

Find it here

Cylindrical roller and insulated bearings for electric motors from SKF





Expect more

It takes more than a longer-lasting SKF® bearing to make a longer-lasting motor. However, selecting the right bearing, with the right features, can have a significant impact on a motor's reliability and performance. Your customers understand that – which is why SKF is dedicated to providing you with only the highest-quality products and services.

Get more

In addition to a full range of bearings and solution products, you also have access to the wide range of engineering services that only SKF can provide. Our services go beyond bearing selection to include design and testing services that can build additional value into your motor design and decrease your “time-to-market”.

Give more

When customers buy your motor, they want to know that they are getting the most reliable motor money can buy – because reliability means productivity.

So show your customers that the components inside that motor were designed for maximum reliability and performance by installing SKF products.

Cylindrical roller bearings

Cylindrical roller bearings with a roller centred, machined brass cage are typically used in belt or gear driven medium to large sized electric motors, where heavy radial loads prevail. These bearings are usually used in the non-locating drive side position, in combination with a deep groove ball bearing. The cage can withstand high temperatures and high speeds and can accommodate vibrations and accelerations.

Advantages

Cylindrical roller bearings have high radial load carrying capability as well as relatively high-speed capability. The separable component design of the cylindrical roller bearing simplifies mounting. The bearings accommodate axial movement inside the bearing, enabling tight shaft and housing fits.

Other advantages include:

- Compared to cylindrical roller bearings with a pressed steel cage or with an inner or outer ring centred brass cage the maintenance (relubrication) interval for cylindrical roller bearings with a roller centred machined brass cage is doubled.
- Low noise – By optimizing the waviness of the rings and rollers, noise levels were reduced by as much as 30–50 %.
- Reduced energy consumption – Optimized surface finish of the rollers, raceways and cage, reduce friction torque and energy consumption.
- Longer service life and higher load carrying capacity – Ultra clean steel combined with a unique heat treatment process, tighter manufacturing tolerances and optimized rolling contact surfaces increase service life 1,3 to 6 times. Load carrying capacity can be increased by 15 % when compared to other standard bearings.

For additional information, see the product tables starting on page 7.



Cylindrical roller bearing



Hybrid bearing



INSOCOAT bearing

Insulated bearings

Hybrid bearings

Hybrid bearings are typically used in small electric motors where premature bearing damage can be caused by stray electric currents. These bearings have rings made from bearing steel and rolling elements made from bearing grade silicon nitride. Silicon nitride is a low density, high strength ceramic material that has a high degree of toughness and hardness and also has excellent insulating properties.

When used as an insulator, the ceramic rolling elements in a hybrid bearing prevent damaging electric currents from passing through the bearing.

When used in high-speed electric motors, they provide substantially longer service life and lower friction than traditional all-steel bearings.

Advantages

- Higher speed capabilities:
 - Lower density: Silicon nitride balls have a density of only 40 % of similarly sized steel balls. This means higher speeds,

less weight, lower inertia, more rapid starts and stops.

- Low friction: Silicon nitride's low coefficient of friction enhances wear resistance enabling the bearing to run cooler even under poor lubrication conditions. This means better lubrication, lower noise level, lower operating temperatures.
 - Higher modulus of elasticity: Ceramic rolling elements have a 50 % higher modulus of elasticity than steel. This means increased bearing stiffness.
 - Lower coefficient of thermal expansion: Ceramic rolling elements have a thermal expansion only 29 % of similar steel rolling elements. This means less sensitivity to temperature gradients for more accurate preload control.
- Improved service life of those applications where poor lubrication is caused by any of the following conditions:
 - High temperatures
 - Vertical shaft or outer ring rotation
 - Air streams

- Improved grease life – Hybrid bearings generate less friction and less heat than comparably sized all-steel bearings.
- Resist wear caused by solid particle contamination. Silicon nitride is very hard, harder than most particles that can occur as contaminants in a bearing. The silicon nitride rolling elements eliminate the particles either by crushing them or pressing them into the (softer) steel rings, where they are rendered harmless.
- Resist vibration. Silicon nitride rolling elements on steel have much higher resistance against wear caused by small vibrations within the bearings, particularly at standstill.

For additional information, see the product table starting on page 9.

INSOCOAT[®] bearings

INSOCOAT bearings have an aluminium oxide coating applied to the bearing surface by a unique plasma-spraying technology. This coating acts as an insulator to protect the bearing against the damage caused by stray electric currents. In principle, any bearing type can be electrically insulated but for electric motor and generator applications, INSOCOAT bearings are usually deep groove ball bearings and cylindrical roller bearings. INSOCOAT bearings are generally mounted on the non-drive end of medium and large converter driven induction motors, and at both bearing locations in large generators. These bearings are available with an insulating coating on either the outer ring (designa-

tion suffix VL0241) or the inner ring (designation suffix VL2071). An outer ring coating can be applied to bearings with an outside diameter > 80 mm. An inner ring coating can be applied to bearings with a bore diameter > 70 mm.

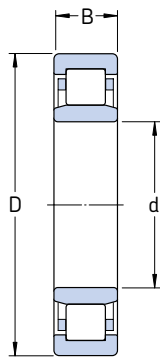
Fits can be applied up to and including p6 for inner ring coated bearings and up to and including P6 for outer ring coated bearings. INSOCOAT bearings can therefore use the same fit, as a standard bearing in the same application. SKF performs 100 % testing at a breakdown voltage of 1 000 V DC. Lab tests have shown that electrical breakdown occurs above 3 000 V DC. INSOCOAT bearings have a minimum resistance of 50 M ohms.

Advantages

- Provides two features in one solution: a bearing function and electrical insulation function.
- Virtually eliminates arcing related failures to improve uptime.
- Reduces maintenance costs.
- Cost-effective when compared with other insulating solutions.
- Global availability – in more than 130 countries and at 7 000 distribution locations worldwide.

For additional information, see the product tables starting on page 11.

Cylindrical roller bearings
for electrical motors



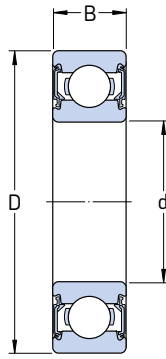
Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation	Alternative standard cage design
d	D	B	dynamic C	static C ₀	Reference speed	Limiting speed			
mm			kN		r/min		kg	–	–
60	110	22	108	102	6 700	7500	0,92	NU 212 ECM	P
	130	31	173	160	5 600	6700	2,10	NU 312 ECM	P
65	120	23	122	118	6 300	6700	1,20	NU 213 ECM	P
	140	33	212	196	5 300	6000	2,55	NU 313 ECM	P
70	125	24	137	137	6 000	6300	1,32	NU 214 ECM	P
	150	35	236	228	4 800	5600	3,15	NU 314 ECM	P
75	130	25	150	156	5 600	6000	1,45	NU 215 ECM	P
	160	37	280	265	4 500	5300	3,80	NU 315 ECM	P
80	140	26	160	166	5 300	5600	1,80	NU 216 ECM	P
	170	39	300	290	4 300	5000	4,40	NU 316 ECM	P
85	150	28	190	200	4 800	5300	2,15	NU 217 ECM	P
	180	41	340	335	4 000	4800	5,40	NU 317 ECM	P
90	160	30	208	220	4 500	5000	2,75	NU 218 ECM	P
	190	43	365	360	3 800	4500	6,15	NU 318 ECM	P
95	170	32	255	265	4 300	4800	3,30	NU 219 ECM	P
	200	45	390	390	3 600	4300	7,10	NU 319 ECM	P
100	180	34	285	305	4 000	4500	4,00	NU 220 ECM	P
	215	47	450	440	3 200	3800	8,50	NU 320 ECM	P
110	200	38	335	365	3 600	4000	5,45	NU 222 ECM	P
	240	50	530	540	3 000	3400	11,6	NU 322 ECM	P
120	215	40	390	430	3 400	3600	6,55	NU 224 ECM	P
	260	55	610	620	2 800	3200	14,6	NU 324 ECM	P
130	230	40	415	455	3 200	3400	7,15	NU 226 ECM	P
	280	58	720	750	2 400	3000	18,0	NU 326 ECM	P
140	250	42	450	510	2 800	3200	9,00	NU 228 ECM	–
	300	62	780	830	2 400	2800	22,0	NU 328 ECM	–
150	270	45	510	600	2 600	2800	13,7	NU 230 ECM	–
	320	65	900	965	2 200	2600	26,3	NU 330 ECM	–
160	290	48	585	680	2 400	2600	14,1	NU 232 ECM	–
	340	68	1 000	1 080	2 000	2400	32,0	NU 332 ECM	–

The bearings are available with Normal and C3 clearance
Blue items are SKF Explorer bearings

Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	B	dynamic	static	Reference speed	Limiting speed		
			C	C ₀				
mm			kN		r/min		kg	–
170	310 360	52 72	695 952	815 1 180	2 200 1 700	2 400 2 200	18,2 37,5	NU 234 ECM NU 334 ECM
180	320 380	52 75	720 1 020	850 1 290	2 200 1 600	3 200 2 200	19,0 44,0	NU 236 ECM NU 336 ECM
190	340 400	55 78	800 1 140	965 1 500	2 000 1 500	3 000 2 000	24,0 50,0	NU 238 ECM NU 338 ECM
200	360	58	850	1 020	1 900	2 800	28,5	NU 240 ECM
220	400	65	1 060	1 290	1 600	2 400	38,5	NU 244 ECM

The bearings are available with Normal and C3 clearance
Blue items are SKF Explorer bearings

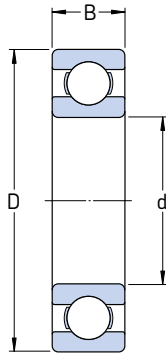
Sealed and greased-for-life hybrid deep groove ball bearings
for electric motors



Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	B	dynamic C	static C ₀	Reference speed	Limiting speed		
mm			kN		r/min		kg	–
5	16	5	1,14	0,38	130 000	85 000	0,0050	625-2RZTN9/HC5C3WTF1
6	19	6	2,34	0,95	110 000	70 000	0,0080	626-2RSLTN9/HC5C3WTF1
7	19	6	2,34	0,95	110 000	70 000	0,0070	607-2RSLTN9/HC5C3WTF1
	22	7	3,25	1,37	95 000	63 000	0,012	627-2RSLTN9/HC5C3WTF1
8	22	7	3,45	1,37	95 000	63 000	0,012	608-2RSLTN9/HC5C3WTF1
10	26	8	4,75	1,95	85 000	56 000	0,018	6000-2RSLTN9/HC5C3WT
	30	9	5,4	2,36	75 000	50 000	0,032	6200-2RSLTN9/HC5C3WT
12	28	8	5,4	2,36	75 000	50 000	0,022	6001-2RSLTN9/HC5C3WT
	32	10	7,28	3,1	67 000	45 000	0,037	6201-2RSLTN9/HC5C3WT
15	32	9	5,85	2,85	63 000	43 000	0,030	6002-2RSLTN9/HC5C3WT
	35	11	8,06	3,75	60 000	40 000	0,044	6202-2RSLTN9/HC5C3WT
17	35	10	6,37	3,25	56 000	38 000	0,038	6003-2RSLTN9/HC5C3WT
	40	12	9,95	4,75	53 000	34 000	0,059	6203-2RSLTN9/HC5C3WT
20	42	12	9,95	5	48 000	32 000	0,062	6004-2RSLTN9/HC5C3WT
	47	14	13,5	6,55	45 000	30 000	0,097	6204-2RSLTN9/HC5C3WT
25	47	12	11,9	6,55	40 000	28 000	0,073	6005-2RSLTN9/HC5C3WT
	52	15	14,8	7,8	38 000	26 000	0,12	6205-2RSLTN9/HC5C3WT
30	55	13	13,8	8,3	34 000	24 000	0,11	6006-2RZTN9/HC5C3WT
	62	16	20,3	11,2	32 000	22 000	0,18	6206-2RZTN9/HC5C3WT
35	62	14	16,8	10,2	30 000	20 000	0,15	6007-2RZTN9/HC5C3WT
	72	17	27	15,3	28 000	18 000	0,26	6207-2RZTN9/HC5C3WT
40	68	15	17,8	11,6	28 000	18 000	0,19	6008-2RZTN9/HC5C3WT
	80	18	32,5	19	24 000	16 000	0,34	6208-2RZTN9/HC5C3WT
45	85	19	35,1	21,6	22 000	14 000	0,42	6209-2RZTN9/HC5C3WT
	100	25	55,3	31,5	20 000	4 500	0,77	6309-2RS1TN9/HC5C3WT
50	90	20	37,1	23,2	20 000	4 800	0,44	6210-2RS1/HC5C3WT
	110	27	65	38	18 000	4 300	0,92	6310-2RS1/HC5C3WT
55	100	21	46,2	29	19 000	4 300	0,59	6211-2RS1/HC5C3WT
	120	29	74,1	45	17 000	3 800	1,18	6311-2RS1/HC5C3WT

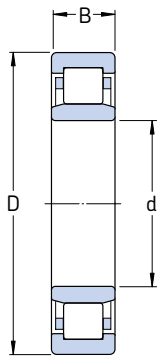
Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	B	dynamic	static	Reference speed	Limiting speed		
			C	C ₀				
mm			kN		r/min		kg	–
60	110	22	55,3	36	17 000	4 000	0,71	6212-2RS1/HC5C3WT
	130	31	85,2	52	15 000	3 400	1,49	6312-2RS1/HC5C3WT
65	120	23	58,5	40,5	16 000	3 600	0,92	6213-2RS1/HC5C3WT
	140	33	97,5	60	14 000	3 200	1,84	6313-2RS1/HC5C3WT
70	125	24	63,7	45	15 000	3 400	0,99	6214-2RS1/HC5C3WT
75	130	25	68,9	49	14 000	3 200	1,05	6215-2RS1/HC5C3WT

**INSOCOAT deep groove ball bearings
for electric motors**



Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	B	dynamic C	static C ₀	Reference speed	Limiting speed		
mm			kN		r/min		kg	–
70	150	35	104	68	9 500	6 300	2,50	6314/C3VL0241
75	130	25	66,3	49	10 000	6 700	1,20	6215/C3VL0241
	160	37	114	76,5	9 000	5 600	3,05	6315/C3VL0241
80	140	26	70,2	55	9 500	6 000	1,40	6216/C3VL0241
	170	39	124	86,5	8 500	5 300	3,55	6316/C3VL0241
85	150	28	83,2	64	9 000	5 600	1,75	6217/C3VL0241
	180	41	133	96,5	8 000	5 000	4,10	6317/C3VL0241
90	160	30	95,6	73,5	8 500	5 300	2,40	6218/C3VL0241
	190	43	143	108	7 500	4 800	4,90	6318/C3VL0241
95	170	32	108	81,5	8 000	5 000	2,50	6219/C3VL0241
	200	45	153	118	7 000	4 500	5,65	6319/C3VL0241
100	180	34	124	93	7 500	4 800	3,15	6220/C3VL0241
	215	47	174	140	6 700	4 300	7,00	6320/C3VL0241
110	200	38	143	118	6 700	4 300	4,25	6222/C3VL0241
	240	50	203	180	6 000	3 800	9,65	6322/C3VL0241
120	215	40	146	118	6 300	4 000	5,20	6224/C3VL0241
	260	55	208	186	5 600	3 400	12,5	6324/C3VL2071
130	230	40	156	132	5 600	3 600	5,75	6226/C3VL2071
	280	58	229	216	5 000	3 200	15,2	6326/C3VL2071
140	300	62	251	245	4 800	4 300	21,8	6328 M/C3VL2071
150	270	45	174	166	5 000	3 200	9,80	6230/C3VL2071
	320	65	276	285	4 300	2 800	23,0	6330/C3VL2071
170	360	72	312	340	3 800	3 400	34,5	6334 M/C3VL2071
180	380	75	351	405	3 600	3 200	42,5	6336 M/C3VL2071

INSOCOAT cylindrical roller bearings
for electric motors



Principal dimensions			Basic load ratings		Speed ratings		Mass	Designation
d	D	B	dynamic	static	Reference speed	Limiting speed		
			C	C ₀				
mm			kN		r/min		kg	–
75	160	37	280	265	4 500	5 300	3,30	NU 315 ECP/VL0241
85	180	41	340	335	4 000	4 800	5,25	NU 317 ECM/C3VL0241
95	200	45	390	390	3 600	4 300	7,25	NU 319 ECM/C3VL0241
110	240	50	530	540	3 000	3 400	12,0	NU 322 ECM/C3VL0241
120	260	55	610	620	2 800	3 200	15,2	NU 324 ECM/C3VL0241



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