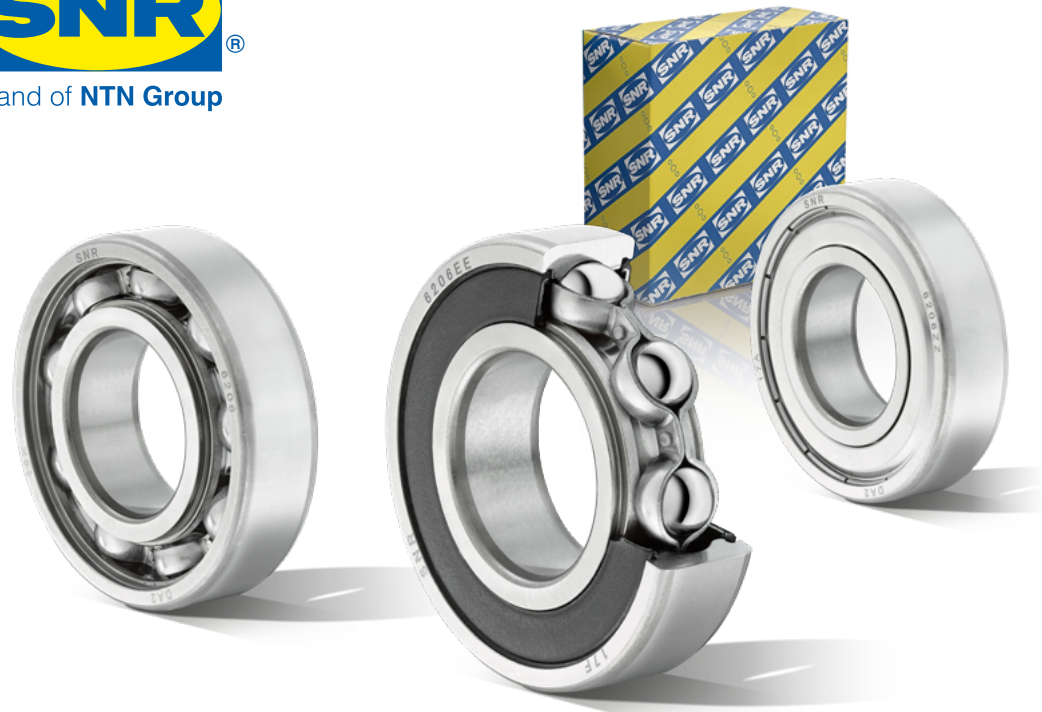


Brand of **NTN Group**

BALL BEARINGS



Because your efficiency is a priority,
we are offering you the essentials:
performance, quality and competitiveness.



Your benefits
By choosing
this range

Performance and quality

Premium quality bearings benefiting from the expertise of NTN Group teams

Competitiveness

Products manufactured in very high volumes to make premium quality **accessible**

Availability

A compact range to meet all industrial needs



SUMMARY

SNR performance for your applications	4
Deep groove ball bearings	8
TOPLINE deep groove ball bearings	34
Double-row deep groove ball bearings	54
Double-row angular contact ball bearings	58
Self-aligning ball bearings	68
Thrust ball bearings	78
Digital tools	86

SNR PERFORMANCE FOR YOUR APPLICATIONS

The design of our bearings

Our R&D teams offer you bearings with an optimised design to give you the **maximum level of performance**: improved internal design, precision, optimal number of rolling elements, etc.

The development of our ranges is subject to **careful inspections** of the parts manufactured: initial samples, regular quality audits of the production sites, and random inspection of parts received at our logistics platform.



Steel, a carefully selected material



The NTN group has years of experience in the selection of high-quality **steels** as the material used is the fundamental basis for the performance of the bearing.

Laboratory tests are conducted to assess the performance of the alloys, but also to define their level of cleanliness. Bench tests are then conducted to confirm endurance and performance.

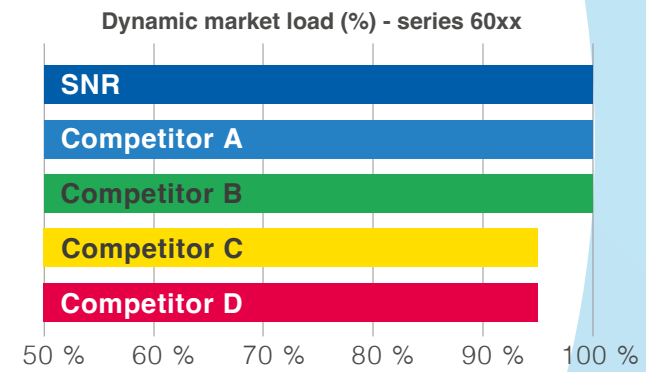
We only work with steel manufacturers who have passed our approval tests to guarantee the **best quality of steel** for our bearings.

The care of the NTN teams ensures optimal performance of our bearings and positions the SNR brand at a premium level on the market.

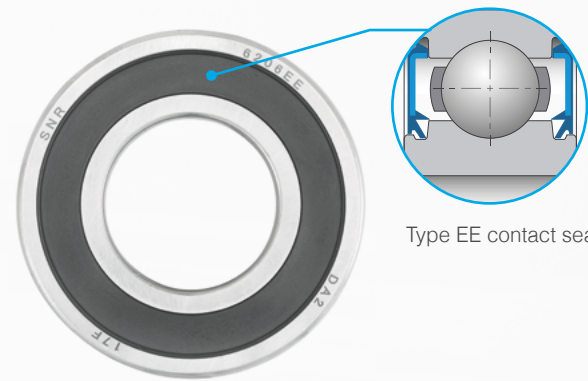
The performance of our bearings

Our teams have defined a calculation factor representing the increase in the bearings service life, depending on the properties of the steel used.

The endurance tests conducted have enabled us to position our bearings at a **high level of performance**.



Study conducted in 2022, based on the catalogues of the main players in the European market



Type EE contact seal

Sealing solutions

The sealing solution in the standard SNR range is a nitrile contact seal. Its design is features a **contact-lip** and two non-contact lips to create a **labyrinth effect**.

This solution offers reduced frictional torque for a good compromise between rotation speed and sealing performance.

The seals developed by our teams have undergone various stringent tests:



Rotating water jet tests: to detect any water ingress



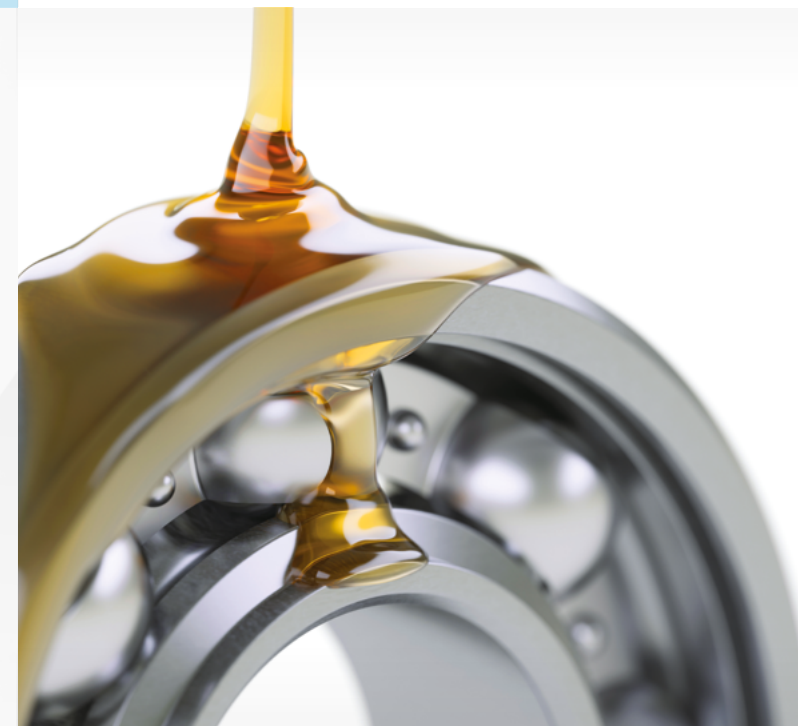
Tests in severe conditions: total immersion, immersion in muddy water



The cages

The design of the cages is optimised to allow unimpeded lubricant circulation and improved guidance of the rolling elements. This therefore helps to increase the speed, life and performance of your bearing.

Available **in pressed steel, brass or polyamide** as an option, or as standard depending on the product range, they will meet your needs in terms of load or speed.



Lubrication

We offer a selection of premium lubricants as standard, covering needs from -40 to 120° C (depending on the seal type).

The TOPLINE range offers specific lubrication features adapted to extreme applications:

- Low temperatures down to -60°c
- High temperatures up to +350°c
- Low noise
- High rotation speeds

Technical know-how to develop your specific needs

Our teams are available to you to develop custom bearings in terms of:

- Dimensions (non-standard bore, non-ISO dimensions)
- Special internal clearance (CM, reduced clearance etc.)
- Polyamide or brass cage
- Specific lubrication
- Protective oil...

DEEP GROOVE BALL BEARINGS

Deep groove ball bearings

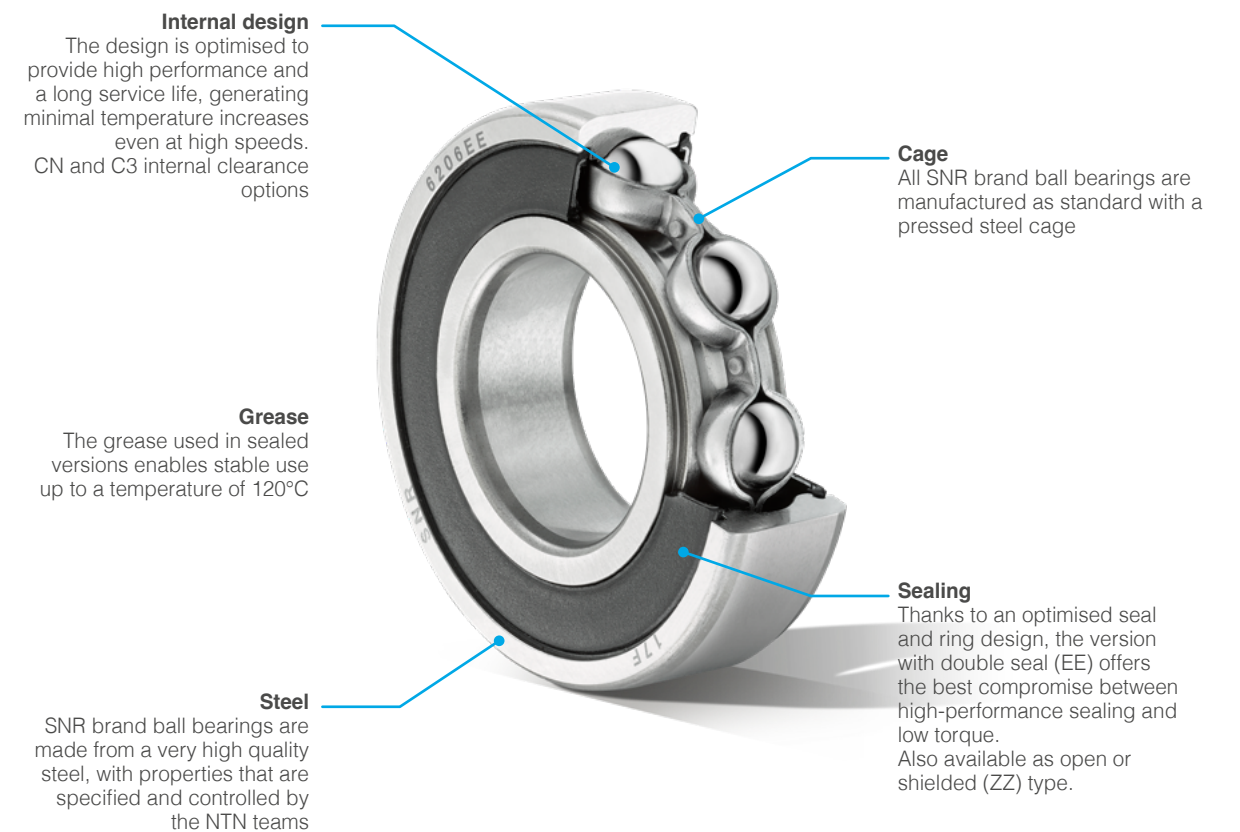
Deep groove ball bearings are the most popular ball bearings.

They are designed to withstand moderate radial, axial and combined loads, depending on the internal design.

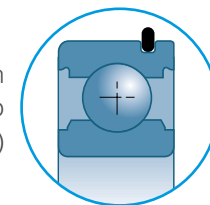
The SNR brand offers a compact range that contains the essential sizes, with standard sealing options.

A superior quality bearing benefiting from the expertise of NTN's teams.

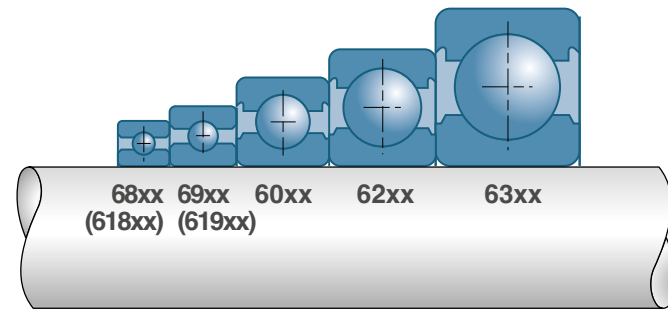
Technical specifications



Bearings can be supplied with a groove, with or without a snap ring (suffix NR/N)

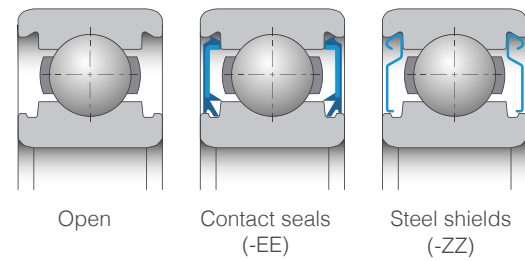


Series



Series	60X	62X	63X	60XX	62XX	63XX	62XXX	63XXX
Bores	607	623	634	6000	6200	6300	62200	63000
	~ 609	~ 629	~ 635	~ 6028	~ 6226	~ 6322	~ 62308	~ 63008

Sealing and protection



Characteristics	Contact seals -EE	Non-contact steel shields -ZZ
Frictional torque	Relatively high	Low
Dust resistance	Exceptional	Very good
Water resistance	Very high	Low
High-speed capability	Limited by seal friction	Identical to open version
Operating temperature	-25°C ~ 110°C	Dependant on lubricant and whether steel is heat-stabilised.

Bearings may include:

- One or two seals or shields. They are supplied pre-lubricated with general purpose grease (suffix e or ee for seals, z or zz for steel shields).
- one-sided protection by a single Z shield, the bearings are subsequently not provided with lubrication.

On a single bearing, there may be a combination of shielding and sealing types, for example, an E seal and a Z shield (suffix EZ).

NTN can, in collaboration with the user, develop special seals for mass production applications. Please do not hesitate to contact our sales teams to work on specific developments such as:

- Reinforced sealing
- Filtration for polluted oil application
- Speed sensor

Tolerances and internal clearances

Tolerances

Ball bearings are manufactured in the Normal tolerance class of ISO 492 (P0 tolerance class of DIN620).

Single-row ball bearings can be supplied on request in tolerance classes P5 and P6 for all or certain characteristics (bore or radial run-out in tolerance class 6, for example).

Radial internal clearance

The normal clearance group CN is used for all bearings currently in production. The other groups can be provided on request.

For single-row radial ball bearings with a tapered bore, C3 clearance is used as standard to compensate for the greater reduction in clearance, due to mounting on a tapered seat.

Radial clearance is directly proportional to axial clearance. A simplified formula defines the theoretical axial clearance J_a , depending on the operating radial clearance J_r .

$$J_a = (J_r(D-d)/20)^{1/2}$$



Series 6xx, 6xxx, 62xxx, 16xxx, 4xxx

Bore diameter d (mm)	C2		CN		C3		C4		C5	
	min	max	min	max	min	max	min	max	min	max
2,5 <d≤ 6	0	7	2	13	8	23	-	-	-	-
6 <d≤ 10	0	7	2	13	8	23	14	29	20	37
10 <d≤ 18	0	9	3	18	11	25	18	33	25	45
16 <d≤ 24	0	10	5	20	13	28	20	36	28	48
24 <d≤ 30	1	11	5	20	13	23	41	30	53	-
30 <d≤ 40	1	11	6	20	15	33	28	46	40	64
40 <d≤ 50	1	11	6	23	18	36	30	51	45	73
50 <d≤ 65	1	15	8	28	23	43	38	61	55	90
65 <d≤ 80	1	15	10	30	25	51	46	71	65	105
80 <d≤ 100	1	18	12	36	30	58	53	84	75	120
100 <d≤ 120	2	20	15	41	36	66	61	97	90	140
120 <d≤ 140	2	23	18	48	41	81	71	114	105	160
140 <d≤ 160	2	23	18	53	46	91	81	130	120	180
160 <d≤ 180	2	25	20	61	53	102	91	147	135	200
180 <d≤ 200	2	30	25	71	63	117	107	163	150	230
200 <d≤ 225	2	35	25	85	75	140	125	195	175	265
225 <d≤ 250	2	40	30	95	85	160	145	225	205	300
250 <d≤ 280	2	45	35	105	90	170	155	245	225	340
280 <d≤ 315	2	55	40	115	100	190	175	270	245	370
315 <d≤ 355	3	60	45	125	110	210	195	300	275	410
355 <d≤ 400	3	70	55	145	130	240	225	340	315	460
400 <d≤ 450	3	80	60	170	150	270	250	380	350	510
450 <d≤ 500	3	90	70	190	170	300	280	420	390	570
500 <d≤ 560	10	100	80	210	190	330	310	470	440	630
560 <d≤ 630	10	110	90	230	210	360	340	520	490	690
630 <d≤ 710	20	130	110	260	240	400	380	570	540	760
710 <d≤ 800	20	140	120	290	270	450	430	630	600	840

values in microns (µm)

Characteristics

Deep groove ball bearings are designed for:

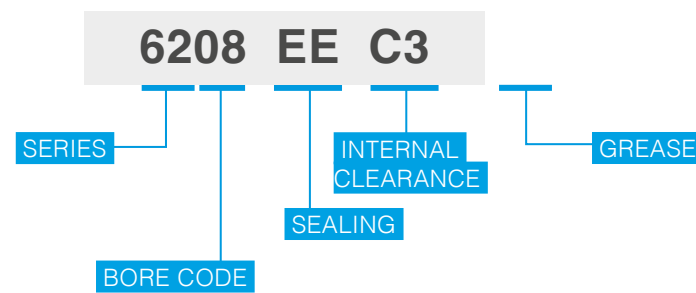
- Supporting radial loads
- Supporting axial loads in both directions
- High rotation speeds

Misalignments

These bearings allow misalignments between 0.10° and 0.23°, depending on the residual clearance of the bearing after mounting, the bearing series and the load. When the misalignment is significant, a synthetic cage is recommended due to its better flexibility and resistance to wear.

Designations

Simply Smart, the range of deep groove ball bearings from the SNR brand is easy to understand with short, memorable designations.



Bearing characteristics are defined by the following prefixes and suffixes:

PREFIXES	
Prefix	Description
S	Stainless steel
SUFFIXES	
Suffix	Description
COMPONENT	
2RS	Contact seals on both sides - For stainless steel ball bearings only
Dxxx	Non-standard grease
E	Contact seal on one side
EE	Contact seals on both sides
G14	Polyamide cage 6.6
G15	Polyamide cage 6.6 with glass fibers
M	Machined brass cage, ball-centred
MA	Machined brass cage, guided by the outer ring
MB	Machined brass cage, guided by the inner ring
Z, ZZ	Steel shield
DESIGN	
C2	Radial internal clearance, class C2
C3	Radial internal clearance, class C3
C4	Radial internal clearance, class C4
C5	Radial internal clearance, class C5
K	Tapered bore, 1:12
N	Snap ring groove
N2	Anti-rotation slots on the outer ring
NR	Snap ring groove with snap ring included
P2	Precision tolerance class 2
P4	Precision tolerance class 4
P5	Precision tolerance class 5
P6	Precision tolerance class 6
S	Spherical outer diameter
SPECIAL RANGES	
EMTR	Range dedicated to electric motors

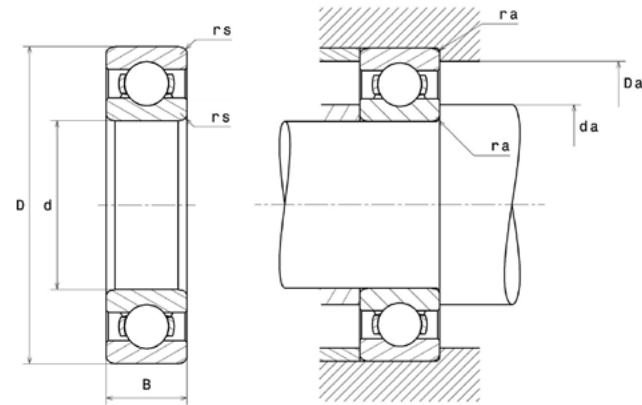
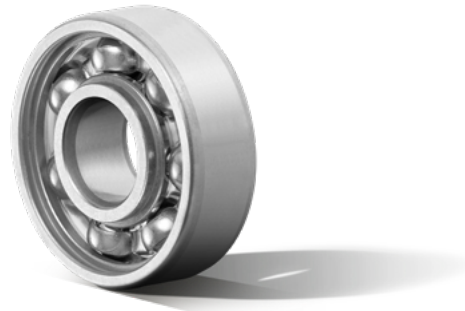
Interchanges

	Series	Technical specifications	NTN	SNR	FAG	SKF	NSK
DEEP GROOVE BALL BEARINGS	600	1 or 2 steel shields	Z / ZZ	Z / ZZ	Z / ZZ	Z / 2Z	Z / ZZ
		1 or 2 contact seals	LU / LLU	E / EE	HRS / 2HRS	RS1 / 2RS1	DU / DDU
	6700 6800 (61800) 6900 (61900) 6000 / 6200 6300 / 6400	1 or 2 non-contact seals	LB / LLB	-	RSR / 2RSR BRS / 2BRS	RZ / 2RZ	V / VV
		Groove without/with snap ring	N / NR	N / NR	N / NR	N / NR	N / NR
	16000 / 16100	Internal clearance (if different to standard radial clearance)	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.



Deep groove ball bearings

Standard range

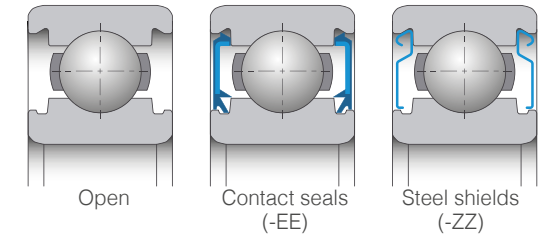


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code / diameter	Bearing	Type	Internal clearance	Dimensions (mm)				Mass (kg)
				Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

60x Series Miniatures

7	607	Open	CN	7	19	6	0,30	0,0070
		EE	CN, C3	7	19	6	0,30	0,0070
		ZZ	CN,C3	7	19	6	0,30	0,0070
8	608	Open	CN	8	22	7	0,30	0,0115
		EE	CN, C3	8	22	7	0,30	0,0115
		ZZ	CN,C3	8	22	7	0,30	0,0120
9	609	Open	CN	9	24	7	0,30	0,0144
		EE	CN, C3	9	24	7	0,30	0,0144
		ZZ	CN,C3	9	24	7	0,30	0,0144

62x Series Miniatures

3	623	Open	CN	3	10	4	0,15	0,0015
		EE	CN, C3	3	10	4	0,15	0,0020
		ZZ	CN,C3	3	10	4	0,15	0,0020
4	624	EE	CN, C3	4	13	5	0,20	0,0030
		ZZ	CN,C3	4	13	5	0,20	0,0030
5	625	EE	CN, C3	5	16	5	0,30	0,0047
		ZZ	CN,C3	5	16	5	0,30	0,0047
6	626	EE	CN, C3	6	19	6	0,30	0,0075
		ZZ	CN,C3	6	19	6	0,30	0,0075
7	627	EE	CN, C3	7	22	7	0,30	0,0130
		ZZ	CN,C3	7	22	7	0,30	0,0130
9	629	EE	CN, C3	9	26	8	0,30	0,0193
		ZZ	CN,C3	9	26	8	0,30	0,0193

63x Series Miniatures

4	634	ZZ	CN	4	16	5	0,30	0,0048
5	635	ZZ	CN	5	19	6	0,30	0,0079

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (Cr)	Static load capacity (C _{0r})	Fatigue limit load (C _{0f})	Factor f ₀	Max. shaft and housing corner radius (max. ra)	Shoulder diameter OR (max. Dm)	Shoulder diameter IR (min. dm)	Shoulder diameter IR (max. dm)	Thermal reference speed	Mechanical limiting speed

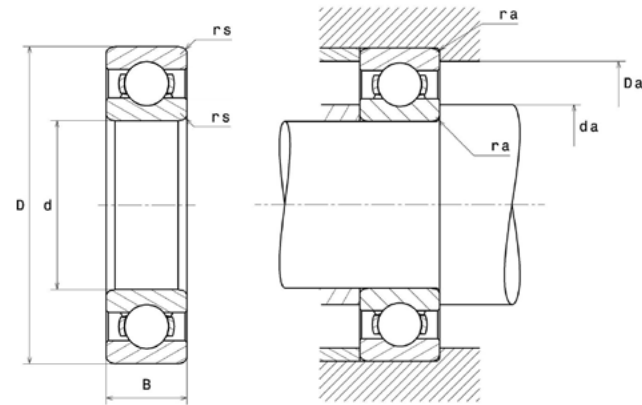
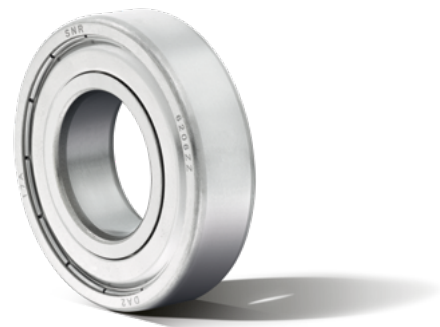
2,75	0,90	0,04	10,50	0,30	17,00	9,00	-	35000	64000
2,75	0,90	0,04	10,50	0,30	17,00	9,00	9,20	-	31000
2,75	0,90	0,04	10,50	0,30	17,00	9,00	9,20	35000	31000
3,45	1,37	0,06	12,40	0,30	20,00	10,00	-	32000	57000
3,45	1,37	0,06	12,40	0,30	20,00	10,00	11,20	-	26000
3,45	1,37	0,06	12,40	0,30	20,00	10,00	11,20	32000	46000
3,50	1,41	0,06	12,80	0,30	22,00	11,00	-	28000	56000
3,50	1,41	0,06	12,80	0,30	22,00	11,00	11,80	-	23000
3,50	1,41	0,06	12,80	0,30	22,00	11,00	11,80	28000	45000

0,68	0,13	0,02	7,60	0,15	8,80	4,20	-	57000	102000
0,68	0,13	0,02	7,60	0,15	8,80	4,20	4,70	-	102000
0,68	0,13	0,01	12,90	0,15	8,80	4,20	4,70	57000	81000
1,37	0,47	0,02	11,90	0,20	11,40	5,60	6,00	-	49000
1,37	0,47	0,02	11,90	0,20	11,40	5,60	6,00	47000	63000
1,83	0,67	0,03	12,40	0,30	14,00	7,00	7,70	-	38000
1,83	0,67	0,03	12,40	0,30	14,00	7,00	7,70	36000	54000
2,75	0,90	0,04	10,50	0,30	17,00	8,00	9,00	-	31000
2,75	0,90	0,04	10,50	0,30	17,00	8,00	9,00	33000	46000
3,45	1,37	0,06	12,40	0,30	20,00	9,00	11,20	-	26000
3,45	1,37	0,06	12,40	0,30	20,00	9,00	11,20	30000	41000
4,80	1,97	0,09	12,40	0,30	24,00	11,00	13,90	-	21000
4,80	1,97	0,09	12,40	0,30	24,00	11,00	13,90	26000	37000

1,83	0,67	0,03	12,40	0,30	14,00	6,00	7,70	35000	52000
2,75	0,90	0,04	10,50	0,30	17,00	7,00	9,00	32000	44000

Deep groove ball bearings

Standard range

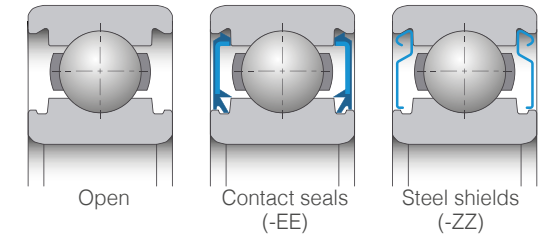


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Type	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
					Inner diameter (d)	Outer diameter (D)	Width (B)	Minimum corner radius (rs)	Mass

60xx series

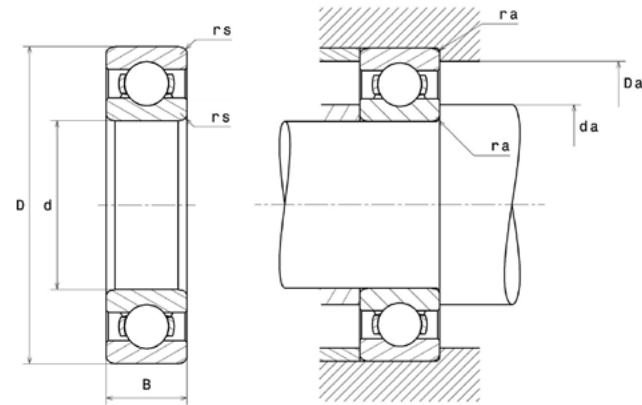
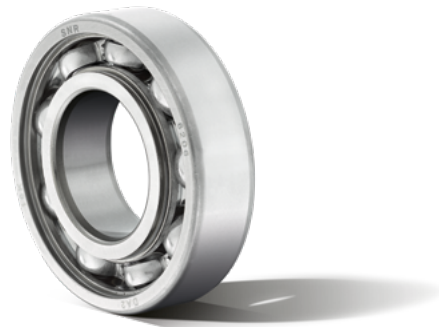
00	6000	Open	CN,C3	-	10	26	8	0,30	0,0177
		EE	CN, C3	-	10	26	8	0,30	0,0200
		ZZ	CN,C3	-	10	26	8	0,30	0,0200
01	6001	Open	CN,C3	-	12	28	8	0,30	0,0200
		EE	CN, C3	-	12	28	8	0,30	0,0210
		ZZ	CN,C3	-	12	28	8	0,30	0,0210
02	6002	Open	CN,C3	N	15	32	9	0,30	0,0280
		EE	CN, C3	-	15	32	9	0,30	0,0290
		ZZ	CN,C3	N	15	32	9	0,30	0,0290
03	6003	Open	CN	-	17	35	10	0,30	0,0370
		EE	CN, C3	NR	17	35	10	0,30	0,0370
		ZZ	CN,C3	-	17	35	10	0,30	0,0370
04	6004	Open	CN,C3	NR	20	42	12	0,60	0,0660
		EE	CN, C3	NR	20	42	12	0,60	0,0680
		ZZ	CN,C3	NR	20	42	12	0,60	0,0680
05	6005	Open	CN,C3	N	25	47	12	0,60	0,0790
		EE	CN, C3	-	25	47	12	0,60	0,0790
		ZZ	CN,C3	-	25	47	12	0,60	0,0830
06	6006	Open	CN,C3	NR	30	55	13	1,00	0,1160
		EE	CN, C3	NR	30	55	13	1,00	0,1160
		ZZ	CN,C3	NR	30	55	13	1,00	0,1160
07	6007	Open	CN,C3	N, NR	35	62	14	1,00	0,1460
		EE	CN, C3	-	35	62	14	1,00	0,1520
		ZZ	CN, C3	NR	35	62	14	1,00	0,1520
08	6008	Open	CN,C3	N, NR	40	68	15	1,00	0,1890
		EE	CN, C3	-	40	68	15	1,00	0,1920
		ZZ	CN, C3	NR	40	68	15	1,00	0,1890
09	6009	Open	CN,C3	-	45	75	16	1,00	0,2380
		EE	CN, C3	-	45	75	16	1,00	0,2450
		ZZ	CN,C3	-	45	75	16	1,00	0,2310
10	6010	Open	CN,C3	N, NR	50	80	16	1,00	0,2570
		EE	CN, C3	N, NR	50	80	16	1,00	0,2510
		ZZ	CN,C3	NR	50	80	16	1,00	0,2490

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (C _d)	Static load capacity (C _s)	Fatigue limit load (C _f)	Factor f ₀	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed

4,80	1,97	0,09	12,40	0,30	24,00	12,00	-	28000	51000
4,80	1,97	0,09	12,40	0,30	24,00	12,00	13,90	-	21000
4,80	1,97	0,09	12,40	0,30	24,00	12,00	13,90	32800	41000
5,40	2,39	0,11	13,20	0,30	26,00	14,00	-	24000	45000
5,40	2,39	0,11	13,20	0,30	26,00	14,00	16,30	-	18000
5,40	2,39	0,11	13,20	0,30	26,00	14,00	16,30	24000	36000
5,90	2,85	0,13	13,90	0,30	30,00	17,00	-	22000	39000
5,90	2,85	0,13	13,90	0,30	30,00	17,00	19,00	-	15000
5,90	2,85	0,13	13,90	0,30	30,00	17,00	19,00	22000	31000
6,30	3,25	0,15	14,40	0,30	33,00	19,00	-	20000	35000
6,30	3,25	0,15	14,40	0,30	33,00	19,00	21,30	-	13000
6,30	3,25	0,15	14,40	0,30	33,00	19,00	21,30	20000	28000
9,90	5,10	0,23	13,90	0,60	38,00	24,00	-	18000	29000
9,90	5,10	0,23	13,90	0,60	38,00	24,00	26,30	-	11000
9,90	5,10	0,23	13,90	0,60	38,00	24,00	26,30	18000	23000
10,60	5,90	0,27	14,50	0,60	43,00	29,00	-	15000	25000
10,60	5,90	0,27	14,50	0,60	43,00	29,00	30,20	-	9500
10,60	5,90	0,27	14,50	0,60	43,00	29,00	30,20	15000	20000
13,90	8,30	0,38	14,80	1,00	50,00	35,00	-	13000	21000
13,90	8,30	0,38	14,80	1,00	50,00	35,00	36,40	-	8000
13,90	8,30	0,38	14,80	1,00	50,00	35,00	36,40	13000	17000
16,80	10,30	0,47	14,80	1,00	57,00	40,00	-	12000	19000
16,80	10,30	0,47	14,80	1,00	57,00	40,00	41,90	-	6900
16,80	10,30	0,47	14,80	1,00	57,00	40,00	41,90	12000	15000
17,70	11,50	0,52	15,20	1,00	63,00	45,00	-	11000	17000
17,70	11,50	0,52	15,20	1,00	63,00	45,00	46,70	-	6200
17,70	11,50	0,52	15,20	1,00	63,00	45,00	46,70	11000	13000
22,10	15,20	0,69	15,30	1,00	70,00	50,00	-	9700	15000
22,10	15,20	0,69	15,30	1,00	70,00	50,00	53,30	-	5400
22,10	15,20	0,69	15,30	1,00	70,00	50,00	53,30	9700	12000
23,00	16,70	0,76	15,60	1,00	75,00	55,00	-	8800	14000
23,00	16,70	0,76	15,60	1,00	75,00	55,00	58,30	-	4900
23,00	16,70	0,76	15,60	1,00	75,00	55,00	58,30	8800	11000

Deep groove ball bearings

Standard range

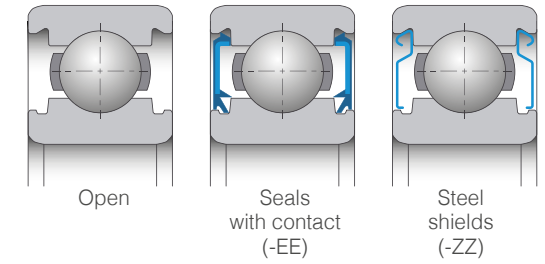


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius

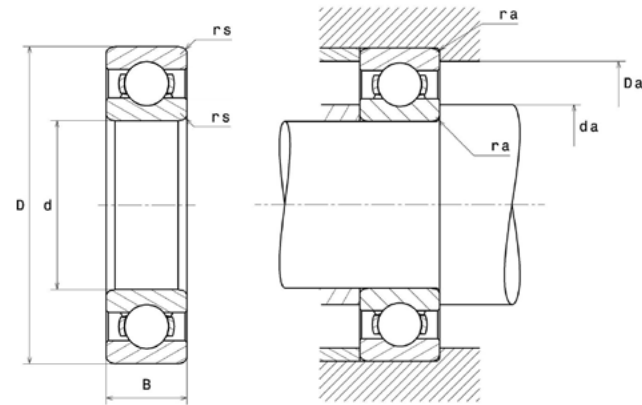


Bore code	Bearing	Type	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
					Inner diameter (d)	Outer diameter (D)	Width (B)	Minimum corner radius (rs)	Mass
11	6011	Open	CN,C3	-	55	90	18	1,10	0,3820
		EE	CN, C3	NR	55	90	18	1,10	0,3770
		ZZ	CN,C3	-	55	90	18	1,10	0,3710
12	6012	Open	CN,C3	-	60	95	18	1,10	0,4130
		EE	CN, C3	-	60	95	18	1,10	0,3960
		ZZ	CN,C3	-	60	95	18	1,10	0,4130
13	6013	Open	CN	N, NR	65	100	18	1,10	0,4300
14	6014	Open	CN,C3	-	70	110	20	1,10	0,6100
		EE	CN, C3	-	70	110	20	1,10	0,6000
		ZZ	CN,C3	-	70	110	20	1,10	0,6100
15	6015	Open	CN,C3	-	75	115	20	1,10	0,6400
		EE	CN, C3	-	75	115	20	1,10	0,6400
		ZZ	CN,C3	-	75	115	20	1,10	0,6400
16	6016	Open	CN,C3	-	80	125	22	1,10	0,8700
		EE	CN, C3	-	80	125	22	1,10	0,8700
		ZZ	CN,C3	-	80	125	22	1,10	0,8700
17	6017	Open	CN,C3	N	85	130	22	1,10	0,9000
		EE	CN, C3	-	85	130	22	1,10	0,9000
		ZZ	CN,C3	NR	85	130	22	1,10	0,9000
18	6018	Open	CN,C3	NR	90	140	24	1,50	1,1200
		EE	CN, C3	NR	90	140	24	1,50	1,1500
		ZZ	CN,C3	-	90	140	24	1,50	1,1750
19	6019	Open	CN,C3	-	95	145	24	1,50	1,2200
		EE	CN, C3	-	95	145	24	1,50	1,2200
		ZZ	CN	-	95	145	24	1,50	1,2200
20	6020	Open	CN,C3	-	100	150	24	1,50	1,2600
		EE	CN, C3	-	100	150	24	1,50	1,2600
		ZZ	CN,C3	-	100	150	24	1,50	1,2600
21	6021	Open	CN, C3	-	105	160	26	2,00	1,5900
		EE	CN,C3	-	105	160	26	2,00	1,5900
22	6022	Open	CN, C3	-	110	170	28	2,00	1,4900
		EE	CN,C3	-	110	170	28	2,00	1,4900
24	6024	Open	C3	-	120	180	28	2,00	2,1000
		EE	CN	-	120	180	28	2,00	2,1000
26	6026	Open	CN, C3	-	130	200	33	2,00	3,2700
28	6028	Open	CN, C3	-	140	210	33	2,00	3,3000
		EE	CN	-	140	210	33	2,00	3,5000

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (C _r)	Static load capacity (C ₀)	Fatigue limit load (C ₁)	Factor f ₀	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed
29,80	21,30	0,97	15,40	1,00	83,50	61,50	-	8300	12000
29,80	21,30	0,97	15,40	1,00	83,50	61,50	63,70	-	4500
29,80	21,30	0,97	15,40	1,00	83,50	61,50	63,70	8300	8300
31,00	24,70	1,12	15,60	1,00	88,50	66,50	-	7700	11000
31,00	23,20	1,12	15,60	1,00	88,50	66,50	69,90	-	4100
31,00	23,20	1,12	15,60	1,00	88,50	66,50	69,90	7700	9300
32,20	25,20	1,15	15,80	1,00	93,50	71,50	-	7100	11000
40,10	31,00	1,41	15,60	1,00	103,50	76,50	-	6800	10000
40,10	31,00	1,41	15,60	1,00	103,50	76,50	80,60	-	3600
40,10	31,00	1,41	15,60	1,00	103,50	76,50	80,60	6800	8000
41,70	33,60	1,53	15,80	1,00	108,50	81,50	-	6400	9400
41,70	33,60	1,53	15,80	1,00	108,50	81,50	83,50	-	3400
41,70	33,60	1,53	15,80	1,00	108,50	81,50	83,50	6400	7600
50,20	39,80	1,79	15,60	1,00	118,50	86,50	-	6100	8700
50,20	39,80	1,79	15,60	1,00	118,50	86,50	89,30	-	3100
50,20	39,80	1,79	15,60	1,00	118,50	86,50	89,30	6100	7000
52,20	43,10	1,89	15,80	1,00	123,50	91,50	-	5800	8300
52,20	43,10	1,89	15,80	1,00	123,50	91,50	95,40	-	3000
52,20	43,10	1,89	15,80	1,00	123,50	91,50	95,40	5800	6700
61,30	49,80	2,11	15,70	1,50	132,00	98,00	-	5600	7800
61,30	49,80	2,11	15,70	1,50	132,00	98,00	101,30	-	2800
61,30	49,80	2,11	15,70	1,50	132,00	98,00	101,30	5600	6200
63,60	54,00	2,22	15,60	1,50	137,00	103,00	-	5300	7300
63,60	54,00	2,22	15,60	1,50	137,00	103,00	107,70	-	2700
63,60	54,00	2,22	15,60	1,50	137,00	103,00	107,70	5300	5800
63,40	54,20	2,20	15,90	1,50	142,00	108,00	-	5100	7100
63,40	54,20	2,20	15,90	1,50	142,00	108,00	110,50	-	2600
63,40	54,20	2,20	15,90	1,50	142,00	108,00	110,50	5100	5700
76,20	65,90	2,60	15,80	2,00	151,00	114,00	-	5000	6600
76,20	65,90	2,60	15,80	2,00	151,00	114,00	118,90	-	2400
86,40	73,00	2,80	15,70	2,00	161,00	119,00	-	4800	6300
86,40	73,00	2,80	15,70	2,00	161,00	119,00	123,70	-	2300
89,50	79,30	2,95	15,70	2,00	171,00	129,00	-	4500	5900
92,90	80,00	2,95	15,70	2,00	171,00	129,00	135,30	-	2100
112,00	101,00	3,55	15,80	2,00	191,00	139,00	-	4400	5300
116,00	109,00	3,75	16,00	2,00	201,00	149,00	-	4100	5000
116,00	109,00	3,75	16,00	2,00	201,00	149,00	156,60	-	1800

Deep groove ball bearings

Standard range

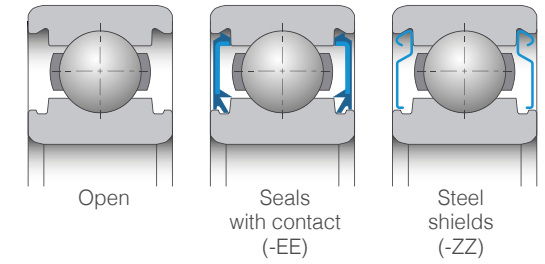


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Type	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
					Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

62xx series

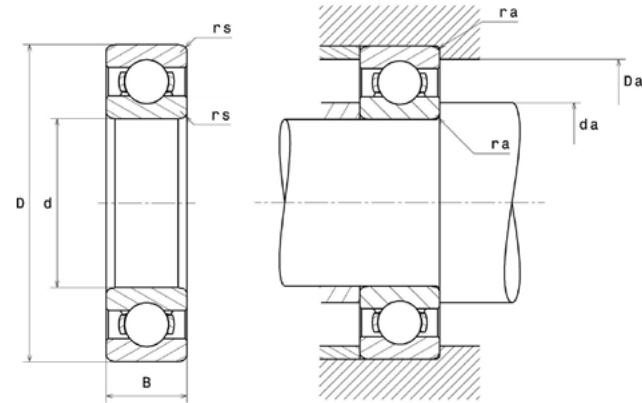
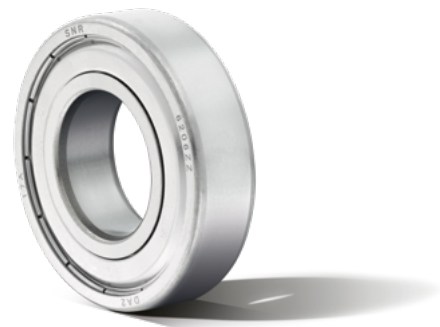
00	6200	Open	CN,C3	-	10	30	9	0,60	0,0300
		EE	CN, C3	-	10	30	9	0,60	0,0310
		ZZ	CN,C3	NR	10	30	9	0,60	0,0310
01	6201	Open	CN,C3	-	12	32	10	0,60	0,3700
		EE	CN, C3	-	12	32	10	0,60	0,0380
		ZZ	CN,C3	NR	12	32	10	0,60	0,0380
02	6202	Open	CN,C3	-	15	35	11	0,60	0,0430
		EE	CN, C3	NR	15	35	11	0,60	0,0450
		ZZ	CN,C3	NR	15	35	11	0,60	0,0450
03	6203	Open	CN	NR	17	40	12	0,60	0,0650
		EE	CN, C3	NR,S	17	40	12	0,60	0,0670
		ZZ	CN,C3	NR	17	40	12	0,60	0,0670
04	6204	Open	CN,C3	NR	20	47	14	1,00	0,0960
		EE	CN, C3	NR,S	20	47	14	1,00	0,1000
		ZZ	CN,C3	NR	20	47	14	1,00	0,1000
05	6205	Open	CN,C3	N, NR	25	52	15	1,00	0,1250
		EE	CN, C3	N, NR, S	25	52	15	1,00	0,1290
		ZZ	CN,C3	NR	25	52	15	1,00	0,1290
06	6206	Open	CN,C3	N, NR	30	62	16	1,00	0,1940
		EE	CN, C3	N, NR, S	30	62	16	1,00	0,2020
		ZZ	CN,C3	NR	30	62	16	1,00	0,1990
07	6207	Open	CN,C3	N, NR	35	72	17	1,10	0,2800
		EE	CN, C3	N, NR	35	72	17	1,10	0,2800
		ZZ	CN, C3	NR	35	72	17	1,10	0,2800
08	6208	Open	CN,C3	N, NR	40	80	18	1,10	0,3700
		EE	CN, C3	N, NR	40	80	18	1,10	0,3700
		ZZ	CN, C3	NR	40	80	18	1,10	0,3700
09	6209	Open	CN,C3	N, NR	45	85	19	1,10	0,4200
		EE	CN, C3	N, NR, S	45	85	19	1,10	0,4200
		ZZ	CN,C3	NR	45	85	19	1,10	0,4200
10	6210	Open	CN,C3	NR	50	90	20	1,10	0,4600
		EE	CN, C3	NR	50	90	20	1,10	0,4600
		ZZ	CN,C3	NR	50	90	20	1,10	0,4600
12	6212	Open	CN,C3	N, NR	60	110	22	1,50	0,7800
		EE	CN, C3	-	60	110	22	1,50	0,7800
		ZZ	CN,C3	-	60	110	22	1,50	0,7800

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed

6,30	2,65	0,12	12,20	0,60	26,00	14,00	-	23000	42000
6,30	2,65	0,12	12,20	0,60	26,00	14,00	14,90	-	19000
6,30	2,65	0,12	12,20	0,60	26,00	14,00	14,90	23000	34000
7,30	3,05	0,14	12,30	0,60	28,00	16,00	-	22000	38000
7,30	3,05	0,14	12,30	0,60	28,00	16,00	17,60	-	17000
7,30	3,05	0,14	12,30	0,60	28,00	16,00	17,60	22000	30000
8,20	3,60	0,16	12,70	0,60	31,00	19,00	-	20000	34000
8,20	3,60	0,16	12,70	0,60	31,00	19,00	19,70	-	15000
8,20	3,60	0,16	12,70	0,60	31,00	19,00	19,70	20000	27000
10,10	4,80	0,22	13,20	0,60	36,00	21,00	-	18000	29000
10,10	4,80	0,22	13,20	0,60	36,00	21,00	22,70	-	13000
10,10	4,80	0,22	13,20	0,60	36,00	21,00	22,70	18000	23000
14,40	6,70	0,30	12,60	1,00	42,00	25,00	-	16000	25000
14,40	6,70	0,30	12,60	1,00	42,00	25,00	26,50	-	11000
14,40	6,70	0,30	12,60	1,00	42,00	25,00	26,50	16000	20000
14,80	7,90	0,36	13,90	1,00	47,00	30,00	-	14000	22000
14,80	7,90	0,36	13,90	1,00	47,00	30,00	31,80	-	9100
14,80	7,90	0,36	13,90	1,00	47,00	30,00	31,80	14000	17000
20,50	11,30	0,51	13,80	1,00	57,00	35,00	-	12000	18000
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	-	7500
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	12000	14000
27,10	15,30	0,70	13,80	1,00	65,50	41,50	-	10000	16000
27,10	15,30	0,70	13,80	1,00	65,50	41,50	44,00	-	6400
27,10	15,30	0,70	13,80	1,00	65,50	41,50	44,00	10000	13000
30,70	18,10	0,82	14,00	1,00	73,50	46,50	-	9300	14000
30,70	18,10	0,82	14,00	1,00	73,50	46,50	50,40	-	5700
30,70	18,10	0,82	14,00	1,00	73,50	46,50	50,40	9300	11000
34,50	20,50	0,93	14,10	1,00	78,50	51,50	-	8700	13000
34,50	20,50	0,93	14,10	1,00	78,50	51,50	54,50	-	5100
34,50	20,50	0,93	14,10	1,00	78,50	51,50	54,50	8700	10000
37,00	23,20	1,06	14,40	1,00	83,50	56,50	-	8200	12000
37,00	23,20	1,06	14,40	1,00	83,50	56,50	60,00	-	4800
37,00	23,20	1,06	14,40	1,00	83,50	56,50	60,00	8200	9500
53,30	36,00	1,64	14,30	1,50	102,00	68,00	-	6800	9800
53,30	36,00	1,64	14,30	1,50	102,00	68,00	73,20	-	3900
53,30	36,00	1,64	14,30	1,50	102,00	68,00	73,20	6800	7600

Deep groove ball bearings

Standard range

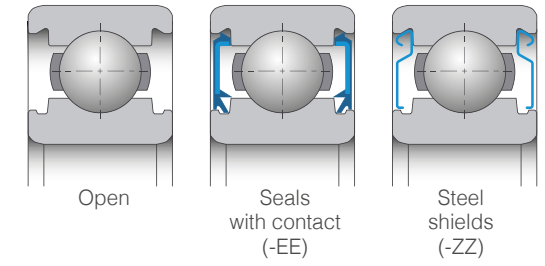


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius

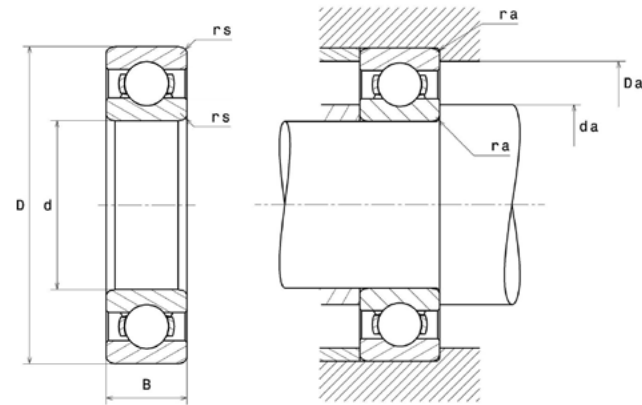
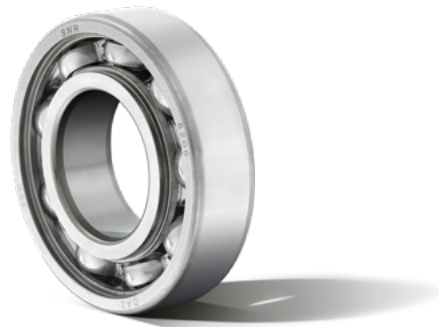


Bore code	Bearing	Type	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
					Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass
13	6213	Open	CN,C3	N, NR	65	120	23	1,50	1,0100
		EE	CN, C3	-	65	120	23	1,50	1,0300
		ZZ	CN,C3	-	65	120	23	1,50	1,0300
14	6214	Open	CN,C3	N	70	125	24	1,50	1,0400
		EE	CN, C3	-	70	125	24	1,50	1,0900
		ZZ	CN,C3	-	70	125	24	1,50	1,0800
15	6215	Open	CN,C3	-	75	130	25	1,50	1,1900
		EE	CN, C3	-	75	130	25	1,50	1,1900
		ZZ	CN,C3	-	75	130	25	1,50	1,1900
16	6216	Open	CN,C3	-	80	140	26	2,00	1,4200
		EE	CN, C3	-	80	140	26	2,00	1,4200
		ZZ	CN,C3	-	80	140	26	2,00	1,4200
17	6217	Open	CN,C3	-	85	150	28	2,00	1,8200
		EE	CN, C3	-	85	150	28	2,00	1,8500
		ZZ	CN,C3	-	85	150	28	2,00	1,8400
18	6218	Open	CN,C3	-	90	160	30	2,00	2,1800
		EE	CN, C3	-	90	160	30	2,00	2,2500
		ZZ	CN,C3	-	90	160	30	2,00	2,2500
19	6219	Open	CN,C3	-	95	170	32	2,10	2,6500
		EE	CN, C3	-	95	170	32	2,10	2,6500
		ZZ	CN,C3	-	95	170	32	2,10	2,6500
20	6220	Open	CN,C3	-	100	180	34	2,10	3,1700
		EE	CN, C3	-	100	180	34	2,10	3,1700
		ZZ	C3	-	100	180	34	2,10	3,1700
21	6221	Open	CN, C3	-	105	190	36	2,10	4,4800
22	6222	Open	CN, C3	-	110	200	38	2,10	5,8500
24	6224	Open	CN, C3	-	120	215	40	2,10	5,3500
26	6226	Open	CN, C3	-	130	230	40	3,00	5,8500

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed
60,30	40,10	1,82	14,40	1,50	112,00	73,00	-	6400	9000
60,30	40,10	1,82	14,40	1,50	112,00	73,00	80,40	-	3600
60,30	40,10	1,82	14,40	1,50	112,00	73,00	80,40	6400	7200
64,10	45,00	2,05	14,70	1,50	117,00	78,00	-	6100	8400
64,10	45,00	2,05	14,70	1,50	117,00	78,00	86,30	-	3300
64,10	45,00	2,05	14,70	1,50	117,00	78,00	86,30	6100	6700
71,00	48,30	2,17	14,50	1,50	122,00	83,00	-	5900	8100
71,00	48,30	2,17	14,50	1,50	122,00	83,00	86,00	-	3300
71,00	48,30	2,17	14,50	1,50	122,00	83,00	86,00	5900	6500
76,60	53,00	2,30	14,60	2,00	131,00	89,00	-	5500	7500
76,60	53,00	2,30	14,60	2,00	131,00	89,00	93,40	-	3100
76,60	53,00	2,30	14,60	2,00	131,00	89,00	93,40	5500	6000
88,60	62,00	2,60	14,60	2,00	141,00	94,00	-	5300	7000
88,60	62,00	2,60	14,60	2,00	141,00	94,00	100,90	-	2800
88,60	62,00	2,60	14,60	2,00	141,00	94,00	100,90	5300	5600
101,00	71,60	2,90	14,50	2,00	151,00	99,00	-	5100	6600
101,00	71,60	2,90	14,50	2,00	151,00	99,00	106,40	-	2700
101,00	71,60	2,90	14,50	2,00	151,00	99,00	106,40	5100	5300
115,00	81,90	3,25	14,50	2,00	159,00	106,00	-	5000	6200
115,00	81,90	3,25	14,50	2,00	159,00	106,00	111,30	-	2600
115,00	81,90	3,25	14,50	2,00	159,00	106,00	111,30	5000	5000
129,00	93,20	3,55	14,40	2,00	169,00	111,00	-	4800	5800
129,00	93,20	3,55	14,40	2,00	169,00	111,00	119,00	-	2400
129,00	93,20	3,55	14,40	2,00	169,00	111,00	119,00	4800	4600
132,00	105,00	3,95	14,40	2,00	179,00	116,00	-	4700	5500
152,00	118,00	4,30	14,40	2,00	189,00	121,00	-	4500	5200
164,00	132,00	4,65	14,50	2,00	204,00	131,00	-	4200	4800
176,00	146,00	4,95	14,50	2,50	217,00	143,00	-	3900	4500

Deep groove ball bearings

Standard range

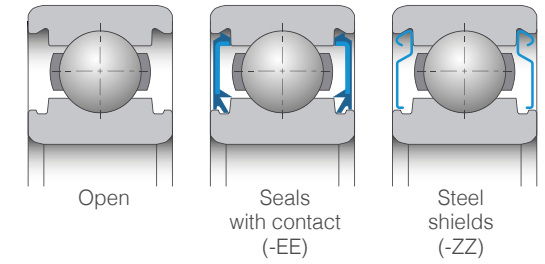


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Type	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
					Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

63xx series

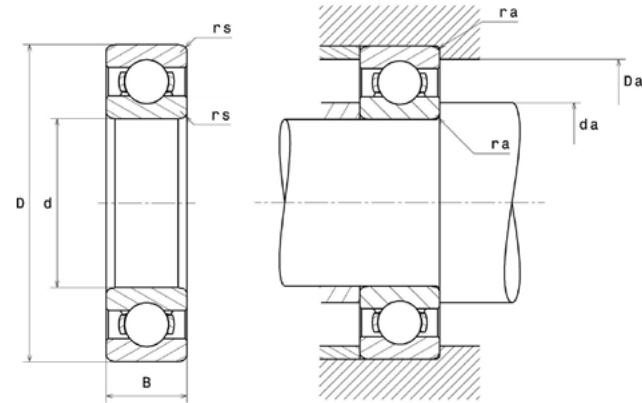
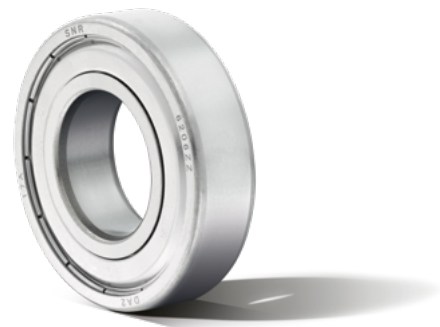
00	6300	Open	CN,C3	-	10	35	11	0,60	0,0530
		EE	CN, C3	-	10	35	11	0,60	0,0550
		ZZ	CN,C3	-	10	35	11	0,60	0,0550
01	6301	Open	CN,C3	-	12	37	12	1,00	0,0580
		EE	CN, C3	-	12	37	12	1,00	0,0600
		ZZ	CN,C3	-	12	37	12	1,00	0,0600
02	6302	Open	CN,C3	-	15	42	13	1,00	0,0800
		EE	CN, C3	-	15	42	13	1,00	0,0840
		ZZ	CN,C3	-	15	42	13	1,00	0,0840
03	6303	Open	CN	-	17	47	14	1,00	0,1120
		EE	CN, C3	-	17	47	14	1,00	0,1160
		ZZ	CN,C3	-	17	47	14	1,00	0,1160
04	6304	Open	CN,C3	N	20	52	15	1,10	0,1410
		EE	CN, C3	N,NR	20	52	15	1,10	0,1460
		ZZ	CN,C3	-	20	52	15	1,10	0,1460
05	6305	Open	CN,C3	N, NR	25	62	17	1,10	0,2280
		EE	CN, C3	NR	25	62	17	1,10	0,2350
		ZZ	CN,C3	NR	25	62	17	1,10	0,2350
06	6306	Open	CN,C3	N, NR	30	72	19	1,10	0,3450
		EE	CN, C3	N, NR, S	30	72	19	1,10	0,3450
		ZZ	CN,C3	NR	30	72	19	1,10	0,3450
07	6307	Open	CN,C3	N, NR	35	80	21	1,50	0,4550
		EE	CN, C3	N, NR	35	80	21	1,50	0,4560
		ZZ	CN, C3	NR	35	80	21	1,50	0,4530
08	6308	Open	CN,C3	N, NR	40	90	23	1,50	0,6410
		EE	CN, C3	N, NR	40	90	23	1,50	0,6500
		ZZ	CN, C3	NR	40	90	23	1,50	0,6470
09	6309	Open	CN,C3	N, NR	45	100	25	1,50	0,8170
		EE	CN, C3	N, NR, S	45	100	25	1,50	0,8160
		ZZ	CN,C3	NR	45	100	25	1,50	0,8010
10	6310	Open	CN,C3	NR	50	110	27	2,00	1,0600
		EE	CN, C3	NR	50	110	27	2,00	1,0600
		ZZ	CN,C3	NR	50	110	27	2,00	1,0700
11	6311	Open	CN,C3	N, NR	55	120	29	2,00	1,3400
		EE	CN, C3	-	55	120	29	2,00	1,3400
		ZZ	CN,C3	NR	55	120	29	2,00	1,3320

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (C _n)	Static load capacity (C ₀)	Fatigue limit load (C _u)	Factor f ₀	Max. shaft & housing corner radius (ra max)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed

8,10	3,45	0,16	12,30	0,60	31,00	14,00	-	21000	36000
8,10	3,45	0,16	12,30	0,60	31,00	14,00	17,70	-	16000
8,10	3,45	0,16	12,30	0,60	31,00	14,00	17,70	21000	29000
10,20	4,20	0,19	11,10	1,00	32,00	17,00	-	20000	34000
10,20	4,20	0,19	11,10	1,00	32,00	17,00	19,30	-	15000
10,20	4,20	0,19	11,10	1,00	32,00	17,00	19,30	20000	28000
11,90	5,40	0,25	12,30	1,00	37,00	20,00	-	17000	29000
12,00	5,40	0,25	12,70	1,00	37,00	20,00	22,60	-	13000
12,00	5,40	0,25	12,70	1,00	37,00	20,00	22,60	17000	23000
14,30	6,60	0,30	12,30	1,00	42,00	22,00	-	16000	26000
14,30	6,60	0,30	12,30	1,00	42,00	22,00	24,60	-	12000
14,30	6,60	0,30	12,30	1,00	42,00	22,00	24,60	16000	21000
16,80	7,90	0,36	12,40	1,00	45,50	26,50	-	14000	24000
16,80	7,90	0,36	12,40	1,00	45,50	26,50	27,50	-	11000
16,80	7,90	0,36	12,40	1,00	45,50	26,50	27,50	14000	19000
23,60	11,50	0,52	12,40	1,00	55,50	31,50	-	12000	19000
23,60	11,50	0,52	12,40	1,00	55,50	31,50	34,00	-	8600
23,60	11,50	0,52	12,40	1,00	55,50	31,50	34,00	12000	15000
28,10	15,00	0,68	13,30	1,00	65,50	36,50	-	11000	16000
28,10	15,00	0,68	13,30	1,00	65,50	36,50	42,40	-	6700
28,10	15,00	0,68	13,30	1,00	65,50	36,50	42,40	11000	13000
35,20	19,30	0,88	13,20	1,50	72,00	43,00	-	9900	14000
35,20	19,30	0,88	13,20	1,50	72,00	43,00	48,40	-	6000
35,20	19,30	0,88	13,20	1,50	72,00	43,00	48,40	9900	11000
43,00	24,10	1,10	13,20	1,50	82,00	48,00	-	9000	13000
43,00	24,10	1,10	13,20	1,50	82,00	48,00	54,40	-	5300
43,00	24,10	1,10	13,20	1,50	82,00	48,00	54,40	9000	10000
55,70	31,90	1,45	13,10	1,50	92,00	53,00	-	8300	11000
55,70	31,90	1,45	13,10	1,50	92,00	53,00	59,30	-	4800
55,70	31,90	1,45	13,10	1,50	92,00	53,00	59,30	8300	9100
65,10	37,90	1,72	13,30	2,00	101,00	59,00	-	7700	10000
65,10	37,90	1,72	13,30	2,00	101,00	59,00	66,20	-	4400
65,10	37,90	1,72	13,30	2,00	101,00	59,00	66,20	7700	8300
75,30	44,70	2,03	13,10	2,00	111,00	64,00	-	7200	9500
75,30	44,70	2,03	13,10	2,00	111,00	64,00	71,00	-	4100
75,30	44,70	2,03	13,10	2,00	111,00	64,00	71,00	7200	7600

Deep groove ball bearings

Standard range

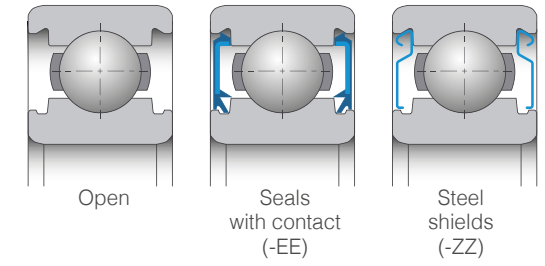


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius

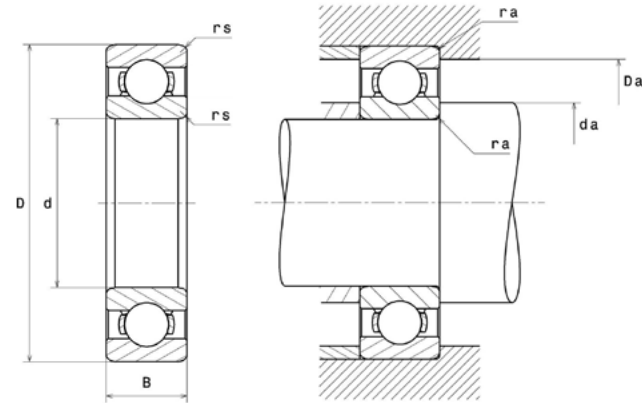


Bore code	Bearing	Type	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
					Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass
12	6312	Open	CN,C3	N, NR	60	130	31	2,10	1,7200
		EE	CN, C3	-	60	130	31	2,10	1,7200
		ZZ	CN,C3	-	60	130	31	2,10	1,7100
13	6313	Open	CN,C3	N, NR	65	140	33	2,10	2,1100
		EE	CN, C3	-	65	140	33	2,10	2,1100
		ZZ	CN,C3	-	65	140	33	2,10	2,1100
14	6314	Open	CN,C3	N	70	150	35	2,10	2,5400
		EE	CN, C3	-	70	150	35	2,10	2,5600
		ZZ	CN,C3	-	70	150	35	2,10	2,5400
15	6315	Open	CN,C3	-	75	160	37	2,10	3,1200
		EE	CN, C3	-	75	160	37	2,10	3,1200
		ZZ	CN,C3	-	75	160	37	2,10	3,0860
16	6316	Open	CN,C3	-	80	170	39	2,10	4,3200
		EE	CN, C3	-	80	170	39	2,10	4,4100
		ZZ	CN,C3	-	80	170	39	2,10	4,4100
17	6317	Open	CN,C3	-	85	180	41	3,00	4,2100
		EE	CN, C3	-	85	180	41	3,00	4,2100
		ZZ	CN,C3	-	85	180	41	3,00	4,2100
18	6318	Open	CN,C3	-	90	190	43	3,00	5,0200
		EE	CN, C3	-	90	190	43	3,00	4,9730
		ZZ	CN,C3	-	90	190	43	3,00	5,0200
19	6319	Open	CN,C3	-	95	200	45	3,00	5,8200
		ZZ	CN,C3	-	95	200	45	3,00	5,8200
20	6320	Open	CN,C3	-	100	215	47	3,00	7,0000
		ZZ	C3	-	100	215	34	3,00	7,0000
22	6322	Open	CN, C3	-	110	240	50	3,00	9,6000

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft & housing corner radius (ra max)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed
86,20	52,20	2,37	13,20	2,00	119,00	71,00	-	6800	8600
86,20	52,00	2,36	13,20	2,00	119,00	71,00	79,30	-	3600
86,20	52,00	2,36	13,20	2,00	119,00	71,00	79,30	6800	7000
97,70	59,80	2,70	13,20	2,00	129,00	76,00	-	6400	8100
97,70	59,80	2,70	13,20	2,00	129,00	76,00	85,80	-	3400
97,70	59,80	2,70	13,20	2,00	129,00	76,00	85,80	6400	6500
110,00	68,20	2,95	13,20	2,00	139,00	81,00	-	6100	7500
110,00	68,20	2,95	13,20	2,00	139,00	81,00	92,40	-	3100
110,00	68,20	2,95	13,20	2,00	139,00	81,00	92,40	6100	6000
120,00	77,20	3,25	13,20	2,00	149,00	86,00	-	5800	7000
120,00	77,20	3,25	13,20	2,00	149,00	86,00	94,00	-	3000
120,00	77,20	3,25	13,20	2,00	149,00	86,00	94,00	5800	5600
130,00	86,70	3,55	13,30	2,00	159,00	91,00	-	5500	6600
130,00	86,70	3,55	13,30	2,00	159,00	91,00	105,50	-	2700
130,00	86,70	3,55	13,30	2,00	159,00	91,00	105,50	5500	5300
140,00	96,80	3,80	13,30	2,50	167,00	98,00	-	5300	6200
140,00	96,80	3,80	13,30	2,50	167,00	98,00	106,40	-	2700
140,00	96,80	3,80	13,30	2,50	167,00	98,00	106,40	5300	5000
150,00	107,00	4,10	13,30	2,50	177,00	103,00	-	5100	5900
150,00	107,00	4,10	13,30	2,50	177,00	103,00	112,20	-	2600
150,00	107,00	4,10	13,30	2,50	177,00	103,00	112,20	5100	4700
161,00	119,00	4,45	13,30	2,50	187,00	108,00	-	4900	5500
161,00	119,00	4,45	13,30	2,50	187,00	108,00	118,30	4900	4400
183,00	141,00	5,10	13,30	2,50	202,00	113,00	-	4600	5100
183,00	141,00	5,10	13,30	2,50	202,00	113,00	127,00	4600	4100
216,00	180,00	6,10	13,20	2,50	227,00	123,00	-	4100	4600

Deep groove ball bearings

Standard range

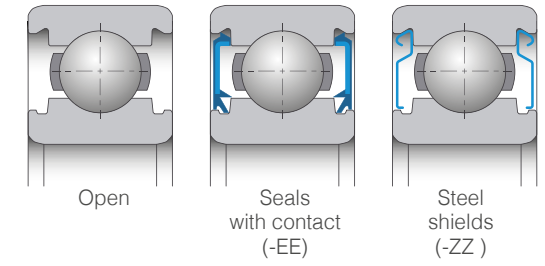


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Type	Internal clearance	Dimensions (mm)				Mass (kg)
				Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

622xx series

00	62200	EE	CN	10	30	14	0,60	0,0480
		ZZ	CN	10	30	14	0,60	0,0480
01	62201	EE	CN,C3	12	32	14	0,60	0,0510
02	62202	EE	CN,C3	15	35	14	0,60	0,0560
03	62203	EE	CN,C3	17	40	16	0,60	0,0860
04	62204	EE	CN,C3	20	47	18	1,00	0,1200
05	62205	EE	CN,C3	25	52	18	1,00	0,1520
06	62206	EE	CN,C3	30	62	20	1,00	0,2460
07	62207	EE	CN,C3	35	72	23	1,10	0,3800
08	62208	EE	CN,C3	40	80	23	1,10	0,4600
09	62209	EE	CN,C3	45	85	23	1,10	0,4840
10	62210	EE	CN,C3	50	90	23	1,10	0,5140

623xx series

00	62300	EE	CN	10	35	17	0,60	0,0790
01	62301	EE	CN	12	37	17	1,00	0,0700
02	62302	EE	CN	15	42	17	1,00	0,1080
03	62303	EE	CN	17	47	19	1,00	0,1460
04	62304	EE	CN	20	52	21	1,10	0,1970
05	62305	EE	CN	25	62	24	1,10	0,3170
06	62306	EE	CN,C3	30	72	27	1,10	0,4740
07	62307	EE	CN	35	80	31	1,50	0,6580
08	62308	EE	CN	40	90	33	1,50	0,8740

630xx series

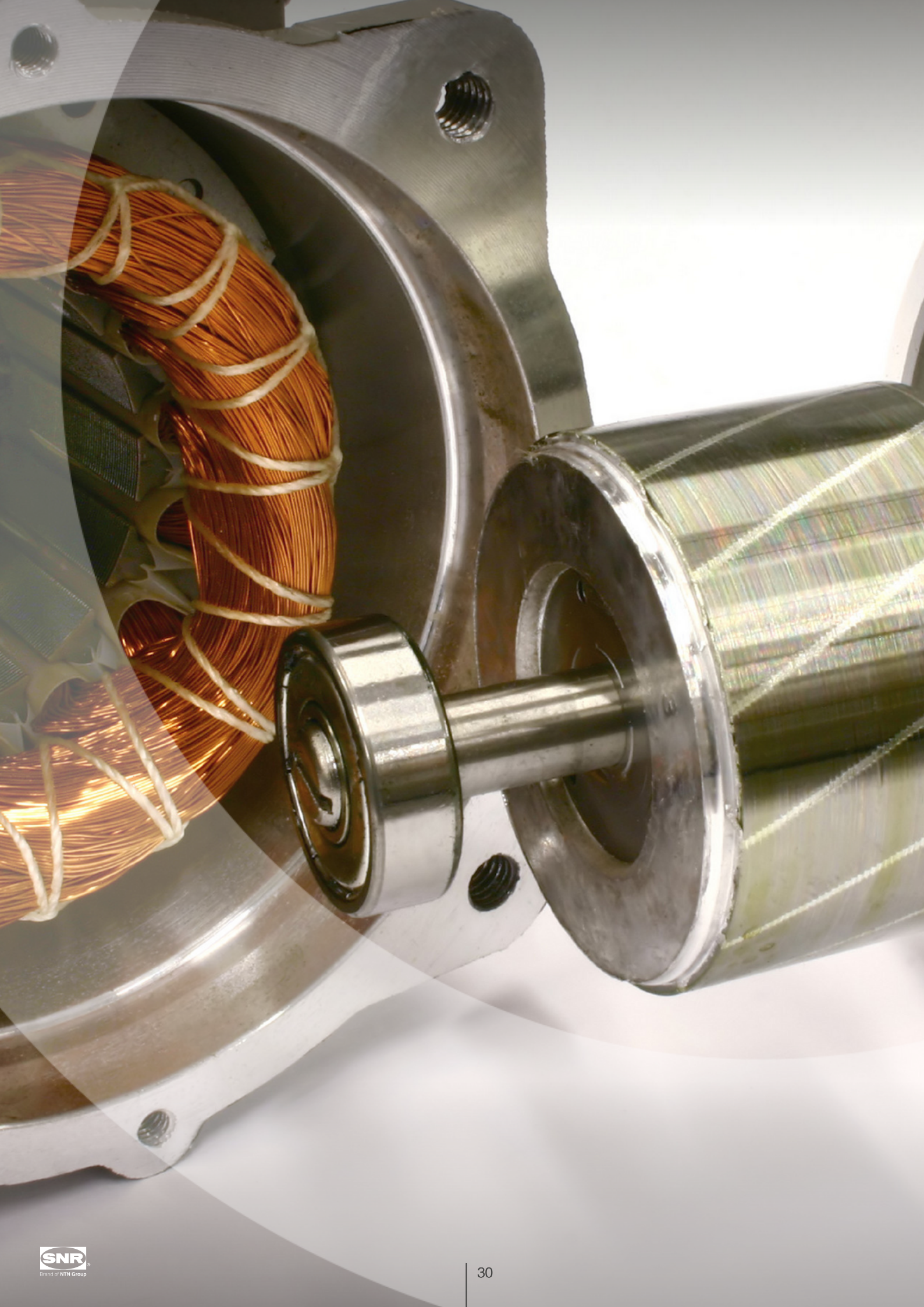
00	63000	EE	CN,C3	10	26	12	0,30	0,0280
01	63001	EE	CN,C3	12	28	13	0,30	0,0290
02	63002	EE	CN,C3	15	32	14	0,30	0,0440
03	63003	EE	CN,C3	17	35	14	0,30	0,0550
04	63004	EE	CN,C3	20	42	16	0,60	0,0820
05	63005	EE	CN,C3	25	47	16	0,60	0,1050
06	63006	EE	CN,C3	30	55	19	1,00	0,1660
07	63007	EE	CN,C3	35	62	20	1,00	0,2140
08	63008	EE	CN,C3	40	68	21	1,00	0,2620

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Mechanical limiting speed

6,30	2,60	0,12	12,10	0,60	26,00	14,00	16,00	18000
6,30	2,60	0,12	12,10	0,60	26,00	14,00	16,00	42000
7,30	3,10	0,14	12,20	0,60	28,00	16,00	18,30	16000
8,10	3,75	0,17	13,10	0,60	31,00	19,00	21,10	14000
10,10	4,75	0,22	13,10	0,60	36,00	21,00	24,10	12000
13,50	6,60	0,30	13,10	1,00	42,00	25,00	25,90	11000
14,80	7,90	0,36	13,90	1,00	47,00	30,00	32,00	9000
20,50	11,30	0,51	13,90	1,00	57,00	35,00	39,00	7300
27,10	15,30	0,70	13,80	1,00	65,50	41,50	45,10	6400
30,70	17,90	0,81	14,00	1,00	73,50	46,50	49,50	5800
34,50	20,40	0,93	14,10	1,00	78,50	51,50	54,50	5300
37,00	23,20	1,05	14,40	1,00	83,50	56,50	58,80	4900

8,50	3,45	0,16	11,20	0,60	31,00	14,00	15,40	19000
10,20	4,20	0,19	11,10	1,00	32,00	17,00	19,30	15000
11,90	5,30	0,24	12,10	1,00	37,00	20,00	17,90	12000
14,40	6,60	0,30	12,40	1,00	42,00	22,00	27,50	10000
16,80	7,90	0,36	12,40	1,00	45,50	26,50	30,00	9500
24,90	12,10	0,55	12,20	1,00	55,50	31,50	27,50	7800
29,70	15,90	0,72	13,10	1,00	65,50	36,50	33,60	6700
35,10	19,20	0,87	13,20	1,50	72,00	43,00	45,50	6300
42,90	24,00	1,09	13,20	1,50	82,00	48,00	51,10	5600

4,80	1,97	0,09	12,40	0,60	31,00	14,00	15,40	20000
5,40	2,37	0,11	13,10	1,00	32,00	17,00	19,30	17000
5,90	2,85	0,13	13,90	1,00	37,00	20,00	17,90	14000
6,30	3,25	0,15	14,40	1,00	42,00	22,00	27,50	13000
9,90	5,00	0,23	13,80	1,00	45,50	26,50	30,00	10000
10,60	5,80	0,26	14,50	1,00	55,50	31,50	27,50	9100
13,90	8,30	0,38	14,80	1,00	65,50	36,50	33,60	7500
16,80	10,30	0,47	14,80	1,50	72,00	43,00	45,50	6600
17,70	11,50	0,52	15,30	1,50	82,00	48,00	51,10	5900



EMTR

Our range of deep groove ball bearings for electric motors

Are you looking for superior reliability and quality, with the lowest possible noise level and without compromising on price?

The EMTR bearing range, with an optimised design for electric motors, will meet all these requirements.

Characteristics

Sealing options

- Two suggestions:
- Contact seals EE
 - Steel shields ZZ

DESIGN

- P6 precision (ISO 492) and improved ball quality (G10) to limit vibrations
- Raceway roughness:
- improved by 25%*
- Raceway roundness :
- improved by 20%*

* Compared to the standard tolerance

Cage

Pressed steel cage

Clearance

C3 internal clearance

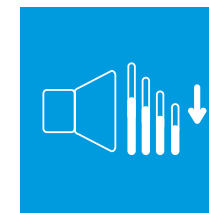
Grease

Adapted grease with low noise properties:

- Use up to 150 °C (no suffix)
- High-temperature use up to 200 °C (suffix D189)



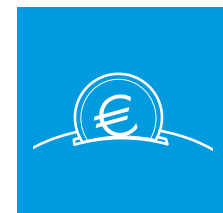
Benefits



Low-noise

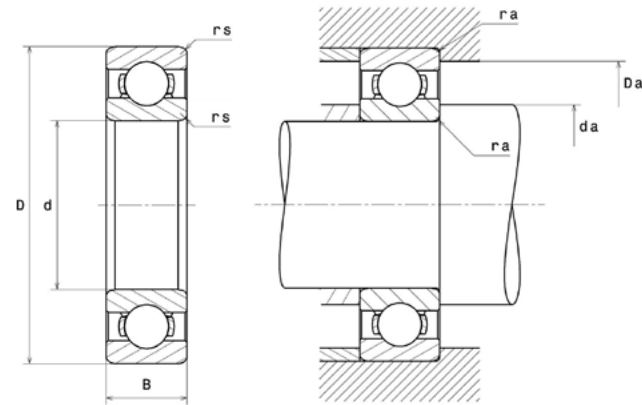


Increased service life



Competitiveness

EMTR range

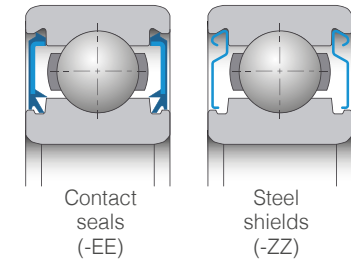


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
				Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

EMTR - Sealed version

6200 series

01	6201EEC3EMTR	C3	-	12	32	10	0,60	0,0380
02	6202EEC3EMTR	C3	-	15	35	11	0,60	0,0450
04	6204EEC3EMTR	C3	-	20	47	14	1,00	0,1000
05	6205EEC3EMTR	C3	-	25	52	15	1,00	0,1290

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Mechanical limiting speed

6,80	3,05	0,14	12,30	0,60	28,00	16,00	17,60	17000
7,70	3,60	0,16	12,70	0,60	31,00	19,00	27,70	15000
13,70	6,70	0,30	12,60	1,00	42,00	25,00	26,50	11000
14,80	7,90	0,36	13,90	1,00	47,00	30,00	31,80	9100

Bore code	Bearing	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
				Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius rs	Mass

EMTR - Shielded version

6200 series

02	6202ZZC3EMTR	C3	D189	15	35	11	0,60	0,0450
03	6203ZZC3EMTR	C3	-	17	40	12	0,60	0,0670
04	6204ZZC3EMTR	C3	D189	20	47	14	1,00	0,1000
05	6205ZZC3EMTR	C3	D189	25	52	15	1,00	0,1290
06	6206ZZC3EMTR	C3	D189	30	62	16	1,00	0,1990

6300 series

04	6304ZZC3EMTR	C3	-	20	52	15	1,10	0,1460
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Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed

7,70	3,60	0,16	12,70	0,60	31,00	19,00	19,70	20000	27000
9,60	4,80	0,22	13,20	0,60	36,00	21,00	22,70	18000	23000
13,70	6,70	0,30	12,60	1,00	42,00	25,00	26,50	16000	20000
14,80	7,90	0,36	13,90	1,00	47,00	30,00	31,80	14000	17000
19,50	11,30	0,51	13,80	1,00	57,00	35,00	38,80	12000	14000
15,80	7,90	0,36	12,40	1,00	45,50	26,50	27,50	14000	19000

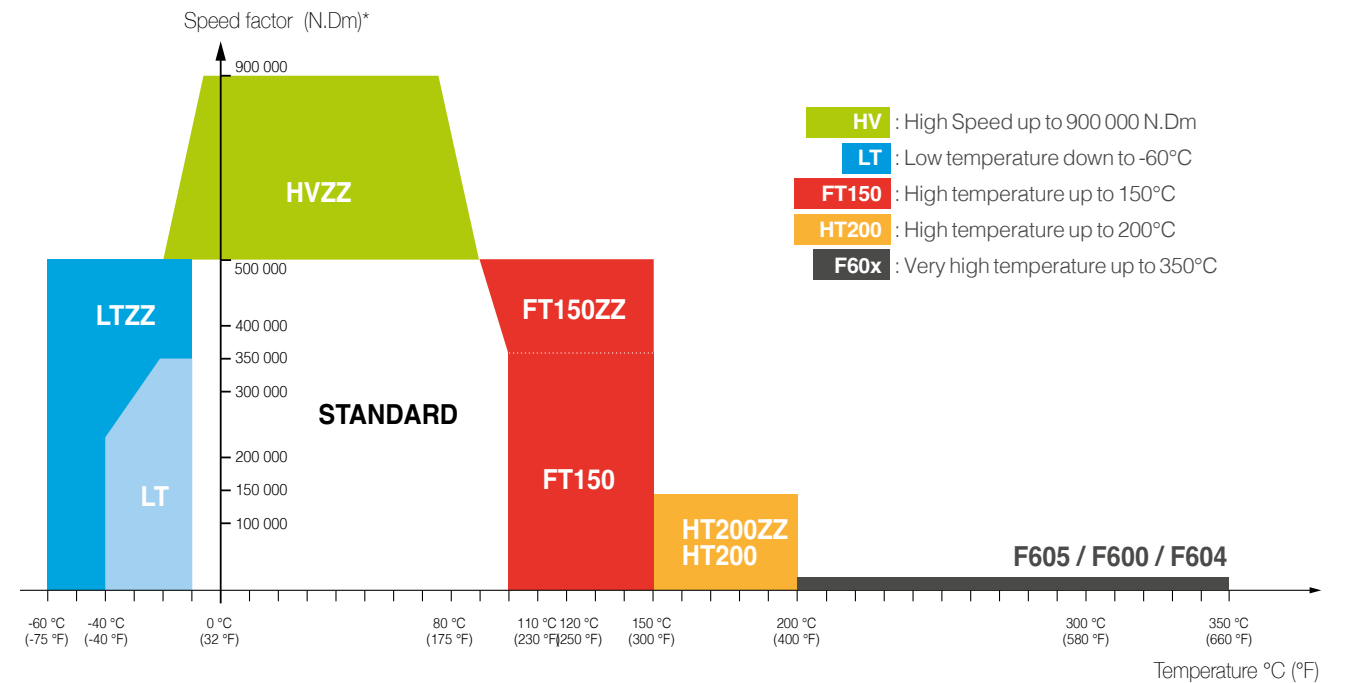
TOPLINE DEEP GROOVE BALL BEARINGS

TOPLINE

The only range of ball bearings dedicated to extreme applications.

6000, 6200 and 6300 series ball bearings.

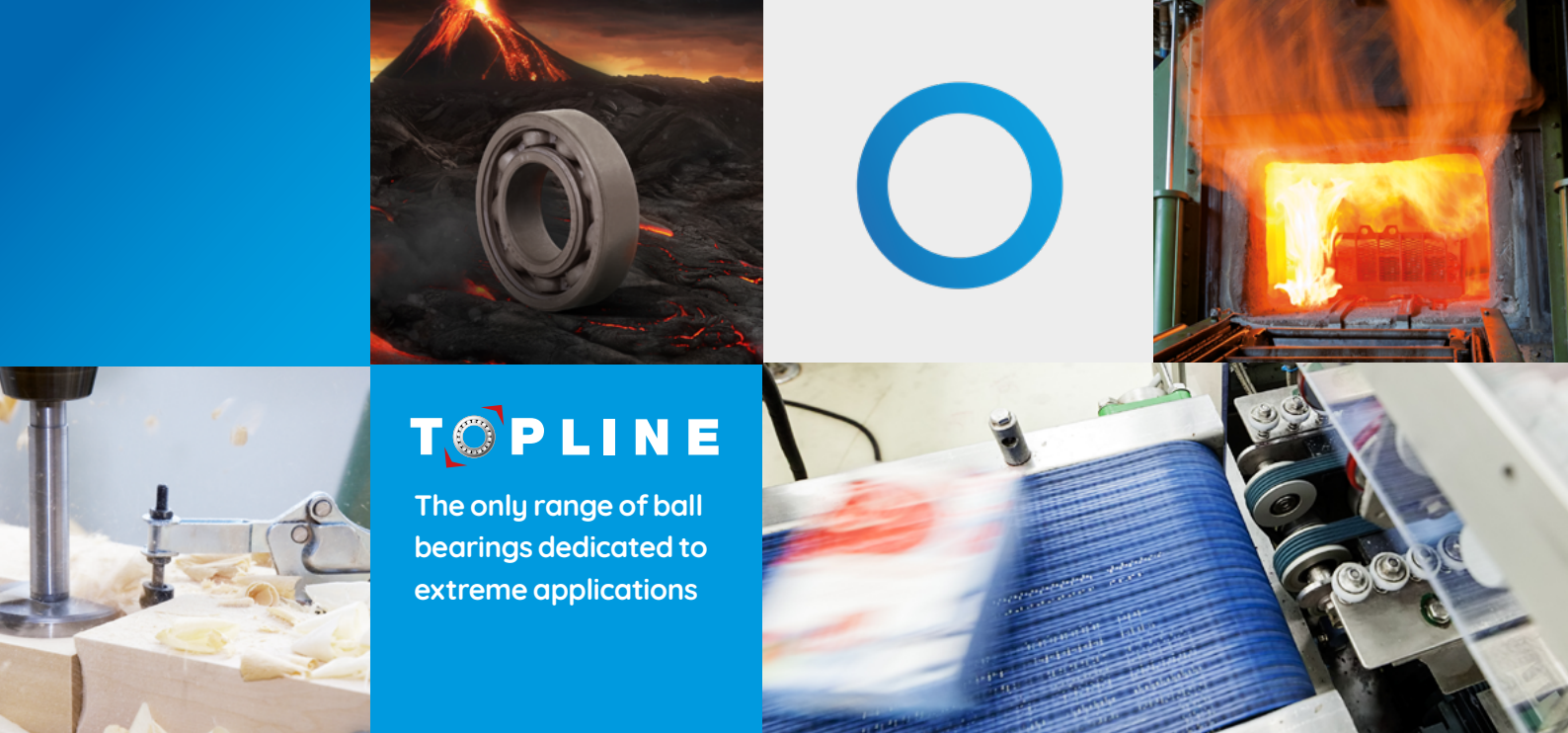
For applications with specific temperatures or speeds.



- High availability to solve problems quickly
- A unique range of products from a premium brand
- Ready-to-use products for specific applications
- A wide selection of bore diameters for 6000, 6200 and 6300 series
- An optimised design: cage, internal clearance, lubrication and seals
- The technical support of our teams

“A bearing for every specific use”





TOPLINE
The only range of ball bearings dedicated to extreme applications

TOPLINE deep groove ball bearings

LT - Low temperatures down to -60°C

Thanks to its moisture-resistant adapted lubrication, this range is ideal for use at low temperatures.

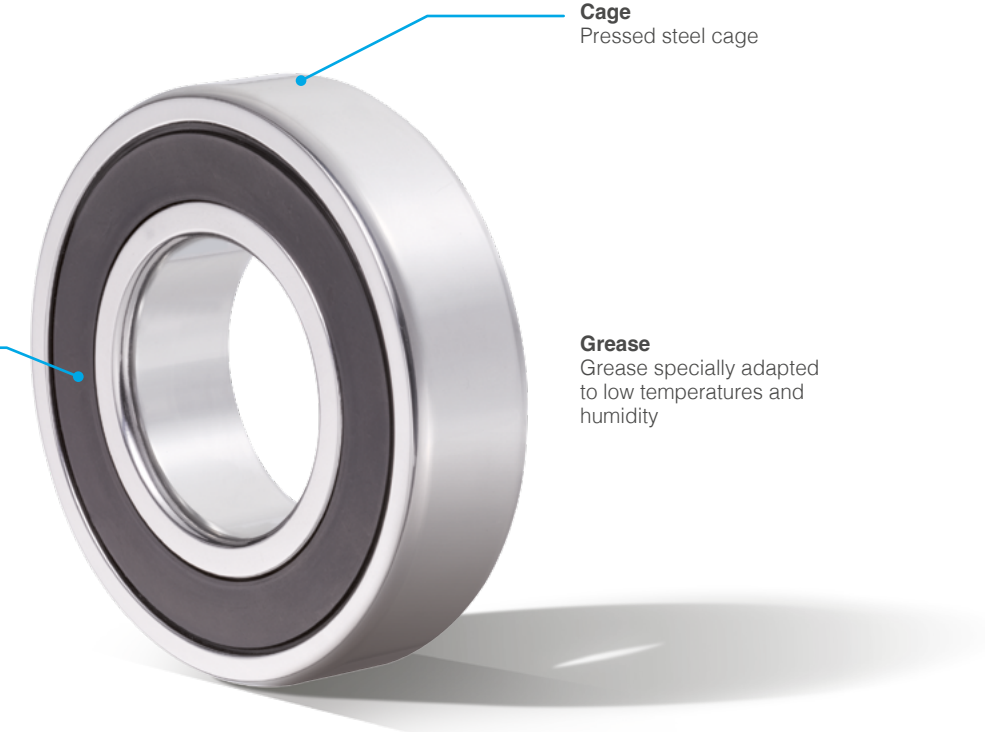
Characteristics

Internal clearance
Increased clearance (C3) to compensate for temperature expansions

Cage
Pressed steel cage

Sealing solutions
Two options :
• acrylic nitrile seals (-40°C to +120°C) for the LT series
• steel shields for the LTZZ series (-60°C to +120°C)

Grease
Grease specially adapted to low temperatures and humidity



Series	Cage	Internal clearance	Grease	Sealing	Other	Permissible temperature range
HVZZ	Polyamide 6.6 reinforced glass fibres	C3	Superior quality. Lithium thickener + synthetic base oil	Steel shields	Precision P6, P5. High-precision balls (<=class 10)	-20°C to +120°C
LT LTZZ	Steel	C3	Adapted to low temperatures. Lithium thickener + synthetic base oil	Nitrile seals (NBR) or steel shields	-	LT: -40°C to +100°C LTZZ: -60°C to +120°C
FT150 FT150ZZ	Steel	C3	Adapted to high temperatures. Polyurea thickener + synthetic base oil	Fluorinated seals (FKM) or steel shields	-	-30°C to +150°C
HT200 HT200ZZ	Steel	C4	Adapted to high temperatures. Solid PTFE lubricant and PFPE oil	Fluorinated seals (FKM) or steel shields	Specific heat treatment	-40°C to +200°C
F605	Steel	Multiple of C5*	**	-	Brand is stamped on bearing	Temperature range between +200°C and +350°C (continuous or cycle)
F600	Steel	Multiple of C5*		-	Specific surface treatment (phosphating + MoS2 deposit)***	
F604	Steel	Multiple of C5*	Adapted to very high temperatures. Polyalkylene glycol base oil + solid additive	Steel shields	Brand is stamped	

Applications

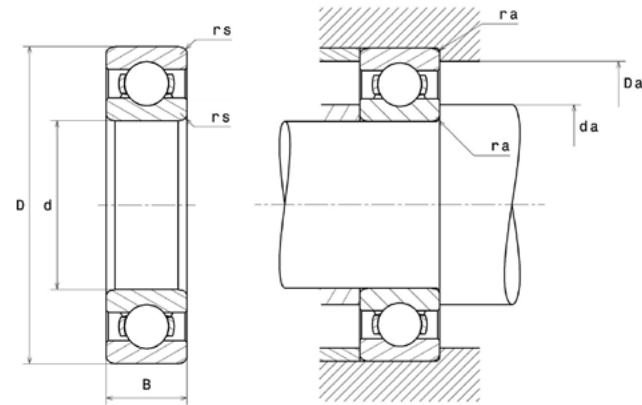
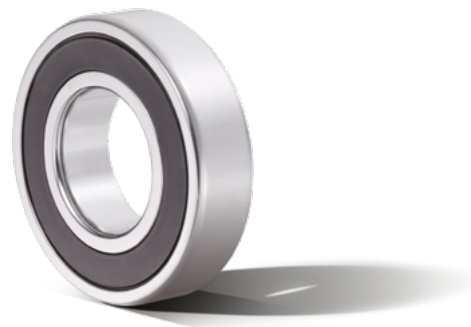
Cold rooms, cable transport etc.



* Greatly increased internal clearance to compensate for material expansion effects.
 ** With regard to the F600 and F605 series, if additional lubrication is required, an appropriate quantity of grease can be introduced into the bearing. Please contact NTN for more information.
 *** Surface treatment for better resistance to oxidation and improved lubrication. Please note: F600 and F604 series must be used carefully in a humid environment as the MoS2 may react with water and produce sulphuric acid.

LT range

Low temperatures down to -60°C

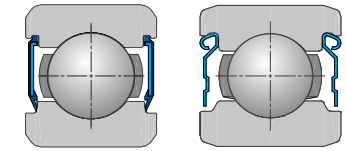


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Sealed version (LT)

Shielded version (LTZZ)

Bore code	Bearing	Internal clearance	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

LT - Sealed version

60xx series							
02	6002LT	C3	15	35	11	0,30	0,0300
03	6003LT	C3	17	40	12	0,30	0,0400
04	6004LT	C3	20	47	14	0,60	0,0680
05	6005LT	C3	25	52	15	0,60	0,0770
06	6006LT	C3	30	62	16	1,00	0,1160

62xx series							
00	6200LT	C3	10	30	9	0,60	0,0300
03	6203LT	C3	17	40	12	0,60	0,0677
04	6204LT	C3	20	47	14	1,00	0,1070
05	6205LT	C3	25	52	15	1,00	0,1280
06	6206LT	C3	30	62	16	1,00	0,1990

LTZZ - Shielded version

60xx series							
03	6003LTZZ	C3	17	35	10	0,30	0,0400
04	6004LTZZ	C3	20	42	12	0,60	0,0680
05	6005LTZZ	C3	25	47	12	0,60	0,0770
06	6006LTZZ	C3	30	55	13	1,00	0,1160
07	6007LTZZ	C3	35	62	14	1,00	0,1530

62xx series							
00	6200LTZZ	C3	10	30	9	0,60	0,0300
04	6204LTZZ	C3	20	47	14	1,00	0,1070
05	6205LTZZ	C3	25	52	15	1,00	0,1280
06	6206LTZZ	C3	30	62	16	1,00	0,1990

63xx series							
02	6302LTZZ	C3	15	42	13	1,00	0,0830
04	6304LTZZ	C3	20	52	15	1,10	0,1350
13	6313LTZZ	C3	65	140	33	2,10	2,1100

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Mechanical limiting speed

5,90	2,85	0,13	13,90	0,30	30,00	17,00	20,50	14000
6,30	3,25	0,15	14,40	0,30	33,00	19,00	22,80	13000
9,90	5,00	0,23	13,80	0,60	38,00	24,00	27,50	10000
10,60	5,80	0,26	14,50	0,60	43,00	29,00	24,10	9100
13,90	8,30	0,38	14,80	1,00	50,00	35,00	38,20	7500

6,30	2,60	0,12	12,10	0,60	26,00	14,00	16,00	18000
10,10	4,75	0,22	13,10	0,60	31,00	19,00	21,10	12000
13,50	6,60	0,30	13,10	1,00	42,00	25,00	25,90	11000
13,80	7,90	0,45	13,90	1,00	47,00	30,00	31,80	8700
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	7300

6,30	3,25	0,15	14,40	0,30	33,00	19,00	22,80	15000
9,90	5,00	0,23	13,80	0,60	38,00	24,00	27,50	13000
10,60	5,80	0,26	14,50	0,60	43,00	29,00	31,60	11000
13,90	8,30	0,38	14,80	1,00	50,00	35,00	38,20	9300
16,80	10,30	0,47	14,80	1,00	57,00	40,00	43,50	8100

6,30	2,60	0,12	12,10	0,60	26,00	14,00	16,00	20000
13,50	6,60	0,30	13,10	1,00	42,00	25,00	25,90	12000
13,80	7,90	0,45	13,90	1,00	47,00	30,00	31,80	10000
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	8600

11,90	5,30	0,24	12,10	1,00	37,00	20,00	23,20	14000
16,80	7,90	0,36	12,40	1,00	45,50	26,50	30,00	11000
97,70	59,80	2,70	13,20	2,00	129,00	76,00	82,20	3800

TOPLINE deep groove ball bearings

FT150 - High temperatures up to +150°C

Characteristics

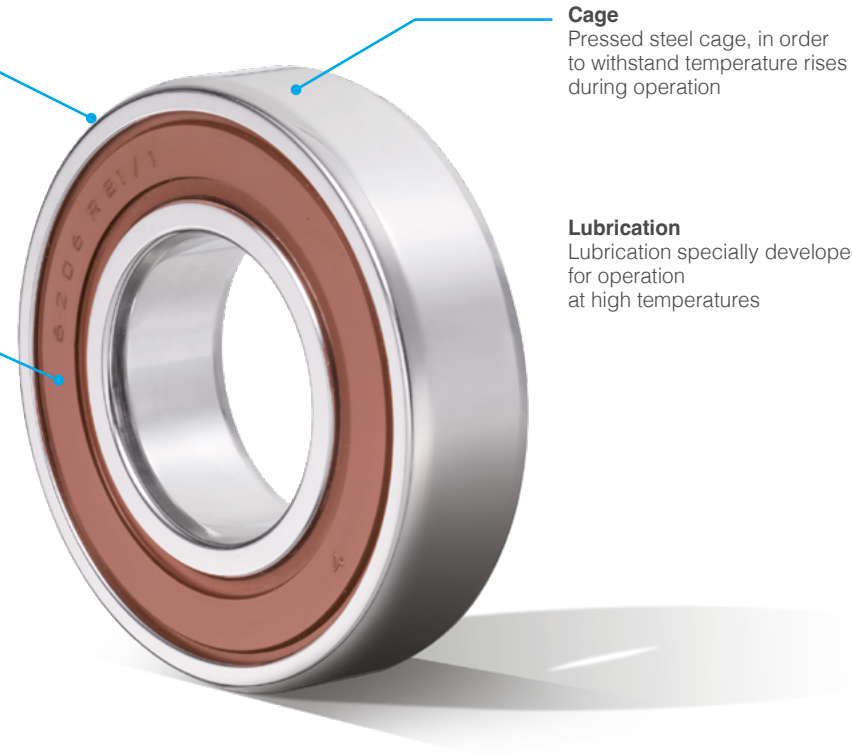
Internal clearance

Increased internal clearance C3 to compensate for thermal expansion

Sealing solutions

Two options:

- **Specific** high-temperature seals in Viton fluoroelastomer (FT150) with excellent resistance to chemical agents and high rotation speeds, highly effective against external pollution
- **Steel** shields (FT150ZZ), suitable for higher rotation speeds



Cage

Pressed steel cage, in order to withstand temperature rises during operation

Lubrication

Lubrication specially developed for operation at high temperatures

Applications

Industrial fans, electric motors, conveyor belts etc.



HT200 - High temperatures up to +200°C

Characteristics

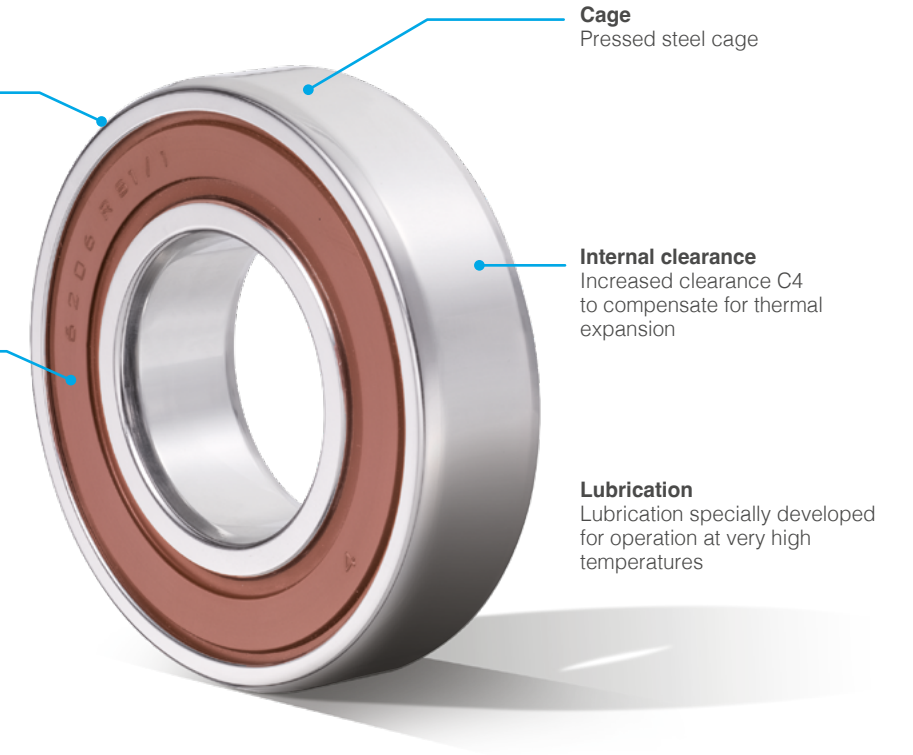
Material

Specific heat treatment ensuring steel stability up to +200°C

Sealing solutions

Two options:

- **Specific** high-temperature seals in Viton fluoroelastomer (HT200) with an operating temperature range of -40°C to +200°C
- **Steel** shields (HT200ZZ), suitable for higher rotation speeds



Cage

Pressed steel cage

Internal clearance

Increased clearance C4 to compensate for thermal expansion

Lubrication

Lubrication specially developed for operation at very high temperatures

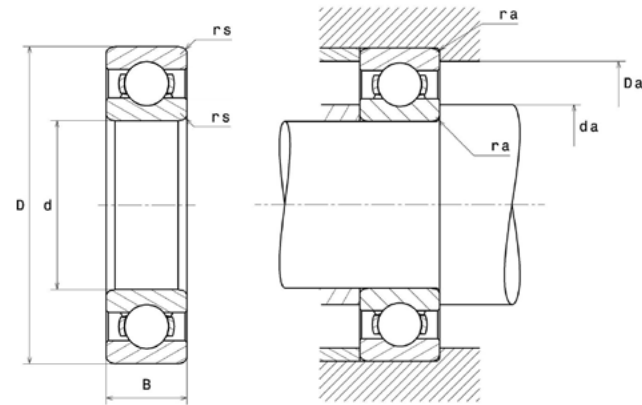
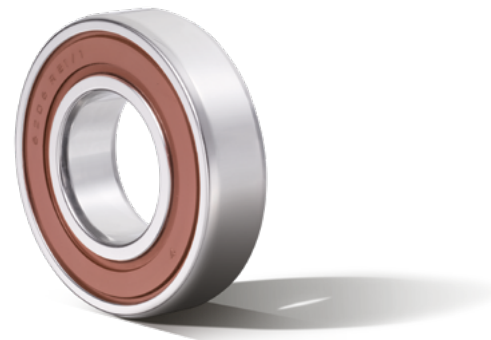
Applications

Packaging machines, ovens in the food industry, electric motors, dryers, etc.



FT150 range

High temperatures up to +150°C

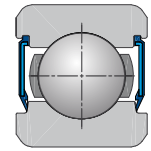


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Sealed version (FT150)

Bore code	Bearing	Internal clearance	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

FT150 - Sealed version

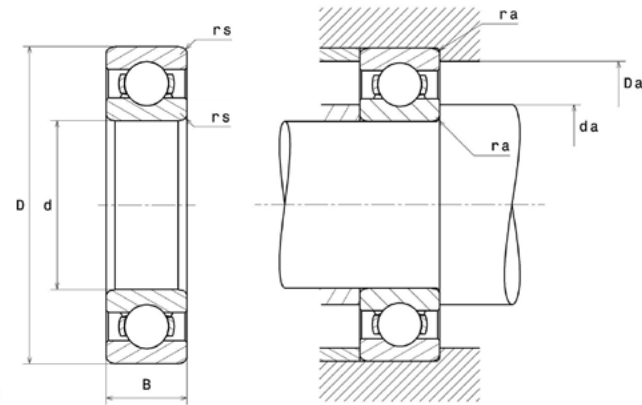
60xx series							
00	6000FT150	C3	10	26	8	0,30	0,0200
01	6001FT150	C3	12	28	8	0,30	0,0210
02	6002FT150	C3	15	32	9	0,30	0,0300
03	6003FT150	C3	17	35	10	0,30	0,0390
04	6004FT150	C3	20	42	12	0,60	0,0680
05	6005FT150	C3	25	47	12	0,60	0,0770
06	6006FT150	C3	30	55	13	1,00	0,1160
07	6007FT150	C3	35	62	14	1,00	0,1530
08	6008FT150	C3	40	68	15	1,00	0,1920
09	6009FT150	C3	45	75	16	1,00	0,2430
10	6010FT150	C3	50	80	16	1,00	0,2670
13	6013FT150	C3	65	100	18	1,10	0,4300
62xx series							
00	6200FT150	C3	10	30	9	0,60	0,0330
01	6201FT150	C3	12	32	10	0,60	0,0380
02	6202FT150	C3	15	35	11	0,60	0,0450
03	6203FT150	C3	17	40	12	0,60	0,0677
04	6204FT150	C3	20	47	14	1,00	0,1070
06	6206FT150	C3	30	62	16	1,00	0,1990
07	6207FT150	C3	35	72	17	1,10	0,2850
08	6208FT150	C3	40	80	18	1,10	0,3730
09	6209FT150	C3	45	85	19	1,10	0,4040
10	6210FT150	C3	50	90	20	1,10	0,4530
13	6213FT150	C3	65	120	23	1,50	0,9900
63xx series							
03	6303FT150	C3	17	47	14	1,00	0,1100
04	6304FT150	C3	20	52	15	1,10	0,1350
05	6305FT150	C3	25	62	17	1,10	0,2250
06	6306FT150	C3	30	72	19	1,10	0,3460
07	6307FT150	C3	35	80	21	1,50	0,4460
08	6308FT150	C3	40	90	23	1,50	0,6120
09	6309FT150	C3	45	100	25	1,50	0,8250
10	6310FT150	C3	50	110	27	2,00	1,0700

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Mechanical limiting speed

4,80	1,97	0,09	12,40	0,30	24,00	12,00	14,70	20000
5,40	2,37	0,11	13,10	0,30	26,00	14,00	17,20	17000
5,90	2,85	0,13	13,90	0,30	30,00	17,00	20,50	14000
6,30	3,25	0,15	14,40	0,30	33,00	19,00	27,50	13000
9,90	5,00	0,23	13,80	0,60	38,00	24,00	27,50	10000
10,60	5,80	0,26	14,50	0,60	43,00	29,00	31,60	9100
13,90	8,30	0,38	14,80	1,00	50,00	35,00	38,20	7500
16,80	10,30	0,47	14,80	1,00	57,00	40,00	43,50	6600
17,70	11,50	0,52	15,30	1,00	63,00	45,00	27,80	5900
22,10	15,10	0,69	15,30	1,00	70,00	50,00	54,20	5300
23,00	16,60	0,75	15,60	1,00	75,00	55,00	59,70	4800
32,20	25,20	1,15	15,80	1,00	93,50	71,50	48,40	3800
63xx series								
6,30	2,60	0,12	12,10	0,60	26,00	14,00	33,60	18000
7,30	3,10	0,14	12,20	0,60	28,00	16,00	51,90	16000
8,10	3,75	0,17	13,10	0,60	31,00	19,00	19,70	14000
10,10	4,75	0,22	13,10	0,60	36,00	21,00	24,10	12000
13,50	6,60	0,30	13,10	1,00	42,00	25,00	25,90	10000
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	7300
27,10	15,30	0,70	13,80	1,00	65,50	41,50	25,90	6300
30,70	17,90	0,81	14,00	1,00	73,50	46,50	34,30	5500
34,50	20,40	0,93	14,10	1,00	78,50	51,50	54,50	5100
37,00	23,20	1,05	14,40	1,00	83,50	56,50	30,00	4700
60,30	40,10	1,82	14,40	1,50	112,00	73,00	77,50	3600
63xx series								
14,40	6,60	0,30	12,40	1,00	42,00	22,00	64,70	10000
16,80	7,90	0,36	12,40	1,00	45,50	26,50	25,00	9500
24,90	12,10	0,55	12,20	1,00	55,50	31,50	37,90	8200
29,70	15,90	0,72	13,10	1,00	65,50	36,50	41,70	6600
35,10	19,20	0,87	13,20	1,50	72,00	43,00	46,20	6000
42,90	24,00	1,09	13,20	1,50	82,00	48,00	51,90	5300
55,60	31,70	1,44	13,00	1,50	92,00	53,00	59,30	4800
65,40	38,30	1,74	13,20	2,00	101,00	59,00	64,70	4200

FT150 range

High temperatures up to +150°C

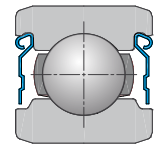


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Shielded version (FT150ZZ)

Bore code	Bearing	Internal clearance	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

FT150ZZ - Shielded version

60xx series

00	6000FT150ZZ	C3	10	26	8	0,30	0,0200
01	6001FT150ZZ	C3	12	28	8	0,30	0,0210
02	6002FT150ZZ	C3	15	32	9	0,30	0,0300
03	6003FT150ZZ	C3	17	35	10	0,30	0,0390
04	6004FT150ZZ	C3	20	42	12	0,60	0,0680
05	6005FT150ZZ	C3	25	47	12	0,60	0,0770
06	6006FT150ZZ	C3	30	55	13	1,00	0,1160
07	6007FT150ZZ	C3	35	62	14	1,00	0,1530
08	6008FT150ZZ	C3	40	68	15	1,00	0,1920
09	6009FT150ZZ	C3	45	75	16	1,00	0,2430
10	6010FT150ZZ	C3	50	80	16	1,00	0,2670

62xx series

00	6200FT150ZZ	C3	10	30	9	0,60	0,0330
01	6201FT150ZZ	C3	12	32	10	0,60	0,0370
02	6202FT150ZZ	C3	15	35	11	0,60	0,0400
03	6203FT150ZZ	C3	17	40	12	0,60	0,0677
04	6204FT150ZZ	C3	20	47	14	1,00	0,1070
05	6205FT150ZZ	C3	25	52	15	1,00	0,1280
06	6206FT150ZZ	C3	30	62	16	1,00	0,1990
07	6207FT150ZZ	C3	35	72	17	1,10	0,2850
08	6208FT150ZZ	C3	40	80	18	1,10	0,3640
09	6209FT150ZZ	C3	45	85	19	1,10	0,4040
10	6210FT150ZZ	C3	50	90	20	1,10	0,4530

63xx series

00	6300FT150ZZ	C3	10	35	11	0,60	0,0530
01	6301FT150ZZ	C3	12	37	12	1,00	0,0600
02	6302FT150ZZ	C3	15	42	13	1,00	0,0830
03	6303FT150ZZ	C3	17	47	14	1,00	0,1100
04	6304FT150ZZ	C3	20	52	15	1,10	0,1350
05	6305FT150ZZ	C3	25	62	17	1,10	0,2250
06	6306FT150ZZ	C3	30	72	19	1,10	0,3460
07	6307FT150ZZ	C3	35	80	21	1,50	0,4460
08	6308FT150ZZ	C3	40	90	23	1,50	0,6120
09	6309FT150ZZ	C3	45	100	25	1,50	0,8250

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Mechanical limiting speed

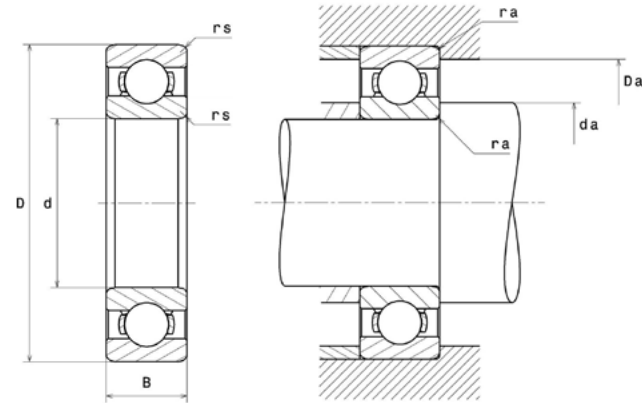
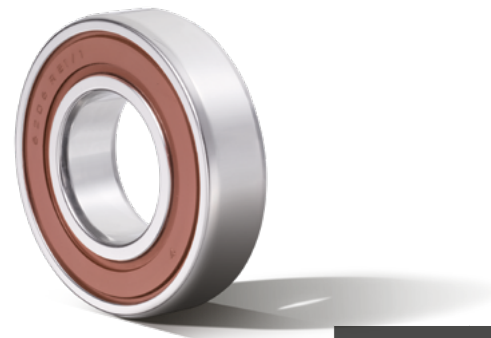
4,80	1,97	0,09	12,40	0,30	24,00	12,00	14,70	28000
5,40	2,37	0,11	13,10	0,30	26,00	14,00	17,20	25000
5,90	2,85	0,13	13,90	0,30	30,00	17,00	20,50	21000
6,30	3,25	0,15	14,40	0,30	33,00	19,00	22,80	19000
9,90	5,00	0,23	13,80	0,60	38,00	24,00	27,50	16000
10,60	5,80	0,26	14,50	0,60	43,00	29,00	31,60	14000
13,90	8,30	0,38	14,80	1,00	50,00	35,00	38,20	12000
16,80	10,30	0,47	14,80	1,00	57,00	40,00	43,50	10000
17,70	11,50	0,52	15,30	1,00	63,00	45,00	48,90	9100
22,10	15,10	0,69	15,30	1,00	70,00	50,00	54,20	8200
23,00	16,60	0,75	15,60	1,00	75,00	55,00	59,70	7500

6,30	2,60	0,12	12,10	0,60	26,00	14,00	16,00	25000
7,30	3,10	0,14	12,20	0,60	28,00	16,00	18,30	23000
8,10	3,75	0,17	13,10	0,60	31,00	19,00	21,10	20000
10,10	4,75	0,22	13,10	0,60	36,00	21,00	24,10	17000
13,50	6,60	0,30	13,10	1,00	42,00	25,00	25,90	15000
14,80	7,90	0,36	13,90	1,00	47,00	30,00	31,80	13000
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	11000
27,10	15,30	0,70	13,80	1,00	65,50	41,50	44,00	9200
30,70	17,90	0,81	14,00	1,00	73,50	46,50	50,30	8200
34,50	20,40	0,93	14,10	1,00	78,50	51,50	54,50	7600
37,00	23,20	1,05	14,40	1,00	83,50	56,50	59,60	7000

8,50	3,45	0,16	11,20	0,60	31,00	14,00	15,40	22000
10,20	4,20	0,19	11,10	1,00	32,00	17,00	19,30	20000
11,90	5,30	0,24	12,10	1,00	37,00	20,00	23,20	17000
14,40	6,60	0,30	12,40	1,00	42,00	22,00	27,50	15000
16,80	7,90	0,36	12,40	1,00	45,50	26,50	30,00	14000
24,90	12,10	0,55	12,20	1,00	55,50	31,50	33,60	11000
29,70	15,90	0,72	13,10	1,00	65,50	36,50	42,40	9500
35,10	19,20	0,87	13,20	1,50	72,00	43,00	46,20	8500
42,90	24,00	1,09	13,20	1,50	82,00	48,00	51,90	7600
55,60	31,70	1,44	13,00	1,50	92,00	53,00	59,30	6800

HT200 range

High temperatures up to +200°C

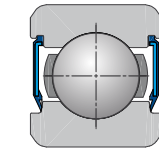


d - Inner diameter

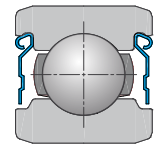
D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Sealed version (HT200)



Shielded version (HT200ZZ)

Bore code	Bearing	Internal clearance	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

HT200 - Sealed version

60xx series							
04	6004HT200	C4	20	42	12	0,60	0,0700
08	6008HT200	C4	40	68	15	1,00	0,1920
09	6009HT200	C4	45	75	16	1,00	0,2430
62xx series							
04	6204HT200	C4	20	47	14	1,00	0,1070
05	6205HT200	C4	25	52	15	1,00	0,1280
06	6206HT200	C4	30	62	16	1,00	0,1990
07	6207HT200	C4	35	72	17	1,10	0,2850
08	6208HT200	C4	40	80	18	1,10	0,3640
09	6209HT200	C4	45	85	19	1,10	0,4040
10	6210HT200	C4	50	90	20	1,10	0,4530
63xx series							
04	6304HT200	C4	20	52	15	1,10	0,1470
05	6305HT200	C4	25	62	17	1,10	0,2250
06	6306HT200	C4	30	72	19	1,10	0,3460
08	6308HT200	C4	40	90	23	1,50	0,6120
10	6310HT200	C4	50	110	27	2,00	1,0700

HT200ZZ - Shielded version

60xx series							
05	6005HT200ZZ	C4	25	47	12	0,60	0,0800
09	6009HT200ZZ	C4	45	75	16	1,00	0,2430
62xx series							
01	6201HT200ZZ	C4	12	32	10	0,60	0,0380
02	6202HT200ZZ	C4	15	35	11	0,60	0,0450
03	6203HT200ZZ	C4	17	40	12	0,60	0,0677
04	6204HT200ZZ	C4	20	47	14	1,00	0,1070
05	6205HT200ZZ	C4	25	52	15	1,00	0,1280
06	6206HT200ZZ	C4	30	62	16	1,00	0,1990
07	6207HT200ZZ	C4	35	72	17	1,10	0,2850
08	6208HT200ZZ	C4	40	80	18	1,10	0,3640
09	6209HT200ZZ	C4	45	85	19	1,10	0,4040
10	6210HT200ZZ	C4	50	90	20	1,10	0,4530
63xx series							
04	6304HT200ZZ	C4	20	52	15	1,10	0,1470
05	6305HT200ZZ	C4	25	62	17	1,10	0,2250
06	6306HT200ZZ	C4	30	72	19	1,10	0,3460
07	6307HT200ZZ	C4	35	80	21	1,50	0,4460
08	6308HT200ZZ	C4	40	90	23	1,50	0,6120
09	6309HT200ZZ	C4	45	100	25	1,50	0,8250

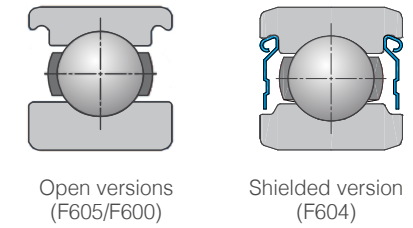
Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Mechanical limiting speed

9,90	5,00	0,23	13,80	0,60	38,00	24,00	27,50	7600
17,70	11,50	0,52	15,30	1,00	63,00	45,00	48,90	4400
22,10	15,10	0,69	15,30	1,00	70,00	50,00	54,20	3900
13,50	6,60	0,30	13,10	1,00	42,00	25,00	25,90	7100
13,80	7,90	0,45	13,90	1,00	47,00	30,00	31,80	6100
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	5200
27,10	15,30	0,70	13,80	1,00	65,50	41,50	44,00	4400
30,70	17,90	0,81	14,00	1,00	73,50	46,50	44,70	3900
34,50	20,40	0,93	14,10	1,00	78,50	51,50	54,50	3600
37,00	23,20	1,05	14,40	1,00	83,50	56,50	18,30	3400
16,80	7,90	0,36	12,40	1,00	45,50	26,50	30,00	6600
24,90	12,10	0,55	12,20	1,00	55,50	31,50	90,90	5500
29,70	15,90	0,72	13,10	1,00	65,50	36,50	42,40	4600
42,90	24,00	1,09	13,20	1,50	82,00	48,00	51,90	3600
65,40	38,30	1,74	13,20	2,00	101,00	59,00	119,00	2900

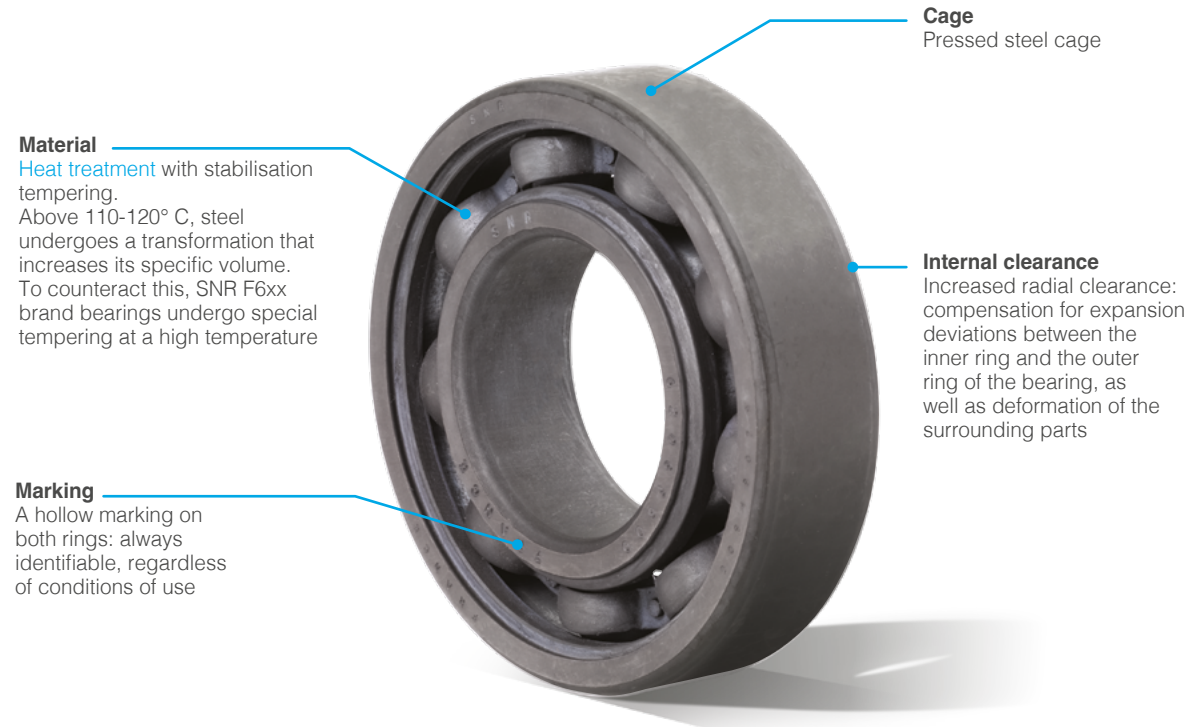
10,60	5,80	0,26	14,50	0,60	43,00	29,00	31,60	6700
22,10	15,10	0,69	15,30	1,00	70,00	50,00	54,20	3900
7,30	3,10	0,14	12,20	0,60	28,00	16,00	18,30	11000
8,10	3,75	0,17	13,10	0,60	31,00	19,00	21,10	9400
10,10	4,75	0,22	13,10	0,60	36,00	21,00	24,10	8400
13,50	6,60	0,30	13,10	1,00	42,00	25,00	25,90	7100
13,80	7,90	0,45	13,90	1,00	47,00	30,00	31,80	6100
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	5200
27,10	15,30	0,70	13,80	1,00	65,50	41,50	44,00	4400
30,70	17,90	0,81	14,00	1,00	73,50	46,50	50,30	3900
34,50	20,40	0,93	14,10	1,00	78,50	51,50	54,50	3600
37,00	23,20	1,05	14,40	1,00	83,50	56,50	59,60	3400
16,80	7,90	0,36	12,40	1,00	45,50	26,50	30,00	6600
24,90	12,10	0,55	12,20	1,00	55,50	31,50	33,60	5500
29,70	15,90	0,72	13,10	1,00	65,50	36,50	41,70	4600
35,10	19,20	0,87	13,20	1,50	72,00	43,00	46,20	4100
42,90	24,00	1,09	13,20	1,50	82,00	48,00	51,90	3600
55,60	31,70	1,44	13,00	1,50	92,00	53,00	59,30	3200

TOPLINE deep groove ball bearings

F6xx - Very high temperatures up to +350°C



Characteristics



Cage
Pressed steel cage

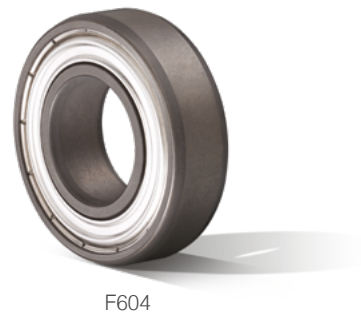
Material
Heat treatment with stabilisation tempering. Above 110-120° C, steel undergoes a transformation that increases its specific volume. To counteract this, SNR F6xx brand bearings undergo special tempering at a high temperature

Internal clearance
Increased radial clearance: compensation for expansion deviations between the inner ring and the outer ring of the bearing, as well as deformation of the surrounding parts

Marking
A hollow marking on both rings: always identifiable, regardless of conditions of use

Three proposals for optimal performance, depending on the requirements of your application:

- **F605**: open, no surface processing, permissible temperature range -40°C to 350°C
- **F600**: open, specific surface processing (phosphating and MoS2 deposition), permissible temperature range -40°C to 350°C
- **F604**: Shielded version, lubrication adapted to very high temperatures, specific surface treatment (phosphating and MoS2 deposition), permissible temperature range of -30°C to 350°C



F604

Reference	F605			Lubricant quantity (g)	Dimensions (mm)			Speed limit (rpm)	Shoulders and fillets (mm)			Mass (kg)	Maximum recommended permissible load per roller bearing (kN)							
	F605	F600	F604		d	D	B		ra max (mm)	Da max (mm)	da min (mm)		Idler wheel (2 bearings per wheel)				Axle on two bearings (1 bearing per wheel)			
													200°	250°	300°	350°	200°	250°	300°	350°
6004	X	X	X	1,4	20	42	12	140	0,6	38	24	0,07	1,7	1,5	1,3	1	2,4	2,3	2	1,6
6005			X	1,4	25	47	12	120	0,6	43	29	0,08	1,9	1,7	1,5	1,2	2,8	2,6	2,3	1,9
6007	X	X	X	3,2	35	62	14	90	1	57	40	0,15	3,4	3,1	2,6	2,1	4,9	4,6	4,1	3,3
6008	X	X		3,9	40	68	15	80	1	63	45	0,19	3,8	3,5	2,9	2,3	5,5	5,2	4,6	3,7
6201			X	1	12	32	10	200	0,6	28	16	0,04	1	0,9	0,8	0,6	1,5	1,4	1,2	1
6204	X	X	X	2,3	20	47	14	130	1	42	25	0,1	2,2	2	1,7	1,3	3,2	3	2,6	2,1
6205	X	X	X	2,7	25	52	15	110	1	47	30	0,13	2,6	2,4	2	1,6	3,8	3,6	3,2	2,5
6206	X	X	X	4	30	62	16	100	1	57	35	0,19	3,7	3,4	2,8	2,3	5,4	5,1	4,5	3,6
6207	X	X	X	5,7	35	72	17	80	1	65,5	41,5	0,27	5	4,6	3,8	3,1	7,3	6,9	6,1	4,9
6208	X	X	X	7,6	40	80	18	70	1	73,5	46,5	0,35	5,9	5,4	4,5	3,6	8,6	8,1	7,2	5,7
6209	X	X	X	9,3	45	85	19	70	1	78,5	51,5	0,39	6,8	6,2	5,1	4,1	9,8	9,2	8,2	6,6
6210	X	X	X	10,8	50	90	20	60	1	83,5	56,5	0,44	7,7	7	5,8	4,6	11,1	10,4	9,3	7,4
6211	X	X	X	13,5	55	100	21	60	1,5	92	63	0,58	9,6	8,7	7,3	5,8	13,9	13,1	11,6	9,3
6212	X	X	X	17,7	60	110	22	50	1,5	102	68	0,73	11,9	10,8	9	7,2	17,3	16,2	14,4	11,5
6213	X	X	X	20,4	65	120	23	50	1,5	112	73	0,94	13,2	12	10	8	19,2	18	16	12,8
6214	X	X	X	24,5	70	125	24	40	1,5	117	78	1,03	14,5	13,2	11	8,8	21,1	19,8	17,6	14,1
6217		X		-	85	150	28	40	2	139	96	1,79	21,1	19,2	16	12,8	30,7	28,8	25,6	20,5
6305	X	X	X	5,1	25	62	17	100	1	55,5	31,5	0,24	4	3,7	3,1	2,4	5,9	5,5	4,9	3,9
6306	X	X		6,9	30	72	19	90	1	65,5	36,5	0,35	5,2	4,7	4	3,2	7,6	7,1	6,3	5,1
6307	X	X		-	35	80	21	80	1,5	72	43	0,45	6,4	5,8	4,8	3,8	9,2	8,6	7,7	6,1
6309	X	X	X	18,9	45	100	25	60	1,5	92	53	0,83	10,4	9,5	7,9	6,3	15,1	14,2	12,6	10,1
6310	X			-	50	110	27	50	2	101	59	1,07	12,5	11,4	9,5	7,6	18,2	17,1	15,2	12,2
6311	X	X	X	31,1	55	120	29	50	2	111	64	1,35	14,7	13,4	11,1	8,9	21,4	20	17,8	14,2
6312	X	X		-	60	130	31	50	2	119	71	1,68	17,2	15,6	13	10,4	25	23,4	20,8	16,6

Applications

Kiln cars, construction material manufacturing, steel industry etc.





TOPLINE deep groove ball bearings

HVZZ - High speeds

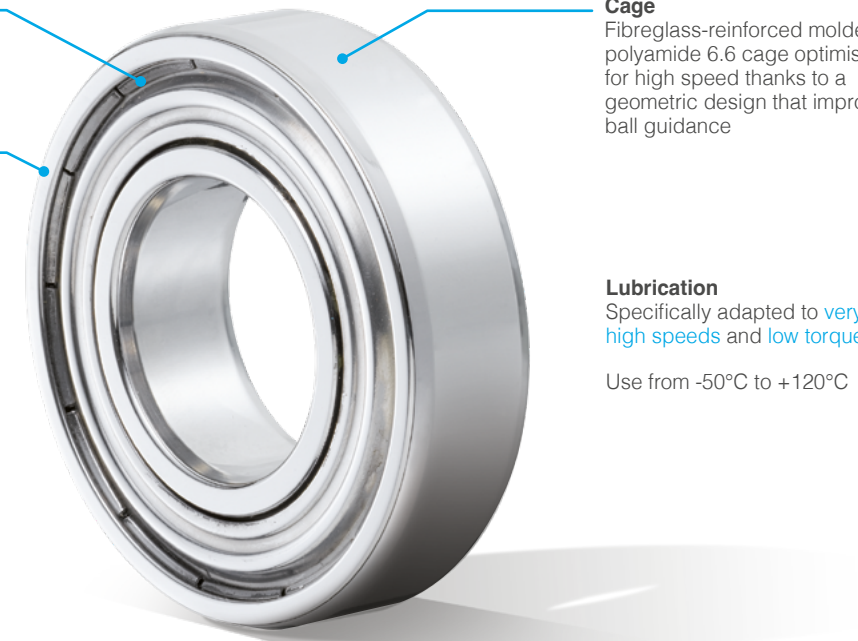
Characteristics

Shields
Mild steel

- Design**
- High precision equivalent to with standard DIN620 P6 or ISO 492
 - High ball precision of grade ≤ 10 . Grade 10 is the 3rd strictest grade in the classification of rolling elements (in order: grade 3, 5, 10, 16, etc). Extremely high quality surface condition
 - Optimised internal geometry, tighter tolerances

Cage
Fibreglass-reinforced molded polyamide 6.6 cage optimised for high speed thanks to a geometric design that improves ball guidance

Lubrication
Specifically adapted to **very high speeds** and **low torque**
Use from -50°C to +120°C



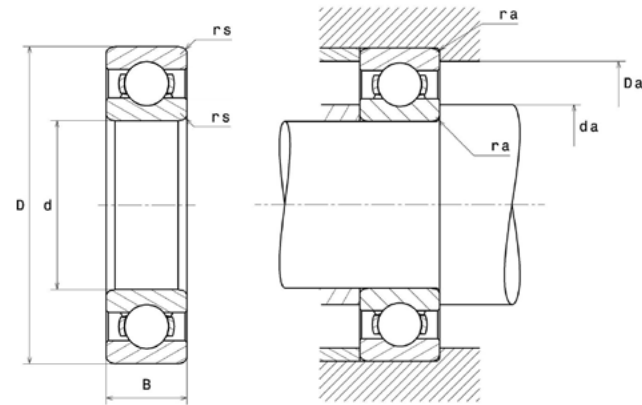
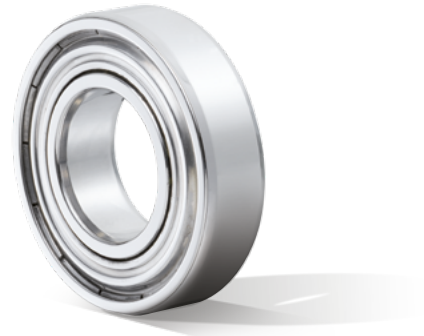
HVZZ bearings contribute to reduced energy consumption.

Applications

Wood machines, electric motors, wire rolling mills etc.

HVZZ range

High speeds

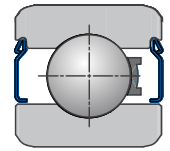


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



HVZZ

Bore code	Bearing	Internal clearance	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

HVZZ- Shielded version

60x series							
00	6000HVZZ	C3	10	26	8	0,30	0,0200
01	6001HVZZ	C3	12	28	8	0,30	0,0210
02	6002HVZZ	C3	15	32	9	0,30	0,0300
03	6003HVZZ	C3	17	35	10	0,30	0,0400
04	6004HVZZ	C3	20	42	12	0,60	0,0680
05	6005HVZZ	C3	25	47	12	0,60	0,0770
06	6006HVZZ	C3	30	55	13	1,00	0,1160
07	6007HVZZ	C3	35	62	14	1,00	0,1530
08	6008HVZZ	C3	40	68	15	1,00	0,1920
09	6009HVZZ	C3	45	75	16	1,00	0,2430
10	6010HVZZ	C3	50	80	16	1,00	0,2670
11	6011HVZZ	C3	55	90	18	1,10	0,3870
62xx series							
01	6201HVZZ	C3	12	32	10	0,60	0,0380
02	6202HVZZ	C3	15	35	11	0,60	0,0450
03	6203HVZZ	C3	17	40	12	0,60	0,0677
04	6204HVZZ	C3	20	47	14	1,00	0,1070
05	6205HVZZ	C3	25	52	15	1,00	0,1280
06	6206HVZZ	C3	30	62	16	1,00	0,1990
07	6207HVZZ	C3	35	72	17	1,10	0,2850
08	6208HVZZ	C3	40	80	18	1,10	0,3640
09	6209HVZZ	C3	45	85	19	1,10	0,4040
10	6210HVZZ	C3	50	90	20	1,10	0,4530
63xx series							
08	6308HVZZ	C3	40	90	23	1,50	0,6120

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Mechanical limiting speed

4,80	1,97	0,09	12,40	0,30	24,00	12,00	14,70	51000
5,40	2,37	0,11	13,10	0,30	26,00	14,00	17,20	46000
5,90	2,85	0,13	13,90	0,30	30,00	17,00	20,50	39000
6,30	3,25	0,15	14,40	0,30	33,00	19,00	22,80	35000
9,90	5,00	0,23	13,80	0,60	38,00	24,00	27,50	29000
10,60	5,80	0,26	14,50	0,60	43,00	29,00	31,60	26000
13,90	8,30	0,38	14,80	1,00	50,00	35,00	38,20	19000
16,80	10,30	0,47	14,80	1,00	57,00	40,00	43,50	16000
17,70	11,50	0,52	15,30	1,00	63,00	45,00	48,90	17000
22,10	15,10	0,69	15,30	1,00	70,00	50,00	54,20	15000
23,00	16,60	0,75	15,60	1,00	75,00	55,00	59,70	14000
29,80	21,30	0,97	15,40	1,00	83,50	61,50	65,70	12000
7,30	3,10	0,14	12,20	0,60	28,00	16,00	18,30	38000
8,10	3,75	0,17	13,10	0,60	31,00	19,00	21,10	33000
10,10	4,75	0,22	13,10	0,60	36,00	21,00	24,10	30000
13,50	6,60	0,30	13,10	1,00	42,00	25,00	25,90	25000
14,80	7,90	0,36	13,90	1,00	47,00	30,00	31,80	22000
20,50	11,30	0,51	13,80	1,00	57,00	35,00	37,90	18000
27,10	15,30	0,70	13,80	1,00	65,50	41,50	44,00	16000
30,70	17,90	0,81	14,00	1,00	73,50	46,50	50,30	14000
34,50	20,40	0,93	14,10	1,00	78,50	51,50	54,50	13000
37,00	23,20	1,05	14,40	1,00	83,50	56,50	59,60	12000
42,90	24,00	1,09	13,20	1,50	82,00	48,00	51,90	13000

* We can offer versions with a single steel shield, do not hesitate to contact our teams to determine the most suitable solution to your application needs.

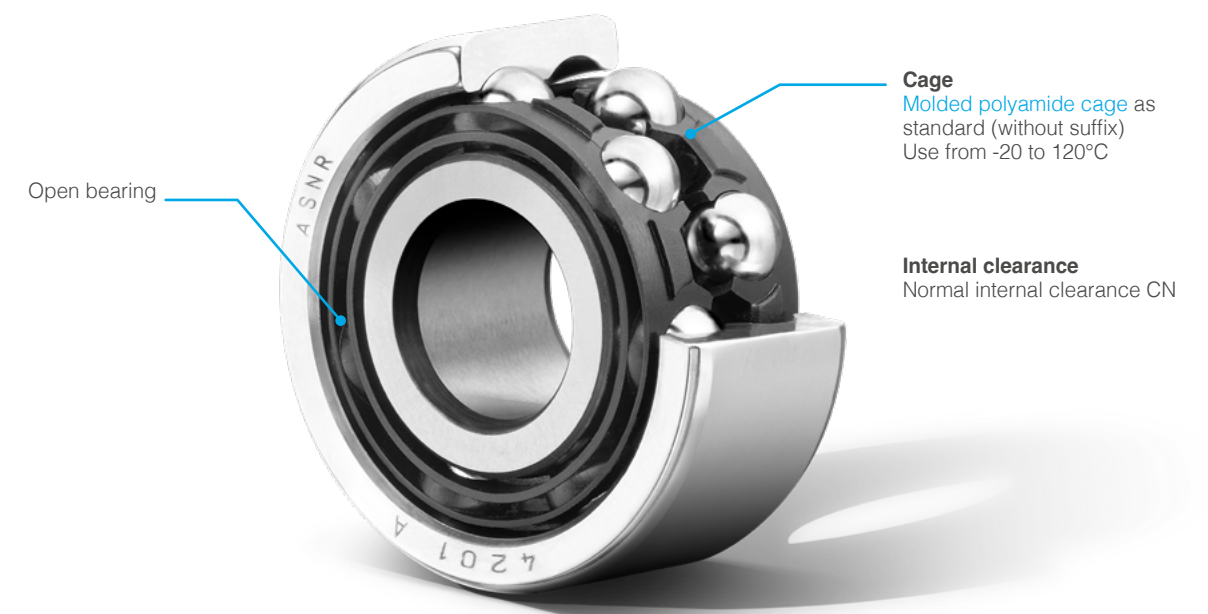
DOUBLE-ROW DEEP GROOVE BALL BEARINGS

Double-row deep groove ball bearings

Double-row deep groove ball bearings are designed to support higher radial loads than a single row ball bearing, as well as axial loads in both directions. They have identical inner and outer diameters, but are wider in order to meet space constraints where two deep groove ball bearings are required.

These bearings only allow minimal misalignment between the shaft and the housing, of around 0.06°.

Characteristics



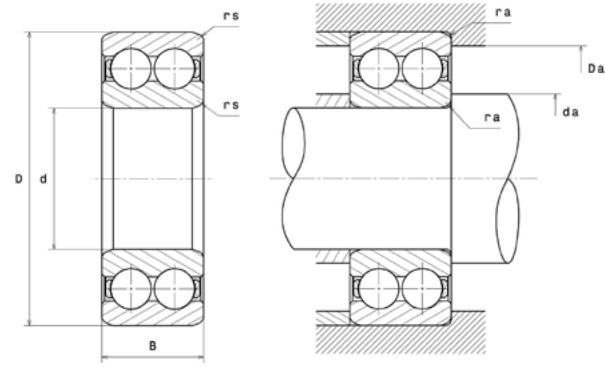
Tolerances

Double-row deep groove ball bearings can be supplied on request in tolerance classes 6, or 5 for all or certain characteristics (bore or radial run-out in tolerance class 6, for example).

Interchange

Technical specifications	NTN	SNR	FAG	SKF	NSK
Polyamide cage	-	No suffix	TVH	TN9	T
Without slot	-	A	-	A	B
Internal clearance (if different to standard clearance)	-	-	-	C2/C3 etc.	C2/C3 etc.

Double-row rigid ball bearings

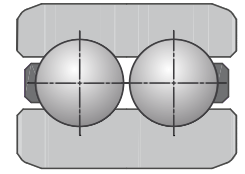


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Internal clearance	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass
00	4200A	CN, C3	10	30	14	0,60	0,0490
01	4201A	CN	12	32	14	0,60	0,0530
02	4202A	CN	15	35	14	0,60	0,0590
03	4203A	CN	17	40	16	0,60	0,0900
04	4204A	CN	20	47	18	1,00	0,1400
05	4205A	CN	25	52	18	1,00	0,1600
06	4206A	CN	30	62	20	1,00	0,2600
07	4207A	CN	35	72	23	1,10	0,4000
08	4208A	CN	40	80	23	1,10	0,5000
09	4209A	CN	45	85	23	1,10	0,5400
10	4210A	CN	50	90	23	1,10	0,5800

Basic load rating (kN)				Shoulder and fillet dimensions (mm)			Speed (rpm)	
Dynamic load capacity (Cn)	Capacité charge ctatique (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Reference thermal speed	Mechanical limiting speed
9,20	5,20	0,35	12,10	0,60	26,00	14,00	21000	24000
9,40	5,50	0,35	12,70	0,60	28,00	16,00	19000	22000
10,40	6,60	0,40	13,40	0,60	31,00	19,00	16000	19000
14,70	9,50	0,59	13,10	0,60	36,00	21,00	15000	17000
17,80	12,70	0,74	13,80	1,00	41,00	26,00	13000	14000
19,10	14,70	0,82	14,40	1,00	46,00	31,00	11000	12000
26,20	20,80	0,94	14,40	1,00	56,00	36,00	9600	10000
32,20	26,30	1,46	14,50	1,00	65,00	42,00	8700	9000
34,10	29,90	1,66	15,00	1,00	73,00	47,00	7600	8000
35,80	33,20	1,81	15,30	1,00	78,00	52,00	6900	7400
37,40	36,70	2,02	15,60	1,00	83,00	57,00	6300	6800



DOUBLE ROW ANGULAR CONTACT BALL BEARINGS

Double row angular contact ball bearings

Double row angular contact ball bearings have a similar configuration to two angular contact ball bearings, but have the advantage of taking up less space.

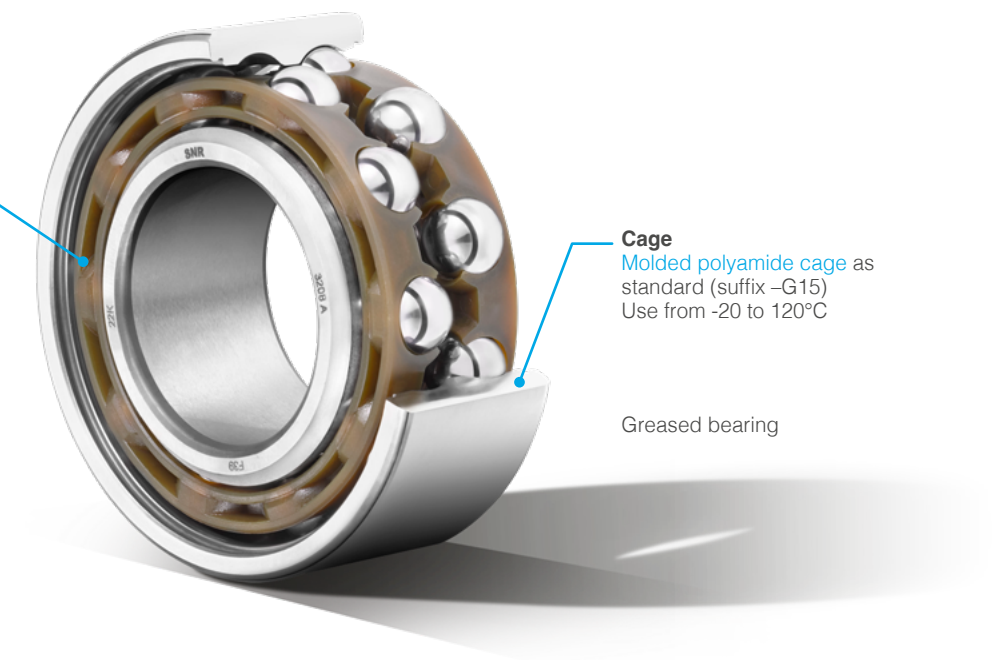
These bearings withstand axial and radial loads in both directions.

Characteristics

Sealing solutions :

Three options:

- open version
- with **contact seals** (-EE)
- with **steel shields** (-ZZ)



Cage
Molded polyamide cage as standard (suffix -G15)
Use from -20 to 120°C

Greased bearing

Tolerances and clearances

Tolerances

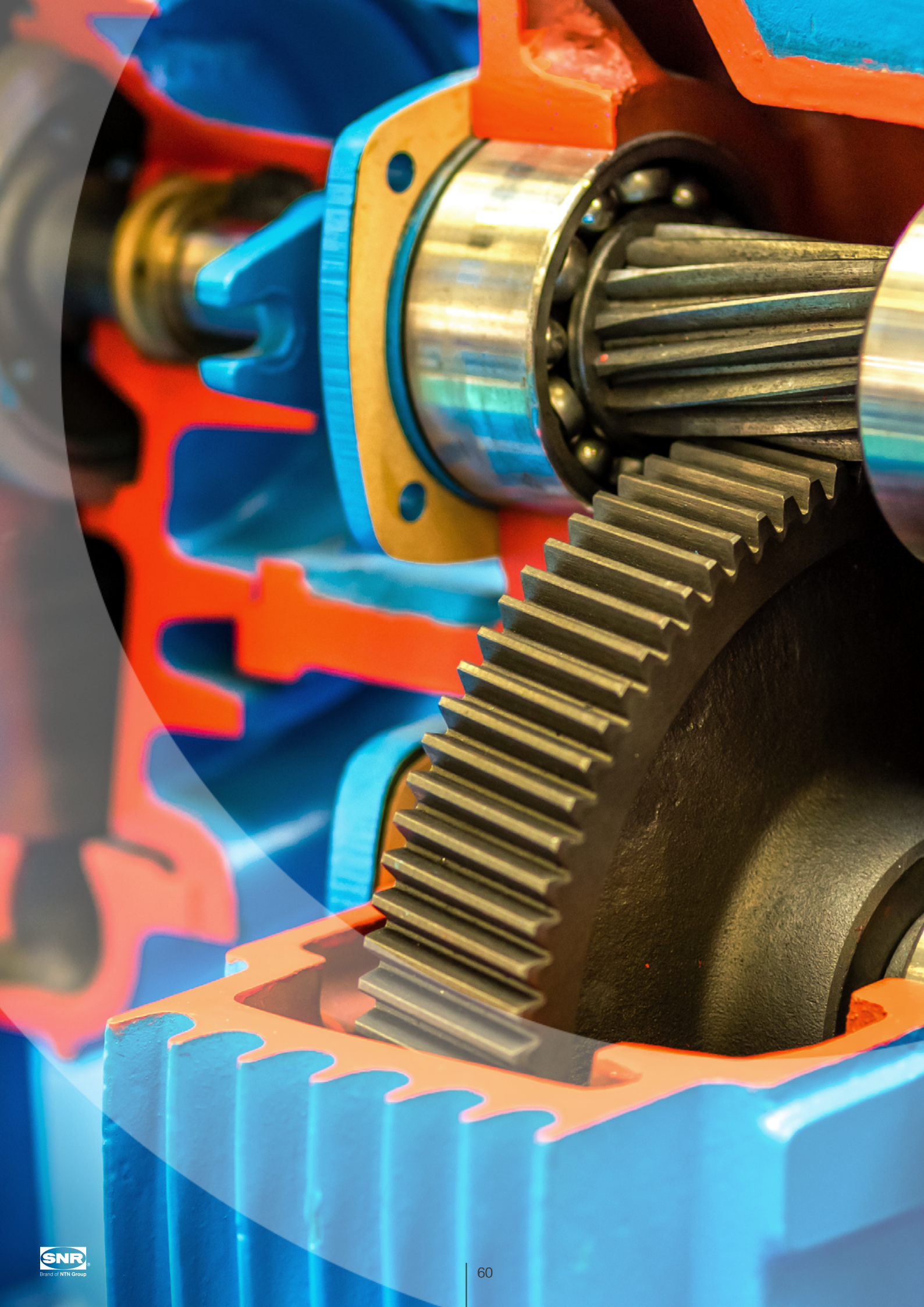
Bearings manufactured in the normal tolerance class (ISO 492).

Axial internal clearance

The axial clearance of these bearings is defined by the standard DIN628-3. Values are provided on request. The relationship between the radial clearance J_r of a bearing and the axial clearance J_a can be obtained using the following formula:

Type A: $J_r = 0,4 J_a$

Type B: $J_r = 0,5 J_a$



Mounting elements

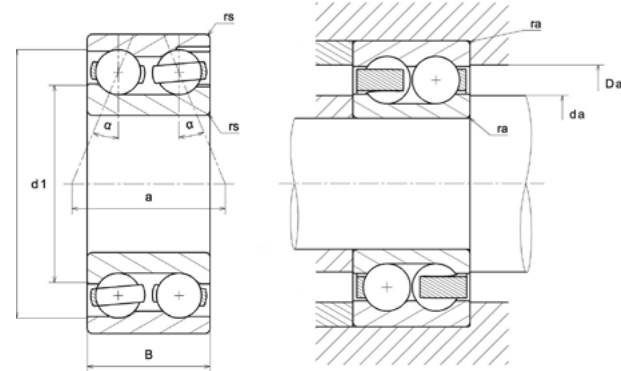
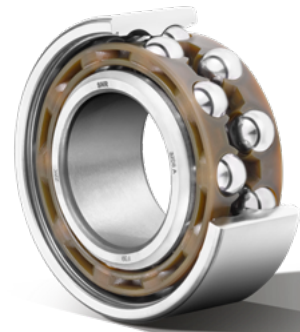
In most applications, this bearing is considered to be a single bearing. It can sometimes be used, due to the distance between the load application points, as a double bearing fulfilling the role of two bearings.

Interchange

Technical data	NTN	SNR	FAG	SKF	NSK
Contact angle from 32° to 35° with slot	3xxxS	3XXB	No suffix	No suffix	No suffix
Contact angle from 25° to 30° without slot	5xxxS	3xxxA	B	A	B
Polyamide cage	T2	G15	TVH / TVP	TN9	T
Pressed steel cage	No suffix	No suffix	No suffix	No suffix	J
1 or 2 pressed steel shields	5xxxSCZZ	5xxx ZZ	Z / 2Z	Z / 2Z	Z / ZZ
1 or 2 contact seals	5xxxSCLLD	5xxx EE	HRS / 2HRS	RS1 / 2RS1	RSR / 2RSR
1 or 2 non-contact seals	5xxxSCLLM	-	RSR / 2RSR	-	ZR / 2ZR
Axial internal clearance (if different to standard axial clearance)	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.



Angular contact double-row ball bearings

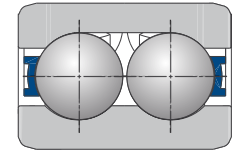


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Internal clearance	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

3xxxA

32xxA series

00	3200A	CN, C3	10	30	14,00	0,60	0,0430
01	3201A	CN, C3	12	32	15,90	0,60	0,0510
02	3202A	CN, C3	15	35	15,90	0,60	0,0580
03	3203A	CN, C3	17	40	17,50	0,60	0,0850
04	3204A	CN, C3	20	47	20,60	1,00	0,1470
05	3205A	CN, C3	25	52	20,60	1,00	0,1680
06	3206A	CN, C3	30	62	23,80	1,00	0,2740
07	3207A	CN, C3	35	72	27,00	1,10	0,4190
08	3208A	CN, C3	40	80	30,20	1,10	0,5270
09	3209A	CN, C3	45	85	30,20	1,10	0,5830
10	3210A	CN, C3	50	90	30,20	1,10	0,7600
11	3211A	CN, C3	55	100	33,30	1,50	0,8760
12	3212A	CN, C3	60	110	36,50	1,50	1,1800
13	3213A	CN, C3	65	120	38,10	1,50	1,5200
14	3214A	CN, C3	70	125	39,70	1,50	1,5200

33xxA series

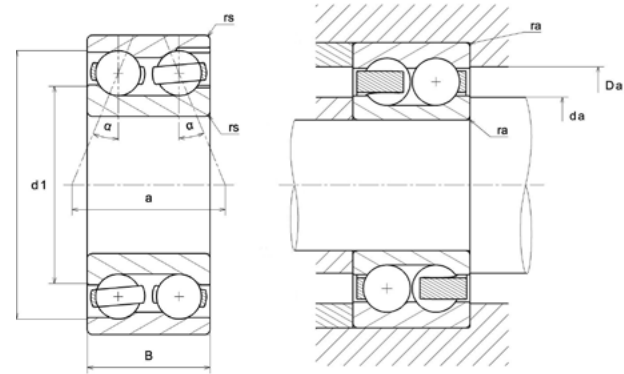
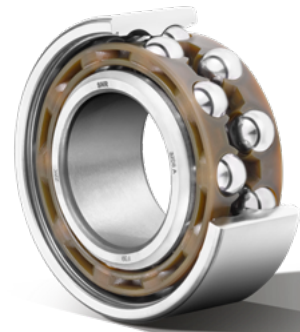
02	3302A	CN	15	42	19,00	1,00	0,1120
03	3303A	CN	17	47	22,20	1,00	0,1610
04	3304A	CN, C3	20	52	22,20	1,10	0,2080
05	3305A	CN, C3	25	62	25,40	1,10	0,3340
06	3306A	CN, C3	30	72	30,20	1,10	0,5190
08	3308A	CN, C3	40	90	36,50	1,50	0,9500
09	3309A	CN, C3	45	100	39,70	1,50	1,2100
10	3310A	CN, C3	50	110	44,40	2,00	1,6000
11	3311A	CN, C3	55	120	49,20	2,00	2,1100
12	3312A	CN, C3	60	130	54,00	2,10	3,2400
13	3313A	CN, C3	65	140	58,70	2,10	3,3900

Basic load rating (kN)				Shoulder and fillet dimensions (mm)			Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Thermal reference speed	Mechanical limiting speed

7,60	4,55	0,29	13,80	0,60	26,00	14,00	17000	23000
10,40	5,90	0,38	12,80	0,60	28,00	16,00	16000	22000
11,40	7,10	0,48	13,50	0,60	31,00	19,00	14000	20000
14,20	9,00	0,59	13,60	0,60	36,00	21,00	13000	17000
19,10	12,40	0,81	13,60	1,00	42,00	25,00	12000	15000
20,80	14,70	0,91	14,30	1,00	47,00	30,00	9700	13000
28,90	21,10	1,32	14,30	1,00	57,00	35,00	8500	11000
37,40	28,20	1,73	14,30	1,00	65,50	41,50	7600	9200
46,20	37,10	2,29	14,40	1,00	73,50	46,50	7000	8200
45,70	37,20	2,27	14,60	1,00	78,50	51,50	6500	7500
48,50	42,20	2,55	14,90	1,00	83,50	56,50	5900	7000
55,50	49,40	2,95	15,00	1,50	92,00	63,00	5500	6400
68,00	61,50	3,70	14,90	1,50	102,00	68,00	5200	5800
75,10	72,70	4,35	15,20	1,50	112,00	73,00	4800	5200
81,50	76,30	4,55	15,20	1,50	117,00	78,00	4600	5100

15,70	10,00	0,66	13,60	1,00	37,00	20,00	11000	16000
20,10	12,10	0,80	12,50	1,00	42,00	22,00	11000	15000
22,90	15,10	0,95	13,60	1,00	45,50	26,50	9100	13000
31,20	21,00	1,32	13,60	1,00	55,50	31,50	7800	11000
42,80	29,70	1,87	13,50	1,00	65,50	36,50	7100	9300
61,20	45,20	2,80	13,70	1,50	82,00	48,00	6000	7300
66,20	51,00	3,15	13,90	1,50	92,00	53,00	5500	6600
78,40	61,60	3,80	13,90	2,00	101,00	59,00	5200	6000
98,60	78,80	4,90	13,80	2,00	111,00	64,00	5000	5500
121,00	97,90	6,10	13,70	2,00	119,00	71,00	4700	5000
145,00	118,00	7,30	13,60	2,00	129,00	76,00	4500	4600

Double-row angular contact ball bearings

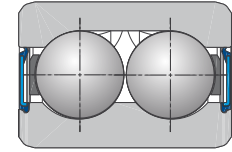


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Internal clearance	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

5xxx series- Sealed version

52xx series

01	5201EEG15	-	12	32	15,90	0,60	0,0510
02	5202EEG15	-	15	35	15,90	0,60	0,0580
03	5203EEG15	-	17	40	17,50	0,60	0,0850
04	5204EEG15	-	20	47	20,60	1,00	0,1400
05	5205EEG15	NR, C3	25	52	20,60	1,00	0,1600
06	5206EEG15	C3	30	62	23,80	1,00	0,2650
07	5207EEG15	-	35	72	27,00	1,10	0,4300
08	5208EEG15	-	40	80	30,20	1,10	0,5640
09	5209EEG15	-	45	85	30,20	1,10	0,6200
10	5210EEG15	C3	50	90	30,20	1,10	0,7600
11	5211EEG15	-	55	100	33,30	1,50	0,8760
12	5212EEG15	-	60	110	36,50	1,50	1,2500
13	5213EEG15	-	65	120	38,10	1,50	1,5200
14	5214EEG15	-	70	125	39,70	1,50	1,6400

53xx series

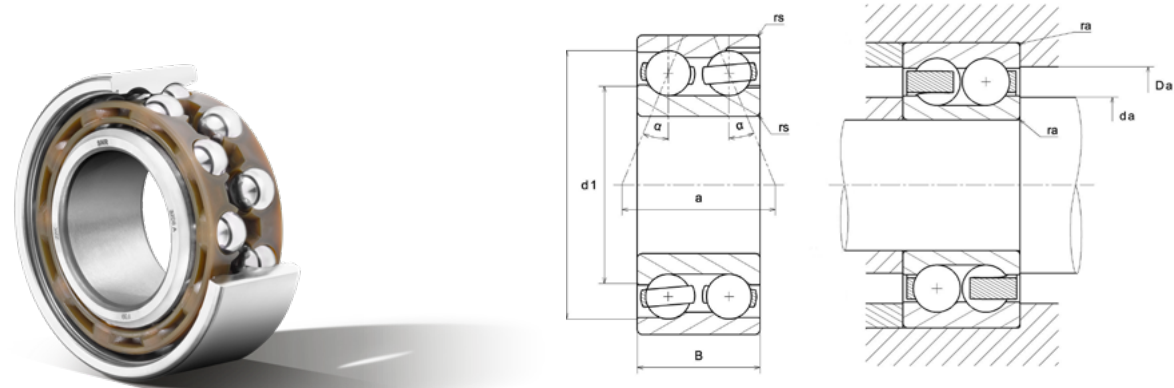
02	5302EEG15	-	15	42	19,00	1,00	0,1120
03	5303EEG15	-	17	47	22,20	1,00	0,1610
04	5304EEG15	-	20	52	22,20	1,10	0,2000
05	5305EEG15	-	25	62	25,40	1,10	0,3200
06	5306EEG15	-	30	72	30,20	1,10	0,5100
07	5307EEG15	-	35	80	34,90	1,50	0,6640
08	5308EEG15	-	40	90	36,50	1,50	1,0500
09	5309EEG15	-	45	100	39,70	1,50	1,4200
10	5310EEG15	-	50	110	44,40	2,00	1,9300

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Mechanical limiting speed

10,40	5,90	0,38	12,80	0,60	28,00	16,00	18,30	16000
11,40	7,10	0,48	13,50	0,60	31,00	19,00	21,10	14000
14,20	9,00	0,59	13,60	0,60	36,00	21,00	24,00	12000
19,10	12,50	0,81	13,70	1,00	42,00	25,00	28,80	10000
20,60	14,70	0,91	14,30	1,00	47,00	30,00	33,50	8600
28,10	21,10	1,32	14,30	1,00	57,00	35,00	40,00	7200
37,30	28,70	1,77	14,20	1,00	65,50	41,50	45,00	6100
46,20	37,10	2,29	14,40	1,00	73,50	46,50	48,00	5800
45,70	37,20	2,27	14,60	1,00	78,50	51,50	57,20	5000
48,50	42,20	2,55	14,90	1,00	83,50	56,50	62,00	4600
55,50	49,40	2,95	15,00	1,50	92,00	63,00	68,70	4200
67,20	61,50	3,65	15,10	1,50	102,00	68,00	70,00	4000
74,10	70,60	4,20	14,70	1,50	112,00	73,00	82,00	3500
78,40	76,30	4,55	15,20	1,50	117,00	78,00	86,80	3300

15,70	10,00	0,66	13,60	1,00	37,00	20,00	25,60	11000
20,10	12,10	0,80	12,50	1,00	42,00	22,00	26,20	11000
22,20	14,60	0,92	13,20	1,00	45,50	26,50	29,20	9800
28,30	19,40	1,21	13,40	1,00	55,50	31,50	36,40	7900
40,00	28,50	1,79	13,60	1,00	65,50	36,50	41,40	6700
50,20	34,60	2,21	13,40	1,50	72,00	43,00	49,30	5800
59,10	43,90	2,75	13,30	1,50	82,00	48,00	55,60	5200
65,80	51,00	3,15	13,90	1,50	92,00	53,00	62,00	4600
78,40	61,60	3,80	13,90	2,00	101,00	59,00	68,00	4200

Double-row angular contact ball bearings

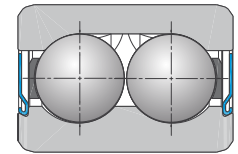


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Available options	Dimensions (mm)				Mass (kg)
			Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

5xxx series - Shielded version

52xx series

01	5201ZZG15	-	12	32	15,90	0,60	0,0510
02	5202ZZG15	NR	15	35	15,90	0,60	0,0580
03	5203ZZG15	NR	17	40	17,50	0,60	0,0850
04	5204ZZG15	NR	20	47	20,60	1,00	0,1400
05	5205ZZG15	NR	25	52	20,60	1,00	0,1600
06	5206ZZG15	NR	30	62	23,80	1,00	0,2620
07	5207ZZG15	NR	35	72	27,00	1,10	0,4300
08	5208ZZG15	NR	40	80	30,20	1,10	0,5700
09	5209ZZG15	NR	45	85	30,20	1,10	0,6200
10	5210ZZG15	NR	50	90	30,20	1,10	0,7600
11	5211ZZG15	NR	55	100	33,30	1,50	0,8760
12	5212ZZG15	NR	60	110	36,50	1,50	1,1800
13	5213ZZG15	-	65	120	38,10	1,50	1,5200
14	5214ZZG15	-	70	125	39,70	1,50	1,6400

53xx series

03	5303ZZG15	-	17	47	22,20	1,00	0,1600
04	5304ZZG15	NR	20	52	22,20	1,10	0,2000
05	5305ZZG15	-	25	62	25,40	1,10	0,3200
06	5306ZZG15	NR	30	72	30,20	1,10	0,5100
07	5307ZZG15	NR	35	80	34,90	1,50	0,7900
08	5308ZZG15	NR	40	90	36,50	1,50	1,0500
09	5309ZZG15	NR	45	100	39,70	1,50	1,4200
10	5310ZZG15	NR	50	110	44,40	2,00	1,9300
11	5311ZZG15	NR	55	120	49,20	2,00	2,1100
12	5312ZZG15	NR	60	130	54,00	2,10	2,7000
13	5313ZZG15	NR	65	140	58,70	2,10	3,3900

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Reference thermal speed	Mechanical limiting speed

10,40	5,90	0,38	12,80	0,60	28,00	16,00	18,30	16000	18000
11,40	7,10	0,48	13,50	0,60	31,00	19,00	21,10	14000	16000
14,20	9,00	0,59	13,60	0,60	36,00	21,00	24,00	13000	14000
19,10	12,50	0,81	13,70	1,00	42,00	25,00	28,80	12000	12000
20,60	14,70	0,91	14,30	1,00	47,00	30,00	33,50	9700	10000
28,10	21,10	1,32	14,30	1,00	57,00	35,00	40,00	8500	8500
37,30	28,70	1,77	14,20	1,00	65,50	41,50	47,20	7600	7300
46,10	36,30	2,22	14,20	1,00	73,50	46,50	53,00	7100	6500
45,70	37,20	2,27	14,60	1,00	78,50	51,50	57,20	6500	6000
48,50	42,20	2,55	14,90	1,00	83,50	56,50	62,00	5900	5600
55,50	49,40	2,95	15,00	1,50	92,00	63,00	68,70	5500	5100
67,00	59,70	3,55	14,50	1,50	102,00	68,00	75,80	5200	4600
74,10	70,60	4,20	14,70	1,50	112,00	73,00	82,00	4800	4200
78,40	76,30	4,55	15,20	1,50	117,00	78,00	86,80	4600	4100

20,10	12,10	0,80	12,50	1,00	42,00	22,00	26,20	11000	12000
22,20	14,60	0,92	13,20	1,00	45,50	26,50	29,20	9100	10000
28,30	19,40	1,21	13,40	1,00	55,50	31,50	36,40	7900	8700
40,00	28,50	1,79	13,60	1,00	65,50	36,50	44,00	7200	7500
50,20	34,60	2,21	13,40	1,50	72,00	43,00	49,30	6800	6600
59,10	43,90	2,75	13,30	1,50	82,00	48,00	55,60	6000	5800
65,80	51,00	3,15	13,90	1,50	92,00	53,00	62,00	5500	5300
78,40	61,60	3,80	13,90	2,00	101,00	59,00	68,00	5200	4800
98,60	78,80	4,90	13,80	2,00	111,00	64,00	75,20	5000	4400
121,00	97,90	6,10	13,70	2,00	119,00	71,00	81,25	4700	4000
145,00	118,00	7,30	13,60	2,00	129,00	76,00	88,25	4500	3700

SELF-ALIGNING BALL BEARINGS

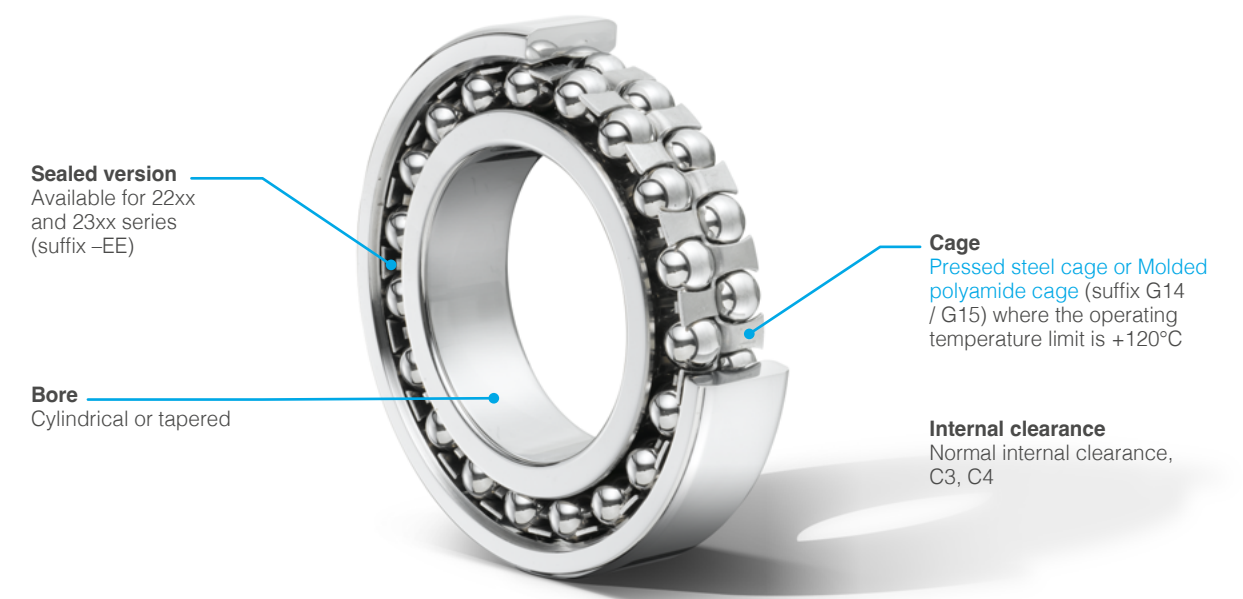
Self-aligning ball bearings

Self-aligning ball bearings have two rows of balls, inside of the outer ring forms a spherical surface and the inner ring has two raceways.

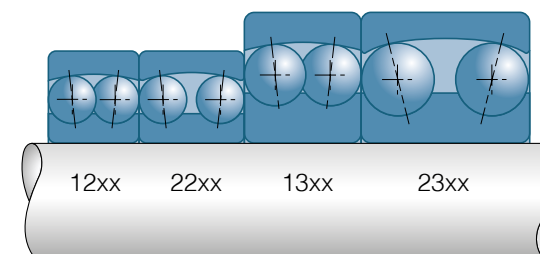
The balls, cage and inner ring of these bearings are able to move in order to compensate for any misalignment with the outer ring. As a consequence, these bearings are able to align and compensate for shaft/housing finish irregularities, bearing adjustment errors and other sources of misalignment.

These bearings are designed to support radial loads and are not suitable for applications with heavy axial loads.

Characteristics



Series



SNR	Series			
	12xx	13xx	22xx	23xx
Cylindrical bore	1201	1302	2201	2302
	~ 1222	~ 1320	~ 2220	~ 2318
Tapered bore	1205K	1305K	2204K	2305K
	~ 1222K	~ 1317K	~ 2220K	~ 2315K
Cage material	steel or polyamide (G15)		steel or polyamide (G15/G14)	
Sealing			2201 ~ 2212 EE with polyamide cage	2303 ~ 2310 EE with polyamide cage

Tolerances and clearances

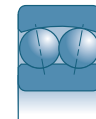
Tolerances

These bearings are supplied with tolerances that comply with ISO 492, but only in the normal tolerance class.

Radial internal clearance

Clearance is standardised (ISO 5753). The values are different for cylindrical bore bearings and tapered bore bearings (suffix K). The latter have a significantly higher clearance in order to take into account the reduction in clearance resulting from tightening the adapter sleeve. The factor of the residual recommended clearance after mounting is equal to:

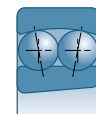
$$J_{rm} = 2 d^{1/2} 10^{-3}$$



Self-aligning ball bearings with cylindrical bore series 12xx, 13xx, 22xx, 23xx

Bore diameter d (mm)	Group 2		Group N		Group 3		Group 4		Group 5	
	min	max	min	max	min	max	min	max	min	max
2,5 <d ≤6	1	8	5	15	10	20	15	25	21	33
6 <d ≤ 10	2	9	6	17	12	25	19	33	27	42
10 <d ≤ 18	2	10	6	19	13	26	21	35	30	48
14 <d ≤ 18	3	12	8	21	15	28	23	37	32	50
18 <d ≤ 24	4	14	10	23	17	30	25	39	34	52
24 <d ≤ 30	5	16	11	24	19	35	29	46	40	58
30 <d ≤ 40	6	18	13	29	23	40	34	53	46	66
40 <d ≤ 50	6	19	14	31	25	44	37	57	50	71
50 <d ≤ 65	7	21	16	36	30	50	45	69	62	88
65 <d ≤ 80	8	24	18	40	35	60	54	83	76	108
80 <d ≤ 100	9	27	22	48	42	70	64	96	89	124
100 <d ≤ 120	10	31	25	56	50	83	75	114	105	145
120 <d ≤ 140	10	38	30	68	60	100	90	135	125	175
140 <d ≤ 160	15	44	35	80	70	120	110	161	150	210

Value in μm



Self-aligning ball bearings with tapered bore 12xxK, 13xxK, 22xxK, 23xxK series

Bore diameter d (mm)	Group 2		Group N		Group 3		Group 4		Group 5	
	min	max	min	max	min	max	min	max	min	max
18 <d ≤ 24	7	17	13	26	20	33	28	42	37	55
24 <d ≤ 30	9	20	15	28	23	39	33	50	44	62
30 <d ≤ 40	12	24	19	35	29	46	40	59	52	72
40 <d ≤ 50	14	27	22	39	33	52	45	65	58	79
50 <d ≤ 65	18	32	27	47	41	61	56	80	73	99
65 <d ≤ 80	23	39	35	57	50	75	69	98	91	123
80 <d ≤ 100	29	47	42	68	62	90	84	116	109	144
100 <d ≤ 120	35	56	50	81	75	108	100	139	130	170
120 <d ≤ 140	40	68	60	98	90	130	120	165	155	205
140 <d ≤ 160	45	74	65	110	100	150	140	191	180	240

Value in μm

Axial clearance

As the axial clearance J_a is influenced by radial clearance J_r , it can be calculated using the following formula:

$$J_a = 2,27 Y_0 \cdot J_r$$

Mounting and adjustment

This type of bearing is very sensitive to any clearance adjustments and operating clearance must therefore be verified after mounting manually. This precaution is particularly important for bearings with a tapered bore.

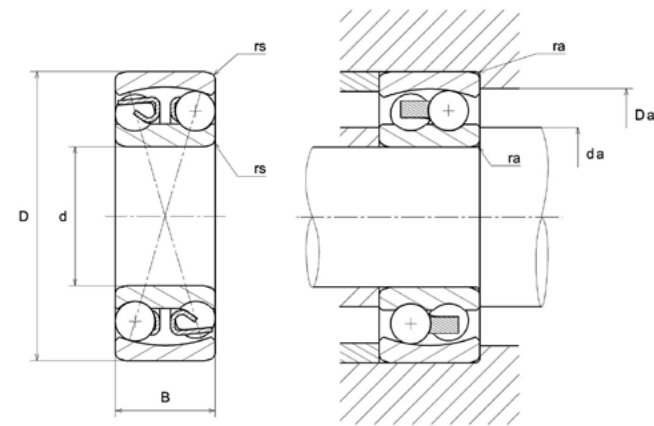
In some self-aligning ball bearings, the balls protrude slightly from the side faces. Example: 1320.

Equivalences

Technical specifications	NTN	SNR	FAG	SKF	NSK
Steel cage	S	No suffix	-	J1	No suffix
Polyamide cage	T2	G15	TVH	TN9	T
2 contact seals	-	EE	2RS	2RS1	DDU
Internal clearance (if diff. to standard radial clearance)	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.
Tapered bore 1:12	K	K	K	K	K



Self-aligning ball bearings

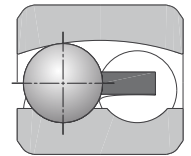


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Open version

Bore code	Bearing	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
				Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

12xx series

Open version

01	1201	CN, C3	G15 as std	12	32	10	0,60	0,0400
02	1202	CN, C3	G15 as std	15	35	11	0,60	0,0490
03	1203	CN	G15 as std	17	40	12	0,60	0,0730
04	1204	CN, C3	-	20	47	14	1,00	0,1170
05	1205	CN, C3	K	25	52	15	1,00	0,1390
06	1206	CN, C3	K	30	62	16	1,00	0,2210
07	1207	CN, C3	K	35	72	17	1,10	0,3220
08	1208	CN, C3	K	40	80	18	1,10	0,4170
09	1209	CN, C3	K	45	85	19	1,10	0,4640
10	1210	CN, C3	K	50	90	20	1,10	0,5270
11	1211	CN, C3	K	55	100	21	1,50	0,6970
13	1213	CN, C3	-	65	120	23	1,50	1,1330
15	1215	CN, C3	K	75	130	25	1,50	1,3410
16	1216	CN, C3	K	80	140	26	2,00	1,6700
17	1217	CN, C3	K	85	150	28	2,00	2,0350
18	1218	CN, C3	K	90	160	30	2,00	2,5000
19	1219	CN, C3	K	95	170	32	2,10	3,2000
20	1220	CN, C3	K	100	180	34	2,10	3,7000
22	1222	CN, C3	K	110	200	38	2,10	5,3200

13xx series

Open version

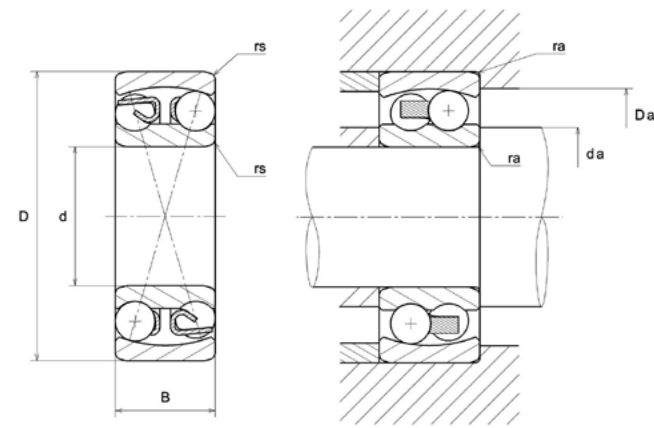
02	1302	CN, C3	G14 as std	15	42	13	1,00	0,0940
03	1303	CN, C3	G14 as std	17	47	14	1,00	0,1300
06	1306	CN, C3	K	30	72	19	1,10	0,3870
08	1308	CN, C3	K	40	90	23	1,50	0,7150
09	1309	CN, C3	K	45	100	25	1,50	0,9590
12	1312	CN, C3	K	60	130	31	2,10	1,9520
15	1315	CN, C3	K	75	160	37	2,10	3,6800
17	1317	CN, C3	K	85	180	41	3,00	4,9800

Basic load rating (kN)				Shoulder and fillet dimensions (mm)			Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Reference thermal speed	Mechanical limiting speed

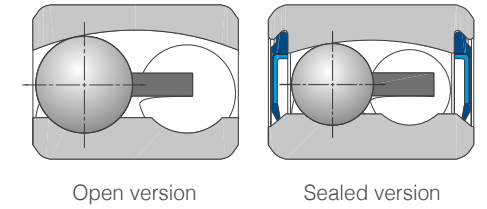
5,60	1,27	0,06	2,90	0,60	28,00	16,00	20000	32000
7,50	1,75	0,08	2,90	0,60	31,00	19,00	18000	28000
7,90	2,01	0,09	2,80	0,60	36,00	21,00	17000	25000
9,70	2,60	0,12	2,80	1,00	42,00	25,00	15000	21000
11,90	3,30	0,15	2,70	1,00	47,00	30,00	13000	18000
15,40	4,65	0,21	2,70	1,00	57,00	35,00	11000	15000
15,60	5,10	0,23	2,60	1,00	65,50	41,50	9600	13000
18,90	6,50	0,30	2,50	1,00	73,50	46,50	8600	11000
21,50	7,30	0,33	2,60	1,00	78,50	51,50	8100	11000
22,50	8,10	0,37	2,50	1,00	83,50	56,50	7600	9800
26,50	10,00	0,45	2,50	1,50	92,00	63,00	6900	8800
30,70	12,50	0,57	2,40	1,50	112,00	73,00	5900	7300
38,40	15,70	0,70	2,40	1,50	122,00	83,00	5500	6600
39,40	17,00	0,73	2,40	2,00	131,00	89,00	5200	6100
48,60	20,80	0,87	2,40	2,00	141,00	94,00	5000	5700
56,40	23,50	0,96	2,50	2,00	151,00	99,00	4800	5400
63,10	27,10	1,07	2,50	2,00	159,00	106,00	4700	5100
68,40	29,70	1,14	2,50	2,00	169,00	111,00	4600	4800
87,00	38,60	1,40	2,50	2,00	189,00	121,00	4300	4300

9,50	2,28	0,10	2,90	1,00	37,00	20,00	14000	24000
12,50	3,20	0,15	2,90	1,00	42,00	22,00	13000	21000
20,90	6,30	0,29	2,70	1,00	65,50	36,50	8800	13000
29,00	9,70	0,44	2,60	1,50	82,00	48,00	7400	10000
36,90	12,60	0,57	2,60	1,50	92,00	53,00	6800	9200
56,30	20,80	0,95	2,60	2,00	119,00	71,00	5600	6800
78,00	30,00	1,25	2,60	2,00	149,00	86,00	4800	5600
97,60	37,90	1,48	2,60	2,50	167,00	98,00	4400	5000

Self-aligning ball bearings



d - Inner diameter
 D - Outer diameter
 B - Width of bearing or inner ring
 rs - Minimum corner radius



Bore code	Bearing	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
				Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed

22xx series

Open version

01	2201	CN	G15 as std	12	32	14	0,60	0,0550
02	2202	CN	G15 as std	15	35	14	0,60	0,0630
03	2203	CN, C3	G15 as std	17	40	16	0,60	0,0880
05	2205	CN, C3	K	25	52	18	1,00	0,1640
06	2206	CN, C3	K	30	62	20	1,00	0,2640
07	2207	CN, C3	K	35	72	23	1,10	0,4010
09	2209	CN, C3	K	45	85	23	1,10	0,5500
10	2210	CN, C3	K	50	90	23	1,10	0,5840
11	2211	CN	K	55	100	25	1,50	0,7880
12	2212	CN, C3	K	60	110	28	1,50	1,0690
13	2213	CN, C3	K	65	120	31	1,50	1,4700
14	2214	CN	-	70	125	31	1,50	1,5500
15	2215	CN, C3	K	75	130	31	1,50	1,6000
16	2216	CN, C3	K	80	140	33	2,00	2,1000
18	2218	CN, C3	K	90	160	40	2,00	3,1900
20	2220	CN, C3	K	100	180	46	2,10	4,6800

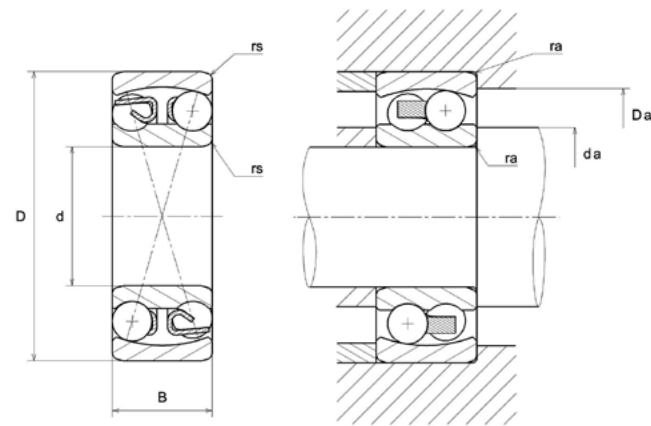
8,90	1,94	0,09	3,20	0,60	28,00	16,00	-	22000	30000
9,20	2,10	0,10	3,00	0,60	31,00	19,00	-	19000	26000
11,50	2,75	0,13	3,00	0,60	36,00	21,00	-	18000	23000
12,20	3,45	0,16	2,70	1,00	47,00	30,00	-	13000	17000
15,00	4,55	0,21	2,70	1,00	47,00	30,00	-	11000	14000
21,20	6,60	0,30	2,70	1,00	65,50	41,50	-	10000	12000
23,00	8,20	0,37	2,50	1,00	78,50	51,50	-	8100	10000
23,00	8,50	0,39	2,50	1,00	83,50	56,50	-	7400	9300
26,30	9,90	0,45	2,50	1,50	92,00	63,00	-	6900	8400
33,70	12,60	0,57	2,50	1,50	102,00	68,00	-	6600	7700
43,00	16,40	0,75	2,50	1,50	112,00	73,00	-	6400	7100
43,90	17,10	0,78	2,50	1,50	117,00	78,00	-	6000	6700
43,80	17,80	0,80	2,50	1,50	122,00	83,00	-	5600	6300
48,50	19,90	0,86	2,50	2,00	131,00	89,00	-	5400	5900
69,30	28,70	1,17	2,50	2,00	151,00	99,00	-	5200	5200
96,30	40,60	1,56	2,50	2,00	169,00	111,00	-	4900	4600

Sealed version

01	2201EEG15	CN	-	12	32	14	0,60	0,0530
02	2202EEG15	CN	-	15	35	14	0,60	0,0600
03	2203EEG15	CN	-	17	40	16	0,60	0,0880
04	2204EEG15	CN	-	20	47	18	1,00	0,1480
05	2205EEG15	CN	K	25	52	18	1,00	0,1620
06	2206EEG15	CN	K	30	62	20	1,00	0,2740
07	2207EEG15	CN	-	35	72	23	1,10	0,4420
08	2208EEG15	CN	-	40	80	23	1,10	0,5280
09	2209EEG15	CN	K	45	85	23	1,10	0,5480
10	2210EEG15	CN	-	50	90	23	1,10	0,6060
11	2211KEEG15	CN	-	55	100	25	1,50	0,8080
12	2212EEG15	CN	-	60	110	28	1,50	1,1300

5,60	1,27	0,06	2,90	0,60	28,00	16,00	16,20	-	15000
7,50	1,75	0,08	2,90	0,60	31,00	19,00	19,05	-	13000
7,90	2,01	0,09	2,80	0,60	36,00	21,00	21,65	-	11000
9,90	2,60	0,12	2,70	1,00	42,00	25,00	25,80	-	9400
12,10	3,30	0,15	2,70	1,00	47,00	28,00	30,70	-	8000
15,70	4,65	0,21	2,70	1,00	57,00	35,00	36,00	-	6500
15,80	5,10	0,23	2,60	1,00	65,50	41,50	42,00	-	5600
19,20	6,50	0,30	2,50	1,00	73,50	46,50	47,00	-	4900
21,80	7,30	0,33	2,60	1,00	78,50	51,50	53,00	-	4500
22,70	8,10	0,37	2,50	1,00	83,50	56,50	59,00	-	4000
26,80	10,00	0,45	2,50	1,50	92,00	63,00	67,30	-	3600
30,20	11,50	0,52	2,50	1,50	102,00	68,00	73,00	-	3400

Self-aligning ball bearings

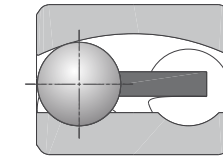


d - Inner diameter

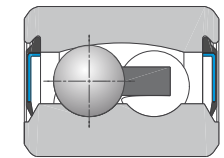
D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Open version



Sealed version (-EE)

Bore code	Bearing	Internal clearance	Available options	Dimensions (mm)				Mass (kg)
				Inner diameter (d)	Outer diameter (D)	Width of bearing or inner ring (B)	Minimum corner radius (rs)	Mass

23xx series

Open version

02	2302	CN, C3	G15 as std	15	42	17	1,00	0,1100
03	2303	CN	G14 as std	17	47	19	1,00	0,1570
06	2306	CN, C3	K	30	72	27	1,10	0,5010
09	2309	C3 en std	K as std	45	100	36	1,50	1,2500
10	2310	C3 en std	K as std	50	110	40	2,00	1,6500
11	2311	C3 en std	K as std	55	120	43	2,00	2,2600
12	2312	C3 en std	K as std	60	130	46	2,10	2,5200
14	2314	CN	K	70	150	51	2,10	4,1700
15	2315	CN, C3	K	75	160	55	2,10	4,7000

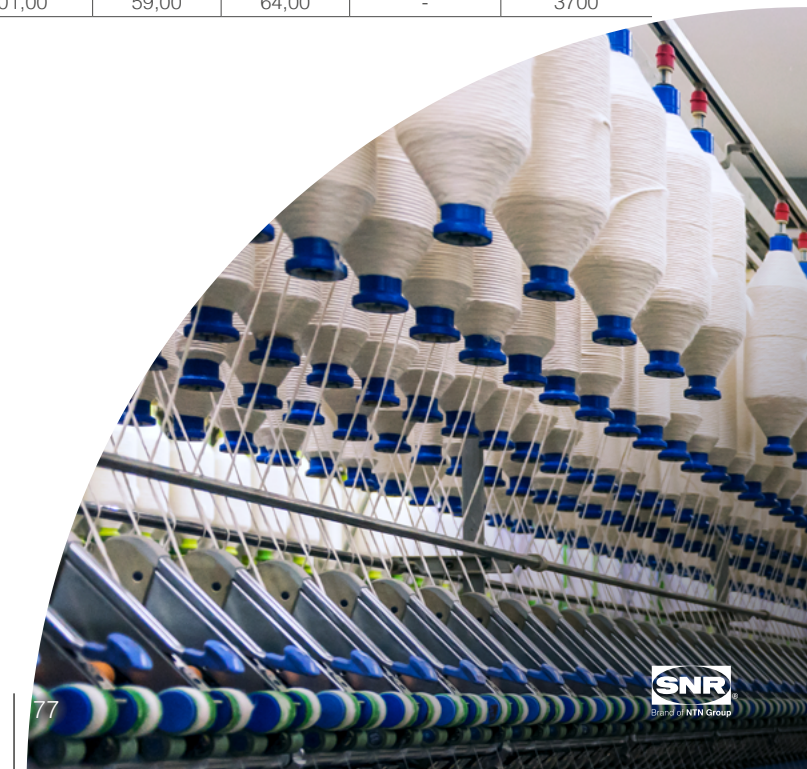
Sealed version

03	2303EEG14	CN	G14 as std	17	47	19	1,00	0,1600
04	2304EEG15	CN	G15 as std	20	52	21	1,10	0,2300
05	2305EEG15	CN	G15 as std	25	62	24	1,10	0,3670
07	2307EEG15	CN	G15 as std	35	80	31	1,50	0,7440
08	2308EEG15	CN	G15 as std	40	90	33	1,50	1,0100
09	2309EEG15	CN	G15 as std	45	100	36	1,50	1,3400
10	2310EEG15	CN	G15 as std	50	110	40	2,00	1,8200

Basic load rating (kN)				Shoulder and fillet dimensions (mm)				Speed (rpm)	
Dynamic load capacity (Cn)	Static load capacity (C0)	Fatigue limit load (Cu)	Factor f0	Max. shaft and housing corner radius (max. ra)	Max. shoulder diameter OR (Da max)	Min. shoulder diameter IR (da min)	Max. shoulder diameter IR (da max)	Thermal reference speed	Mechanical limiting speed

16,30	3,85	0,18	3,30	1,00	37,00	20,00	-	15000	24000
14,40	3,55	0,16	3,00	1,00	42,00	22,00	-	14000	21000
30,40	8,80	0,40	2,90	1,00	65,50	36,50	-	10000	13000
54,00	16,60	0,75	2,90	1,50	92,00	53,00	-	7800	9300
64,60	20,20	0,92	2,90	2,00	101,00	59,00	-	7400	8500
75,20	24,00	1,09	2,90	2,00	111,00	64,00	-	6900	7800
87,00	28,20	1,28	2,90	2,00	119,00	71,00	-	6600	7200
109,00	37,60	1,63	2,80	2,00	139,00	81,00	-	5800	6100
120,00	42,90	1,80	2,80	2,00	149,00	86,00	-	5600	5700

12,50	3,20	0,15	2,90	1,00	42,00	22,00	23,85	-	10000
12,40	3,35	0,15	2,80	1,00	45,50	26,50	27,20	-	8900
18,00	5,00	0,23	2,80	1,00	55,50	31,50	33,50	-	7300
25,10	7,90	0,36	2,70	1,50	72,00	43,00	44,50	-	5500
29,40	9,70	0,44	2,60	1,50	82,00	48,00	51,20	-	4800
38,00	12,70	0,58	2,70	1,50	92,00	53,00	59,00	-	4300
41,60	14,20	0,65	2,60	2,00	101,00	59,00	64,00	-	3700

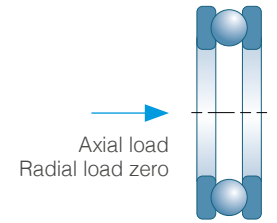


THRUST BALL BEARINGS

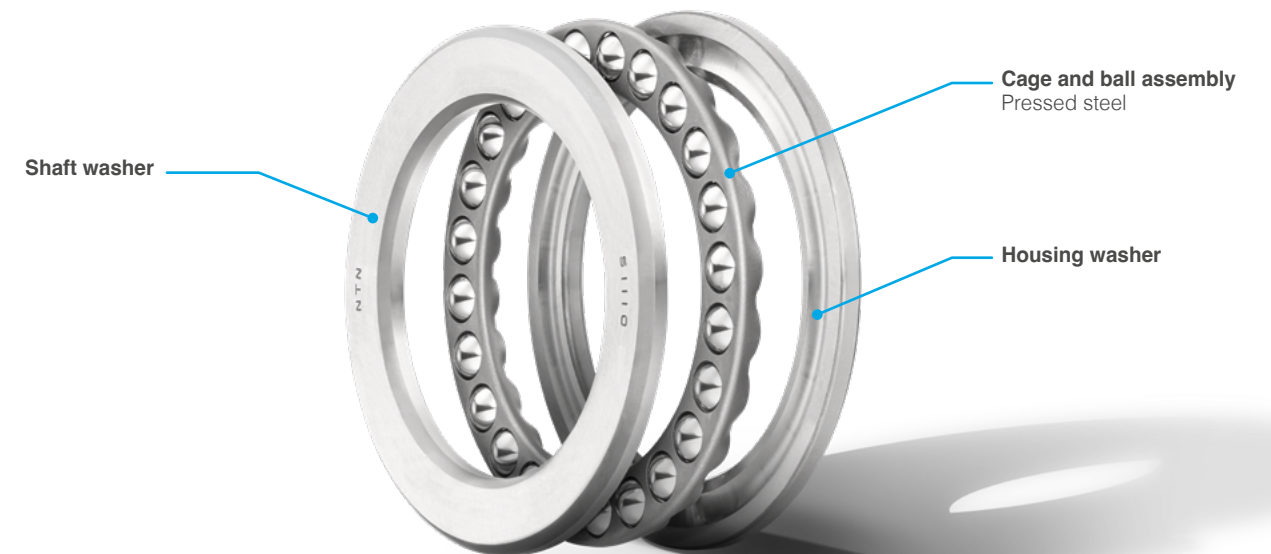
Thrust ball bearings

The thrust ball bearing, with a contact angle of 90°, is designed to only support axial loads. It must therefore often be combined with a radial bearing.

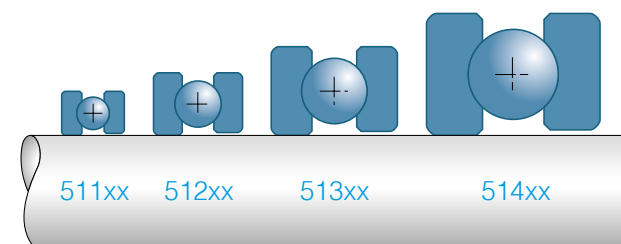
As the name suggests, single direction thrust ball bearing supports the axial load of a shaft in one direction.



Characteristics



Series



Series			
511xx	512xx	513xx	514xx
51100	51202	51305	51405
~51132	~51217	~51313	51416



Features

Loads and speed

Can only withstand axial loads in one direction and low speeds.

Misalignments

As the performance of a thrust bearing relies on the load being distributed across its circumference, it is important that there is practically no misalignment between the shaft washer and the housing washer (less than 0.03°).

Calculations

Minimum dynamic axial load

To compensate for the effects of the centrifugal force exerted on the balls, it is necessary to exert a permanent axial load F_a on the thrust bearings, where the minimum value F_{am} (in N) is determined by the formula:

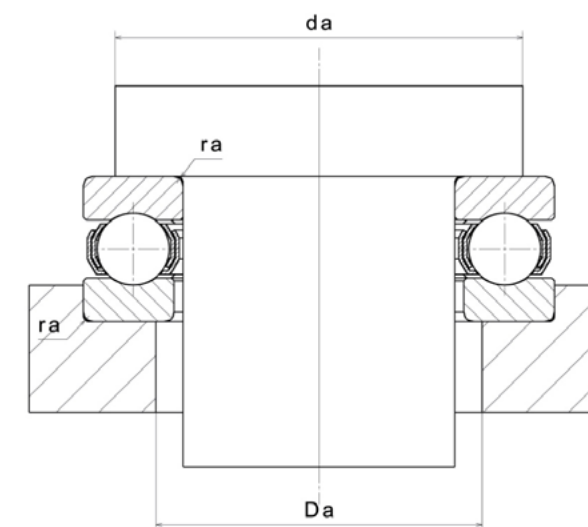
$$F_{am} = 10^{-14} (N \cdot C_0)^2$$

Maximum static axial load

This is defined by the base static capacity C_0 .

Component mounting

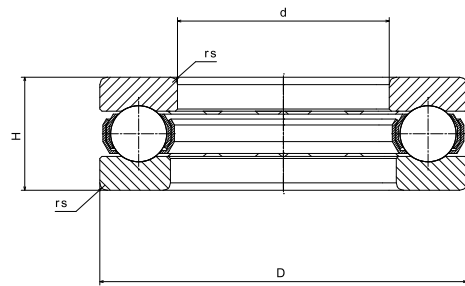
As the components are separable, they are interchangeable. The shaft washer is mounted tightly on its bearing surface. The housing washer must be fixed. To facilitate correct positioning during mounting, the housing washer has a larger bore (d_a) than the shaft washer (d). If the axial load of the unloaded thrust bearing is insufficient, it must be preloaded with springs, to achieve the minimum dynamic axial load defined above.



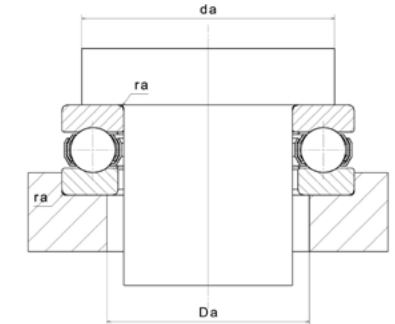
Interchange

Technical specifications	NTN	SNR	FAG	SKF	NSK
Pressed steel cage	J	No suffix	No suffix	No suffix	No suffix
Solid brass cage	-	-	M, MP	M	M
Polyamide cage	T2	-	-	-	-

Single-direction thrust ball bearings



- d - Inner diameter
- D - Outer diameter
- B - Width of bearing or inner ring
- rs - Minimum corner radius



Bore code	Bearing	Dimensions (mm)				Mass (kg)
		Inner diameter (d)	Outer diameter (D)	Minimum corner radius (rs)	Thrust bearing height (H)	Mass

51xxx series

511xx						
00	51100	10	24	0,30	9	0,0210
01	51101	12	26	0,30	9	0,0230
02	51102	15	28	0,30	9	0,0250
03	51103	17	30	0,30	9	0,0250
04	51104	20	35	0,30	10	0,0380
05	51105	25	42	0,60	11	0,0580
06	51106	30	47	0,60	11	0,0650
07	51107	35	52	0,60	12	0,0810
08	51108	40	60	0,60	13	0,1100
09	51109	45	65	0,60	14	0,1280
10	51110	50	70	0,60	14	0,1390
11	51111	55	78	0,60	16	0,2200
12	51112	60	85	1,00	17	0,2570
14	51114	70	95	1,00	18	0,3540
15	51115	75	100	1,00	19	0,3980
16	51116	80	105	1,00	19	0,4300
17	51117	85	110	1,00	19	0,4420
18	51118	90	120	1,00	22	0,5980
20	51120	100	135	1,00	25	0,9740
22	51122	110	145	1,00	25	1,0600
24	51124	120	155	1,00	25	1,1400
26	51126	130	170	1,00	30	1,7400
30	51130	150	190	1,00	31	2,0000
32	51132	160	200	1,00	31	2,1000

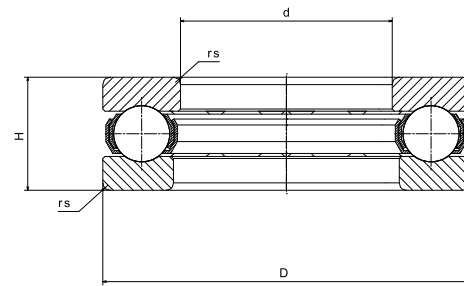
512xx						
02	51202	15	32	0,60	12	0,0420
03	51203	17	35	0,60	12	0,0500
04	51204	20	40	0,60	14	0,0780
05	51205	25	47	0,60	15	0,1100
06	51206	30	52	0,60	16	0,1330
07	51207	35	62	1,00	18	0,2030
08	51208	40	68	1,00	19	0,2600
09	51209	45	73	1,00	20	0,2830
10	51210	50	78	1,00	22	0,3800
11	51211	55	90	1,00	25	0,5900
13	51213	65	100	1,00	27	0,7290
14	51214	70	105	1,00	27	0,7830
15	51215	75	110	1,00	27	0,8270
16	51216	80	115	1,00	28	0,9080
17	51217	85	125	1,00	31	1,3000

Basic load rating (kN)		Shoulder and fillet dimensions (mm)		
Dynamic axial load capacity (Ca)	Static axial load capacity (C0a)	Max. shaft & housing corner radius (max. ra)	Max. shoulder diameter OR (max. Dm)	Min. shoulder diameter IR (min. dm)

10,00	14,00	0,30	16,00	18,00
10,30	15,40	0,30	18,00	20,00
10,50	16,80	0,30	20,00	23,00
11,30	19,60	0,30	22,00	25,00
15,00	26,60	0,30	26,00	29,00
18,10	35,50	0,60	32,00	35,00
18,80	39,90	0,60	37,00	40,00
20,10	46,60	0,60	42,00	45,00
26,90	62,90	0,60	48,00	52,00
27,90	69,20	0,60	53,00	57,00
28,80	75,50	0,60	58,00	62,00
34,80	93,20	0,60	64,00	69,00
41,40	113,00	1,00	70,00	75,00
43,10	127,00	1,00	80,00	85,00
44,50	136,00	1,00	85,00	90,00
44,60	141,00	1,00	90,00	95,00
46,00	150,00	1,00	95,00	100,00
59,70	190,00	1,00	102,00	108,00
85,10	268,00	1,00	114,00	121,00
87,30	288,00	1,00	124,00	131,00
88,90	308,00	1,00	134,00	141,00
119,00	406,00	1,00	146,00	154,00
123,00	448,00	1,00	166,00	174,00
125,00	476,00	1,00	176,00	184,00

15,70	24,40	0,60	22,00	25,00
16,20	26,60	0,60	24,00	28,00
22,30	37,70	0,60	28,00	32,00
27,80	50,50	0,60	34,00	38,00
29,40	58,20	0,60	39,00	43,00
39,10	78,20	1,00	46,00	51,00
44,00	92,40	1,00	51,00	57,00
46,50	105,00	1,00	56,00	62,00
47,20	111,00	1,00	61,00	67,00
69,40	159,00	1,00	69,00	76,00
74,90	189,00	1,00	79,00	86,00
76,10	199,00	1,00	84,00	91,00
77,30	209,00	1,00	89,00	96,00
78,50	219,00	1,00	94,00	101,00
95,40	264,00	1,00	101,00	109,00

Single-direction thrust ball bearings

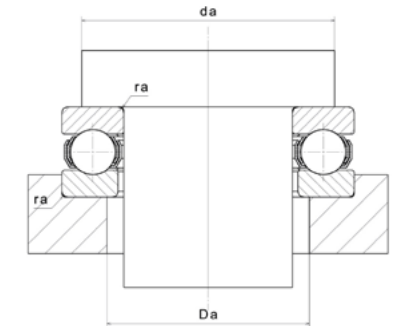


d - Inner diameter

D - Outer diameter

B - Width of bearing or inner ring

rs - Minimum corner radius



Bore code	Bearing	Dimensions (mm)				Mass (kg)
		Inner diameter (d)	Outer diameter (D)	Minimum corner radius (rs)	Thrust bearing height (H)	Mass
513xx						
05	51305	25	52	1,00	18	0,1670
06	51306	30	60	1,00	21	0,2700
07	51307	35	68	1,00	24	0,3770
08	51308	40	78	1,00	26	0,5400
09	51309	45	85	1,00	28	0,6620
11	51311	55	105	1,00	35	1,3500
12	51312	60	110	1,00	35	1,4500
13	51313	65	115	1,00	36	1,5500
514xx						
05	51405	25	60	1,00	24	0,3400
06	51406	30	70	1,00	28	0,5300
07	51407	35	80	1,00	32	0,7900
09	51409	45	100	1,00	39	1,4500
16	51416	80	170	2,10	68	7,3000

Basic load rating (kN)		Shoulder and fillet dimensions (mm)		
Dynamic axial load capacity (Ca)	Static axial load capacity (C0a)	Max. shaft & housing corner radius (max. ra)	Max. shoulder diameter OR (max. Dm)	Min. shoulder diameter IR (min. dm)
35,70	61,50	1,00	36,00	41,00
42,70	78,70	1,00	42,00	48,00
55,50	105,00	1,00	48,00	55,00
69,30	135,00	1,00	55,00	63,00
80,00	164,00	1,00	61,00	69,00
119,00	246,00	1,00	75,00	85,00
124,00	270,00	1,00	80,00	90,00
128,00	287,00	1,00	85,00	95,00
55,50	89,40	1,00	39,00	46,00
72,70	126,00	1,00	42,00	48,00
86,90	155,00	1,00	53,00	62,00
130,00	243,00	1,00	67,00	78,00
317,00	751,00	2,10	117,00	133,00

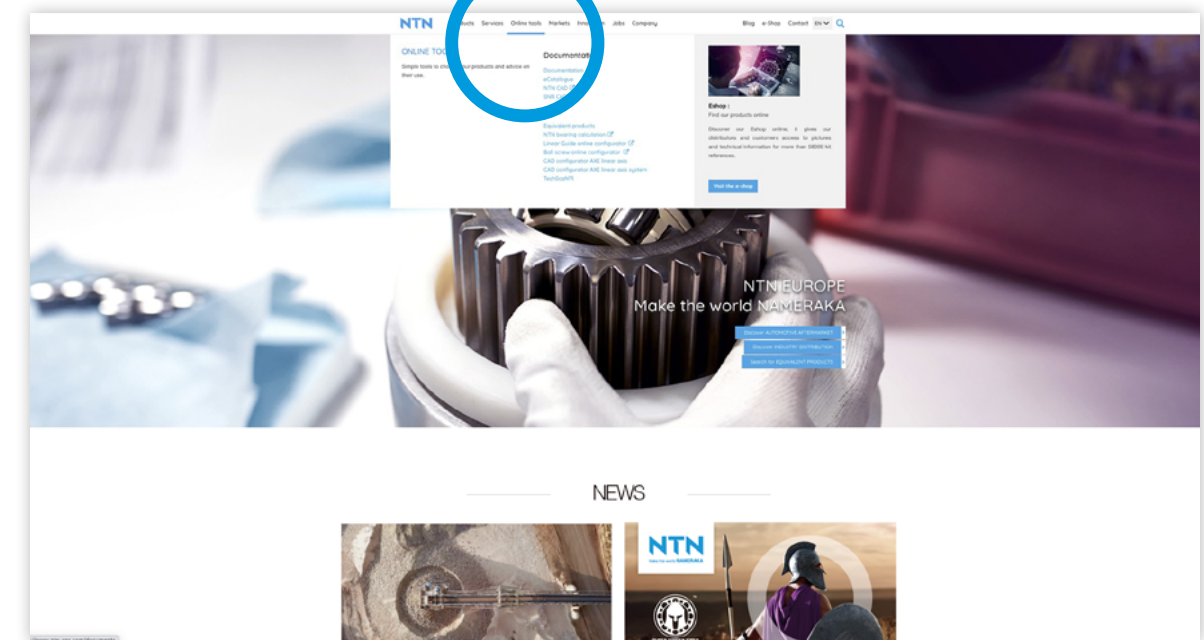


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