

## 5. Thrust Ball Bearings

Single direction thrust ball bearings can only accommodate axial loads, only in one direction and no radial loads. As they are separable their three parts the shaft washer, the ball and cage assembly and the housing washer can be mounted separately.

### Dimensions

The boundary dimensions are according to ISO 104-1979 (AFBMA standard 24.1) thrust bearings with flat back faces and DIN 711.

**Misalignment:** Not permitted.

### Precision grades

IBC thrust ball bearings are manufactured to normal tolerances as well as to higher accuracy, P6, P5 due to DIN 620, part 3.

### Cages

The cages are made out of pressed steel. Special executions (brass) on request.

### Minimum load

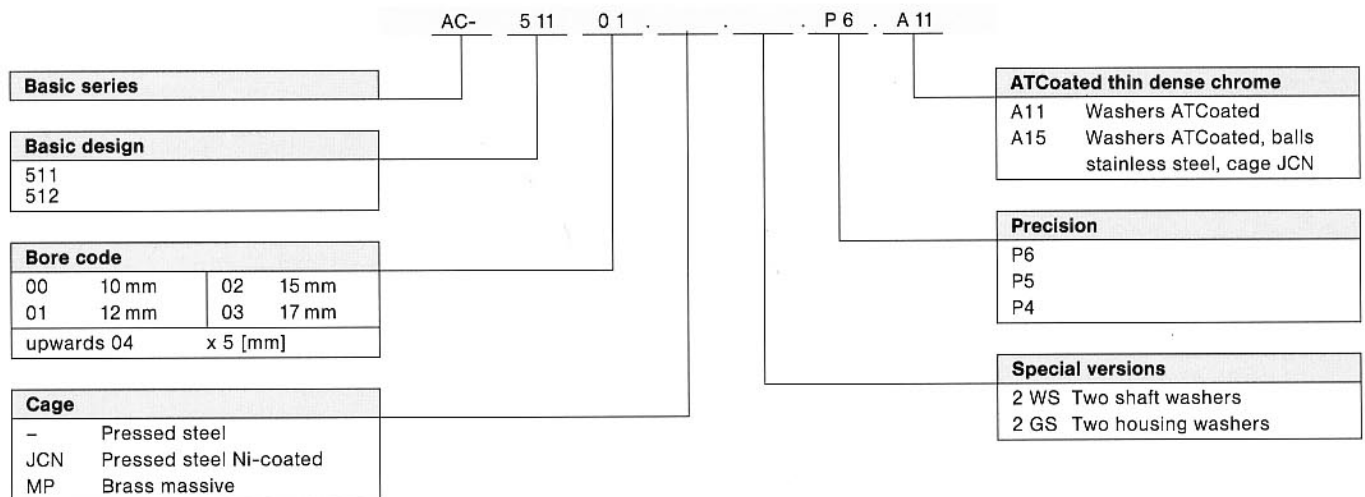
In order to assure satisfactory rolling condition despite the inertia forces acting on balls and cage a minimum load  $F_{a\ min}$  should be applied avoiding skidding of balls:

$$F_{a\ min} = f_{a\ min} \cdot \left(\frac{n}{1000}\right)^2 \quad [N] \quad [11.0]$$

$f_{a\ min}$  see data table next page 35  
n [min<sup>-1</sup>]

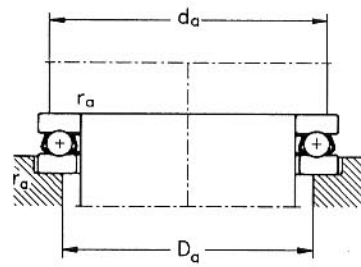
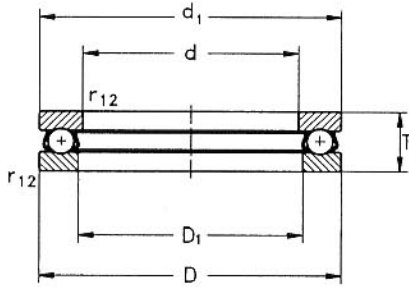
**Recommended fits of adjacent parts:** shaft h6, js6; housing H8.

### 5.1 Designation of IBC Thrust Ball Bearings



## 5.2 Thrust Ball Bearings

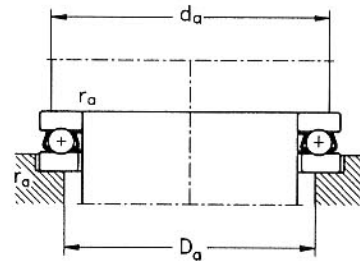
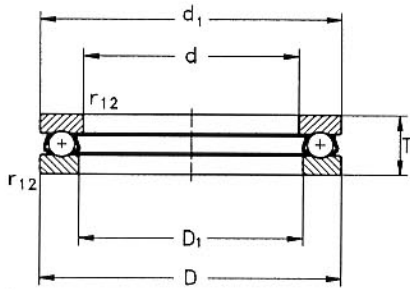
511..  
512..



Primary dimensions			Basic bearing number	Dimensions						Basic load ratings		Load factor $f_{a_{min}}$	Speed limits $n_g$		Weight $m$ kg
d	D mm	T		d <sub>1</sub>	D <sub>1</sub>	r <sub>12</sub> mm	d <sub>a</sub>	D <sub>a</sub>	r <sub>a</sub> max	C N	C <sub>0</sub>		Grease min <sup>-1</sup>	Oil	
10	24	9	51100	24	11	0,5	19	15	0,3	9950	14000	1	7000	9500	0,020
12	26	9	51101	26	13	0,5	21	17	0,3	10400	15300	0,8	6700	9000	0,022
15	28	9	51102	28	16	0,5	23	20	0,3	9360	14000	1	6300	9500	0,024
15	32	12	51202	32	17	1,0	25	22	0,6	16500	25000	3	5300	7000	0,046
17	30	9	51103	30	18	0,5	25	22	0,3	9750	15300	1	6300	8500	0,028
17	35	12	51203	35	19	1,0	28	24	0,6	17200	27500	4	5000	6700	0,053
20	35	10	51104	35	21	0,5	29	26	0,3	12700	20800	2	5600	7500	0,040
20	40	14	51204	40	22	1,0	32	28	0,6	22500	37500	7	4500	6000	0,082
25	42	11	51105	42	26	1,0	35	32	0,6	15900	29000	4	4800	6300	0,059
25	47	15	51205	47	27	1,0	38	34	0,6	27600	50000	13	4000	5300	0,120
30	47	11	51106	47	32	1,0	40	37	0,6	16800	33500	6	4500	6000	0,068
30	52	16	51206	52	32	1,0	43	39	0,6	25500	47500	11	3600	4800	0,144
35	52	12	51107	52	37	1,0	45	42	0,6	17400	37500	7	4300	5600	0,085
35	62	18	51207	62	37	1,5	51	46	1,0	35100	67000	23	3000	4000	0,220
40	60	13	51108	60	42	1,0	52	48	0,6	23400	50000	13	3800	5000	0,120
40	68	19	51208	68	42	1,5	57	51	1,0	46800	98000	50	2800	3800	0,270
45	65	14	51109	65	47	1,0	57	53	0,6	24200	57000	16	3400	4500	0,150
45	73	20	51209	73	47	1,5	62	56	1,0	39000	80000	34	2600	3600	0,320
50	70	14	51110	70	52	1,0	62	58	0,6	25500	63000	20	3200	4300	0,160
50	78	22	51210	78	52	1,5	67	61	1,0	49400	106000	60	2400	3400	0,390
55	78	16	51111	78	57	1,0	69	64	0,6	30700	78000	32	2800	3800	0,240
55	90	25	51211	90	57	1,5	76	69	1,0	61800	134000	94	1900	2800	0,610
60	85	17	51112	85	62	1,5	75	70	1,0	36400	93000	45	2600	3600	0,290
60	95	26	51212	95	62	1,5	81	74	1,0	62400	140000	100	1900	2800	0,690
65	90	18	51113	90	67	1,5	80	75	1,0	37100	98000	50	2400	3400	0,340
65	100	27	51213	100	67	1,5	86	79	1,0	63700	150000	120	1800	2600	0,770
70	95	18	51114	95	72	1,5	85	80	1,0	37700	104000	57	2400	3400	0,360
70	105	27	51214	105	72	1,5	91	84	1,0	65000	160000	130	1800	2600	0,810

## 5.2 Thrust Ball Bearings

511..  
512..



Primary dimensions			Basic bearing number	Dimensions						Basic load ratings		Load factor $f_{a_{min}}$	Speed limits $n_g$		Weight m kg
d	D mm	T		$d_1$	$D_1$	$r_{12}$ mm	$d_a$	$D_a$	$r_{a_{max}}$	C N	$C_0$		Grease $min^{-1}$	Oil $min^{-1}$	
75	100	19	51115	100	77	1,5	90	85	1,0	44200	137000	100	2200	3200	0,420
75	110	27	51215	110	77	1,5	96	89	1,0	67600	170000	150	1700	2400	0,860
80	105	19	51116	105	82	1,5	95	90	1,0	44900	140000	100	2000	3000	0,430
80	115	28	51216	115	82	1,5	101	94	1,0	76100	190000	190	1700	2400	0,950
85	110	19	51117	110	87	1,5	100	95	1,0	46200	150000	122	2000	3000	0,460
85	125	31	51217	125	88	1,5	109	101	1,0	97500	250000	340	1600	2200	1,290
90	120	22	51118	120	92	1,5	108	102	1,0	59200	190000	190	2600	1800	0,680
90	135	35	51218	135	93	2,0	117	108	1,0	119000	300000	480	2000	1500	1,770
100	135	25	51120	135	102	1,5	121	114	1,0	85200	270000	390	2400	1700	0,990
100	150	38	51220	150	103	2,0	130	120	1,0	124000	320000	540	1800	1300	2,360
110	145	25	51122	145	112	1,5	131	124	1,0	87100	290000	445	2200	1600	1,080
110	160	38	51222	160	113	2,0	140	130	1,0	130000	360000	680	1700	1200	2,570
120	155	25	51124	155	122	1,5	141	134	1,0	88400	310000	500	2200	1600	1,160
120	170	39	51224	170	123	2,0	150	140	1,0	140000	400000	840	1600	1100	2,860
130	170	30	51126	170	132	1,5	154	146	1,0	111000	390000	800	1900	1400	1,870
140	180	31	51128	178	142	1,5	164	156	1,0	111000	400000	835	1800	1300	2,070
150	190	31	51130	188	152	1,5	174	166	1,0	111000	400000	840	1700	1200	2,200
160	200	31	51132	198	162	1,5	184	176	1,0	112000	425000	950	1700	1200	2,330
170	215	34	51134	213	172	2,0	197	188	1,0	133000	500000	1350	1600	1100	3,310
180	225	34	51136	222	183	2,0	207	198	1,0	135000	530000	1500	1500	1000	3,480
190	240	37	51138	237	193	2,0	220	210	1,0	172000	655000	2250	1400	950	4,060
200	250	37	51140	247	203	2,0	230	220	1,0	168000	655000	2300	1400	950	4,240