



Spherical Roller Bearings



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Spherical roller bearings are commonly used in heavy industries. The reasons spherical roller bearings are widely used are its ability to carry high loads and accommodate misalignment.

调心滚子轴承具有重载和偏心的特性，因此在工业领域得到广泛的应用。



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1.1 Open Design

Open design spherical roller bearings are more commonly found in the various applications. The following are some of the common design of cages used in spherical roller bearings. Standard design of SRB comes with suffix W33.

1.1.1 CC Design Cage (Photo 1):

Two pressed window-type steel cages, symmetrical rollers

1.1.2 CA Design Cage (Photo 2):

One piece brass cage, symmetrical rollers

1.1.3 CAF Design Cage (Photo 3):

As CA cage design but with steel cage, mainly used in extra large size bearings

1.1 开式轴承

开式调心滚子轴承是调心滚子轴承中最常用的类型。轴承均设有W33的油槽。

1.1.1 CC型 (图1):

两片窗式冲压铁制保持架，对称滚子。

1.1.2 CA型 (图2):

叉型机削黄铜保持架，对称滚子。

1.1.3 CAF型 (图3):

叉型机削铁制保持架，对称滚子。(主要适用于大型轴承)

(Photo 1)
(图1)



(Photo 2)
(图2)



(Photo 3)
(图3)

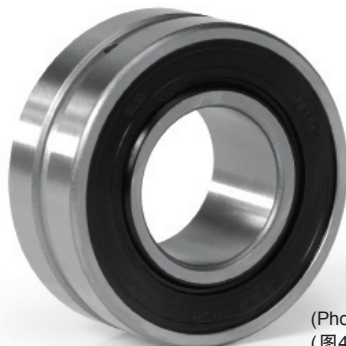


1.2 Sealed Design (Photo 4)

Sealed design spherical roller bearings are the improved design to open design spherical roller bearings. It is suitable for use in dusty/dirty environment. It is also recommended in applications where sealing solutions are expensive or impossible.

密封轴承 (图4)

密封调心滚子轴承是调心滚子轴承的改进型。主要适用于多尘埃的环境和没有辅助密封装置的情况。



(Photo 4)
(图4)

Bearings are consumable components. Hence, it is critical to improve the lifespan of bearings. By increasing the lifespan of bearings, efficiency and productivity of machines can be achieved. 3 Main factors to increasing bearing life include:

- a) Proper designing of bearings
- b) Proper bearing selection and mounting
- c) Proper maintenance

Based on research, statistics on bearing failures are indicated as follows:

- a) Improper mounting: 16%
- b) Improper maintenance/lubrication: 36%
- c) Foreign objects in bearings (i.e. dust/particles, etc): 14%
- d) Normal (fatigue life) failure: 34%

轴承在机器中属于容易损坏的部件(易损件), 因此提高轴承寿命对于整个机器的持续运转时间有重要的意义。影响轴承的寿命主要有以下三个因素:

- 1) 设计制造寿命
- 2) 正确的选择和安装
- 3) 日常的维护

大量调查显示: 在引起轴承失效的因素中, 16%是由于安装不当。36%是润滑不当(包括缺少维护引起的润滑油变质, 缺少润滑等情况)。14%是污染(包括外来颗粒的进入及其他情况)。34%是疲劳失效(主要指材料的疲劳寿命属于轴承的正常寿命)。在此我们首先介绍轴承的选型安装。



2.1 Dimensions and Tolerances

Bearing dimensions and tolerances are very important in order to determine if mounting can be performed smoothly. NIS Rhino spherical roller bearings dimensions conform to ISO standard. To find out the specific dimensions, please check the data in this catalog. Spherical roller bearings are manufactured under tolerance class P0. For specific conditions and requirements of the bearings, we can offer a more suitable product after understanding your applications.

2.1 轴承的外形尺寸和公差

轴承能否安装到位，满足设备的工作需求，轴承的外形尺寸和公差十分重要，调心滚子轴承的外形尺寸符合国际标准ISO标准，具体尺寸详见轴承目录。调心滚子轴承是根据普通级公差(P0)生产制造，对于特殊工况和特殊要求的轴承,我们可以提供更高精度等级的产品。

Table 1a. Normal Tolerances

Inner Ring													
d		$\Delta_{dmp}^{1)}$		V_{dp} Diameter Series			V_{dmp}	Δ_{Bs}		Δ_{B1s}		V_{Bs}	K_{ia}
over	incl.	high	low	7,8,9 max	0,1 max	2,3,4 max	max	high	low	high	low	max	max
mm		μm		μm			μm	μm		μm		μm	μm
-	2.5	0	-8	10	8	6	6	0	-40	-	-	12	10
2.5	10	0	-8	10	8	6	6	0	-120	0	-250	15	10
10	18	0	-8	10	8	6	6	0	-120	0	-250	20	10
18	30	0	-10	13	10	8	8	0	-120	0	-250	20	13
30	50	0	-12	15	12	9	9	0	-120	0	-250	20	15
50	80	0	-15	19	19	11	11	0	-150	0	-380	25	20
80	120	0	-20	25	25	15	15	0	-200	0	-380	25	25
120	180	0	-25	31	31	19	19	0	-250	0	-500	30	30
180	250	0	-30	38	38	23	23	0	-300	0	-500	30	40
250	315	0	-35	44	44	26	26	0	-350	0	-500	35	50
315	400	0	-40	50	50	30	30	0	-400	0	-630	40	60
400	500	0	-45	56	56	34	34	0	-450	0	-630	50	65
500	630	0	-50	63	63	38	38	0	-500	0	-800	60	70
630	800	0	-75	-	-	-	-	0	-750	-	-	70	80
800	1000	0	-100	-	-	-	-	0	-1000	-	-	80	90
1000	1250	0	-125	-	-	-	-	0	-1250	-	-	100	100
1250	1600	0	-160	-	-	-	-	0	-1600	-	-	120	120
1600	2000	0	-200	-	-	-	-	0	-2000	-	-	140	140

1) Tolerances for tapered bores, see table 2a and table 2b

Outer Ring													
D		Δ_{dmp}		$V_{Op}^{1)}$ Diameter Series			$V_{Dmp}^{1)}$		$\Delta_{Cs}, \Delta_{C1s}, V_{Cs}$		K_{ea}		
over	incl.	high	low	7,8,9 max	0,1 max	2,3,4 max	Bearings with shields or seals ²⁾ max	max			max		
mm		μm		μm			μm	μm			μm		
6	18	0	-8	10	8	6	10	6	Values are identical to those for inner ring of same bearing		15		
18	30	0	-9	12	9	7	12	7			15		
30	50	0	-11	14	11	8	16	8			20		
50	80	0	-13	16	13	10	20	10			25		
80	120	0	-15	19	19	11	26	11			35		
120	150	0	-18	23	23	14	30	14			40		
150	180	0	-25	31	31	19	38	19			45		
180	250	0	-30	38	38	23	-	23			50		
250	315	0	-35	44	44	26	-	26			60		
315	400	0	-40	50	50	30	-	30			70		
400	500	0	-45	56	56	34	-	34			80		
500	630	0	-50	63	63	38	-	38			100		
630	800	0	-75	94	94	55	-	55			120		
800	1000	0	-100	125	125	75	-	75			140		
1000	1250	0	-125	-	-	-	-	-			160		
1250	1600	0	-160	-	-	-	-	-			190		
1600	2000	0	-200	-	-	-	-	-			220		
2000	2500	0	-250	-	-	-	-	-			250		

1) Applies before bearing is assembled and after removal of internal and/or external snap ring
2) Applies only to bearings of Diameter Series 2, 3 and 4

Table 1b. Class P6 Tolerances

Inner Ring

d		$\Delta_{dmp}^{(1)}$		V_{dp} Diameter Series 7,8,9 0,1 2,3,4			V_{dmp}	Δ_{Bs}		Δ_{B1s}		V_{Bs}	K_{ia}
over	incl.	high	low	max	max	max	max	high	low	high	low	max	max
mm		μm		μm			μm	μm		μm		μm	μm
-	2.5	0	-7	9	7	5	5	0	-40	-	-	12	5
2.5	10	0	-7	9	7	5	5	0	-120	0	-250	15	6
10	18	0	-7	9	7	5	5	0	-120	0	-250	20	7
18	30	0	-8	10	8	6	6	0	-120	0	-250	20	8
30	50	0	-10	13	10	8	8	0	-120	0	-250	20	10
50	80	0	-12	15	15	9	9	0	-150	0	-380	25	10
80	120	0	-15	19	19	11	11	0	-200	0	-380	25	13
120	180	0	-18	23	23	14	14	0	-250	0	-500	30	18
180	250	0	-22	28	28	17	17	0	-300	0	-500	30	20
250	315	0	-25	31	31	19	19	0	-350	0	-500	35	25
315	400	0	-30	38	38	23	23	0	-400	0	-630	40	30
400	500	0	-35	44	44	26	26	0	-450	0	-630	45	35
500	630	0	-40	50	50	30	30	0	-500	0	-800	50	40
630	800	0	-50	-	-	-	-	0	-750	-	-	55	45
800	1000	0	-65	-	-	-	-	0	-1000	-	-	60	50
1000	1250	0	-80	-	-	-	-	0	-1250	-	-	70	60
1250	1600	0	-100	-	-	-	-	0	-1600	-	-	70	70
1600	2000	0	-130	-	-	-	-	0	-2000	-	-	80	80

Outer Ring

D		Δ_{Dmp}		$V_{Dp}^{(1)}$ Diameter Series 7,8,9 0,1 2,3,4			Shield bearings ⁽²⁾	$V_{Dmp}^{(1)}$	$\Delta_{Cs}, \Delta_{C1s}, V_{Cs}$	K_{ea}
over	incl.	high	low	max	max	max	max	max		max
mm		μm		μm			μm	μm		μm
6	18	0	-7	9	7	5	9	5	Values are identical to those for inner ring of same bearing	8
18	30	0	-8	10	8	6	10	6		9
30	50	0	-9	11	9	7	13	7		10
50	80	0	-11	14	11	8	16	8		13
80	120	0	-13	16	16	10	20	10		18
120	150	0	-15	19	19	11	25	11		20
150	180	0	-18	23	23	14	30	14		23
180	250	0	-20	25	25	15	-	15		25
250	315	0	-25	31	31	19	-	19		30
315	400	0	-28	35	35	21	-	21		35
400	500	0	-33	41	41	25	-	25		40
500	630	0	-38	48	48	29	-	29		50
630	800	0	-45	56	56	34	-	34		60
800	1000	0	-60	75	75	45	-	45		75
1000	1250	0	-80	-	-	-	-	-		85
1250	1600	0	-100	-	-	-	-	-		100
1600	2000	0	-130	-	-	-	-	-		100
2000	2500	0	-160	-	-	-	-	-		120

¹⁾ Applies before bearing is assembled and after removal of internal and/or external snap ring

²⁾ Applies only to bearings of Diameter Series 0, 1, 2, 3 and 4

Table 1c. Class P5 Tolerances

Inner Ring

d		Δ_{dmp}		V_{dp} Diameter Series 7,8,9 0,1,2,3,4		V_{dmp}	Δ_{Bs}		Δ_{B1s}		V_{Bs}	K_{ia}	S_d	$S_{ia}^{(1)}$
over	incl.	high	low	max	max	max	high	low	high	low	max	max	max	max
mm		μm		μm		μm	μm		μm		μm	μm	μm	μm
-	2.5	0	-5	5	4	3	0	-40	0	-250	5	4	7	7
2.5	10	0	-5	5	4	3	0	-40	0	-250	5	4	7	7
10	18	0	-5	5	4	3	0	-80	0	-250	5	4	7	7
18	30	0	-6	6	5	3	0	-120	0	-250	5	4	8	8
30	50	0	-8	8	6	4	0	-120	0	-250	5	5	8	8
50	80	0	-9	9	7	5	0	-150	0	-250	6	5	8	8
80	120	0	-10	10	8	5	0	-200	0	-380	7	6	9	9
120	180	0	-13	13	10	7	0	-250	0	-380	8	8	10	10
180	250	0	-15	15	12	8	0	-300	0	-500	10	10	11	13
250	315	0	-18	18	14	9	0	-350	0	-500	13	13	13	15
315	400	0	-23	23	18	1	0	-400	0	-630	15	15	15	20
400	500	0	-27	28	21	1	0	-450	0	-630	18	17	18	23
500	630	0	-33	35	26	1	0	-500	0	-800	20	19	20	25
630	800	0	-40	-	-	-	0	-750	-	-	26	22	26	30
800	1000	0	-50	-	-	-	0	-1000	-	-	32	26	32	30
1000	1250	0	-65	-	-	-	0	-1250	-	-	38	30	38	30
1250	1600	0	-80	-	-	-	0	-1600	-	-	45	35	45	30
1600	2000	0	-100	-	-	-	0	-2000	-	-	55	40	55	30

¹⁾ Applies only to deep groove and angular contact ball bearings

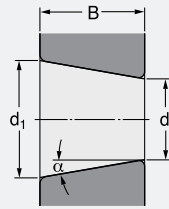
Outer Ring

D		Δ_{Dmp}		$V_{Dp}^{(1)}$ Diameter Series 7,8,9 0,1,2,3,4		V_{Dmp}	$\Delta_{Cs}, \Delta_{C1s},$	V_{Cs}	K_{ea}	S_D	$S_{ea}^{(2)}$
over	incl.	high	low	max	max	max		max	max	max	max
mm		μm		μm		μm		μm	μm	μm	μm
6	18	0	-5	5	4	3	Values are identical to those for inner ring of same bearing	5	5	8	8
18	30	0	-6	6	5	3		5	6	8	8
30	50	0	-7	7	5	4		5	7	8	8
50	80	0	-9	9	7	5		6	8	8	10
80	120	0	-10	10	8	5		8	10	9	11
120	150	0	-11	11	8	6		8	11	10	13
150	180	0	-13	13	10	7		8	13	10	14
180	250	0	-15	15	11	8		10	15	11	15
250	315	0	-18	18	14	9		11	18	13	18
315	400	0	-20	20	15	10		13	20	13	20
400	500	0	-23	23	17	12		15	23	15	23
500	630	0	-28	28	21	14		18	25	18	25
630	800	0	-35	35	26	18		20	30	20	30
800	1000	0	-40	50	29	25		25	35	25	35
1000	1250	0	-50	-	-	-		30	40	30	45
1250	1600	0	-65	-	-	-		35	45	35	55
1600	2000	0	-85	-	-	-		38	55	40	55
2000	2500	0	-110	-	-	-		45	65	50	55

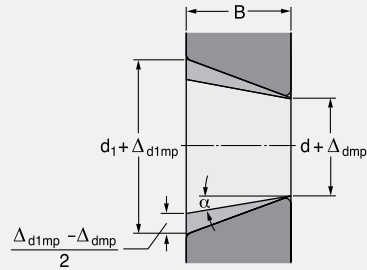
¹⁾ Does not apply to sealed or shielded bearings

²⁾ Applies only to deep groove and angular contact ball bearings

Table 2a. Normal, P6 and P5 Class Tolerances for Tapered Bores, Taper 1:12



Half angle of taper 1:12
 $\alpha = 2^\circ 23' 9.4''$

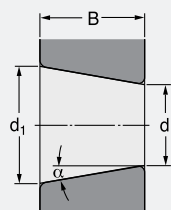


Largest theoretical diameter d_1
 $d_1 = d + \frac{1}{12} \times B$

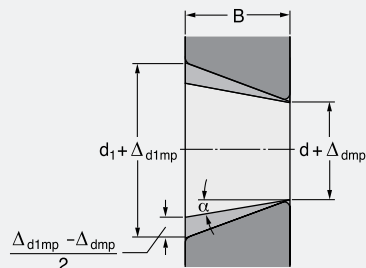
Bore diameter		Tolerance Classes Normal, P6						Tolerance Class P5				
d		Δ_{dmp}		$V_{dp}^{1)}$	Δ_{d1mp}	$-\Delta_{dmp}$		Δ_{dmp}		$V_{dp}^{1)}$	Δ_{d1mp}	$-\Delta_{dmp}$
over	incl.	high	low	max	high	low		high	low	max	high	low
mm		μm		μm	μm			μm		μm	μm	
18	30	+21	0	13	+21	0		+13	0	13	+13	0
30	50	+25	0	15	+25	0		+16	0	15	+16	0
50	80	+30	0	19	+30	0		+19	0	19	+19	0
80	120	+35	0	25	+35	0		+22	0	22	+22	0
120	180	+40	0	31	+40	0		+25	0	25	+25	0
180	250	+46	0	38	+46	0		+29	0	29	+29	0
250	315	+52	0	44	+52	0		+32	0	32	+32	0
315	400	+57	0	50	+57	0		+36	0	36	+36	0
400	500	+63	0	56	+63	0		+40	0	-	+40	0
500	630	+70	0	-	+70	0		+44	0	-	+44	0
630	800	+80	0	-	+90	0		+50	0	-	+50	0
800	1000	+90	0	-	+90	0		+56	0	-	+56	0
1000	1250	+105	0	-	+105	0		+66	0	-	+66	0
1250	1600	+125	0	-	+125	0		+78	0	-	+78	0
1600	2000	+150	0	-	+150	0		+92	0	-	+92	0

¹⁾ Applies in any single radial plane of the bore

Table 2b. Normal Tolerances for Tapered Bores, Taper 1:30



Half angle of taper 1:30
 $\alpha = 0^\circ 57' 17.4''$



Largest theoretical diameter d_1
 $d_1 = d + \frac{1}{30} \times B$

Bore diameter		Normal Tolerances				
d		Δ_{dmp}		$V_{dp}^{1)}$	Δ_{d1mp}	$-\Delta_{dmp}$
over	incl.	high	low	max	high	low
mm		μm		μm	μm	
80	120	+20	0	25	+40	0
120	180	+25	0	31	+50	0
180	250	+30	0	38	+55	0
250	315	+35	0	44	+60	0
315	400	+40	0	50	+65	0
400	500	+45	0	56	+70	0
500	630	+50	0	63	+85	0
630	800	+75	0	-	+100	0
800	1000	+100	0	-	+100	0
1000	1250	+125	0	-	+115	0
1250	1600	+160	0	-	+125	0
1600	2000	+200	0	-	+150	0

¹⁾ Applies in any single radial plane of the bore

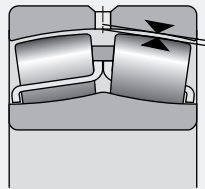
2.2 Clearance (Table 3)

Selection of bearings not only includes the correct selection on the critical dimensions but also the clearances. The importance on clearances of bearings cannot be underestimated. Proper clearance can improve heat dissipation, lubrication and stability of bearings during rotation.

2.2 轴承的游隙 (表格3)

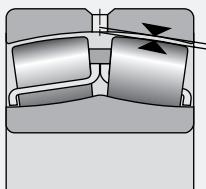
正确的选择轴承：不仅包含轴承的外形尺寸还包含轴承的游隙。轴承的游隙不仅涉及到轴承散热，润滑还涉及到轴承的运转平稳性。对于轴承寿命有着重要的影响。下表是轴承的装配游隙表。

Table 3a: Radial internal clearance of spherical roller bearings with cylindrical bore



Bore diameter		Radial internal clearance									
		C2		Normal		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
mm		μm									
18	24	10	20	20	35	35	45	45	60	60	75
24	30	15	25	25	40	40	55	55	75	75	95
30	40	15	30	30	45	45	60	60	80	80	100
40	50	20	35	35	55	55	75	75	100	100	125
50	65	20	40	40	65	65	90	90	120	120	150
65	80	30	50	50	80	80	110	110	145	145	185
80	100	35	60	60	100	100	135	135	180	180	225
100	120	40	75	75	120	120	160	160	210	210	260
120	140	50	95	95	145	145	190	190	240	240	300
140	160	60	110	110	170	170	220	220	280	280	350
160	180	65	120	120	180	180	240	240	310	310	390
180	200	70	130	130	200	200	260	260	340	340	430
200	225	80	140	140	220	220	290	290	380	380	470
225	250	90	150	150	240	240	320	320	420	420	520
250	280	100	170	170	260	260	350	350	460	460	570
280	315	110	190	190	280	280	370	370	500	500	630
315	355	120	200	200	310	310	410	410	550	550	690
355	400	130	220	220	340	340	450	450	600	600	750
400	450	140	240	240	370	370	500	500	660	660	820
450	500	140	260	260	410	410	550	550	720	720	900
500	560	150	280	280	440	440	600	600	780	780	1000
560	630	170	310	310	480	480	650	650	850	850	1100
630	710	190	350	350	530	530	700	700	920	920	1190
710	800	210	390	390	580	580	770	770	1010	1010	1300
800	900	230	430	430	650	650	860	860	1120	1120	1440
900	1000	260	480	480	710	710	930	930	1220	1220	1570
1000	1120	290	530	530	780	780	1020	1020	1330	1330	1720
1120	1250	320	580	580	860	860	1120	1120	1460	1460	1870
1250	1400	350	640	640	950	950	1240	1240	1620	1620	2060
1400	1600	400	720	720	1060	1060	1380	1380	1800	1800	2300
1600	1800	450	810	810	1180	1180	1550	1550	2000	2000	2550

Table 3b: Radial internal clearance of spherical roller bearings with tapered bore



Bore diameter		Radial internal clearance									
d	over	C2		Normal		C3		C4		C5	
incl.		min	max	min	max	min	max	min	max	min	max
mm		μm									
24	30	20	30	30	40	40	55	55	75	-	-
30	40	25	35	35	50	50	65	65	85	85	105
40	50	30	45	45	60	60	80	80	100	100	130
50	65	40	55	55	75	75	95	95	120	120	160
65	80	50	70	70	95	95	120	120	150	150	200
80	100	55	80	80	110	110	140	140	180	180	230
100	120	65	100	100	135	135	170	170	220	220	280
120	140	80	120	120	160	160	200	200	260	260	330
140	160	90	130	130	180	180	230	230	300	300	380
160	180	100	140	140	200	200	260	260	340	340	430
180	200	110	160	160	220	220	290	290	370	370	470
200	225	120	180	180	250	250	320	320	410	410	520
225	250	140	200	200	270	270	350	350	450	450	570
250	280	150	220	220	300	300	390	390	490	490	620
280	315	170	240	240	330	330	430	430	540	540	680
315	355	190	270	270	360	360	470	470	590	590	740
355	400	210	300	300	400	400	520	520	650	650	820
400	450	230	330	330	440	440	570	570	720	720	910
450	500	260	370	370	490	490	630	630	790	790	1000
500	560	290	410	410	540	540	680	680	870	870	1100
560	630	320	460	460	600	600	760	760	980	980	1230
630	710	350	510	510	670	670	850	850	1090	1090	1360
710	800	390	570	570	750	750	960	960	1220	1220	1500
800	900	440	640	640	840	840	1070	1070	1370	1370	1690
900	1000	490	710	710	930	930	1190	1190	1520	1520	1860
1000	1120	530	770	770	1030	1030	1300	1300	1670	1670	2050
1120	1250	570	830	830	1120	1120	1420	1420	1830	1830	2250
1250	1400	620	910	910	1230	1230	1560	1560	2000	2000	2450
1400	1600	680	1000	1000	1350	1350	1720	1720	2200	2200	2700
1600	1800	750	1110	1110	1500	1500	1920	1920	2400	2400	2950

2.3 Misalignment (Table 4)

Self alignment is one of the characteristics of spherical roller bearings. However, there is a limit on the tilting angle during operations. For the purpose of designing of machines, the table below demonstrates the permissible angular misalignment.

2.3 轴承的偏心率 (表格4)

可调心性是调心滚子轴承特性。但是轴承的调心也是有限度的，为了便于机械设计中对于轴承的选择，下表给出各种尺寸轴承最大的调心角度。

Table 4: Permissible angular misalignment

Bearing series Series ¹⁾	Permissible angular misalignment
-	degrees
Series 213	2
Series 222	
Sizes < 52	2
Sizes ≥ 52	1.5
Series 223	3
Series 230	
Sizes < 56	2
Sizes ≥ 56	2.5
Series 231	
Sizes < 60	2
Sizes ≥ 60	3
Series 232	
Sizes < 52	2.5
Sizes ≥ 52	3.5
Series 238	1.5
Series 239	1.5
Series 240	2
Series 241	
Sizes < 64	2.5
Sizes ≥ 64	3.5
Series 248	1.5
Series 249	2.5

¹⁾ Last two figures of bearings designations

2.4 Bearing Life Calculation

In modern technology, it is important to control the downtime of machines during operations to reduce the disruption to production flow. In order to achieve the required, periodic maintenance is necessary. Bearing life calculation becomes an important factor to determine when the maintenance is to be carried out.

2.4 轴承的寿命计算

现代工业的流水线设计要求设备的故障是可控的，这就需要定期的维护。轴承的计算寿命是制定维护周期的一个重要参数。

Bearing Life

When bearing rotates, the inner, outer ring and rolling elements are constantly loaded. This produces material fatigue and eventually bearing failure. The total number of revolutions before a failure occurs is called the basic rating life.

Life of individual bearings varies considerably, even if they are of the same size, same material, same heat treatment and are under the same operating condition.

Statistically, the total number of revolutions reached or exceeded by 90% of a sufficiently large group of apparently identical bearings before the first evidence of material fatigue occurs is called the basic rating life.

Basic Dynamic Load Rating

The basic dynamic load rating of a bearing with rotating inner ring and stationary outer ring is that load of constant magnitude and size which a sufficiently large group of apparently identical bearings can endure for a basic rating life of one million revolutions.

Radial bearings take central load. Values given for C in the dimension tables of this catalogue are for standard high chromium steel. 80% to 85% of the chromium steel values should be used for stainless steel.

Life Formula

The equation for the basic rating life for dynamically loaded ball bearings is as follow:

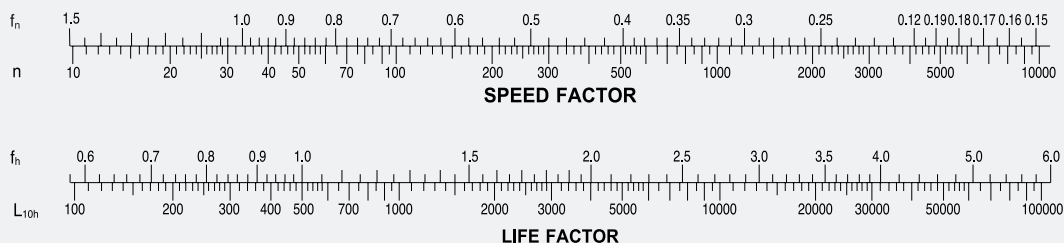
$$L_{10} = \left(\frac{C_r}{P} \right)^3 \quad (\times 10^6 \text{ Revolutions})$$

whereby : L_{10} = Basic Rating Life
 C_r = Basic Dynamic Load Rating (kgf)
 n = R.P.M. (Revolutions Per Minute)
 f_n = Speed Factor

$$L_{10h} = \frac{16666}{n} \cdot \left(\frac{C_r}{P} \right)^3 \quad (\text{Hours})$$

L_{10h} = Basic Rating Life in Operating Hours
 P = Equivalent Load (kgf)
 f_n = Life Factor

$$L_{10h} = 500 \cdot f_n^3, \quad f_h = f_n \cdot \frac{C_r}{P}, \quad f_n = \left(\frac{33.3}{n} \right)^{1/3}$$



Examples of Rating Life L_{10h} Values Used:

Operating Conditions	Basic Rating Life L_{10h}
Infrequent operation.	500
Short or intermittent operation. Failure has little effect on function.	4,000 ~ 8,000
Intermittent operation. Failure has significant effect on function.	8,000 ~ 12,000
8 hours of non-continuous operation.	12,000 ~ 20,000
8 hours of continuous operation.	20,000 ~ 30,000
24 hours continuous operation.	40,000 ~ 60,000
24 hours of guaranteed trouble-free operation.	100,000 ~ 200,000

Adjusted Life Formula

The above life formula is for general use. In cases where a reliability of over 90% is required and where influences apart from load and speed or operating frequency should be taken into account for the rating life, ISO 281, 1990 gives an extended life formula:

$$L_{na} = a_1 \times a_2 \times a_3 \times \left(\frac{C_r}{P} \right)^3 \quad (\times 10^6 \text{ Revolutions})$$

whereby : L_{na} = Adjusted rating life in millions of revolutions with a reliability of (100-n) % (n=the reliability rate)

C_r = Basic Dynamic Load Rating (kgf)

P = Equivalent Dynamic Load (kgf)

a_1 = Factor for a reliability other than 90%

a_2 = Factor for non-conventional materials

a_3 = Factor for non-conventional operating conditions, in particular lubrication

(1) Reliability Factor a_1

When a reliability of over 90% is required, the corresponding factor should be selected from the following table.

Reliability Factor a_1

Reliability (%)	90	91	92	93	94	95	96	97	98	99	(99.6)	(9.99)
a_1	1.00	0.92	0.84	0.77	0.64	0.62	0.53	0.44	0.33	0.21	(0.10)	(0.037)

(2) Material Factor a_2

Improvement in manufacturing techniques for raw material and for heat treatment of components have led to an extended fatigue life for bearings.

Our standard bearing uses material of high-quality bearing steel leading to an extended life for bearings.

The basic load ratings given in this catalogue have been established by taking this longer life into consideration. This gives an increase in the operating life in hours of a factor of 2.2 and a factor of 1.3 for the load carrying capacity. The material factor $a_2 = 1$.

(3) Operating Conditions Factor a_3

This is an adjustment factor to meet non-conventional operating conditions for lubrication, temperature and load. Under good lubrication conditions with a permanent oil film between rolling elements and rings, the factor $a_2 = 1$. In unfavourable conditions ($d_m \cdot n \leq 10,000$), a factor $a_3 < 1$ must be selected. d_m = mean bearing diameter $(D+d)/2$

n = operating speed

At temperatures above 120°C, greater dimensional changes occur and the material hardness deteriorates which affects the bearing life.

The operating factor f_t for temperature can be taken from the following table:

Operating Temperature and Life Compensation Factor f_t

Bearing Temperature (°C)	120	150	175	200	225	250	275	300
Temperature Factor (f_t)	1.00	0.90	0.85	0.75	0.65	0.60	0.52	0.45

Heat stabilized bearings, where the dimensions are stable above 120°C, are available on request.

3.1 Mounting Bearings with Cylindrical Bore

Factors affecting mounting of bearings include tolerances and fits. In different working environments the tolerances required will be different. Fits are also important in mounting. 2 areas of fits need to be considered. Firstly, fit between bearings and shaft. Secondly, fit between bearings and housing. For the convenience of the readers, table 3 shows the fits for solid steel shafts with the required tolerances.

Fits for Solid Steel Shafts

Radial bearings with cylindrical bore (except high-precision bearings)

Calculations and graphics presentation

3.1 轴承的安装配合

轴承的安装 (圆柱孔轴承) 涉及到轴承的公差和配合: 轴承和轴的配合, 轴承和基座的配合。针对配合公差, 是要根据不同的工作环境 (振动, 工作时间等信息) 来确定。在此为了便于顾客在实际安装。我们就对于常见的工作环境给出一个简单的公差配合对照表。

Conditions ¹⁾	Examples	CARB and spherical roller bearings	Tolerance class
Rotating inner ring load or direction of load indeterminate			
Light and variable loads ($P \leq 0,05 C$)	Conveyors, lightly loaded gearbox bearings	-	js5 (h5) ²⁾
		-	j6 (j5) ²⁾
		-	k5
		-	k6
		-	m6
Normal heavy loads ($P > 0,05 C$)	and Bearing applications generally, electric motors, turbines, pumps, gearing, wood-working machines, wind mills	-	js5
		-	j5 (js5) ²⁾
		-	k5 ³⁾
		-	k6
		25 to 40	m5
		-	m6
		(40) to 60	n5 ⁴⁾
		(60) to 100	n6 ⁴⁾
		(100) to 200	p6 ⁵⁾
Heavy to very heavy loads and shock loads with difficult working conditions ($P > 0,1 C$)	Axleboxes for heavy railway vehicles, traction motors, rolling mills	-	p7 ⁴⁾
		(200) to 500	r6 ⁴⁾
		> 500	r7 ⁴⁾
		(50) to 70	n5 ⁴⁾
		-	n6 ⁴⁾
		(70) to 140	p6 ⁶⁾
High demands on running accuracy with light loads ($P \leq 0,05 C$)	Machine tools	(140) to 280	r6 ⁷⁾
		(280) to 400	s6 _{min} ± IT6/2
		> 400	s7 _{min} ± IT7/2
		-	js4
		-	js4 (j5) ⁹⁾
		-	k4 (k5) ⁹⁾
		-	m5
		-	n5

Radial bearings with cylindrical bore (except high-precision bearings)

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Conditions 1)	Examples	CARB and spherical roller bearings	Tolerance class
Stationary inner ring load			
Easy axial displacement of the inner ring on the shaft necessary	Wheels on non-rotating axles		g6 ¹⁰⁾
Easy axial displacement of the inner ring on the shaft unnecessary	Tension pulleys, rope sheaves		h6
Axial loads only			
	Bearing applications of all kinds	≤ 250 > 250	j6 js6

- 1) The tolerance class in brackets applies to stainless steel bearings.
- 2) Bearings with radial internal clearance greater than Normal may be necessary.
- 3) Bearings with radial internal clearance greater than Normal are recommended for $d \leq 150$ mm. For $d > 150$ mm bearings with radial internal clearance greater than Normal may be necessary.
- 4) Bearings with radial internal clearance greater than Normal are recommended.
- 5) The tolerance class f6 can be selected for large bearings to provide easy displacement.
- 6) Refer to table 5 for definition of tolerance class.



Table 5a: Shaft tolerances and resultant fits

Calculations and graphics presentation

Shaft diameter		Bearing bore diameter Δdmp		Deviations of shaft diameter, resultant fits Tolerances									
d	Nominal			e7	f5				f6	g5		g6	
over	incl.	low	high	Deviations (shaft diameter) Theoretical interference(+)/clearance(-) Probable interference(+)/clearance(-)									
mm		μm		μm									
1	3	-8	0	-14 -6 -8	-24 -24 -22	-6 +2 +1	-10 -10 -9	-6 +2 0	-12 -12 -10	-2 +6 +5	-6 -6 -5	-2 +6 +4	-8 -8 -6
3	6	-8	0	-20 -12 -14	-32 -32 -30	-10 -2 -3	-15 -15 -14	-10 -2 -4	-18 -18 -16	-4 +4 +3	-9 -9 -8	-4 +4 +2	-12 -12 -10
6	10	-8	0	-25 -17 -20	-40 -40 -37	-13 -5 -7	-19 -19 -17	-13 -5 -7	-22 -22 -20	-5 +3 +1	-11 -11 -9	-5 +3 +1	-14 -14 -12
10	18	-8	0	-32 -24 -27	-50 -50 -47	-16 -8 -10	-24 -24 -22	-16 -8 -10	-27 -27 -25	-6 +2 0	-14 -14 -12	-6 +2 0	-17 -17 -15
18	30	-10	0	-40 -30 -33	-61 -61 -58	-20 -10 -12	-29 -29 -27	-20 -10 -13	-33 -33 -30	-7 +3 +1	-16 -16 -14	-7 +3 0	-20 -20 -17
30	50	-12	0	-50 -38 -42	-75 -75 -71	-25 -13 -16	-36 -36 -33	-25 -13 -17	-41 -41 -37	-9 +3 0	-20 -20 -17	-9 +3 -1	-25 -25 -21
50	80	-15	0	-60 -45 -50	-90 -90 -85	-30 -15 -19	-43 -43 -39	-30 -15 -19	-49 -49 -45	-10 +5 +1	-23 -23 -19	-10 +5 +1	-29 -29 -25
80	120	-20	0	-72 -52 -59	-107 -107 -100	-36 -16 -21	-51 -51 -46	-36 -16 -22	-58 -58 -52	-12 +8 +3	-27 -27 -22	-12 +8 +2	-34 -34 -28
120	180	-25	0	-85 -60 -68	-125 -125 -117	-43 -18 -24	-61 -61 -55	-43 -18 -25	-68 -68 -61	-14 +11 +5	-32 -32 -26	-14 +11 +4	-39 -39 -32
180	250	-30	0	-100 -70 -80	-146 -146 -136	-50 -20 -26	-70 -70 -64	-50 -20 -28	-79 -79 -71	-15 +15 +9	-35 -35 -29	-15 +15 +7	-44 -44 -36
250	315	-35	0	-110 -75 -87	-162 -162 -150	-56 -21 -29	-79 -79 -71	-56 -21 -30	-88 -88 -79	-17 +18 +10	-40 -40 -32	-17 +18 +9	-49 -49 -40
315	400	-40	0	-125 -85 -98	-182 -182 -169	-62 -22 -30	-87 -87 -79	-62 -22 -33	-98 -98 -87	-18 +22 +14	-43 -43 -35	-18 +22 +11	-54 -54 -43
400	500	-45	0	-135 -90 -105	-198 -198 -183	-68 -23 -32	-95 -95 -86	-68 -23 -35	-108 -108 -96	-20 +25 +16	-47 -47 -38	-20 +25 +13	-60 +25 -53
500	630	-50	0	-145 -95 -111	-215 -215 -199	-76 -26 -36	-104 -104 -94	-76 -26 -39	-120 -120 -107	-22 +28 +18	-50 -50 -40	-22 +28 +15	-66 -66 +15
630	800	-75	0	-160 -85 -107	-240 -240 -218	-80 -5 -17	-112 -112 -100	-80 -5 -22	-130 -130 -113	-24 +51 +39	-56 -56 -44	-24 +51 +34	-74 -74 -57
800	1000	-100	0	-170 -70 -97	-260 -260 -233	-86 +14 0	-122 -122 -108	-86 +14 -6	-142 -142 -122	-26 +74 +60	-62 -62 -48	-26 +74 +54	-82 -82 -62
1000	1250	-125	0	-195 -70 -103	-300 -300 -267	-98 +27 +10	-140 -140 -123	-98 +27 +3	-164 -164 -140	-28 +97 +80	-70 -70 -53	-28 +97 +73	-94 -94 -70
1250	1600	-160	0	-220 -60 -100	-345 -345 -305	-110 +50 +29	-160 -160 -139	-110 +50 +20	-188 -188 -158	-30 +130 +109	-80 -80 -59	-30 +130 +100	-108 -108 -78
1600	2000	-200	0	-240 -40 -90	-390 -390 -340	-120 +80 +55	-180 -180 -155	-120 +80 +45	-212 -212 -177	-32 +168 +143	-92 -92 -67	-32 +168 +133	-124 -124 -89

Table 5b: Shaft tolerances and resultant fits

Calculations and graphics presentation

Shaft diameter		Bearing bore diameter Δdmp		Deviations of shaft diameter, resultant fits Tolerances									
d	Nominal			h5		h6		h8		h9		j5	
over	incl.	low	high	Deviations (shaft diameter) Theoretical interference(+)/clearance(-) Probable interference(+)/clearance(-)									
mm		μm		μm									
1	3	-8	0	0 +8 +7	-4 -4 -3	0 +8 +6	-6 -6 -4	0 +8 +6	-14 -14 -12	0 +8 +5	-25 -25 -22	+2 +10 +9	-2 -2 -1
3	6	-8	0	0 +8 +7	-5 -5 -4	0 +8 +6	-8 -8 -6	0 +8 +5	-18 -18 -15	0 +8 +5	-30 -30 -27	+3 +11 +10	-2 -2 -1
6	10	-8	0	0 +8 +6	-6 -6 -4	0 +8 +6	-9 -9 -7	0 +8 +5	-22 -22 -19	0 +8 +5	-36 -36 -33	+4 +12 +10	-2 -2 0
10	18	-8	0	0 +8 +6	-8 -8 -6	0 +8 +6	-11 -11 -9	0 +8 +5	-27 -27 -24	0 +8 +5	-43 -43 -40	+5 +13 +11	-3 -3 -1
18	30	-10	0	0 +10 +8	-9 -9 -7	0 +10 +7	-13 -13 -10	0 +10 +6	-33 -33 -29	0 +10 +6	-52 -52 -48	+5 +15 +13	-4 -4 -2
30	50	-12	0	0 +12 +9	-11 -11 -8	0 +12 +8	-16 -16 -12	0 +12 +7	-39 -39 -34	0 +12 +7	-62 -62 -57	+6 +18 +15	-5 -5 -2
50	80	-15	0	0 +15 +11	-13 -13 -9	0 +15 +11	-19 -19 -15	0 +15 +9	-46 -46 -40	0 +15 +9	-74 -74 -68	+6 +21 17	-7 -7 -3
80	120	-20	0	0 +20 +15	-15 -15 -10	0 +20 +14	-22 -22 -16	0 +20 +12	-54 -54 -46	0 +20 +12	-87 -87 -79	+6 +21 +17	-9 -9 -4
120	180	-25	0	0 +25 +19	-18 -18 -12	0 +25 +18	-25 -25 -18	0 +25 +15	-63 -63 -53	0 +25 +15	-100 -100 -90	+7 +32 +26	-11 -11 -5
180	250	-30	0	0 +30 +24	-20 -20 -14	0 +30 +22	-29 -29 -21	0 +30 +18	-72 -72 -60	0 +30 +17	-115 -115 -102	+7 +37 +31	-13 -13 -7
250	315	-35	0	0 +35 +27	-23 -23 -15	0 +35 +26	-32 -32 -23	0 +35 +22	-81 -81 -68	0 +35 +20	-130 -130 -115	+7 +42 +34	-16 -16 -8
315	400	-40	0	0 +40 +32	-25 -25 -17	0 +40 +29	-36 -36 -25	0 +40 +25	-89 -89 -74	0 +40 +23	-140 -140 -123	+7 +47 +39	-18 -18 -10
400	500	-45	0	0 +45 +36	-27 -27 -18	0 +45 +33	-40 -40 -28	0 +45 +28	-97 -97 -80	0 +45 +26	-155 -155 -136	+7 +52 +43	-20 -20 -11
500	630	-50	0	0 +50 +40	-28 -28 -18	0 +50 +37	-44 -44 -31	0 +50 +31	-110 -110 -91	0 +50 +29	-175 -175 -154	- - -	- - -
630	800	-75	0	0 +75 +63	-32 -32 -20	0 +75 +58	-50 -50 -33	0 +75 +48	-125 -125 -98	0 +75 +45	-200 -200 -170	- - -	- - -
800	1000	-100	0	0 +100 +86	-36 -36 -22	0 +100 +80	-56 -56 -36	0 +100 +67	-140 -140 -107	0 +100 +61	-230 -230 -191	- - -	- - -
1000	1250	-125	0	0 +125 +108	-42 -42 -25	0 +125 +101	-66 -66 -42	0 +125 +84	-165 -165 -124	0 +125 +77	-260 -260 -212	- - -	- - -
1250	1600	-160	0	0 +160 +139	-50 -50 -29	0 +160 +130	-78 -78 -48	0 +160 +109	-195 -195 -144	0 +160 +100	-310 -310 -250	- - -	- - -
1600	2000	-200	0	0 +200 +175	-60 -60 -35	0 +200 +165	-92 -92 -57	0 +200 +138	-230 -230 -168	0 +200 +126	-370 -370 -296	- - -	- - -

Table 5c: Shaft tolerances and resultant fits

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Shaft diameter		Bearing bore diameter Δdmp		Deviations of shaft diameter, resultant fits Tolerances									
d	Nominal			j6	js5		js6		js7		k4		
over	incl.	low	high	Deviations (shaft diameter) Theoretical interference(+)/clearance(-) Probable interference(+)/clearance(-)									
mm		μm		μm									
1	3	-8	0	+4 +12 +10	-2 -2 0	+2 +10 +9	-2 -2 -1	+3 +11 +9	-3 -3 -1	+5 +13 +11	-5 -5 -3	+3 +11 +10	0 0 +1
3	6	-8	0	+6 +14 +12	-2 -2 0	+2.5 +10.5 +9	-2.5 -2.5 -1	+4 +12 +10	-4 -4 -2	+6 +14 +12	-6 -6 -4	+5 +13 +12	+1 +1 +2
6	10	-8	0	+7 +15 +13	-2 -2 0	+3 +11 +9	-3 -3 -1	+4.5 +12.5 +11	-4.5 -4.5 -3	+7.5 +15.5 +13	-7.5 -7.5 -5	+5 +13 +12	+1 +1 +2
10	18	-8	0	+8 +16 +14	-3 -3 -1	+4 +12 +10	-4 -4 -2	+5.5 +13.5 +11	-5.5 -5.5 -3	+9 +17 +14	-9 -9 -6	+6 +14 +13	+1 +1 +2
18	30	-10	0	+9 +19 +16	-4 -4 -1	+4.5 +14.5 +12	-4.5 -4.5 -2	+6.5 +16.5 +14	-6.5 -6.5 -4	+10.5 +20.5 +17	-10.5 -10.5 -7	+8 +18 +16	+2 +2 +4
30	50	-12	0	+11 +23 +19	-5 -5 -1	+5.5 +17.5 +15	-5.5 -5.5 -3	+8 +20 +16	-8 -8 -4	+12.5 +24.5 +20	-12.5 -12.5 -8	+9 +21 +19	+2 +2 +4
50	80	-15	0	+12 +27 +23	-7 -7 -3	+6.5 +21.5 +18	-6.5 -6.5 -3	+9.5 +24.5 +20	-9.5 -9.5 -5	+15 +30 +25	-15 -15 -10	+10 +25 +22	+2 +2 +5
80	120	-20	0	+13 +33 +27	-9 -9 -3	+7.5 +27.5 +23	-7.5 -7.5 -3	+11 +31 +25	-11 -11 -5	+17.5 +37.5 +31	-17.5 -17.5 -11	+13 +33 +30	+3 +3 +6
120	180	-25	0	+14 +39 +32	-11 -11 -4	+9 +34 +28	-9 -9 -3	+12.5 +37.5 +31	-12.5 -12.5 -6	+20 +45 +37	-20 -20 -12	+15 +40 +36	+3 +3 +7
180	250	-30	0	+16 +46 +38	-13 -13 -5	+10 +40 +34	-10 -10 -4	+14.5 +44.5 +36	-14.5 -14.5 -6	+23 +53 +43	-23 -23 -13	+18 +48 +43	+4 +4 +9
250	315	-35	0	+16 +51 +42	-16 -16 -7	+11.5 +46.5 +39	-11.5 -11.5 -4	+16 +51 +42	-16 -16 -7	+26 +61 +49	-26 -26 -14	+20 +55 +49	+4 +4 +10
315	400	-40	0	+18 +58 +47	-18 -18 -7	+12.5 +52.5 +44	-12.5 -12.5 -4	+18 +58 +47	-18 -18 -7	+28.5 +68.5 +55	-28.5 -28.5 -15	+22 +62 +55	+4 +4 +11
400	500	-45	0	+20 +65 +53	-20 -20 -8	+13.5 +58.5 +49	-13.5 -13.5 -4	+20 +65 +53	-20 -20 -8	+31.5 +76.5 +62	-31.5 -31.5 -17	+25 +70 +63	+5 +5 -12
500	630	-50	0	+22 +72 +59	-22 -22 -9	+14 +64 +54	-14 -14 -4	+22 +72 +59	-22 -22 -9	+35 +85 +69	-35 -35 -19	-	-
630	800	-75	0	+25 +100 +83	-25 -25 -8	+16 +91 +79	-16 -16 -4	+25 +100 +83	-25 -25 -8	+40 +115 +93	-40 -40 -18	-	-
800	1000	-100	0	+28 +128 +108	-28 -28 -8	+18 +118 +104	-18 -18 -4	+28 +128 +108	-28 -28 -8	+45 +145 +118	-45 -45 -18	-	-
1000	1250	-125	0	+33 +158 +134	-33 -33 -9	+21 +146 +129	-21 -21 -4	+33 +158 +134	-33 -33 -9	+52 +177 +145	-52 -52 -20	-	-
1250	1600	-160	0	+39 +199 +169	-39 -39 -9	+25 +185 +164	-25 -25 -4	+39 +199 +169	-39 -39 -9	+62 +222 +182	-62 -62 -22	-	-
1600	2000	-200	0	+46 +246 +211	-46 -46 -11	+30 +230 +205	-30 -30 -5	+46 +246 +211	-46 -46 -11	+75 +275 +225	-75 -75 -25	-	-

Table 5d: Shaft tolerances and resultant fits

Calculations and graphics presentation

Shaft diameter		Bearing bore diameter		Deviations of shaft diameter, resultant fits									
d		Δdmp		Tolerances									
Nominal				k5		k6		m5		m6		n5	
				Deviations (shaft diameter)									
				Theoretical interference(+)/clearance(-)									
				Probable interference(+)/clearance(-)									
mm		μm		μm									
1	3	-8	0	+4 +12 +11	0 0 +1	+6 +14 +12	0 0 +2	+6 +14 +13	+2 +2 +3	+8 +16 +14	+2 +2 +4	+8 +16 +15	+4 +4 +5
3	6	-8	0	+6 +14 +13	+1 +1 +2	+9 +17 +15	+1 +1 +3	+9 +17 +16	+4 +4 +5	+12 +20 +18	+4 +4 +6	+13 +21 +20	+8 +8 +9
6	10	-8	0	+7 +15 +13	+1 +1 +3	+10 +18 +16	+1 +1 +3	+12 +20 +18	+6 +6 +8	+15 +23 +21	+6 +6 +8	+16 +24 +22	+10 +10 +12
10	18	-8	0	+9 +17 +15	+1 +1 +3	+12 +20 +18	+1 +1 +3	+15 +23 +21	+7 +7 +9	+18 +26 +24	+7 +7 +9	+20 +28 +26	+12 +12 +14
18	30	-10	0	+11 +21 +19	+2 +2 +4	+15 +25 +22	+2 +2 +5	+17 +27 +25	+8 +8 +10	+21 +31 +28	+8 +8 +11	+24 +34 +32	+15 +15 +17
30	50	-12	0	+13 +2 +4	+2 +25 +22	+18 +2 +5	+2 +27 +25	+20 +8 +10	+9 +31 +28	+25 +8 +11	+9 +34 +32	+28 +34 +32	+17 +17 +20
50	80	-15	0	+15 +30 +26	+2 +2 +6	+21 +36 +32	+2 +2 +6	+24 +39 +35	+11 +11 +15	+30 +45 +41	+11 +11 +15	+33 +48 +44	+20 +20 +24
80	120	-20	0	+18 +38 +33	+3 +3 +8	+25 +45 +39	+3 +3 +9	+28 +48 +43	+13 +13 +18	+35 +55 +49	+13 +13 +19	+38 +58 +53	+23 +23 +28
120	180	-25	0	+21 +46 +40	+3 +3 +9	+28 +53 +46	+3 +3 +10	+33 +58 +52	+15 +15 +21	+40 +65 +58	+15 +15 +22	+45 +70 +64	+27 +27 +33
180	250	-30	0	+24 +54 +48	+4 +4 +10	+33 +63 +55	+4 +4 +12	+37 +67 +61	+17 +17 +23	+46 +76 +68	+17 +17 +25	+51 +81 +75	+31 +31 +37
250	315	-35	0	+27 +4 +10	+4 +63 +55	+36 +4 +12	+4 +67 +61	+43 +17 +23	+20 +76 +68	+52 +17 +25	+20 +81 +75	+57 +81 +75	+34 +34 +42
315	400	-40	0	+29 +69 +61	+4 +4 +12	+40 +80 +69	+4 +4 +15	+46 +86 +78	+21 +21 +29	+57 +97 +86	+21 +21 +32	+62 +102 +94	+37 +37 +45
400	500	-45	0	+32 +77 +68	+5 +5 +14	+45 +90 +78	+5 +5 +17	+50 +95 +86	+23 +23 +32	+63 +108 +96	+23 +23 +35	+67 +112 +103	+40 +40 +49
500	630	-50	0	+29 +78 +68	0 0 +10	+44 +94 +81	0 0 +13	+55 +105 +94	+26 +26 +36	+70 +120 +107	+26 +26 +39	+73 +122 +112	+44 +44 +54
630	800	-75	0	+32 +107 +95	0 0 +12	+50 +125 +108	0 0 +17	+62 +137 +125	+30 +30 +42	+80 +155 +138	+30 +30 +47	+82 +157 +145	+50 +50 +62
800	1000	-100	0	+36 +136 +122	0 0 +14	+56 +156 +136	0 0 +20	+70 +170 +156	+34 +34 +48	+90 +190 +170	+34 +34 +54	+92 +192 +178	+56 +56 +70
1000	1250	-125	0	+42 +167 +150	0 0 +17	+66 +191 +167	0 0 +24	+82 +207 +190	+40 +40 +57	+106 +231 +207	+40 +40 +64	+108 +233 +216	+66 +66 +83
1250	1600	-160	0	+50 +210 +189	0 0 +21	+78 +238 +208	0 0 +30	+98 +258 +237	+48 +48 +69	+126 +286 +256	+48 +48 +78	+128 +288 +267	+78 +78 +99
1600	2000	-200	0	+60 +260 +235	0 0 +25	+92 +292 +257	0 0 +35	+118 +318 +293	+58 +58 +83	+150 +350 +315	+58 +58 +93	+152 +352 +327	+92 +92 +117

Table 5e: Shaft tolerances and resultant fits
Calculations and graphics presentation

Shaft diameter		Bearing bore diameter Δdmp		Deviations of shaft diameter, resultant fits Tolerances											
d	Nominal			n6 Deviations (shaft diameter)		p6		p7		r6		r7		s6	
over	incl.	low	high	Theoretical interference(+)/clearance(-) Probable interference(+)/clearance(-)											
mm		μm		μm											
1	3	-8	0	+10 +18 +16	+4 +4 +6	+12 +20 +18	+6 +6 +8	+16 +24 +22	+6 +6 +8	+16 +24 +22	+10 +10 +12	+20 +28 +26	+10 +10 +12	+20 +28 +26	+14 +14 +16
3	6	-8	0	+16 +24 +22	+8 +8 +10	+20 +28 +26	+12 +12 +14	+24 +32 +30	+12 +12 +14	+23 +31 +29	+15 +15 +17	+27 +35 +33	+15 +15 +17	+27 +35 +33	+19 +19 +21
6	10	-8	0	+19 +27 +25	+10 +10 +12	+24 +32 +30	+15 +15 +17	+30 +38 +35	+15 +15 +18	+28 +36 +34	+19 +19 +21	+34 +42 +39	+19 +19 +22	+32 +40 +38	+23 +23 +25
10	18	-8	0	+23 +31 +29	+12 +12 +14	+29 +37 +35	+18 +18 +20	+36 +44 +41	+18 +18 +21	+34 +42 +40	+23 +23 +25	+41 +49 +46	+23 +23 +26	+39 +47 +44	+28 +28 +31
18	30	-10	0	+28 +38 +35	+15 +15 +18	+35 +45 +42	+22 +22 +25	+43 +53 +50	+22 +22 +25	+41 +51 +48	+28 +28 +31	+49 +59 +56	+28 +28 +31	+48 +58 +55	+35 +35 +38
30	50	-12	0	+33 +45 +41	+17 +17 +21	+42 +54 +50	+26 +26 +30	+51 +63 +59	+26 +26 +30	+50 +62 +58	+34 +34 +38	+59 +71 +67	+34 +34 +38	+59 +71 +67	+43 +43 +47
50	65	-15	0	+39 +54 +50	+20 +20 +24	+51 +66 +62	+32 +32 +36	+62 +77 +72	+32 +32 +37	+60 +75 +71	+41 +41 +45	+71 +86 +81	+41 +41 +46	+72 +87 +82	+53 +53 +58
65	80	-15	0	+39 +54 +50	+20 +20 +24	+51 +66 +62	+32 +32 +36	+62 +77 +72	+32 +32 +37	+62 +77 +73	+43 +43 +47	+73 +88 +83	+43 +43 +48	+78 +93 +88	+59 +59 +64
80	100	-20	0	+45 +65 +59	+23 +23 +29	+59 +79 +73	+37 +37 +43	+72 +92 +85	+37 +37 +44	+73 +93 +87	+51 +51 +57	+86 +106 +99	+51 +51 +58	+93 +113 +107	+71 +71 +77
100	120	-20	0	+45 +65 +59	+23 +23 +29	+59 +79 +73	+37 +37 +43	+72 +92 +85	+37 +37 +44	+76 +96 +90	+54 +54 +60	+89 +109 +102	+54 +54 +61	+101 +121 +115	+79 +79 +85
120	140	-25	0	+52 +77 +70	+27 +27 +34	+68 +93 +86	+43 +43 +50	+83 +108 +100	+43 +43 +51	+88 +113 +106	+63 +63 +70	+103 +128 +120	+63 +63 +71	+117 +142 +135	+92 +92 +99
140	160	-25	0	+52 +77 +70	+27 +27 +34	+68 +93 +86	+43 +43 +50	+83 +108 +100	+43 +43 +51	+90 +115 +108	+65 +65 +72	+105 +130 +122	+65 +65 +73	+125 +150 +143	+100 +100 +107
160	180	-25	0	+52 +77 +70	+27 +27 +34	+68 +93 +86	+43 +43 +50	+83 +108 +100	+43 +43 +51	+93 +118 +111	+68 +68 +75	+108 +133 +125	+68 +68 +76	+133 +158 +151	+108 +108 +115
180	200	-30	0	+60 +90 +82	+31 +31 +39	+79 +109 +101	+50 +50 +58	+96 +126 +116	+50 +50 +60	+106 +136 +128	+77 +77 +85	+123 +153 +143	+77 +77 +87	+151 +181 +172	+122 +122 +131
200	225	-30	0	+60 +90 +82	+31 +31 +39	+79 +109 +101	+50 +50 +58	+96 +126 +116	+50 +50 +60	+109 +139 +131	+80 +80 +88	+126 +156 +146	+80 +80 +90	+159 +189 +180	+130 +130 +139
225	250	-30	0	+60 +90 +82	+31 +31 +39	+79 +109 +101	+50 +50 +58	+96 +126 +116	+50 +50 +60	+113 +143 +135	+84 +84 +92	+130 +160 +150	+84 +84 +94	+169 +199 +190	+140 +140 +149
250	280	-35	0	+66 +101 +92	+34 +34 +43	+88 +123 +114	+56 +56 +65	+108 +143 +131	+56 +56 +68	+126 +161 +152	+94 +94 +103	+146 +181 +169	+94 +94 +106	+190 +225 +215	+158 +158 +168
280	315	-35	0	+66 +101 +92	+34 +34 +43	+88 +123 +114	+56 +56 +65	+108 +143 +131	+56 +56 +68	+130 +165 +156	+98 +98 +107	+150 +185 +173	+98 +98 +110	+202 +237 +227	+170 +170 +180
315	355	-40	0	+73 +113 +102	+37 +37 +48	+98 +138 +127	+62 +62 +73	+119 +159 +146	+62 +62 +75	+144 +184 +173	+108 +108 +119	+165 +205 +192	+108 +108 +121	+226 +266 +255	+190 +190 +201

Table 5e: Shaft tolerances and resultant fits
Calculations and graphics presentation

Shaft diameter		Bearing bore diameter Δdmp		Deviations of shaft diameter, resultant fits Tolerances											
d	Nominal			n6	p6		p7		r6		r7		s6		
over	incl.	low	high	Deviations (shaft diameter) Theoretical interference(+)/clearance(-) Probable interference(+)/clearance(-)											
mm		μm		μm											
355	400	-40	0	+73	+37	+98	+62	+119	+62	+150	+114	+171	+114	+244	+208
				+113	+37	+138	+62	+159	+62	+190	+114	+211	+114	+284	+208
				+102	+48	+127	+73	+146	+75	+179	+125	+198	+127	+273	+219
400	450	-45	0	+80	+40	+108	+68	+131	+68	+166	+126	+189	+126	+272	+232
				+125	+40	+153	+68	+176	+68	+211	+126	+234	+126	+317	+232
				+113	+52	+141	+80	+161	+83	+199	+138	+219	+141	+305	+244
450	500	-45	0	+80	+40	+108	+68	+131	+68	+172	+132	+195	+132	+292	+252
				+125	+40	+153	+68	+176	+68	+217	+132	+240	+132	+337	+252
				+113	+52	+141	+80	+161	+83	+205	+144	+225	+147	+325	+264
500	560	-50	0	+88	+44	+122	+78	+148	+78	+194	+150	+220	+150	+324	+280
				+40	+153	+68	+176	+68	+217	+132	+240	+150	+374	+280	
				+52	+141	+80	+161	+83	+205	+144	+225	+225	+166	360	294
560	630	-50	0	+88	+44	+122	+78	+148	+78	+199	+155	+225	+155	+354	+310
				+138	+44	+172	+78	+198	+78	+249	+155	+275	+155	+404	+310
				+125	+57	+159	+91	+182	+94	+236	+168	+259	+171	+390	+324
630	710	-75	0	+100	+50	+138	+88	+168	+88	+225	+175	+255	+175	+390	+340
				+175	+50	+213	+88	+243	+88	+300	+175	+330	+175	+465	+340
				+158	+67	+196	+105	+221	+110	+283	+192	+308	+197	+448	+357
710	800	-75	0	+100	+50	+138	+88	+168	+88	+235	+185	+265	+185	+430	+380
				+175	+50	+213	+88	+243	+88	+310	+185	+340	+185	+505	+380
				+158	+67	+196	+105	+221	+110	+293	+202	+318	+207	+488	+397
800	900	-100	0	+112	+56	+156	+100	+190	+100	+266	+210	+300	+210	+486	+430
				+212	+56	+256	+100	+290	+100	+366	+210	+400	+210	+586	+430
				+192	+76	+236	+120	+263	+127	+346	+230	+373	+237	+565	+451
900	1000	-100	0	+112	+56	+156	+100	+190	+100	+276	+220	+310	+220	+526	+470
				+212	+56	+256	+100	+290	+100	+376	+220	+410	+220	+626	+470
				+192	+76	+236	+120	+263	+127	+356	+240	+383	+247	+605	+491
1000	1120	-125	0	+132	+66	+186	+120	+225	+120	+316	+250	+355	+250	+586	+520
				+257	+66	+311	+120	+350	+120	+441	+250	+480	+250	+711	+520
				+233	+90	+287	+144	+317	+153	+417	+274	+447	+283	+686	+545
1120	1250	-125	0	+132	+66	+186	+120	+225	+120	+326	+260	+365	+260	+646	+580
				+257	+66	+311	+120	+350	+120	+451	+260	+490	+260	+771	+580
				+233	+90	+287	+144	+317	+153	+427	+284	+457	+293	+746	+605
1250	1400	-160	0	+156	+78	+218	+140	+265	+140	+378	+300	+425	+300	+718	+640
				+316	+78	+378	+140	+425	+140	+538	+300	+585	+300	+878	+640
				+286	+108	+348	+170	+385	+180	+508	+330	+545	+340	+848	+670
1400	1600	-160	0	+156	+78	+218	+140	+265	+140	+408	+330	+455	+330	+798	+720
				+316	+78	+378	+140	+425	+140	+568	+330	+615	+330	+958	+720
				+286	+108	+348	+170	+385	+180	+538	+360	+575	+370	+928	+750
1600	1800	-200	0	+184	+92	+262	+170	+320	+170	+462	+370	+520	+370	+912	+820
				+384	+92	+462	+170	+520	+170	+662	+370	+720	+370	+1112	+820
				+349	+127	+427	+205	+470	+220	+627	+405	+670	+420	+1076	+856
1800	2000	-200	0	+184	+92	+262	+170	+320	+170	+492	+400	+550	+400	+1012	+920
				+384	+92	+462	+170	+520	+170	+692	+400	+750	+400	+1212	+920
				+349	+127	+427	+205	+470	+220	+657	+435	+700	+450	+1176	+956

3.2 Mounting Bearings with Tapered Bore

Bearings with tapered bore are always mounted with interference fit. As sizes of spherical roller bearings increases, the mounting difficulty also escalates. To reduce inconvenience in mounting, tapered bore bearings can be introduced. There are 2 types of tapered ratio; 1:30 and 1:12. For series such as 240, 241, 248 and 249, the tapered ratio is 1:30. Suffix is designated by K30. For the rest of the series, the tapered ratio is 1:12. Suffix is designated by K. During mounting, either adaptor or withdrawal sleeve can be used. Not only does the sleeve reduces ease of mounting, it also reduces the risk of damaging the bearings.

3.2.1 Measuring Clearance Reduction

1 way of checking clearance of tapered bore spherical roller bearings is to use filler gauge. This method can be performed on medium and large size bearings. By checking the clearance before and after mounting, changes in clearance can be determined. (Table 6)

3.2 圆锥孔调心滚子轴承

调心滚子轴承主要适用于工业领域。轴承的尺寸都比较大，给轴承的安装带有很大的不便。因此在工业领域中，除了常规的圆柱孔调心滚子轴承之外，常常会用到圆锥孔调心滚子轴承。对于圆锥孔轴承的锥度：240、241、248和249系列轴承的锥度是1:30（即后缀为K30），其他系列轴承的锥度为1:12（即后缀为K）。

这里主要介绍便于安装的圆锥孔调心滚子轴承。圆锥孔调心滚子轴承在安装中经常会使用紧定套，使得轴承的安装更加简单，同时也降低了在轴承安装中轴承损坏的风险。下面就简单介绍下轴承安装中对于游隙的控制：

3.2.1 塞尺

使用塞尺，来判断轴承的游隙是否满足要求。该方法主要适用于中型和特大型轴承，通过塞尺测量安装前后游隙的变化量来实现。（表格6）



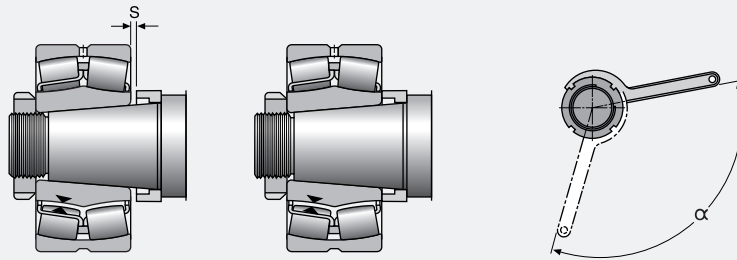
3.2.2 Measuring Lock Nut Tightening Angle

This is another common method used to control the clearance for small to medium size tapered bore spherical roller bearings. Ensure the bore of bearing or sleeve is in contact with the shaft around its whole circumference. This implies that bearing inner ring cannot be rotated relative to the shaft. By turning the locknut through angle α , clearance can be adjusted accordingly. (Table 6)

3.2.2 通过测量螺母的角度变化

这是一种常用的，简单的游隙的控制方法。主要适用于中小型轴承。当轴承的内径完全和锥面接触后，对扳手施加一个力，驱动螺母转动一定的角度 α ，从而实现轴承的预紧得到合格的安装游隙。(表格6)

Table 6: Guideline values for reduction of radial internal clearance, axial drive-up and lock nut tightening angle

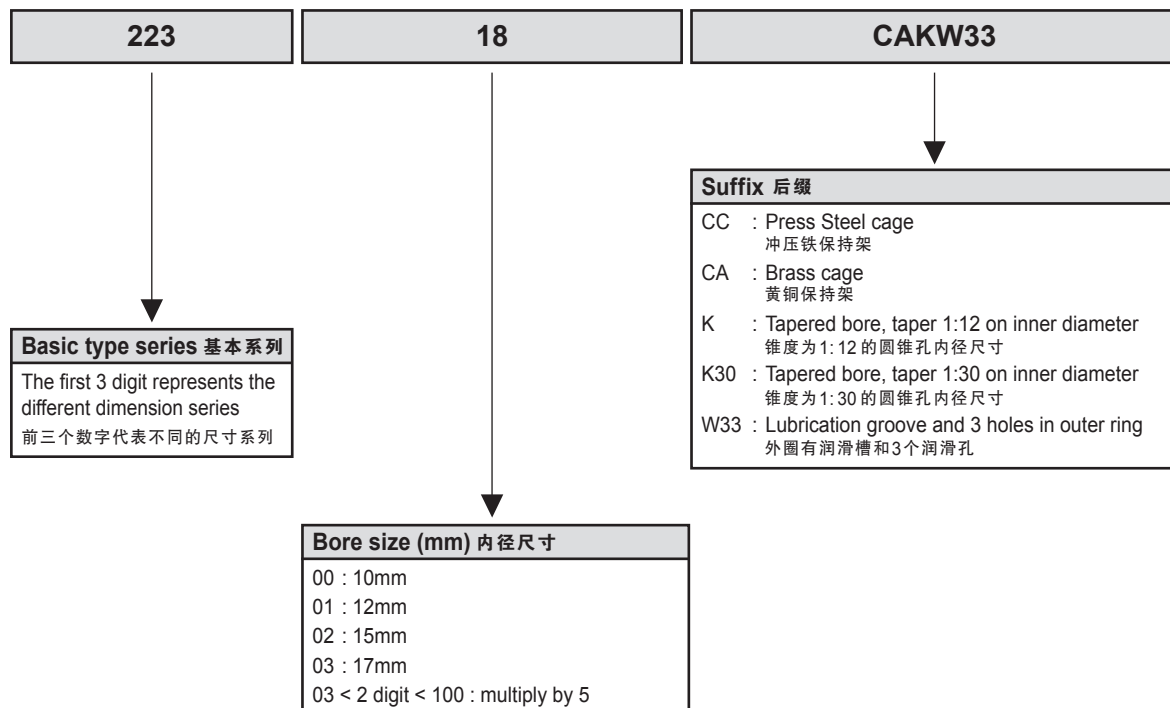


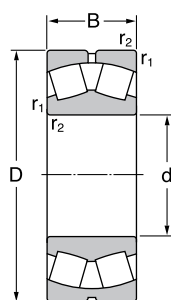
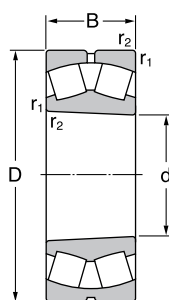
Bore diameter d		Reduction of radial internal clearance		Axial drive-up ¹⁾ s				Permissible residual ²⁾ radial clearance after mounting bearings with initial clearance			Lock nut tightening angle α
over	incl.	min	max	min	max	min	max	Normal	C3	C4	
mm		mm		mm				mm			degree
24	30	0.015	0.020	0.3	0.35	-	-	0.015	0.020	0.035	110
30	40	0.020	0.025	0.35	0.4	-	-	0.015	0.025	0.040	120
40	50	0.025	0.030	0.4	0.45	-	-	0.020	0.030	0.050	130
50	65	0.030	0.040	0.45	0.6	3	4	0.025	0.035	0.055	110
65	80	0.040	0.050	0.6	0.7	3.2	4.2	0.025	0.040	0.070	130
80	100	0.045	0.060	0.7	0.9	1.7	2.2	0.035	0.050	0.080	150
100	120	0.050	0.070	0.75	1.1	1.9	2.7	0.050	0.065	0.100	-
120	140	0.065	0.090	1.1	1.4	2.7	3.5	0.055	0.080	0.110	-
140	160	0.075	0.100	1.2	1.6	3	4	0.055	0.090	0.130	-
160	180	0.080	0.110	1.3	1.7	3.2	4.2	0.060	0.100	0.150	-
180	200	0.090	0.130	1.4	2	3.5	5	0.070	0.100	0.160	-
200	225	0.100	0.140	1.6	2.2	4	5.5	0.080	0.120	0.180	-
225	250	0.110	0.150	1.7	2.4	4.2	6	0.090	0.130	0.200	-
250	280	0.120	0.170	1.9	2.7	4.7	6.7	0.100	0.140	0.220	-
280	315	0.130	0.190	2	3	5	7.5	0.110	0.150	0.240	-
315	355	0.150	0.210	2.4	3.3	6	8.2	0.120	0.170	0.260	-
355	400	0.170	0.230	2.6	3.6	6.5	9	0.130	0.190	0.290	-
400	450	0.200	0.260	3.1	4	7.7	10	0.130	0.200	0.310	-
450	500	0.210	0.280	3.3	4.4	8.2	11	0.160	0.230	0.350	-
500	560	0.240	0.320	3.7	5	9.2	12.5	0.170	0.250	0.360	-
560	630	0.260	0.350	4	5.4	10	13.5	0.200	0.290	0.410	-
630	710	0.300	0.400	4.6	6.2	11.5	15.5	0.210	0.310	0.450	-
710	800	0.340	0.450	5.3	7	13.3	17.5	0.230	0.350	0.510	-
800	900	0.370	0.500	5.7	7.8	14.3	19.5	0.270	0.390	0.570	-
900	1000	0.410	0.550	6.3	8.5	15.8	21	0.300	0.430	0.640	-
1000	1120	0.450	0.600	6.8	9	17	23	0.320	0.480	0.700	-
1120	1250	0.490	0.650	7.4	9.8	18.5	25	0.340	0.540	0.770	-
1250	1400	0.550	0.720	8.3	10.8	21	27	0.360	0.590	0.840	-
1400	1600	0.600	0.800	9.1	11.9	22.7	29.8	0.400	0.650	0.920	-
1600	1800	0.670	0.900	10.2	13.4	25.4	33.6	0.440	0.720	1.020	-

¹⁾ Valid only for solid steel shafts and general application.

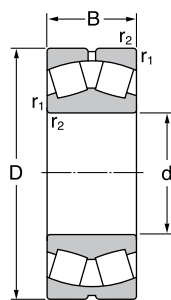
²⁾ The residual clearance must be checked in cases where the initial internal clearance is in the lower half of the tolerance range, and where large temperature differentials between the bearing rings can arise in operation. The residual clearance must not be less than the minimum values quoted above.

■ Prefix & Suffix 前缀与后缀

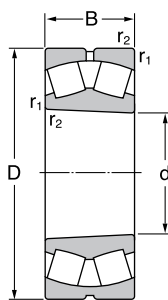


Cylindrical bore
圆柱孔Tapered bore
圆锥孔

Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
25	52	18	46.550	41.800	16,150	1.0	0.260	22205 CAW33	22205 CAKW33
25	62	17	39.330	39.425	11,400	1.1	0.280	21305 CAW33	21305 CAKW33
30	62	20	60.800	57.000	13,300	1.0	0.290	22206 CAW33	22206 CAKW33
30	72	19	52.440	57.950	9,500	1.1	0.410	21306 CAW33	21306 CAKW33
35	72	23	82.175	80.750	11,400	1.1	0.450	22207 CAW33	22207 CAKW33
35	80	21	62.320	68.400	9,025	1.5	0.550	21307 CAW33	21307 CAKW33
40	80	23	91.675	85.500	10,450	1.1	0.530	22208 CAW33	22208 CAKW33
40	90	23	98.800	102.600	9,025	1.5	0.750	21308 CAW33	21308 CAKW33
40	90	33	142.500	133.000	7,600	1.5	1.050	22308 CAW33	22308 CAKW33
45	85	23	96.900	93.100	9,500	1.1	0.580	22209 CAW33	22209 CAKW33
45	100	25	118.750	120.650	8,075	1.5	0.990	21309 CAW33	21309 CAKW33
45	100	36	173.850	173.850	6,650	1.5	1.400	22309 CAW33	22309 CAKW33
50	90	23	98.800	102.600	9,025	1.1	0.630	22210 CAW33	22210 CAKW33
50	110	27	148.200	157.700	7,125	2.0	1.350	21310 CAW33	21310 CAKW33
50	110	40	209.000	212.800	5,985	2.0	1.900	22310 CAW33	22310 CAKW33
55	100	25	118.750	120.650	8,075	1.5	0.840	22211 CAW33	22211 CAKW33
55	120	29	148.200	157.700	7,125	2.0	1.700	21311 CAW33	21311 CAKW33
55	120	43	256.500	266.000	5,320	2.0	2.450	22311 CAW33	22311 CAKW33
60	110	28	148.200	157.700	7,125	1.5	1.150	22212 CAW33	22212 CAKW33
60	130	31	201.400	228.000	5,985	2.1	2.100	21312 CAW33	21312 CAKW33
60	130	46	294.500	318.250	5,035	2.1	3.100	22312 CAW33	22312 CAKW33
65	120	31	183.350	205.200	6,650	1.5	1.550	22213 CAW33	22213 CAKW33
65	140	33	224.200	256.500	5,700	2.1	2.550	21313 CAW33	21313 CAKW33
65	140	48	323.000	342.000	4,750	2.1	3.750	22313 CAW33	22313 CAKW33
70	125	31	197.600	216.600	6,365	1.5	1.550	22214 CAW33	22214 CAKW33
70	150	35	270.750	308.750	5,320	2.1	3.100	21314 CAW33	21314 CAKW33
70	150	51	380.000	408.500	4,275	2.1	4.550	22314 CAW33	22314 CAKW33
75	130	31	201.400	228.000	5,985	1.5	1.700	22215 CAW33	22215 CAKW33
75	160	37	270.750	308.750	5,320	2.1	3.750	21315 CAW33	21315 CAKW33
75	160	55	418.000	451.250	4,085	2.1	5.550	22315 CAW33	22315 CAKW33
80	140	33	224.200	256.500	5,700	2.0	2.100	22216 CAW33	22216 CAKW33
80	170	39	308.750	356.250	5,035	2.1	4.450	21316 CAW33	21316 CAKW33

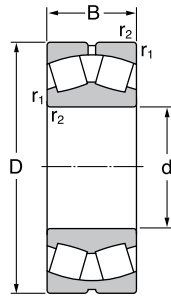
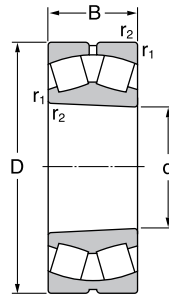


Cylindrical bore
圆柱孔

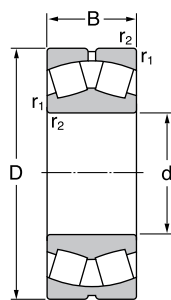


Tapered bore
圆锥孔

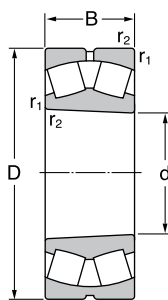
Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
80	170	58	465.500	513.000	3,800	2.1	6.600	22316 CAW33	22316 CAKW33
85	150	36	270.750	308.750	5,320	2.0	2.650	22217 CAW33	22217 CAKW33
85	180	41	308.750	356.250	5,035	3.0	5.200	21317 CAW33	21317 CAKW33
85	180	60	522.500	589.000	3,610	3.0	7.650	22317 CAW33	22317 CAKW33
90	160	40	308.750	356.250	5,035	2.0	3.400	22218 CAW33	22218 CAKW33
90	160	52.4	337.250	418.000	3,610	2.0	4.650	23218 CAW33	23218 CAKW33
90	190	43	361.000	427.500	4,560	3.0	6.100	21318 CAW33	21318 CAKW33
90	190	64	579.500	660.250	3,420	3.0	9.050	22318 CAW33	22318 CAKW33
95	170	43	361.000	427.500	4,560	2.1	4.150	22219 CAW33	22219 CAKW33
95	200	45	403.750	465.500	4,275	3.0	7.050	21319 CAW33	21319 CAKW33
95	200	67	636.500	726.750	3,230	3.0	10.500	22319 CAW33	22319 CAKW33
100	150	50	270.750	394.250	3,800	1.5	3.150	24020 CAW33	24020 CAK30W33
100	165	52	346.750	465.500	3,800	2.0	4.550	23120 CAW33	23120 CAKW33
100	165	65	432.250	608.000	3,040	2.0	5.650	24120 CAW33	24120 CAK30W33
100	180	46	403.750	465.500	4,275	2.1	4.900	22220 CAW33	22220 CAKW33
100	180	60.3	451.250	570.000	3,230	2.1	6.850	23220 CAW33	23220 CAKW33
100	215	47	403.750	465.500	4,275	3.0	8.600	21320 CAW33	21320 CAKW33
100	215	73	774.250	902.500	2,850	3.0	13.500	22320 CAW33	22320 CAKW33
110	170	45	294.500	418.000	4,085	2.0	3.800	23022 CAW33	23022 CAKW33
110	170	60	394.250	589.000	3,420	2.0	5.000	24022 CAW33	24022 CAK30W33
110	180	56	408.500	555.750	3,420	2.0	5.750	23122 CAW33	23122 CAKW33
110	180	69	494.000	712.500	2,850	2.0	7.100	24122 CAW33	24122 CAK30W33
110	200	53	532.000	608.000	3,800	2.1	7.000	22222 CAW33	22222 CAKW33
110	200	69.8	570.000	726.750	3,040	2.1	9.850	23222 CAW33	23222 CAKW33
110	240	80	902.500	1,064.000	2,660	3.0	18.400	22322 CAW33	22322 CAKW33
120	180	46	337.250	484.500	3,800	2.0	4.200	23024 CAW33	23024 KCAW33
120	180	60	408.500	636.500	3,230	2.0	5.450	24024 CAW33	24024 CAK30W33
120	200	62	484.500	660.250	3,230	2.0	8.000	23124 CAW33	23124 CAKW33
120	200	80	622.250	902.500	2,470	2.0	10.300	24124 CAW33	24124 CAK30W33
120	215	58	598.500	726.750	3,610	2.1	8.700	22224 CAW33	22224 CAKW33
120	215	76	660.250	883.500	2,660	2.1	12.000	23224 CAW33	23224 CAKW33
120	260	86	916.750	1,064.000	2,470	3.0	23.000	22324 CAW33	22324 CAKW33

Cylindrical bore
圆柱孔Tapered bore
圆锥孔

Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
130	200	52	408.500	579.500	3,420	2.0	6.000	23026 CAW33	23026 CAKW33
130	200	69	513.000	774.250	2,850	2.0	8.050	24026 CAW33	24026 CAK30W33
130	210	64	532.000	741.000	3,040	2.0	8.800	23126 CAW33	23126 CAKW33
130	210	80	646.000	950.000	2,280	2.0	11.000	24126 CAW33	24126 CAK30W33
130	230	64	698.250	883.500	3,420	3.0	11.000	22226 CAW33	22226 CAKW33
130	230	80	741.000	1,007.000	2,470	3.0	14.500	23226 CAW33	23226 CAKW33
130	280	93	1,064.000	1,254.000	2,280	4.0	29.000	22326 CAW33	22326 CAKW33
140	210	53	441.750	646.000	3,230	2.0	6.550	23028 CAW33	23028 CAKW33
140	210	69	541.500	855.000	2,660	2.0	8.550	24028 CAW33	24028 CAK30W33
140	225	68	598.500	855.000	2,660	2.1	10.500	23128 CAW33	23128 CAKW33
140	225	85	726.750	1,102.000	2,280	2.1	13.500	24128 CAW33	24128 CAK30W33
140	250	68	674.500	855.000	3,040	3.0	14.000	22228 CAW33	22228 CAKW33
140	250	88	869.250	1,187.500	2,280	3.0	19.000	23228 CAW33	23228 CAKW33
140	300	102	1,225.500	1,482.000	2,090	4.0	36.500	22328 CAW33	22328 CAKW33
150	225	56	484.500	712.500	3,040	2.1	7.950	23030 CAW33	23030 CAKW33
150	225	75	622.250	988.000	2,470	2.1	10.500	24030 CAW33	24030 CAK30W33
150	250	80	788.500	1,140.000	2,470	2.1	16.000	23130 CAW33	23130 CAKW33
150	250	100	969.000	1,453.500	2,090	2.1	20.000	24130 CAW33	24130 CAK30W33
150	270	73	807.500	1,026.000	2,850	3.0	18.000	22230 CAW33	22230 CAKW33
150	270	96	1,026.000	1,387.000	2,090	3.0	24.500	23230 CAW33	23230 CAKW33
150	320	108	1,387.000	1,672.000	1,900	4.0	43.500	22330 CAW33	22330 CAKW33
160	240	60	555.750	836.000	2,850	2.1	9.700	23032 CAW33	23032 CAKW33
160	240	80	712.500	1,140.000	2,280	2.1	13.000	24032 CAW33	24032 CAK30W33
160	270	86	931.000	1,301.500	2,280	2.1	20.500	23132 CAW33	23132 CAKW33
160	270	109	1,121.000	1,672.000	1,805	2.1	25.000	24132 CAW33	24132 CAK30W33
160	290	80	950.000	1,225.500	2,660	3.0	22.500	22232 CAW33	22232 CAKW33
160	290	104	1,159.000	1,577.000	2,090	3.0	31.000	23232 CAW33	23232 CAKW33
160	340	114	1,520.000	1,862.000	1,805	4.0	52.000	22332 CAW33	22332 CAKW33
170	260	67	674.500	1,007.000	2,660	2.1	13.000	23034 CAW33	23034 CAKW33
170	260	90	883.500	1,387.000	2,280	2.1	17.500	24034 CAW33	24034 CAK30W33
170	280	88	988.000	1,425.000	2,280	2.1	22.000	23134 CAW33	23134 CAKW33
170	280	109	1,159.000	1,767.000	1,805	2.1	27.500	24134 CAW33	24134 CAK30W33

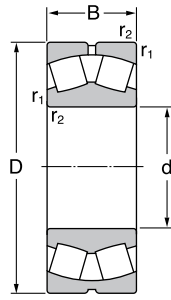
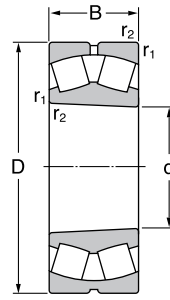


Cylindrical bore
圆柱孔

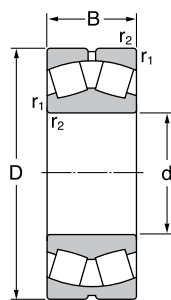


Tapered bore
圆锥孔

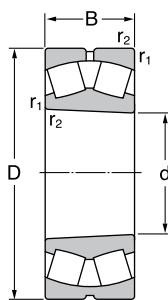
Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
170	310	86	1,064.000	1,387.000	2,470	4.0	28.500	22234 CAW33	22234 CAKW33
170	310	110	1,330.000	1,833.500	1,900	4.0	37.500	23234 CAW33	23234 CAKW33
170	360	120	1,672.000	2,052.000	1,710	4.0	61.000	22334 CAW33	22334 CAKW33
180	250	52	409.450	788.500	2,660	2.0	7.900	23936 CAW33	23936 CAKW33
180	280	74	788.500	1,187.500	2,470	2.1	17.000	23036 CAW33	23036 CAKW33
180	280	100	1,026.000	1,643.500	2,090	2.1	23.000	24036 CAW33	24036 CAK30W33
180	300	96	1,140.000	1,672.000	2,090	3.0	28.000	23136 CAW33	23136 CAKW33
180	300	118	1,330.000	2,052.000	1,615	3.0	34.500	24136 CAW33	24136 CAK30W33
180	320	86	1,121.000	1,482.000	2,470	4.0	29.500	22236 CAW33	22236 CAKW33
180	320	112	1,425.000	2,014.000	1,805	4.0	39.500	23236 CAW33	23236 CAKW33
180	380	126	1,900.000	2,327.500	1,615	4.0	71.500	22336 CAW33	22336 CAKW33
190	260	52	393.300	760.000	2,470	2.0	8.300	23938 CAW33	23938 CAKW33
190	290	75	821.750	1,273.000	2,280	2.1	18.000	23038 CAW33	23038 CAKW33
190	290	100	1,064.000	1,710.000	1,900	2.1	24.500	24038 CAW33	24038 CAK30W33
190	320	104	1,301.500	1,976.000	1,900	3.0	35.000	23138 CAW33	23138 CAKW33
190	320	128	1,520.000	2,375.000	1,520	3.0	43.000	24138 CAW33	24138 CAK30W33
190	340	92	1,206.500	1,615.000	2,280	4.0	36.500	22238 CAW33	22238 CAKW33
190	340	120	1,577.000	2,280.000	1,710	4.0	48.000	23238 CAW33	23238 CAKW33
190	400	132	2,014.000	2,517.500	1,520	5.0	82.500	22338 CAW33	22338 CAKW33
200	280	60	518.700	988.000	2,280	2.1	11.500	23940 CAW33	23940 CAKW33
200	310	82	950.000	1,453.500	2,090	2.1	23.300	23040 CAW33	23040 CAKW33
200	310	109	1,225.500	2,014.000	1,805	2.1	31.000	24040 CAW33	24040 CAK30W33
200	340	112	1,520.000	2,242.000	1,805	3.0	43.000	23140 CAW33	23140 CAKW33
200	340	140	1,710.000	2,660.000	1,425	3.0	53.500	24140 CAW33	24140 CAK30W33
200	360	98	1,387.000	1,833.500	2,090	4.0	43.500	22240 CAW33	22240 CAKW33
200	360	128	1,767.000	2,565.000	1,615	4.0	58.000	23240 CAW33	23240 CAKW33
200	420	138	2,204.000	2,755.000	1,425	5.0	95.000	22340 CAW33	22340 CAKW33
220	300	60	518.700	1,026.000	2,090	2.1	12.500	23944 CAW33	23944 CAKW33
220	340	90	1,159.000	1,767.000	1,900	3.0	30.500	23044 CAW33	23044 CAKW33
220	340	118	1,482.000	2,470.000	1,615	3.0	40.000	24044 CAW33	24044 CAK30W33
220	370	120	1,710.000	2,612.500	1,615	4.0	53.500	23144 CAW33	23144 CAKW33
220	370	150	2,014.000	3,182.500	1,330	4.0	67.000	24144 CAW33	24144 CAK30W33

Cylindrical bore
圆柱孔Tapered bore
圆锥孔

Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
220	400	108	1,672.000	2,242.000	1,900	4.0	60.500	22244 CAW33	22244 CAKW33
220	400	144	2,242.000	3,277.500	1,425	4.0	81.500	23244 CAW33	23244 CAKW33
220	460	145	2,565.000	3,277.500	1,330	5.0	120.000	22344 CAW33	22344 CAKW33
240	320	60	535.800	1,102.000	1,900	2.1	13.500	23948 CAW33	23948 CAKW33
240	360	92	1,225.500	1,976.000	1,805	3.0	33.500	23048 CAW33	23048 CAKW33
240	360	118	1,520.000	2,565.000	1,520	3.0	43.000	24048 CAW33	24048 CAK30W33
240	400	128	1,976.000	3,040.000	1,520	4.0	66.500	23148 CAW33	23148 CAKW33
240	400	160	2,280.000	3,705.000	1,235	4.0	83.000	24148 CAW33	24148 CAK30W33
240	440	120	2,090.000	2,850.000	1,710	4.0	83.000	22248 CAW33	22248 CAKW33
240	440	160	2,755.000	4,085.000	1,235	4.0	110.000	23248 CAW33	23248 CAKW33
240	500	155	2,945.000	3,800.000	1,235	5.0	115.000	22348 CAW33	22348 CAKW33
260	360	75	836.000	1,710.000	1,805	2.1	23.500	23952 CAW33	23952 CAKW33
260	400	104	1,520.000	2,422.500	1,615	4.0	48.500	23052 CAW33	23052 CAKW33
260	400	140	1,938.000	3,277.500	1,330	4.0	65.500	24052 CAW33	24052 CAK30W33
260	440	144	2,422.500	3,705.000	1,330	4.0	90.500	23152 CAW33	23152 CAKW33
260	440	180	2,850.000	4,560.000	1,140	4.0	110.000	24152 CAW33	24152 CAK30W33
260	480	130	2,517.500	3,372.500	1,520	5.0	110.000	22252 CAW33	22252 CAKW33
260	480	174	3,087.500	4,512.500	1,140	5.0	140.000	23252 CAW33	23252 CAKW33
260	540	165	3,372.500	4,322.500	1,045	6.0	190.000	22352 CAW33	22352 CAKW33
280	380	75	802.750	1,672.000	1,615	2.1	25.000	23956 CAW33	23956 CAKW33
280	420	106	1,643.500	2,707.500	1,520	4.0	52.500	23056 CAW33	23056 CAKW33
280	420	140	2,052.000	3,610.000	1,330	4.0	69.500	24056 CAW33	24056 CAK30W33
280	460	146	2,517.500	4,037.500	1,235	5.0	97.000	23156 CAW33	23156 CAKW33
280	460	180	2,945.000	4,845.000	1,045	5.0	120.000	24156 CAW33	24156 CAK30W33
280	500	130	2,565.000	3,562.500	1,425	5.0	115.000	22256 CAW33	22256 CAKW33
280	500	176	3,087.500	4,655.000	1,045	5.0	150.000	23256 CAW33	23256 CAKW33
280	580	175	3,800.000	4,940.000	1,045	6.0	235.000	22356 CAW33	22356 CAKW33
300	380	60	623.200	1,520.000	1,615	2.1	16.500	23860 CAW33	23860 CAKW33
300	420	90	1,140.000	2,375.000	1,520	3.0	39.500	23960 CAW33	23960 CAKW33
300	460	118	2,014.000	3,277.500	1,425	4.0	71.500	23060 CAW33	23060 CAKW33
300	460	160	2,565.000	4,512.500	1,140	4.0	97.000	24060 CAW33	24060 CAK30W33
300	500	160	3,040.000	4,845.000	1,140	5.0	125.000	23160 CAW33	23160 CAKW33

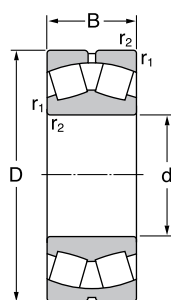
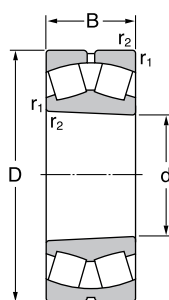


Cylindrical bore
圆柱孔

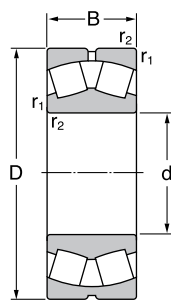


Tapered bore
圆锥孔

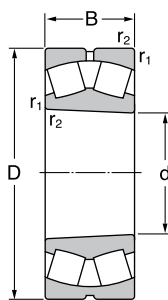
Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
300	500	200	3,562.500	5,985.000	95	5.0	160.000	24160 CAW33	24160 CAK30W33
300	540	140	2,992.500	4,037.500	1,330	5.0	145.000	22260 CAW33	22260 CAKW33
300	540	192	3,705.000	5,557.500	95	5.0	190.000	23260 CAW33	23260 CAKW33
320	440	90	1,358.500	2,565.000	1,425	3.0	42.000	23964 CAW33	23964 CAKW33
320	480	121	2,128.000	3,610.000	1,330	4.0	78.000	23064 CAW33	23064 CAKW33
320	480	160	2,707.500	4,845.000	1,140	4.0	100.000	24064 CAW33	24064 CAK30W33
320	540	176	3,562.500	5,700.000	1,045	5.0	165.000	23164 CAW33	23164 CAKW33
320	540	218	4,037.500	6,745.000	85	5.0	210.000	24164 CAW33	24164 CAK30W33
320	580	150	3,420.000	4,655.000	1,235	5.0	175.000	22264 CAW33	22264 CAKW33
320	580	208	4,180.000	6,365.000	903	5.0	240.000	23264 CAW33	23264 CAKW33
340	460	90	1,387.000	2,660.000	1,330	3.0	45.500	23968 CAW33	23968 CAKW33
340	520	133	2,565.000	4,322.500	1,235	5.0	105.000	23068 CAW33	23068 CAKW33
340	520	180	3,277.500	5,890.000	1,045	5.0	140.000	24068 CAW33	24068 CAK30W33
340	580	190	4,037.500	6,460.000	950	5.0	210.000	23168 CAW33	23168 CAKW33
340	580	243	5,035.000	8,217.500	808	5.0	280.000	24168 CAW33	24168 CAK30W33
340	620	224	4,845.000	7,410.000	760	6.0	295.000	23268 CAW33	23268 CAKW33
360	480	90	1,330.000	2,612.500	1,235	3.0	46.000	23972 CAW33	23972 CAKW33
360	540	134	2,612.500	4,560.000	1,140	5.0	110.000	23072 CAW33	23072 CAKW33
360	540	180	3,372.500	6,222.500	950	5.0	145.000	24072 CAW33	24072 CAK30W33
360	600	192	4,085.000	6,602.500	950	5.0	220.000	23172 CAW33	23172 CAKW33
360	600	243	5,320.000	8,835.000	760	5.0	280.000	24172 CAW33	24172 CAK30W33
360	650	170	4,085.000	5,890.000	808	6.0	255.000	22272 CAW33	22272 CAKW33
360	650	232	5,130.000	7,885.000	713	6.0	335.000	23272 CAW33	23272 CAKW33
380	520	106	1,862.000	3,610.000	1,140	4.0	69.000	23976 CAW33	23976 CAKW33
380	560	135	2,755.000	4,750.000	1,140	5.0	115.000	23076 CAW33	23076 CAKW33
380	560	180	3,420.000	6,460.000	903	5.0	150.000	24076 CAW33	24076 CAK30W33
380	620	194	4,180.000	6,745.000	950	5.0	230.000	23176 CAW33	23176 CAKW33
380	620	243	5,415.000	9,310.000	808	5.0	300.000	24176 CAW33	24176 CAK30W33
380	680	240	5,557.500	8,692.500	713	6.0	375.000	23276 CAW33	23276 CAKW33
400	540	106	1,900.000	3,705.000	1,140	4.0	71.000	23980 CAW33	23980 CAKW33
400	600	148	3,087.500	5,415.000	1,045	5.0	150.000	23080 CAW33	23080 CAKW33
400	600	200	4,085.000	7,600.000	855	5.0	205.000	24080 CAW33	24080 CAK30W33

Cylindrical bore
圆柱孔Tapered bore
圆锥孔

Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
400	650	200	4,417.500	7,267.500	903	6.0	265.000	23180 CAW33	23180 CAKW33
400	650	250	5,890.000	10,070.000	760	6.0	340.000	24180 CAW33	24180 CAK30W33
400	720	256	6,222.500	9,880.000	637	6.0	450.000	23280 CAW33	23280 CAKW33
400	820	243	7,125.000	9,880.000	713	7.5	650.000	22380 CAW33	22380 CAKW33
420	560	106	1,938.000	3,942.500	1,045	3.0	74.500	23984 CAW33	23984 CAKW33
420	620	150	3,230.000	5,700.000	1,045	5.0	155.000	23084 CAW33	23084 CAKW33
420	620	200	4,180.000	7,885.000	855	5.0	210.000	24084 CAW33	24084 CAK30W33
420	700	224	5,320.000	8,835.000	855	6.0	350.000	23184 CAW33	23184 CAKW33
420	700	280	6,982.500	11,970.000	665	6.0	445.000	24184 CAW33	24184 CAK30W33
420	760	272	6,982.500	11,020.000	599	7.5	535.000	23284 CAW33	23284 CAKW33
440	600	118	2,327.500	4,655.000	950	4.0	99.500	23988 CAW33	23988 CAKW33
440	650	157	3,467.500	6,222.500	950	6.0	180.000	23088 CAW33	23088 CAKW33
440	650	212	4,560.000	8,692.500	808	6.0	245.000	24088 CAW33	24088 CAK30W33
440	720	226	5,700.000	9,500.000	808	6.0	360.000	23188 CAW33	23188 CAKW33
440	720	280	7,125.000	12,540.000	665	6.0	460.000	24188 CAW33	24188 CAK30W33
440	790	280	7,410.000	11,875.000	570	7.5	590.000	23288 CAW33	23288 CAKW33
460	580	118	1,700.500	4,655.000	1,045	3.0	75.500	24892 CAW33	24892 CAK30W33
460	620	118	2,375.000	4,750.000	950	4.0	105.000	23992 CAW33	23992 CAKW33
460	680	163	3,705.000	6,602.500	903	6.0	205.000	23092 CAW33	23092 CAKW33
460	680	218	4,940.000	9,500.000	760	6.0	275.000	24092 CAW33	24092 CAK30W33
460	760	240	6,080.000	10,260.000	760	7.5	440.000	23192 CAW33	23192 CAKW33
460	760	300	7,885.000	13,870.000	637	7.5	560.000	24192 CAW33	24192 CAK30W33
460	830	296	8,075.000	13,015.000	532	7.5	695.000	23292 CAW33	23292 CAKW33
480	600	90	1,368.000	3,562.500	1,045	3.0	61.000	23896 CAW33	23896 CAKW33
480	650	128	2,755.000	5,415.000	950	5.0	125.000	23996 CAW33	23996 CAKW33
480	700	165	3,705.000	6,460.000	903	6.0	215.000	23096 CAW33	23096 CAKW33
480	700	218	5,035.000	9,880.000	713	6.0	285.000	24096 CAW33	24096 CAK30W33
480	790	248	6,602.500	11,400.000	713	7.5	485.000	23196 CAW33	23196 CAKW33
480	790	308	8,550.000	14,820.000	599	7.5	605.000	24196 CAW33	24196 CAK30W33
480	870	310	8,835.000	14,250.000	504	7.5	800.000	23296 CAW33	23296 CAKW33
500	620	90	1,406.000	3,800.000	950	3.0	62.000	238/500 CAW33	238/500 CAKW33
500	670	128	2,755.000	5,700.000	903	5.0	130.000	239/500 CAW33	239/500 CAKW33

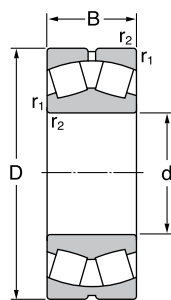
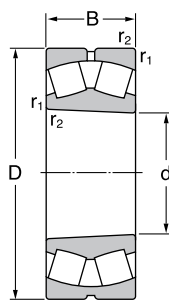


Cylindrical bore
圆柱孔

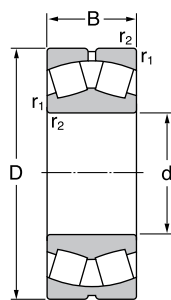


Tapered bore
圆锥孔

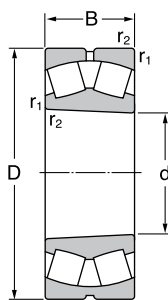
Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
500	720	167	3,942.500	7,410.000	855	6.0	225.000	230/500 CAW33	230/500 CAKW33
500	720	218	5,225.000	10,450.000	665	6.0	295.000	240/500 CAW33	240/500 CAK30W33
500	830	264	7,267.500	12,255.000	665	7.5	580.000	231/500 CAW33	231/500 CAKW33
500	830	325	9,310.000	16,150.000	570	7.5	700.000	241/500 CAW33	241/500 CAK30W33
500	920	336	10,070.000	16,435.000	475	7.5	985.000	232/500 CAW33	232/500 CAKW33
530	650	118	1,748.000	5,035.000	903	3.0	86.000	248/530 CAW33	248/530 CAK30W33
530	710	136	3,040.000	6,365.000	855	5.0	155.000	239/530 CAW33	239/530 CAKW33
530	780	185	4,845.000	8,835.000	760	6.0	310.000	230/530 CAW33	230/530 CAKW33
530	780	250	6,365.000	12,540.000	637	6.0	410.000	240/530 CAW33	240/530 CAK30W33
530	870	272	7,742.500	13,300.000	637	7.5	645.000	231/530 CAW33	231/530 CAKW33
530	870	335	10,070.000	18,050.000	532	7.5	830.000	241/530 CAW33	241/530 CAK30W33
530	980	355	10,545.000	19,380.000	456	9.5	1200.000	232/530 CAW33	232/530 CAKW33
560	750	140	3,277.500	6,840.000	808	5.0	175.000	239/560 CAW33	239/560 CAKW33
560	820	195	5,320.000	9,690.000	713	6.0	355.000	230/560 CAW33	230/560 CAKW33
560	820	258	6,982.500	13,870.000	599	6.0	465.000	240/560 CAW33	240/560 CAK30W33
560	920	280	8,692.500	15,200.000	599	7.5	740.000	231/560 CAW33	231/560 CAKW33
560	920	355	11,400.000	20,520.000	475	7.5	985.000	241/560 CAW33	241/560 CAK30W33
560	1030	365	10,925.000	20,900.000	409	9.5	1350.000	232/560 CAW33	232/560 CAKW33
600	800	150	3,705.000	7,885.000	713	5.0	220.000	239/600 CAW33	239/600 CAKW33
600	870	200	5,700.000	10,830.000	665	6.0	405.000	230/600 CAW33	230/600 CAKW33
600	870	272	7,742.500	16,150.000	532	6.0	520.000	240/600 CAW33	240/600 CAK30W33
600	980	300	9,690.000	17,100.000	532	7.5	895.000	231/600 CAW33	231/600 CAKW33
600	980	375	10,925.000	22,420.000	456	7.5	1200.000	241/600 CAW33	241/600 CAK30W33
600	1090	388	12,445.000	24,225.000	380	9.5	1600.000	232/600 CAW33	232/600 CAKW33
630	780	112	2,080.500	5,795.000	713	4.0	120.000	238/630 CAW33	238/630 CAKW33
630	850	165	4,417.500	9,310.000	665	6.0	280.000	239/630 CAW33	239/630 CAKW33
630	920	212	6,365.000	11,875.000	637	7.5	485.000	230/630 CAW33	230/630 CAKW33
630	920	290	8,360.000	17,100.000	504	7.5	645.000	240/630 CAW33	240/630 CAK30W33
630	1030	315	9,975.000	19,760.000	504	7.5	1050.000	231/630 CAW33	231/630 CAKW33
630	1030	400	12,065.000	25,650.000	428	7.5	1400.000	241/630 CAW33	241/630 CAK30W33
670	820	112	2,137.500	6,080.000	665	4.0	130.000	238/670 CAW33	238/670 CAKW33
670	820	150	2,954.500	9,025.000	665	4.0	172.000	248/670 CAW33	248/670 CAK30W33

Cylindrical bore
圆柱孔Tapered bore
圆锥孔

Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
670	900	170	4,750.000	10,260.000	637	6.0	315.000	239/670 CAW33	239/670 CAKW33
670	980	230	7,267.500	13,870.000	570	7.5	600.000	230/670 CAW33	230/670 CAKW33
670	980	308	9,500.000	19,380.000	475	7.5	790.000	240/670 CAW33	240/670 CAK30W33
670	1090	336	10,355.000	21,280.000	475	7.5	1250.000	231/670 CAW33	231/670 CAKW33
670	1090	412	13,110.000	27,550.000	380	7.5	1600.000	241/670 CAW33	241/670 CAK30W33
670	1220	438	14,630.000	28,975.000	342	12.0	2270.000	232/670 CAW33	232/670 CAKW33
710	870	118	2,451.000	7,125.000	637	4.0	153.000	238/710 CAW33	238/710 CAKW33
710	950	180	5,320.000	11,400.000	570	6.0	365.000	239/710 CAW33	239/710 CAKW33
710	950	243	6,460.000	14,820.000	475	6.0	495.000	249/710 CAW33	249/710 CAK30W33
710	1030	236	7,885.000	15,485.000	532	7.5	670.000	230/710 CAW33	230/710 CAKW33
710	1030	315	9,880.000	20,900.000	428	7.5	895.000	240/710 CAW33	240/710 CAK30W33
710	1150	345	11,590.000	24,700.000	428	9.5	1450.000	231/710 CAW33	231/710 CAKW33
710	1150	438	14,440.000	30,875.000	361	9.5	1900.000	241/710 CAW33	241/710 CAK30W33
710	1280	450	16,720.000	32,775.000	304	12.0	2610.000	232/710 CAW33	232/710 CAKW33
750	920	128	2,783.500	8,075.000	570	5.0	180.000	238/750 CAW33	238/750 CAKW33
750	1000	185	5,700.000	12,540.000	532	6.0	420.000	239/750 CAW33	239/750 CAKW33
750	1000	250	7,267.500	17,100.000	456	6.0	560.000	249/750 CAW33	249/750 CAK30W33
750	1090	250	9,167.500	17,670.000	504	7.5	795.000	230/750 CAW33	230/750 CAKW33
750	1090	335	10,830.000	22,800.000	409	7.5	1065.000	240/750 CAW33	240/750 CAK30W33
750	1220	365	13,110.000	27,550.000	409	9.5	1700.000	231/750 CAW33	231/750 CAKW33
750	1220	475	16,435.000	35,625.000	342	9.5	2100.000	241/750 CAW33	241/750 CAK30W33
750	1360	475	17,765.000	34,675.000	285	15.0	3050.000	232/750 CAW33	232/750 CAKW33
800	980	180	3,933.000	12,255.000	532	5.0	300.000	248/800 CAW33	248/800 CAK30W33
800	1060	195	6,080.000	13,585.000	504	6.0	470.000	239/800 CAW33	239/800 CAKW33
800	1060	258	7,600.000	18,335.000	409	6.0	640.000	249/800 CAW33	249/800 CAK30W33
800	1150	258	9,500.000	19,000.000	456	7.5	895.000	230/800 CAW33	230/800 CAKW33
800	1150	345	11,875.000	26,125.000	380	7.5	1200.000	240/800 CAW33	240/800 CAK30W33
800	1280	375	14,060.000	29,925.000	380	9.5	1920.000	231/800 CAW33	231/800 CAKW33
800	1280	475	17,480.000	38,475.000	304	9.5	2300.000	241/800 CAW33	241/800 CAK30W33
850	1030	136	3,173.000	9,500.000	504	5.0	240.000	238/850 CAW33	238/850 CAKW33
850	1120	200	6,602.500	14,820.000	456	6.0	560.000	239/850 CAW33	239/850 CAKW33
850	1120	272	8,835.000	21,660.000	380	6.0	740.000	249/850 CAW33	249/850 CAK30W33

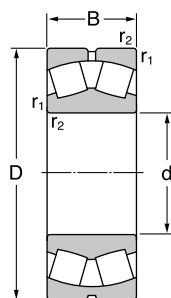
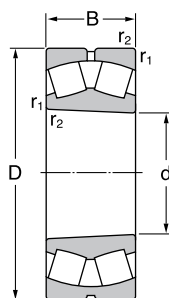


Cylindrical bore
圆柱孔



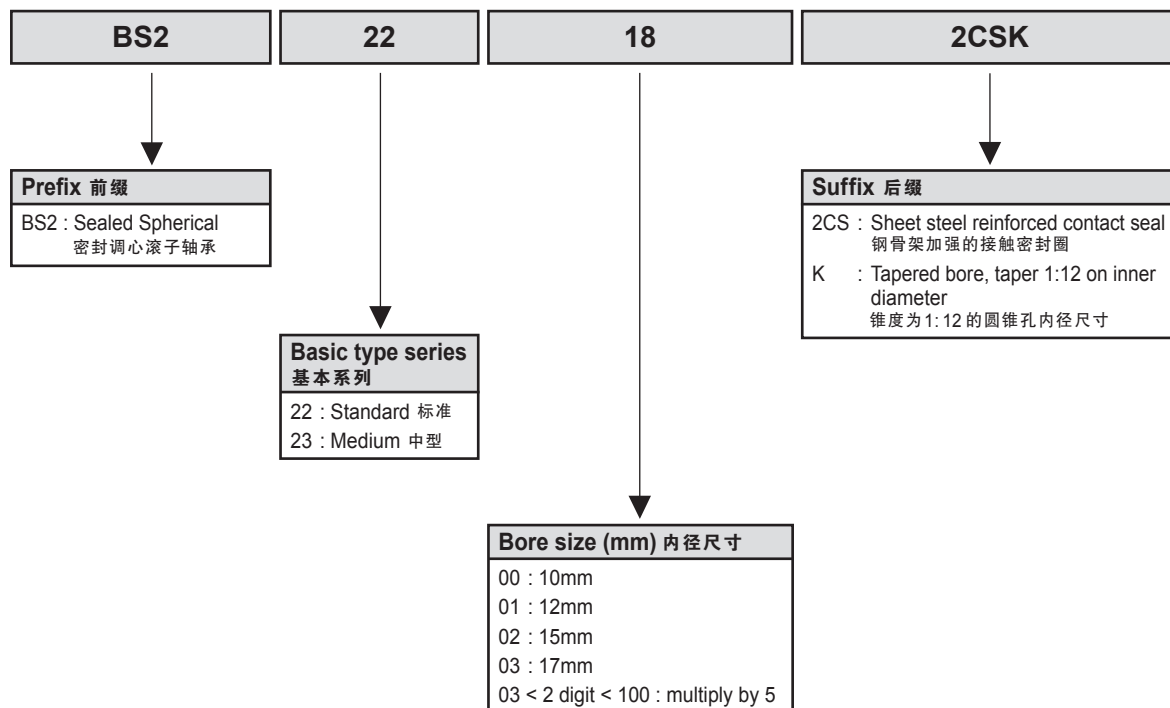
Tapered bore
圆锥孔

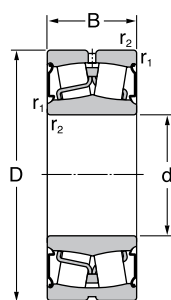
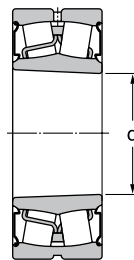
Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r ₁₂ max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
850	1220	272	8,901.500	20,520.000	428	7.5	1050.000	230/850 CAW33	230/850 CAKW33
850	1220	365	12,065.000	29,925.000	342	7.5	1410.000	240/850 CAW33	240/850 CAK30W33
850	1360	400	15,295.000	32,775.000	342	12.0	2200.000	231/850 CAW33	231/850 CAKW33
850	1360	500	19,190.000	42,750.000	285	12.0	2710.000	241/850 CAW33	241/850 CAK30W33
900	1090	190	4,427.000	14,535.000	456	5.0	370.000	248/900 CAW33	248/900 CAK30W33
900	1180	206	7,125.000	16,150.000	428	6.0	605.000	239/900 CAW33	239/900 CAKW33
900	1280	280	9,595.000	22,040.000	380	7.5	1200.000	230/900 CAW33	230/900 CAKW33
900	1280	375	12,920.000	32,775.000	323	7.5	1570.000	240/900 CAW33	240/900 CAK30W33
900	1420	515	20,330.000	46,550.000	266	12.0	3350.000	241/900 CAW33	241/900 CAK30W33
950	1250	224	6,887.500	18,620.000	409	7.5	755.000	239/950 CAW33	239/950 CAKW33
950	1250	300	8,740.000	24,700.000	323	7.5	1015.000	249/950 CAW33	249/950 CAK30W33
950	1360	300	11,400.000	27,075.000	361	7.5	1450.000	230/950 CAW33	230/950 CAKW33
950	1360	412	14,060.000	37,050.000	285	7.5	1990.000	240/950 CAW33	240/950 CAK30W33
950	1500	545	22,705.000	52,250.000	247	12.0	3535.000	241/950 CAW33	241/950 CAK30W33
1000	1220	165	4,427.000	13,585.000	380	6.0	410.000	238/1000 CAW33	238/1000 CAKW33
1000	1320	315	9,880.000	27,550.000	304	7.5	1200.000	249/1000 CAW33	249/1000 CAK30W33
1000	1420	308	12,065.000	28,975.000	342	7.5	1600.000	230/1000 CAW33	230/1000 CAKW33
1000	1420	412	14,630.000	38,475.000	266	7.5	2140.000	240/1000 CAW33	240/1000 CAK30W33
1000	1580	462	20,330.000	45,600.000	266	12.0	3500.000	231/1000 CAW33	231/1000 CAKW33
1000	1580	580	25,365.000	58,900.000	228	12.0	4300.000	241/1000 CAW33	241/1000 CAK30W33
1060	1280	165	4,531.500	14,250.000	361	6.0	435.000	238/1060 CAW33	238/1060 CAKW33
1060	1280	218	5,795.000	19,000.000	361	6.0	570.000	248/1060 CAW33	248/1060 CAK30W33
1060	1400	250	9,072.500	24,700.000	342	7.5	1100.000	239/1060 CAW33	239/1060 CAKW33
1060	1400	335	10,925.000	30,875.000	266	7.5	1400.000	249/1060 CAW33	249/1060 CAK30W33
1060	1500	325	13,110.000	32,300.000	304	9.5	2250.000	230/1060 CAW33	230/1060 CAKW33
1060	1500	438	16,435.000	43,225.000	247	9.5	2515.000	240/1060 CAW33	240/1060 CAK30W33
1120	1360	243	6,887.500	22,800.000	323	6.0	735.000	248/1120 CAW33	248/1120 CAK30W33
1120	1460	335	11,115.000	32,775.000	247	7.5	1500.000	249/1120 CAW33	249/1120 CAK30W33
1120	1580	462	17,765.000	47,500.000	228	9.5	2925.000	240/1120 CAW33	240/1120 CAK30W33
1180	1420	180	5,576.500	17,670.000	304	6.0	575.000	238/1180 CAW33	238/1180 CAKW33
1180	1420	243	7,324.500	25,650.000	304	6.0	770.000	248/1180 CAW33	248/1180 CAK30W33
1180	1540	272	10,545.000	29,450.000	285	7.5	1400.000	239/1180 CAW33	239/1180 CAKW33


 Cylindrical bore
 圆柱孔

 Tapered bore
 圆锥孔

Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Oil 油 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
1180	1540	355	12,920.000	38,475.000	228	7.5	1800.000	249/1180 CAW33	249/1180 CAK30W33
1250	1750	375	17,005.000	42,750.000	228	9.5	2840.000	230/1250 CAW33	230/1250 CAKW33
1320	1600	280	9,291.000	31,825.000	247	6.0	1160.000	248/1320 CAW33	248/1320 CAK30W33
1320	1720	400	15,295.000	46,550.000	190	7.5	2500.000	249/1320 CAW33	249/1320 CAK30W33
1500	1820	315	12,065.000	42,750.000	190	7.5	1710.000	248/1500 CAW33	248/1500 CAK30W33
1800	2180	375	16,720.000	59,850.000	124	9.5	2900.000	248/1800 CAW33	248/1800 CAK30W33

■ Prefix & Suffix 前缀与后缀



Cylindrical bore
圆柱孔Tapered bore
圆锥孔

Basic Dimensions 基本尺寸			Basic Load Ratings 基本载荷		Limiting Speed 极限转速	Chamfer Dimension 外角尺寸	Mass 重量	Designation 型号	
d mm	D mm	B mm	Dynamic 动载荷 C kN	Static 静载荷 C ₀ kN	Grease 脂 r/min	r _{1,2} max mm	kg	Bearings with Cylindrical Bore 圆柱孔轴承	Tapered Bore 圆锥孔轴承
25	52	23	46.550	41.800	3,420	1.0	0.310	BS2-2205-2CS	-
30	62	25	60.800	57.000	2,660	1.0	0.340	BS2-2206-2CS	-
35	72	28	82.175	80.750	2,280	1.1	0.520	BS2-2207-2CS	-
40	80	28	91.675	85.500	2,090	1.1	0.570	BS2-2208-2CS	BS2-2208-2CSK
40	90	38	142.500	133.000	1,805	1.5	1.200	BS2-2308-2CS	-
45	85	28	96.900	93.100	1,900	1.1	0.660	BS2-2209-2CS	BS2-2209-2CSK
50	90	28	98.800	102.600	1,805	1.1	0.700	BS2-2210-2CS	BS2-2210-2CSK
55	100	31	118.750	120.650	1,615	1.5	1.000	BS2-2211-2CS	BS2-2211-2CSK
55	120	49	256.500	266.000	1,330	2.0	2.800	BS2-2311-2CS	-
60	110	34	148.200	157.700	1,520	1.5	1.300	BS2-2212-2CS	BS2-2212-2CSK
65	120	38	183.350	205.200	1,425	1.5	1.600	BS2-2213-2CS	BS2-2213-2CSK
70	125	38	197.600	216.600	1,330	1.5	1.800	BS2-2214-2CS	BS2-2214-2CSK
75	130	38	201.400	228.000	1,235	1.5	2.100	BS2-2215-2CS	BS2-2215-2CSK
75	160	64	418.000	451.250	903	2.1	6.500	BS2-2315-2CS	-
80	140	40	224.200	256.500	1,140	2.0	2.400	BS2-2216-2CS	BS2-2216-2CSK
85	150	44	270.750	308.750	1,045	2.0	3.000	BS2-2217-2CS	BS2-2217-2CSK
90	160	48	308.750	356.250	950	2.0	3.700	BS2-2218-2CS	BS2-2218-2CSK



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