

ZWZ

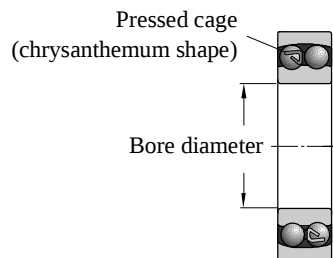
Bearing Integral Catalogue



WAFANGDIAN BEARING GROUP CORP., LTD.

Product Characteristics:

Self-aligning ball bearing has two-row balls and one concave spherical raceway on outer raceway. The center of outer raceway curvature is in accordance with the bearing center, therefore this bearing is self-aligning and can also rotate even if the inner ring, balls and cage are tilting against the outer ring. This bearing can resist the misalignment of shaft with bearing box. It is mainly used for carrying radial load and small axial load, but can not carry pure axial load. This bearing is used especially for the applications with serious shaft deflection or misalignment. So this bearing is a the most widely used in machinery industries such as precision meter, low noise electric motor, automobile, motorcycle, woodworker, transmission shaft of textile machinery, mining machinery, electromechanical equipments, plastic machinery, office equipments, medical equipments, fitness equipments, excise equipments and other general machineries.



Product Type:

ZWZ manufactures two types of self-aligning ball bearings:

- Self-aligning ball bearing with cylindrical bore
- Self-aligning ball bearing with tapered bore

Self-aligning ball bearing with cylindrical bore

Realizes self-aligning automatically because of two-row steel balls and arc outer raceway. This bearing can also resist the angle error between the shaft and bearing housing, so it is suitable for the applications with shaft deflection and error shaft center due to eccentricity. Self-aligning ball bearing has the smallest internal friction among all rolling bearings, so it has small temperature raise even at high rotation speed.

Self-aligning ball bearing with tapered bore

Has the same features with self-aligning ball bearing with cylindrical bore. This bearing has a tapered bore (normal conicity 1:12) and the clearance of bearing can be adjusted slightly when mounting onto tapered shaft. This bearing is usually applied to the double-supporting shafts that bend greatly under load, as well as to the parts whose two supporting holes can not ensure strictly concentric. This bearing mainly bear radial load and slight axial load. Normally, it can not carry pure axial load. The generality of this bearing type is just the second to the deep groove ball bearing. The limited rotation speed is smaller than that of deep groove ball bearing. But the loads it can bear are higher than those of deep groove ball bearing.

Dimension Range

The basic dimensions of ZWZ self-aligning ball bearing are listed in dimension table.

Bore diameter range : 25mm - 1100mm

Outer diameter range: 52mm - 1300mm

Width range: 15mm - 300mm

Tolerance

The standard tolerance of ZWZ self-aligning ball bearing is Class Normal, which conforms to GB307.1. Please refer to tolerances listed in the table of preface pages.

Radial Clearance

The standard internal clearances of ZWZ self-aligning ball bearing are C2, Normal (CN), C3, C4 and C5, which all conform to GB4604. The standard clearance of self-aligning ball bearing with tapered bore is C3. Please refer to radial clearances listed in the table of preface pages. The values are available for the bearings before mounting or without load. The bearings with internal clearance larger or lower than standard values can also be manufactured according to customers' requirements.

Cage

Self-aligning ball bearing generally use pressed cage, solid brass cage and nylon cage. The materials of cage are sheet steel, brass and synthetic resin. When bearing outer diameter is lower than 200mm, pressed steel sheet (strap) cage is adopted without suffix after basic bearing number. When outer diameter is larger than 200mm, brass solid cage is adopted without suffix after basic bearing number. The bearing with nylon cage can operate under ambient temperature of +120* or higher. The brass solid cage is considered when the bearing is used under high temperature or in critical conditions.

Please contact with ZWZ if requesting for the bearing with non-standard cage.

Dynamic Equivalent Load:

$$\begin{aligned} &\text{When } F_a/F_r \leq e, \\ &P = F_r + Y_1 F_a \\ &\text{When } F_a/F_r > e, \\ &P = 0.65 F_r + Y_2 F_a \end{aligned}$$

The values of e, Y1 and Y2 can be found in dimension table of bearing.

Static Equivalent Load

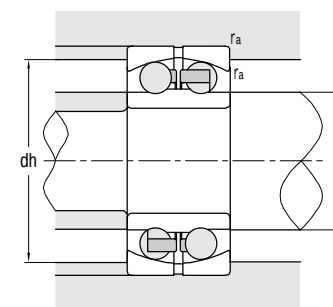
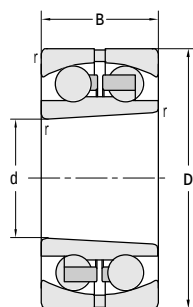
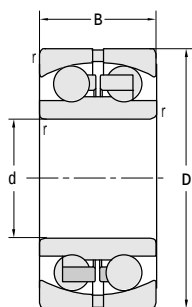
$$P_0 = F_r + Y_0 F_a$$

The value of Y0 can be found in dimension table of bearing.

Self-aligning Ball Bearing

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d 25–45 mm



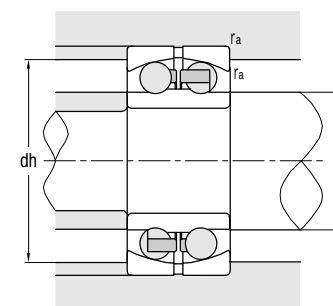
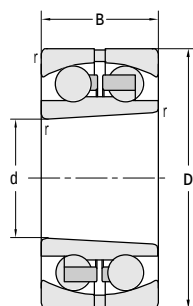
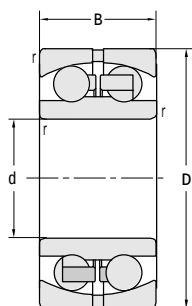
Principal dimensions				Basic load ratings		Limit speed ratings		Designations	
d	D	B	r _{min}	C _r	C _{or}	Grease	Oil	Cylindrical bore	Tapered bore
mm				kN		r/min			
25	52	15	1	13.9	3.88	13000	16000	1205TN1	
	62	17	1.1	18.4	5.24	9500	12000	1305TN1	
30	62	16	1	15.6	4.70	10000	13000	1206	1206K
	62	20	1	23.0	6.50	9500	12000	2206	2206K
	62	20	1	23.0		9500	12000	2206TN1	
	72	27	1.1	31.0	8.70	8500	10000	2306	2306K
	72	27	1.1	31.0		8500	10000	2306TN1	
35	72	17	1.1	18.4	5.82	9000	11000	1207	1207K
	72	17	1.1	18.4	5.82	9000	11000	1207TN1	1207KTN1
	72	23	1.1	29.8	8.54	8500	10000	2207	2207K
	72	23	1.1	29.8	8.54	8500	10000	2207TN1	
	80	21	1.5	25.7	8.25	7500	9000	1307	1307K
	80	21	1.5	25.7	8.25	7500	9000	1307TN1	1307KTN1
	80	31	1.5	39.0	11.1	7000	8500	2307	2307K
	80	31	1.5	39.0	11.1	7000	8500	2307TN1	
	80	18	1.1	19.3	6.74	8500	10000	1208	1208K
	80	18	1.1	19.3	6.74	8500	10000	1208TN1	1208KTN1
40	80	23	1.1	30.9	9.70	7500	9000	2208	2208K
	80	23	1.1	30.9	9.70	7500	9000	2208TN1	2208KTN1
	90	23	1.5	32.8	10.9	6700	8000	1308	1308K
	90	23	1.5	32.8	10.9	6700	8000	1308TN1	1308KTN1
	90	33	1.5	52.4	15.5	6300	7500	2308	2308K
	90	33	1.5	52.4	15.5	6300	7500	2308TN1	2308KTN1
	85	19	1.1	22.2	7.57	7500	9000	1209	1209K
	85	19	1.1	22.2	7.57	7500	9000	1209TN1	1209KTN1
	85	23	1.1	31.5	10.3	7000	8500	2209	2209K
	85	23	1.1	31.5	10.3	7000	8500	2209TN1	2209KTN1
45	100	25	1.5	38.5	13.0	6300	7500	1309	1309K
	100	25	1.5	38.5	13.0	6300	7500	1309TN1	1309KTN1
	100	36	1.5	61.8	18.7	5600	6700	2309	2309K
	100	36	1.5	61.8	18.7	5600	6700	2309M	

Abutment and fillet dimensions			Axle load coefficient				Weight	
D _{smin}	dh _{max}	r _{amax}	e	Y1	Y2	Y0	Cylindrical bore	Tapered bore
mm			mm				kg	
30	47	1	0.28	2.2	3.5	2.5	0.137	
31.5	55.5	1	0.28	2.2	3.5	2.5	0.249	
35	57	1	0.25	2.5	3.87	2.62	0.228	0.221
35	57	1	0.39	1.63	2.53	1.71	0.260	0.248
35	57	1	0.39	1.63	2.53	1.71	0.242	
36.5	65.5	1	0.44	1.43	2.22	1.5	0.515	0.495
36.5	65.5	1	0.44	1.43	2.22	1.5	0.494	
41.5	65.5	1	0.23	2.74	4.24	2.87	0.318	0.308
41.5	65.5	1	0.23	2.74	4.24	2.87	0.309	0.300
41.5	65.5	1	0.37	1.69	2.61	1.77	0.604	0.585
41.5	65.5	1	0.37	1.69	2.61	1.77	0.587	
43	72	1.5	0.25	2.56	3.97	2.69	0.507	0.492
43	72	1.5	0.25	2.56	3.97	2.69	0.486	0.471
43	72	1.5	0.46	1.36	2.11	1.43	0.675	0.645
43	72	1.5	0.46	1.36	2.11	1.43	0.659	
46.5	73.5	1	0.22	2.87	4.45	3.01	0.410	0.400
46.5	73.5	1	0.22	2.87	4.45	3.01	0.402	0.392
46.5	73.5	1	0.33	1.9	2.94	1.99	0.520	0.500
46.5	73.5	1	0.33	1.9	2.94	1.99	0.476	0.456
48	82	1.5	0.24	2.62	4.05	2.74	0.714	0.694
48	82	1.5	0.24	2.62	4.05	2.74	0.688	0.668
48	82	1.5	0.43	1.45	2.25	1.52	0.959	0.919
48	82	1.5	0.43	1.45	2.25	1.52	0.901	0.861
51.5	78.5	1	0.21	2.94	4.55	3.08	0.469	0.455
51.5	78.5	1	0.21	2.94	4.55	3.08	0.458	0.444
51.5	78.5	1	0.31	2.04	3.15	2.13	0.553	0.533
51.5	78.5	1	0.31	2.04	3.15	2.13	0.503	0.483
53	92	1.5	0.25	2.53	3.92	2.66	0.951	0.926
53	92	1.5	0.25	2.53	3.92	2.66	0.920	0.895
53	92	1.5	0.42	1.51	2.33	1.58	1.24	1.19
53	92	1.5	0.42	1.51	2.33	1.58	1.36	

Self-aligning Ball Bearing

ZWZ

d 50~70 mm



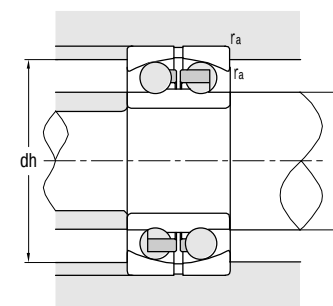
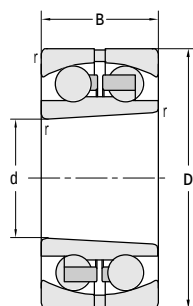
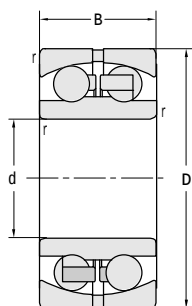
Principal dimensions				Basic load ratings		Limit speed ratings		Designations	
d	D	B	r _{min}	C _r	C _{or}	Grease	Oil	Cylindrical bore	Tapered bore
mm				kN		r/min			
50	90	20	1.1	25.7	8.88	7000	8500	1210	1210K
	90	20	1.1	25.7	8.88	7000	8500	1210TN1	1210KTN1
	90	23	1.1	32.8	10.9	6300	7500	2210	2210K
	90	23	1.1	32.8	10.9	6300	7500	2210TN1	2210KTN1
	110	27	2	43.5	14.0	5600	6700	1310	1310K
	110	40	2	63.5	20.0	5300	6300	2310	2310K
55	100	21	1.5	27.0	10.6	6300	7500	1211	1211K
	100	21	1.5	27.0	10.6	6300	7500	1211TN1	1211KTN1
	100	25	1.5	37.8	13.0	6000	7000	2211	2211K
	120	29	2	51.5	18.0	5000	6000	1311	1311K
	120	29	2	51.5	18.0	5000	6000	1311TN1	1311KTN1
	120	43	2	75.0	23.5	4300	5000	2311	2311K
60	110	22	1.5	31.0	11.8	5600	6700	1212	1212K
	110	22	1.5	31.0	11.8	5600	6700	1212TN1	1212KTN1
	110	28	1.5	47.5	16.5	5300	6300	2212	2212K
	110	28	1.5	47.5	16.5	5300	6300	2212TN1	2212KTN1
	130	31	2.1	58.5	21.3	4500	5300	1312	1312K
	130	31	2.1	58.5	21.3	4500	5300	1312TN1	1312KTN1
	130	46	2.1	86.5	27.7	4500	5300	2312	2312K
	130	46	2.1	86.5	27.7	4500	5300	2312M	
	150	35	2.1	76.5	28.4	3800	4500	1412	
	150	35	2.1	73.5	26.7	3800	4500	1412M	
65	120	23	1.5	34.0	13.6	5300	6300	1213	1213K
	120	23	1.5	34.0	13.6	5300	6300	1213TN1	1213KTN1
	120	31	1.5	55.5	19.4	5000	6000	2213	2213K
	140	33	2.1	63.0	24.7	4300	5000	1313	1313K
	140	48	2.1	95.5	32.5	4000	4800	2313	2313K
70	125	24	1.5	34.5	14.2	5000	6000	1214	1214K
	125	31	1.5	44.0	17.0	4800	5600	2214	2214K
	150	35	2.1	74.5	27.8	4000	4800	1314	1314K
	150	51	2.1	109	37.5	3800	4500	2314	

Abutment and fillet dimensions			Axle load coefficient				Weight	
D _{smin}	dh _{max}	r _{amax}	e	Y1	Y2	Y0	Cylindrical bore	Tapered bore
mm			mm				kg	
56.5	83.5	1	0.2	3.13	4.85	3.28	0.547	0.527
56.5	83.5	1	0.2	3.13	4.85	3.28	0.535	0.515
56.5	83.5	1	0.29	2.2	3.41	2.31	0.618	0.598
56.5	83.5	1	0.29	2.2	3.41	2.31	0.567	0.547
59	101	2	0.24	2.68	4.14	2.8	1.21	1.18
59	101	2	0.42	1.49	2.3	1.56	1.66	1.58
63	95	1.5	0.2	3.23	4.99	3.38	0.708	0.683
63	95	1.5	0.2	3.23	4.99	3.38	0.681	0.656
63	95	1.5	0.28	2.26	3.5	2.37	0.824	0.794
64	111	2	0.23	2.7	4.18	2.83	1.57	1.53
64	111	2	0.23	2.7	4.18	2.83	1.51	1.47
64	111	2	0.41	1.53	2.36	1.6	2.10	2.00
68	102	1.5	0.19	3.39	5.25	3.56	0.892	0.872
68	102	1.5	0.19	3.39	5.25	3.56	0.870	0.850
68	102	1.5	0.28	2.27	3.51	2.38	1.16	1.12
68	102	1.5	0.28	2.27	3.51	2.38	1.09	1.05
71	119	2	0.23	2.8	4.33	2.93	1.98	1.93
71	119	2	0.23	2.8	4.33	2.93	1.92	1.87
71	119	2	0.4	1.56	2.41	1.63	2.61	2.41
71	119	2	0.4	1.56	2.41	1.63	2.68	
71	139	2	0.22	2.81	4.35	2.95	3.26	
71	139	2	0.22	2.81	4.35	2.95	3.31	
73	112	1.5	0.17	3.71	5.73	3.88	0.915	0.885
73	112	1.5	0.17	3.71	5.73	3.88	0.865	0.835
73	112	1.5	0.28	2.25	3.48	2.35	1.50	1.44
76	129	2	0.23	2.78	4.31	2.92	2.38	2.31
76	129	2	0.38	1.65	2.55	1.72	3.22	3.07
78	117	1.5	0.18	3.51	5.44	3.68	1.29	1.25
78	117	1.5	0.27	2.36	3.66	2.48	1.63	1.57
81	139	2	0.22	2.81	4.35	2.95	2.98	2.90
81	139	2	0.39	1.62	2.5	1.69	3.92	

Self-aligning Ball Bearing

ZWZ

d 75~100 mm



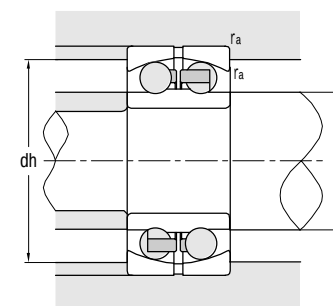
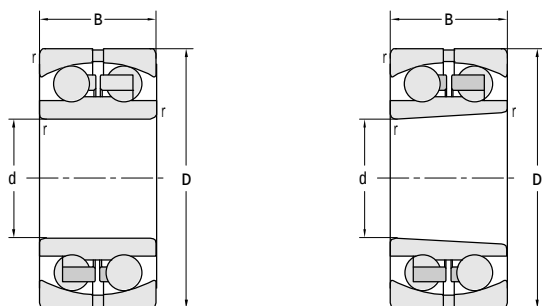
Principal dimensions				Basic load ratings		Limit speed ratings		Designations	
d	D	B	r _{min}	C _r	C _{or}	Grease	Oil	Cylindrical bore	Tapered bore
mm				kN		r/min			
75	130	25	1.5	39.0	15.5	4800	5600	1215	1215K
	130	31	1.5	55.5	21.3	4500	5300	2215	2215K
	160	37	2.1	79.5	29.9	3800	4500	1315	1315K
	160	55	2.1	123	43.0	3400	4000	2315	2315K
	160	55	2.1	123	43.0	3400	4000	2315TN1	
80	140	26	2	40.0	16.9	4500	5300	1216	1216K
	140	26	2	40.0	16.9	4500	5300	1216TN1	1216KTN1
	140	33	2	63.0	24.7	4000	4800	2216	2216K
	170	39	2.1	89.0	33.5	3600	4300	1316	1316K
	170	58	2.1	131	47.5	3200	3800	2316	2316K
	170	58	2.1	131	47.5	3200	3800	2316TN1	
	170	58	2.1	131	47.5	3200	3800	2316M	
85	150	28	2	49.0	20.5	4000	4800	1217	1217K
	150	36	2	58.5	23.6	3800	4500	2217	2217K
	180	41	3	98.5	38.0	3400	4000	1317	1317K
	180	60	3	139	51.5	3000	3600	2317	2317K
90	160	30	2	57.0	23.4	3800	4500	1218	1218K
	160	40	2	70.0	28.5	3400	4300	2218	2218K
	190	43	3	117	45.0	3200	3800	1318	1318K
	190	43	3	118	45.1	3200	3800	1318M	
	190	64	3	151	57.0	2800	3400	2318	2318K
	190	64	3	152	57.1	2800	3400	2318M	2318KM
95	170	32	2.1	64.0	27.0	3600	4300	1219	1219K
	170	43	2.1	83.5	34.0	3400	4000	2219	2219K
	200	45	3	132	51.0	3000	3600	1319	1319K
	200	67	3	164	64.5	2600	3200	2319	2319K
100	180	34	2.1	69.0	29.5	3400	4000	1220	1220K
	180	34	2.1	69.1	29.5	3400	4000	1220M	1220KM
	180	46	2.1	97.5	40.5	3200	3800	2220	2220K
	180	46	2.1	97.6	40.6	3200	3800	2220M	2220KM
	215	47	3	143	58.0	2800	3400	1320J	1320KJ

Abutment and fillet dimensions			Axle load coefficient				Weight	
D _{smin}	dh _{max}	r _{amax}	e	Y1	Y2	Y0	Cylindrical bore	Tapered bore
mm			mm				kg	
83	122	1.5	0.17	3.6	5.58	3.77	1.35	1.31
83	122	1.5	0.25	2.49	3.86	2.61	1.71	1.64
86	149	2	0.22	2.84	4.39	2.97	3.55	3.45
86	149	2	0.38	1.66	2.56	1.73	4.71	4.51
86	149	2	0.38	1.66	2.56	1.73	4.71	
89	131	2	0.16	3.94	6.1	4.13	1.65	1.60
89	131	2	0.16	3.94	6.1	4.13	1.59	1.54
89	131	2	0.25	2.49	3.86	2.61	2.19	2.11
91	159	2	0.22	2.92	4.52	3.06	4.19	4.09
91	159	2	0.39	1.63	2.53	1.71	5.70	5.50
91	159	2	0.39	1.63	2.53	1.71	5.62	
91	159	2	0.39	1.63	2.53	1.71	5.93	
94	141	2	0.17	3.69	5.7	3.86	2.10	2.04
94	141	2	0.25	2.48	3.84	2.6	2.53	2.43
98	167	2.5	0.22	2.9	4.49	3.04	4.95	4.81
98	167	2.5	0.38	1.67	2.59	1.75	6.73	6.43
99	151	2	0.17	3.76	5.81	3.94	2.44	2.36
99	151	2	0.27	2.36	3.65	2.47	3.22	3.08
103	177	2.5	0.22	2.81	4.35	2.94	5.99	5.82
103	177	2.5	0.22	2.81	4.35	2.94	6.70	
103	177	2.5	0.38	1.67	2.58	1.74	8.27	7.97
103	177	2.5	0.38	1.67	2.58	1.74	8.45	8.15
106	159	2	0.17	3.68	5.69	3.85	3.06	2.96
106	159	2	0.26	2.38	3.69	2.5	5.38	5.20
108	187	2.5	0.23	2.77	4.29	2.9	6.98	6.80
108	187	2.5	0.38	1.68	2.59	1.76	9.20	8.80
111	169	2	0.17	3.64	5.63	3.81	3.68	3.58
111	169	2	0.17	3.64	5.63	3.81	3.78	3.68
111	169	2	0.27	2.34	3.62	2.45	4.95	4.74
111	169	2	0.27	2.34	3.62	2.45	5.15	4.95
113	202	2.5	0.24	2.67	4.13	2.8	9.14	8.94

Self-aligning Ball Bearing

ZWZ

d 100~1100 mm



Principal dimensions				Basic load ratings		Limit speed ratings		Designations	
d	D	B	r _{min}	C _r	C _{or}	Grease	Oil	Cylindrical bore	Tapered bore
mm				kN		r/min			
100	215	73	3	191	78.5	2400	3000	2320J	2320KJ
	215	73	3	191	78.5	2400	3000	2320TN1	
105	190	36	2.1	75.0	32.0	3200	3800	1221	
	225	77	3	194	79.5	3200	2800	2321	
110	200	38	2.1	115	51.5	3000	3600	1222	1222K
	200	38	2.1	116	51.6	3000	3600	1222M	1222KM
	200	53	2.1	124	52.0	2800	3400	2222	2222K
	200	53	2.1	125	52.1	2800	3400	2222M	2222KM
	240	50	3	163.5	72.0	2400	3000	1322J	1322KJ
	240	80	3	215.5	94.0	2200	2800	2322J	2322KJ
	240	80	3	215.5	94.0	2200	2800	2322TN1	
120	215	42	2.1	119.5	52.5	2000	2600	1224	1224K
	215	42	2.1	115	50.0	2000	2600	1224J	1224KJ
130	230	46	3	125	56.5	3600	5600	1226	
140	250	50	3	155	72.0	1900	2500	1228	1228K
	250	50	3	155	72.0	1900	2500	1228-NTW	
150	235	36	3	104	53.0	2000	2600	1730	
500	720	300	6	338	301	350	400	150/500D1L	
680	900	300	6	360	370	300	350	150/680D1L	
1100	1300	300	6	328	440	130	160	150/1100D1L	

Abutment and fillet dimensions			Axle load coefficient				Weight	
D _{smin}	dh _{max}	ra _{max}	e	Y1	Y2	Y0	Cylindrical bore	Tapered bore
mm			mm				kg	
113	202	2.5	0.37	1.69	2.62	1.77	12.4	11.8
113	202	2.5	0.37	1.69	2.62	1.77	12.1	
116	179	2	0.18	3.55	5.5	3.72	4.71	
118	212	2.5	0.39	1.64	2.53	1.71	14.4	
121	189	2	0.17	3.64	5.64	3.82	5.20	5.04
121	189	2	0.17	3.64	5.64	3.82	5.56	5.40
121	189	2	0.28	2.25	3.49	2.36	7.16	6.86
121	189	2	0.28	2.25	3.49	2.36	7.36	7.06
123	227	2.5	0.22	2.83	4.39	2.97	11.9	11.7
123	227	2.5	0.38	1.67	2.59	1.75	17.6	16.9
123	227	2.5	0.38	1.67	2.59	1.75	15.9	
131	204	2	0.2	3.21	4.97	3.36	7.04	6.84
131	204	2	0.2	3.21	4.97	3.36	7.04	6.84
144	216	2.5	0.2	3.3	5.1	3.6	8.64	
153	237	2	0.2	3.12	4.83	3.27	11.3	11.0
153	237	2	0.2	3.12	4.83	3.27	10.7	
163	222	2	0.15	4.18	6.46	4.38	6.25	
523	697	5.5	0.32	1.98	3.06	2.07	342	
703	877	5.5	0.26	2.38	3.69	2.5	447	
1123	1277	5.5	0.21	2.99	4.62	3.13	614	