



PRODUCT CATALOG

THRUST BALL BEARING SINGLE ACTING

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Thrust Ball Bearing

SINGLE ACTING

DESIGN | CHARACTERISTICS | APPLICATIONS

THRUST BALL BEARINGS

Thrust ball bearings can be applied for high axial loads and low to medium speeds.

However, they cannot take radial loads. They are sensitive to angular deflection and characterized by extremely rigid guidance in axial direction. The thrust loading is in one direction only.

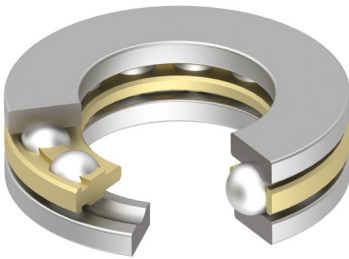
Thrust ball bearings are separable bearings. The single acting thrust ball bearing consists of one shaft washer, one housing washer and one ball set with cage.

The standard cage is made of a steel sheet.

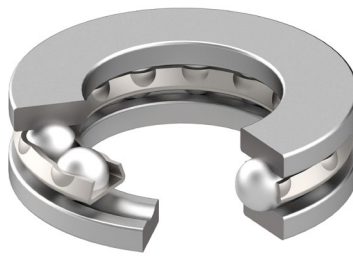
Depending on speed, a minimum load is necessary to avoid sliding movements of the ball set, which are caused by centrifugal forces. To compensate for misalignments of the shaft, bearings with spherical housing washers and support washers should be used.

The thrust loading should not drop below a minimum axial load, thus maintaining contact between the balls and the track when centrifugal forces are present.

Single – acting thrust ball bearings



Brass Cage M



Steel Cage

ANGULAR MISALIGNMENT

These are sensitive for axial deflection and cannot accommodate misalignment.

ISO SPECIFICATIONS

- Dimensions in accordance with ISO 104 (latest version)
- Precision class in accordance with ISO 199 (latest version)

SERIES

The standard series are 51100 | 51200 | 51300 | 51400.



51100



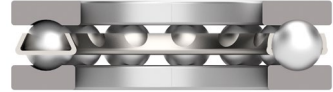
51200



51300



51400



NOMENCLATURE

Suffixes:

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

P0 - P6 : Precision class

EQUIVALENT LOAD EQUATIONS

Equivalent dynamic load P_e

$P = F_a$ [KN] where F_a = the axial load

Equivalent static load P_o

$P_o = F_a$ [KN]

Minimum load

For a thrust ball bearing to function correctly it requires an axial load to ensure that the rolling elements maintain contact with the raceways. This prevents wear due to sliding. F_{am} can be obtained from the formula below.

Single – acting thrust ball bearings

$$F_{am} = M \left(\frac{n \text{ Max}}{1000} \right)^2 \text{ [N]}$$

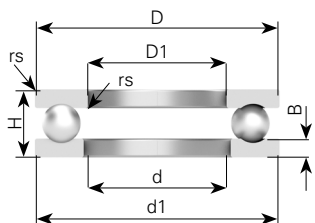
where F_{am} = minimum thrust load (N)

M = Factor for minimum load

n = speed in RPM

Thrust Ball Bearing

DATA TABLE - SINGLE ACTING



Part number	Principal dimensions			Basic load ratings			Speed limits		Weight	Dimensions			
	d	D	H	Dynamic	Static	Fatigue	Grease	Oil		rs min	D1	d1	M
				Cr	Cor	Pu	rpm		Kg				
	mm			kN			1 min ⁻¹			mm			
51100	10	24	9	10,0	14,0	0,64	6300	9000	0,02	0,3	11	24	0,001
51101	12	26	9	10,2	15,2	0,69	6000	8500	0,02	0,3	13	26	0,001
51201	12	28	11	13,2	19,0	0,86	5300	7500	0,03	0,6	14	28	0,002
51102	15	28	9	10,5	16,8	0,76	5600	8000	0,02	0,3	16	28	0,001
51202	15	32	12	16,5	24,8	1,13	4800	6700	0,04	0,6	17	32	0,004
51103	17	30	9	10,8	18,2	0,83	5300	7500	0,02	0,5	18	30	0,002
51203	17	35	12	17,0	27,2	1,24	4500	6800	0,05	0,6	19	35	0,004
51104	20	35	10	14,2	24,5	1,11	4800	6700	0,04	0,3	21	35	0,003
51204	20	40	14	22,2	37,5	1,70	3800	5300	0,08	0,6	22	40	0,008
51105	25	42	11	15,2	30,2	1,37	4300	6000	0,06	1,0	26	42	0,005
51205	25	47	15	27,8	50,5	2,30	3400	4300	0,11	0,6	27	47	0,013
51305	25	52	18	35,5	61,5	2,80	3000	4300	0,17	1,0	27	52	0,019
51106	30	47	11	16,0	34,2	1,55	4000	5600	0,06	0,6	32	47	0,007
51206	30	52	16	28,0	54,2	2,46	3200	4500	0,13	0,6	32	52	0,014
51306	30	60	21	42,8	78,5	3,57	2400	3600	0,26	1,0	32	60	0,028
51107	35	52	12	18,2	41,5	1,89	3800	5300	0,08	0,6	37	52	0,009
51207	35	62	18	39,2	78,2	3,55	2800	4000	0,21	1,0	37	62	0,028
51307	35	68	24	55,2	105,0	4,77	2000	3200	0,37	1,0	37	68	0,050
51108	40	60	13	26,8	62,8	2,85	3400	4800	0,11	0,6	42	60	0,016
51208	40	68	19	44,8	91,8	4,17	2400	3600	0,26	1,5	42	68	0,050
51308	40	78	26	69,2	135,0	6,14	1900	3000	0,53	1,0	42	78	0,080
51109	45	65	14	27,0	66,0	3,00	3200	4500	0,14	0,6	47	65	0,020
51209	45	73	20	47,8	105,0	4,77	2200	3400	0,30	1,0	47	73	0,043
51309	45	85	28	75,8	150,0	6,82	1700	2600	0,66	1,0	47	85	0,120
51110	50	70	14	27,2	69,2	3,15	3000	4300	0,15	0,6	52	70	0,024
51210	50	78	22	48,5	112,0	5,09	2000	3200	0,37	1,0	52	78	0,070
51310	50	95	31	96,6	202,0	9,18	1600	2400	0,92	1,1	52	95	0,180
51111	55	78	16	33,8	89,2	4,05	2800	4000	0,22	1,0	57	78	0,038
51211	55	90	25	67,5	158,0	7,18	1900	3000	0,58	1,0	57	90	0,110
51311	55	105	35	115,0	242,0	11,00	1500	2200	1,28	1,1	57	105	0,260
51112	60	85	17	40,2	108,0	4,91	2600	3800	0,27	1,0	62	85	0,053
51212	60	95	26	73,5	178,0	8,09	1800	2800	0,66	1,0	62	95	0,120
51312	60	110	35	118,0	262,0	11,91	1400	2000	1,37	1,1	62	110	0,280
51113	65	90	18	40,5	112,0	5,09	2400	3600	0,31	1,0	67	90	0,060
51213	65	100	27	74,8	188,0	8,55	1700	2600	0,72	1,0	67	100	0,140
51313	65	115	36	115,0	262,0	11,91	1300	1900	1,18	1,1	67	115	0,320

Thrust Ball Bearing

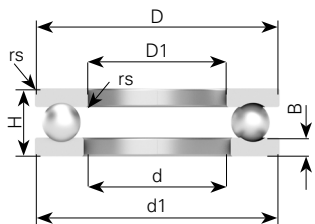
DATA TABLE - SINGLE ACTING



Part number	Principal dimensions			Basic load ratings			Speed limits		Weight	Dimensions			
	d	D	H	Dynamic	Static	Fatigue	Grease	Oil		rs min	D1	d1	M
				Cr	Cor	Pu							
	mm				kN		rpm	1 min ⁻¹	Kg		mm		
51114	70	95	18	40,8	115,0	5,23	2200	3400	0,33	1,5	72	95	0,067
51214	70	105	27	73,5	188,0	8,55	1600	2400	0,75	1,0	72	105	0,160
51314	70	125	40	148,0	340,0	15,45	1200	1800	1,98	1,1	72	125	0,530
51115	75	100	19	48,2	140,0	6,36	2000	3200	0,38	1,0	77	100	0,095
51215	75	110	27	74,8	198,0	9,00	1500	2200	0,82	1,0	77	110	0,180
51315	75	135	44	162,0	380,0	16,86	1100	1700	2,58	1,5	77	135	0,750
51116	80	105	19	48,5	145,0	6,59	1900	3000	0,40	1,0	82	105	0,100
51216	80	115	28	83,8	222,0	10,09	1400	2000	0,90	1,0	82	115	0,220
51316	80	140	44	160,0	380,0	16,47	1000	1600	2,69	1,5	82	140	0,800
51117	85	110	19	49,2	150,0	6,82	1800	2800	0,42	1,0	87	110	0,120
51217	85	125	31	102,0	280,0	12,42	1300	1900	1,21	1,0	88	125	0,180
51317	85	150	49	208,0	495,0	20,76	950	1500	3,47	1,5	88	150	1,100
51118	90	120	22	65,0	200,0	8,87	1700	2600	0,65	1,0	92	120	0,190
51218	90	135	35	115,0	315,0	13,50	1200	1800	1,65	1,1	93	135	0,530
51318	90	155	50	205,0	495,0	20,33	900	1400	3,69	1,5	93	155	1,200
51120	100	135	25	85,0	268,0	11,24	1600	2400	0,95	1,0	102	135	0,360
51220	100	150	38	132,0	375,0	15,25	1100	1700	2,21	1,1	103	150	0,670
51320 M	100	170	55	235,0	595,0	23,28	800	1200	4,86	1,5	103	170	1,800
51122 M	110	145	25	87,0	288	11,59	2500	2200	1,03	1,0	112	145	0,430
51222 M	110	160	38	138,0	412	16,12	2000	1600	2,39	1,1	113	160	0,800
51224 M	120	170	39	135,0	412	15,55	950	1500	2,62	1,1	123	170	0,480
51324 M	120	210	70	347,0	977	34,57	800	1100	10,71	2,1	123	205	1,000
51126 M	130	170	30	111,0	316	11,73	1400	1900	1,86	1,0	170	170	0,750
51226 M	130	190	45	212,0	620	22,28	950	1400	4,44	1,5	133	187	1,700
51128 M	140	180	31	107,0	377	13,55	1300	1800	1,88	1	142	178	0,850
51228 M	140	200	46	215,0	669	23,32	950	1400	4,33	1,5	143	197	1,900
51130 M	150	190	31	109,0	402	14,01	1200	1700	2,188	1	152	188	0,900
51230 M	150	215	50	257,0	795	26,75	900	1300	6,05	1,5	153	212	2,800
51330 M	150	250	80	377,0	1200	38,57	670	900	16,4	3	154	245	9,000
51430 M	150	300	120	668,0	2242	67,94	-	650	42,00	4,0	154	295	20,000
51132 M	160	200	31	112,0	427	14,47	1200	1700	2,2	1	162	198	1,000
51232 M	160	225	51	247,0	803	26,31	850	1200	6,5	1,5	163	222	3,200
51134 M	170	215	34	134,0	512	16,77	1100	1600	2,96	1,1	172	213	1,400
51234 M	170	240	55	269,0	874	27,75	800	1100	6,56	1,5	173	237	4,500
51334 M	170	280	87	463,0	1570	47,58	600	800	22,1	3	174	275	13,000

Thrust Ball Bearing

DATA TABLE - SINGLE ACTING



Part number	Principal dimensions			Basic load ratings			Speed limits		Weight	Dimensions			
	d	D	H	Dynamic	Static	Fatigue	Grease	Oil		rs min	D1	d1	M
	mm			Cr	Cor	Pu	rpm		Kg				
				kN			1 min ⁻¹						
51136 M	180	225	34	135,0	528	16,87	1000	1500	3,082	1,1	183	222	1,500
51236 M	180	250	56	294,0	986	30,57	800	1100	8,7	1,5	183	247	5,000
51336 M	180	300	95	463,0	1580	46,36	560	750	28,10	3,0	184	295	18,000
51138 M	190	240	37	170,0	657	20,37	950	1400	3,94	1,1	193	237	2,400
51238 M	190	270	62	357,0	1019	30,54	750	1000	12	2	194	267	8,400
51338 M	190	320	105	607,0	1662	47,31	700	800	36,76	4,0	195	315	30,000
51140 M	200	250	37	169,0	602	18,24	950	1400	4,07	1,1	203	247	2,400
51240 M	200	280	62	333,0	1207	35,41	750	1000	12,2	2	204	275	8,000
51144 M	220	270	37	177,0	739	21,46	900	1300	4,6	1,1	223	267	3,000
51244 M	220	300	63	342,0	1308	36,87	700	950	13,2	2	224	295	9,500
51148 M	240	300	45	230,0	91	2,52	850	1200	7,3	1,5	243	297	5,000
51248 M	240	340	78	463,0	1889	50,42	600	800	23	2,1	244	335	18,000
51152 M	260	320	45	236,0	984	26,26	750	1000	8,1	1,5	263	317	5,600
51252 M	260	360	79	473,0	1967	50,78	560	750	23,3	2,1	264	355	22,000
51156 M	280	350	53	337,0	1435	36,75	700	950	12	1,5	283	347	10,000
51256 M	280	380	80	506,0	2168	54,25	560	750	26,5	2,1	284	375	24,000
51160 M	300	380	62	400,0	1530	37,72	630	850	17,4	2	304	376	14,000
51260 M	300	420	95	625,0	2872	68,80	480	630	41,7	3	304	415	40,000
51164 M	320	400	63	390,0	1580	37,85	600	800	18,5	2	324	396	16,000



PRODUCT CATALOG

THRUST BALL BEARING
DOUBLE ACTING

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Thrust Ball Bearing

DOUBLE ACTING

DESIGN | CHARACTERISTICS | APPLICATIONS

DOUBLE ACTING THRUST BALL BEARING

Differs from the Single - acting thrust ball bearings in a way that it can carry the thrust load in 2 directions with a low to medium speeds. The thrust load is always carried between the central shaft washer and one of the housing washers. They are sensitive to angular deflection and characterized by extremely rigid guidance in axial direction.

Thrust ball bearings are separable bearings. The double acting bearing is made of 5 separable parts and consists of one shaft washer, two housing washers and 2 ball sets with cage.

The standard cage is made of a steel sheet

Double – acting thrust ball bearing

The double-acting type consists of a shaft washer (center washer) and two housing washer and two ball sets with cages. This bearing can carry thrust loadings in both directions.



Brass Cage M



Steel Cage

ANGULAR MISALIGNMENT

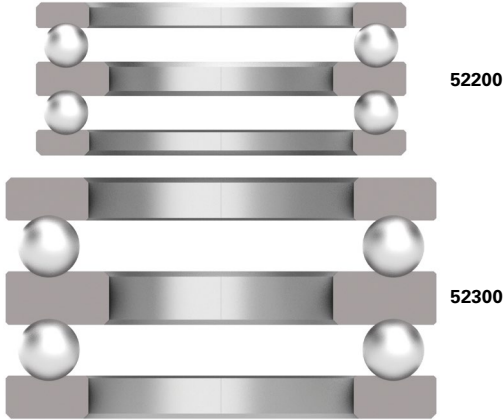
These are sensitive for axial deflection and cannot accommodate misalignment.

ISO SPECIFICATIONS

- Dimensions in accordance with ISO 104 (latest version)
- Precision class in accordance with ISO 199 (latest version)

SERIES

The standard series are 52200 | 52300.



NOMENCLATURE

Suffixes:

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

P0 - P6 : Precision class

EQUIVALENT LOAD EQUATIONS

Equivalent dynamic load P_e

$P = F_a$ [KN] where F_a = the axial load

Equivalent static load P_o

$P_o = F_a$ [KN]

Ball thrust bearings must have a minimum thrust load to function correctly. This ensures that sliding does not occur due to centrifugal forces acting on the ball and cage assembly.

Minimum load

For a thrust ball bearing to function correctly it requires an axial load to ensure that the rolling elements maintain contact with the raceways. This prevents wear due to sliding. F_{am} can be obtained from the formula below.

$$F_{am} = M \left(\frac{n \text{ Max}}{1000} \right)^2 \text{ [N]}$$

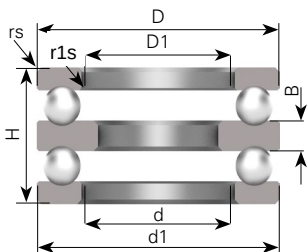
where F_{am} = minimum thrust load (N)

M = Factor for minimum load

n = speed in RPM

Thrust Ball Bearing

DATA TABLE - DOUBLE ACTING



Part number	Principal dimensions			Basic load ratings			Speed limits		Weight	Radius		Dimensions	
	d	D	H	Dynamic	Static	Fatigue	Grease	Oil		rs min	r1s min	D1	B
	mm			Cr	Cor	Pu	rpm		Kg	mm			
							1 min ⁻¹						
52202	10	32	22	17	25	1,14	5000	6700	0,09	0,6	0,3	17	5
52204	15	40	26	22	38	1,73	4300	5600	0,15	0,6	0,3	22	6
52405	15	60	45	56	89	4,05	2600	3600	0,63	1,0	0,3	27	11
52205	20	47	28	28	50	2,27	3800	5000	0,23	0,6	0,3	27	7
52305	20	52	34	36	61	2,77	3200	4300	0,33	1,0	0,3	27	8
52406	20	70	52	73	126	5,73	2000	3000	1,00	1,0	0,6	32	12
52206	25	52	29	28	54	2,45	3600	4800	0,27	0,6	0,3	32	7
52306	25	60	38	43	79	3,59	2800	3800	0,49	1,0	0,3	32	9
52407	25	80	59	87	155	7,05	1800	2600	1,44	1,1	0,6	37	14
52207	30	62	34	41	84	3,82	3000	4000	0,42	1,0	0,3	37	8
52208	30	68	36	47	98	4,45	2800	3800	0,54	1,0	0,6	42	9
52307	30	68	44	56	105	4,77	2400	3400	0,71	1,0	0,3	37	10
52308	30	78	49	69	135	6,14	2000	3000	1,06	1,0	0,6	42	12
52408	30	90	65	113	205	9,32	1700	2400	2,08	1,1	0,6	42	15
52209	35	73	37	48	105	4,77	2600	3600	0,62	1,0	0,6	47	9
52309	35	85	52	81	163	7,41	1900	2800	1,29	1,0	0,6	47	12
52409	35	100	72	130	242	11,00	1600	2200	2,71	1,1	0,6	47	17
52210	40	78	39	49	111	5,05	2400	3400	0,71	1,0	0,6	52	9
52310	40	95	58	92	186	8,45	1800	2600	1,86	1,1	0,6	52	14
52410	40	110	78	148	283	12,86	1500	2000	3,56	1,5	0,6	52	18
52211	45	90	45	69	159	7,23	1900	2800	1,12	1,0	0,6	57	10
52311	45	105	64	119	246	11,18	1600	2200	2,51	1,1	0,6	57	15
52411	45	120	87	178	359	16,32	1300	1800	4,70	1,5	0,6	57	20
52212	50	95	46	74	179	8,14	1900	2800	1,25	1,0	0,6	62	10
52312	50	110	64	124	267	12,14	1600	2200	2,68	1,1	0,6	62	15
52412	50	130	93	201	397	18,05	1100	1600	6,33	1,5	0,6	62	21
52413	50	140	101	232	493	22,41	1000	1500	8,03	2,0	1,0	68	23
52213	55	100	47	75	189	8,59	1800	2600	1,36	1,0	0,6	67	10
52214	55	105	47	74	189	8,59	1800	2600	1,48	1,0	1,0	72	10
52313	55	115	65	128	287	13,05	1500	2000	2,90	1,1	0,6	67	15
52314	55	125	72	148	339	15,41	1400	1900	3,90	1,1	1,0	72	16
52215	60	110	47	77	209	9,50	1700	2400	1,57	1,0	1,0	77	10
52315	60	135	79	171	396	18,00	1200	1700	4,83	1,5	1,0	77	18
52216	65	115	48	79	218	9,91	1700	2400	1,69	1,0	1,0	82	10
52316	65	140	79	176	424	19,04	1200	1700	5,06	1,5	1,0	82	18

Thrust Ball Bearing

DATA TABLE - DOUBLE ACTING



Part number	Principal dimensions			Basic load ratings			Speed limits		Weight	Radius		Dimensions	
	d	D	H	Dynamic	Static	Fatigue	Grease	Oil		rs min	r1s min	D1	B
				Cr	Cor	Pu							
	mm			kN			rpm		Kg	mm			
52217	70	125	55	92	251	11,41	1600	2200	2,34	1,0	1,0	88	12
52317	70	150	87	206	489	21,19	1100	1600	6,43	1,5	1,0	88	19
52218	75	135	62	117	326	14,46	1500	2000	3,22	1,1	1,0	93	14
52318	75	155	88	213	524	22,21	1000	1500	6,60	1,5	1,0	93	19
52420	80	210	150	368	983	37,11	700	950	26,60	2,0	1,0	103	33
52220	85	150	67	147	410	17,19	1300	1800	4,29	1,1	1,0	103	15
52320	85	170	97	236	596	23,99	950	1400	8,90	1,5	1,0	103	21
52322	95	90	110	280	754	34,27	850	1200	13,80	2,0	1,0	113	24
52222	95	160	67	148	431	17,35	1200	1700	4,68	1,1	1,0	113	15
52224	100	170	68	154	472	18,47	1100	1600	5,24	1,1	1,1	123	15
52324	100	210	123	325	931	33,99	800	1100	17,20	2,1	1,1	123	27
52226	110	190	80	203	622	23,08	950	1400	7,74	1,5	1,1	133	18
52228 M	120	200	81	215	669	24,04	950	1400	8,95	1,5	1,1	143	18
52230 M	130	215	89	244	768	26,58	900	1300	10,60	1,5	1,1	153	20
52330 M	130	250	140	377	1200	39,57	670	900	27,10	2,1	1,1	154	31
52232 M	140	225	90	247	803	27,02	850	1200	12,20	1,5	1,1	163	20
52332 M	140	250	140	470	1570	51,10	630	850	26,20	2,1	1,1	154	31
52234 M	150	240	97	269	874	28,45	800	1100	15,20	1,5	1,1	173	21

Notes

[illegible]