

SKF

Reliable bearing solutions for corrosive environments



Stainless steel deep groove ball bearings

Longer service life in a severe environment

Open or sealed

Available from stock



Stainless steel deep groove ball bearings for increased reliability



Stainless steel deep groove ball bearings

The bearings

SKF stainless steel deep groove ball bearings, like their standard steel counterparts, have deep raceway grooves without filling slots and a close osculation between raceways and balls. For this reason they can carry axial loads acting in both directions in addition to radial loads, even at high speeds. They have the same running properties as standard steel bearings, but with slightly reduced load carrying capacity. SKF stainless steel deep groove ball bearings are available in several designs and sizes, and they are identified as stainless steel by the designation prefix W (→ “Range and designs”).

Benefits

The main advantage of SKF stainless steel deep groove ball bearings is their resistance to corrosion in moisture and other corrosive environments. They are also highly versatile since the sealed versions can be supplied with different grease fillings. This allows the choice of the most suitable grease for each application, for example, the use of food compatible, non-toxic bearing grease for the food industry. SKF bearings are temperature-stabilized at 150 °C but can be used up to 300 °C

depending on the lubricant used.

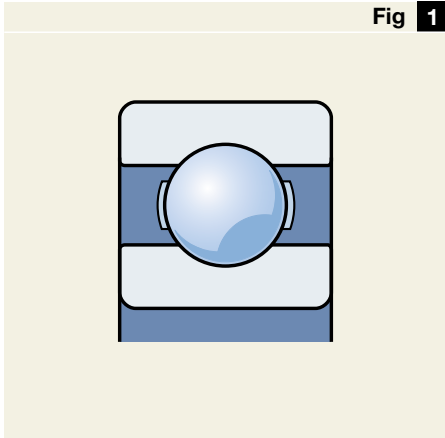
Applications

SKF stainless steel deep groove ball bearings are recommended for use wherever resistance to corrosion is a factor. Typical applications include:

- Food and beverage industry
- Chemical equipment
- Medical equipment
- Optical instruments
- Printing machines
- Nuclear technology
- Engines and pumps
- Paper mills
- Off-shore
- Marine industry

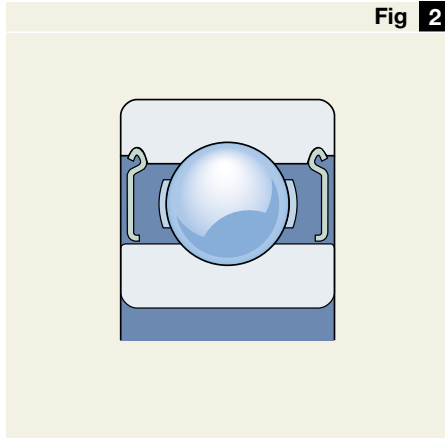


Fig 1



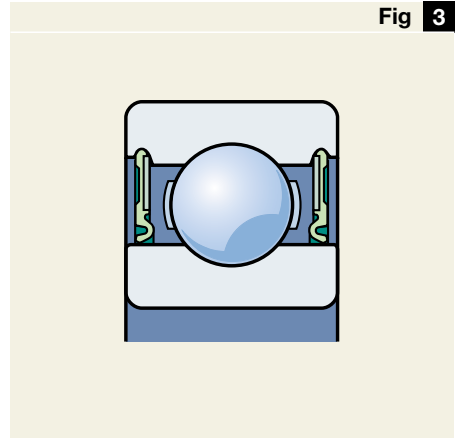
Open bearing

Fig 2



Bearing with Z shields, suffix 2Z

Fig 3



Bearing with RS1 seals, suffix 2RS1

Range and designs

SKF stainless steel deep groove ball bearings were formerly available up to a maximum bore diameter of 10 mm. The line has been expanded with the series W60, W62 and W63, offering new possibilities to design engineers having requirements for bearings with bore diameter up to 50 mm.

SKF stainless steel deep groove ball bearings are available in the following designs:

- open (→ fig 1),
- with non-contact Z shields (→ fig 2),
- with contact RS1 seals (→ fig 3),

and on request also with

- RS2 seals of fluoroelastomer rubber or
- low-friction RZ seals.

In addition, SKF stainless steel deep groove ball bearings can also be supplied

- for shaft-diameters of 0,6 to 9 mm
- for inch shaft-diameters of 0,04 to 0,75 in
- with flanged outer ring
- as thin section bearing.

Information about these bearings can be found in the "SKF Interactive Engineering Catalogue" on CD-ROM or online at www.skf.com.

Bearing data - general

Dimensions

The boundary dimensions of metric stainless steel deep groove ball bearings conform to ISO 15-1998.

Tolerances

Metric stainless steel deep groove ball bearings are manufactured to Normal tolerances corresponding to ISO 492-2002.

Internal clearance

SKF stainless steel single row deep groove ball bearings are manufactured as standard with Normal radial internal clearance to ISO 5753-1991, but bear-

ings with greater or smaller clearance can be supplied on request.

The values for radial internal clearance are given in **table 1** and are valid for unmounted bearings under zero measuring load.

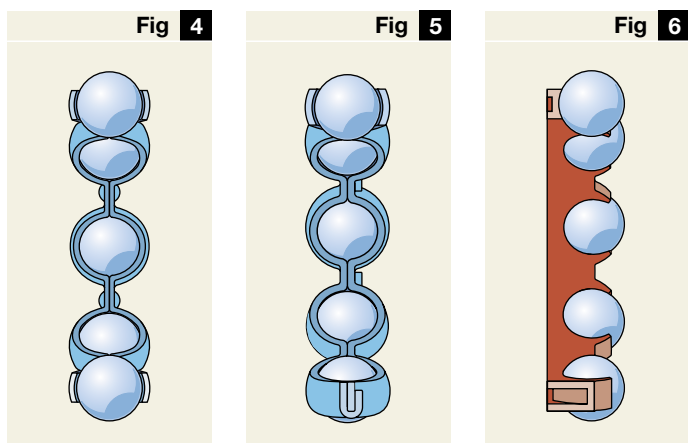
Materials

The bearing rings are produced from stainless steel X65Cr14 according to ISO 683-17:2000 or X105CrMo17 according to EN 10088-1:1995, depending on size. The balls are made of stainless steel X105CrMo17 and the shields and cages of stainless steel X5CrNi18-10, both according to EN 10088-1:1995.

Radial internal clearance

Table 1

Bore		Radial internal clearance									
d	incl.	C2		Normal		C3		C4		C5	
mm	mm	min	max	min	max	min	max	min	max	min	max
–	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73



Riveted cage

Ribbon-type cage

Polyamide cage

Cages

The bearings are equipped as standard with a riveted cage of pressed stainless steel sheet (→ fig 4). On request they can also be supplied with the following cage types:

- Riveted brass sheet cage
- Ribbon-type cage of steel sheet (→ fig 5)
- Ribbon-type cage of brass sheet
- Injection moulded cage of polyamide 6.6 (→ fig 6).

Greases for sealed bearings

Characteristics	Standard grease	Special grease, food-compatible	Special grease for high temperature
Thickener	Lithium soap	Aluminium complex soap	PTFE
Base oil	Mineral oil	Polyalphaolefin	Fluorinated oil
Operating temperature, °C (continuous operation)	-30 to +110	-25 to +120	-35 to +260
Kinematic viscosity of base oil, mm²/s at 40 °C	74	150	400
at 100 °C	8,5	15,5	35
Dropping point, °C	180	290	-
Consistency class (according to NLGI)	2	2	2

Seals

The bearings of 2Z design are equipped with pressed shields of stainless steel. They form a sealing gap with the land of the inner ring shoulder (→ fig 2) and allow high temperatures and speeds. Bearings fitted with shields are primarily intended for applications where the inner ring rotates. If the outer ring rotates, there is a risk of grease leaking from the bearing at elevated speeds.

The bearings of 2RS1 design are equipped with contact seals, which run with their seal lip on the land of the inner ring shoulder (→ fig 3). The seals are fitted with their external edge in the recesses at the outer ring

and seal tightly. The RS1 seals are made of an oil and wear resistant acrylonitrile butadiene rubber (NBR), have a sheet metal reinforcement and can be used at operating temperatures between -40 and +100°C and up to 120°C for brief periods. They protect the bearing reliably against moisture and dirt and prevent the leaking of grease.

Speed ratings

The permissible rotational speeds depend on the type of the built-in sealing and the lubrication. The values are given in the product table.

Grease filling

Bearings with shields or seals as standard are filled for life with a lithium grease that shows good rust-inhibiting properties and is suitable for temperatures between -30 and +110 °C. These bearings are maintenance free. The grease quantity fills about 25 to 35 % of the free space in the bearing. Details of this grease will be found in table 2.

Other lubricating greases can be supplied on request, for example, for other temperature ranges or, for use in the food industry (→ table 2).

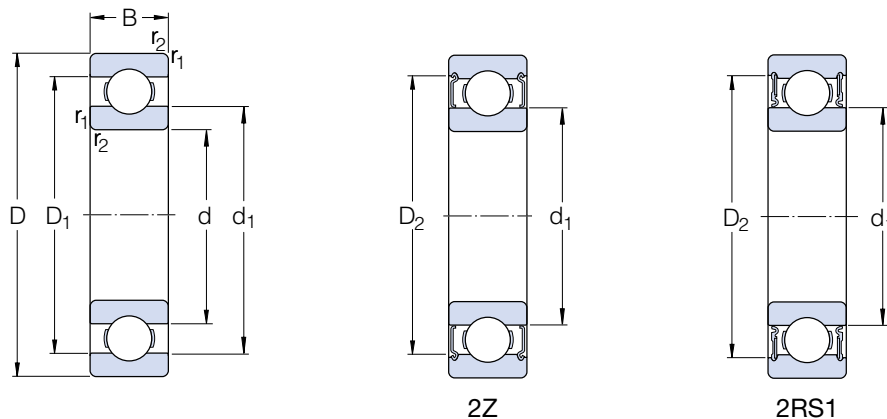
Lubrication of open bearings

For open bearings, SKF recommends lubrication with one of the approved and application-proven dependable SKF bearing greases:

- Grease LGMT 2: all-purpose bearing grease for a wide range of industrial and automotive applications.
- Grease LGLT 2: low temperature bearing grease for high speed and low noise applications.
- Grease LGLC 2: low temperature bearing grease for high speed and medium load applications.
- Grease LGHQ 3: high temperature and low noise bearing grease.
- Grease LGFP 2: food processing bearing grease USDA H1.

Stainless steel deep groove ball bearings

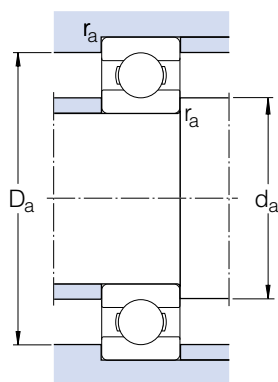
d 10 – 50 mm



Boundary dimensions			Basic load ratings		Calculation factors		Mass	Designations		
d	D	B	C	C ₀	k _r ¹⁾	f ₀ ²⁾		Open bearing	Bearing with shields	Bearing with seals
mm			kN		–		kg	–		
10	26	8	3,90	1,90	0,025	12	0,019	W 6000	W 6000-2Z	W 6000-2RS1
	30	9	4,23	2,28	0,025	13	0,032	W 6200	W 6200-2Z	W 6200-2RS1
	35	11	6,76	3,25	0,030	11	0,053	W 6300	W 6300-2Z	W 6300-2RS1
12	28	8	4,23	2,28	0,025	13	0,022	W 6001	W 6001-2Z	W 6001-2RS1
	32	10	5,72	2,90	0,025	12	0,037	W 6201	W 6201-2Z	W 6201-2RS1
	37	12	8,19	4,05	0,030	11	0,060	W 6301	W 6301-2Z	W 6301-2RS1
15	32	9	4,68	2,75	0,025	14	0,030	W 6002	W 6002-2Z	W 6002-2RS1
	35	11	6,37	3,60	0,025	13	0,045	W 6202	W 6202-2Z	W 6202-2RS1
	42	13	9,56	5,20	0,030	12	0,085	W 6302	W 6302-2Z	W 6302-2RS1
17	35	10	5,07	3,15	0,025	14	0,039	W 6003	W 6003-2Z	W 6003-2RS1
	40	12	8,06	4,65	0,025	13	0,065	W 6203	W 6203-2Z	W 6203-2RS1
	47	14	11,40	6,30	0,030	12	0,12	W 6303	W 6303-2Z	W 6303-2RS1
20	42	12	7,93	4,90	0,025	14	0,069	W 6004	W 6004-2Z	W 6004-2RS1
	47	14	10,80	6,40	0,025	13	0,11	W 6204	W 6204-2Z	W 6204-2RS1
	52	15	13,50	7,65	0,030	12	0,14	W 6304	W 6304-2Z	W 6304-2RS1
25	47	12	8,52	5,70	0,025	15	0,080	W 6005	W 6005-2Z	W 6005-2RS1
	52	15	11,90	7,65	0,025	14	0,13	W 6205	W 6205-2Z	W 6205-2RS1
	62	17	17,20	10,80	0,030	13	0,23	W 6305	W 6305-2Z	W 6305-2RS1
30	55	13	11,10	8,00	0,025	15	0,12	W 6006	W 6006-2Z	W 6006-2RS1
	62	16	16,30	10,80	0,025	14	0,20	W 6206	W 6206-2Z	W 6206-2RS1
	72	19	22,50	14,60	0,030	13	0,35	W 6306	W 6306-2Z	W 6306-2RS1
35	62	14	13,50	10,00	0,025	15	0,16	W 6007	W 6007-2Z	W 6007-2RS1
	72	17	21,60	14,60	0,025	14	0,29	W 6207	W 6207-2Z	W 6207-2RS1
	80	21	27,60	18,60	0,030	13	0,46	W 6307	W 6307-2Z	W 6307-2RS1
40	68	15	14,00	10,80	0,025	15	0,19	W 6008	W 6008-2Z	W 6008-2RS1
	80	18	24,70	17,30	0,025	14	0,37	W 6208	W 6208-2Z	W 6208-2RS1
45	75	16	17,80	14,60	0,025	15	0,25	W 6009	W 6009-2Z	W 6009-2RS1
	85	19	27,60	19,60	0,025	14	0,41	W 6209	W 6209-2Z	W 6209-2RS1
50	80	16	18,20	16,00	0,025	15	0,26	W 6010	W 6010-2Z	W 6010-2RS1
	90	20	29,60	22,40	0,025	14	0,46	W 6210	W 6210-2Z	W 6210-2RS1

¹⁾ Factor for calculating minimum load. For formula, see SKF General Catalogue or SKF Interactive Engineering Catalogue

²⁾ Calculation factor to determine factor Y when calculating equivalent dynamic bearing load. See SKF General Catalogue or SKF Interactive Engineering Catalogue



Dimensions					Abutment and fillet dimensions			Speed ratings						
d	d ₁ ≈	D ₁ ≈	D ₂ ≈	r _{1,2} min	d _a min	D _a max	r _a max	Bearing design Open		Shielded (2Z)		Sealed (2RS1)		
								Reference	Limiting	Reference	Limiting	Limiting		
								speed	speed	speed	speed	speed		
mm								r/min						
10	14,2	21	22,4	0,3	12	24	0,3	67 000	40 000	67 000	34 000	19 000		
	17,6	23,8	25,3	0,6	14,2	25,8	0,6	56 000	34 000	56 000	28 000	17 000		
	17,7	27,4	29,3	0,6	14,2	30,8	0,6	50 000	32 000	50 000	26 000	15 000		
12	17,2	24,1	25,5	0,3	14	26	0,3	60 000	38 000	60 000	30 000	17 000		
	18,5	26,2	28	0,6	16,2	27,8	0,6	50 000	32 000	50 000	26 000	15 000		
	19,3	29,9	31,9	1	17,6	31,4	1	45 000	28 000	45 000	22 000	14 000		
15	20,2	27	28,7	0,3	17	30	0,3	50 000	32 000	50 000	26 000	14 000		
	21,7	29,5	31,4	0,6	19,2	30,8	0,6	43 000	28 000	43 000	22 000	13 000		
	24,5	34,9	36,8	1	20,8	36,2	1	38 000	24 000	38 000	19 000	12 000		
17	23,5	30,1	31,9	0,3	19	33	0,3	45 000	28 000	45 000	22 000	13 000		
	24,9	33,6	35,8	0,6	21,2	35,8	0,6	38 000	24 000	38 000	19 000	12 000		
	27,5	38,9	41,1	1	22,8	41,2	1	34 000	22 000	34 000	17 000	11 000		
20	27,6	35,7	38,7	0,6	23,2	38,8	0,6	38 000	24 000	38 000	19 000	11 000		
	29,5	39,5	40,9	1	25,2	41,8	1	32 000	20 000	32 000	17 000	10 000		
	30	41,7	45,4	1,1	27	45	1,1	30 000	19 000	30 000	15 000	9 500		
25	31,7	40,2	42,7	0,6	28,2	43,8	0,6	32 000	20 000	32 000	16 000	9 500		
	34	44,2	45,7	1	30,6	46,4	1	28 000	18 000	28 000	14 000	8 500		
	38,1	51	53,2	1,1	32	55	1,1	24 000	16 000	24 000	13 000	7 500		
30	38	47,3	49,9	1	34,6	50,4	1	28 000	17 000	28 000	14 000	8 000		
	40,7	52,8	55,1	1	35,6	56,4	1	24 000	15 000	24 000	12 000	7 500		
	44,9	59,3	62,4	1,1	37	65	1,1	20 000	13 000	20 000	11 000	6 300		
35	44	54,3	57,1	1	39,6	57,4	1	24 000	15 000	24 000	12 000	7 000		
	47,6	61,6	64,9	1,1	42	65	1,1	20 000	13 000	20 000	10 000	6 300		
	50,5	66,7	71,6	1,5	44	71	1,5	19 000	12 000	19 000	9 500	6 000		
40	49,2	59,5	62,5	1	44,6	63,4	1	22 000	14 000	22 000	11 000	6 300		
	52,9	67,2	70,8	1,1	47	73	1,1	18 000	11 000	18 000	9 000	5 600		
45	54,5	65,8	69	1	50,8	69,2	1	20 000	12 000	20 000	10 000	5 600		
	56,6	71,8	74,5	1,1	52	78	1,1	17 000	11 000	17 000	8 500	5 000		
50	60	71	74,6	1	54,6	75,4	1	18 000	11 000	18 000	9 000	5 000		
	63,5	78,7	81,4	1,1	57	83	1,1	15 500	10 000	15 000	8 000	4 800		

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