Thin-Section Angular Contact Ball Bearings

TIMKEN



High Precision and Increased Axial Stiffness

Semiconductor processing requires accurate and reliable robotics. The high-speed, repetitive motions of robotic joints demand bearings that maximize the machine's speed and agility. Timken® angular contact ball bearings keep the line moving, while offering increased accuracy due to higher-precision tolerances.

The need of a radar antenna to move smoothly is critical. Just as important is minimizing maintenance investment. Limited or difficult access can drive the need for greater reliability. Timken angular contact bearings in duplex arrangements manage these issues – offering bi-directional stiffness with precision movement, and dependable performance to help reduce service visits.

Timken angular contact ball bearings maximize the ball complement to increase axial stiffness and thrust capacity. They are available in pre-loaded duplex sets to lower torque and increase stiffness. Numerous size, material and separator options are available to match specific customer needs.

Timken's advanced thin-section bearing technology gives designers of precision equipment robust solutions for compact space requirements and similar challenges.

Thin-Section Features

Precision tolerances – meet ABEC 5 or 7 (ISO P5 or P4) standards for better fit with high running accuracy and consistent operation.

Material selection – performance options of 440C stainless steel or 52100 chrome steel offer corrosion resistance in challenging environments.

Superfinished raceways – provide a smooth surface finish of < 0.08 µm (3 µin) Ra to reduce internal friction and vibration.

High-quality ball complement – delivers smooth rolling performance with Grade 5 or better balls optimized for minimum non-repeatable runout and low torque.

Broad size range – provides unique thin-section designs and superior performance up to 300 mm (12 in.) outside diameter in standard product.

Compact size – saves weight and space for both bearing and mating components, helping to reduce overall envelope dimensions.

Duplexing capability – preloaded pairs further increase capacity and stiffness.

Low torque design – minimizes friction and helps to reduce energy input requirements.

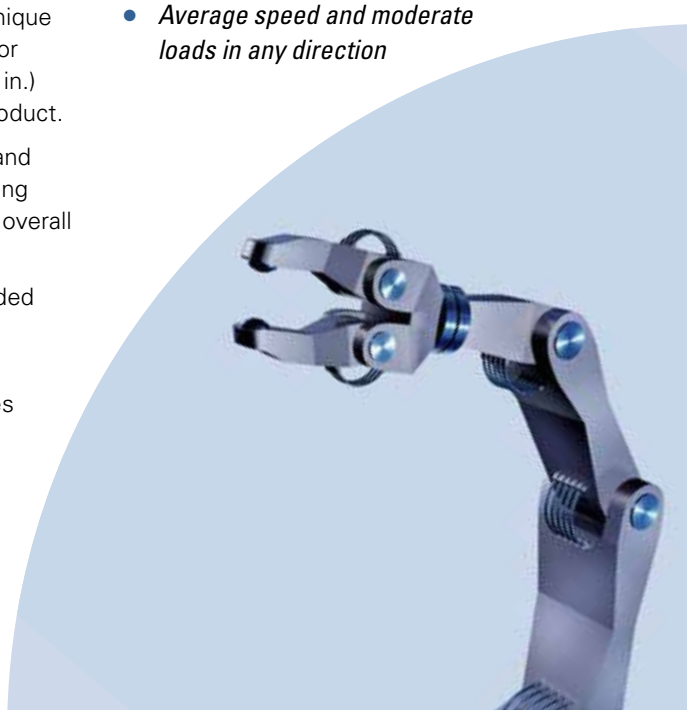
Superior Timken quality – More than a century of bearing expertise and continual technological advances.

Typical Applications

- *Precision Robotics*
- *Guidance Systems*
- *Aerospace Systems*
- *Instrument Gimbals*

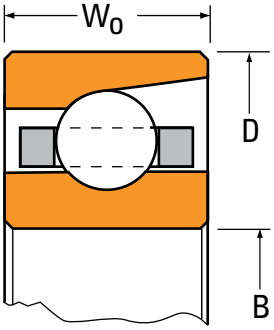
Also Available – Thin-Section Deep-Groove Ball Bearings

- *Potential weight savings over angular contact bearings*
- *Average speed and moderate loads in any direction*



THIN-SECTION BALL BEARINGS

Angular Contact Bearings



Standard thin-section angular contact bearings are available with the following to meet your application requirements:

Materials
- *440C stainless steel*
- *52100 chrome steel*

Separators
- *One-piece snap type phenolic retainer (up to chassis size 80-96)*
- *PTFE spacers*

Tolerances
- *ABEC 5 (ISO P5)*
- *ABEC 7 (ISO P4)*

Preload
- *Multiple preloads available*

Mountings/Sets
- *Back-to-Back*
- *Face-to-Face*
- *Tandem*

To learn about additional custom options, contact your Timken sales representative.

Chassis	B Bore	D O.D.	W_o Width	Load Ratings Radial Static	Radial Dyn.	Thrust Static	Thrust Dyn.	Approx. Weight
	mm/in.	mm/in.	mm/in.	kg/lbs.	kg/lbs.	kg/lbs.	kg/lbs.	g/oz.
64-80	101.60	127.00	12.70	2215	1713	1693	1933	328.9
	4.000	5.000	0.500	4883	3776	3732	4261	11.6
68-76	107.95	120.65	6.35	1217	657	837	743	82.5
	4.25	4.75	0.25	2684	1449	1845	1639	2.9
68-78	107.95	123.83	7.94	1473	888	1049	1007	130.2
	4.25	4.875	0.3125	3246	1959	2313	2220	4.6
68-80	107.95	127.00	9.53	1778	1161	1301	1307	190.3
	4.250	5.000	0.375	3919	2561	2869	2881	6.7
68-84	107.95	133.35	12.70	2331	1740	1774	1964	346.8
	4.250	5.250	0.500	5139	3836	3912	4330	12.2
72-80	114.30	127.00	6.35	1277	666	876	754	87.0
	4.500	5.000	0.250	2815	1469	1931	1663	3.1
72-82	114.30	130.18	7.94	1563	909	1111	1030	137.4
	4.500	5.125	0.3125	3447	2003	2450	2271	4.8
72-84	114.30	133.35	9.53	1907	1196	1391	1346	200.9
	4.500	5.250	0.375	4203	2636	3068	2967	7.1
72-88	114.30	139.70	12.70	2447	1767	1856	1994	364.7
	4.500	5.500	0.500	5395	3895	4092	4397	12.9
76-84	120.65	133.35	6.35	1336	676	915	765	91.5
	4.750	5.250	0.250	2946	1490	2017	1686	3.2
76-86	120.65	136.53	7.94	1654	928	1173	1052	144.6
	4.750	5.375	0.3125	3647	2046	2587	2320	5.1
76-88	120.65	139.70	9.53	1974	1204	1437	1355	210.7
	4.750	5.500	0.375	4351	2654	3168	2987	7.4
76-92	120.65	146.05	12.70	2670	1842	2018	2080	384.6
	4.750	5.750	0.500	5886	4061	4449	4585	13.6
76-100	120.65	158.75	19.05	3918	3252	3117	3665	903.7
	4.750	6.250	0.750	8637	7170	6872	8081	31.9
80-88	127.00	139.70	6.35	1424	694	974	786	96.2
	5.000	5.500	0.250	3140	1530	2146	1732	3.4
80-90	127.00	142.88	7.94	1745	947	1236	1074	151.8
	5.000	5.625	0.3125	3848	2087	2724	2367	5.4
80-92	127.00	146.05	9.53	2103	1236	1527	1392	221.4
	5.000	5.750	0.375	4635	2725	3367	3068	7.8
80-96	127.00	152.40	12.70	2786	1866	2100	2107	402.5
	5.000	6.000	0.500	6142	4113	4629	4646	14.2
80-104	127.00	165.10	19.05	4168	3338	3302	3763	946.2
	5.000	6.500	0.750	9189	7359	7280	8297	33.4
88-96	139.70	152.40	6.35	1571	720	1071	815	105.4
	5.500	6.000	0.250	3465	1587	2362	1796	3.7
88-98	139.70	155.58	7.94	1927	982	1360	1114	166.2
	5.500	6.125	0.3125	4249	2165	2998	2457	5.9
88-100	139.70	158.75	9.53	2299	1274	1663	1435	241.8
	5.500	6.250	0.375	5068	2808	3665	3163	8.5
88-104	139.70	165.10	12.70	3018	1911	2263	2160	438.4
	5.500	6.500	0.500	6654	4214	4988	4761	15.5
88-112	139.70	177.80	19.05	4436	3382	3489	3815	1024.5
	5.500	7.000	0.750	9780	7457	7692	8411	36.1
96-104	152.40	165.10	6.35	1690	736	1150	833	114.3
	6.000	6.500	0.250	3726	1622	2534	1837	4.0
96-106	152.40	168.28	7.94	2109	1016	1484	1153	180.6
	6.000	6.625	0.3125	4650	2239	3271	2541	6.4
96-108	152.40	171.45	9.53	2495	1310	1798	1476	262.3
	6.000	6.750	0.375	5499	2888	3964	3253	9.3
96-112	152.40	177.80	12.70	3358	1999	2506	2259	476.2
	6.000	7.000	0.500	7403	4406	5526	4980	16.8
96-120	152.40	190.50	19.05	4938	3539	3859	3993	1109.7
	6.000	7.500	0.750	10886	7802	8508	8804	39.1
104-112	165.10	177.80	6.35	1838	759	1247	860	123.6
	6.500	7.000	0.250	4051	1674	2750	1895	4.4
104-114	165.10	180.98	7.94	2291	1047	1608	1188	195.0
	6.500	7.125	0.3125	5052	2309	3545	2620	6.9
104-116	165.10	184.15	9.53	2690	1344	1934	1515	282.7
	6.500	7.250	0.375	5931	2963	4263	3339	10.0

Chassis	B Bore	D O.D.	W_o Width	Load Ratings Radial Static	Radial Dyn.	Thrust Static	Thrust Dyn.	Approx. Weight
	mm/in.	mm/in.	mm/in.	kg/lbs.	kg/lbs.	kg/lbs.	kg/lbs.	g/oz.
104-120	165.10	190.50	12.70	3590	2039	2669	2305	512.1
	6.500	7.500	0.500	7915	4495	5885	5082	18.1
104-128	165.10	203.20	19.05	5441	3685	4229	4160	1194.9
	6.500	8.000	0.750	11995	8125	9324	9172	42.1
112-120	177.80	190.50	6.35	1985	781	1345	885	132.8
	7.000	7.500	0.250	4376	1722	2965	1951	4.7
112-122	177.80	193.68	7.94	2429	1065	1701	1208	208.9
	7.000	7.625	0.3125	5356	2347	3750	2664	7.4
112-124	177.80	196.85	9.53	2949	1397	2114	1574	304.0
	7.000	7.750	0.375	6501	3080	4661	3470	10.7
112-128	177.80	203.20	12.70	3822	2078	2832	2350	547.9
	7.000	8.000	0.500	8425	4581	6244	5181	19.3
112-136	177.80	215.90	19.05	5707	3720	4416	4201	1273.2
	7.000	8.500	0.750	12582	8202	9735	9261	44.9
120-128	190.50	203.20	6.35	2132	802	1443	909	142.0
	7.500	8.000	0.250	4701	1769	3181	2004	5.0
120-130	190.50	206.38	7.94	2611	1094	1825	1241	223.3
	7.500	8.125	0.3125	5757	2411	4024	2737	7.9
120-132	190.50	209.55	9.53	3145	1428	2250	1609	324.5
	7.500	8.250	0.375	6933	3147	4960	3547	11.4
120-136	190.50	215.90	12.70	4162	2154	3076	2436	585.8
	7.500	8.500	0.500	9177	4748	6782	5371	20.7
120-144	190.50	228.60	19.05	6211	3854	4786	4354	1358.3
	7.500	9.000	0.750	13694	8498	10552	9598	47.9
128-136	203.20	215.90	6.35	2251	816	1521	924	151.0
	8.000	8.500	0.250	4962	1798	3353	2037	5.3
128-138	203.20	219.08	7.94	2794	1122	1949	1273	237.7
	8.000	8.625	0.3125	6159	2473	4298	2807	8.4
128-140	203.20	222.25	9.53	3341	1457	2385	1642	344.9
	8.000	8.750	0.375	7365	3213	5259	3621	12.2
128-144	203.20	228.60	12.70	4394	2189	3239	2477	621.6
	8.000	9.000	0.500	9687	4826	7141	5460	21.9
128-152	203.20	241.30	19.05	6476	3886	4972	4390	1436.6
	8.000	9.500	0.750	14278	8568	10962	9679	50.7
144-152	228.60	241.30	6.35	2546	854	1716	968	169.4
	9.000	9.500	0.250	5612	1883	3784	2133	6.0
144-154	228.60	244.48	7.94	3158	1174	2198	1333	266.5
	9.000	9.625	0.3125	6962	2589	4845	2939	9.4
144-156	228.60	247.65	9.53	3733	1513	2656	1706	385.8
	9.000	9.750	0.375	8229	3337	5857	3762	13.6
144-160	228.60	254.00	12.70	4967	2291	3646	2593	695.3
	9.000	10.000	0.500	10949	5051	8038	5716	24.5
144-168	228.60	266.70	19.05	7487	4129	5713	4667	1607.0
	9.000	10.500	0.750	16506	9104	12596	10289	56.7
160-168	254.00	266.70	6.35	2841	890	1912	1008	187.8
	10.000	10.500	0.250	6263	1962	4215	2223	6.6
160-170	254.00	269.88	7.94	3478	1212	2415	1377	294.8
	10.000	10.625	0.3125	7667	2673	5324	3036	10.4
160-172	254.00	273.05	9.53	4188	1582	2973	1784	427.5
	10.000	10.750	0.375	9232	3488	6553	3934	15.1
160-176	254.00	279.40	12.70	5540	2386	4053	2700	768.9
	10.000	11.000	0.500	12213	5260	8934	5953	27.1
160-184	254.00	292.10	19.05	8257	4268	6270	4825	1770.5
	10.000	11.500	0.750	18203	9409	13823	10638	62.5
176-184	279.40	292.10	6.35	3107	918	2088	1040	206.0
	11.000	11.500	0.250	6849	2023	4603	2292	7.3
176-186	279.40	295.28	7.94	3842	1259	2663	1430	323.6
	11.000	11.625	0.3125	8470	2775	5872	3152	11.4
176-188	279.40	298.45	9.53	4579	1631	3244	1840	468.4
	11.000	11.750	0.375	10095	3596	7151	4056	16.5
176-192	279.40	304.80	12.70	6002	2444	4378	2903	840.6
	11.000	12.000	0.500	13231	5389	9653	6401	29.7

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TIMKEN

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets bearings, gear drives, automated lubrication systems, belts, brakes, clutches, chain, couplings, linear motion products and related industrial motion rebuild and repair services.