



2016.9

无锡市滚动轴承有限公司
WUXI ROLLING BEARING CO.,LTD.



WGB概况

- ◆ WGB的愿景：成为世界一流的高精度轴承制造商和轴承解决方案的提供者。
- ◆ WGB的历史：始建于1969年，专注于高精密轴承制造，致力于在产品性能和技术服务上完美替代进口轴承。目前是中国最大的调心滚子轴承制造商之一。
- ◆ WGB的产品：生产能力200+万套/年；主要生产P6和P5级别的调心滚子轴承，圆柱滚子轴承，宽内圈轴承，轴承单元，以及各种非标轴承。
- ◆ WGB的行业领域：多年行业服务的技术经验，使得产品广泛应用于流体设备，电梯，矿山和水泥机械，大型工业洗涤设备，冶金，造纸，传动设备，工程机械……
- ◆ WGB的市场占有率：根据权威数据显示，WGB品牌调心滚子轴承2004年产销量在全国轴承行业主要企业的同类产品中排名第二，2005-2010年连续六年排名第一。

WGB Profile

- ◆ WGB Vision: Committed to being a world-leading roller bearing manufacturer and bearing solution provider.
- ◆ WGB History: WGB BEARINGS was established in 1969, and now is a leading roller bearing manufacturer. WGB excels in producing P5 and P6 roller bearings, and offering full technical services for wide industries.
- ◆ WGB Products: Annual 2,000,000 + pieces of P6 and P5 roller bearings, including: Spherical, Cylindrical, SRB with longer inner ring, mounted SRB, and non-standard bearings.
- ◆ WGB Industries: Technically knowledgeable in various applications for years; Widely serving fans & blowers, mining & aggregate, metal processing, paper & pulp, gear box & reducer, elevator & escalator
- ◆ SRB Market Shares: WGB BEARINGS was ranked the #1 from 2005 to 2010 in China, while ranked #2 in 2004, according to China Bearing Industry Association (CBIA).





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WGB[®] Bearings

Roller Bearing Manufacturer est. 1969

调心滚子轴承主要用来承受径向负荷，同时也能承受一定的轴向负荷。有较高的径向载荷能力，调心性能好，能补偿同轴度误差，广泛用于矿山机械、减速机、流体行业、冶金、造纸机械、纺织机械、印染机械、港口机械、水泥机械、电梯、石油化工等行业。

Spherical roller bearings is mainly used to bear radial load, It also can bear certain axial load. It boasts big load capacity and good efficiency of self-aligning. Can compensate error of coaxial degree. It is widely used in mining machinery, power machines, heavy machines and textile machines.



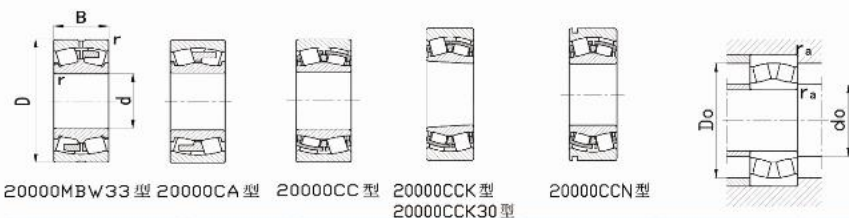
Wuxi Rolling Bearing Co., Ltd

WGB[®]



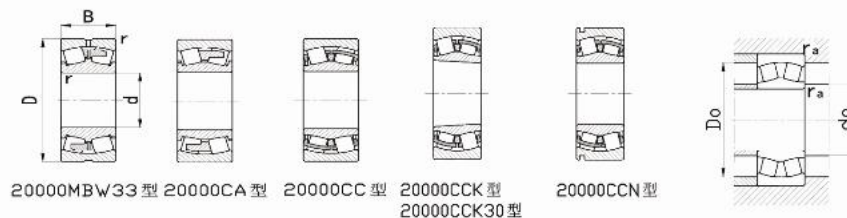
Spherical Roller Bearings

Spherical Roller Bearings



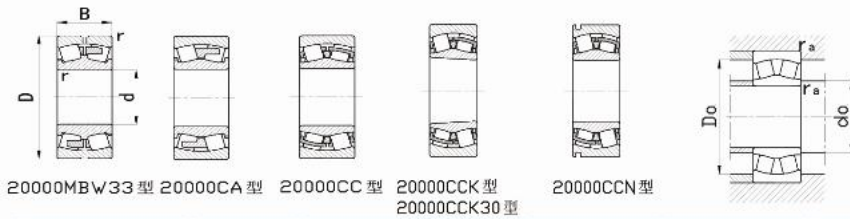
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
20	52	15	1.1	33.7	32.1	21304CA	21304CAK	9500	12000	27	45	1.0	0.18
25	52	18	1.0	43.2	45.0	22205CC	22205CCK	9000	11000	30	46	1.0	0.18
	52	18	1.0	43.2	45.0	22205CA	22205CAK	8500	11000	30	46	1.0	0.18
	62	17	1.1	48.0	49.3	21305CA	21305CAK	7500	9000	32	55	1.0	0.28
30	62	20	1.0	56.0	61.0	22206CA	22206CAK	7000	8500	36	56	1.0	0.3
	62	20	1.0	56.0	61.0	22206CC	22206CCK	7200	8600	36	56	1.0	0.28
	72	19	1.1	61.1	62.9	21306CA	21306CAK	6000	7500	37	65	1.0	0.41
35	72	23	1.1	73.2	83.1	22207CA	22207CAK	6600	8000	42	65	1.0	0.45
	72	23	1.1	73.2	83.1	22207CC	22207CCK	6800	8300	42	65	1.0	0.44
	80	21	1.5	70.1	74.7	21307CA	21307CAK	5300	7000	44	71	1.5	0.54
40	80	23	1.1	86.9	93.5	22208MB	22208MBK	6000	7300	47	73	1.0	0.55
	80	23	1.1	86.9	93.5	22208CA	22208CAK	6500	7500	47	73	1.0	0.54
	80	23	1.1	86.9	93.5	22208CC	22208CCK	6500	7600	47	73	1.0	0.52
	90	23	1.5	90.0	99.0	21308CA	21308CAK	5000	6000	49	81	1.5	0.75
	90	23	1.5	90.0	99.0	21308CC	21308CCK	5000	6000	49	81	1.5	0.74
	90	33	1.5	112.0	123.2	22308MB	22308MBK	5500	6500	49	81	1.5	1.03
	90	33	1.5	123.6	142.1	22308CA	22308CAK	6000	7000	49	81	1.5	1
	90	33	1.5	123.6	142.1	22308CC	22308CCK	6000	7000	49	81	1.5	1.02
45	85	23	1.1	93	102	22209MB	22209MBK	5000	6000	52	78	1.0	0.59
	85	23	1.1	93	102	22209CA	22209CAK	5000	7000	52	78	1.0	0.58
	85	23	1.1	93	102	22209CB	22209CBK	5500	7000	52	78	1.0	0.57
	100	25	1.5	114.7	120.3	21309CA	21309CAK	4000	5000	54	91	1.5	1.02
	100	25	1.5	114.7	120.3	21309CC	21309CCK	4000	5000	54	91	1.5	1
	100	36	1.5	130.0	150.0	22309MB	22309MBK	4500	5500	54	91	1.5	1.4

Spherical Roller Bearings



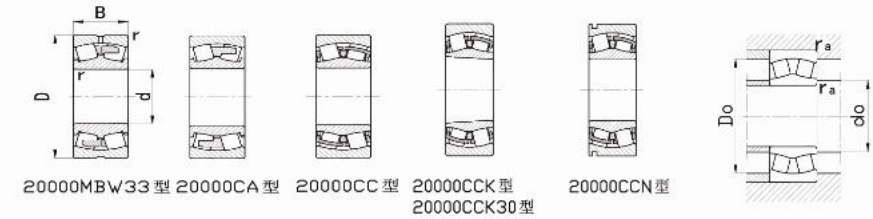
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
	100	36	1.5	156	175	22309CA	22309CAK	5000	6300	54	91	1.5	1.38
	100	36	1.5	156	175	22309CC	22309CCK	5000	6300	54	91	1.5	1.37
50	90	23	1.1	90	105	22210MB	22219MBK	4300	5000	57	83	1.0	0.87
	90	23	1.1	95	112	22210CA	22210CAK	4800	5500	57	83	1.0	0.62
	90	23	1.1	95	112	22210CC	22210CCK	4800	5500	57	83	1.0	0.61
	110	27	2.0	128.7	144	21310CA	21310CAK	3000	4200	60	100	2.0	1.3
	110	27	2.0	128.7	144	21310CC	21310CCK	3000	4200	60	100	2.0	1.3
	110	40	2.0	175.0	201.1	22310MB	22310MBK	4200	5200	60	100	2.0	1.9
	110	40	2.0	194.1	225.3	22310CA	22310CAK	4800	6000	60	100	2.0	1.85
	110	40	2.0	194.1	225.3	22310CC	22310CCK	4800	6000	60	100	2.0	1.79
55	100	25	1.5	100.0	121.0	22211MB	22211MBK	4000	5000	64	91	1.5	0.86
	100	25	1.5	115	139	22211CA	22211CAK	4500	5500	64	91	1.5	0.84
	100	25	1.5	115	139	22211CC	22211CCK	4500	5600	64	91	1.5	0.85
	120	29	2.0	149.6	174.6	21311CA	21311CAK	3000	4000	65	110	2.0	1.65
	120	29	2.0	149.6	174.6	21311CC	21311CCK	3000	4000	65	110	2.0	1.65
	120	43	2.0	196.0	220.0	22311MB	22311MBK	3700	4300	65	110	2.0	2.4
	120	43	2.0	224.0	255.2	22311CA	22311CAK	4100	4800	65	110	2.0	2.35
	120	43	2.0	224.0	255.2	22311CB	22311CCK	4100	4800	65	110	2.0	2.31
60	110	28	1.5	110.0	132.0	22212MB	22212MBK	3500	4300	69	101	1.5	1.22
	110	28	1.5	140	166	22212CA	22212CAK	3800	4800	69	101	1.5	1.2
	110	28	1.5	140	166	22212CC	22212CCK	3800	4800	69	101	1.5	1.15
	130	31	2.1	170.4	210.2	21312CA	21312CAK	3000	3800	72	118	2.1	2.08
	130	31	2.1	170.4	210.2	21312CC	21312CCK	3000	3800	72	118	2.1	2.08
	130	46	2.1	220.0	267.0	22312MB	22312MBK	3500	4300	72	118	2.1	3

Spherical Roller Bearings



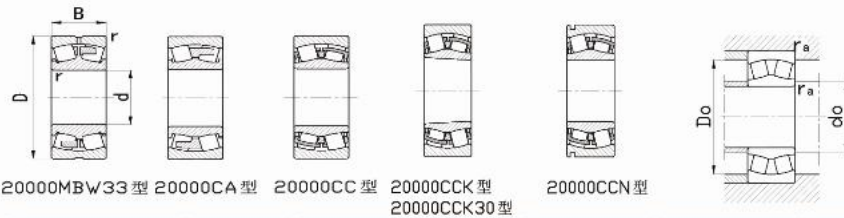
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
65	130	46	2.1	253.2	299.2	22312CA	22312CAK	4000	4800	72	118	2.1	2.95
	130	46	2.1	253.2	299.2	22312CC	22312CCK	4000	4800	72	118	2.1	2.88
	120	31	1.5	160.0	198.0	22213MB	22213MBK	3200	4400	74	111	1.5	1.63
	120	31	1.5	166.6	208.5	22213CA	22213CAK	3800	5000	74	111	1.5	1.6
	120	31	1.5	166.6	208.5	22213CC	22213CCK	3800	5000	74	111	1.5	1.54
	140	33	2.1	193.4	238.5	21313CA	21313CAK	2500	3600	77	128	2.1	2.57
70	140	33	2.1	193.0	238.5	21313CC	21313CCK	2500	3600	77	128	2.1	2.57
	140	48	2.1	260.0	330.0	22313MB	22313MBK	3300	3800	77	128	2.1	3.6
	140	48	2.1	295.0	351.6	22313CA	22313CAK	3900	4500	77	128	2.1	3.55
	140	48	2.1	295.0	351.6	22313CC	22313CCK	3900	4500	77	128	2.1	3.47
	125	31	1.5	175.0	218.0	22214MB	22214MBK	3100	4000	79	116	1.5	1.66
	125	31	1.5	174.5	221.0	22214CA	22214CAK	3600	4600	79	116	1.5	1.7
75	125	31	1.5	175.0	221.0	22214CC	22214CCK	3600	4600	79	116	1.5	1.6
	150	35	2.1	224.8	278.5	21314CA	21314CAK	2300	3200	82	138	2.1	3.11
	150	35	2.1	224.8	278.5	21314CC	21314CCK	2300	3200	82	138	2.1	3.11
	150	51	2.1	301.0	370.0	22314MB	22314MBK	3100	3800	82	138	2.1	4.4
	150	51	2.1	323.8	394.8	22314CA	22314CAK	3600	4200	82	138	2.1	4.4
	150	51	2.1	323.8	394.8	22314CC	22314CCK	3600	4200	82	138	2.1	4.34
80	130	31	1.5	187.0	238.0	22215MB	22215MBK	2900	3800	84	121	1.5	1.75
	130	31	1.5	187.2	238.0	22215CA	22215CAK	3400	4300	84	121	1.5	1.8
	130	31	1.5	187.2	238.0	22215CC	22215CCK	3400	4300	84	121	1.5	1.69
	160	37	2.1	249.4	312.3	21315CA	21315CAK	2100	2800	87	148	2.1	3.76
	160	37	2.1	249.4	312.3	21315CC	21315CCK	2100	2800	87	148	2.1	3.76
	160	55	2.1	340.0	430.0	22315MB	22315MBK	2800	3200	87	148	2.1	5.4

Spherical Roller Bearings



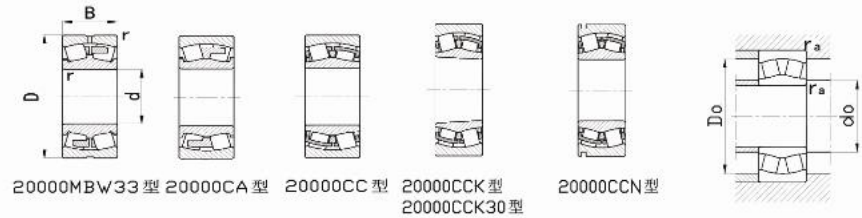
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
80	160	55	2.1	362.7	455.8	22315CA	22315CA	3200	3800	87	148	2.1	5.25
	160	55	2.1	362.7	455.8	22315CC	22315CC	3200	3800	87	148	2.1	5.28
	140	33	2.0	181.0	238.0	22216MB	22216MBK	2800	3600	90	130	2.0	2.2
	140	33	2.0	210.0	265.0	22216CA	22216CAK	3200	4000	90	130	2.0	2.2
	140	33	2.0	210.0	265.0	22216CC	22216CCK	3200	4000	90	130	2.0	2.13
	170	39	2.1	280.0	360.0	21316CA	21316CAK	1900	2600	92	158	2.1	4.47
	170	39	2.1	280.0	360.0	21316CC	21316CCK	1900	2600	92	158	2.1	4.47
	170	58	2.1	401.0	511.0	22316MB	22316MBK	2500	3000	92	158	2.1	6.4
85	170	58	2.1	439.4	531.5	22316CA	22316CAK	3000	3600	92	158	2.1	6.39
	170	58	2.1	439.4	531.5	22316CC	22316CCK	3000	3600	92	158	2.1	6.32
	150	36	2.0	237.4	310.3	22217MB	22217MBK	2700	3300	95	140	2.0	2.8
	150	36	2.0	256.0	330.0	22217CA	22217CAK	3100	3900	95	140	2.0	2.7
	150	36	2.0	256.0	330.0	22217CC	22217CCK	3100	3900	95	140	2.0	2.67
	180	41	3.0	310.4	397.0	21317CA	21317CAK	1800	2400	99	166	2.5	5.23
	180	41	3.0	310.3	397.0	21317CC	21317CCK	1800	2400	99	166	2.5	5.23
	180	60	3.0	410.0	532.0	22317MB	22317MBK	2200	2700	99	166	2.5	7.4
90	180	60	3.0	450.0	570.6	22317CA	22317CAK	2700	3300	99	166	2.5	7.25
	180	60	3.0	450.0	570.6	22317CC	22317CCK	2700	3300	99	166	2.5	7.27
	160	40	2.0	262.0	360.0	22218MB	22218MBK	2500	3200	100	150	2.0	4
	160	40	2.0	281.5	373.8	22218CA	22218CAK	2900	3700	100	150	2.0	3.28
	160	40	2.0	281.5	373.8	22218CC	22218CCK	2900	3700	100	150	2.0	3.38
	160	52.4	2.0	365.0	497.0	23218CA	23218CAK	1900	2400	100	150	2.0	4.6
	160	52.4	2.0	365.0	496.5	23218CC	23218CCK	1900	2400	100	150	2.0	4.4
	190	43	3.0	346.2	430.0	21318CA	21318CAK	1700	2300	104	176	2.5	6.17

Spherical Roller Bearings



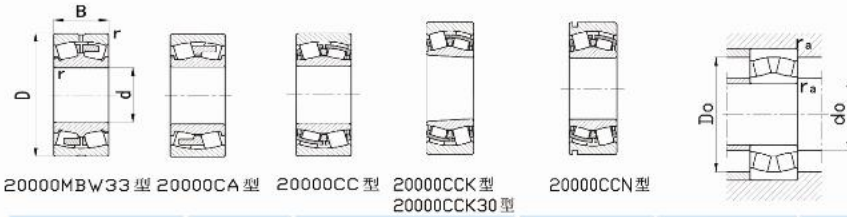
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)	
										da	Da	ra		
d	D	B	r	smin	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
	190	43	3.0	346.2	430.0		21318CC	21318CCK	1700	2300	104	176	2.5	6.17
	190	64	3.0	482.0	619.0		22318MB	22318MBK	2100	2600	104	176	2.5	8.8
	190	64	3.0	505.8	655.3		22318CA	22318CAK	2600	3100	104	176	2.5	8.6
	190	64	3.0	505.8	655.3		22318CC	22318CCK	2600	3100	104	176	2.5	8.63
95	170	43	2.1	300.0	398.0		22219MB	22219MBK	2300	3000	107	158	2.1	4.2
	170	43	2.1	316.5	415.1		22219CA	22219CAK	2700	3500	107	158	2.1	4.1
	170	43	2.1	316.5	415.1		22219CC	22219CCK	2700	3500	107	158	2.1	4.2
	200	45	3.0	386.5	500.0		21319CA	21319CAK	1700	2200	109	186	2.5	7.15
	200	45	3.0	386.5	500.0		21319CC	21319CCK	1700	2200	109	186	2.5	7.15
	200	67	3.0	519.0	689.0		22319MB	22319MBK	2000	2500	109	186	2.5	10.3
	200	67	3.0	555.1	727.0		22319CA	22319CAK	2400	2900	109	186	2.5	10.1
	200	67	3.0	555.1	727.0		22319CC	22319CCK	2400	2900	109	186	2.5	9.97
	100	165	52	2.0	360.0	540.0	23120CA	23120CAK	1800	2200	110	155	2.0	5
	165	52	2.0	362.0	545.0		23120CC	23120CCK	1800	2200	110	155	2.0	4.31
	150	50	1.5	250.8	448.0		24020CA	24020CAK30	1500	2000	110	140	1.5	3.04
	150	50	1.5	250.8	461.0		24020CC	24020CCK30	1500	2000	110	140	1.5	3.04
	180	46	2.1	341.0	450.0		22220MB	22220MBK	2100	2800	112	168	2.1	5
	180	46	2.1	361.9	478.9		22220CA	22220CAK	2500	3200	112	168	2.1	5
	180	46	2.1	361.9	478.9		22220CC	22220CCK	2600	3200	112	168	2.1	5.01
	180	60.3	2.1	438.0	640.1		23220CA	23220CAK	1600	2200	112	168	2.1	6.7
	180	60.3	2.1	438.0	640.1		23220CC	23220CCK	1600	2200	112	168	2.1	6.52
	215	47	3.0	437.7	546.0		21320CA	21320CAK	1600	2000	114	201	2.5	8.81
	215	47	3.0	437.7	546.0		21320CC	21320CCK	1600	2000	114	201	2.5	8.81
	215	73	3.0	601.0	796.0		22320MB	22320MBK	1900	2400	114	201	2.5	13

Spherical Roller Bearings



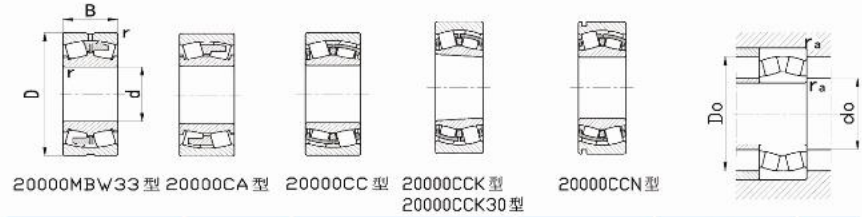
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
	215	73	3.0	644.7	851.0	22320CA	22320CA	2200	2700	114	201	2.5	13.4
	215	73	3.0	644.7	851.0	22320CC	22320CC	2200	2700	114	201	2.5	12.8
105	175	56	2.0	405.4	587.5	23121CA	23121CAK	1500	1900	119	161	2.5	6.64
	225	49	2.0	455.0	575.0	21321CA	21321CAK	1500	1900	119	211	2.5	10
	225	49	2.0	455.0	575.0	21321CC	21321CCK	1500	1900	119	211	2.5	10
110	170	45	2.0	284.9	461.7	23022MB	23022MBK	1600	1900	120	160	2.0	3.9
	170	45	2.0	284.9	461.7	23022CA	23022CAK	1800	2200	120	160	2.0	3.9
	170	45	2.0	284.9	461.7	23022CC	23022CCK	1800	2200	120	160	2.0	3.68
	180	56	2.0	359.0	578.0	23122MB	23122MBK	1300	1700	120	170	2.0	6.1
	180	56	2.0	389.5	620.0	23122CA	23122CAK	1500	2000	120	170	2.0	6.25
	180	56	2.0	389.5	620.0	23122CC	23122CCK	1500	2000	120	170	2.0	5.51
	180	69	2.0	472.0	798.0	24122CA	24122CAK30	1600	2000	120	170	2.0	6.63
	180	69	2.0	472.0	798.0	24122CC	24122CCK30	1600	2000	120	170	2.0	6.63
	200	53	2.1	421.0	598.0	22222MB	22222MBK	2000	2600	122	188	2.1	7.4
	200	53	2.1	463.0	651.0	22222CA	22222CAK	2300	3000	122	188	2.1	7.2
	200	53	2.1	463.0	651.0	22222CC	22222CCK	2400	3000	122	188	2.1	7.32
	200	69.8	2.1	541.6	811.2	23222CA	23222CAK	1500	1900	122	188	2.1	9.7
	200	69.8	2.1	541.6	811.2	23222CC	23222CCK	1500	1900	122	188	2.1	9.46
	240	50	3.0	480.0	635.0	21322CA	21322CAK	1400	1800	124	226	2.5	11.8
	240	50	3.0	480.0	635.0	21322CC	21322CCK	1400	1800	124	226	2.5	11.8
	240	80	3.0	750.0	930.0	22322MB	22322MBK	1500	2000	124	226	2.5	18.1
	240	80	3.0	779.4	990.3	22322CA	22322CAK	1800	2200	124	226	2.5	18
	240	80	3.0	779.4	990.3	22322CC	22322CCK	1900	2300	124	226	2.5	17.5
	120	180	46	2.0	271.0	453.0	23024MB	23024MBK	1500	1800	130	170	2.0

Spherical Roller Bearings



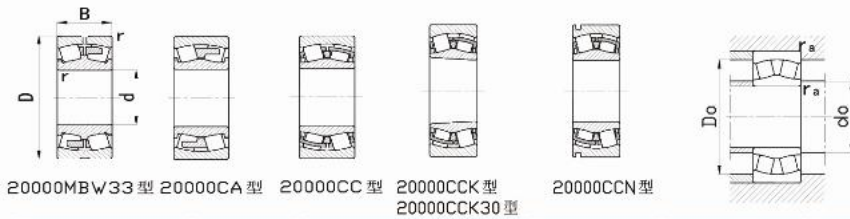
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)	
										da	Da	ra		
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max		
	180	46	2.0	359.0	565.0	23024CA	23024CAK	1700	2100	130	170	2.0	4.3	
	180	46	2.0	359.0	565.0	23024CC	23024CCK	1700	2100	130	170	2.0	3.98	
	180	60	2.0	390.0	700.0	24024CA	24024CAK30	1500	2000	130	170	2.0	5.05	
	180	60	2.0	391.0	700.0	24024CC	24024CCK30	1500	2000	130	170	2.0	5.05	
	200	62	2.0	452.0	710.0	23124MB	23124MBK	1200	1600	130	190	2.0	7.63	
	200	62	2.0	531.0	780.0	23124CA	23124CAK	1300	1700	130	190	2.0	7.63	
	200	62	2.0	530.0	780.0	23124CC	23124CCK	1400	1800	130	190	2.0	7.67	
	200	80	2.0	645.0	1028	24124CA	24124CAK30	1400	1800	130	190	2.0	9.65	
	200	80	2.0	645.0	1028	24124CC	24124CCK30	1400	1800	130	190	2.0	9.65	
	215	58	2.1	496.0	701.0	22224MB	22224MBK	1800	2200	132	203	2.1	9.2	
	215	58	2.1	529.0	740.0	22224CA	22224CAK	2100	2800	132	203	2.1	9	
	215	58	2.1	529.0	740.0	22224CC	22224CCK	2100	2800	132	203	2.1	9.1	
	215	76	2.1	668.0	970.0	23224CA	23224CAK	1300	1800	132	203	2.1	12	
	215	76	2.1	668.0	970.0	23224CC	23224CCK	1300	1800	132	203	2.1	11.7	
	260	86	3.0	860.0	1012	22324MB	22324MBK	1400	1900	134	246	2.5	22	
	260	86	3.0	919.8	1187	22324CA	22324CAK	1800	2200	134	246	2.5	22	
	260	86	3.0	919.8	1187	22324CC	22324CCK	1900	2200	134	246	2.5	22.2	
	130	200	52	2.0	382.0	615.0	23026MB	23026MBK	1300	1700	140	190	2.0	6.2
	200	52	2.0	408.8	681.7	23026CA	23026CAK	1600	2000	140	190	2.0	6.2	
	200	52	2.0	408.8	681.7	23026CC	23026CCK	1600	2000	140	190	2.0	5.85	
	200	69	2.0	472.0	852.0	24026CA	24026CAK30	1400	1900	140	190	2.0	7.55	
	200	69	2.0	486.0	878.0	24026CC	24026CCK30	1400	1900	140	190	2.0	7.55	
	210	64	2.0	508.0	814.8	23126CA	23126CAK	1300	1700	140	200	2.0	8.49	
	210	64	2.0	508.0	814.8	23126CC	23126CCK	1300	1700	140	200	2.0	8.49	

Spherical Roller Bearings



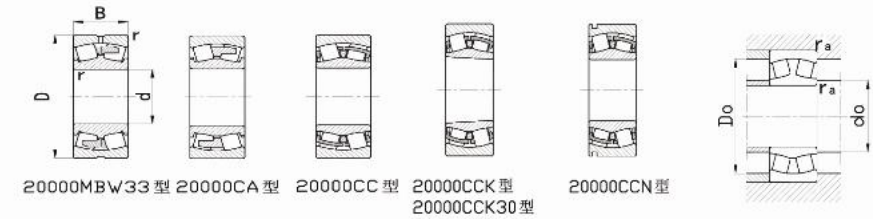
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
	210	80	2.0	608.4	1043	24126CA	24126CAK30	1250	1600	140	200	2.0	10.3
	210	80	2.0	608.4	1043	24126CC	24126CCK30	1300	1700	140	200	2.0	10.3
	230	64	3.0	582.0	839.0	22226MB	22226MBK	1500	1900	144	216	2.5	11.2
	230	64	3.0	625.0	896.0	22226CA	22226CAK	2000	2600	144	216	2.5	11.2
	230	64	3.0	625.0	896.0	22226CC	22226CCK	2000	2600	144	216	2.5	11.2
	230	80	3.0	769.9	1193	23226CA	23226CAK	1200	1600	144	216	2.5	14
	230	80	3.0	769.9	1193	23226CC	23226CCK	1200	1600	144	216	2.5	13.8
	280	93	4.0	986.0	1356	22326MB	22326MBK	1100	1500	148	262	3.0	29
	280	93	4.0	1054	1433	22326CA	22326CAK	1500	1900	148	262	3.0	28.5
	280	93	4.0	1054	1433	22326CC	22326CCK	1500	1900	148	262	3.0	27.5
140	210	53	2.0	434.2	731.9	23028MB	23028MBK	1100	1600	150	200	2.0	6.7
	210	53	2.0	444.0	731.9	23028CA	23028CAK	1500	1900	150	200	2.0	6.7
	210	53	2.0	450.0	731.9	23028CC	23028CCK	1600	1900	150	200	2.0	6.31
	210	69	2.0	509.0	911.0	24028CA	24028CAK30	1300	1700	150	200	2.0	8.01
	210	69	2.0	509.0	911.0	24028CC	24028CCK30	1300	1700	150	200	2.0	8.01
	225	68	2.1	523.0	862.0	23128MB	23128MBK	1000	1400	152	213	2.1	10.9
	225	68	2.1	567.0	912.7	23128CA	23128CAK	1100	1500	152	213	2.1	10.9
	225	68	2.1	567.0	912.7	23128CC	23128CCK	1200	1600	152	213	2.1	10.2
	225	85	2.1	673.2	1169	24128CA	24128CAK30	1200	1600	152	213	2.1	12.5
	225	85	2.1	673.2	1169	24128CC	24128CCK30	1200	1600	152	213	2.1	12.5
	250	68	3.0	653.0	911.0	22228MB	22228MBK	1400	1800	154	236	2.5	14.5
	250	68	3.0	720.0	990.0	22228CA	22228CAK	1900	2400	154	236	2.5	14.5
	250	68	3.0	720.0	990.0	22228CC	22228CCK	1900	2400	154	236	2.5	14.2
	250	88	3.0	846.5	1325	23228CA	23228CAK	1100	1500	154	236	2.5	18.5

Spherical Roller Bearings



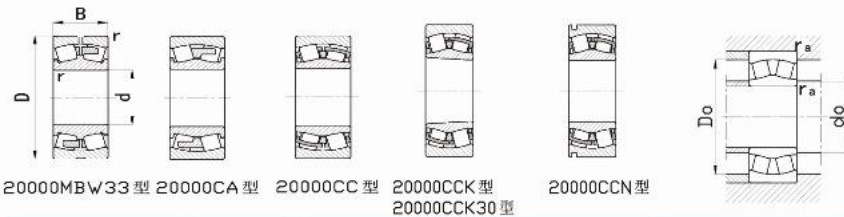
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										da	Da	ra	
d	D	B	rsmin	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
150	250	88	3.0	846.5	1325	23228CC	23228CCK	1100	1500	154	236	2.5	18.1
	300	102	4.0	1082	1566	22328MB	22328MBK	1000	1400	158	282	3.0	36
	300	102	4.0	1190	1668	22328CA	22328CAK	1400	1500	158	282	3.0	34.5
	300	102	4.0	1190	1668	22328CC	22328CCK	1400	1700	158	282	3.0	34.6
	225	56	2.1	463.0	781.0	23030MB	23030MBK	1000	1300	162	213	2.1	8.14
	225	56	2.1	481.1	819.7	23030CA	23030CAK	1400	1800	162	213	2.1	8.14
	225	56	2.1	481.1	819.7	23030CC	23030CCK	1400	1800	162	213	2.1	7.74
	225	75	2.1	596.4	1095	24030CA	24030CAK30	1200	1500	162	213	2.1	10.6
	225	75	2.1	596.4	1095	24030CC	24030CCK30	1200	1500	162	213	2.1	10.1
	250	80	2.1	726.0	1198	23130MB	23130MBK	900	1200	162	238	2.1	16.1
200	250	80	2.1	768.9	1280	23130CA	23130CAK	1100	1400	162	238	2.1	16.1
	250	80	2.1	768.9	1280	23130CC	23130CCK	1100	1400	162	238	2.1	15.7
	250	100	2.1	897.0	1559	24130CA	24130CAK30	1100	1400	162	238	2.1	19
	250	100	2.1	897.0	1559	24130CC	24130CCK30	1100	1400	162	238	2.1	19
	270	73	3.0	801.0	1101	22230MB	22230MBK	1300	1700	164	256	2.5	18.5
	270	73	3.0	970.0	1330	22230CA	22230CAK	1800	2000	164	256	2.5	18.6
	270	73	3.0	970.0	1330	22230CC	22230CCK	1800	2000	164	256	2.5	18
	270	96	3.0	1036	1586	23230CA	23230CAK	1000	1400	164	256	2.5	24
	270	96	3.0	1036	1586	23230CC	23230CCK	1000	1400	164	256	2.5	23.2
	320	108	4.0	1215	1790	22330MB	22330MBK	900	1300	168	302	3.0	43
250	320	108	4.0	1279	1850	22330CA	22330CAK	1200	1500	168	302	3.0	42.5
	320	108	4.0	1279	1905	22330CC	22330CCK	1200	1500	168	302	3.0	42
	240	60	2.1	551.0	925	23032MB	23032MBK	900	1100	172	228	2.1	10
	240	60	2.1	600.0	1000	23032CA	23032CAK	1300	1700	172	228	2.1	10

Spherical Roller Bearings



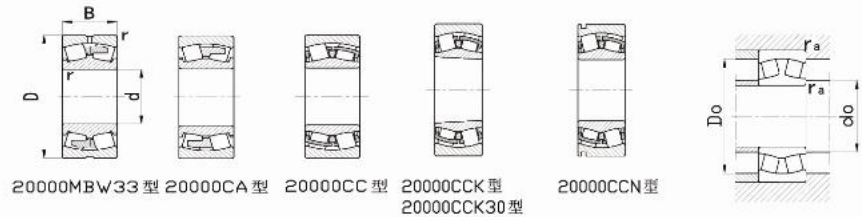
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	rsmin	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
	240	60	2.1	600.0	1000	23032CC	23032CCK	1300	1700	172	228	2.1	9.43
	240	80	2.1	699.4	1303	24032CA	24032CAK30	1150	1400	172	228	2.1	12.2
	240	80	2.1	699.4	1303	24032CC	24032CCK30	1150	1400	172	228	2.1	12.2
	270	86	2.1	536.0	1140	23132MB	23132MBK	800	1000	172	258	2.1	19.7
	270	86	2.1	870.0	1460	23132CA	23132CAK	900	1250	172	258	2.1	19.7
	270	86	2.1	870.0	1480	23132CC	23132CCK	1000	1300	172	258	2.1	19.8
	270	109	2.1	1093	1912	24132CA	24132CAK30	1000	1300	172	258	2.1	24.6
	270	109	2.1	1093	1912	24132CC	24132CCK30	1000	1300	172	258	2.1	24.4
	290	80	3.0	885.0	1201	22232MB	22232MBK	1200	1600	174	276	2.5	22.2
	290	80	3.0	915.7	1289	22232CA	22232CAK	1700	1900	174	276	2.5	23.1
	290	80	3.0	915.7	1289	22232CC	22232CCK	1700	1900	174	276	2.5	22.9
	290	104	3.0	1142	1802	23232CA	23232CAK	950	1300	174	276	2.5	30
	290	104	3.0	1142	1802	23232CC	23232CCK	950	1300	174	276	2.5	29.4
	340	114	4.0	1411	1981	22332MB	22332MBK	850	1200	178	322	3.0	51
	340	114	4.0	1460	2063	22332CA	22332CAK	1100	1400	178	322	3.0	51
	340	114	4.0	1460	2063	22332CC	22332CCK	1100	1400	178	322	3.0	51
170	260	67	2.1	621.0	1086	23034MB	23034MBK	850	1050	182	248	2.1	13
	260	67	2.1	726.0	1151	23034CA	23034CAK	1200	1600	182	248	2.1	13
	260	67	2.1	733.0	1151	23034CC	23034CCK	1200	1600	182	248	2.1	12.8
	260	90	2.1	826.3	1517	24034CA	24034CAK30	1100	1350	182	248	2.1	16.7
	260	90	2.1	826.3	1517	24034CC	24034CCK30	1100	1350	182	248	2.1	16.7
	280	88	2.1	977.3	1618	23134CA	23134CAK	950	1200	182	268	2.1	21.1
	280	88	2.1	977.3	1618	23134CC	23134CCK	950	1200	182	268	2.1	21.1
	280	109	2.1	1125	1970	24134CA	24134CAK30	950	1250	182	268	2.1	25.5

Spherical Roller Bearings



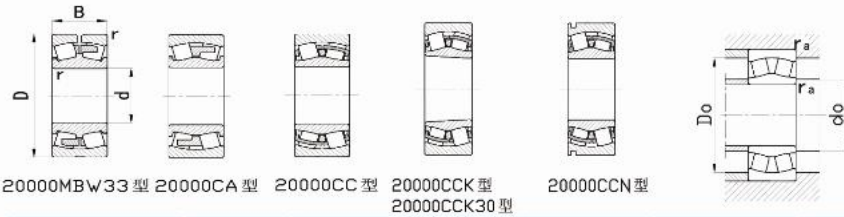
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										da	Da	ra		
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max		
	280	109	2.1	1125	1970	24134CC	24134CCK30	950	1250	182	268	2.1	25.5	
	310	86	4.0	980.1	1408	22234MB	22234MBK	1100	1400	188	292	3.0	29	
	310	86	4.0	1025	1495	22234CA	22234CAK	1300	1600	188	292	3.0	29	
	310	86	4.0	1025	1495	22234CC	22234CCK	1300	1600	188	292	3.0	28.1	
	310	110	4.0	1258	1997	23234CA	23234CAK	900	1200	188	292	3.0	35.7	
	310	110	4.0	1258	1997	23234CC	23234CCK	900	1200	188	292	3.0	35.7	
	360	120	4.0	1486	2100	22334MB	22334MBK	800	1100	188	342	3.0	60	
	360	120	4.0	1541	2188	22334CA	22334CAK	1000	1300	188	342	3.0	60	
	180	280	74	2.1	715.0	1269	23036MB	23036MBK	800	1000	192	268	2.1	17.6
	280	74	2.1	830.0	1350	23036CA	23036CAK	1100	1500	192	268	2.1	17.6	
	280	74	2.1	840.0	1350	23036CC	23036CCK	1100	1500	192	268	2.1	16.9	
	280	100	2.1	990.9	1866	24036CA	24036CAK30	1050	1300	192	268	2.1	22.1	
	280	100	2.1	990.9	1866	24036CC	24036CCK30	1050	1300	192	268	2.1	22.1	
	300	96	3.0	950.0	1620	23136MB	23136MBK	750	900	194	286	2.5	27.1	
	300	96	3.0	1166	1927	23136CA	23136CAK	900	1150	194	286	2.5	27.1	
	300	96	3.0	1166	1927	23136CC	23136CCK	900	1150	194	286	2.5	26.9	
	300	118	3.0	1266	2221	24136CA	24136CAK30	900	1200	194	286	2.5	32	
	300	118	3.0	1266	2221	24136CC	23136CCK30	900	1200	194	286	2.5	32	
	320	86	4.0	996.0	1506	22236MB	22236MBK	1000	1300	198	302	3.0	30	
	320	86	4.0	1061	1591	22236CA	22236CAK	1300	1500	198	302	3.0	30	
	320	86	4.0	1061	1591	22236CC	22236CCK	1300	1500	198	302	3.0	29.4	
	320	112	4.0	1326	2116	23236CA	23236CAK	880	1100	198	302	3.0	37.9	
	320	112	4.0	1326	2116	23236CC	23236CCK	880	1100	198	302	3.0	37.9	
	380	126	4.0	1828	2602	22336CA	22336CAK	950	1200	198	362	3.0	70	

Spherical Roller Bearings



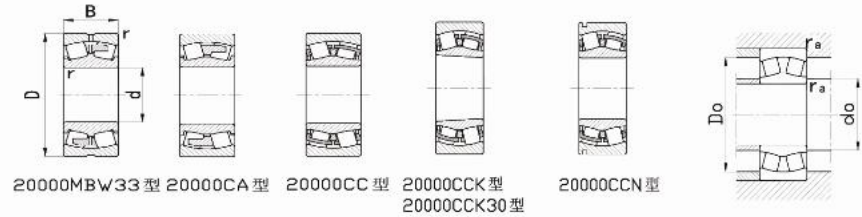
主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	rsmin	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
190	290	75	2.1	723.0	1300	23038MB	23038MBK	750	950	202	278	2.1	20
	290	75	2.1	867.0	1490	23038CA	23038CAK	1050	1400	202	278	2.1	20
	290	75	2.1	877.0	1520	23038CC	23038CCK	1050	1400	202	278	2.1	17.7
	290	100	2.1	1025	1945	24038CA	24038CAK30	950	1200	202	278	2.1	23
	290	100	2.1	1025	1945	24038CC	24038CCK30	950	1200	202	278	2.1	23
	320	104	3.0	1185	1986	23138MB	23138MBK	700	850	204	306	2.5	35.3
	320	104	3.0	1235	2079	23138CA	23138CAK	850	1100	204	306	2.5	35.3
	320	104	3.0	1235	2079	23138CC	23138CCK	850	1100	204	306	2.5	17.7
	320	128	3.0	1491	2655	24138CA	24138CAK30	850	1100	204	306	2.5	40.2
	320	128	3.0	1491	2655	24138CC	24138CCK30	850	1100	204	306	2.5	40.2
	340	92	4.0	1213	1826	22238CA	22238CAK	1200	1500	208	322	3.0	35.3
	340	92	4.0	1213	1826	22238CC	22238CCK	1200	1500	208	322	3.0	35.3
	340	120	4.0	1539	2518	23238CA	23238CAK	780	1050	208	322	3.0	46.1
	400	132	5.0	1964	2814	22338CA	22338CAK	900	1100	212	378	4.0	81
200	310	82	2.1	947.7	1707	23040CA	23040CAK	1000	1300	212	298	2.1	24
	310	82	2.1	947.7	1707	23040CC	23040CCK	1000	1300	212	298	2.1	22.7
	310	109	2.1	1132	2165	24040CA	24040CAK30	850	1100	212	298	2.1	29.3
	310	109	2.1	1132	2165	24040CC	24040CCK30	850	1100	212	298	2.1	29.3
	340	112	3.0	1432	2502	23140CA	23140CAK	800	1000	214	326	2.5	50.7
	340	112	3.0	1432	2502	23140CC	23140CCK	800	1000	214	326	2.5	47.6
	340	140	3.0	1704	3082	24140CA	24140CAK30	800	1000	214	326	2.5	49.55
	340	140	3.0	1704	3082	24140CC	24140CCK30	800	1000	214	326	2.5	49.9
	360	98	4.0	1333	2052	22240CA	22240CAK	1100	1400	218	342	3.0	47.7
	360	128	4.0	1733	2883	23240CC	23240CCK	730	1000	218	342	3.0	55.4

Spherical Roller Bearings



主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)	
										da	Da	ra		
d	D	B	r	min	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
220	420	138	5.0	2147	3089		22340CA	22340CAK	800	1000	222	398	4.0	94
	340	90	3.0	1120	2047		23044CA	23044CAK	950	1200	234	326	2.5	28.8
	340	90	3.0	1120	2047		23044CC	23044CCK	950	1200	234	326	2.5	29.7
	340	118	3.0	1346	2565		24044CC	24044CCK30	750	1000	234	326	2.5	38.1
	370	120	4.0	1665	2944		23144CA	23144CAK	700	950	238	352	3.0	55
240	370	120	4.0	1665	2944		23144CC	23144CCK	700	950	238	352	3.0	51.5
	370	150	4.0	1986	3671		24144CC	24144CCK30	700	950	238	352	3.0	62.3
	400	108	4.0	1603	2510		22244CA	22244CAK	1000	1300	238	382	3.0	61.5
	400	144	4.0	2087	3514		23244CC	23244CCK	670	900	238	382	3.0	78.5
	460	145	5.0	2414	3533		22344CA	22344CAK	700	900	242	438	4.0	120
260	360	92	3.0	1167	2154		23048CA	23048CAK	850	1100	254	346	2.5	35.5
	360	92	3.0	1167	2154		23048CC	23048CCK	850	1100	254	346	2.5	32.4
	360	118	3.0	1440	2930		24048CC	24048CCK30	700	950	254	346	2.5	40.8
	400	128	4.0	1914	3417		23148CA	23148CAK	670	850	258	382	3.0	55.5
	400	128	4.0	1914	3417		23148CC	23148CCK	670	850	258	382	3.0	63.7
280	400	160	4.0	2160	4090		24148CC	24148CCK30	700	850	258	382	3.0	76.9
	440	120	4.0	1927	3077		22248CA	22248CAK	900	1000	258	422	3.0	80.4
	440	160	4.0	2560	4620		23248CC	23248CCK	630	800	258	422	3.0	107.3
	500	155	5.0	2580	4351		22348CA	22348CAK	630	800	262	478	4.0	153
	400	104	4.0	1464	2850		23052CA	23052CAK	800	1000	278	382	3.0	515
300	400	104	4.0	1464	2850		23052CC	23052CCK	800	1050	278	382	3.0	47.7
	400	140	4.0	1840	3850		24052CC	24052CCK30	630	850	278	382	3.0	62.4
	440	144	4.0	1470	3410		23152MB	23152MBK	450	560	278	422	3.0	95.3
	440	144	4.0	2270	4190		23152CC	23152CCK	600	800	278	422	3.0	88.2

Spherical Roller Bearings



主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Mounting dimensions (mm)			质量 Mass (kg)	
										da	Da	ra		
d	D	B	r	min	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
280	440	180	4.0	2730	5330		24152CC	24152CCK30	600	800	278	422	3.0	107.6
	540	165	6.0	2860	4310		22352CA	22352CAK	480	700	288	512	5.0	191
	420	106	4.0	1610	2960		23056CA	23056CAK	450	560	298	402	3.0	62
	420	106	4.0	1580	3030		23056CC	23056CCK	700	900	298	402	3.0	50.9
	420	140	4.0	1960	4100		24056CC	24056CCK	600	800	298	402	3.0	65.8
300	460	146	5.0	1635	3730		23156CA	23156CAK	430	530	302	438	4.0	103
	460	146	5.0	2380	4410		23156CC	23156CCK	560	750	302	438	4.0	94.1
	460	180	5.0	2810	5480		24156CC	24156CCK30	560	750	302	438	4.0	113.2
	500	130	5.0	2150	3480		22256CA	22256CAK	800	900	302	478	4.0	112.3
	580	175	6.0	3490	5200		22356CA	22356CAK	450	600	308	552	5.0	238
300	460	118	4.0	1690	3560		23060MB	23060MBK	430	530	318	442	3.0	75.2
	460	118	4.0	1730	3800		23060CC	23060CCK	670	850	318	442	3.0	71.4
	460	160	4.0	2430	5160		24060CC	24060CCK30	530	700	318	442	3.0	94.1
	500	160	5.0	2250	4550		23160MB	23160MBK	500	700	322	478	4.0	133
	540	140	5.0	2520	2950		22260CA	22260CAK	700	850	322	518	4.0	134

WGB® Bearings

Roller Bearing Manufacturer est. 1969

长内圈调心滚子轴承除了具有一般调心滚子轴承的优点外，还具有滚子长、承载能力大、调心性能好、滚子与滚道摩擦小等特点，特别适用于林业机械、木工机械及森林开发机械等重要机械的配套。

In addition to common advantages of normal spherical roller bearing, extended inner ring spherical roller bearing has some more favourable features, such as longer roller, strong load-bearing capacity, nice efficiency of self-aligning, much less friction between roller and raceway, etc. It is especially suitable to match such important machines as forestry machine, carpent machine and forest developping machine.



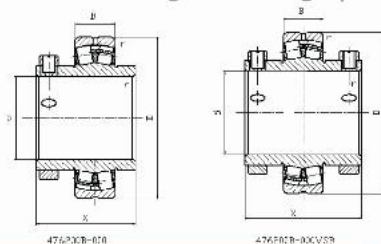
Wuxi Rolling Bearing Co.,Ltd

WGB®



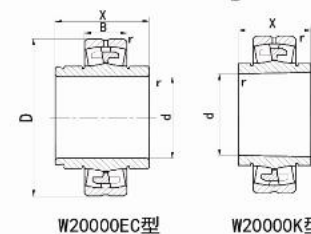
Long Inner Ring Spherical Roller Bearing

Long Inner Ring Spherical Roller Bearing



轴承代号 Bearing No.	主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (KN)		质量 Mass (kg)
	d	D	B	X	rsmin	Cr	Cor	
476208B-107	36.513	80	23	69.85	1.1	80.6	90.6	1.12
476208B-108	38.100	80	23	69.85	1.1	80.6	90.6	1.11
476209B-111	42.863	85	23	73.03	1.1	84.2	97.6	1.16
476209B-112	44.450	85	23	73.03	1.1	84.2	97.6	1.14
476210B-050	50.000	90	23	73.03	1.1	86.8	103.5	1.15
476210B-115	49.213	90	23	73.03	1.1	86.8	103.5	1.19
476210B-200	50.800	90	23	73.03	1.1	86.8	103.5	1.12
476211B-203	55.563	100	25	79.38	1.5	106.3	126	1.55
476211B-204	57.150	100	25	79.38	1.5	106.3	126	1.52
476213B-060	60.000	120	31	85.73	1.5	166.6	208.5	2.98
476213B-207	61.913	120	31	85.73	1.5	166.6	208.5	2.46
476213B-208	63.500	120	31	85.73	1.5	166.6	208.5	2.75
476215B-075	75.000	130	31	92.08	1.5	187.2	238	3.24
476215B-211	68.263	130	31	92.08	1.5	187.2	238	3.38
476215B-212	69.850	130	31	92.08	1.5	187.2	238	3.31
476215B-215	74.613	130	31	92.08	1.5	187.2	238	3.28
476215B-300	76.200	130	31	92.08	1.5	187.2	238	3.17
476218B-085	85.000	160	40	102.39	2	281.5	373.8	6.01
476218B-307	87.313	160	40	102.39	2	281.5	373.8	5.72
476220B-100	100.000	180	46	116.69	2.1	361.9	478.9	8.23
476220B-315	100.013	180	46	116.69	2.1	361.9	478.9	8.23
476220B-400	101.600	180	46	116.69	2.1	361.9	478.9	8.21
476222B-407VSB	112.713	200	53	155.58	2.1	463	651	13.14
476222B-408VSB	114.300	200	53	155.58	2.1	463	651	14.59
476226B-415VSB	125.413	230	64	168.28	3	608	896	18.46
476226B-500VSB	127.000	230	64	168.28	3	608	896	18.04

Long Inner Ring Spherical Roller Bearing



轴承代号 Bearing No.	主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (KN)		质量 Mass (kg)
	d	D	B	X	rsmin	Cr	Cor	
W22210EC-31	49.212	90	23	55.55	1.1	101	119	0.85
W22211EC-35	55.562	100	25	63.551	1.5	123	149	1.15
W22211K	55.997	100	25	49.037	1.5	123	149	1
W22213K	66.065	120	31	56.131	1.5	174	213	1.76
W22213EC-39	61.912	120	31	61.138	1.5	174	213	1.72
W22213EC-40	63.5	120	31	61.138	1.5	174	213	1.64
W22226K	128.349	230	64	106.426	2	655	925	12.4

WGB[®] Bearings

Roller Bearing Manufacturer est. 1969

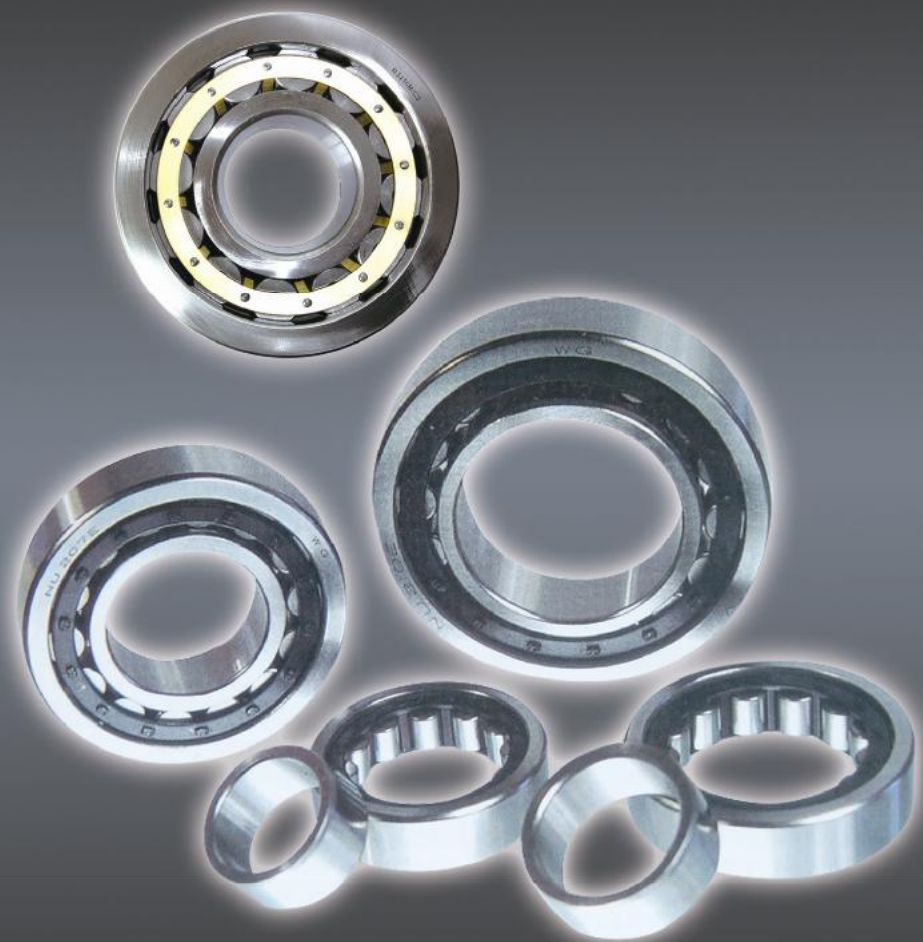
圆柱滚子轴承一般只用于承受径向负荷，有较大的径向截荷能力，广泛用于动力机械、工程机械、汽车行业、流体行业、石油机械等。

Cylindrical roller bearings are generally only used to bear radial load, there is a large radial load capacity, widely used in power machinery, construction machinery, automotive industry, fluid industry, petroleum machinery, etc..

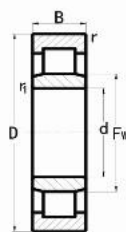


Wuxi Rolling Bearing Co.,Ltd

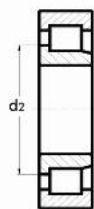
WGB[®]



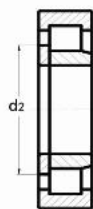
Cylindrical Roller Bearing



NU0000型

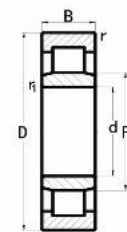


NJ0000型

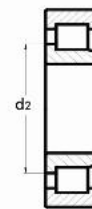


NUP0000型

主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (kN)		轴承代号 Bearing No.			极限转速 Limiting speeds(r/min)		其它尺寸 Other dimensions (mm)		质量 Mass (kg)
d	D	B	r _{min}	r _{1min}	Cr	Cor	NU0000型	NJ0000型	NUP0000型	脂润滑 Grease	油润滑 Oil	F _w	d ₂	
20	42	12	0.6	0.3	10.5	9.5	NU1004	—	—	13000	17000	25.5	—	0.09
	47	14	1	0.6	25.1	22.0	NU204E	NJ204E	NUP204E	12000	16000	26.5	29.7	0.12
	47	18	1	0.6	29.7	27.5	NU2204E	NJ2204E	NUP2204E	12000	16000	26.5	29.7	0.15
	52	15	1.1	0.6	35.5	26	NU304E	NJ304E	NUP304E	11000	15000	27.5	31.2	0.16
	52	21	1.1	0.6	47.5	38	NU2304E	NJ2304E	NUP2304E	10000	14000	27.5	29.7	0.22
25	47	12	0.6	0.3	14.2	13.2	NU1005	—	—	11000	15000	30.5	—	0.10
	52	15	1	0.6	28.6	27.0	NU205E	NJ205E	NUP205E	11000	14000	31.5	34.7	0.14
	52	18	1	0.6	34.1	34	NU2205E	NJ2205E	NUP2205E	11000	14000	31.5	34.7	0.17
	62	17	1.1	1.1	46.5	36.5	NU305E	NJ305E	NUP305E	9000	12000	34	38.1	0.25
	62	24	1.1	1.1	64	55.0	NU2305E	NJ2305E	NUP2305E	9000	12000	34	38.1	0.36
30	55	13	1	0.6	17.9	17.3	NU1006	—	—	9500	12000	36.5	—	0.12
	62	16	1	0.6	44.0	36.5	NU206E	NJ206E	NUP206E	8500	11000	37.5	41.3	0.21
	62	20	1	0.6	55	49	NU2206E	NJ2206E	NUP2206E	8500	11000	37.5	41.3	0.27
	72	19	1.1	1.1	58.5	48.0	NU306E	NJ306E	NUP306E	8000	10000	40.5	45	0.38
	72	27	1.1	1.1	83	75.0	NU2306E	NJ2306E	NUP2306E	8000	10000	40.5	45	0.54
	90	23	1.5	1.5	60.5	53	NU406	NJ406	NUP406	7000	9000	45	50.5	0.73
35	62	14	1	0.6	35.8	38	NU1007	—	—	8500	11000	42	—	0.16
	72	17	1.1	0.6	56	48.0	NU207E	NJ207E	NUP207E	7500	9500	44	48.3	0.31
	72	23	1.1	0.6	69.5	63.0	NU2207E	NJ2207E	NUP2207E	7500	9500	44	48.3	0.41
	80	21	1.5	1.1	75.0	63.2	NU307E	NJ307E	NUP307E	7000	9000	46.2	51.1	0.50
	80	31	1.5	1.1	106	98.2	NU2307E	NJ2307E	NUP2307E	7000	9000	46.2	51.1	0.74



NU0000型

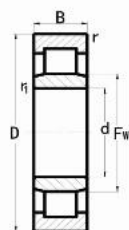


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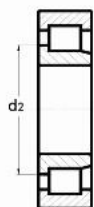


NUP0000型

主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (KN)		轴承代号 Bearing No.			极限转速 Limiting speeds(r/min)		其它尺寸 Other dimensions (mm)		质量 Mass (kg)
d	D	B	r _{min}	r _{1min}	Cr	Cor	NU0000型	NJ0000型	NUP0000型	脂润滑 Grease	油润滑 Oil	Fw	d2	
40	100	25	1.5	1.5	76.5	69.5	NU407	NJ407	NUP407	6000	7500	53	59	0.94
	68	15	1	0.6	25.1	26.0	NU1008	NJ1008	—	7500	9500	47	—	0.22
	80	18	1.1	1.1	62.0	53	NU208E	NJ208E	NUP208E	7000	9000	49.5	54.2	0.39
	80	23	1.1	1.1	81.5	75	NU2208E	NJ2208E	NUP2208E	7000	9000	49.5	54.2	0.51
	90	23	1.5	1.5	93	78.0	NU308E	NJ308	NUP308E	6300	8000	52	57.7	0.68
45	90	33	1.5	1.5	129	120.0	NU2308E	NJ2308E	NUP2308E	6300	8000	52	57.7	0.97
	110	27	2	2	96.8	90	NU408	NJ408	NUP408	5600	7000	58	64.8	1.25
	75	16	1	0.6	44.6	52	NU1009	NJ1009	—	6500	8500	52.5	—	0.26
	85	19	1.1	1.1	69.5	64.0	NU209E	NJ209E	NUP209E	6300	8000	54.5	59.2	0.45
	85	23	1.1	1.1	85	81.5	NU2209E	NJ2209E	NUP2209E	6300	8000	54.5	59.2	0.55
50	100	25	1.5	1.5	112.0	100	NU309E	NJ309E	NUP309E	5600	7000	58.5	64.7	0.93
	100	36	1.5	1.5	160	153	NU2309E	NJ2309E	NUP2309E	5600	7000	58.5	64.7	1.34
	120	29	2	2	106	102.0	NU409	NJ409	NUP409	5000	6300	64.5	71.8	1.80
	90	20	1.1	1.1	73.5	69.5	NU210E	NJ210E	NUP210E	6000	7500	59.5	64.2	0.51
	90	23	1.1	1.1	90.0	88	NU2210E	NJ2210E	NUP2210E	6000	7500	59.5	64.2	0.59
55	110	27	2	2	127	112	NU310E	NJ310E	NUP310E	5300	6700	65	71.2	1.20
	110	40	2	2	186	186.0	NU2310E	NJ2310E	NUP2310E	5300	6700	65	71.2	1.79
	130	31	2.1	2.1	130	127.0	NU410	NJ410	NUP410	4800	6000	70.8	78.8	2.30
	90	18	1.1	1	57.2	69.5	NU1011	NJ1011	—	5600	7000	64.5	—	0.45
	100	21	1.5	1.1	96.5	95	NU211E	NJ211E	NUP211E	5300	6700	66	70.9	0.68



NU0000型

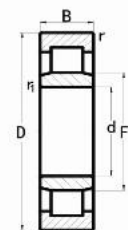


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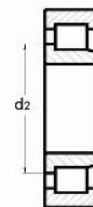


NUP0000型

主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (kN)		轴承代号 Bearing No.			极限转速 Limiting speeds(r/min)		其它尺寸 Other dimensions (mm)		质量 Mass (kg)
d	D	B	rsmin	r1smin	Cr	Cor	NU0000型	NJ0000型	NUP0000型	脂润滑 Grease	油润滑 Oil	Fw	d2	
60	100	25	1.5	1.1	114	118.0	NU2211E	NJ2211E	NUP2211E	5300	6700	66	70.9	0.81
	120	29	2	2	156	143.0	NU311E	NJ311E	NUP311E	4800	6000	70.5	77.4	1.53
	120	43	2	2	232.0	232	NU2311E	NJ2311E	NUP2311E	4800	6000	70.5	77.4	2.28
	140	33	2.1	2.1	142	140	NU411	NJ411	NUP411	4300	5300	77.2	85.2	2.80
	95	18	1.1	1	38.5	45.0	NU1012	NJ1012	—	5300	6700	69.5	—	0.48
	110	22	1.5	1.5	108	102.0	NU212E	NJ212E	NUP212E	5000	6300	72	77.7	0.86
	110	28	1.5	1.5	146.0	153	NU2212E	NJ2212E	NUP2212E	5000	6300	72	77.7	1.12
	130	31	2.1	2.1	173	160	NU312E	NJ312E	NUP312E	4500	5600	77	84.3	1.87
	130	46	2.1	2.1	260	265.0	NU2312E	NJ2312E	NUP2312E	4500	5600	77	84.3	2.81
65	150	35	2.1	2.1	168	173.0	NU412	NJ412	NUP412	4000	5000	83	91.8	3.40
	100	18	1.1	1	62.7	81.5	NU1013	NJ1013	—	4800	6000	74.5	—	0.51
	120	23	1.5	1.5	122	118	NU213E	NJ213E	NUP213E	4500	5600	78.5	84.6	1.08
	120	31	1.5	1.5	170	180.0	NU2213E	NJ2213E	NUP2213E	4500	5600	78.5	84.6	1.48
	140	33	2.1	2.1	212	196.0	NU313E	NJ313E	NUP313E	4000	5000	82.5	90.6	2.31
	140	48	2.1	2.1	285.0	290	NU2313E	NJ2313E	NUP2313E	4000	5000	82.5	90.6	3.34
	160	37	2.1	2.1	183	190	NU413	NJ413	NUP413	3800	4800	89.5	98.5	4.00
	110	20	1.1	1	76.5	93.0	NU1014	NJ1014	—	4800	6000	80	—	0.71
	125	24	1.5	1.5	137	137.0	NU214E	NJ214E	NUP214E	4300	5300	83.5	89.6	1.20
70	125	31	1.5	1.5	180.0	193	NU2214E	NJ2214E	NUP2214E	4300	5300	83.5	89.6	1.56
	150	35	2.1	2.1	236	228	NU314E	NJ314E	NUP314E	3800	4800	89	97.5	2.86
	150	51	2.1	2.1	315	325.0	NU2314E	NJ2314E	NUP2314E	3800	4800	89	97.5	4.10



NU0000型

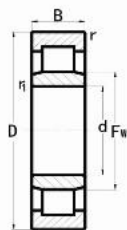


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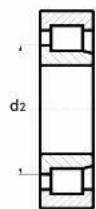


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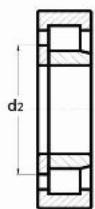
主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (kN)		轴承代号 Bearing No.			极限转速 Limiting speeds(r/min)		其它尺寸 Other dimensions (mm)		质量 Mass (kg)
d	D	B	rsmin	r1smin	Cr	Cor	NU0000型	NJ0000型	NUP0000型	脂润滑 Grease	油润滑 Oil	Fw	d2	
	180	42	3	3	229	240.0	NU414	NJ414	NUP414	3400	4300	100	110	5.90
75	115	20	1.1	1	58.3	71	NU1015	NJ1015	—	4500	5600	85	—	0.74
	130	25	1.5	1.5	150	156	NU215E	NJ215E	NUP215E	4000	5000	88.5	94.6	1.32
	130	31	1.5	1.5	186	208.0	NU2215E	NJ2215E	NUP2215E	4000	5000	88.5	94.6	1.64
	160	37	2.1	2.1	280	265.0	NU315E	NJ315E	NUP315E	3600	4500	95	104.2	3.43
	160	55	2.1	2.1	380.0	400	NU2315E	NJ2315E	NUP2315E	3600	4500	95.5	104	5.40
	190	45	3	3	264	280	NU415	NJ415	NUP415	3200	4000	104.5	116	7.10
80	125	22	1.1	1	66	81.5	NU1016	NJ1016	—	4300	5300	91.5	—	1.00
	140	26	2	2	160	166.0	NU216E	NJ216E	NUP216E	3800	4800	95.3	101.1	1.58
	140	33	2	2	212.0	245	NU2216E	NJ2216E	NUP2216E	3800	4800	95.3	101.1	2.05
	170	39	2.1	2.1	300	290	NU316E	NJ316E	NUP316E	3400	4300	101	110.1	4.05
	170	58	2.1	2.1	415	440.0	NU2316	NJ2316	NUP2316	3400	4300	103	111	6.40
	200	48	3	3	303	320.0	NU416	NJ416	NUP416	3000	3800	110	122	8.30
85	130	22	1.1	1	68.2	86.5	NU1017	NJ1017	—	4000	5000	96.5	—	1.05
	150	28	2	2	190	200	NU217E	NJ217E	NUP217E	3600	4500	100.5	107.1	2.00
	150	36	2	2	250	280.0	NU2217E	NJ2217E	NUP2217E	3600	4500	100.5	107.1	2.58
	180	41	3	3	340	335.0	NU317E	NJ317E	NUP317E	3200	4000	108	117.4	4.82
	180	60	3	3	455.0	490	NU2317	NJ2317	NUP2317	3200	4000	108	117	7.40
	210	52	4	4	319	335	NU417	NJ417	NUP417	2800	3600	113	126	9.80
90	140	24	1.5	1.1	80.9	104.0	NU1018	NJ1018	—	3800	4800	103	—	1.36
	160	30	2	2	208	220.0	NU218E	NJ218E	NUP218E	3400	4300	107	113.9	2.44



NU0000型

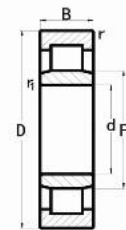


NJ0000型



NUP0000型

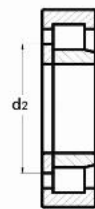
主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (KN)		轴承代号 Bearing No.			极限转速 Limiting speeds(r/min)		其它尺寸 Other dimensions (mm)		质量 Mass (kg)
d	D	B	rsmin	r1smin	Cr	Cor	NU0000型	NJ0000型	NUP0000型	脂润滑 Grease	油润滑 Oil	Fw	d2	
	160	40	2	2	280.0	315	NU2218E	NJ2218E	NUP2218E	3400	4300	107	113.9	3.26
	190	43	3	3	365	360	NU318E	NJ318E	NUP318E	3000	3800	113.5	123.7	5.59
	190	64	3	3	500	540.0	NU2318	NJ2318	NUP2318	3000	3800	115	125	8.40
	225	54	4	4	380	415.0	NU418	NJ418	NUP418	2400	3200	123.5	137	11.00
95	145	24	1.5	1.1	84.2	110	NU1019	NJ1019	—	3600	4500	108	—	1.40
	170	32	2.1	2.1	255	265	NU219E	NJ219E	NUP219E	3200	4000	112.5	120.2	2.96
	170	43	2.1	2.1	325	375.0	NU2219E	NJ2219E	NUP2219E	3200	4000	112.5	120.2	3.97
	200	45	3	3	390	390.0	NU319E	NJ319E	NUP319E	2800	3600	121.5	131.7	6.52
	200	67	3	3	530.0	585	NU2319	NJ2319	NUP2319	2800	3600	121.5	132	10.40
	240	55	4	4	413	455	NU419	NJ419	NUP419	2200	3000	133	147	14.00
100	150	24	1.5	1.1	85.8	114.0	NU1020	NJ1020	—	3400	4300	113	—	1.50
	180	34	2.1	2.1	285	305.0	NU220E	NJ220E	NUP220E	3000	3800	119	127	3.58
	180	46	2.1	2.1	380.0	450	NU2220E	NJ2220E	NUP2220E	3000	3800	119	127	4.86
	215	47	3	3	450	440	NU320E	NJ320E	NUP320E	2600	3200	127.5	139.1	7.89
	215	73	3	3	670	735.0	NU2320	NJ2320	NUP2320	2600	3200	129.5	140	13.50
	250	58	4	4	429	475.0	NU420	NJ420	NUP420	2000	2800	139	153	16.00
105	160	26	2	1.1	101.0	137	NU1021	NJ1021	—	3200	4000	119.5	—	1.90
	190	36	2.1	2.1	300	315	NU221	NJ221	NUP221	2800	3600	126.8	135	4.00
110	170	28	2	1.1	128	166.0	NU1022	NJ1022	—	3000	3800	125	131	2.30
	200	38	2.1	2.1	335	365	NU222E	NJ222E	NUP222E	2600	3400	133.5	141.3	5.02
	200	53	2.1	2.1	440	520	NU2222	NJ2222	NUP2222	2600	3400	132	141	7.50



NU0000型

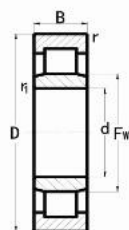


NJ0000型



NUP0000型

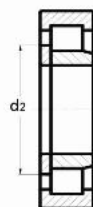
主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (KN)		轴承代号 Bearing No.			极限转速 Limiting speeds(r/min)		其它尺寸 Other dimensions (mm)		质量 Mass (kg)
d	D	B	rsmin	r1smin	Cr	Cor	NU0000型	NJ0000型	NUP0000型	脂润滑 Grease	油润滑 Oil	Fw	d2	
	240	50	3	3	530	540.0	NU322	NJ322	NUP322	2000	2800	143	155	11
	240	80	3	3	532	900	NU2322	NJ2322	NUP2322	2000	2800	143	155	17.5
	280	65	4	4	134	585	NU422	NJ422	NUP422	1800	2400	155	171	22
120	180	28	2	1.1	390	183	NU1024	NJ1024	—	2600	3400	135	—	2.96
	215	40	2.1	2.1	520	430	NU224E	NJ224E	NUP224E	2200	3000	143	1153	6.11
	215	58	2.1	2.1	610	630	NU2224	NJ2224	NUP2224	2200	3000	143.5	153	9.5
	260	55	3	3	780	620	NU324	NJ324	NUP324	1900	2600	154	168	14
	260	86	3	3	915	455	NU2324	NJ2324	NUP2324	1900	2600	154	147	22.5
	310	72	5	5	644	735	NU424	NJ424	NUP424	1700	2200	170	188	30
130	200	33	2	1.1	165	224	NU1026	NJ1026	—	2400	3200	148	—	3.7
	230	40	3	3	415	455	NU226	NJ226	NUP226	2000	3800	156	165	7
	230	64	3	3	610	735	NU2226	NJ2226	NUP2226	2000	2800	156	—	11.5
	280	58	4	4	720	750	NU326	NJ326	NUP326	1700	2200	167	182	18
	280	93	4	4	1060	1250	NU2326	NJ2326	NUP2326	1700	2200	167	182	28.5
	340	78	5	5	782	942	NU426	NJ426	NUP426	1500	1900	185	—	39
140	210	33	2	1.1	172	245	NU1028	NJ1028	—	2000	2000	158	—	4
	250	42	3	3	450	510	NU228	NJ228	NUP228	1800	2400	169	179	9.1
	250	68	3	3	655	830	NU2228	NJ2228	NUP2228	1800	2400	169	179	15
	300	62	4	4	780	830	NU328	NJ328	NUP328	1600	2000	180	196	22
	300	102	4	4	1200	1430	NU2328	NJ2328	NUP2328	1600	2000	180	192	37
150	225	35	2.1	1.5	194	275	NU1030	NJ1030	—	1900	2600	169.5	—	4.80



NU0000型

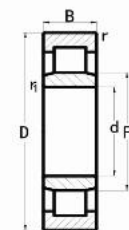


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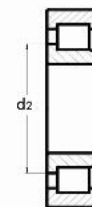


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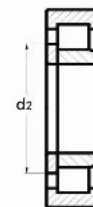
主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (KN)		轴承代号 Bearing No.			极限转速 Limiting speeds(r/min)		其它尺寸 Other dimensions (mm)		质量 Mass (kg)
d	D	B	r _{min}	r _{1min}	Cr	Cor	NU0000型	NJ0000型	NUP0000型	脂润滑 Grease	油润滑 Oil	F _w	d ₂	
	270	45	3	3	510	600.0	NU230	NJ230	NUP230	1700	2200	182	193	11.00
	270	73	3	3	735	930	NU2230	NJ2230	NUP2230	1700	2200	182	193	17.00
	320	65	4	4	900	965	NU330	NJ330	NUP330	1500	1900	193	209	26.00
	320	108	4	4	1370	1630	NU2330	NJ2330	NUP2330	1500	1900	193	209	45.00
	380	85	5	5	912	1100	NU430	NJ430	NUP430	1300	1700	209	—	53.00
160	240	38	2.1	1.5	229	325	NU1032	NJ1032	—	1800	2400	180	—	6.00
	290	48	3	3	585	680	NU232	NJ232	NUP232	1600	2000	193	206	14.00
	290	80	3	3	930	1200	NU2232	NJ2232	NUP2232	1600	2000	193	205	25.00
	340	68	4	4	1000	1080	NU332	NJ332	NUP332	1400	1800	208	—	31.60
	340	114	4	4	1250	1730	NU2332	NJ2332	NUP2332	1400	1800	208	—	55.80
170	260	42	2.1	2.1	275	400	NU1034	NJ1034	—	1700	2200	193	—	8.14
	310	52	4	4	695	815	NU234	NJ234	NUP234	1500	1900	208	220	17.10
	360	72	4	4	952	1180	NU334	NJ334	NUP334	1300	1700	220	—	36.00
	360	120	4	4	1450	2040	NU2334	NJ2334	NUP2334	1300	1700	220	—	63.00
180	280	46	2.1	2.1	336	475	NU1036	NJ1036	—	1600	2000	205	215	10.10
	320	52	4	4	720	850	NU236	NJ236	NUP236	1400	2800	218	230	18.00
	380	75	4	4	1020	1290	NU336	NJ336	NUP336	1200	1600	232	252	42.00
	380	126	4	4	1610	2240	NU2336	NJ2336	NUP2336	1200	1600	230	252	71.2
190	340	55	4	4	800.0	965	NU238	NJ238	NUP238	1300	1700	231	244	23.00
	340	92	4	4	1220	1600	NU2238	NJ2238	NUP2238	1300	1700	228	—	38.50
	400	78	5	5	1140	1500.0	NU338	NJ338	NUP338	1100	1500	245	—	50.00



NU0000型



NJ0000型



NUP0000型

主要尺寸 Boundary dimensions (mm)					额定负荷 Load ratings (KN)		轴承代号 Bearing No.			极限转速 Limiting speeds(r/min)		其它尺寸 Other dimensions (mm)		质量 Mass (kg)
d	D	B	r _{min}	r _{1min}	Cr	Cor	NU0000型	NJ0000型	NUP0000型	脂润滑 Grease	油润滑 Oil	F _w	d ₂	
200	310	51	2.1	2.1	380	570.0	NU1040	NJ1040	—	1400	1800	229	239	14.30
	360	58	4	4	850.0	1020	NU240	NJ240	NUP240	1200	1600	244	258	26.00
	360	98	4	4	1370	1800	NU2240	NJ2240	NUP2240	1200	1600	—	—	49.00
	420	80	5	5	1230	1630.0	NU340	NJ340	NUP340	1000	1400	260	—	62.00
220	400	65	4	4	1060	1290	NU244	NJ244	NUP244	1000	1400	270	286	36.00
	400	108	4	4	1570	2280	NU2244	NJ2244	NUP2244	1000	1400	270	—	62.00
	460	88	5	5	1210	1630	NU344	NJ344	—	900	1200	284	307	75.00
240	360	56	3	3	523	800	NU1048	NJ1048	—	1000	1400	270	282	21.00
	440	72	4	4	952	1370	NU248	NJ248	NUP248	900	1200	295	313	48.20
	500	95	5	5	1450	2000	NU348	NJ348	—	800	1000	310	335	97.10
260	400	65	4	4	627	965	NU1052	NJ1052	—	950	1300	296	309	31.00
280	420	65	4	4	660	1060	NU1056	NJ1056	—	850	1100	316	329	33.00
300	460	74	4	4	858	1370	NU1060	NJ1060	—	800	1000	340	356	44.40
	540	85	5	5	1420	2120	NU260	NJ260	—	700	900	365	387	87.2

WGB[®] Bearings

Roller Bearing Manufacturer est. 1969

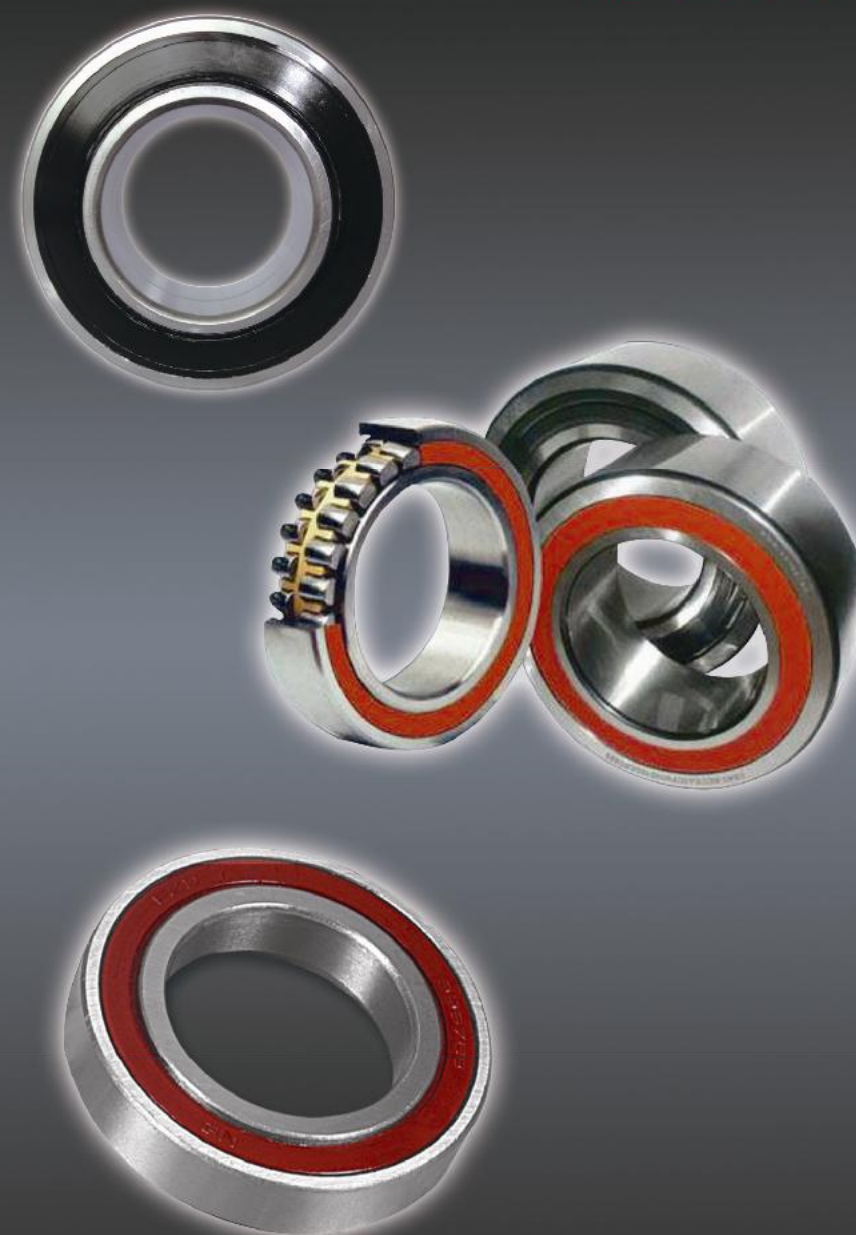
带密封圈调心滚子轴承是一种两侧带骨架密封圈的闭式结构轴承。该轴承具有调心滚子轴承的功能外，还具有内部运转环境优良的特点，利于轴承的长寿命。广泛用于工程机械和电梯上。

Seals on spherical roller bearings can extend life by helping to keep contamination out and lubricant in.

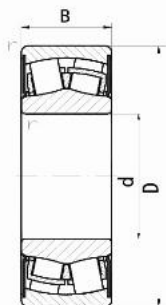


Wuxi Rolling Bearing Co.,Ltd

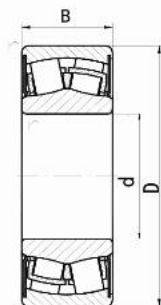
WGB[®]



Spherical Roller Bearing With Seals



轴承代号 Bearing No.	主要尺寸 Boundary dimensions (mm)				极限转速 Limiting speeds(r/min)	额定负荷 Load ratings (KN)		质量 Mass (kg)
	d	D	B	rsmin		Cr	Cor	
BS2-2205-2CS	25	52	23	1	3700	43.2	45	0.26
BS2-2206-2CS	30	62	25	1	2900	52.9	56.8	0.34
BS2-2207-2CS	35	72	28	1.1	2500	73.2	83.1	0.52
BS2-2208-2CS	40	80	28	1.1	2300	80.6	90.6	0.57
BS2-2209-2CS	45	85	28	1.1	2100	84.2	97.6	0.66
BS2-2210-2CS	50	90	28	1.1	2000	86.8	103.5	0.7
BS2-2211-2CS	55	100	31	1.5	1700	106.3	125.9	1
BS2-2212-2CS	60	110	34	1.5	1700	126.6	154	1.31
BS2-2213-2CS	65	120	38	1.5	1600	166.6	208.5	1.6
BS2-2214-2CS	70	125	38	1.5	1500	174.5	218	1.8
BS2-2215-2CS	75	130	38	1.5	1400	187.2	238	2.1
BS2-2216-2CS	80	140	40	2	1300	197.9	255.9	2.4
BS2-2217-2CS	85	150	44	2	1200	237.4	310.3	3
BS2-2218-2CS	90	160	48	2	1100	281.5	373.8	3.7
BS2-2220-2CS	100	180	55	2.1	1000	361.9	478.9	5.5
BS2-2222-2CS	110	200	63	2.1	900	463	651	7.6
BS2-2224-2CS	120	215	69	2.1	850	529	740	9.75
BS2-2308-2CS	40	90	38	1.5	2000	122	136.4	1.2
BS2-2309-2CS	45	100	42	1.5	1600	146.4	168.5	1.6
BS2-2310-2CS	50	110	45	2	1500	194.1	225.3	2.1
BS2-2311-2CS	55	120	49	2	1500	217.9	255.2	2.8
BS2-2312-2CS	60	130	53	2.1	1200	253.2	299.2	3.4



轴承代号 Bearing No.	主要尺寸 Boundary dimensions (mm)				极限转速 Limiting speeds(r/min)	额定负荷 Load ratings (KN)		质量 Mass (kg)
	d	D	B	rsmin		Cr	Cor	
BS2-2313-2CS	65	140	56	2.1	1100	295	351.6	4.15
BS2-2314-2CS	70	150	60	2.1	1000	323.8	394.8	5.1
BS2-2315-2CS	75	160	64	2.1	1050	362.7	455.8	6.5
BS2-2316-2CS	80	170	67	2.1	900	439.4	531.5	7.2
22324-2CS	120	260	86	3	700	919.8	1187.1	23
23022-2CS	110	170	45	2	1000	310	440	3.8
23024-2CS	120	180	46	2	950	355	510	4.2
23120-2CS	100	165	52	2	950	365	490	4.4
23122-2CS	110	180	56	2	900	430	585	5.75
23128-2CS	140	225	68	2.1	480	549	857	10.25
23218-2CS	90	160	52.4	2	850	355	440	4.65
23220-2CS	100	180	60.3	2.1	780	475	600	6.85
23222-2CS	110	200	69.8	2.1	720	600	765	9.85
23224-2CS	120	215	76	2.1	680	695	930	12
24015-2CS	75	115	40	1.1	1000	173	232	1.55
24020-2CS	100	150	50	1.5	880	285	415	3.2
24022-2CS	110	170	45	2	750	415	620	5
24024-2CS	120	180	60	2	750	430	670	5.45
24120-2CS	100	165	65	2	750	455	640	5.65
24122-2CS	110	180	69	2	700	520	750	7.1
24122-2CS	120	200	80	2	650	655	950	10.5
24124-2CS	120	200	80	2	560	520	950	10.2

WGB[®] Bearings

Roller Bearing Manufacturer est. 1969

振动机械专用轴承主要用于矿山机械装置和一些振动压力设备。例如：振动筛、压路机和锯齿形的切割机械等。

Vibratory screens used for grading materials and other vibratory machinery. Such as road rollers and saw frames ect.

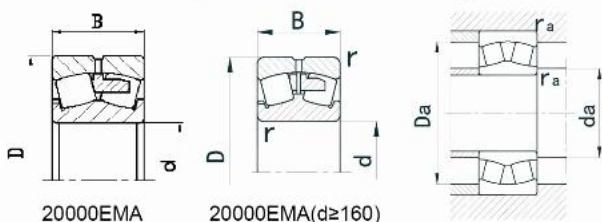


Wuxi Rolling Bearing Co.,Ltd

WGB[®]



Spherical Roller Bearings for Vibrating Screens



主要尺寸 Boundary dimensions (mm)				额定负荷 Load ratings (KN)		轴承代号 Bearing No.		极限转速 Limiting speeds(r/min)		安装尺寸 Boundary dimensions (mm)			质量 Mass (kg)
										da	Da	ra	
d	D	B	r _{min}	Cr	Cor	圆柱孔 cylindrical bore	圆锥孔 tapered bore	脂润滑 grease	油润滑 oil	min	max	max	
40	90	33	1.5	122.0	136.4	22308EMA	22308EMAK	5100	6800	52	78	1.5	1.04
45	100	36	1.5	146.4	168.5	22309EMA	22309EMAK	4500	5950	56	91	1.5	1.44
50	110	40	2.0	194.1	225.3	22310EMA	22310EMAK	4080	5355	60	100	2.1	1.93
55	120	43	2.0	217.9	255.2	22311EMA	22311EMAK	3655	4760	65	110	2.1	2.46
60	130	46	2.1	253.2	299.2	22312EMA	22312EMAK	3400	4500	72	118	2.1	3.09
65	140	48	2.1	295.0	351.6	22313EMA	22313EMAK	3230	4250	77	128	2.1	3.71
70	150	51	2.1	323.8	394.8	22314EMA	22314EMAK	2890	3825	82	138	2.1	4.50
75	160	55	2.1	362.7	455.8	22315EMA	22315EMAK	2700	3500	87	148	2.1	5.55
80	170	58	2.1	439.4	531.5	22316EMA	22316EMAK	2550	3400	92	158	2.1	6.54
85	180	60	3.0	450.0	570.6	22317EMA	22317EMAK	2500	3000	99	166	2.5	7.54
90	190	64	3.0	505.8	655.3	22318EMA	22318EMAK	2300	2700	104	176	2.5	9.06
95	200	67	3.0	555.1	721.7	22319EMA	22319EMAK	2100	2500	109	186	2.5	10.43
100	215	73	3.0	644.7	851.0	22320EMA	22320EMAK	1900	2200	114	201	2.5	13.34
110	240	80	3.0	779.4	990.3	22322EMA	22322EMAK	1800	2000	124	226	2.5	18.62
120	260	86	3.0	919.8	1187.1	22324EMA	22324EMAK	1500	1900	134	246	2.5	23.17
130	280	93	4.0	1054.0	1432.7	22326EMA	22326EMAK	1300	1800	148	262	3.0	28.78
140	300	102	4.0	1189.9	1667.5	22328EMA	22328EMAK	1200	1600	158	282	3.0	36.18
150	320	108	4.0	1279.3	1796.2	22330EMA	22330EMAK	1200	1500	168	302	3.0	43.35
160	340	114	4.0	1460.4	2063.2	22332EMA	22332EMAK	1050	1400	178	322	3.0	51.76
170	360	120	4.0	1541.0	2187.7	22334EMA	22334EMAK	980	1300	188	342	3.0	61.39
180	380	126	4.0	1828.2	2601.5	22336EMA	22336EMAK	930	1200	198	362	3.0	71.25
190	400	132	5.0	1964.4	2814.1	22338EMA	22338EMAK	880	1100	208	382	4.0	81.02

公差 Tolerance

不同的使用场合要求不同的轴承精度。

按公差等级, P0级使用于正常情况下的滚子轴承, P6及以上等级适用于要求精度更高的滚子轴承。

符号—内圈

Δd_{mp} : 单—平面平均内径的偏差 (对于圆锥孔 Δd_{mp} 仅指内孔的理论小端)

Vdsp: 单一径向平面内径变动量

Vdmp: 平均内径变动量 (只适用于圆柱孔)

Kia: 成套轴承内圈的径向跳动

ΔBs : 内圈单一宽度偏差, 即宽度公差

VBS: 内圈宽度变动量, 即平行差

Different applications need different precisions.

According to the tolerance grade, P0 is applicable to the roller bearings for general conditions, while P6 is applicable to roller bearings for demanding applications.

Code-inner ring

Δd_{mp} : single plane mean bore diameter deviation (For the tapered bore, Δd_{mp} refers to the theoretical small end only.)

Vdsp: variation in a single radial plane
Vdmp: mean bore diameter variation (applicable for straight bore only)

Kia: radial runout of assembled bearing inner ring

ΔBs : deviation of a single inner ring width, i.e. width tolerance

VBS: variation of inner ring width, i.e. parallel tolerance

表1 内圈公差 Table 1 Inner Ring Tolerance

(μm)

轴承内径 Bearing Bore d(mm)		$\Delta d_{mp}^{(1)}$ 0—		Vdsp直径系列 Dia. Series				Vdmp max		Kia max		ΔBs 0—		VBs max	
				0.1	2,3, 4	0.1	2,3, 4								
超过 Over	至 incl	P0	P6	P0		P6		P0	P6	P0	P6	P0	P6	P0	P6
18	30	−10	−8	10	8	8	6	8	6	13	8	−120	−120	20	20
30	50	−12	−10	12	9	10	8	9	8	15	10	−120	−120	20	20
50	80	−15	−12	19	11	15	9	11	9	20	10	−150	−150	25	25
80	120	−20	−15	25	15	19	11	15	11	25	13	−200	−200	25	25
120	180	−25	−20	31	19	23	14	19	14	30	18	−250	−250	30	30
180	250	−30	−25	38	23	28	17	23	17	40	20	−300	−300	30	30
250	315	−35	−30	44	26	31	19	26	19	50	25	−350	−350	35	35
315	400	−40	−35	50	30	38	23	30	23	60	30	−400	−400	40	40

1. 本表公差符合GB/T307.1-2005等效应采用ISO492-2002滚动一向心轴承—公差

2. d_{min} (内径的最小值) 和 d_{max} (内径的最大值) 可能超出范围, 但 $\frac{d_{min}+d_{max}}{2}$ 必须符合的要求。

1. This table is built on the basis of GB/T307.1-2005, identical of ISO492-2002

2. The figures of d_{min} and d_{max} may be out of scale, but the value of $\frac{d_{min}+d_{max}}{2}$ must conform to the requirement.

符号—外圈

△Dmp: 单一平面平均外径的偏差, 即外径公差

VDsp: 单一径向平面外径变动量

VDmp: 平均外径变动量

Kea: 成套轴承外圈的径向跳动

△Cs: 外圈单一宽度偏差, 即宽度公差

VCs: 外圈宽度变动量, 即平行差

Code-Outer ring

△Dmp: deviation of mean outside diameter, i.e. outside dia. tolerance

VDsp: single plane outside dia. variation

VDmp: mean outside dia. variation

Kea: radial runout of assembled bearing outer ring

△Cs: deviation of a single outer ring width, i.e. width tolerance

VCs: outer ring width variation, i.e. parallel tolerance

表2 外圈公差 Table 2 Outer Ring Tolerance

(μm)

轴承内径 Bearing O.D (mm)	△D _{mp} ⁽¹⁾ 0—	VDsp直径系列 Dia.Series				VDmp max		Kea max		△Cs 0—		VCs max	
		0.1	2,3, 4	0.1	2,3, 4	P0	P6	P0	P6	P0	P6	P0	P6
30	50	-11	-9	11	8	9	7	8	7	20	10		
50	80	-13	-11	13	10	11	8	10	8	25	13		
80	120	-15	-13	19	11	16	10	11	10	35	18		
120	150	-18	-15	23	14	19	11	14	11	40	20		
150	180	-25	-18	31	19	23	14	19	14	45	23		
180	250	-30	-20	38	23	25	15	23	15	50	25		
250	315	-35	-25	44	26	31	19	26	19	60	30		
315	400	-40	-28	50	30	35	21	30	21	70	35		
400	500	-45	-33	56	34	41	25	34	25	80	40		
500	630	-50	-38	63	38	48	29	38	29	100	50		
630	800	-75	-45	94	55	56	34	55	34	120	60		

与同一轴承内圈的
△Bs及VBs相同

The △Bs and VBs
of bore in the same
bearing are identical

1. 本表公差符合GB/T307.1-2005等效应采用ISO492-2002滚动一向心轴承—公差

2. Dmin(内径的最小值)和Dmax(外径的最大值)可能超出范围,但 $\frac{Dmin+Dmax}{2}$ 必须符合要求。

1. This table is built on the basis of GB/T307.1-2005, identical of ISO492-2002

2. The figures of Dmin (O.D.max) and Dmax (O.D.max) may be out of the value of $\frac{Dmin+Dmax}{2}$ must conform to the requirement.

径向游隙 Radial Internal Clearance

径向游隙是指轴承内部的径向游隙,是允许轴承在紧配合装配后,在正常条件下有宽裕的内部游隙。

带有锥孔的调心滚子轴承则要求其配合时的过盈量比圆柱孔的更大一些,更大的过盈量则引起径向游隙的减少,所以对于锥孔调心滚子轴承,选择时要考虑到径向游隙的减少量,这一点很重要。

例: 22328K/C3轴承,内径为140mm, C3组径向游隙是装在锥轴上的。用塞尺测量后,径向游隙为0.178mm,下表显示径向游隙减少0.064~0.089mm时达到合适的配合,装配后的游隙(0.178-0.076=0.102mm)所以锁紧螺母旋至径向游隙达到0.102mm为止。

下表列出了径向游隙的最大、最小值,每一单列代表相邻径向游隙的界限。例如: C5的最小值为C4的最大值, C4的最小值也是C3的最大值等等。

Internal clearance means Radial Clearance, it allows a sufficient internal clearance inside the bearing under normal conditions after its tight fit installation.

As to the spherical roller bearing with tapered bore, its interference should be larger than that of a cylindrical bore, therefore, this will reduce the radial clearance and the reduction of radial internal clearance should be taken into account when a tapered bore spherical roller bearing is chosen. This is very important.

Take the bearing K/C3 as an example: the bore diameter is 140mm and the radial internal clearance of group C3, which is mounted on a tapered shaft is measured at 0.178mm. The table as below shows that the radial internal clearance should be reduced by 0.064 to 0.089mm to get the proper fit and the adjusted clearance should be 0.178-0.076=0.102mm. Screw the nut until the radial internal clearance is 0.102mm.

The table indicates the max. and min. values of the radial internal clearance and the correlation between them. For example, the minimum of C5 is the maximum of C4 while the minimum of C4 is the maximum of C3 etc.

表3 圆柱滚子轴承 Table 3 Cylindrical Ring Bearing

径向游隙 Radial Internal Clearance (μm)

公称内径 Nominal Bore d(mm)		C2		C0		C3		C4		C5	
超过 Over	至 incl	min	max	min	max	min	max	min	max	min	max
	10	0	25	20	45	35	60	50	75	—	—
10	24	0	25	20	45	35	60	50	75	65	90
24	30	0	25	20	45	35	60	50	75	70	95
30	40	5	30	25	50	45	70	60	85	80	105
40	50	5	35	30	60	50	80	70	100	95	125
50	65	10	40	40	70	60	90	80	110	110	140
65	80	10	45	40	75	65	100	90	125	130	165
80	100	15	50	50	85	75	110	105	140	155	190
100	120	15	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	100	145	145	190	200	245
140	160	20	70	70	120	115	165	165	215	225	275
160	180	25	75	75	125	120	170	170	220	250	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	395
250	280	55	125	125	195	190	260	260	330	370	440
280	315	55	130	130	205	200	275	275	350	410	485

表4 调心滚子轴承 Table 4 Spherical Roller Bearing

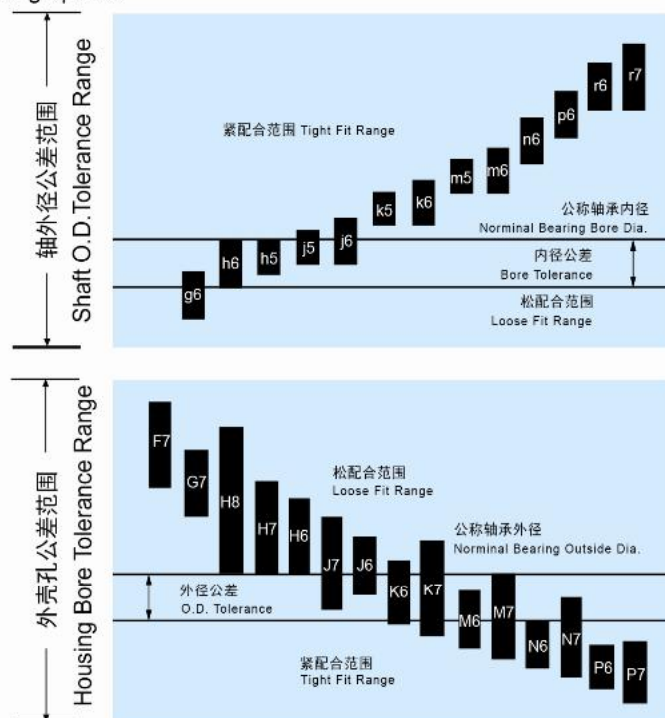
径向游隙 Radial Internal Clearance (μm)

公称内径 Nominal Bore d(mm)		圆柱孔 Cylindrical bore						圆锥孔 Tapered bore									
		C0		C4				C0		C4				安装时建议 径向游隙的 减少量 Recommended Reduction of Radial internal Clearance in Installation		安装后的 建议游隙 Recommended Radial Internal Clearance After Installation	
超过 Over	至 incl	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
18	24	10	20	35	45	60	75	15	25	35	45	60	75	10	15	10	
24	30	15	25	40	55	75	90	20	30	40	55	75	95	15	20	15	
30	40	15	30	45	60	80	100	25	35	50	65	85	105	20	25	15	
40	50	20	35	55	75	100	125	30	45	60	80	100	130	25	30	20	
50	65	20	40	65	90	120	150	40	55	75	95	120	160	30	38	25	
65	80	30	50	80	110	145	180	50	70	95	120	150	200	38	51	25	
80	100	35	60	100	135	180	225	55	80	110	140	180	230	46	64	36	
100	120	40	75	120	160	210	260	65	100	135	170	220	280	51	71	51	
120	140	50	95	145	190	240	300	80	120	160	200	260	330	64	89	56	
140	160	60	110	170	220	280	350	90	130	180	230	300	380	76	102	56	
160	180	65	120	180	240	310	390	100	140	200	260	340	340	76	114	61	
180	200	70	130	200	260	340	430	110	160	220	290	370	470	89	127	71	
200	225	80	140	220	290	380	470	120	180	250	320	410	520	102	140	76	
225	250	90	150	240	320	420	520	140	200	270	350	450	570	114	152	89	
250	280	100	170	260	350	460	570	150	220	300	390	490	620	114	165	102	
280	315	110	190	280	370	500	630	170	240	330	430	540	680	125	180	128	
315	355	120	200	310	410	550	690	190	270	360	470	590	740	140	210	135	
355	400	130	220	340	450	600	750	210	300	400	520	650	820	160	240	155	

配合 Fits

为了防止轴承内圈与轴，轴承外圈与轴承外壳孔在机器运转中产生打滑现象，选择和保持正确的配合非常重要。下图是符合国家标准的轴承与轴及外壳的配合的选择。这些标有g6、h6等的块标表示在不同负荷和套圈旋转的情况下，为满足不同松和紧配合的要求，轴和外壳的直径和公差范围。

In order to prevent the bearing from malfunctioning, the inner ring and the axle, the outer ring and the housing bore should be kept in good coordination. The table as below, which is based on the China National Standard shows fits among the bearing, the axle and the housing. All the columns marked as g6, h6, etc. indicate the range of diameters and tolerances for the axle and housing that meet different loose or tight fit requirements at different load and rotating speed.



轴承与轴的配合

轴承与轴的配合采用基孔制，轴承与外壳的配合采用基轴制。轴承与轴的配合与机器制造业采用的公差配合制不同，轴承的内径公差多为负公差，因此，在采用相同配合的条件下，轴承内径与轴的配合比通常的配合较为紧密。轴承的外径虽为负公差，但其公差取值与一般公差带也不相同。

表5显示g6, h6, h5, j5, j6, k5, k6等轴的公差和轴承内径的公差及它们之间的差值。(L代表间隙, T代表过盈)

The fit of the bearing and shaft is based on the bore, while that of the bearing and housing is based on the shaft. The fit between the bearing and shaft is different from the tolerance fitting system applied in the manufacturing industry, consequently the bearing bore tolerance is usually in minus values. Under those conditions, the fit is tighter than usual.

Bearing and Shaft Fits

Table 5 shows the shaft tolerance of g6, p6, h5, j5, j6, k5, k6 etc., and bearing inner bore tolerance as well as their differences. (L stands for clearance and T stands for interference)

表5 轴承与轴的配合 Table 5 Bearing & Shaft Fits (μm)

轴承内径 Bearing Bore		g6			h6			h5			j5			j6			k5			k6		
公称 Nominal	公差 Tol.	轴直径 Shaft Dia.		配合 Fit	轴直径 Shaft Dia.		配合 Fit	轴直径 Shaft Dia.		配合 Fit	轴直径 Shaft Dia.		配合 Fit	轴直径 Shaft Dia.		配合 Fit	轴直径 Shaft Dia.		配合 Fit	轴直径 Shaft Dia.		
超过 Over	至 incl	至 To	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max
mm	mm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm
3	6	-8	-4	-12	12L 4T	0	-8	8L 8T	0	-5	5L 8T	+3	-2	2L 11T	+6	-2	2L 14T	+6	+1	1L 14T		
6	10	-8	-5	-14	14L 3T	0	-9	9L 8T	0	-6	6L 8T	+4	-2	2L 12T	+7	-2	2L 15T	+7	+1	1L 15T		
10	18	-8	-6	-17	17L 2T	0	-11	11L 8T	0	-8	8L 8T	+5	-3	3L 13T	+8	-3	3L 16T	+8	+1	1L 17T		
18	30	-10	-7	-20	20L 3T	0	-13	13L 10T				+5	-4	4L 15T	+9	-4	4L 19T	+11	+2	2T 21T		
30	50	-12	-9	-25	25L 3T	0	-16	16L 12T				+6	-5	5L 18T	+11	-5	5L 23T	+13	+2	2T 30T	+18	+2
50	80	-15	-10	-29	29L 5T	0	-19	19L 15T				+6	-7	7L 21T	+12	-7	7L 27T	+15	+2	2T 30T	+21	+2
80	120	-20	-12	-34	34L 8T	0	-22	22L 20T				+6	-9	9L 26T	+13	-9	9L 33T	+18	+3	3T 38T	+25	+3
120	180	-25	-14	-39	39L 11T	0	-25	25L 25T				+7	-11	11L 32T	+14	-11	11L 39T	+21	+3	3T 46T	+28	+3
180	200	-30	-15	-44	44L 15T	0	-29	29L 30T				+7	-13	13L 37T	+16	-13	13L 46T	+24	+4	4T 54T		
200	225	-30	-15	-44	44L 15T	0	-29	29L 30T				+7	-13	13L 37T	+16	-13	13L 46T	+24	+4	4T 54T		
225	250	-30	-15	-44	44L 15T	0	-29	29L 30T				+7	-13	13L 37T	+16	-13	13L 46T	+24	+4	4T 54T		
250	280	-35	-17	-49	49L 18T	0	-32	32L 35T				+7	-16	16L 42T	+16	-16	16L 51T	+27	+4	4T 62T		
280	315	-35	-17	-49	49L 18T	0	-32	32L 35T				+7	-16	16L 42T	+16	-16	16L 51T	+27	+4	4T 62T		

轴承与轴的配合

表6显示m5, m6, n6, p6, r6, r7等轴的公差和轴承内径的公差及它们之间的差值。
(L代表间隙, T代表过盈)

Bearing and Shaft Fits

Table 6 shows the shaft tolerance of m5, m6, n6, p6, r6, r7 etc., and bearing inner bore tolerance as well as their differences. (L stands for clearance and T stands for interference)

表6 轴承与轴的配合 Table 6 Bearing & Shaft Fits

(μm)

轴承内径 Bearing Bore			m5			m6			n6			p6			r6			r7			
公称 Nominal	公差 Tol.0	轴直径 Shaft Dia.	轴直径 Shaft Dia.			配合 Fit	轴直径 Shaft Dia.			配合 Fit	轴直径 Shaft Dia.			配合 Fit	轴直径 Shaft Dia.			配合 Fit	轴直径 Shaft Dia.		
超过 Over	至 incl	至 To	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	
mm	mm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	
3	6	-8	+9	+4	4T 17T																
6	10	-8	+12	+6	6T 20T																
10	18	-8	+15	+17	7T 23T																
18	30	-10	+17	+8	8T 27T																
30	50	-12	+20	+9	9T 32T	+25	+9	9T 37T													
50	80	-15	+24	+11	11T 39T	+30	+11	11T 45T	+39	+20	20T 54T										
80	120	-20	+28	+13	13T 42T	+35	+13	13T 55T	+45	+23	23T 65T	+59	37	37T 79T							
120	180	-25	+33	+15	15T 58T	+40	+15	15T 65T	+52	+27	27T 77T	+68	43	43T 93T	90	65	65T 115T				
180	200	-30	+37	+17	17T 67T	+46	+17	17T 76T	+60	+31	31T 90T	+79	50	50T 109T	106	106	106T 136T				
200	225	-30	+37	+17	17T 67T	+46	+17	17T 76T	+60	+31	31T 90T	+79	50	50T 109T	109	109	109T 139T	126	80	80T 156T	
225	250	-30	+37	+17	17T 67T	+46	+17	17T 76T	+60	+31	31T 90T	+79	50	50T 109T	113	113	113T 143T	130	84	84T 160T	
250	280	-35	+43	+20	20T 78T	+52	+20	20T 87T	+66	+34	34T 101T	+88	56	56T 123T	126	126	126T 161T	146	94	94T 181T	
280	315	-35	+43	+20	20T 78T	+52	+20	20T 87T	+66	+34	34T 101T	+88	56	56T 123T	130	130	30T 165T	150	98	98T 185T	

表中公差与ISO标准一致。

The tolerance in above table is same as ISO standard.

轴承与外壳的配合

表7显示F7、G7、H8、H7、H6、J6、J7、K6、K7等外壳公差和轴承外径的公差及它们之间的差值。(L代表间隙, T代表过盈)

Bearing and Housing Fits

Table 7 shows the housing tolerance of F7, G7, H8, H7, H6, J6, J7, K6, K7 etc., and bearing O.D. tolerance as well as their differences. (L stands for clearance and T stands for interference)

表7 轴承与外壳的配合 Table 7 Bearing & Housing Fits

(μm)

轴承内径 Bearing Bore			F7			G7			H8			H7			H6			J6			J7			K6			K7		
公称 Nominal	公差 Tol.	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit	轴直径 Shaft Dia.	配合 Fit				
超过 Over	至 incl	To	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max	最小 min	最大 max			
mm	mm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm			
10	18	-8	+16	+34	16L 42L	+6	+24	6L 32L	0	+27	0L 35L	0	+18	0L 28L	0	+11	0L 19L	-5	+8	5T 19L	-8	+10	8T 18L	-9	+2	9T 10L	-12	+6	12T 14L
18	30	-9	+20	+41	20L 50L	+7	+28	7L 37L	0	+33	0L 42L	0	+21	0 30	0	+13	0L 22L	-5	+8	0T 22L	-9	+12	9T 21L	-11	+2	11T 11L	-15	+6	15T 15L
30	50	-11	+25	+50	26L 61L	+9	+34	9L 45L	0	+39	0L 50L	0	+25	36	0	+16	27L 0L	-6	+10	0T 32L	-11	+14	11T 25L	-13	+3	13T 14L	-18	+7	18T 18L
50	80	-13	+30	+60	30L 73L	+10	+40	10L 53L	0	+46	0L 59L	0	+30	0 43	0	+19	0L 32L	-6	+13	0T 31L	-12	+18	12T 31L	-15	+4	15T 17L	-21	+9	21T 22L
80	120	-15	+36	+71	36L 86L	+12	+47	12L 62L	0	+54	0L 69L	0	+35	50	0	+22	37L 0L	-6	+16	0T 37L	-13	+22	13T 37L	-18	+4	18T 19L	-25	+10	25T 25L
120	150	-18	+43	+83	43L 101L	+14	+54	14L 72L	0	+63	0L 81L	0	+40	58	0	+25	43L 0L	-7	+18	0T 43L	-14	+26	14T 44L	-21	+4	21T 22L	-28	+12	28T 30L
150	180	-25	+43	+83	43L 108L	+14	+54	14L 79L	0	+63	0L 88L	0	+40	65	0	+25	50L 0L	-7	+18	0T 50L	-14	+26	14T 51L	-21	+4	21T 29L	-28	+12	28T 37L
180	250	-30	+50	+96	50L 126L	+15	+61	15L 91L	0	+72	0L 102L	0	+46	76	0	+29	59T 0L	-7	+22	0T 59L	-16	+30	16T 60L	-24	+5	24T 35L	-33	+13	33T 43L
250	315	-35	+56	+108	56L 143L	+17	+69	17L 104L	0	+81	0L 118L	0	+52	87	0	+32	67L 0L	-7	+25	0T 67L	-16	+36	16T 71L	-27	+5	27T 40L	-36	+16	36T 51L
315	400	-40	+62	+119	62L 159L	+18	+75	18L 115L	0	+89	0L 129L	0	+57	97	0	+36	78L 0L	-7	+29	0T 76L	0	+39	18T 79L	-29	+7	29T 47L	-40	+17	40T 57L
400	500	-45	+68	+131	50L 178L	+20	+83	20L 128L	0	+97	0L 142L	0	+63	108	0	+40	85L 0L	-7	+33	0T 85L	20	+43	20T 88L	-32	+6	32T 53L	-45	+18	45T 63L

表中公差与ISO标准一致。

The tolerance in above table is same as ISO standard.

轴承与外壳的配合

表8显示M6、M7、N6、N7、P6、P7等外壳公差和轴承外径的公差及它们之间的差值。(L代表间隙, T代表过盈)

Bearing and Housing Fits

Table 8 shows the housing tolerance of M6、M7、N6、N7、P6、P7 etc., and bearing O.D. tolerance as well as their differences. (L stands for clearance and T stands for interference)

表8 轴承与外壳的配合 Table 8 Bearing & Housing Fits

(μm)

轴承内径 Bearing Bore		M6				M7				N6				N7				P6				P7			
公称 Nominal		公差 Tol.0		外壳直径 Housing Bore		配合 Fit		外壳直径 Housing Bore		配合 Fit		外壳直径 Housing Bore		配合 Fit		外壳直径 Housing Bore		配合 Fit		外壳直径 Housing Bore		配合 Fit			
超过 Over	至 Incl	至 To	最小 min	最大 max	Fit	最小 min	最大 max	Fit	最小 min	最大 max	Fit	最小 min	最大 max	Fit	最小 min	最大 max	Fit	最小 min	最大 max	Fit	最小 min	最大 max	Fit		
mm	mm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm	μm		
10	18	-8	-15	-4	15T 4L	-18	0	18T 8L	-20	-9	20T 1L	-23	-5	23T 7T	-26	-15	26T 7T	-29	-11	29T 3T					
18	30	-9	-17	-4	17T 5L	-21	0	21T 9L	-24	-11	24T 2L	-28	-7	28T 9T	-31	-18	31T 9T	-35	-14	35T 5T					
30	50	-11	-20	-4	20T 7L	-25	0	25T 11L	-28	-12	28T 1L	-33	-8	33T 10T	-37	-21	37T 10T	-42	-17	42T 6T					
50	80	-13	-24	-5	24T 8L	-30	0	30T 13L	-33	-14	33T 1L	-39	-9	39T 13T	-45	-26	45T 13T	-51	-21	51T 8T					
80	120	-15	-28	-6	28T 9L	-35	0	35T 15L	-38	-16	38T 1L	-45	-10	45T 15T	-52	-30	52T 15T	-59	-24	59T 9T					
120	150	-18	-33	-8	33T 10L	-40	0	40T 18L	-45	-20	45T 2L	-52	-12	52T 18T	-61	-36	61T 18T	-68	-28	68T 10T					
150	180	-25	-33	-8	33T 17L	-40	0	40T 25L	-45	-20	45T 5L	-52	-12	52T 11T	-61	-36	61T 11T	-68	-28	68T 3T					
180	250	-30	-37	-8	37T 22L	-46	0	46T 30L	-51	-22	51T 8L	-60	-14	60T 11T	-70	-41	70T 11T	-79	-33	79T 3T					
250	315	-35	-41	-9	41T 26L	-52	0	52T 35L	-57	-25	57T 10L	-66	-14	66T 12T	-79	-47	79T 12T	-88	-36	88T 1T					
315	400	-40	-46	-10	46T 30L	-57	0	57T 40L	-62	-26	62T 14L	-73	-16	73T 11T	-87	-51	87T 11T	-98	-41	98T 1T					
400	500	-45	-50	-10	50T 35L	-63	0	63T 45L	-67	-27	67T 18L	-80	-17	80T 10T	-95	-55	95T 10T	-108	-45	108T 0T					

表中公差与ISO标准一致。

The tolerance in above table is same as ISO standard.

润 滑

滚动轴承是一种重要的机械元件。一台机械设备的性能能否充分发挥出来要取决于轴承的润滑是否适当,可以说,润滑是保证轴承正常运转的必要条件,它对于提高轴承的承载能力和使用寿命起着重要作用。

润滑目的

轴承润滑的目的是使滚动体表面或滑动表面间形成一层薄薄的油膜,以防止金属直接接触。

润滑作用

减少金属间摩擦,减缓其磨损;
油膜的形成增大接触面积,减小接触应力;
确保滚动轴承能在高频接触应力下,长时间地正常运转,延长疲劳寿命;
消除摩擦热,降低轴承工作表面温度,防止烧伤;
起防尘、防锈、防蚀作用。

润滑方式

滚动轴承的润滑方式主要分为油润滑和脂润滑。

油润滑

油润滑适用于高速轴承并可耐一定程度的高温,而且还起到减小轴承振动和降低噪音的作用。

油润滑大体分为:

1) 油杯滴油润滑

油杯滴油润滑是通过油杯中的节流口向轴承滴油,达到对轴承的润滑。节流口根据用油量可以调节。

此种润滑方式的优点是:结构简单,使用方便;缺点是:粘度不易过高,否则滴油不畅,影响润滑效果。所以一般用于低速轻载的滚动轴承润滑。

2) 油浴润滑

油浴润滑也叫浸油润滑,就是把轴承部分浸入润滑油中,使轴承在运转中每个滚动体都能进入一次润滑油中,并把润滑油带到轴承的其他工作部位。考虑到搅拌损耗及温升,为减缓润滑油的老化速度,一般油浴润滑不易在高速轴承中采用。

3) 飞溅润滑

飞溅润滑是在闭式齿轮传动装置中滚动轴承常用的润滑方式。它是利用旋转部件

如齿轮、甩油盘等将润滑油溅起。散落到轴承上或沿箱壁流入预先设计好的油槽进入滚动轴承内，对滚动轴承进行润滑，经使用的润滑油又可汇集箱体内循环重复使用。由于滚动轴承在采用飞溅润滑时，不需要任何辅助设施，故常被结构简单及紧凑的齿轮传动装置所采用。但在采用飞溅润滑时应注意以下三点：

- a. 润滑油面不能太高，否则搅油损耗过大，及会将油池中的沉淀物如磨屑等带入轴承部位，从而引起磨粒磨损。
- b. 箱体内的润滑油应经常保持清洁，油池内可用磁性吸附器及时清除磨屑和异物，减少磨粒磨损的发生。
- c. 在结构设计时，可在箱壁上设置贮油槽及向轴承导通的节流口，以使轴承有类似处于油浴润滑或滴油润滑的状态，补充润滑，防止供油不足。

4) 油循环润滑

油循环润滑是一种对滚动轴承部位进行积极润滑的一种方式。它是利用油泵将润滑油从油箱中吸出，通过油管、油孔导入滚动轴承座中，再通过轴承座的回油口，将油返回油箱经冷却和过滤后再使用。因此，此种润滑方式能够在排除较多热量的同时有效地排出摩擦热，故适用于负荷量大、转速高的轴承支承。

5) 喷油润滑

喷油润滑是油循环润滑的一种。但是，为了能够使润滑油充分地进入高速轴承的内部相对运动表面，同时又要避免由于高速运转条件下循环给油量过大而产生温升过高及摩擦阻力过大，在轴承座进油口增设了喷嘴，并提高供油压力。依靠喷嘴把油喷射到轴承上，达到轴承的润滑和冷却。所以，喷油润滑是一种良好的润滑方式，主要用于高速运转的滚动轴承，可用于滚动轴承的 dn 值大于 $2 \times 10^6 \text{ r} \cdot \text{p} \cdot \text{m}$ 的场合。喷油润滑的油泵压力一般为 $3 \sim 5 \text{ bar}$ ，为了克服和避免高速状况下的附壁效应，还必须使喷嘴出口的喷油速度达到滚动轴承线速度的20%以上。

6) 油雾润滑

油雾润滑是一种微量润滑，是用很少量的润滑油来满足滚动轴承的润滑要求。油雾润滑是将润滑油在油雾发生器中变成油雾，通过油雾对轴承进行润滑。由于油雾在滚动轴承工作表面凝聚成油滴，实际上滚动轴承仍保持着稀油润滑状态。当轴承滚动体线速度很高时，常采用油雾润滑，以避免其他润滑方法由于供油过多，油的内摩擦增大而增高滚动轴承的工作温度。一般油雾压力约为 $0.05 \sim 0.1 \text{ bar}$ 。但是，使用这种润滑方式应注意以下两点：

- a. 油的粘度选择一般不应高于 $340 \text{ mm}^2/\text{s}$ (40°C)，因为过高粘度将达不到雾化效果。
 - b. 润滑过的油雾可能部分地随空气散逸污染环境。必要时可用油气分离器来收集油雾或者采用通风装置来排除废气。
- #### 7) 油气润滑

用活塞式定量分配器，每隔一定时间将微量油送到管内的压缩空气流中，在管壁上形成连续流动的油流提供给轴承。由于经常送进新的润滑油，因而油不会老化。压缩空气使得外部杂质不易侵入轴承内部。油的微量供给减少了对周围环境的污染，油气润滑比油雾润滑油量少且稳定、摩擦力矩小、温升高，特别适用于高速轴承。

脂润滑

脂润滑可以做到充填一次润滑脂后长时间不需补充，而且其密封装置的结构也较简单，因此使用广泛。

脂润滑有预先在密封型轴承中充填润滑脂的密封方式，以及在外壳内部充填适量润滑脂，每隔一段时间进行补充或更换的充填供脂方式。

此外，对有多处轴承需要润滑的机械，还采用管道连接至各润滑处的集中供脂方式。

脂润滑的应用是直接润滑脂涂抹到滚动轴承各个运动表面间，但是在给滚动轴承的滚道和滑动工作表面输入润滑脂时，必须遵循以下原则：

- 1) 润滑脂必须贯穿轴承的工作表面和轴承的内部空隙，这样才能使润滑脂充分起到润滑作用。
- 2) 在滚动轴承的工作表面应保留一定数量的润滑脂，并持续一定的时间，但又要防止因润滑脂过多流失。
- 3) 润滑脂的输入和排出的流向应和密封要求一致，这有利于入侵污物的排出。
- 4) 在保证良好的润滑的前提下，尽量减少润滑脂的用量。
- 5) 在润滑脂流向尽头开设出口孔，以便使新补充的润滑脂能挤走旧的润滑脂，确保良好的润滑。

润滑油的选择原则

从油润滑的滚动轴承失效实例可知，失效多数是由于润滑油粘度不足引起的。润滑油的粘度越低，则油膜的承载能力越差，油膜容易破裂，滚动轴承内部相对运动表面的金属材料会发生直接接触，导致摩擦增大、磨损加剧、滚动轴承的使用寿命明显缩短或发生轴承的烧伤、断裂事故。但是，润滑油的粘度过高，会使摩擦阻力加大，因搅拌润滑剂而产生的热量增多，系统的能耗增加。另一方面，对于高速、高负荷及高温等特殊条件下运转的滚动轴承，可能会有防锈、抗氧化、抗磨及提高润滑油的吸附能力的特殊要求。所以，润滑油的选择主要是润滑油的粘度等级的确定和所用添加剂种类或选择带有一定添加剂的不同润滑油品的确定。

润滑油的一般选择原则如下：

1) 工作温度

工作温度影响着润滑油的粘度变化和润滑效果。故当工作温度较低时，应选用粘度较低的润滑油；工作温度很高时，应选用高粘度或有适当添加剂的润滑油。环境温度

度不同,所选的润滑油的粘度也应随着变化。例如润滑同一轴承或处于冬季,应比南方或夏季选用粘度较低的润滑油。当工作温度经常变化时,还应选用粘温特性优良的润滑油,即所用的润滑油粘度随工作温度的上升或下降变化不大,以保证油膜厚度稳定在一定范围。

2) 运动速度

转速越高,越应选用粘度低的润滑油,以避免运动阻力增大,产生热量过多;反之,在低速情况下,则应采用粘度较高的润滑油,以利提高承载能力。

3) 运动性质

运动中有冲击、振动、经常变载、变速,起动、停车、反转频繁、以及做往复或间歇运动时,都不利于油膜的形成,故应选用粘度较高的润滑油。有时宁可采用润滑脂,甚至固体润滑剂,以保证可靠的润滑。

4) 工作载荷

滚动轴承承受的载荷越大,润滑油粘度也应选得越高,并应具有较好的油性和极压性,以免润滑油从摩擦中挤出,或产生金属间的直接接触。

5) 结构特点

滚动轴承的径向间隙越小,摩擦面的加工精度愈高,润滑油的粘度应愈低。

6) 环境条件

当轴承在潮湿、有腐蚀性气体、低温、尘埃、强辐射条件下工作时,润滑油易被污染变质,此时应选用抗水、抗磨、抗蚀、耐寒、抗辐射性强的润滑油。在有流水溅污、乳化液喷射、潮湿空气或灰尘屑沫严重处,一般不宜选用润滑油,而选用润滑脂。

7) 轴承精度

轴承运动摩擦表面粗糙时,一般适用粘度大的油品,以便承受由于接触不良而形成局部较大的压力,而运动摩擦表面精度高时,应选用低粘度的润滑油,以减小不必要的能耗损失和温升。

8) 轴承硬度

轴承运动摩擦表面硬度低时,应选用粘度高的润滑油,而且油量要充足;反之,润滑油的粘度可降低。

润滑油的选择原则

润滑脂是由基油、稠化剂和添加剂所组成的半固体状的润滑剂。其中基油约占70~95%,稠化剂占30~50%,添加剂仅占微量。

润滑脂的选择原则和润滑油选择原则类同。主要根据滚动轴承的类型和工作条件,诸如环境潮度、工作温度、速度参数 dmN 值及负荷大小和脂润滑方法来选择润滑脂的种类、基油粘度及锥入度等。同时,还应注意以下几点:

- a. 所选润滑脂的滴点必须高过工作温度 $20\sim 30^{\circ}C$,以保证润滑效果。

b. 由于润滑脂的流动性差、摩擦阻力大、机械效率较低导热系数也较小,故不宜作循环润滑剂。用于干油集中润滑时,脂的锥入度一般应在300(1/10mm)以上。

c. 因润滑脂对一般温度影响不敏感,对载荷性质、运动速度的变化等有较大的适应性,故宜用于温度、速度变化较大或有反转、间歇运动的机械,以及农业、建筑、矿山等机械中。

d. 因润滑脂不易流失或被挤出,又不需经常更换,故所需密封简单,且其本身也有一定的密封作用,特别适用于不易经常加油、不易安装复杂密封、不许润滑剂污染的产品,以及灰尘屑沫很多的地方。

常用润滑脂一般特性

润滑脂按稠化剂的不同可分为钙基、钠基、钙钠基、锂基、铝基、钡基等多种。同是一个种类的润滑脂,也会因牌号的不同而特性相差很大。

所以在选用时应特别注意:

1) 钙基润滑脂:其特点是不溶于水、滴点低,适用于温度较低、环境潮湿的轴承部件中;

2) 钠基润滑脂:其特点是耐高温、易溶于水,适用于温度较高、环境干燥的轴承部件中;

3) 锂基润滑脂:其特点是有较高的抗水性、滴点较高,可用于潮湿与水接触的机械部位;

4) 铝基润滑脂:其特点是耐高温,可用于与水接触的部位,适用于集中润滑系统和航运机械部位的润滑及防蚀;

5) 钡基润滑脂:其特点是有良好的抗水性、滴点较高,不溶于汽油和醇等有机溶剂,适用于油泵、水泵等摩擦部位润滑。

轴承的使用

使用注意事项

与一般的机械零件相比，滚动轴承的精度较高，因此使用时也相应地应小心谨慎。

- 1) 保持轴承及其周边的清洁
- 2) 使用时仔细认真

若使用时粗心大意给轴承以强烈冲击，会使轴承出现裂痕，压痕，断裂等损伤。

- 3) 使用合适的工具
- 4) 注意轴承的防锈

避免在潮湿的场所使用，而且为不使汗水沾上，应戴手套。

- 5) 使用者应熟悉轴承
- 6) 制定轴承使用的作业规范

- ◆轴承的保管
- ◆轴承及其周边的清洗
- ◆安装部位的尺寸与加工质量的检验
- ◆安装作业
- ◆拆卸作业
- ◆维护保养(定期检查)
- ◆润滑剂的补充

轴承的保管

轴承在出厂时均涂有适量的防锈油并用防锈纸包装，只要该包装不被破坏，轴承的质量将得到保证。

但长期存放时，拟在湿度低于65%、温度为20℃左右的条件下，存放在高于地面30cm的架子上为宜。另外，保管场所应避免直射阳光或寒冷的墙壁接触。

带密封圈或防尘盖的轴承经过长期存放后，轴承内润滑脂的特性会受到影响。在原包装中取出后的轴承，应妥善保护以防止受到腐蚀和污染。

大型滚动轴承以水平的位置摆放，轴承套圈的整个侧面都应受到支撑。如果轴承以垂直的位置摆放，轴承套圈的厚度相对较小，轴承套圈和滚动体的重量可能会导致轴承的永久变形。

轴承的安装

1 轴承安装前的准备工作

1.1 轴承安装的环境

安装轴承应尽量在干燥、无尘的室内进行，并应远离金属加工或其它会产生金属碎屑和灰尘的设备。当必须在无保护的环境下安装轴承时（较大型轴承经常会碰到的情况），必须采取适当的措施保护轴承和相关部件免受灰尘或湿气等的污染，直至安装完成为止。

1.2 轴承的准备

由于轴承经过防锈处理并加以包装，因此不到安装前不要打开包装。另外，轴承上涂布的防锈油具有良好的润滑性能，对于一般用途的轴承或充填润滑脂的轴承，可不必清洗直接使用。但对于仪表用轴承或用于高速旋转的轴承，应用清洁的清洗油将防锈油洗去。这时轴承容易生锈，不可长时间放置。

1.3 安装工具的准备

安装时所用的工具应以木制或轻金属制品为主，避免使用其它易产生碎屑的东西，应保持工具的清洁。

1.4 轴与外壳的检验

清洗轴与外壳，确认无伤痕或机械加工留下的毛刺，如有应用油石、细砂纸除去。外壳内绝对不得有研磨剂型砂、切屑等。

其次检验轴与外壳的尺寸、形状和加工质量是否与图纸符合。

如图1和图2所示，分几处测量轴径与外壳孔径。还要认真检验轴承与外壳的圆角尺寸及挡肩的垂直度。为了使轴承更加容易装配、减少冲撞，安装轴承前，在检验合格的轴与外壳的各配合面应涂布机械油。

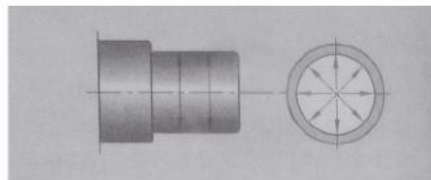


图1 轴径的测量位置

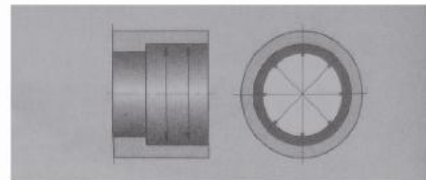
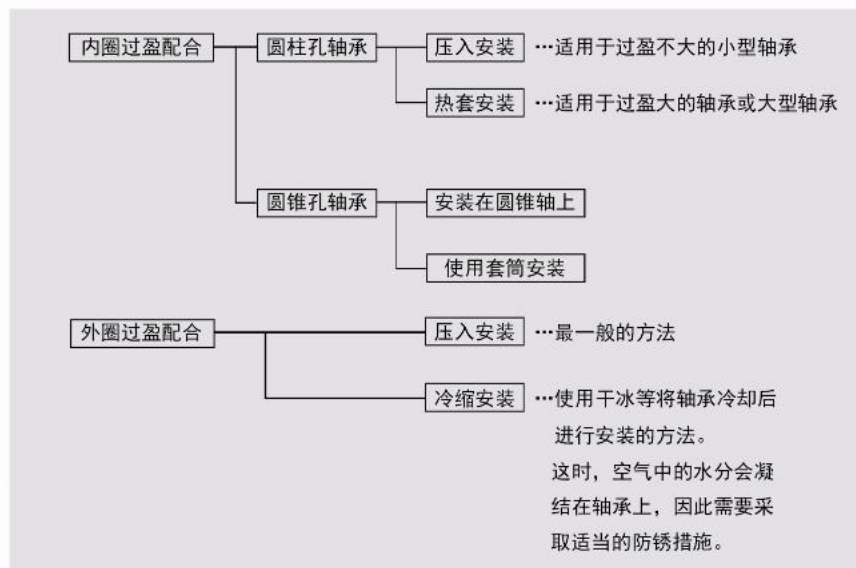


图2 外壳孔径的测量位置

2 轴承的安装方法分类

轴承的安装方法因轴承类型及配合条件而有所不同。由于一般多为轴旋转，因此内圈与外圈可分别采用过盈配合与间隙配合，而外圈旋转时，则外圈采用过盈配合。采用过盈配合时轴承安装方法主要可分为以下几种（详细如下表所示）：

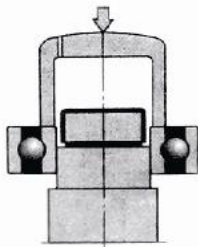


3 圆柱孔轴承的安装

3.1 压入安装

压入安装一般利用压力机，也可利用螺栓与螺母等。

当轴承为内圈过盈配合，安装在轴上时，需在轴承内圈施加压力；当轴承为外圈过盈配合安装在外壳上时，需在轴承外圈施加压力；当轴承内、外圈均为过盈配合时，应当使用垫板，务必使压力能同时施加在轴承的内、外圈上。



3.2 热套安装

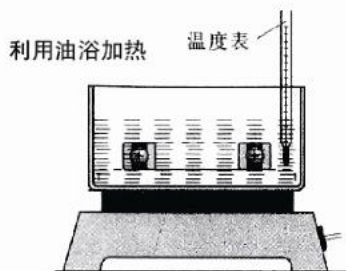
将轴承加热，使其膨胀后再安装在轴上的热套方法可以使轴承避免受不必要的外力，在短时间内完成安装作业。加热的方法主要有油浴加热和电感应加热两种。

油浴加热注意事项

- 1) 一般加热不要超过100℃；
- 2) 不允许轴承接触油槽底部。

电感应加热的优点：

- 1) 清洁无污染；
- 2) 定时、定温；
- 3) 操作简单。



轴承加热到期望的温度（100℃以下）后。将轴承取出，迅速套进轴上，轴承会随着冷却而收缩，有时轴肩与轴承端面之间会产生间隙，因此，需使用工具将轴承往轴肩方向压紧。

带防尘盖或密封圈的轴承，由于预先填充的润滑脂或密封圈材料对温度有一定的限制，加热的温度不可超过80℃，并且不能采用油浴加热的方式。加热轴承时应确保轴承受热均匀，不会产生局部过热的情况。

4 圆锥孔轴承的安装

内孔为圆锥孔的轴承，其内圈大部分是以过盈配合的方式来安装的。

圆锥孔轴承可以直接安装到圆锥形轴上或通过紧定套、退卸套安装在圆柱轴上。

通过测量轴承的游隙减小量或内圈在圆锥形轴颈上的轴向位移量来确定过盈的程度。在某些情况下，也可以用测量锁紧螺母的锁紧角度或测量内圈膨胀量的方式来确定过盈量。

对于圆锥孔轴承，随着内圈在锥轴、紧定套或退卸套上轴向压入的同时，过盈量增大，径向游隙减少，通过测量径向游隙的减少量便可推断过盈量。

4.1 测量游隙减少量

使用塞尺测量安装前后的径向游隙仅适用于中型到特大型的轴承。测量的游隙必须是在没有承受负荷的滚子和外圈滚道之间的位置，在测量前，将外圈转动数圈，并必须确定内、外圈和滚子组的中心线彼此重叠。在第一次测量中，应选择比游隙最低值略薄的塞尺片，然后选用一个稍厚的塞尺片来反复测量，直至塞尺在以下情况移动时感觉到一定阻力。

安装前——在外圈与最高的滚子之间；

安装后——根据不同的保持架，在内圈或外圈与最低的滚子之间。

5 外圈的安装

用过盈配合将外圈安装到轴承箱上时，对于小型轴承，可在常温下将外圈压入。过盈量大时，则采用加热轴承箱或冷却外圈的方式压入。在用于干冰或其它冷却剂时空气中的湿气会凝聚在轴承上，必须采用相应的防锈措施。

轴承的拆卸

定期检查或更换零件需要拆卸轴承，通常轴和轴承箱几乎都要继续使用，轴承也往往要继续使用。因此，在机械的结构设计时就应考虑到拆卸轴承时，不至损坏轴承、轴、轴承箱及其他零部件，同时还要准备适当的拆卸工具。拆卸过盈配合的套圈时，只能将拉力加在该套圈上，不得通过滚动体拉拔套圈。

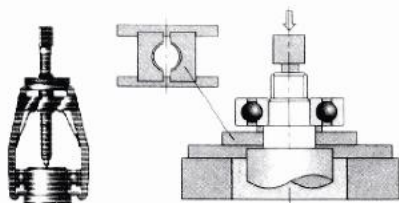
轴承的拆卸工具

最合适的拆卸轴承的工具是压力机，另外还有一些简单手动的轴承拆卸工具，

使用起来也非常方便。

圆柱孔轴承的拆卸方法

对非分离型轴承，首先从较松配合面（一般是外圈与壳体孔径的配合面）将轴承拆出，然后使用压力机将轴承从紧配合表面压出。



若轴承拆下后还将再次使用。则绝不允许通过滚动体传递拆卸力，否则滚动体和套圈滚道都会被压伤。

圆锥孔轴承的拆卸

安装在圆锥形轴颈上的中小型轴承，只需普通的拉拔器拉拔内圈，便可以轻易将其卸下。使用一些有自动对中设计的拉拔器，可以避免在拉出轴承时把轴颈的表面弄坏。在圆锥形轴颈卸下来的轴承会松脱得很快，因此应加上一些装置以防止轴承从轴上掉下来。

配用紧定套安装在圆柱型光轴上的中小型轴承，可以先将紧定套的螺母松开数圈，然后使用锤子通过冲头敲击轴承的侧面来进行拆卸。

配用紧定套在阶梯轴上靠着一个支承环的中小型轴承，可以使用锤子通过一个特制的套筒来敲击紧定套的小端面来进行拆卸，但同样需要先把螺母松开数圈。

利用液压螺母拆卸在紧定套上的大型轴承，是一种简单和实用的方法，但必须是轴承靠在一个支承环的情况下才可以采用。注油法是更简单的方法，但必须使用带有油道和油槽的紧定套。

拆卸拆卸套上的轴承时，必须先拆除一些轴向锁定装置，如锁紧螺母或端盖等。对于中小型的轴承，可以利用锁紧螺母、钩形扳手或冲击扳手来进行拆卸。

轴承的维护保养

使轴承充分发挥并长期保持其应有的性能，必须切实地做好定期维护保养（定期检查）。

通过适当的定期检查，做到早期发现故障，防范事故于未然，对提高生产率和经济性十分重要。

轴承清洗

将轴承拆下检查时，先用摄影等方法做好外观记录。

另外，要确认剩余润滑剂的量并对润滑剂采样，然后再清洗轴承。

◆粗洗时，在油中用刷子等清除润滑脂或粘着物。此时若在油中转动轴承，注意会因异物等损伤滚动面。

◆精洗时，在油中慢慢转动轴承，须仔细地进行。

通常使用的清洗剂为不含水柴油或煤油，根据需要有时也使用温性碱液等。不论使用哪种清洗剂，都要经常过滤保持清洁。

清洗后，立即在轴承上涂布防锈油或防锈脂。

轴承的检查与判断

为了判断拆下的轴承能否重新使用，要着重检查其尺寸精度、旋转精度、内部游隙以及配合面、滚道面、保持架和密封圈等，关于检查结果，可由专业人员进行判断。

判断的标准根据机械性能和重要度以及检查周期等有所不同。如有以下损伤，轴承不得重新使用，必须更换：

轴承零部件的断裂和缺陷；
滚道面或滚动面的剥离。

LUBRICATION

Purposes of Lubrication

The main purposes of lubrication are to reduce friction and wear inside the bearings that may cause premature failure. The effects of lubrication may be briefly explained as follows:

(1) Reduction of Friction and Wear

Direct metallic contact between the bearing rings, rolling elements and cage, which are the basic components of a bearing, is prevented by an oil film which reduces the friction and wear in the contact areas.

(2) Extension of Fatigue Life

The rolling fatigue life of bearings depends greatly upon the viscosity and film thickness between the rolling contact surfaces. A heavy film thickness prolongs the fatigue life, but it is shortened if the viscosity of the oil is too low so the film thickness is insufficient.

(3) Dissipation of Frictional Heat and Cooling

Circulation lubrication may be used to carry away frictional heat or heat transferred from the outside to prevent the bearing from overheating and the oil from deteriorating.

(4) Others

Adequate lubrication also helps to prevent foreign material from entering the bearings and guards against corrosion or rusting.

Lubricating Methods

The various lubricating methods are first divided into either grease or oil lubrications. Satisfactory bearing performance can be achieved by adopting the lubricating method which is most suitable for the particular application and operating condition. In general, oil offers superior lubrication, however, grease lubrication allows a simpler structure around the bearings. A comparison of grease and oil lubrication is given in Table 9.

Grease Lubrication

(1) Grease Quantity

The quantity of grease to be packed in a housing depends on the housing design and free space, grease characteristics, and ambient temperature. For example, the bearings for the main shafts of machine tools, where the accuracy may be impaired

by a small temperature rise, require only a small amount of grease. The quantity of grease for ordinary bearings is determined as follows.

Sufficient grease must be packed inside the bearing including the cage guide face.

The available space inside the housing to be packed with grease depends on the speed as follows:

Table 9 Comparison of Grease and Oil Lubrication

Item	Grease Lubrication	Oil Lubrication
Housing Structure and Sealing Method	Simple	May be complex, Careful maintenance required.
Speed	Limiting speed is 65 to 80% of that with oil lubrication	Higher limiting speed.
Cooling Effect	Poor	Heat transfer is possible using forced oil circulation.
Fluidity	Poor	Good
Full Lubricant Replacement	Sometimes difficult	Easy
Removal of Foreign Matter	Removal of particles from grease is impossible.	Easy
External Contamination due to Leakage	Surroundings seldom contaminated by leakage.	Often leaks without proper countermeasures. Not suitable if external contamination must be avoided.

1/2 to 2/3 of the space...When the speed is less than 50% of the limiting speed.

1/3 to 1/2 of the space...When the speed is more than 50% of the limiting speed.

(2) Replacement of Grease

Grease, once packed, usually need not be replenished for a long time; however, for severe operating conditions, grease should be frequently replenished or replaced. In such cases, the bearing housing should be designed to facilitate grease replenishment and replacement.

When replenishment intervals are short, provide replenishment and discharge ports at appropriate positions so deteriorated grease is replaced by fresh grease. For example, the housing space on the grease supply side can be divided into several sections with partitions. The grease on the partitioned side gradually passes through the bearings and old grease forced from the bearing is discharged through a grease valve.

Oil Lubrication**(1) Oil Bath Lubrication**

Oil bath lubrication is widely used with low or medium speeds. The oil level should be at the center of the lowest rolling element. It is desirable to provide a sight gauge so the proper oil level may be maintained.

(2) Drip-Feed Lubrication

Drip feed lubrication is widely used for small ball bearings operated at relatively high speeds.

(3) Splash Lubrication

With this lubricating method, oil is splashed onto the bearings by gears or a simple rotating disc installed near bearings without submerging the bearings in oil. It is commonly used in automobile transmissions and final drive gears.

(4) Circulating Lubrication

Circulating lubrication is commonly used for high speed operation requiring bearing cooling and for bearings used at high temperatures.

(5) Jet Lubrication

Jet lubrication is often used for ultra-high speed bearings, such as the bearings in jet engines with a dm_n valve (dm: pitch diameter of rolling element set in mm; n: rotational speed in min⁻¹) exceeding one million. Lubricating oil is sprayed under pressure from one or more nozzles directly into the bearing.

(6) Oil Mist Lubrication

Oil mist lubrication, also called oil fog lubrication, utilizes an oil mist sprayed into a bearing. This method has the following advantages:

- (a) Because of the small quantity of oil required, the oil agitation resistance is small, and higher speeds are possible.
- (b) Contamination of the vicinity around the bearing is slight because the oil leakage is small.
- (c) It is relatively easy to continuously supply fresh oil; therefore, the bearing life is extended.

(7) Oil/Air Lubricating Method

Using the oil/air lubricating method, a very small amount of oil is discharged intermittently by a constant-quantity piston into a pipe carrying a constant flow of compressed air. The oil flows along the wall of the pipe and approaches a constant flow rate.

The major advantages of oil/air lubrication are:

- (a) Since the minimum necessary amount of oil is supplied, this method is suitable for high speeds because less heat is generated.
- (b) Since the minimum amount of oil is fed continuously, bearing temperature remains stable. Also, because of the small amount of oil, there is almost no atmospheric pollution.
- (c) Since only fresh oil is fed to the bearings, oil deterioration need not be considered.
- (d) Since compressed air is always fed to the bearings, the internal pressure is high, so dust, cutting fluid, etc. cannot enter.

For these reasons, this method is used in the main spindles of machine tools and other high speed applications.

BEARING HANDLING

Precautions for Proper Handling of Bearings

Since rolling bearings are high precision machine parts, they must be handled accordingly. Even if high quality bearings are used, their expected performance cannot be achieved if they are not handled properly.

The main precautions to be observed are as follows:

(1) Keep bearings and surrounding area clean

Dust and dirt, even if invisible to the naked eye, have harmful effects on bearings. It is necessary to prevent the entry of dust and dirt by keeping the bearings and their environment as clean as possible.

(2) Careful handling

Heavy shocks during handling may cause bearings to be scratched or otherwise damaged possibly resulting in their failure. Excessively strong impacts may cause brinelling, breaking, or cracking.

(3) Use proper tools

Always use the proper equipment when handling bearings and avoid general purpose tools.

(4) Prevent corrosion

Since perspiration on the hands and various other contaminants may cause corrosion, keep the hands clean when handling bearings. Wear gloves if possible. Pay attention to rust of bearing caused by corrosive gasses.

Mounting

The method of mounting rolling bearings strongly affects their accuracy, life, and performance, so their mounting deserves careful attention. Their characteristics should first be thoroughly studied, and then they should be mounted in the proper manner. It is recommended that the handling procedures for bearings be fully investigated by the design engineers and that standards be established with respect to the following items:

(1) Cleaning the bearings and related parts.

(2) Checking the dimensions and finish of related parts.

(3) Mounting

(4) Inspection after mounting.

(5) Supply of lubricants.

Bearings should not be unpacked until immediately before mounting. When using ordinary grease lubrication, the grease should be packed in the bearings without first cleaning them. Even in the case of ordinary oil lubrication, cleaning the bearings is not required. However, bearings for instruments or for high speed operation must first be cleaned with clean filtered oil in order to remove the anti-corrosion agent. After the bearings are cleaned with filtered oil, they should be protected to prevent corrosion.

Pre-lubricated bearings must be used without cleaning.

Bearing mounting methods depend on the bearing type and type of fit. As bearings are usually used on rotating shafts, the inner rings require a tight fit.

Bearings with cylindrical bores are usually mounted by pressing them on the shafts (press fit) or heating them to expand their diameter (shrink fit). Bearings with tapered bores can be mounted directly on tapered shafts or cylindrical shafts using tapered sleeves.

Bearings are usually mounted in housings with a loose fit. However, in cases where the outer ring has an interference fit, a press may be used. Bearings can be interference-fitted by cooling them before mounting using dry ice. In this case, a rust preventive treatment must be applied to the bearing because moisture in the air condenses on its surface.

Mounting of Bearings with Cylindrical Bores

(1) Press fits

Fitting with a press is widely used for small bearings. A mounting tool is placed on the inner ring as shown in Fig. 14.1 and the bearing is slowly pressed on the shaft with a press until the side of the inner ring rests against the shoulder of the shaft. The mounting tool must not be placed on the outer ring for press mounting, since the bearing may be damaged. Before mounting, applying oil to the fitted shaft surface is recommended for smooth insertion. The mounting method using a hammer should only be used for small ball bearings with minimally tight fits and when a press is not available. In the case of tight interference fits or for medium and large bearings, this method should not be used. Any time a hammer is used, a mounting tool must be placed on the inner ring.

When both the inner and outer rings of non-separable bearings, such as deep groove ball bearings, require tight-fit, a mounting tool is placed on both rings as shown in Fig. 14.2, and both rings are fitted at the same time using a screw or hydraulic press. Since the outer ring of self-aligning ball bearings may deflect a mounting tool such as

that shown in Fla. 14.2 should always be used for mounting them.

In the case of separable bearings, such as cylindrical roller bearings and tapered roller bearings, the inner and outer rings may be mounted separately. Assembly of the inner and outer rings, which were previously mounted separately, should be done carefully to align the inner and outer rings correctly. Careless or forced assembly may cause scratches on the rolling contact surfaces.

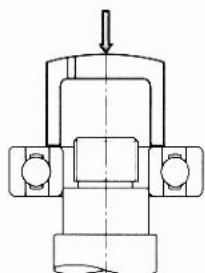


Fig.14.1 Press Fitting Inner Ring

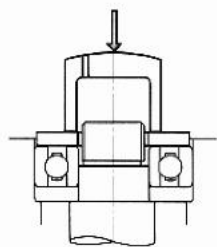


Fig.14.2 Simultaneous Press Fitting of Inner and Outer Rings

(2) Shrink fits

Since press fitting large bearings requires a large force, a shrink is widely used. The bearings are first heated in oil to expand them before mounting.

This method prevents an excessive force from being imposed on the bearings and allows mounting them in a short time.

Fig. 14.3.

The precautions to follow when making shrink fits are as follows:

- (a) Do not heat bearings to more than 100 °C .
- (b) Put the bearings on a wire net or suspend them in an oil tank in order to prevent them from touching the tank's bottom directly.
- (c) Heat the bearings to a temperature 20 to 30 °C higher than the lowest temperature required for mounting without interference since the inner ring will cool a little during mounting.
- (d) After mounting, the bearings will shrink in the axial direction as well as the radial direction while cooling. Therefore, press the bearing firmly against the shaft shoulder using locating methods to avoid clearance between the bearing and shoulder.

Mounting of Bearings with Tapered Bores

Bearings with tapered bores are mounted on tapered shafts directly or on cylindrical shafts with adapters or withdrawal sleeves (Figs. 14.4 and 14.5). Large spherical roller bearings are often mounted using hydraulic pressure. Fig. 14.6 shows a bearing mounting utilizing a sleeve and hydraulic nut. Fig. 14.7 shows another mounting method. Holes are drilled in the sleeves which are used to feed oil under pressure to the bearing seat. As the bearing expands radially, the sleeve is inserted axially with adjusting bolts.

Spherical roller bearings should be mounted while checking their radial-clearance reduction and referring to the push-in amounts listed in Table 4. The radial clearance must be measured using clearance gauges.

In this measurement, as shown in Fig. 14.8, the clearance for both rows of rollers must be measured simultaneously, and these two values should be kept roughly the same by adjusting the relative position of the outer and inner rings.

When a large bearing is mounted on a shaft, the outer ring may be deformed into an oval shape by its own weight. If the clearance is measured at the lowest part of the deformed bearing, the measured value may be bigger than the true value. If an incorrect radial internal clearance is obtained in this manner and the values in Table 4 are used, then the interference fit may become too tight and the true residual clearance may become too small. In this case, as shown in Fig. 14.9, one half of the total clearance at points a and b (which are on a horizontal line passing through the bearing center) and c (which is at the lowest position of the bearing) may be used as the residual clearance.

When a self-aligning ball bearing is mounted on a shaft with an adapter, be sure that the residual clearance does not become too small. Sufficient clearance for easy alignment of the outer ring must be allowed.

Operation Inspection

After the mounting has been completed, a running test should be conducted to determine if the bearing has been mounted correctly. Small machines may be manually operated to assure that they rotate smoothly.

Items to be checked include sticking due to foreign matter or visible flaws, uneven torque caused by improper mounting or an improper mounting surface, and excessive torque caused by an inadequate clearance, mounting error, or seal friction. If there are no abnormalities, powered operation may be started.



Fig. 14.4 Mounting with Adapter



Fig. 14.5 Mounting with Withdrawal Sleeve

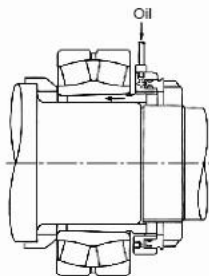


Fig. 14.6 Mounting with Hydraulic Nut

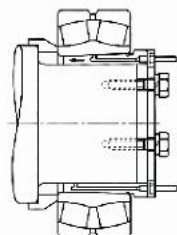


Fig. 14.7 Mounting with Special Sleeve and Hydraulic Pressure



Fig. 14.8 Clearance Measurement of Spherical Roller Bearing

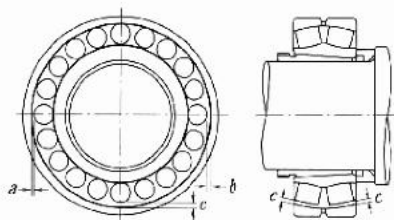


Fig. 14.9 Measuring Clearance in Large Spherical Roller Bearing

Large machines, which cannot be turned by hand, can be started after examination with no load, and the power immediately cutoff and the machine allowed to coast to a stop. Confirm that there is no abnormality such as vibration, noise, contact of rotating parts, etc.

Powered operation should be started slowly without load and the operation should be observed carefully until it is determined that no abnormalities exist, then gradually increase the speed, load, etc. to their normal levels. Items to be checked during the test operation include the existence of abnormal noise, excessive rise of bearing temperature, leakage and contamination of lubricants, etc. If any abnormality is found during the test operation, it must be stopped immediately and the machine should be inspected. If necessary, the bearing should be dismounted for examination.

Although the bearing temperature can generally be estimated by the temperature of the outside surface of the housing, it is more desirable to directly measure the temperature of the outer ring using oil holes for access.

The bearing temperature should rise gradually to the steady state level within one to two hours after the operation starts. If the bearing or its mounting is improper, the bearing temperature may increase rapidly and become abnormally high. The cause of this abnormal temperature may be an excessive amount of lubricant, insufficient bearing clearance, incorrect mounting, or excessive friction of the seals.

In the case of high speed operation, an incorrect selection of bearing type or lubricating method may also cause an abnormal temperature rise.

The sound of a bearing may be checked with a noise locator or other instruments. Abnormal conditions are indicated by a loud metallic sound, or other irregular noise, and the possible cause may include incorrect lubrication, poor alignment of the shaft and housing, or the entry of foreign matter into the bearing. The possible causes and measures for irregularities are listed in Table 10.

Table 10 Causes of and measures for Operating Irregularities

Irregularities		Possible Causes	Measures
Noise	Loud Metallic Sound (1)	Abnormal Load	Improve the fit, internal clearance, preload, position of housing shoulder etc.
		Incorrect mounting	Improve the machining accuracy and alignment of shaft and housing, accuracy of mounting method.
		Insufficient or improper Lubricant	Replenish the lubricant or select another lubricant.
Noise	Loud Regular Sound	Contact of rotating parts	Modify the labyrinth seal etc.
		Flaws, corrosion, or scratches on raceways	Replace or clean the bearing, improve the seals, and use clean lubricant.
		Brinelling	Replace the bearing and use care when handling bearings.
Noise	Irregular Sound	Flaking on raceway	Replace the bearing
		Excessive clearance	Improve the fit, clearance and preload.
		Penetration of foreign particles	Replace or clean the bearing, improve the seals, and use clean lubricant.
Abnormal Temperature Rise	Abnormal Temperature Rise	Flaws or flaking on balls	Replace the bearing.
		Excessive amount of lubricant	Reduce amount of lubricant, select stiffer grease.
		Insufficient or improper lubricant	Replenish lubricant or select a better one.
Vibration (Axial runout)	Vibration (Axial runout)	Abnormal load	Improve the fit, internal clearance, preload, position of housing shoulder.
		Incorrect mounting	Improve the machining accuracy and alignment of shaft and housing, accuracy of mounting, or mounting method.
		Creep on fitted surface, excessive seal friction	Correct the seals, replace the bearing, correct the fitting or mounting.
Leakage or Discoloration of Lubricant	Leakage or Discoloration of Lubricant	Brinelling	Replace the bearing and use care when handling bearings.
		Flaking	Replace the bearing.
		Incorrect mounting	Correct the squareness between the shaft and housing shoulder or side of spacer.
Leakage or Discoloration of Lubricant	Leakage or Discoloration of Lubricant	Penetration of foreign particles	Replace or clean the bearing, improve the seals.
		Too much lubricant, Penetration by foreign matter or abrasion chips	Reduce the amount of lubricant, select a stiffer grease. Replace the bearing or lubricant. Clean the housing and adjacent parts.

Note (1) Intermittent squeal or high-pitch noise may be heard in medium-to large-sized cylindrical roller bearings or ball bearings that are operating under grease lubrication in low-temperature environments. Under such low-temperature conditions, bearing temperature will not rise resulting in fatigue nor is grease performance affected. Although intermittent squeal or high-pitch noise may occur under these conditions, the bearing is fully functional and can continue to be used. In the event that greater noise reduction or quieter running properties are needed, please contact your nearest WGB branch office.

Dismounting

A bearing may be removed for periodic inspection or for other reasons. If the removed bearing is to be used again or it is removed only for inspection, it should be dismantled as carefully as when it was mounted. If the bearing has a tight fit, its removal may be difficult. The means for removal should be considered in the original design of the adjacent parts of the machine. When dismantling, the procedure and sequence of removal should first be studied using the machine drawing and considering the type of mounting fit in order to perform the operation properly.

Dismounting of Outer Rings

In order to remove an outer ring that is tightly fitted, first place bolts in the push-out holes in the housing at several locations on its circumference as shown in Fig. 14.10, and remove the outer ring by uniformly tightening the bolts. These bolt holes should always be fitted with blank plugs when not being used for dismantling. In the case of separable bearings, such as tapered roller bearings, some notches should be made at several positions in the housing shoulder, as shown in Fig. 14.11, so the outer ring may be pressed out using a dismantling tool or by tapping it.

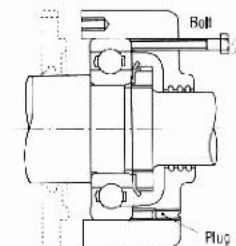


Fig. 14.10 Removal of Outer Ring with Dismounting Bolts

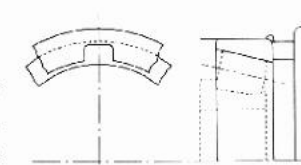


Fig. 14.11 Removal Notches

Dismounting of Bearings with Cylindrical Bores

If the mounting design allows space to press out the inner ring, this is an easy and fast method. In this case, the withdrawal force should be imposed only on the inner ring (Fig. 14.12). Withdrawal tools like those shown in Figs. 14.13 and 14.14 are often used.

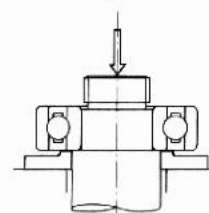


Fig. 14.12 Removal of Inner Ring Using a Press

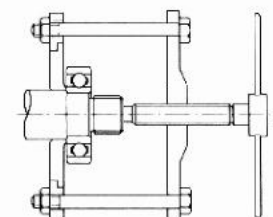


Fig. 14.13 Removal of Inner Ring Using Withdrawal Tool(1)

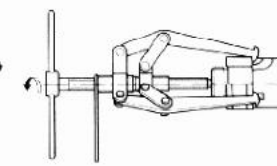


Fig. 14.14 Removal of Inner Ring Using Withdrawal Tool(2)

In both cases, the claws of the tools must substantially engage the face of the inner ring: therefore, it is advisable to consider the size of the shaft shoulder or to cut grooves in the shoulder to accommodate the withdrawal tools (Fig.14.14).

The oil injection method is usually used for the withdrawal of large bearings. The withdrawal is achieved easily by mean of oil pressure applied through holes in the shaft. In the case of extra wide bearings, the oil injection method is used together with a withdrawal tool.

Induction heating is used to remove the inner rings of NU and NJ types of cylindrical roller bearings. The inner rings are expanded by brief local heating, and then withdrawn (Fig. 14.15). Induction heating is also used to mount several bearings of these types on a shaft.

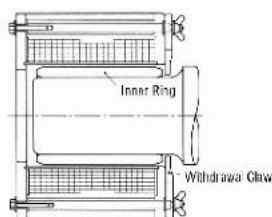


Fig. 14.15 Removal of Inner Ring Using Induction Heater

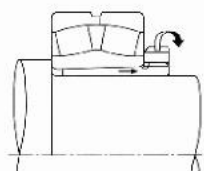


Fig. 14.16 Removal of Withdrawal Sleeve Using Withdrawal Nut (1)

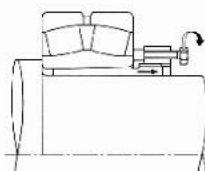


Fig. 14.17 Removal of Withdrawal Sleeve Using Withdrawal Nut (2)

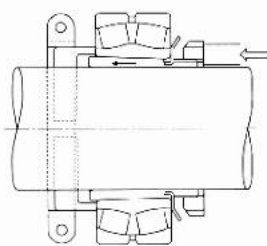


Fig. 14.18 Removal of Adapter with Stop and Axial Pressure

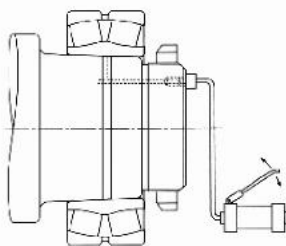


Fig. 14.19 Removal Using Oil Injection Hydraulic Pump

Dismounting of Bearings with Tapered Bores

When dismounting relatively small bearings with adapters, the inner ring is held by a stop fastened to the shaft and the nut is loosened several turns. This is followed by hammering on the sleeve using a suitable tool as shown in Fig. 14.18. Fig. 14.16 shows one procedure for dismounting a withdrawal sleeve by tightening the removal nut. If this procedure is difficult, it may be possible to drill and tap bolt holes in the nut and withdraw the sleeve by tightening the bolts as shown in Fig. 14.17.

Large bearings may be withdrawn easily using oil pressure. Fig. 14.19 illustrates the removal of a bearing by forcing oil under pressure through a hole and groove in a tapered shaft to expand the inner ring. The bearing may suddenly move axially when the interference is relieved during this procedure so a stop nut is recommended for protection. Fig. 14.20 shows a withdrawal using a hydraulic nut.

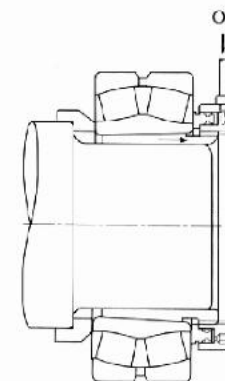


Fig. 14.20 Removal Using Hydraulic Nut

Inspection of Bearings

Bearing Cleaning

When bearings are inspected, the appearance of the bearings should first be recorded and the amount and condition of the residual lubricant should be checked.

After the lubricant has been sampled for examination, the bearings should be cleaned. In general, light oil or kerosene may be used as a cleaning solution.

Dismounted bearings should first be given a preliminary cleaning followed by a finishing rinse. Each bath should be provided with a metal net to support the bearings in the oil without touching the sides or bottom of the tank. If the bearings are rotated with foreign matter in them during preliminary cleaning, the raceways may be damaged. The lubricant and other deposits should be removed in the oil bath during the initial rough cleaning with a brush or other means.

After the bearing is relatively clean, it is given the finishing rinse. The finishing rinse should be done carefully with the bearing being rotated while immersed in the rinsing oil. It is necessary to always keep the rinsing oil clean.

Inspection and Evaluation of Bearings

After being thoroughly cleaned, bearings should be examined for the condition of their raceways and external surfaces, the amount of cage wear, the increase in internal clearance, and degradation of tolerances. These should be carefully checked, in addition to examination for possible damage or other abnormalities, in order to determine the possibility for its reuse.

In the case of small non-separable ball bearings, hold the bearing horizontally in one hand, and then rotate the outer ring to confirm that it turns smoothly.

Separable bearings such as tapered roller bearings may be checked by individually examining their rolling elements and the outer ring raceway.

Large bearings cannot be rotated manually; however, the rolling elements, raceway surfaces, cages, and contact surface of the ribs should be carefully examined visually. The more important a bearing is, the more carefully it should be inspected. The determination to reuse a bearing should be made only after considering the degree of bearing wear, the function of the machine, the importance of the bearings in the machine, operating conditions, and the time until the next inspection. However, if any of the following directs exist, reuse is impossible and replacement is necessary.

- (a) When there are cracks in the inner or outer rings, rolling elements, or cage.
- (b) When there is flaking of the raceway or rolling elements.
- (c) When there is significant smearing of the raceway surfaces, ribs, or rolling elements.
- (d) When the cage is significantly worn or rivets are loose.
- (e) When there is rust or scoring on the raceway surfaces or rolling elements.
- (f) When there are any significant impact or brinell traces on the raceway surfaces or rolling elements.
- (g) When there is significant evidence of creep on the bore or the periphery of the outer ring.
- (h) When discoloration by heat is evident.
- (i) When significant damage to the seals or shields of grease sealed bearings has occurred.

轴承的损伤与对策 Damage of bearing and Countermeasures

运转中无法直接观察轴承，但通过噪声、振动、温度润滑剂等的状况可察知轴承异常。表中所示为轴承损伤的代表列：

项目	现象	原因	措施
剥离	滚动面剥离 剥离后呈明显凹凸状	负荷过大，使用不当 安装不良 轴或轴承精度不良 游隙过小 异物侵入 发生生锈 异常高温造成的硬度下降	重新研究使用条件 重新选择轴承 重新考虑游隙 检查轴和轴承加工精度 研究轴承周围设计 检查安装时的方法 检查润滑剂及润滑方法
烧伤	轴承发热变色进而 烧伤不能旋转	游隙过小（包括变形部分游隙过小） 润滑不足或润滑剂不当 负荷过大（预压过大） 滚子偏斜	设定适当游隙（增大游隙） 检查润滑剂种类确保注入量 检查使用条件 防止定位误差 检查轴承周围设计（包括轴承受热） 改善轴承组装方法
裂纹缺陷	部分缺口 且有裂口	冲击负荷过大 有较大剥离摩擦裂纹 安装侧精度不良 摩擦裂纹 使用不良（用铜锤、卡入大异物） 力矩负荷过大	检查使用条件 设定适当过盈检查材质 改善安装及使用的方法 防止摩擦裂纹（检查润滑剂） 检查轴承周围设计
保持架 破损	铆钉松动或断裂 保持架破裂	高速旋转或转速变动频繁 润滑不良 卡入异物 振动大 安装不良（倾斜状态下安装） 异常升温（树脂保持架）	检查使用条件 检查润滑条件 重新研究保持架的旋转 注意轴承使用 研究轴和轴承箱刚性
擦伤卡伤	表面粗糙，伴有微小 溶敷套圈挡边与滚子 端面的擦伤	润滑不良 异物侵入 轴承倾斜造成的滚子偏斜 轴向负荷大造成的挡边面断油 表面粗糙度大 滚动体滑动大	再研究润滑剂、润滑方法 检查使用条件 设定适宜的预压 强化密封性能 正确使用轴承
生锈腐蚀	表面局部或全部生锈， 呈滚动体齿状生锈。	保管状态不良 包装不当 防锈剂不足 水分、酸溶液等侵入 直接用手拿轴承	防止保管中生锈 强化密封性能 定期检查润滑油 注意轴承使用
腐蚀	配合面产生红锈色 磨损粉粒子	过盈量不够 轴承摆动角小 润滑不足（或处于无润滑状态） 非稳定性负荷 旋转中振动	检查过盈及润滑剂涂布状态 运输时内外圈分开包装 不可分开时则施加预压 重新选择润滑剂 重新选择轴承
磨损	表面磨损、造成尺寸变化 多伴有磨伤、磨痕	润滑剂中混入异物 润滑不良 滚子偏斜	检查润滑剂及润滑方法 强化密封性能 防止定位误差
电蚀	滚动面有喷火口状凹坑 进一步发展则呈波状	滚动面通电	制作电流旁通阀 采取绝缘措施，避免电流 通过轴承内部
压痕 碰伤	卡入固体异物，或冲击 造成表面凹坑及安装时的 擦伤	固体异物侵入 卡入金属片 安装不良造成的撞击脱落 在倾斜状态下安装	改善安装、使用方法 防止异物混入 若因金属片引起，则需检 查其他部位
蠕变	内径面或外径面打滑，造 成镜面或变色，有时卡住	配合处过盈不足 螺母紧固不够 异常升温 负荷过大	重新研究过盈量 研究使用条件 检查轴和轴承箱精度



照片1

- ◆调心滚子轴承
 - ◆沟道剥落区的间距为滚动间距
 - ◆原因是由于锈蚀
- Spherical roller bearing
Flaking of whole raceway width
The reason is rust



照片2

- ◆调心滚子轴承
 - ◆在潮湿空气中存放轴承
 - ◆原因是由于锈蚀
- Spherical roller bearing
Bearing was stored in damp air
The reason is rust



照片3



照片4

- ◆调心滚子轴承的内圈。
 - ◆1列滚道面整周产生剥落。
 - ◆过大轴向载荷造成的损伤。
- Part: Inner ring of a spherical roller bearing
Symptom: Flaking of only one raceway over its entire circumference
Cause: Excessive axial load



照片5

- ◆调心滚子轴承的外圈。
 - ◆1列滚道面整周产生剥落。
 - ◆过大轴向载荷造成的损伤。
- Part: Inner ring of a spherical roller bearing
Symptom: Flaking of only one raceway over its entire circumference
Cause: Excessive axial load



照片6

- ◆调心滚子轴承的内圈。
 - ◆1列滚道面产生剥落。
 - ◆润滑不良造成的损伤
- Part: Inner ring of a spherical roller bearing
Symptom: Flaking of only one row of raceway
Cause: Poor lubrication



照片7

- ◆圆柱滚子轴承的滚子。
 - ◆滚动面沿轴向产生的早期剥落。
 - ◆安装不当造成的安装伤痕进一步发展而成。
- Part: Rollers of a cylindrical roller bearing
Symptom: Premature flaking occurs axially on the rolling surfaces
Cause: Scratches caused during improper mounting



照片8

- ◆调心滚子轴承的内圈。
 - ◆滚道面中央的圆形花纹状剥落。
 - ◆润滑不良造成的损伤。
- Part: Inner ring of a spherical roller bearing
Symptom: Round shaped peeling pattern occurs on the center of the raceway surfaces
Cause: Poor lubrication



照片9

- ◆调心滚子轴承的球面滚子。
 - ◆滚道面中央的圆形花纹状剥落。
 - ◆润滑不良造成的损伤。
- Part: Convex rollers of a spherical roller bearing
Symptom: Round shaped peeling pattern occurs on the center of the rolling surfaces
Cause: Poor lubrication



照片10

- ◆调心滚子轴承的内圈。
 - ◆滚道面上下整圈产生的剥皮。
 - ◆润滑不良造成的损伤
- Part: Inner ring of a spherical roller bearing
Symptom: Peeling occurs near the shoulder of the raceway over the entire circumference
Cause: Poor lubrication



照片11

- ◆调心滚子轴承的内圈。
 - ◆内圈大挡边上的擦伤。
 - ◆原因是急加、减速造成的滚子打滑。
- Part: Inner ring of a spherical roller bearing
Symptom: Scoring on large rib face of inner ring
Cause: Roller slipping due to sudden acceleration and deceleration



照片12

- ◆调心滚子轴承的球面滚子。
 - ◆滚子端面上的擦伤。
 - ◆原因是急加、减速造成的滚子打滑。
- Part: Convex rollers of a spherical roller bearing
Symptom: Scoring on roller end face
Cause: Roller slipping due to sudden acceleration and deceleration



照片13

- ◆调心滚子轴承的内圈。
 - ◆滚道面圆周方向上的轻微擦伤。
 - ◆因润滑不良造成的。
- Part: Inner ring of a spherical roller bearing
Symptom: Smearing occurs circumferentially on raceway surface
Cause: Poor lubrication



照片14

- ◆调心滚子轴承的外圈。
 - ◆滚道面圆周方向上的轻微擦伤。
 - ◆因润滑不良造成的。
- Part: Outer ring of a spherical roller bearing
Symptom: Smearing occurs circumferentially on raceway surface
Cause: Poor lubrication



照片15

- ◆调心滚子轴承的内圈。
 - ◆滚道面圆周方向上的轻微擦伤。
 - ◆因润滑不良造成的。
- Part: Inner ring of a spherical roller bearing
Symptom: Smearing occurs circumferentially on raceway surface
Cause: Poor lubrication



照片16

- ◆调心滚子轴承的外圈。
 - ◆滚道面圆周方向上的轻微擦伤。
 - ◆因润滑不良造成的。
- Part: Outer ring of a spherical roller bearing
Symptom: Smearing occurs circumferentially on raceway surface
Cause: Poor lubrication



照片17

- ◆调心滚子轴承的球面滚子。
 - ◆滚道面中央的轻微擦伤。
 - ◆因润滑不良造成的。
- Part: Convex rollers of a spherical roller bearing
Symptom: Smearing occurs at the center of the rolling surface
Cause: Poor lubrication



照片18

- ◆调心滚子轴承的内圈。
 - ◆滚道面上的轴向裂纹。
 - ◆原因是轴与内圈的温差造成配合应力过大。
- Part: Inner ring of a spherical roller bearing
Symptom: Axial cracks occurs on raceway surface
Cause: Large fitting stress due to temperature difference between shaft and inner ring



照片19

- ◆调心滚子轴承的内圈
 - ◆挡边上的破裂
 - ◆由安装时受到的
- Inner ring of a spherical roller bearing
Flange was brden
Burden during mounting



照片20

- ◆圆柱滚子轴承的保持架
 - ◆高强度黄铜车制保持架端面的变形
 - ◆安装时由过大的冲击载荷造成的
- Part: Cage of a cylindrical roller bearing
Symptom: Deformation of the side face of a machined high-tension brass cage
Cause: Large shock during mounting



照片21



照片22

- ◆圆柱滚子轴承的保持架。
 - ◆高强度黄铜车制保持架的磨损变形。
- Part: Cage of a cylindrical roller bearing
Symptom: Deformation of the side face of a machined high-tension brass cage



照片23

- ◆圆柱滚子轴承的内圈。
 - ◆因波状磨损和电蚀使滚道面上产生许多凹坑。
 - ◆由电蚀进一步发展而成。
- Part: Inner ring of a cylindrical roller bearing
Symptom: Many pits occur due to electrical corrosion and wave-shaped wear on raceway surface
Cause: Electrical corrosion



照片24

- ◆调心滚子轴承的内圈。
 - ◆承载区滚道面上凹凸不平的波纹状磨损。
 - ◆静止状态下反复震动，由异物侵入而成的损失。
- Part: Outer ring of a spherical roller bearing
Symptom: Wear having a wavy or concave-and-convex texture on loaded side of raceway surface
Cause: Entry of debris under repeated vibration while stationary



照片25

- ◆调心滚子轴承的内圈。
 - ◆内径上的蠕变，伴随有擦伤。
 - ◆因过盈量不足而造成的。
- Part: Inner ring of a spherical roller bearing
Symptom: Creep accompanied by scoring of bore surface
Cause: Insufficient intreferece



照片26

- ◆调心滚子轴承的外圈。
 - ◆外径面上整周的蠕变。
 - ◆由外圈和轴承座的间隙配合造成的。
- Part: Outer ring of a spherical roller bearing
Symptom: Creep occurs over entire circumference of outside surface
Cause: Loose fit between outer ring and housing



照片27

- ◆调心滚子轴承的内圈。
 - ◆滚道面变色，保持架磨损粉末未熔后被碾轧，附着。
 - ◆润滑不良造成的损伤。
- Part: Inner ring of a spherical roller bearing
Symptom: Raceway is discolored and melted. Worn particles from the cage were rolled and attached to the raceway
Cause: Insufficient lubrication



照片28

- ◆调心滚子轴承的球面滚子。
 - ◆滚子滚动面变色，保持架磨损粉末未熔融后被碾轧，附着。
 - ◆润滑不良造成的损伤。
- Part: Convex rollers of a spherical roller bearing
Symptom: Discoloration and melting of roller rolling surface, adhesion of worn particles from cage
Cause: Insufficient lubrication



照片29

- ◆圆柱滚子轴承的外圈。
 - ◆滚道面及挡边上生锈。
 - ◆原因是由于进水造成润滑不良。
- Part: Outer ring of a cylindrical roller bearing
Symptom: Rust on the rib face and raceway surface
Cause: Poor lubrication due to water entry



照片30

- ◆调心滚子轴承的内圈。
 - ◆滚道面上的锈蚀呈滚子间距分布。
 - ◆水分侵入润滑剂中造成的。
- Part: Inner ring of a spherical roller bearing
Symptom: Rust on raceway surface at roller pitch
Cause: Entry of water into lubricant



照片31

- ◆调心滚子轴承的滚子。
 - ◆滚道面上产生的凹坑状锈蚀。
 - ◆保管过程中水分凝结造成的。
- Part: Rollers of a spherical roller bearing
Symptom: Pit-shaped rust on rolling contact surface. Corroded portions.
Cause: Moisture condensation during storage



照片32

- ◆圆柱滚子轴承的滚子。
 - ◆滚道面上产生的轴向伤痕。
 - ◆安装时内、外圈倾斜造成的。
- Part: Rollers of a cylindrical roller bearing
Symptom: Axial scratches on rolling surface
Cause: Inclination of inner and outer rings during mounting



照片33

- ◆圆柱滚子轴承的内圈。
 - ◆滚道面上产生的轴向伤痕。
 - ◆安装时内、外圈倾斜造成的。
- Part: Inner ring of a cylindrical roller bearing
Symptom: Axial scratches on raceway surface
Cause: Inclination of inner and outer rings during mounting