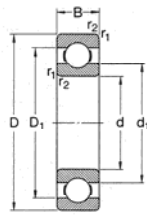
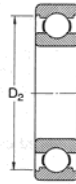


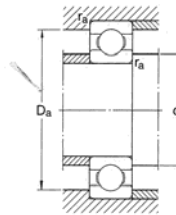
یاتاقان‌های ساچمه‌ای شیار عمیق (Deep Groove Ball Bearings)



With full outer ring shoulders



With recessed outer ring shoulders



Principal dimensions		Basic load ratings		Fatigue load limit P_u	Speed ratings		Mass	Designation	Series	Abutment and fillet dimensions						
d	D	C	C_0		r/min	grease				oil	d_1	D_1	D_2	r_{1a}	$d_{a \min}$	$D_{a \max}$
mm	in	N	lbf	N	lbf	r/min	kg	lb	-	-	mm	in	mm	in		
2.5	8	2.8	319	106	4	67 000	0.0007	-	60/2.5	4.6	6.4	-	0.15	3.7	6.8	0.1
0.0984	0.3150	0.1102	71.7	23.8	0.899	23.8	0.0015	-		0.181	0.252	-	0.006	0.146	0.268	0.004
3	10	4	488	146	6	60 000	0.0015	-	623	5.2	7.5	8.2	0.15	4.2	8.8	0.1
0.1181	0.3937	0.1575	110	32.8	1.35	60 000	0.0033	-		0.205	0.295	0.323	0.006	0.165	0.346	0.004
4	9	2.5	540	180	7	63 000	0.0007	-	618/4	5.2	7.5	-	0.1	5.2	7.8	0.1
0.1575	0.3543	0.0984	121	40.5	1.57	63 000	0.0015	-		0.205	0.295	-	0.004	0.205	0.307	0.004
	12	4	806	280	12	53 000	0.0022	-	604	6.4	9.6	-	0.2	5.6	10.4	0.2
	0.4724	0.1575	181	62.9	2.70	53 000	0.0049	-		0.252	0.378	-	0.008	0.220	0.409	0.008
	13	5	975	305	14	48 000	0.0031	-	624	6.7	10.3	11.2	0.2	5.6	11.4	0.2
	0.5118	0.1969	219	68.6	3.15	48 000	0.0068	-		0.264	0.406	0.441	0.008	0.220	0.449	0.008
	16	5	1 110	380	16	43 000	0.0054	-	634	8.4	12	13.3	0.3	6	14	0.3
	0.6299	0.1969	250	85.4	3.60	43 000	0.012	-		0.331	0.472	0.524	0.012	0.236	0.551	0.012
5	11	3	637	255	11	53 000	0.0012	-	618/5	6.8	9.3	-	0.15	6.2	9.8	0.1
0.1969	0.4331	0.1181	143	57.3	2.47	53 000	0.0026	-		0.268	0.366	-	0.016	0.244	0.386	0.004
	16	5	1 110	380	16	43 000	0.0050	-	625	8.4	12	13.3	0.3	7	14	0.3
	0.6299	0.1969	250	85.4	3.60	43 000	0.011	-		0.331	0.472	0.524	0.012	0.276	0.551	0.012
	19	6	1 720	620	26	36 000	0.0090	-	635	10.7	15.3	16.5	0.3	7	17	0.3
	0.7480	0.2362	387	139	5.85	36 000	0.020	-		0.421	0.602	0.650	0.012	0.276	0.669	0.012
6	13	3.5	884	345	15	48 000	0.0020	-	618/6	7.9	11.2	-	0.15	7.2	11.8	0.1
0.2362	0.5118	0.1378	199	77.6	3.37	48 000	0.0044	-		0.311	0.441	-	0.006	0.283	0.465	0.004
	19	6	1 720	620	26	36 000	0.0084	-	626	10.7	15.3	16.5	0.3	8	17	0.3
	0.7480	0.2362	387	139	5.85	36 000	0.019	-		0.421	0.602	0.650	0.012	0.315	0.669	0.012
7	14	3.5	956	400	17	45 000	0.0022	-	618/7	8.9	12.2	-	0.15	8.2	12.8	0.1
0.2756	0.5512	0.1378	215	89.9	3.82	45 000	0.0049	-		0.350	0.480	-	0.006	0.323	0.504	0.004
	19	6	1 720	620	26	38 000	0.0075	-	607	10.7	15.3	16.5	0.3	9	17	0.3
	0.7480	0.2362	387	139	5.85	38 000	0.017	-		0.421	0.602	0.650	0.012	0.354	0.669	0.012
	22	7	3 250	1 370	57	32 000	0.013	-	627	11.9	17.6	19	0.3	9	20	0.3
	0.8661	0.2756	731	308	12.8	32 000	0.029	-		0.485	0.693	0.748	0.012	0.354	0.787	0.012
8	16	4	1 330	570	24	40 000	0.0030	-	618/8	10.1	14	-	0.2	9.6	14.4	0.2
0.3150	0.6299	0.1575	299	128	5.40	40 000	0.0066	-		0.398	0.551	-	0.008	0.378	0.567	0.008
	22	7	3 250	1 370	57	36 000	0.012	-	608	11.8	17.6	19	0.3	10	20	0.3
	0.8661	0.2756	731	308	12.8	36 000	0.026	-		0.465	0.693	0.748	0.012	0.394	0.787	0.012
9	17	4	1 430	640	27	38 000	0.0034	-	618/9	11.1	15	-	0.2	10.6	15.4	0.2
0.3543	0.6693	0.1575	321	144	6.07	38 000	0.0075	-		0.437	0.591	-	0.008	0.417	0.606	0.008
	24	7	3 710	1 660	71	32 000	0.014	-	609	14.2	19.8	21.2	0.3	11	22	0.3
	0.9449	0.2756	834	373	16.0	32 000	0.031	-		0.559	0.780	0.835	0.012	0.433	0.866	0.012
	26	8	4 620	1 960	83	28 000	0.020	-	629	14.4	21.4	22.6	0.3	11	24	0.3
	1.0236	0.3150	1 040	441	18.7	28 000	0.044	-		0.567	0.843	0.890	0.012	0.433	0.945	0.012
10	19	5	1 380	585	25	36 000	0.0055	-	61800	12.6	16.4	-	0.3	12	17	0.3
0.3937	0.7480	0.1969	310	132	5.62	36 000	0.012	-		0.496	0.646	-	0.012	0.472	0.669	0.012
	22	6	1 950	750	32	34 000	0.010	-	61900	13	18.1	-	0.3	12	20	0.3
	0.8661	0.2362	438	169	7.19	34 000	0.022	-		0.512	0.713	-	0.012	0.472	0.787	0.012
	26	8	4 620	1 960	83	30 000	0.019	-	6000	14.4	21.4	22.6	0.3	12	24	0.3
	1.0236	0.3150	1 040	441	18.7	30 000	0.042	-		0.567	0.843	0.890	0.012	0.472	0.945	0.012
	28	8	4 620	1 960	83	28 000	0.022	-	16100	16.7	23.4	24.8	0.3	12	26	0.3
	1.1024	0.3150	1 040	441	18.7	28 000	0.049	-		0.657	0.921	0.976	0.012	0.472	1.024	0.012
	30	9	5 070	2 360	100	24 000	0.032	-	6200	16.7	23.4	24.8	0.6	14	26	0.6
	1.1811	0.3543	1 140	531	22.5	24 000	0.071	-		0.657	0.921	0.976	0.024	0.551	1.024	0.024
	35	11	8 060	3 400	143	20 000	0.053	-	6300	17.5	27.1	28.7	0.6	14	31	0.6
	1.3780	0.4331	1 810	764	32.1	20 000	0.12	-		0.689	1.067	1.130	0.024	0.551	1.220	0.024
12	21	5	1 430	670	28	32 000	0.0063	-	61801	15	18.2	-	0.3	14	19	0.3
0.4724	0.8268	0.1969	321	151	6.29	32 000	0.014	-		0.591	0.717	-	0.012	0.551	0.748	0.012
	24	6	2 250	980	43	30 000	0.011	-	61901	15.5	20.6	-	0.3	14	22	0.3
	0.9449	0.2362	506	220	9.67	30 000	0.024	-		0.610	0.811	-	0.012	0.551	0.866	0.012
	28	8	5 070	2 360	100	26 000	0.022	-	6001	16.7	23.4	24.8	0.3	14	26	0.3
	1.1024	0.3150	1 140	531	22.5	26 000	0.049	-		0.657	0.921	0.976	0.012	0.551	1.024	0.012
	30	8	5 070	2 360	100	26 000	0.023	-	16101	16.7	23.4	24.8	0.3	14	28	0.3
	1.1811	0.3150	1 140	531	22.5	26 000	0.051	-		0.657	0.921	0.976	0.012	0.551	1.102	0.012
	35	11	8 060	3 400	132	22 000	0.037	-	6201	18.2	25.9	27.4	0.6	16	28	0.6
	1.2598	0.3937	1 550	697	29.7	22 000	0.082	-		0.717	1.020	1.079	0.024	0.630	1.102	0.024
	37	12	9 750	4 150	176	19 000	0.060	-	6301	19.5	29.7	31.5	1	17	32	1
	1.4567	0.4724	2 190	933	39.6	19 000	0.13	-		0.768	1.169	1.240	0.039	0.669	1.260	0.039
15	24	5	1 560	800	34	28 000	0.0074	-	61802	17.9	21.1	-	0.3	17	22	0.3
0.5906	0.9449	0.1969	351	180	7.64	28 000	0.016	-		0.705	0.831	-	0.012	0.669	0.866	0.012
	28	7	4 030	2 040	85	24 000	0.016	-	61902	18.4	24.7	-	0.3	17	26	0.3
	1.1024	0.2756	906	459	19.1	24 000	0.035	-		0.724	0.972	-	0.012	0.669	1.024	0.012
	32	8	5 590	2 850	120	22 000	0.025	-	16002	20.2	27	28.2	0.3	17	30	0.3
	1.2598	0.3150	1 260	641	27.0	22 000	0.055	-		0.795	1.063	1.110	0.012	0.669	1.181	0.012

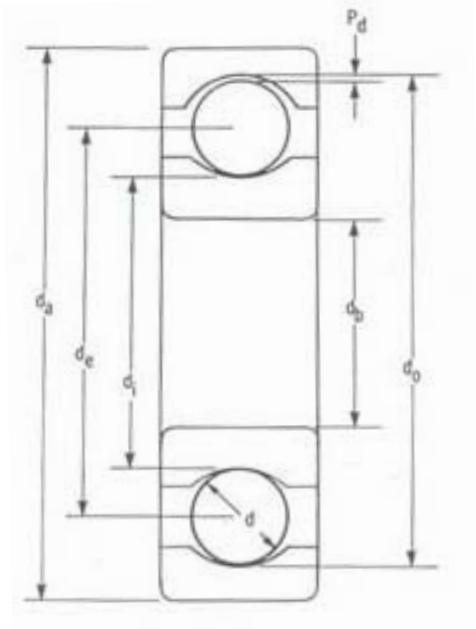
Principal dimensions			Basic load ratings		Fatigue load limit P _u	Speed ratings		Mass	Designation	Dimensions					Abutment and fillet dimensions		
d	D	B	C	C ₀		r/min	oil			d ₁	D ₁	D ₂	r _{1,2} mm	d _{fr} mm	D _{fr} mm	r _{fr} mm	
mm in			N lbf	N lbf	N lbf		kg lb	-	mm in								
20 0.7874	32	7	2 700	1 500	63	19 000	24 000	0.018	61804	24	28.3	-	0.3	22	30	0.3	
	1.2598	0.2756	607	337	14.2			0.040		0.945	1.114	-	0.012	0.866	1.181	0.012	
	37	9	6 370	3 650	156	18 000	22 000	0.038	61904	25.6	31.4	-	0.3	22	35	0.3	
	1.4567	0.3543	1 430	821	35.1			0.084		1.008	1.236	-	0.012	0.866	1.378	0.012	
	42	8	6 890	4 050	173	17 000	20 000	0.050	16004	27.3	34.6	-	0.3	22	40	0.3	
	1.6535	0.3150	1 550	910	38.9			0.11		1.075	1.362	-	0.012	0.866	1.575	0.012	
	42	12	9 360	5 000	212	17 000	20 000	0.069	6004	27.2	35.1	37.2	0.6	24	38	0.6	
	1.6535	0.4724	2 100	1 120	47.7			0.15		1.071	1.382	1.465	0.024	0.945	1.496	0.024	
	47	14	12 700	6 550	280	15 000	18 000	0.11	6204	28.5	38.7	40.6	1	25	42	1	
	1.8504	0.5512	2 860	1 470	62.9			0.24		1.122	1.524	1.598	0.039	0.984	1.654	0.039	
52	15	15 900	7 800	335	13 000	16 000	0.14	6304	30.3	42.1	44.8	1.1	26.5	45.5	1		
2.0472	0.5906	3 570	1 750	75.3			0.31		1.193	1.657	1.764	0.043	1.043	1.791	0.039		
72	19	30 700	15 000	640	10 000	13 000	0.40	6404	37.1	55.6	-	1.1	26.5	65.5	1		
2.8346	0.7480	6 900	3 370	144			0.88		1.461	2.189	-	0.043	1.043	2.579	0.039		
25 0.9843	37	7	4 360	2 600	125	17 000	20 000	0.022	61805	28.5	33.3	-	0.3	27	35	0.3	
	1.4567	0.2756	980	585	28.1			0.049		1.122	1.311	-	0.012	1.063	1.378	0.012	
	42	9	6 630	4 000	176	16 000	19 000	0.045	61905	30.2	36.8	-	0.3	27	40	0.3	
	1.65	0.3543	1 490	899	39.6			0.099		1.189	1.449	-	0.012	1.063	1.575	0.012	
	47	8	7 610	4 750	212	14 000	17 000	0.060	16005	33.3	40.7	-	0.3	27	45	0.3	
	1.8504	0.3150	1 710	1 070	47.7			0.13		1.311	1.602	-	0.012	1.063	1.772	0.012	
	47	12	11 200	6 550	275	15 000	18 000	0.080	6005	32	40.3	42.2	0.6	29	43	0.6	
	1.8504	0.4724	2 520	1 470	61.8			0.18		1.260	1.587	1.661	0.024	1.142	1.693	0.024	
	52	15	14 000	7 800	335	12 000	15 000	0.13	6205	34	44.2	46.3	1	30	47	1	
	2.0472	0.5906	3 150	1 750	75.3			0.29		1.339	1.740	1.823	0.039	1.181	1.850	0.039	
62	17	22 500	11 600	490	11 000	14 000	0.23	6305	36.6	50.9	52.7	1.1	31.5	55.5	1		
2.4409	0.6693	5 060	2 610	110			0.51		1.441	2.004	2.075	0.043	1.240	2.185	0.039		
80	21	35 800	19 300	815	9 000	11 000	0.53	6405	45.4	63.8	-	1.5	33	72	1.5		
3.1496	0.8268	8 050	4 340	183			1.15		1.787	2.512	-	0.059	1.299	2.835	0.059		
30 1.1811	42	7	4 490	2 900	146	15 000	18 000	0.027	61806	33.7	38.5	-	0.3	32	40	0.3	
	1.6535	0.2756	1 010	652	32.8			0.060		1.327	1.516	-	0.012	1.260	1.575	0.012	
	47	9	7 280	4 550	212	14 000	17 000	0.051	61906	35.2	41.8	-	0.3	32	45	0.3	
	1.8504	0.3543	1 640	1 020	47.7			0.11		1.386	1.646	-	0.012	1.260	1.772	0.012	
	55	9	11 200	7 350	310	12 000	15 000	0.085	16006	38	47.3	-	0.3	32	53	0.3	
	2.1654	0.3543	2 520	1 650	69.7			0.19		1.496	1.862	-	0.012	1.260	2.087	0.012	
	55	13	13 300	8 300	355	12 000	15 000	0.12	6006	38.2	47.1	49	1	35	50	1	
	2.1654	0.5118	2 990	1 870	79.8			0.26		1.504	1.854	1.929	0.039	1.378	1.969	0.039	
	62	16	19 500	11 200	475	10 000	13 000	0.20	6206	40.3	52.1	54.1	1	35	57	1	
	2.4409	0.6299	4 380	2 520	107			0.44		1.587	2.051	2.130	0.039	1.378	2.244	0.039	
72	19	28 100	16 000	670	9 000	11 000	0.35	6306	44.8	59.9	61.9	1.1	36.5	65.5	1		
2.8346	0.7480	6 300	3 600	151			0.77		1.756	2.358	2.437	0.043	1.437	2.579	0.039		
90	23	43 600	23 600	1 000	8 500	10 000	0.74	6406	50.3	70.7	-	1.5	38	82	1.5		
3.5433	0.9055	9 800	5 310	225			1.653		1.980	2.783	-	0.059	1.496	3.228	0.059		
35 1.3780	47	7	4 750	3 200	166	13 000	16 000	0.030	61807	38.7	43.5	-	0.3	37	45	0.3	
	1.8504	0.2756	1 070	719	37.3			0.066		1.524	1.713	-	0.012	1.457	1.772	0.012	
	55	10	9 560	6 200	290	11 000	14 000	0.080	61907	41.6	48.6	-	0.6	39	51	0.6	
	2.1654	0.3937	2 150	1 390	65.2			0.18		1.638	1.913	-	0.024	1.535	2.008	0.024	
	62	9	12 400	8 150	375	10 000	13 000	0.11	16007	44	53.3	-	0.3	37	60	0.3	
	2.4409	0.3543	2 790	1 830	84.3			0.24		1.732	2.098	-	0.012	1.457	2.362	0.012	
	62	14	15 900	10 200	440	10 000	13 000	0.16	6007	43.7	53.6	55.7	1	40	57	1	
	2.4409	0.5512	3 570	2 290	98.9			0.35		1.720	2.110	2.193	0.039	1.575	2.244	0.039	
	72	17	25 500	15 300	655	9 000	11 000	0.29	6207	46.9	60.6	62.7	1.1	41.5	65.5	1	
	2.8346	0.6693	5 730	3 440	147			0.64		1.746	2.386	2.469	0.043	1.434	2.579	0.039	
90	21	33 200	19 000	815	8 500	10 000	0.46	6307	49.5	66.1	69.2	1.5	43	72	1.5		
3.1496	0.8268	7 460	4 270	183			1.00		1.949	2.602	2.724	0.059	1.693	2.835	0.059		
100	25	55 300	31 000	1 290	7 000	8 500	0.95	6407	57.4	80.6	-	1.5	43	92	1.5		
3.9370	0.9843	12 400	6 970	290			2.10		2.260	3.173	-	0.059	1.693	3.622	0.059		
40 1.5748	52	7	4 940	3 450	186	11 000	14 000	0.034	61808	43.7	48.5	-	0.3	42	50	0.3	
	2.0472	0.2756	1 110	776	41.8			0.075		1.720	1.909	-	0.012	1.654	1.969	0.012	
	62	12	13 600	9 300	425	10 000	13 000	0.12	61908	47	55.2	-	0.6	44	58	0.6	
	2.4409	0.4724	3 100	2 090	95.5			0.26		1.850	2.173	-	0.024	1.732	2.283	0.024	
	68	9	13 300	9 150	440	9 500	12 000	0.13	16008	49.4	57	-	0.3	42	66	0.3	
	2.6772	0.3543	2 990	2 060	98.9			0.29		1.945	2.244	-	0.012	1.654	2.598	0.012	
	68	15	16 800	11 600	490	9 500	12 000	0.19	6008	49.2	59.1	61.1	1	45	63	1	
	2.6772	0.5906	3 780	2 610	110			0.42		1.937	2.327	2.406	0.039	1.772	2.480	0.039	
	80	18	30 700	19 000	800	8 500	10 000	0.37	6208	52.6	67.9	69.8	1.1	46.5	73.5	1	
	3.1496	0.7087	6 900	4 270	180			0.82		2.071	2.673	2.748	0.043	1.831	2.894	0.039	
90	23	41 000	24 000	1 020	7 500	9 000	0.63	6308	56.1	74.7	77.7	1.5	48	82	1.5		
3.5433	0.9055	9 220	5 400	229			1.40		2.209	2.941	3.059	0.059	1.890	3.228	0.059		
110	27	63 700	36 500	1 530	6 700	8 000	1.25	6408	62.8	88	-	2	49	101	2		
4.3307	1.0630	14 300	8 210	344			2.75		2.472	3.465	-	0.079	1.929	3.976	0.079		
45 1.7717	58	7	6 050	4 300	228	9 500	12 000	0.040	61809	48.7	54.5	-	0.3	47	56	0.3	
	2.2835	0.2756	1 360	967	51.3			0.088		1.917	2.146	-	0.012	1.850	2.205	0.012	
	68	12	14 000	9 800	465	9 000	11										

Principal dimensions		Basic load ratings		Fatigue	Speed ratings	Mass	Designation	Dimensions		Abutment and fillet dimensions						
d	D	B	C	static C ₀	dynamic C	limit P _u	grease oil	d ₁	D ₁	D ₂	r _{1,2} mm	d ₁ mm	D ₁ mm	r ₁ mm		
mm in			N lbf	N lbf	r/min	kg lb	-	mm in				mm in				
55 2.1654	72	9	8 320	6 200	325	8 500	10 000	0.083	61811	60.2	67	-	0.3	57	70	0.3
	2.8346	0.3543	1 870	1 390	73.1		0.18			2.370	2.638	-	0.012	2.244	2.756	0.012
	80	13	15 900	11 400	560	8 000	9 500	0.19	61911	63	72.1	-	1	60	75	1
	3.1496	0.5118	3 570	2 560	126		0.42			2.480	2.839	-	0.039	2.362	2.953	0.039
	90	11	19 500	14 000	695	7 500	9 000	0.26	16011	67	78	-	0.6	59	86	0.6
	3.5433	0.4331	4 380	3 150	156		0.57			2.638	3.071	-	0.024	2.523	3.386	0.024
	90	18	28 100	21 200	900	7 500	9 000	0.39	6011	66.3	79.1	81.5	1.1	61.5	83.5	1.1
	3.5433	0.7087	6 320	4 770	202		0.86			2.610	3.114	3.209	0.043	2.421	3.287	0.039
	100	21	43 600	29 000	1 250	6 300	7 500	0.61	6211	69	86.8	89.4	1.5	63	92	1.5
	3.9370	0.8268	9 800	6 520	281		1.35			2.717	3.409	3.520	0.059	2.480	3.622	0.059
120	29	71 500	45 000	1 900	5 600	6 700	1.35	6311	75.3	101	104	2	64	111	2	
4.7244	1.1417	16 100	10 100	427		3.00			2.965	3.976	4.094	0.079	2.520	4.370	0.079	
140	33	99 500	62 000	2 600	5 000	6 000	2.30	6411	81.5	115	-	2.1	66	129	2	
5.5118	1.2992	22 400	13 900	585		5.05			3.209	4.528	-	0.083	2.598	5.079	0.079	
60 2.3622	78	10	8 710	6 700	365	7 500	9 000	0.11	61812	65.6	72.6	-	0.3	62	76	0.3
	3.0709	0.3937	1 960	1 510	82.1		0.24			2.583	2.858	-	0.012	2.441	2.992	0.012
	85	13	16 500	12 000	600	7 500	9 000	0.20	61912	68	77.1	-	1	65	80	1
	3.3465	0.5118	3 710	2 700	135		0.44			2.677	3.035	-	0.039	2.559	3.150	0.039
	95	11	19 900	15 000	735	6 700	8 000	0.28	16012	72	83.4	-	0.6	64	91	0.6
	3.7402	0.4331	4 470	3 370	165		0.62			2.835	3.283	-	0.024	2.520	3.583	0.024
	95	18	29 600	23 200	980	6 700	8 000	0.42	6012	71.3	84.1	86.5	1.1	66.5	88.5	1.1
	3.7402	0.7087	6 650	5 220	220		0.93			2.807	3.311	3.406	0.043	2.618	3.484	0.039
	110	22	47 500	32 500	1 400	6 000	7 000	0.78	6212	75.5	94.2	97	1.5	68	102	1.5
	4.3307	0.8661	10 700	7 310	315		1.70			2.972	3.709	3.819	0.059	2.677	4.016	0.059
130	31	81 900	52 000	2 200	5 000	6 000	1.70	6312	81.8	109	113	2.1	71	119	2	
5.1181	1.2205	18 400	11 700	495		3.75			3.220	4.291	4.449	0.083	2.795	4.685	0.079	
150	35	108 000	69 500	2 900	4 800	5 600	2.75	6412	88.1	123	-	2.1	71	139	2	
5.9055	1.3780	24 300	15 600	652		6.05			3.469	4.843	-	0.083	2.795	5.472	0.079	
65 2.5591	85	10	11 700	9 150	490	7 000	8 500	0.13	61813	71.1	79.1	-	0.6	69	81	0.6
	3.3465	0.3937	2 630	2 060	110		0.29			2.799	3.114	-	0.024	2.717	3.189	0.024
	90	13	17 400	13 400	680	6 700	8 000	0.22	61913	73	82.1	-	1	70	85	1
	3.5433	0.5118	3 910	3 010	153		0.49			2.874	3.232	-	0.039	2.756	3.346	0.039
	100	11	21 200	16 600	830	6 300	7 500	0.30	16013	76.5	88.5	-	0.6	69	96	0.6
	3.9370	0.4331	4 770	3 730	187		0.66			3.012	3.484	-	0.024	2.717	3.780	0.024
	100	18	30 700	25 000	1 060	6 300	7 500	0.44	6013	76.3	89.1	91.5	1.1	71.5	93.5	1.1
	3.9370	0.7087	6 900	5 620	238		0.97			3.004	3.508	3.602	0.043	2.815	3.681	0.039
	120	23	55 900	40 500	1 730	5 300	6 300	0.99	6213	83.3	103	106	1.5	73	112	1.5
	4.7244	0.9055	12 600	9 110	389		2.20			3.280	4.055	4.173	0.059	2.874	4.409	0.059
140	33	92 300	60 000	2 500	4 800	5 600	2.10	6313	88.3	118	122	2.1	76	129	2	
5.5118	1.2992	20 800	13 500	562		4.65			3.476	4.646	4.803	0.083	2.992	5.079	0.079	
160	37	119 000	78 000	3 150	4 500	5 300	3.30	6413	94	132	-	2.1	76	149	2	
6.2992	1.4567	26 800	17 500	708		7.30			3.701	5.197	-	0.083	2.992	5.866	0.079	
70 2.7559	90	10	12 100	10 000	540	6 700	8 000	0.14	61814	76.1	84.1	-	0.6	74	86	0.6
	3.5433	0.3937	2 720	2 250	121		0.31			2.996	3.311	-	0.024	2.913	3.386	0.024
	100	16	23 800	18 300	900	6 300	7 500	0.35	61914	79.6	90.6	-	1	75	95	1
	3.9370	0.6299	5 350	4 110	202		0.77			3.134	3.567	-	0.039	2.953	3.740	0.039
	110	13	28 100	25 000	1 060	6 000	7 000	0.43	16014	83.3	97.1	-	0.6	74	106	0.6
	4.3307	0.5118	6 320	5 620	238		0.95			3.280	3.823	-	0.024	2.913	4.173	0.024
	110	20	37 700	31 000	1 320	6 000	7 000	0.60	6014	82.8	97.6	99.9	1.1	76.5	103.5	1.1
	4.3307	0.7874	8 480	6 970	297		1.30			3.260	3.843	3.933	0.043	3.012	4.075	0.039
	125	24	60 500	45 000	1 900	5 000	6 000	1.05	6214	87	109	111	1.5	78	117	1.5
	4.9213	0.9449	13 600	10 100	427		2.30			3.425	4.291	4.370	0.059	3.071	4.606	0.059
150	35	104 000	68 000	2 750	4 500	5 300	2.50	6314	94.9	126	130	2.1	81	139	2	
5.9055	1.3780	23 400	15 300	618		5.50			3.736	4.961	5.118	0.083	3.189	5.472	0.079	
180	42	143 000	104 000	3 900	3 800	4 500	4.85	6414	103	147	-	3	83	167	2.5	
7.0866	1.6535	32 200	23 400	877		10.5			4.055	5.787	-	0.118	3.268	6.575	0.098	
75 2.9528	95	10	12 500	10 800	585	6 300	7 500	0.15	61815	81.1	89.1	-	0.6	79	91	0.6
	3.7402	0.3937	2 810	2 430	132		0.33			3.193	3.508	-	0.024	3.110	3.583	0.024
	105	16	24 200	19 300	965	6 000	7 000	0.37	61915	84.6	95.6	-	1	80	100	1
	4.1339	0.6299	5 440	4 340	217		0.82			3.331	3.764	-	0.039	3.150	3.937	0.039
	115	13	28 600	27 000	1 140	5 600	6 700	0.46	16015	88.3	102	-	0.6	79	111	0.6
	4.5276	0.5118	6 430	6 070	256		1.00			3.476	4.016	-	0.024	3.110	4.370	0.024
	115	20	39 700	33 500	1 430	5 600	6 700	0.64	6015	87.8	103	105	1.1	81.5	108.5	1.1
	4.5276	0.7874	8 930	7 530	321		1.40			3.457	4.055	4.134	0.043	3.209	4.272	0.039
	130	25	66 300	49 000	2 040	4 800	5 600	1.20	6215	92	114	117	1.5	83	122	1.5
	5.1181	0.9843	14 900	11 000	459		2.65			3.622	4.488	4.606	0.059	3.268	4.803	0.059
160	37	114 000	76 500	3 000	4 300	5 000	3.00	6315	101	135	139	2.1	86	149	2	
6.2992	1.4567	25 600	17 200	674		6.60			3.976	5.315	5.472	0.083	3.386	5.866	0.079	
190	45	153 000	114 000	4 150	3 600	4 300	6.80	6415	110	156	159	3	88	177	2.5	
7.4803	1.7717	34 400	25 600	933		15.0			4.331	6.142	6.260	0.118	3.465	6.969	0.098	
80 3.1496	100	10	12 400	10 800	585	6 000	7 000	0.15	61816	86.1	94.1	-	0.6	84	96	0.6
	3.9370	0.3937	2 790	2 430	132		0.33			3.390	3.705	-	0.024	3.307	3.780	0.024
	110	16	25 100	20 400	1 020	5 600	6 700	0.40	61916	89.6	101	-	1	85	105	1

Principal dimensions			Basic load ratings		Fatigue	Speed ratings		Mass	Designation	Dimensions			Abutment and fillet dimensions				
d	D	B	C	C ₀	load limit P _u	Lubrication grease	oil	kg lb	-	d	d ₁	D ₁	D ₂	r _{1,2} mm	d _{fil}	D _{fil}	r _{fil} max
mm in			N lbf		N lbf	r/min				mm in					mm in		
90 3.5433	115	13	19 500	17 000	915	5 300	6 300	0.28	61818	97.5	108	-	1	95	110	1	
	4.5276	0.5118	4 380	3 820	206			0.62		3.839	4.252	-	0.039	3.740	4.331	0.039	
	125	16	33 200	31 500	1 230	5 000	6 000	0.59	61918	101	114	-	1.1	96.5	118.5	1	
	4.9213	0.7087	7 460	7 080	277			1.30		3.976	4.488	-	0.043	3.799	4.665	0.039	
	140	16	41 600	39 000	1 560	4 800	5 600	0.85	16018	106	124	-	1	95	135	1	
	5.5118	0.6299	9 350	8 770	351			1.85		4.173	4.882	-	0.039	3.740	5.315	0.039	
	140	24	58 500	50 000	1 960	4 800	5 600	1.15	6018	105	125	129	1.5	98	132	1.5	
	5.5118	0.9449	13 200	11 200	441			2.55		4.134	4.921	5.079	0.059	3.858	5.197	0.059	
	160	30	95 600	73 500	2 800	3 800	4 500	2.15	6218	112	139	143	2	99	151	2	
	6.2992	1.1811	21 500	16 500	629			4.75		4.409	5.472	5.630	0.079	3.898	5.945	0.079	
190	43	143 000	108 000	3 850	3 400	4 000	4.90	6318	121	160	164	3	103	177	2.5		
7.4803	1.6929	32 200	24 300	866			11.0		4.764	6.299	6.457	0.118	4.055	6.969	0.098		
225	54	186 000	150 000	5 000	3 000	3 600	11.5	6418	132	182	-	4	106	209	3		
8.8583	2.1260	41 800	33 700	1 120			25.5		5.197	7.165	-	0.157	4.173	8.228	0.118		
95 3.7402	120	13	19 900	17 600	930	5 000	6 000	0.30	61819	102	113	-	1	100	115	1	
	4.7244	0.5118	4 470	3 960	209			0.66		4.016	4.449	-	0.039	3.937	4.528	0.039	
	130	16	33 800	33 500	1 430	4 800	5 600	0.61	61919	106	119	-	1.1	101.5	123.5	1	
	5.1181	0.7087	7 600	7 530	321			1.35		4.173	4.685	-	0.043	3.996	4.862	0.039	
	145	16	42 300	41 500	1 630	4 500	5 300	0.89	16019	111	129	-	1	100	140	1	
	5.7087	0.6299	9 310	9 330	366			1.95		4.370	5.079	-	0.039	3.937	5.512	0.039	
	145	24	60 500	54 000	2 080	4 500	5 300	1.20	6019	110	130	132	1.5	103	137	1.5	
	5.7087	0.9449	13 600	12 100	468			2.65		4.331	5.118	5.197	0.059	4.055	5.394	0.059	
	170	32	108 000	81 500	3 000	3 600	4 300	2.60	6219	118	148	152	2.1	106	159	2	
	6.6929	1.2598	24 300	18 300	674			5.75		4.646	5.827	5.984	0.083	4.173	6.260	0.079	
200	45	153 000	118 000	4 150	3 200	3 800	5.65	6319	127	169	172	3	108	187	2.5		
7.8740	1.7717	34 400	26 500	933			12.5		5.000	6.654	6.772	0.118	4.252	7.362	0.098		
100 3.9370	125	13	19 900	18 300	950	4 800	5 600	0.31	61820	107	118	-	1	105	120	1	
	4.9213	0.5118	4 470	4 110	214			0.68		4.213	4.646	-	0.039	4.134	4.724	0.039	
	140	20	42 300	41 500	1 630	4 500	5 300	0.83	61920	112	128	-	1.1	106.5	133.5	1	
	5.5118	0.7874	9 510	9 330	366			1.85		4.409	5.039	-	0.043	4.193	5.256	0.039	
	150	16	44 200	44 000	1 700	4 300	5 000	0.91	16020	116	135	-	1	105	145	1	
	5.9055	0.6299	9 940	9 890	382			2.00		4.567	5.315	-	0.039	4.134	5.709	0.039	
	150	24	60 500	54 000	2 040	4 300	5 000	1.25	6020	115	135	139	1.5	108	142	1.5	
	5.9055	0.9449	13 600	12 100	459			2.75		4.528	5.315	5.472	0.059	4.252	5.591	0.059	
	180	34	124 000	93 000	3 350	3 400	4 000	3.15	6220	124	157	160	2.1	111	169	2	
	7.0866	1.3866	27 900	20 900	753			6.95		4.882	6.181	6.299	0.083	4.370	6.654	0.079	
215	47	174 000	140 000	4 750	3 000	3 600	7.00	6320	135	181	184	3	113	202	2.5		
8.4646	1.8504	39 100	31 500	1 070			15.5		5.315	7.126	7.244	0.118	4.449	7.953	0.098		
105 4.1339	130	13	20 800	19 600	1 000	4 500	5 300	0.32	61821	112	123	-	1	110	125	1	
	5.1181	0.5118	4 680	4 410	225			0.71		4.409	4.843	-	0.039	4.331	4.921	0.039	
	145	20	44 200	44 000	1 700	4 300	5 000	0.87	61921	117	133	-	1.1	111.5	138.5	1	
	5.7087	0.7874	9 940	9 890	382			1.90		4.606	5.236	-	0.043	4.390	5.453	0.039	
	160	18	52 000	51 000	1 880	4 000	4 800	1.20	16021	123	143	-	1	110	155	1	
	6.2992	0.7087	11 700	11 500	418			2.65		4.843	5.630	-	0.039	4.331	6.102	0.039	
	160	26	72 800	65 500	2 400	4 000	4 800	1.60	6021	122	144	147	2	114	151	2	
	6.2992	1.0236	16 400	14 700	540			3.55		4.803	5.669	5.787	0.079	4.488	5.945	0.079	
	190	36	133 000	104 000	3 650	3 200	3 800	3.70	6221	131	164	167	2.1	116	179	2	
	7.4803	1.4173	29 900	23 400	821			8.15		5.157	6.457	6.575	0.083	4.567	7.047	0.079	
225	49	182 000	153 000	5 100	2 800	3 400	8.25	6321	141	189	193	3	118	212	2.5		
8.8583	1.9291	40 900	34 400	1 150			18.0		5.551	7.441	7.598	0.118	4.646	8.346	0.098		
110 4.3307	140	16	28 100	26 000	1 250	4 300	5 000	0.60	61822	119	132	-	1	115	135	1	
	5.5118	0.6299	6 320	5 850	281			1.30		4.685	5.197	-	0.039	4.528	5.315	0.039	
	150	20	43 600	45 000	1 660	4 000	4 800	0.90	61922	122	138	-	1.1	116.5	143.5	1	
	5.9055	0.7874	9 800	10 100	373			2.00		4.803	5.433	-	0.043	4.587	5.650	0.039	
	170	19	57 200	57 000	2 040	3 800	4 500	1.45	16022	130	151	-	1	115	165	1	
	6.6929	0.7480	12 900	12 800	459			3.20		5.118	5.945	-	0.039	4.528	6.496	0.039	
	170	28	81 900	73 500	2 400	3 800	4 500	1.95	6022	129	152	156	2	119	161	2	
	6.6929	1.1024	18 400	16 500	540			4.30		5.079	5.984	6.142	0.079	4.685	6.339	0.079	
	200	38	143 000	118 000	4 000	3 000	3 600	4.35	6222	138	174	177	2.1	121	189	2	
	7.8740	1.4961	32 200	26 500	899			9.60		5.433	6.850	6.969	0.083	4.764	7.441	0.079	
240	50	203 000	180 000	5 700	2 600	3 200	9.55	6322	149	201	205	3	123	227	2.5		
9.4488	1.9685	45 600	40 500	1 280			21.0		5.866	7.913	8.071	0.118	4.843	8.937	0.098		
120 4.7244	150	16	29 100	28 000	1 290	3 800	4 500	0.65	61824	129	142	-	1	125	145	1	
	5.9055	0.6299	6 540	6 300	290			1.45		5.079	5.591	-	0.039	4.921	5.709	0.039	
	165	22	55 300	57 000	2 040	3 600	4 300	1.20	61924	134	151	-	1.1	126.5	158.5	1	
	6.4961	0.8661	12 400	12 800	459			2.65		5.276	5.945	-	0.043	4.980	6.240	0.039	
	180	19	60 500	64 000	2 200	3 400	4 000	1.60	16024	139	162	-	1	125	175	1	
	7.0866	0.7480	13 600	14 400	495			3.55		5.472	6.378	-	0.039	4.921	6.890	0.039	
	180	26	85 200	80 000	2 750	3 400	4 000	2.05	6024	139	162	166	2	129	171	2	
	7.0866	1.1024	19 200	18 000	618			4.50		5.472	6.378	6.535	0				

هندسه یاتاقان‌ها:

جزئیات هندسی یاتاقان‌ها در تعیین نمودن تنش، جابجایی، ظرفیت توانایی بار و کمترین ضخامت لایه نقش بسیار مهمی دارد. در اینجا به تشریح هندسه یاتاقان‌های ساچمه‌ای پرداخته می‌شود.



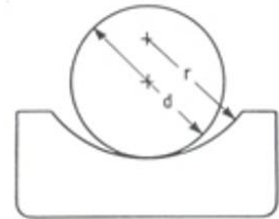
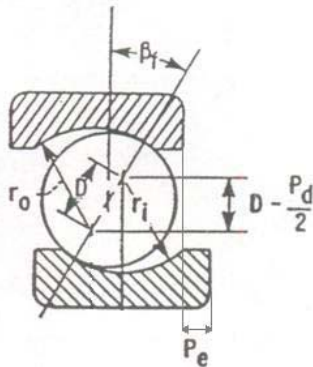
الف) گام قطری (d_e): $d_e = (d_o + d_i)/2$

ب) لقی قطری (P_d): $P_d = d_o - d_i - 2d$

ج) نسبت همدیسی (f): $f = r/d$
 برای مطابقت کامل: $f = 0.5$
 مقدار توصیه شده: $f = 0.52$
 حدود معمول: $0.51 \leq f \leq 0.55$

د) زاویه تماس (β_f): $\beta_f = \cos^{-1} \left[\frac{r_o + r_i - 0.5(d_o - d_i)}{r_o + r_i - d} \right]$

ه) لقی محوری (P_e): $P_e = 2(r_o - r_i - d) \sin \beta_f$



برای تماس ساچمه و ساچمه‌رو درونی:

$$r_{ax} = r_{ay} = d/2$$

$$r_{by} = -f_i d = -r_i$$

$$r_{bx} = \frac{d_e - d \cos \beta}{2 \cos \beta}$$

$$r_{ax} = r_{ay} = d/2$$

$$r_{by} = -f_o d = -r_o$$

$$r_{bx} = -\frac{(d_e + d \cos \beta)}{2 \cos \beta}$$

برای ساچمه و ساچمه‌رو بیرونی:

