

WIND TURBINE GEARBOX BEARING SELECTION

Challenge

Major wind turbine gearbox manufacturer needed to reduce product cost in order to increase its overall competitiveness. Because the large and numerous bearings in a wind turbine gearbox application make up a large percentage of the wind turbine gearbox cost, this customer turned to NSK for help.

Solution

NSK is a major supplier of bearings to the wind energy industry segment. NSK has developed many unique bearing solutions for this industry by utilizing its application engineering expertise as well as the superior materials, designs and manufacturing capabilities that NSK has to offer.

In the case of this wind turbine gearbox requirement, NSK analyzed the customer's drawings as well as the bearing capacity and life requirements. NSK investigated this need for a smaller less expensive design and developed full complement cylindrical roller bearings that still met the capacity and life requirements. These smaller full complement designs provide a significant price advantage for the customer.

The unique full complement solution developed by NSK for this customer in the wind energy industry segment provided the gearbox manufacturer:

- ➔ Increased power density
- ➔ Extended bearing life
- ➔ Reduced product cost
- ➔ Improved shock load capability
- ➔ Reduced axial displacement

Result

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- ➔ Extended bearing life
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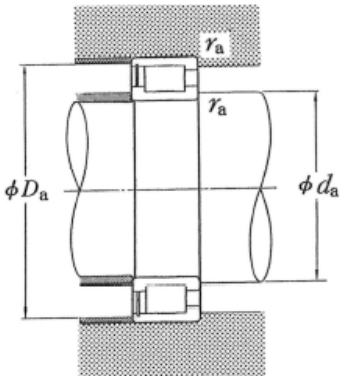
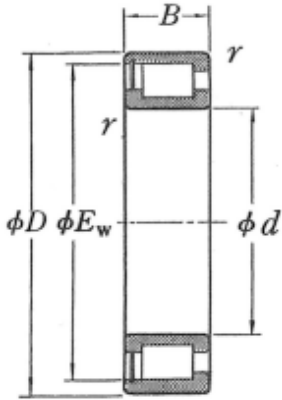
*Enhance your bottom line.
Think NSK.*



WIND TURBINE GEARBOX

BEARING SELECTION

NSK Full-Complement Cylindrical Roller Bearings



d	Boundary Dimensions (mm)				Basic Load Ratings (kN)		Bearing Numbers	Abutment and Fillet Dimensions (mm)			Mass (kg) approx
	D	B	r _{min}	E _w	C _r	C _{or}		d _a	D _a	r _a max	
150	210	36	2	195	289	505	NCF2930V	163	196	2	3.7
	225	56	2.1	206.82	460	710	NCF3030V	165	209	2	7.1
160	220	36	2	207	310	535	NCF2932V	173	208	2	3.8
	240	60	2.1	224.8	520	810	NCF3032V	175	225	2	8.6
170	215	22	1.5	203.5	149	272	NCF1834V	182	204	1.5	1.8
	230	36	2	218	320	570	NCF2934V	183	219	2	4.1
180	260	67	2.1	242.87	675	1070	NCF3034V	185	244	2	11.9
	225	22	1.5	215	154	290	NCF1836V	192	216	1.5	1.8
180	250	42	2	231.5	390	695	NCF2936V	193	236	2	6
	280	74	2.1	260.3	785	1260	NCF3036V	195	263	2	15.8
190	240	24	1.5	228.7	178	335	NCF1838V	202	229	1.5	2.4
	260	42	2	243.6	435	785	NCF2938V	203	245	2	6.5
190	290	75	2.1	269.9	805	1320	NCF3038V	206	273	2	16.7
	250	24	1.5	237	182	350	NCF1840V	213	238	1.5	2.5
200	280	48	2.1	261	530	955	NCF2940V	216	263	2	8.9
	310	82	2.1	287.8	910	1510	NCF3040V	216	293	2	21.4
220	270	24	2	257.7	191	385	NCF1844V	234	258	2	2.7
	300	48	2.1	282	555	1050	NCF2944V	236	283	2	9.6
240	340	90	3	312.3	1100	1820	NCF3044V	238	320	2.5	28.2
	300	28	2	283	236	470	NCF1848V	254	285	2	4.2
240	320	48	2.1	303	580	1140	NCF2948V	257	304	2	10.4
	360	92	3	335.25	1160	1990	NCF3048V	259	340	2.5	31.2
260	320	28	2	307	247	510	NCF1852V	275	308	2	4.5
	360	60	2.1	333.2	750	1460	NCF2952V	277	342	2	18.1
280	400	104	4	376.1	1570	2600	NCF3052V	282	377	3	45.3
	350	33	2.5	333.9	330	675	NCF1856V	298	334	2	6.8
280	380	60	2.1	358.8	880	1740	NCF2956V	297	361	2	19.5
	420	106	4	390.5	1610	2730	NCF3056V	302	395	3	49
300	380	38	2.5	359	445	870	NCF1860V	319	360	2	9.7
	420	72	3	389.6	1120	2200	NCF2960V	320	398	2.5	30.7
320	460	118	4	431.7	1980	3500	NCF3060V	323	435	3	67.6
	400	38	2.1	380	460	925	NCF1864V	338	381	2	10.3
320	440	72	3	410	1150	2340	NCF2964V	340	418	2.5	33
	480	121	4	449.6	2170	3900	NCF3064V	343	454	3	73
340	420	38	2.1	401	475	985	NCF1868V	359	402	2	10.7
	460	72	3	430.3	1190	2470	NCF2968V	361	438	2.5	34.1
360	520	133	5	485.8	2480	4350	NCF3068V	368	490	4	97
	440	38	2.5	422	490	1040	NCF1872V	380	423	2	11.5
360	480	72	3	450.7	1220	2610	NCF2972V	381	457	2.5	36
	540	134	5	503.6	2550	4600	NCF3072V	388	509	4	102
380	480	46	2.5	452.8	575	1230	NCF1876V	400	458	2	18.6
	520	82	4	486.7	1600	3350	NCF2976V	404	493	3	52
400	560	135	5	521.4	2610	4800	NCF3076V	408	529	4	108
	500	46	2.5	475.7	590	1300	NCF1880V	421	478	2	19.5
400	540	82	4	511	1650	3550	NCF2980V	425	513	3	53.4
	600	148	5	558.7	3050	5750	NCF3080AV	429	568	4	139
420	520	46	2.1	491	600	1340	NCF1884V	440	498	2	20.5
	560	82	4	523.2	1680	3650	NCF2984V	445	533	3	55.7
440	620	150	5	577.7	3000	5650	NCF3084V	449	588	4	147
	540	46	2.1	514	615	1410	NCF1888V	461	518	2	21.3
440	600	95	4	562	2070	4300	NCF2988V	466	572	3	78.2
	580	56	3	552.7	920	1950	NCF1892V	483	555	2.5	32.5
460	620	95	4	576.5	2100	4450	NCF2992V	486	591	3	81.2
	600	56	3	573	940	2040	NCF1896V	503	575	2.5	33.8
480	650	100	5	615	2380	5100	NCF2996V	510	617	4	95.1
	620	56	3	593.5	960	2120	NCF18/500V	524	594	2.5	35
500	670	100	5	630.2	2420	5250	NCF29/500V	531	637	4	98.4
	650	56	3	624	990	2240	NCF18/530V	554	625	2.5	36.9
560	680	56	3	654.7	1020	2360	NCF18/560V	585	655	2.5	39.3
	820	195	6	770	5600	11300	NCF30/560V	598	778	5	332.5
600	730	60	3	695.6	1140	2680	NCF18/600V	626	702	2.5	48.9
	800	118	5	752	3050	7300	NCF29/600V	633	764	4	164.9
630	780	69	4	742	1470	3400	NCF18/630V	659	748	3	68.8
670	820	69	4	780	1520	3550	NCF18/670V	700	787	3	72.7
710	870	74	4	832.5	1650	3900	NCF18/710V	741	836	3	87.6
750	920	78	5	882.3	1930	4600	NCF18/750V	786	883	4	103.3
800	980	82	5	936	2110	5100	NCF18/800V	832	950	4	123.1

Remarks:

1. Full-complement cylindrical roller bearings are designed for specific applications, when using them, please contact NSK.
2. Additional sizes and double-row full-complement cylindrical bearings can be found in the NSK Large-Size Rolling Bearings Catalog (CAT.No.E125e 2007)