

Koyo



New Series Spherical Roller Bearings

JTEKT

Koyo TOYODA

JHS Series Spherical Roller Bearings

~ JHS Features at a glance ~

Introduction

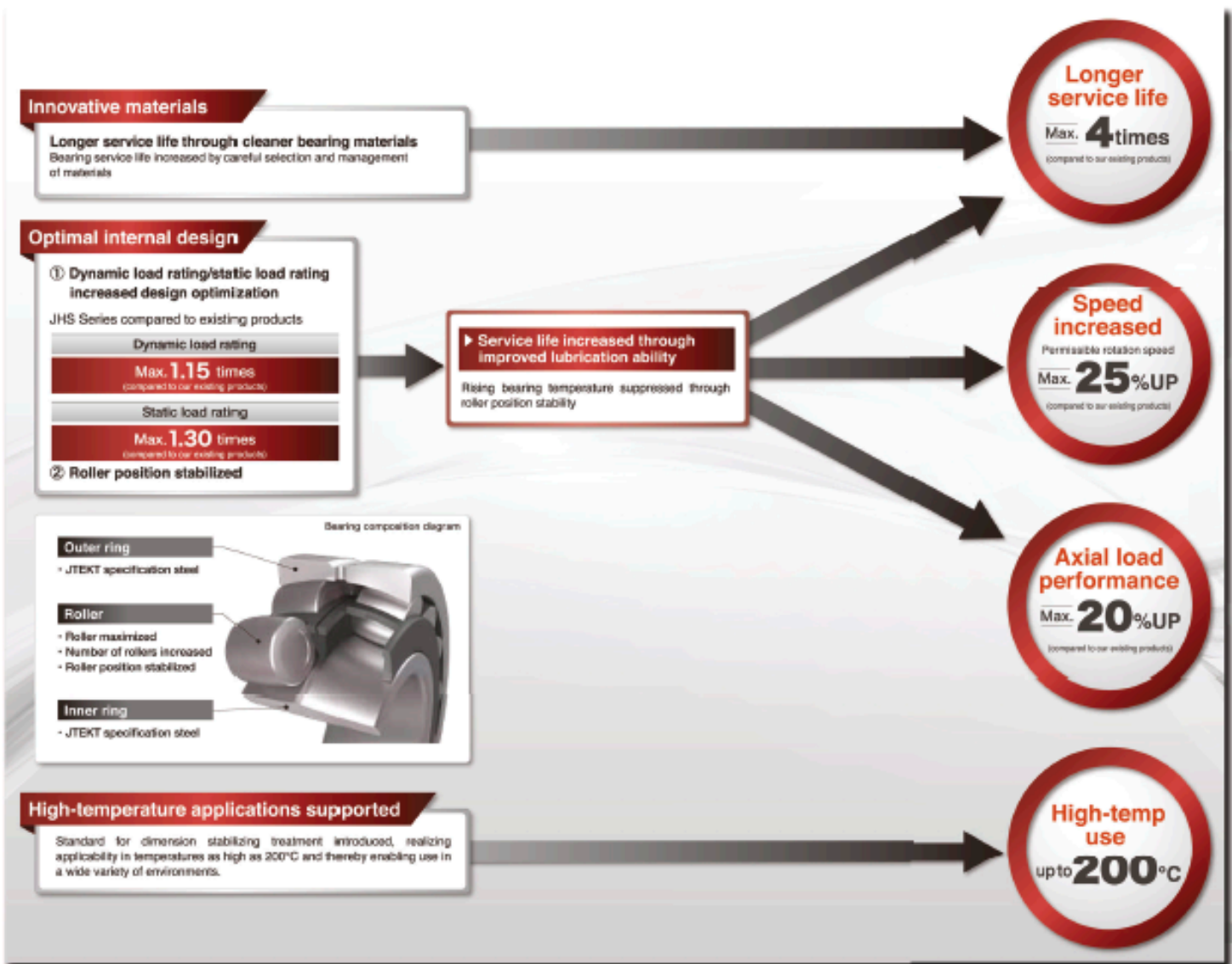
With the introduction of our new JHS Series Spherical Roller bearings we have been able to cater to our customers' needs. By using innovative technology and materials, an optimal internal design and a standardized dimension stabilizing treatment our JHS Series Spherical Roller Bearings enables a longer service life, faster rotation speed, enhanced axial load performance and a product which can endure and perform in high temperature applications.

JHS series stands for Superior high-performance bearings for revolutionary industrial machinery and equipment. The bearings are more compact and have the same capacity and size but can offer a longer service life, higher productivity and less maintenance.

Features

4 advantages of our new JHS Series Spherical Roller Bearings

- ✓ Longer Service Life
- ✓ Speed Increase
- ✓ Axial Load Performance
- ✓ High-temperature environment



Test Results

Longer Service Life

By strictly controlling and monitoring our steel specifications, improvements in lubrication and adopting designs for high load capacity resulted in a longer service life for our JHS series Spherical Roller Bearings.

1) Strict Control of JTEKT's Steel Specifications

Non-metal inclusions are harmful and can reduce the bearing life, therefore by an even more intensive control on these non-metal inclusions the practical life of a bearing could be improved two times or even more than the calculated life, resulting in a 125 times higher dynamic load ratings.

JTEKT Ball & Roller Bearing Catalogue Applied from CAT.NO.B2001-4
 JTEKT Large Size Ball & Roller Bearing Catalogue Applied from CAT.NO.B2002E-1

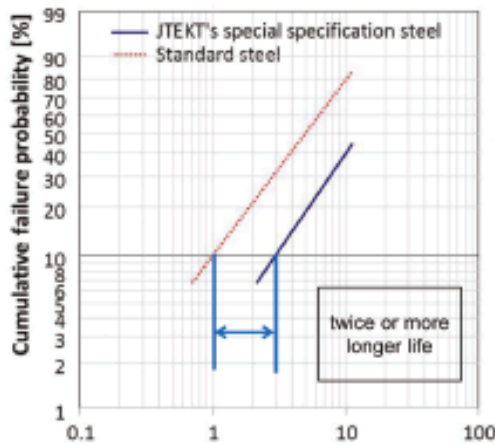


Fig. 2: Life comparison with L10/standard steel

2) Improved Lubrication

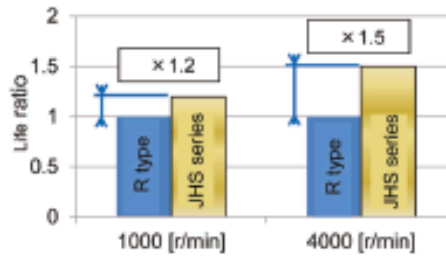


Fig. 3: Improved life due to low temperature rise

Long life realized by arranging the rollers in a more stable position which can curb temperature rise and improve lubrication.

3) Adopting designs for high load capacity

High load capacity could be achieved by using more and larger rollers for the JHS series than for the R type spherical roller bearings (asymmetrical roller).
 Dynamic load rating → max. x 1.5 (life → x 1.5)
 Static load rating → max. x 1.30

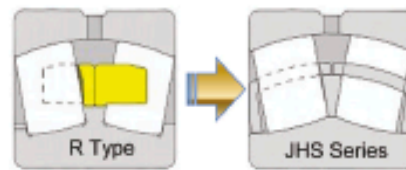


Fig. 4: JHS series

Higher Speed Performance (compared with R, RH types)

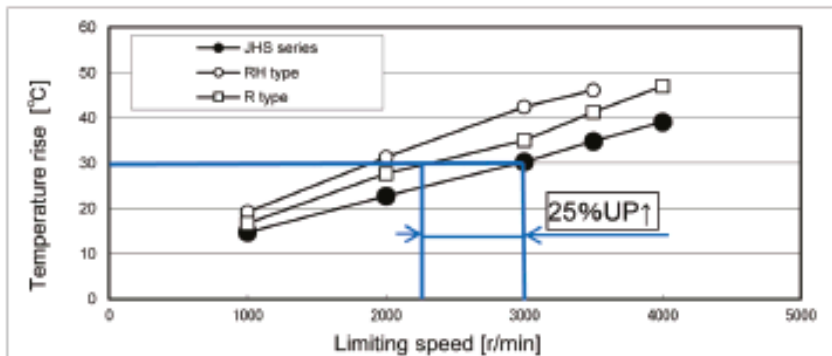


Fig. 5: Test results under both radial and axial loads
 ■ Limiting speed 2400 r/min
 Higher speed performance superior to R type

Axial Load Capacity (compared with R, RH types)

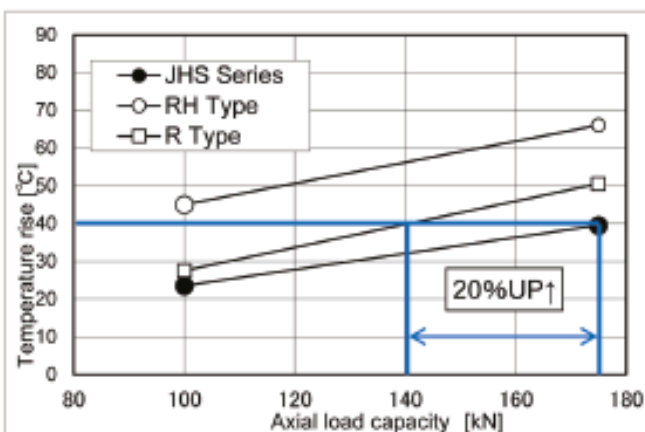


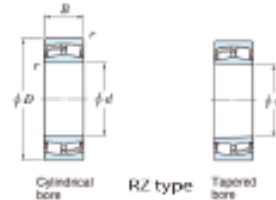
Fig. 6: Test results under both radial and axial loads

Operating Temperature

Our JHS series are undergoing a dimension stabilizing treatment which enables the spherical bearing to perform at temperatures up to 200 °C and a variety of other extreme environments.

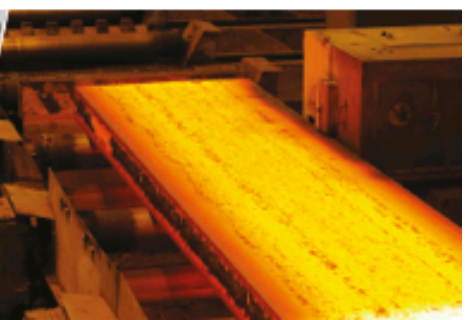
Koyo

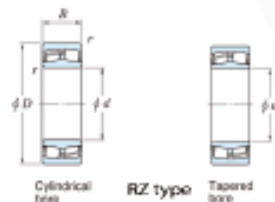
Tough on Friction, Kind to Earth



d (25) ~ (95) mm

Boundary Dimensions (mm)				Basic Load Ratings (kN)		Limiting Speeds (min ⁻¹)		Bearing No.		Constant	Axial Load Factor		
d	D	B	r_{min}	C_{1000}	C_{0r}	Grease lub.	Oil lub.	Cylindrical Bore	Tapered Bore	e	Y_1	Y_2	Y_0
25	52	18	1	56,8	48,1	9600	12800	22205RZ	22205RZK	0,35	1,91	2,85	1,87
	62	20	1	76,5	65,9	8100	10900	22206RZ	22206RZK	0,33	2,04	3,04	2,00
30	72	19	1,1	74,2	62,7	7200	9600	21306RZ	21306RZK	0,27	2,49	3,71	2,43
	72	23	1,1	100	88,7	6900	9200	22207RZ	22207RZK	0,32	2,09	3,11	2,04
35	80	21	1,5	87,0	75,8	6200	8300	21307RZ	21307RZK	0,27	2,49	3,71	2,43
	80	25	1,1	114	102	6200	8300	22208RZ	22208RZK	0,28	2,57	3,53	2,52
40	90	23	1,5	105	95,5	5600	7600	21308RZ	21308RZK	0,26	2,55	3,80	2,50
	90	33	1,5	170	152	5600	7600	22308RZ	22308RZK	0,37	1,83	2,72	1,79
	100	25	1,5	132	124	5000	6700	21309RZ	21309RZK	0,26	2,62	3,90	2,56
45	100	36	1,5	208	183	5100	6700	22309RZ	22309RZK	0,37	1,83	2,72	1,79
	90	23	1,1	128	122	5400	7200	22210RZ	22210RZK	0,24	2,79	4,15	2,73
	110	27	2	157	151	4500	6100	21310RZ	21310RZK	0,25	2,71	4,04	2,65
50	110	40	2	255	237	4500	6200	22310RZ	22310RZK	0,36	1,85	2,76	1,81
	100	25	1,5	155	144	4700	6300	22211RZ	22211RZK	0,24	2,84	4,23	2,78
	120	29	2	181	165	4100	5600	21311RZ	21311RZK	0,25	2,71	4,03	2,65
55	120	43	2	295	264	4100	5500	22311RZ	22311RZK	0,36	1,85	2,76	1,81
	110	28	1,5	191	181	4300	5800	22212RZ	22212RZK	0,25	2,74	4,08	2,68
	130	31	2,1	210	193	3900	5100	21312RZ	21312RZK	0,24	2,78	4,14	2,72
60	130	46	2,1	354	334	3900	5100	22312RZ	22312RZK	0,36	1,86	2,77	1,82
	120	31	1,5	223	211	4000	5200	22213RZ	22213RZK	0,25	2,69	4,00	2,63
	140	33	2,1	242	232	3600	4700	21313RZ	21313RZK	0,24	2,83	4,21	2,76
65	140	48	2,1	382	360	3600	4700	22313RZ	22313RZK	0,34	1,98	2,94	1,93
	125	31	1,5	233	222	3700	5000	22214RZ	22214RZK	0,24	2,87	4,27	2,80
	150	35	2,1	269	260	3300	4400	21314RZ	21314RZK	0,24	2,84	4,23	2,78
70	150	51	2,1	434	413	3300	4400	22314RZ	22314RZK	0,34	1,98	2,94	1,93
	130	31	1,5	241	236	3600	4700	22215RZ	22215RZK	0,22	3,07	4,57	3,00
	160	37	2,1	307	298	3000	4100	21315RZ	21315RZK	0,24	2,87	4,27	2,80
75	160	55	2,1	492	473	3000	4100	22315RZ	22315RZK	0,35	1,95	2,90	1,91
	140	33	2	271	271	3300	4400	22216RZ	22216RZK	0,22	3,07	4,57	3,00
	170	39	2,1	344	339	2900	3900	21316RZ	21316RZK	0,23	2,88	4,29	2,82
80	170	58	2,1	539	521	2900	3900	22316RZ	22316RZK	0,35	1,95	2,90	1,91
	150	36	2	322	324	3000	4100	22217RZ	22217RZK	0,22	3,01	4,48	2,94
	180	41	3	375	372	2800	3600	21317RZ	21317RZK	0,23	2,89	4,33	2,83
85	180	60	3	601	586	2800	3600	22317RZ	22317RZK	0,33	2,02	3,00	1,97
	160	40	2	373	381	2900	3900	22218RZ	22218RZK	0,24	2,79	4,15	2,73
	160	52,4	2	420	482	2900	3900	23218RZ	23218RZK	0,32	2,14	3,19	2,09
	190	43	3	413	416	2600	3400	21318RZ	21318RZK	0,23	2,91	4,30	2,84
90	190	64	3	672	662	2600	3400	22318RZ	22318RZK	0,34	2,00	2,98	1,96
	170	43	2,1	418	422	2800	3600	22219RZ	22219RZK	0,24	2,76	4,11	2,70
	200	45	3	453	461	2500	3200	21319RZ	21319RZK	0,23	2,92	4,35	2,86
	200	67	3	733	726	2500	3200	22319RZ	22319RZK	0,33	2,02	3,00	1,97





Cylindrical bore RZ type Tapered bore





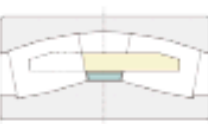
d (100) ~ (180) mm

Boundary Dimensions (mm)				Basic Load Ratings (kN)		Limiting Speeds (min ⁻¹)		Bearing No.		Constant e	Axial Load Factor		
d	D	B	r min.	C_{100R}	C_{0R}	Grease lub.	Oil lub.	Cylindrical Bore	Tapered Bore		Y_1	Y_2	Y_0
100	150	37	1,5	262	332	2900	3000	23020RZ	23020RZK	0,22	3,01	4,48	2,94
	165	52	2	412	510	2800	3600	23120RZ	23120RZK	0,29	2,33	3,47	2,28
	180	46	2,1	470	481	2600	3400	22220RZ	22220RZK	0,25	2,74	4,08	2,68
	180	60,3	2,1	533	629	2600	3400	23220RZ	23220RZK	0,32	2,09	3,11	2,04
	215	47	3	519	524	2200	3000	21320RZ	21320RZK	0,22	3,02	4,49	2,95
	215	73	3	875	877	2200	3000	22320RZ	22320RZK	0,35	1,95	2,90	1,91
110	170	45	2	377	486	2600	3400	23022RZ	23022RZK	0,24	2,84	4,23	2,78
	170	60	2	472	647	2600	3600	24022RZ	24022RZK30	0,32	2,08	3,10	2,04
	180	56	2	481	605	2500	3300	23122RZ	23122RZK	0,29	2,36	3,51	2,31
	180	69	2	566	778	2500	3300	24122RZ	24122RZK30	0,37	1,84	2,74	1,80
	200	53	2,1	613	642	2300	3000	22222RZ	22222RZK	0,26	2,64	3,93	2,58
	200	69,8	2,1	672	792	2300	3000	23222RZ	23222RZK	0,34	1,99	2,96	1,94
	240	50	3	604	616	1900	2600	21322RZ	21322RZK	0,21	3,19	4,75	3,12
	240	80	3	1040	1040	1900	2600	22322RZ	22322RZK	0,33	2,03	3,02	1,98
120	180	46	2	392	524	2300	3200	23024RZ	23024RZK	0,23	2,95	4,40	2,89
	180	60	2	482	709	2300	3200	24024RZ	24024RZK30	0,30	2,23	3,32	2,18
	200	62	2	568	714	2200	3000	23124RZ	23124RZK	0,29	2,34	3,49	2,29
	200	80	2	730	1020	2200	3000	24124RZ	24124RZK30	0,38	1,75	2,61	1,72
	215	58	2,1	707	764	2100	2800	22224RZ	22224RZK	0,26	2,60	3,87	2,54
	215	76	2,1	771	956	2100	2900	23224RZ	23224RZK	0,34	1,97	2,94	1,93
	260	86	3	1120	1130	1800	2500	22324RZ	22324RZK	0,33	2,03	3,02	1,98
	130	200	52	2	506	674	2200	2900	23026RZ	23026RZK	0,24	2,87	4,27
200		69	2	621	914	2200	2900	24026RZ	24026RZK30	0,32	2,14	3,18	2,09
210		64	2	618	799	2100	2800	23126RZ	23126RZK	0,28	2,42	3,61	2,37
210		80	2	750	1080	2100	2800	24126RZ	24126RZK30	0,36	1,90	2,83	1,86
230		64	3	822	914	1900	2600	22226RZ	22226RZK	0,26	2,55	3,80	2,50
230		80	3	878	1090	1900	2600	23226RZ	23226RZK	0,33	2,05	3,05	2,00
280		93	4	1310	1340	1700	2200	22326RZ	22326RZK	0,33	2,03	3,02	1,98
140		210	53	2	527	723	2100	2800	23028RZ	23028RZK	0,23	2,98	4,44
	210	69	2	636	957	2100	2800	24028RZ	24028RZK30	0,30	2,28	3,39	2,23
	225	68	2,1	706	940	1900	2600	23128RZ	23128RZK	0,28	2,45	3,65	2,40
	225	85	2,1	849	1220	1900	2600	24128RZ	24128RZK30	0,36	1,89	2,82	1,85
	250	68	3	948	1030	1800	2300	22228RZ	22228RZK	0,26	2,60	3,87	2,54
	250	88	3	1010	1290	1800	2300	23228RZ	23228RZK	0,34	1,99	2,96	1,95
150	225	56	2,1	576	797	1900	2500	23030RZ	23030RZK	0,22	3,04	4,53	2,97
	225	75	2,1	720	1100	1900	2500	24030RZ	24030RZK30	0,30	2,23	3,32	2,18
	250	80	2,1	897	1230	1800	2300	23130RZ	23130RZK	0,30	2,24	3,34	2,19
	250	100	2,1	1100	1590	1800	2300	24130RZ	24130RZK30	0,38	1,77	2,64	1,73
	270	73	3	1080	1200	1700	2200	22230RZ	22230RZK	0,25	2,69	4,00	2,63
	270	96	3	1200	1540	1700	2200	23230RZ	23230RZK	0,34	1,96	2,93	1,92
160	240	60	2,1	663	924	1800	2300	23032RZ	23032RZK	0,22	3,01	4,48	2,94
	240	80	2,1	825	1270	1800	2300	24032RZ	24032RZK30	0,30	2,24	3,34	2,19
	270	86	2,1	1060	1430	1700	2200	23132RZ	23132RZK	0,30	2,22	3,30	2,17
170	260	67	2,1	790	1090	1700	2200	23034RZ	23034RZK	0,23	2,90	4,31	2,83
	260	90	2,1	1000	1540	1700	2200	24034RZ	24034RZK30	0,32	2,11	3,15	2,07
	280	88	2,1	1150	1550	1500	2100	23134RZ	23134RZK	0,29	2,30	3,43	2,25
180	280	74	2,1	960	1330	1500	1900	23036RZ	23036RZK	0,24	2,84	4,23	2,78



JHS Spherical Roller Bearing Design

Current Designs New Designs

Type	Roller	Cage	Inner ring	Features
 R type / new RR type	Convex asymmetrical roller	Copper alloy prong type machined cage Code: FY	With center rib with rib on both sides to prevent rollers from falling.	High speed general type if application is unknown R or ROVS for vibrating application (223 type).
 RH type	Convex symmetrical roller	Steel plate pressed cage Code: //	Without center rib with guide ring, without ribs on both sides.	Higher load rating.
 RHR type	Convex symmetrical roller	Steel plate pressed cage Code: //	Without center rib with guide ring without ribs on both sides.	Maximum load rating
 RA type	Convex asymmetrical roller	Steel plate pressed cage Code: //	With center rib, without ribs on both sides.	For railway rolling stock.
 RHA type	Convex symmetrical roller	Copper alloy integral type machined cage Code: FY	Without center rib with guide ring with ribs on both sides (to prevent rollers from falling).	Higher load rating.

- ✓ Higher load capacity due to larger & longer rollers and improved steel quality.
- ✓ Higher limiting speed due to optimal internal design.
- ✓ Higher axial load capacity (F_a / F_r can be larger than e).
- ✓ Dimensional stabilisation up to 200 °C (S1) as standard.
- ✓ Split type steel cage, separate guide ring

New Series!...

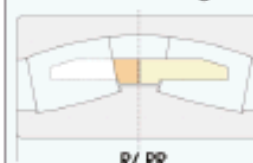


	Load rating	Limiting speed	Axial load carrying capacity
new RZ	⊕⊕⊕⊕	⊕⊕⊕⊕	⊕⊕⊕⊕
RH/ RHR	⊕⊕	⊕	⊕
R/ RR	⊕	⊕⊕	⊕⊕

- excluded from design revision: 239xx series
- ROVS/ RROVS design for shaker screen applications

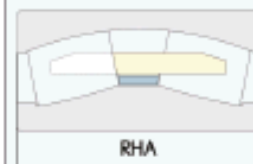
OD > 280 mm

R/RR and RHA design



R/ RR

- current R/ RR design remain, especially for high speed applications



RHA

- current RHA design remain, especially for windmill application and high load applications

Market-leading Expertise



...*"Matching today's expectations in Wind Mill applications"*...

As one of the world's leading bearing manufacturers for Windmill applications, JTEKT is keeping pace with rapid technological developments in this industry by using advanced technology and expertise to improve our products and services in order to meet today's more demanding Windmill applications.

Windmill applications are designed to last for 20 years, which is now further increasing to 25 years in recent developments. There are major factors which have a significant effect on a bearing life, such as a higher load capacity but also:

- ✓ Extreme high static load and moment load
- ✓ Axial load capacity
- ✓ Constant load change
- ✓ Low speed performance under poor lubrication
- ✓ Lower operating temperature

A strict control of our steel specifications and optimal internal design are featured in our newest series JHS Spherical Roller Bearings.

Koyo



JHS
JTEKT HYPER STRONG

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JTEKT

Koyo

TOYODA

JTEKT Europe Bearings BV
European Headquarter and Central Warehouse
Markerkant 13-01
1314 AL Almere, The Netherlands
☎ +31 (0)36 538 3333
✉ info-eu@jtekt.eu

Koyo Italia SRL
Territory: Italy
Via G. Stephenson 43a
20157 Milano, Italy
☎ +39 (0)22 951 0844
✉ koyo.italia@jtekt.eu

Koyo UK LTD
Territory: United Kingdom & Ireland
Whitehall Avenue, Kingston, Milton Keynes
Buckinghamshire MK10 OAX, U.K.
☎ +44 (0)19 082 89300
✉ sales@koyo.co.uk

Koyo Kullager Scandinavia AB
Territory: Sweden, Norway & Finland
Kanalvägen 5a
19461 Upplands-Väsby, Sweden
☎ +46 (0)85 942 1210
✉ kks-info@jtekt.eu

Koyo Romania Representative Office
Territory: Romania, Greece & Israel
Str. Dr. Lister 24, ap1
Sector 5, cod 050543 Bucarest, Romania
☎ +40 (0)21 410 4182
✉ carmen.berbecaru@jtekt.eu (Romanian territory)
✉ mariabianca.predut@jtekt.eu (Israelian & Greek territory)

JTEKT European Operations (Russia, Moscow office)
Territory: Russia, Belarus & Kazakhstan
125493 Russia, Moscow,
Avangardnaya str., 3, bld. 2, office 1505
☎ +7916 5922 8972
✉ alexey.fateev@jtekt.eu

Koyo Deutschland GMBH
Territory: Germany, Austria, Switzerland, Denmark, Turkey, Poland, Ukraine,
Bulgaria, Czech Republic, Hungary, Serbia & Montenegro, Croatia, Slovakia,
Slovenia, Bosnia & Herzegovina, Latvia, Estonia, Lithuania and Macedonia
Bargkoppelweg 4
22145 Hamburg, Germany
☎ +49 (0)40 679 0900
✉ info@jtekt.eu

Koyo France SA
Territory: France, Algeria, Morocco & Tunisia
1 rue François Jacob
92500 Rueil-Malmaison Cedex
☎ +33 (0)14 139 8000
✉ infokf@jtekt.eu

Koyo Iberica SL
Territory: Spain & Portugal
Centro de Negocios,
Calle La Mancha no.1 oficina 1.2
28823 Coslada (Madrid), Spain
☎ +34 (0)91 329 0818
✉ info-kib@jtekt.eu

Koyo Benelux Branch Office
Territory: Belgium, The Netherlands & Luxembourg
Markerkant 13-01
1314 AL Almere, The Netherlands
☎ +31 (0)36 538 3333
✉ info.Koyo.Benelux@jtekt.eu

JTEKT Poland Branch Office
3. Maja 14
41-200 Sosnowiec, Poland
☎ +48 (0)32 746 7777
✉ info-eu@jtekt.eu



www.koyo.eu << visit us at