



PRODUCT CATALOG

ANGULAR CONTACT BALL BEARING SINGLE ROW

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Angular Contact Ball Bearing

SINGLE ROW

DESIGN | CHARACTERISTICS | APPLICATIONS

Single row angular contact bearings

Single row, angular contact ball bearings are non-separable bearings. These are specially designed to carry a combination of a radial load and a single direction thrust load. To carry thrust loads from opposing directions, these bearings are frequently mounted in duplex arrangement with the contact angles opposed. Paired angular contact bearings can be mounted in a variety of arrangements: "Face to Face", "Back to Back" and "Tandem" as illustrated.

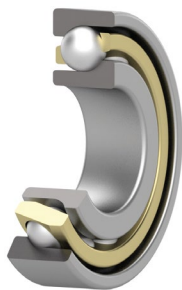
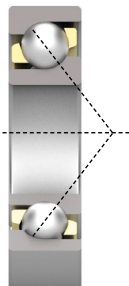
Bearings are also available with universally flush ground side surfaces of the inner and outer rings for duplex mountings. Flush ground bearings are available in different preloads to give axial rigidity. They can be mounted in any of three combinations depending on the loading characteristics.

Angular contact bearings are offered in extra light, light and medium series. Each series is available in 15°, 25° and 40° contact angles to fulfill a wide variety of applications. A higher contact angle increases thrust capacity and axial rigidity but reduces radial capacity and radial rigidity. Pressed steel and machined brass cages are available to meet a variety of speed and duty requirements.



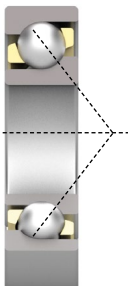
STEEL CAGE

SERIES 72 B, 73 B
CONTACT ANGLE
 $\alpha = 40^\circ$

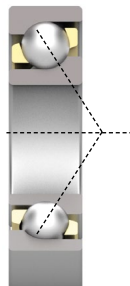


BRASS CAGE

SERIES 70 A, 72 A
CONTACT ANGLE
 $\alpha = 25^\circ$



SERIES 70 C, 72 C
CONTACT ANGLE
 $\alpha = 15^\circ$



Optimum load transmission starts with $F_a \geq F_r$. Radial forces induce internal axial forces which are absorbed by the opposed bearing. Such bearings should therefore be mounted in pairs and should be adjusted against another bearing. In the case of length variations of the shaft caused by changes in temperature, which in turn, affect the internal clearance, the distance between the bearings should be kept small.

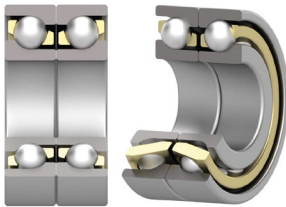
The maximum permissible speed is somewhat lower than that of deep groove ball bearings. A slight angular deflection is still possible while the single bearing; if bearings are mounted in pairs, however, rigidity greatly increases together with the ability to prevent misalignment.

BEARING ARRANGEMENT

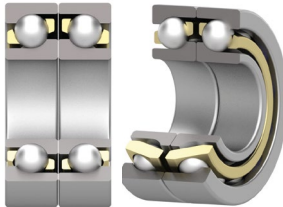
A back-to-back arrangement (closed face together, load line of the bearings diverging towards the shaft axis) is used where rigidity and an ability to absorb fitting moment is required.

A face-to-face arrangement (open faces together, load line of the bearings converging on shaft axis) is used where axial loads acting in both directions are to be catered for by one bearing in one direction. Rigidity is not as good as the back-to-back arrangement and there is less ability to absorb fitting moments.

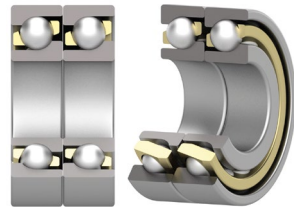
A tandem arrangement (open face-to-closed-face load lines being parallel to each other) is used for thrust loads equally distributed over all bearings, absorbed in one direction only. Adjustment against another bearing which accommodates the opposed thrust load is necessary.



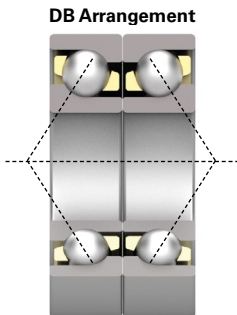
**Back-to-Back
(DB Arrangement)**



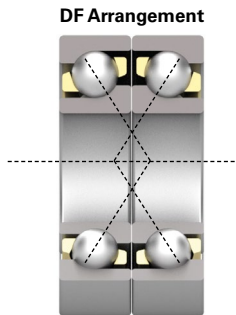
**Face-to-Face
(DF Arrangement)**



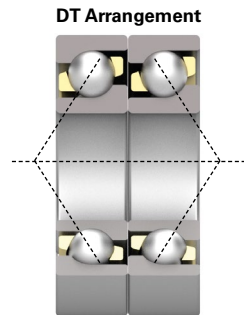
**Tandem
(DT Arrangement)**



DB Arrangement



DF Arrangement



DT Arrangement

Universal match bearings can be mounted in any of three combinations depending on the loading characteristics. Suffix CB.

Angular Contact Ball Bearing

SINGLE ROW

ANGULAR MISALIGNMENT

The following is an approximate guide to the misalignment that can be prevalent when fitting angular contact bearings:

0.0003 radians

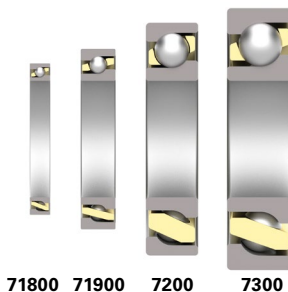
ISO SPECIFICATIONS

- Dimensions in accordance with ISO 15 (latest version)
- Precision class in accordance with ISO 492 (latest version)

SERIES

The standard series are 71800 | 71900 | 7200 | 7300 |

The standard contact angle is 40° (Suffix B)



NOMENCLATURE

Suffixes:

B : Contact angle of 40° | Is Rollway standard contact angle

A : Contact angle of 25°

C : Contact angle of 15°

CB : Universal matching medium clearance | Steel cage

CBM : Universal matching medium clearance | Brass cage

M : Brass cage. Typically for bore size over 100 mm

TN : Polyamide cage

P0 - P6 : Precision class

EQUIVALENT LOAD EQUATIONS

BEARINGS WITH 40° CONTACT ANGLE

Equivalent load P_e

For single row angular contact ball bearings (series 72B and 73B) with contact angle of 40°, the following relations apply for single and tandem mounted bearings.

$$P = F \quad \text{when} \quad F_a/F_r \leq 1.14$$

$$P = 0.35 F_r + 0.57 F_a \quad \text{when} \quad F_a/F_r > 1.14$$

For bearing pairs arranged back to back or face to face:

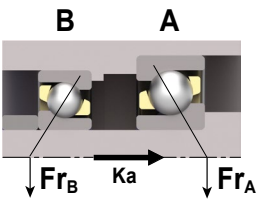
$$P = F_r + 0.55 F_a \quad \text{when} \quad F_a/F_r \leq 1.14$$

$$P = 0.57 F_r + 0.93 F_a \quad \text{when} \quad F_a/F_r > 1.14$$

For paired bearings, F_r and F_a are the loads acting on the pair.

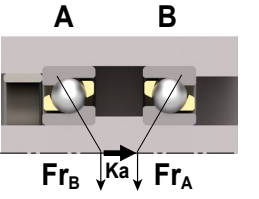
Since the loads are transmitted from one raceway to the other in an inclined position, radial loads induce axial reaction forces which must be considered when calculating the equivalent dynamic load. For calculation purpose the equations show where bearing A and bearing B are subjected to a radial load F_{rA} and F_{rB} respectively and are always considered positive even when they act in the opposite direction to that shown in the figures. The radial loads act at what is termed the pressure centre of the bearings which is given in the bearing tables as "a" dimension. There is an external force $K_a = 0$; the equations are valid only if the bearings have been adjusted against each other to practically zero clearance and no preload.

BEARING ARRANGEMENT AND LOAD EQUATION



1a) $F_{rA} \geq F_{rB}$
 $K_a \geq 0$

$F_{aA} = 1.14 F_{rA}$
 $F_{aB} = F_{aA} + K_a$



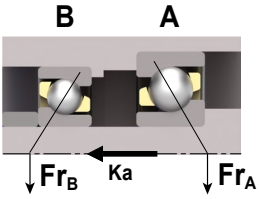
1b) $F_{rA} < F_{rB}$
 $K_a \geq 1.14 (F_{rB} - F_{rA})$

$F_{aA} = 1.14 F_{rA}$
 $F_{aB} = F_{aA} + K_a$



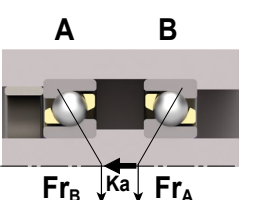
1c) $F_{rA} < F_{rB}$
 $K_a < 1.14 (F_{rB} - F_{rA})$

$F_{aA} = F_{aB} - K_a$
 $F_{aB} = 1.14 F_{rB}$



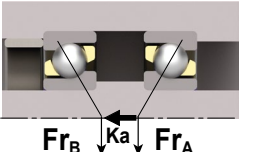
2a) $F_{rA} \leq F_{rB}$
 $K_a \geq 0$

$F_{aA} = F_{aB} + K_a$
 $F_{aB} = 1.14 F_{rB}$



2b) $F_{rA} > F_{rB}$
 $K_a \geq 1.14 (F_{rA} - F_{rB})$

$F_{aA} = F_{aB} + K_a$
 $F_{aB} = 1.14 F_{rB}$



2c) $F_{rA} > F_{rB}$
 $K_a < 1.14 (F_{rA} - F_{rB})$

$F_{aA} = 1.14 F_{rA}$
 $F_{aB} = F_{aA} - K_a$

Angular Contact Ball Bearing

SINGLE ROW

Equivalent static load P_o

For single row angular contact ball bearings of the 72 B and 73 B series, for bearings mounted singly or paired in tandem.

$P_o = 0.5 F_r + 0.26 F_a$ when $\frac{F_a}{F_r} < e$ $P_o = F_r$ should be used

For bearing pairs arranged back to back or face to face

$P_o = F_r + 0.52 F_a$ when F_r and F_a are the loads acting on the pair of bearings

BEARINGS WITH 15° CONTACT ANGLE

Equivalent load P_e

Single bearings and tandem mounted bearings.

$P = F_r$ when $\frac{F_a}{F_r} \leq e$

$P_o = 0.44 F_r + Y F_a$ when $\frac{F_a}{F_r} \leq e$

The thrust factor Y and values of e are dependent on $\frac{F_a}{i C_o}$ given in tables below
where C_o = static load rating [KN]
 i = number of bearings

$\frac{F_a}{i \cdot C_o}$	e	Y
0.025	0.4	1.42
0.04	0.42	1.36
0.07	0.44	1.27
0.13	0.48	1.16
0.25	0.53	1.05
0.50	0.56	1

When paired back to back or face to face

$P = F_r + Y F_a$ when $\frac{F_a}{F_r} \leq e$

$P = 0.72 F_r + Y F_a$ when $\frac{F_a}{F_r} \leq e$

The thrust factor Y and values of e are dependant on $\frac{F_a}{iC_o}$ given in table below

where C_o = static load rating of the single bearing KN.

$\frac{F_a}{C_o}$	e	$\frac{F_a}{Fr} \leq e$ Y_1	$\frac{F_a}{Fr} > e$ Y_2
0.025	0.4	1.6	2.3
0.04	0.42	1.5	2.2
0.07	0.44	1.4	2.1
0.13	0.48	1.3	1.9
0.25	0.53	1.2	1.7
0.50	0.56	1.1	1.6

Equivalent static load

Single bearings and tandem mounted bearings

$$P_o = Fr \quad \text{when} \quad \frac{F_a}{Fr} \leq 1.09$$

$$P_o = 0.5 Fr + 0.46 Fa \quad \text{when} \quad \frac{F_a}{Fr} > 1.09$$

For back to back and face to face arrangements:

$$P_o = Fr + 0.92 Fa$$



Angular Contact Ball Bearing

SINGLE ROW

BEARING WITH 25° CONTACT ANGLE

Equivalent load P_e

Single bearings and tandem mounted bearings.

SINGLE BEARINGS AND TANDEM MOUNTED BEARINGS

$$P = F \quad \text{when} \quad \frac{F_a}{F_r} \leq 0.68$$

$$P = 0.41 F_r + 0.87 F_a \quad \text{when} \quad \frac{F_a}{F_r} > 0.68$$

For back to back and face to face arrangements:

$$P = F_r + 0.92 F_a \quad \text{when} \quad \frac{F_a}{F_r} \leq 0.68$$

$$P_o = 0.67 F_r + 0.41 F_a \quad \text{when} \quad \frac{F_a}{F_r} > 0.68$$

Equivalent load static

Single bearings and tandem arranged bearings:

$$P_o = F_r \quad \text{when} \quad \frac{F_a}{F_r} \leq 1.3$$

$$P_o = 0.5 F_r + 0.38 F_a \quad \text{when} \quad \frac{F_a}{F_r} > 1.3$$

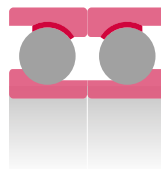
For back to back and face to face arrangements:

$$P_o = F_r + 0.76 F_a$$

AXIAL CLEARANCE TABLES

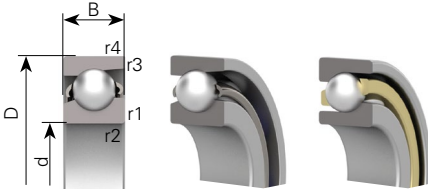
Axial clearance of single row angular contact ball bearings arranged in "DB" and "DF"

Series 72...B		Series 73...B		Axial clearance value	
d mm		d mm		μm	
over	up to	over	up to	over	up to
10	30	15	25	16	36
30	50	25	40	17	47
50	80	40	70	25	65
80	150	70	100	25	76
-	-	100	190	35	95



Angular Contact Ball Bearing

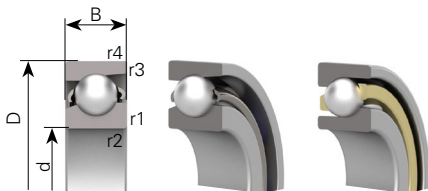
DATA TABLE - SINGLE ROW



Part number	Principal dimensions			Load ratings			Speed limits		Weight	Dimensions		
	d	D	B	Dynamic	Static	Fatigue	Grease	Oil		r1/r2	r3/r4	a
	mm			Cr	Cor	Pu	rpm	Kg	mm			
				kN			1 min ⁻¹					
7200 B	10	30	9	4,95	2,5	0,11	19000	28000	0,031	0,6	0,3	13
7201 B	12	32	10	7,4	3,75	0,17	17000	24000	0,045	0,6	0,3	14
7202 B	15	35	11	7,45	3,9	0,18	16000	22000	0,048	0,6	0,3	16
7302 B	15	42	13	12,90	6,5	0,30	14000	19000	0,090	1,0	0,6	19
7203 B	17	40	12	9,9	5,5	0,25	14000	19000	0,065	0,6	0,3	18
7203 B TN	17	40	12	9,9	5,5	0,25	14000	19000	0,065	0,6	0,3	18
7303 B	17	47	14	14,8	8,1	0,37	12000	17000	0,120	1,0	0,6	21
7204 B	20	47	14	14,1	8,4	0,38	11000	16000	0,110	1,0	0,6	21
7304 B	20	52	15	17,3	9,7	0,44	10000	15000	0,150	1,1	0,6	23
7005 B	25	47	12	13,9	8,5	0,39	11000	16000	0,110	0,6	0,3	8
7005 B 2RSR	25	47	12	10,8	7,0	0,32	7750		0,120	0,6	0,3	8
7205 B	25	52	15	15,5	10,1	0,46	9500	14000	0,130	1,0	0,6	24
7305 B	25	62	17	24,4	14,6	0,66	8500	12000	0,250	1,1	0,6	27
7206 B	30	62	16	20,5	13,6	0,62	8500	12000	0,210	1,0	0,6	27
7306 B	30	72	19	29,3	19,0	0,86	7500	10000	0,370	1,1	0,6	31
7207 B	35	72	17	28,5	19,8	0,90	7500	10000	0,300	1,1	0,6	31
7307 B	35	80	21	36,7	24,3	1,10	7000	9500	0,510	1,5	1,0	35
7208 B	40	80	18	32,1	23,0	1,05	6700	9000	0,390	1,1	0,6	34
7308 B	40	90	23	44,8	30,3	1,38	6300	8500	0,670	1,5	1,0	39
7209 B	45	85	19	36,1	26,2	1,19	6300	8500	0,440	1,1	0,6	37
7309 B	45	100	25	58,3	40,1	1,82	5600	7500	0,900	1,5	1,0	43
7210 B	50	90	20	37,4	28,6	1,30	5600	7500	0,490	1,1	0,6	39
7310 B	50	110	27	69,3	47,9	2,18	5000	6700	1,150	2,0	1,0	47
7211 B	55	100	21	46,2	36,2	1,65	5300	7000	0,650	1,5	1,0	43
7311 B	55	120	29	78,8	56,4	2,56	4500	6000	1,450	2,0	1,0	51
7212 B	60	110	22	56,3	44,7	2,03	4800	6300	0,840	1,5	1,0	47
7312 B	60	130	31	90,0	65,5	2,98	4300	5600	1,850	2,1	1,1	56
7213 B	65	120	23	63,6	52,5	2,39	4300	5600	1,050	1,5	1,0	50
7313 B	65	140	33	101,0	75,3	3,38	4000	5300	2,250	2,1	1,1	60
7214 B	70	125	24	69,1	57,8	2,63	4300	5600	1,150	1,5	1,0	53
7314 B	70	150	35	114,0	86,0	3,73	3800	5000	2,750	2,1	1,1	64
7215 B	75	130	25	74,8	63,2	2,84	4000	5300	1,300	1,5	1,0	56
7315 B	75	160	37	125,0	97,5	4,09	3400	4500	3,300	2,1	1,1	68
7216 B	80	140	26	80,5	69,3	3,00	3800	5000	1,550	2,0	1,0	59
7316 B	80	170	39	135,0	109,0	4,43	3200	4300	3,900	2,1	1,1	72

Angular Contact Ball Bearing

DATA TABLE - SINGLE ROW



Part number	Principal dimensions			Load ratings			Speed limits		Weight	Dimensions		
	d	D	B	Dynamic	Static	Fatigue	Grease	Oil		Kg	r1/r2	r3/r4
				Cr	Cor	Pu	rpm					
	mm			kN			1 min ⁻¹			mm		
7217 B	85	150	28	93,1	81,1	3,40	3400	4500	1,950	2,0	1,0	64
7317 B	85	180	41	145,0	122,0	4,82	3000	4000	4,600	3,0	1,1	76
7218 B	90	160	30	107,0	93,8	3,81	3200	4300	2,400	2,0	1,0	67
7318 B	90	190	43	156,0	135,0	5,19	2800	3800	5,400	3,0	1,1	80
7219 B	95	170	32	116,0	101,0	3,99	3000	4000	2,900	2,1	1,1	71
7319 B	95	200	45	168,0	150,0	5,61	2600	3600	6,250	3,0	1,1	84
7220 B	100	180	34	129,0	116,0	4,46	2800	3800	3,450	2,1	1,1	76
7320 B	100	215	47	190,0	178,0	6,45	2400	3400	7,750	3,0	1,1	90
7222 B	110	200	38	153,0	145,0	5,29	2400	3400	4,800	2,1	1,1	84
7322 B	110	240	50	248,0	229,0	7,87	2000	3000	10,500	3,0	1,1	99
7328 B	140	300	62	290,0	334,0	10,24	1700	2400	21,600	4,0	1,5	123



PRODUCT CATALOG
ANGULAR CONTACT BALL BEARING
DOUBLE ROW

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Data Tables	59-60

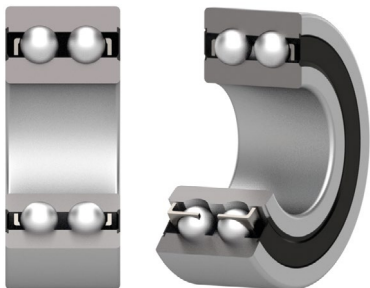
Angular Contact Ball Bearing

DOUBLE ROW

DESIGN | CHARACTERISTICS | APPLICATIONS

Double row angular contact bearings

The inner and outer ring of these bearings each have a double raceway and the two rows of balls are so related that the contact angles are similar to that for a back-to-back arrangement. Thrust loads can be accommodated in either directions as well as fitting moments. The advantage of the double row bearing is that no clearance set-up operation is required during mounting operation.



ANGULAR MISALIGNMENT

The following is an approximate guide to the misalignment that can be prevalent when fitting angular contact bearings:

0.0003 radians

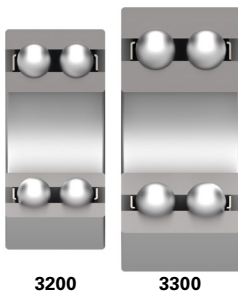
Greater misalignment, particularly under pure axial load can become critical.

ISO SPECIFICATIONS

- Dimensions in accordance with ISO 15 (latest version)
- Precision class in accordance with ISO 492 (latest version)

SERIES

The standard series are 3200 | 3300



NOMENCLATURE

Suffixes:

- 2RS : 2 NBR seals with metallic insert
- ZZ : 2 metallic shields
- TN : Polyamide cage
- P0 - P6 : Precision class
- CN - C3 : Radial clearance class

EQUIVALENT LOAD EQUATIONS

For 3200 and 3300 series with one piece inner ring

Equivalent load P_e

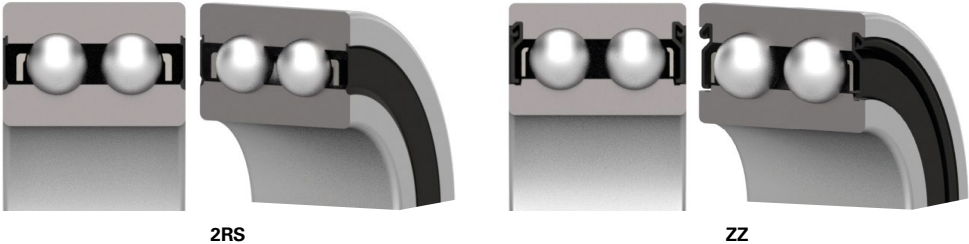
$$P_e = F_r + 0.73F_a \quad \text{when} \quad F_a/F_r \leq 0.86$$

$$P_e = 0.62 F_r + 1.17F_a \quad \text{when} \quad F_a/F_r > 0.86$$

Equivalent static load P_o

$$P_o = F_r + 0.63 F_a$$

SHIELDS | SEALS



The non-contact metallic shields (ZZ) are pre-lubricated with the correct quantity of a lithium base grease which allows operating temperatures of $-30^{\circ}\text{C} + 120^{\circ}\text{C}$.

While the shields make no contact with the inner ring, small dust particles or moisture can still enter inside the bearing. Shields are suitable for a dry environment with a low or medium dust contamination.

The speed limit is the same as the open version.

The contact seals (RS, 2RS) are made from NBR - Nitril Butadiene Rubber. The rubber withstands operating temperatures of 100°C max. They are reinforced with a metallic washer inside. The bearings are pre-lubricated with the correct quantity grease.

Sealed bearings have a lower maximum speed due to the contact between the seal lips and the inner ring. This contact will generate heat which will reduce the speed limit of -20% compared to an open or shielded bearing.

Angular Contact Ball Bearing

DOUBLE ROW

LUBRICATION

Standard shielded or sealed bearings are lubricated with lithium based grease, with a fill rate of 30%. The viscosity is 100 ISO VG

RADIAL CLEARANCE TABLES

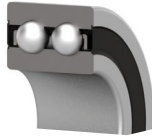
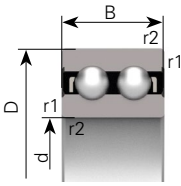
Axial clearance of double row angular contact ball bearings



Bore diameter		Series 32 and 33				Series 33D			
d		C2		CN		C3		CN	
mm		µm		µm		µm		µm	
over	up to	min.	max.	min.	max.	min.	max.	min.	max.
-	10	1	11	5	21	12	28	-	-
10	18	1	12	6	23	13	31	-	-
18	24	2	14	7	25	16	34	-	-
24	30	2	15	8	27	18	37	16	35
30	40	2	16	9	29	21	40	18	38
40	50	2	18	11	33	23	44	22	44
50	65	3	22	13	36	26	48	25	48
65	80	3	24	15	49	30	54	29	54
80	100	3	26	18	46	35	63	35	63
100	110	4	30	22	53	48	73	42	73
Radial clearance ≈ 0,6 axial clearance									

Angular Contact Ball Bearing

DATA TABLE - DOUBLE ROW

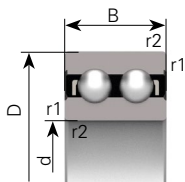


SEALS | 2RS

Part number	Principal dimensions			Load ratings			Speed limits		Weight	Dimensions	
	d	D	B	Dynamic	Static	Fatigue	Grease	Oil		r1/r2	a
				Cr	Cor	Pu	rpm				
	mm			kN			1 min ⁻¹		Kg	mm	
3200	10	30	14,3	7,8	3,9	0,18	16000	22000	0,05	0,6	19
3201	12	32	15,9	10,6	5,1	0,23	15000	20000	0,06	0,6	22
3202	15	35	15,9	11,8	6,1	0,28	13000	18000	0,07	0,6	23
3302	15	42	19	16,3	8,7	0,40	10000	15000	0,13	1	27
3203 2RS	17	40	17,5	14,6	7,8	0,35	7500	-	0,1	0,6	27
3203	17	40	17,5	14,6	7,8	0,35	10000	15000	0,1	0,6	27
3303	17	47	22,2	20,8	10,6	0,48	9500	14000	0,19	1	31
3204	20	47	20,6	19,6	10,8	0,49	9000	13000	0,170	1,0	31
3304	20	52	22,2	23,2	12,9	0,59	8500	12000	0,230	1,1	34
3205	25	52	20,6	21,2	12,7	0,58	8000	11000	0,190	1,0	35
3305	25	62	25,4	29,2	17,3	0,79	7500	10000	0,370	1,1	40
3206	30	62	23,8	28,1	18,3	0,83	7000	9500	0,310	1,0	41
3306	30	72	30,2	38,0	24,5	1,11	6300	8500	0,580	1,1	47
3207	35	72	27,0	39,0	25,0	1,14	6000	8000	0,480	1,1	47
3307	35	80	34,9	51,0	30,0	1,36	5600	7500	0,780	1,5	54
3208	40	80	30,2	48,0	31,5	1,43	5600	7500	0,650	1,1	52
3308	40	90	36,5	62,0	39,0	1,77	5000	6700	1,050	1,5	58
3308 2RS	40	90	36,5	60,5	44,0	2,00	4200	-	1,070	1,5	58
3209	45	85	30,2	49,0	32,5	1,48	5000	6700	0,700	1,1	56
3309	45	100	39,7	71,0	57,0	2,59	4500	6000	1,410	1,5	64
3210	50	90	30,2	51,0	36,0	1,64	4800	6300	0,740	1,1	59
3310	50	110	44,4	85,0	75,0	3,41	4000	5300	1,900	2,0	73
3211	55	100	33,3	54,0	55,0	2,50	4300	5600	1,050	1,5	64
3311	55	120	49,2	98,0	88,0	4,00	3600	4800	2,480	2,0	80
3212	60	110	36,5	69,5	72,0	3,27	3800	5000	1,360	1,5	71
3312	60	130	54,0	114,0	112,0	5,09	3400	4500	3,170	2,1	86
3213	65	120	38,1	73,5	83,0	3,77	3600	4800	1,760	1,5	76
3313	65	140	58,7	129,0	130,0	5,84	3200	4300	4,010	2,1	94
3214	70	125	39,7	81,5	91,5	4,16	3200	4300	1,930	1,5	81
3314	70	150	63,5	143,0	146,0	6,33	2800	3800	5,040	2,1	101
3215	75	130	41,3	85,0	98,0	4,40	3200	4300	2,080	1,5	84
3315	75	160	68,3	163,0	166,0	6,96	2600	3600	6,160	2,1	107
3216	80	140	44,4	95,0	110,0	4,77	2800	3800	2,640	2,0	91
3316	80	170	68,3	176,0	186,0	7,56	2400	3400	6,930	2,1	112

Angular Contact Ball Bearing

DATA TABLE - DOUBLE ROW



SEALS | 2RS

Part number	Principal dimensions			Load ratings			Speed limits		Weight	Dimensions	
	d	D	B	Dynamic	Static	Fatigue	Grease	Oil		r1/r2	a
				Cr	Cor	Pu	rpm		Kg		
	mm			kN			1 min ⁻¹			mm	
3217	85	150	49,2	112,0	132,0	5,54	2600	3600	3,390	2,0	97
3317	85	180	73,0	190,0	200,0	7,90	2200	3200	8,300	3,0	119
3218	90	160	52,4	125,0	146,0	5,94	2400	3400	4,140	2,0	104
3318	90	190	73,0	216,0	240,0	9,22	2000	3000	9,230	3,0	125
3219	95	170	55,6	140,0	163,0	6,44	2200	3200	5,000	2,1	111
3319	95	200	77,8	220,0	245,0	9,17	1900	2800	11,400	3,0	133
3220	100	180	60,3	160,0	196,0	7,53	2000	3000	6,100	2,1	118
3320	100	215	82,6	240,0	280,0	10,14	1800	2600	14,200	3,0	139
3222	110	200	69,8	190,0	228,0	8,32	1900	2800	8,790	2,1	132
3322	110	240	92,1	280,0	400,0	13,74	1800	2600	19,000	3,0	153