

Increase performance and robustness in rope sheaves

With sealed SKF double row full complement cylindrical roller bearings



Extending meantime between failures

Rope sheaves are one of the most common reasons for crane failures. If the rope sheaves break during operation, it may cause instant catastrophic consequences, not to mention the additional cost of reduced equipment availability. For many crane operators, reliable rope sheaves are a pressing concern.

The most common cause for the early failure of rope sheave bearings is the bearing seal. Abrasive particles, surface roughness and corrosion might progressively wear the seal down prematurely. Once the seal lip is worn down, water and dirt will leak into the bearing, contaminating the grease and damaging the bearing. What's more, the seal sometimes pops out of place during relubrication.

Another crucial factor behind rope sheave bearing and crane performance is related to lubrication. Miscalculated relubrication intervals, no relubrication at all, or the use of a lubricant that doesn't withstand the working conditions of the crane are the most common mistakes. Use of contaminated grease can also lead to significantly reduced service life.

Depending on the specific regulations and requirements for a crane to become operational again, a failure could cause extra administrative work including the time to regain authorization to operate.

Costs are not only incurred from failures during operation of rope sheaves. Difficult maintenance and frequent replacement due to operations in high temperature, corrosive and abrasive environments are costly and time consuming. Therefore, a solution that extends meantime between failure would have a positive effect on production capacity and cost reduction.



SKF double row full complement cylindrical roller bearing with polyurethane seal (SKF H-ECOPUR) on both sides of the bearing



A robust and flexible solution

SKF double row full complement cylindrical roller bearings for rope sheaves, designed to accommodate tilting moments, are suitable for crane and lifting device applications specifically in Material handling, Marine, Construction and Oil & Gas. Deploying SKF's extensive knowledge about the challenges of rope sheave bearing performance and requirements in these industries, SKF double row full complement cylindrical roller bearings offer:

- **Superb fit for different crane operating environments** thanks to the possibility of accommodating customizations for machined seal options
- **Pre-sealed and pre-greased units** from the factory, meaning good rust inhibiting properties (low temperature option available). The high cleanliness factor further reduces the risk of malpractice.
- **Flexibility to relubricate** through the inner or outer ring
- **Possibility of eliminating the need for spacer rings** between the inner ring and adjacent components

- **Optional black oxide coating** – offering positive effects against most known bearing failures

New design with extended protection

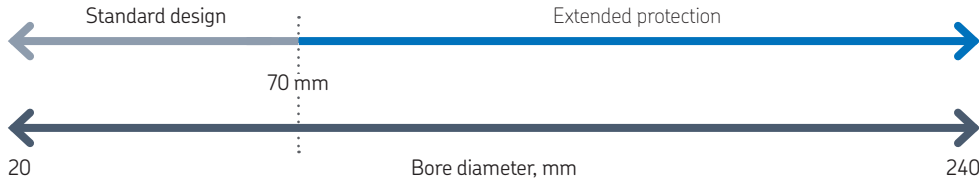
- **Extended service life and better wear properties** – with a contact polyurethane seal (SKF H-ECOPUR) on both sides of the bearing
- **Increased seal retention** thanks to the optimized seal (SKF H-ECOPUR) anchorage

In addition, using SKF Application engineering services, maintenance tools and mounting instructions, you can mitigate the risk of improper installation.

The availability of SKF double row full complement cylindrical roller bearings is high, with quick delivery through global distribution.

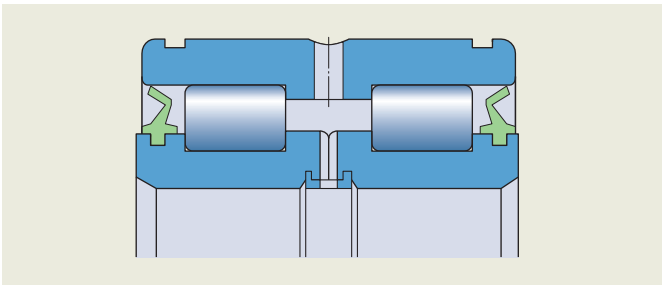
Design variants

SKF double row full complement cylindrical roller bearings come in two design variants - standard and extended protection. Both offers provide exceptional performance for rope sheaves, but the extended protection design – only available for bore diameters exceeding 70 mm – includes a new sealing material (H-ECOPUR), offering even better protection in harsh, corrosive environments.



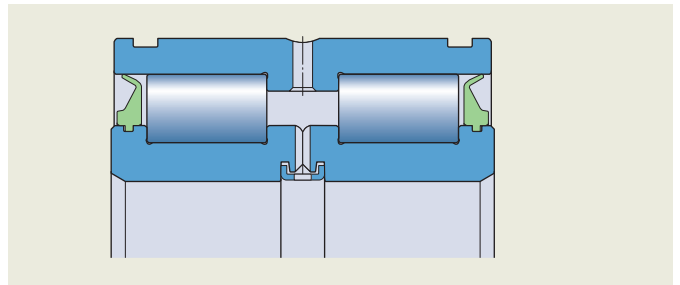
Standard design

The bearings have a contact PUR seal on both sides. Each seal is fitted in a recess on the inner ring shoulder. The seal lip exerts slight pressure against the outer ring raceway. The bearings are filled with a high-quality grease with good rust inhibiting properties.



Extended protection

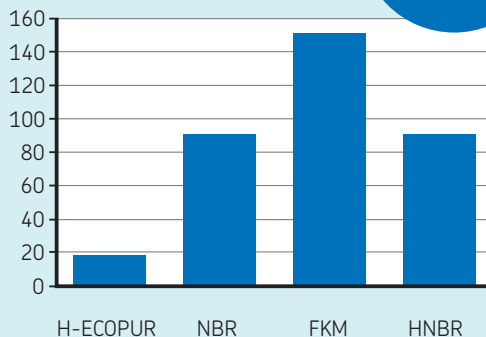
The contact seal in the new design uses SKF proprietary material H-ECOPUR on both sides of the bearing for extended service life, better wear properties and increased seal retention as seen in the test results below. These bearings are also filled with a high-quality grease with good rust inhibiting properties.



Improved seal performance with SKF H-ECOPUR

Abrasion wear of various elastomers

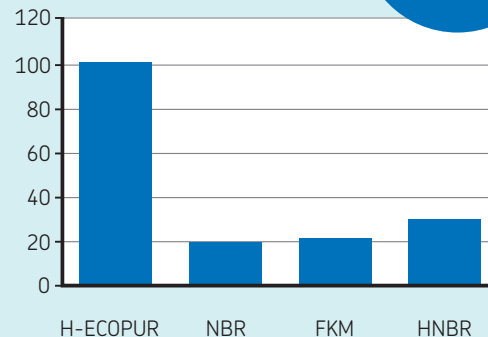
Tear strength (kN/m)



5x
ABRASION
RESISTANT

Tear strength of various elastomers

Tear strength (kN/m)



>3x
TEAR
STRENGTH

Designation system

SKF NNF 50xx and 3194xx-series		NNF 50	20	B	-2LS	C5
Examples	NNF 5020 B-2LS/C5 NNF 5020 ADA-2LSV/C5 319420 B-2LS/C5 319420 DA-2LS/C5	3194	20	B	-2LS	C5
Bearing series						
NNF 50xx	Normal series. Sealed double row full complement cylindrical roller bearings					
3194xx	Thin cross section. Sealed double row full complement cylindrical roller bearings					
Bore diameter						
04	20 mm bore					
48	240 mm bore					
Suffixes						
B	Improved seal and grease					
ADB	Modified internal design and seal (for NNF 50 series)					
DA	Modified internal design and seal (for 3194... series)					
ADA	Standard execution					
Seal						
-2LS	Contact seal on both sides					
Variants						
VL294	Corrosion resistant coating					
LxB	Black oxide coating					
Cx	Radial clearance					
Gxxx	Non standard grease variant					
VU079x	Snap rings attached					

Coating options

SKF double row full complement cylindrical roller bearings come with a coating option that enhances the corrosion resistance of the seal lip interface, further extending service life. There is an option for corrosion resistant coating for 100 h or 400 h in salt spray (DIN EN ISO 9227 test) to prevent rust corrosion and seal wear.

The corrosion resistant coating is Cr(VI) free, accommodating environmental regulations.

An option for black oxide coating is also available. Besides improvements to the running-in process, black oxide coating is a good overall choice to support bearing life.

Grease

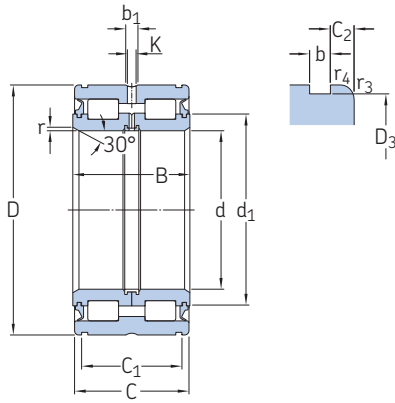
Initial grease fill is GHU. Other grease options for SKF double row full complement cylindrical roller bearings are available upon request.

Grease	Temperature range ¹⁾	Thickener	Base oil type	NLGI grade	Base oil viscosity	
					[mm ² /s] at 40 °C (105 °F)	at 100 °C (210 °F)
GHU		Lithium complex soap	Mineral	2	150	15

For coating, non-standard grease and clearance options, please contact your local SKF representative.

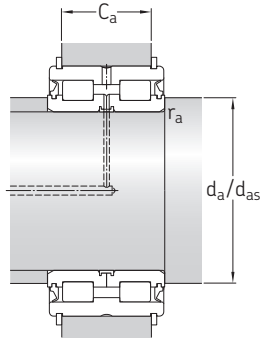
Sealed double row full complement cylindrical roller bearings

d 20 – 140 mm



Principal dimensions				Basic load ratings		Fatigue load limit	Limiting speed	Mass	Designation
d	D	B	C	dynamic	static	P_u			
mm				kN	C_0	kN	r/min	kg	–
20	42	30	29	45,7	55	5,7	3 400	0,2	▶ NNF 5004 ADB-2LSV
25	47	30	29	50,1	65,5	6,8	3 000	0,24	▶ NNF 5005 ADB-2LSV
30	55	34	33	57,2	75	7,8	2 600	0,37	▶ NNF 5006 ADB-2LSV
35	62	36	35	70,4	98	10,6	2 200	0,48	▶ NNF 5007 ADB-2LSV
40	68	38	37	85,8	116	13,2	2 000	0,56	▶ NNF 5008 ADB-2LSV
45	75	40	39	102	146	17	1 800	0,7	▶ NNF 5009 ADB-2LSV
50	80	40	39	108	160	18,6	1 700	0,76	▶ NNF 5010 ADB-2LSV
55	90	46	45	128	193	22,8	1 500	1,2	▶ NNF 5011 ADB-2LSV
60	95	46	45	134	208	25	1 400	1,25	▶ NNF 5012 ADB-2LSV
65	100	46	45	138	224	26,5	1 300	1,35	▶ NNF 5013 ADB-2LSV
70	110	54	53	187	285	34,5	1 200	1,85	▶ NNF 5014 ADA-2LSV
75	115	54	53	224	310	40	1 100	1,95	▶ NNF 5015 ADA-2LSV
80	125	60	59	251	415	53	1 000	2,7	▶ NNF 5016 ADA-2LSV
85	130	60	59	270	430	55	1 000	2,85	▶ NNF 5017 ADA-2LSV
90	140	67	66	319	550	69,5	900	3,7	▶ NNF 5018 ADA-2LSV
95	145	67	66	330	570	71	900	3,9	NNF 5019 ADA-2LSV
100	150	67	66	336	570	68	850	3,95	▶ NNF 5020 ADA-2LSV
110	170	80	79	413	695	81,5	750	6,45	▶ NNF 5022 ADA-2LSV
120	180	80	79	429	750	86,5	700	6,9	▶ NNF 5024 ADA-2LSV
130	190	80	79	446	815	91,5	670	7,3	319426 B-2LS
	200	95	94	616	1 040	120	630	10,5	▶ NNF 5026 ADA-2LS
140	200	80	79	468	865	96,5	630	8	319428 DA-2LS
	210	95	94	644	1 120	127	600	11	▶ NNF 5028 ADA-2LS

▶ Loads are given in the opposite direction to the slots



Dimensions										Abutment and fillet dimensions ¹⁾					Calculation factor k_r	Associated snap rings ²⁾	
d	d_1 ≈	D_3	$C_{1+0,2}$	C_2	b	b_1	K	r min.	$r_{3,4}$ min.	d_a min.	d_{as} ³⁾	$C_{a1-0,2}$	$C_{a2-0,2}$	r_a max.		Seeger	DIN 471
mm										mm					–	–	
20	30,6	40,2	24,7	2,15	1,8	6,5	3,5	0,5	0,3	24	28,8	21,5	21	0,3	0,4	SW 42	42x1.75
25	35,4	45,2	24,7	2,15	1,8	6,5	3,5	0,5	0,3	29	33,6	21,5	21	0,3	0,4	SW 47	47x1.75
30	40,6	53	28,2	2,4	2,1	7,5	4,5	0,5	0,3	34	38,7	25	24	0,3	0,4	SW 55	55x2
35	46,1	60	30,2	2,4	2,1	7,5	4,5	0,5	0,3	39	44	27	26	0,3	0,4	SW 62	62x2
40	51,4	65,8	32,2	2,4	2,7	7,5	4,5	0,8	0,6	44	49,2	28	27	0,4	0,4	SW 68	68x2.5
45	57	72,8	34,2	2,4	2,7	8,5	4,5	0,8	0,6	49	54,7	30	29	0,4	0,4	SW 75	75x2.5
50	61,8	77,8	34,2	2,4	2,7	8,5	4,5	0,8	0,6	54	59,5	30	29	0,4	0,4	SW 80	80x2.5
55	68,6	87,4	40,2	2,4	3,2	8,5	4,5	1	0,6	60	66,1	35	34	0,6	0,4	SW 90	90x3
60	73,7	92,4	40,2	2,4	3,2	9,5	5	1	0,6	65	71,2	35	34	0,6	0,4	SW 95	95x3
65	78,8	97,4	40,2	2,4	3,2	9,5	5	1	0,6	70	76,3	35	34	0,6	0,4	SW 100	100x3
70	84,5	107,1	48,2	2,4	4,2	9,5	5	1	0,6	75	82	43	40	0,6	0,4	SW 110	110x4
75	90	112,1	48,2	2,4	4,2	9,5	5	1	0,6	80	87	43	40	0,6	0,4	SW 115	115x4
80	97	122,1	54,2	2,4	4,2	6	3,5	1,5	0,6	86	94,3	49	46	1	0,4	SW 125	125x4
85	101	127,1	54,2	2,4	4,2	6	3,5	1,5	0,6	91	100	49	46	1	0,4	SW 130	130x4
90	109	137	59,2	3,4	4,2	6	3,5	1,5	0,6	96	106	54	51	1	0,4	SW 140	140x4
95	113	142	59,2	3,4	4,2	6	3,5	1,5	0,6	101	110	54	51	1	0,4	SW 145	145x4
100	118	147	59,2	3,4	4,2	6	3,5	1,5	0,6	106	115	54	51	1	0,4	SW 150	150x4
110	132	167	70,2	4,4	4,2	6	3,5	1,8	0,6	117	128	65	62	1,5	0,4	SW 170	170x4
120	141	176	71,2	3,9	4,2	6	3,5	1,8	0,6	127	138	65	63	1,5	0,4	SW 180	180x4
130	151	186	71,2	3,9	4,2	6	3,5	1,8	0,6	137	147	65	63	1,5	0,4	SW 190	190x4
	155	196	83,2	5,4	4,2	7	4	1,8	0,6	137	150	77	75	1,5	0,4	SW 200	200x4
140	160	196	71,2	3,9	4,2	7	4	1,8	0,6	147	156	65	63	1	0,4	SW 200	200x4
	167	206	83,2	5,4	5,2	7	4	1,8	0,6	147	162	77	73	1,5	0,4	SW 210	210x5

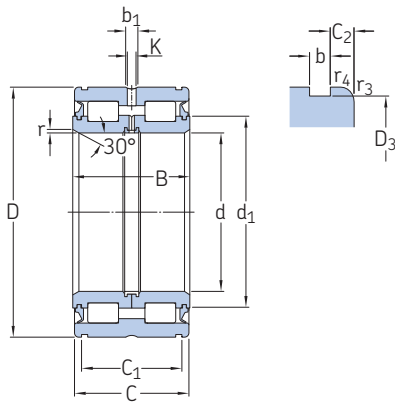
1) The values for C_{a1} apply for SW snap rings, the values for C_{a2} for snap rings in accordance with DIN 471.

2) Snap rings are not supplied by SKF.

3) Recommended shaft abutment diameter for axially loaded bearings.

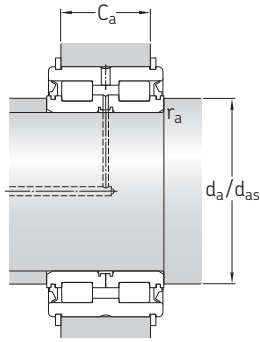
Sealed double row full complement cylindrical roller bearings

d 150 – 280 mm



Principal dimensions				Basic load ratings		Fatigue load limit	Limiting speed	Mass	Designation
d	D	B	C	dynamic	static	P_u			
mm				kN	C_0	kN	r/min	kg	–
150	210	80	79	484	915	100	600	8,4	319430 B-2LS
	225	100	99	748	1 290	143	560	13,5	▶ NNF 5030 ADA-2LS
160	220	80	79	501	1 000	106	530	8,8	319432 DA-2LS
	240	109	108	781	1 400	153	500	16,5	NNF 5032 ADA-2LS
170	230	80	79	512	1 060	110	530	9,2	319434 B-2LS
	260	122	121	1 010	1 800	193	480	22,5	▶ NNF 5034 ADA-2LS
180	240	80	79	528	1 100	114	480	9,8	319436 DA-2LS
	280	136	135	1 170	2 120	228	450	31	NNF 5036 ADA-2LS
190	260	80	79	550	1 180	120	450	12,5	319438 DA-2LS
	290	136	135	1 190	2 200	236	430	31,5	NNF 5038 ADA-2LS
200	270	80	79	583	1 370	137	430	13	319440 B-2LS
	310	150	149	1 450	2 900	300	400	42	NNF 5040 ADA-2LSV
220	300	95	94	880	1 860	190	380	19	319444 B-2LS
	340	160	159	1 610	3 100	315	360	54	NNF 5044 ADA-2LSV
240	320	95	94	952	2 040	200	360	20	319448 B-2LS
	360	160	159	1 680	3 350	335	340	57,5	NNF 5048 B-2LS
260	340	95	94	990	2 160	212	340	22	319452 B-2LS
	400	190	189	2 420	4 650	455	300	86	NNF 5052 B-2LS
280	420	190	189	2 550	5 000	490	280	91	NNF 5056 B-2LS

▶ Loads are given in the opposite direction to the slots



Dimensions										Abutment and fillet dimensions ¹⁾					Calculation factor k_r	Associated snap rings ²⁾	
d	d_1 ≈	D_3	$C_{1+0,2}$	C_2	b	b_1	K	r min.	$r_{3,4}$ min.	d_a min.	d_{as} ³⁾	$C_{a1-0,2}$	$C_{a2-0,2}$	r_a max.		Seeger	DIN 471
mm										mm					-	-	
150	170	206	71,2	3,9	5,2	7	4	1,8	0,6	157	166	65	61	1,5	0,4	SW 210	210x5
	177	221	87,2	5,9	5,2	7	4	2	0,6	157	172	81	77	2	0,4	SW 225	225x5
160	184	216	71,2	3,9	5,2	7	4	1,8	0,6	167	180	65	61	1	0,4	SW 220	220x5
	191	236	95,2	6,4	5,2	7	4	2	0,6	167	186	89	85	2	0,4	SW 240	240x5
170	194	226	71,2	3,9	5,2	7	4	1,8	0,6	177	190	65	61	1,5	0,4	SW 230	230x5
	203	254	107,2	6,9	5,2	7	4	2	0,6	177	197	99	97	2	0,4	SW 260	260x5
180	203	236	71,2	3,9	5,2	7	4	1,8	0,6	187	199	65	61	1	0,4	SW 240	240x5
	220	274	118,2	8,4	5,2	8	4	2	0,6	187	214	110	108	2	0,4	SW 280	280x5
190	218	254	73,2	2,9	5,2	7	4	1,8	0,6	197	214	65	63	1	0,4	SW 260	260x5
	228	284	118,2	8,4	5,2	8	4	2	0,6	197	222	110	108	2	0,4	SW 290	290x5
200	227	264	73,2	2,9	5,2	7	4	1,8	0,6	207	223	65	63	1,5	0,4	SW 270	270x5
	245	304	128,2	10,4	6,3	8	4	2	0,6	207	239	120	116	2	0,4	SW 310	310x6
220	250	295	83,2	5,4	5,2	8	6	1,8	1	227	246	75	73	1,5	0,4	SW 300	300x5
	263	334	138,2	10,4	6,3	9,5	6	2	1	227	256	130	126	2	0,4	SW 340	340x6
240	269	314	83,2	5,4	6,3	8	6	1,8	1	247	265	75	71	1,5	0,4	SW 320	320x6
	282	354	138,2	10,4	6,3	9,5	6	2	1	247	275	130	126	2	0,4	SW 360	360x6
260	291	334	83,2	5,4	6,3	8	6	1,8	1	267	286	75	71	1,5	0,4	SW 340	340x6
	309	394	162,2	13,4	6,3	9,5	6	2	1,1	268	300	154	150	2	0,4	SW 400	400x6
280	333	413	163,2	12,9	7,3	9,5	6	2	1,1	288	324	154	149	2	0,4	SW 420	420x7

¹⁾ The values for C_{a1} apply for SW snap rings, the values for C_{a2} for snap rings in accordance with DIN 471.

²⁾ Snap rings are not supplied by SKF.

³⁾ Recommended shaft abutment diameter for axially loaded bearings.

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