

APPENDICES

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Appendix Table 1 SI (International Units) System Conversion Table

Comparison of SI, CGS, and Engineering Units										
Unit System \ Units	Length	Mass	Time	Temp.	Acceleration	Force	Stress	Pressure	Energy	Power
SI	m	kg	s	K, °C	m/s ²	N	Pa	Pa	J	W
CGS System	cm	g	s	°C	Gal	dyn	dyn/cm ²	dyn/cm ²	erg	erg/s
Engineering Unit System	m	kgf · s ² /m	s	°C	m/s ²	kgf	kgf/m ²	kgf/m ²	kgf · m	kgf · m/s

Prefixes Used in SI					
Multiples	Prefix	Symbols	Multiples	Prefix	Symbols
10 ¹⁸	Exa	E	10 ⁻¹	Deci	d
10 ¹⁵	Peta	P	10 ⁻²	Centi	c
10 ¹²	Tera	T	10 ⁻³	Milli	m
10 ⁹	Giga	G	10 ⁻⁶	Micro	μ
10 ⁶	Mega	M	10 ⁻⁹	Nano	n
10 ³	Kilo	k	10 ⁻¹²	Pico	p
10 ²	Hecto	h	10 ⁻¹⁵	Femto	f
10	Deca	da	10 ⁻¹⁸	Ato	a

Conversion Factors From SI Units					
Parameter	SI Units		Units Other Than SI		Conversion Factors From SI Units
	Names of Units	Symbols	Name of Units	Symbols	
Angle	Radian	rad	Degree Minute Second	° ' "	180/π 10 800/π 648 000/π
Length	Meter	m	Micron Angstrom	μ Å	10 ⁶ 10 ¹⁰
Area	Square meter	m ²	Are Hectare	a ha	10 ⁻² 10 ⁻⁴
Volume	Cubic meter	m ³	Liter Deciliter	l, L dl, dL	10 ³ 10 ⁴
Time	Second	s	Minute Hour Day	min h d	1/60 1/3 600 1/86 400
Frequency	Hertz	Hz	Cycle	s ⁻¹	1
Speed of Rotation	Revolution per second	s ⁻¹	Revolution per minute	rpm	60
Speed	Meter per second	m/s	Kilometer per hour Knot	km/h kn	3 600/1 000 3 600/1 852
Acceleration	Meter per second per second	m/s ²	Gal g	Gal G	10 ² 1/9.806 65
Mass	Kilogram	kg	Ton	t	10 ⁻³
Force	Newton	N	Kilogram-force Ton-force Dyne	kgf tf dyn	1/9.806 65 1/ (9.806 65×10 ³) 10 ⁵
Torque or Moment	Newton · meter	N · m	Kilogram-force meter	kgf · m	1/9.806 65
Stress	Pascal	Pa (N/m ²)	Kilogram-force per square centimeter Kilogram-force per square millimeter	kgf/cm ² kgf/mm ²	1/ (9.806 65×10 ⁴) 1/ (9.806 65×10 ⁶)

Conversion Factors From SI Units (Continued)					
Parameter	SI Units		Units Other Than SI		Conversion Factors From SI Units
	Names of Units	Symbols	Names of Units	Units	
Pressure	Pascal (Newton per square meter)	Pa (N/m ²)	Kilogram-force per square meter Water Column Mercury Column Torr Bar Atmosphere	kgf/m ² mmH ₂ O mmHg Torr bar atm	1/9.806 65 1/(9.806 65×10 ³) 760/(1.013 25×10 ⁵) 760/(1.013 25×10 ⁵) 10 ⁻⁵ 1/(1.013 25×10 ⁵)
Energy	Joule (Newton · meter)	J (N · m)	Erg Calorie (International) Kilogram-force meter Kilowatt hour French horsepower hour	erg cal _{IT} kgf · m kW · h PS · h	10 ⁷ 1/4.186 8 1/9.806 65 1/(3.6×10 ⁶) ≈ 3.776 72×10 ⁻⁷
Work	Watt (Joule per second)	W (J/s)	Kilogram-force meter per second Kilocalorie per hour French horsepower	kgf · m/s kcal/h PS	1/9.806 65 1/1.163 ≈ 1/735.498 8
Viscosity, Viscosity Index	Pascal second	Pa · s	Poise	P	10
Kinematic Viscosity, Kinematic Viscosity Index	Square meter per second	m ² /s	Stokes Centistokes	St cSt	10 ⁴ 10 ⁶
Temperature	Kelvin, Degree celsius	K, °C	Degree	°C	(See note ⁽¹⁾)
Electric Current, Magnetomotive Force	Ampere	A	Ampere	A	1
Voltage, Electromotive Force	Volt	V	(Watts per ampere)	(W/A)	1
Magnetic Field Strength	Ampere per meter	A/m	Oersted	Oe	4π/10 ³
Magnetic Flux Density	Tesla	T	Gauss Gamma	Gs γ	10 ⁴ 10 ⁹
Electrical Resistance	Ohm	Ω	(Volts per ampere)	(V/A)	1

Note ⁽¹⁾ The conversion from T K into θ °C is $\theta = T - 273.15$ but $\Delta T = \Delta \theta$ for temperature differences. Note that, ΔT and $\Delta \theta$ represent temperature differences measured using the Kelvin and Celsius scales respectively.

Remarks Names or symbols in parentheses () are equivalent to those directly above them or on their left.

Example conversion 1 N = 1 / 9.806 65 kgf

Appendix Table 2 N-kgf Force Conversion Table

[Using this table] To convert between units, find the figure in the shaded column that corresponds to the number in the unit you wish to convert. Then, look to the appropriate column on the right or left in the same row for the converted value. For example, from this table 10 N = 1.0197 kgf, while 10 kgf = 98.066 N.

1 N=0.1019716 kgf
1 kgf=9.80665 N

N		kgf	N		kgf	N		kgf
9.8066	1	0.1020	333.43	34	3.4670	657.05	67	6.8321
19.613	2	0.2039	343.23	35	3.5690	666.85	68	6.9341
29.420	3	0.3059	353.04	36	3.6710	676.66	69	7.0360
39.227	4	0.4079	362.85	37	3.7729	686.47	70	7.1380
49.033	5	0.5099	372.65	38	3.8749	696.27	71	7.2400
58.840	6	0.6118	382.46	39	3.9769	706.08	72	7.3420
68.647	7	0.7138	392.27	40	4.0789	715.89	73	7.4439
78.453	8	0.8158	402.07	41	4.1808	725.69	74	7.5459
88.260	9	0.9177	411.88	42	4.2828	735.50	75	7.6479
98.066	10	1.0197	421.69	43	4.3848	745.31	76	7.7498
107.87	11	1.1217	431.49	44	4.4868	755.11	77	7.8518
117.68	12	1.2237	441.30	45	4.5887	764.92	78	7.9538
127.49	13	1.3256	451.11	46	4.6907	774.73	79	8.0558
137.29	14	1.4276	460.91	47	4.7927	784.53	80	8.1577
147.10	15	1.5296	470.72	48	4.8946	794.34	81	8.2597
156.91	16	1.6315	480.53	49	4.9966	804.15	82	8.3617
166.71	17	1.7335	490.33	50	5.0986	813.95	83	8.4636
176.52	18	1.8355	500.14	51	5.2006	823.76	84	8.5656
186.33	19	1.9375	509.95	52	5.3025	833.57	85	8.6676
196.13	20	2.0394	519.75	53	5.4045	843.37	86	8.7696
205.94	21	2.1414	529.56	54	5.5065	853.18	87	8.8715
215.75	22	2.2434	539.37	55	5.6084	862.99	88	8.9735
225.55	23	2.3453	549.17	56	5.7104	872.79	89	9.0755
235.36	24	2.4473	558.98	57	5.8124	882.60	90	9.1774
245.17	25	2.5493	568.79	58	5.9144	892.41	91	9.2794
254.97	26	2.6513	578.59	59	6.0163	902.21	92	9.3814
264.78	27	2.7532	588.40	60	6.1183	912.02	93	9.4834
274.59	28	2.8552	598.21	61	6.2203	921.83	94	9.5853
284.39	29	2.9572	608.01	62	6.3222	931.63	95	9.6873
294.20	30	3.0591	617.82	63	6.4242	941.44	96	9.7893
304.01	31	3.1611	627.63	64	6.5262	951.25	97	9.8912
313.81	32	3.2631	637.43	65	6.6282	961.05	98	9.9932
323.62	33	3.3651	647.24	66	6.7301	970.86	99	10.095

Appendix Table 3 kg-lb Mass Conversion Table

[Using this table] To convert between units, find the figure in the shaded column that corresponds to the number in the unit you wish to convert. Then, look to the appropriate column on the right or left in the same row for the converted value. For example, from this table 10 kg = 22.046 lb, while 10 lb = 4.536 kg.

1 kg=2.2046226 lb
1 lb=0.45359237 kg

kg		lb	kg		lb	kg		lb
0.454	1	2.205	15.422	34	74.957	30.391	67	147.71
0.907	2	4.409	15.876	35	77.162	30.844	68	149.91
1.361	3	6.614	16.329	36	79.366	31.298	69	152.12
1.814	4	8.818	16.783	37	81.571	31.751	70	154.32
2.268	5	11.023	17.237	38	83.776	32.205	71	156.53
2.722	6	13.228	17.690	39	85.980	32.659	72	158.73
3.175	7	15.432	18.144	40	88.185	33.112	73	160.94
3.629	8	17.637	18.597	41	90.390	33.566	74	163.14
4.082	9	19.842	19.051	42	92.594	34.019	75	165.35
4.536	10	22.046	19.504	43	94.799	34.473	76	167.55
4.990	11	24.251	19.958	44	97.003	34.927	77	169.76
5.443	12	26.455	20.412	45	99.208	35.380	78	171.96
5.897	13	28.660	20.865	46	101.41	35.834	79	174.17
6.350	14	30.865	21.319	47	103.62	36.287	80	176.37
6.804	15	33.069	21.772	48	105.82	36.741	81	178.57
7.257	16	35.274	22.226	49	108.03	37.195	82	180.78
7.711	17	37.479	22.680	50	110.23	37.648	83	182.98
8.165	18	39.683	23.133	51	112.44	38.102	84	185.19
8.618	19	41.888	23.587	52	114.64	38.555	85	187.39
9.072	20	44.092	24.040	53	116.84	39.009	86	189.60
9.525	21	46.297	24.494	54	119.05	39.463	87	191.80
9.979	22	48.502	24.948	55	121.25	39.916	88	194.01
10.433	23	50.706	25.401	56	123.46	40.370	89	196.21
10.886	24	52.911	25.855	57	125.66	40.823	90	198.42
11.340	25	55.116	26.308	58	127.87	41.277	91	200.62
11.793	26	57.320	26.762	59	130.07	41.730	92	202.83
12.247	27	59.525	27.216	60	132.28	42.184	93	205.03
12.701	28	61.729	27.669	61	134.48	42.638	94	207.23
13.154	29	63.934	28.123	62	136.69	43.091	95	209.44
13.608	30	66.139	28.576	63	138.89	43.545	96	211.64
14.061	31	68.343	29.030	64	141.10	43.998	97	213.85
14.515	32	70.548	29.484	65	143.30	44.452	98	216.05
14.969	33	72.753	29.937	66	145.51	44.906	99	218.26

Appendix Table 4 °C-°F Temperature Conversion Table

[Using this table] To convert between units, find the figure in the shaded column that corresponds to the number in the unit you wish to convert. Then, look to the appropriate column on the right or left in the same row for the converted value. For example, from this table 38 °C= 100.4 °F, while 38 °F= 3.3 °C.

$$C = \frac{5}{9}(F - 32)$$

$$F = 32 + \frac{9}{5}C$$

°C		°F	°C		°F	°C		°F	°C		°F
-73.3	-100	-148.0	0.0	32	89.6	21.7	71	159.8	43.3	110	230
-62.2	-80	-112.0	0.6	33	91.4	22.2	72	161.6	46.1	115	239
-51.1	-60	-76.0	1.1	34	93.2	22.8	73	163.4	48.9	120	248
-40.0	-40	-40.0	1.7	35	95.0	23.3	74	165.2	51.7	125	257
-34.4	-30	-22.0	2.2	36	96.8	23.9	75	167.0	54.4	130	266
-28.9	-20	-4.0	2.8	37	98.6	24.4	76	168.8	57.2	135	275
-23.3	-10	14.0	3.3	38	100.4	25.0	77	170.6	60.0	140	284
-17.8	0	32.0	3.9	39	102.2	25.6	78	172.4	65.6	150	302
-17.2	1	33.8	4.4	40	104.0	26.1	79	174.2	71.1	160	320
-16.7	2	35.6	5.0	41	105.8	26.7	80	176.0	76.7	170	338
-16.1	3	37.4	5.6	42	107.6	27.2	81	177.8	82.2	180	356
-15.6	4	39.2	6.1	43	109.4	27.8	82	179.6	87.8	190	374
-15.0	5	41.0	6.7	44	111.2	28.3	83	181.4	93.3	200	392
-14.4	6	42.8	7.2	45	113.0	28.9	84	183.2	98.9	210	410
-13.9	7	44.6	7.8	46	114.8	29.4	85	185.0	104.4	220	428
-13.3	8	46.4	8.3	47	116.6	30.0	86	186.8	110.0	230	446
-12.8	9	48.2	8.9	48	118.4	30.6	87	188.6	115.6	240	464
-12.2	10	50.0	9.4	49	120.2	31.1	88	190.4	121.1	250	482
-11.7	11	51.8	10.0	50	122.0	31.7	89	192.2	148.9	300	572
-11.1	12	53.6	10.6	51	123.8	32.2	90	194.0	176.7	350	662
-10.6	13	55.4	11.1	52	125.6	32.8	91	195.8	204	400	752
-10.0	14	57.2	11.7	53	127.4	33.3	92	197.6	232	450	842
-9.4	15	59.0	12.2	54	129.2	33.9	93	199.4	260	500	932
-8.9	16	60.8	12.8	55	131.0	34.4	94	201.2	288	550	1022
-8.3	17	62.6	13.3	56	132.8	35.0	95	203.0	316	600	1112
-7.8	18	64.4	13.9	57	134.6	35.6	96	204.8	343	650	1202
-7.2	19	66.2	14.4	58	136.4	36.1	97	206.6	371	700	1292
-6.7	20	68.0	15.0	59	138.2	36.7	98	208.4	399	750	1382
-6.1	21	69.8	15.6	60	140.0	37.2	99	210.2	427	800	1472
-5.6	22	71.6	16.1	61	141.8	37.8	100	212.0	454	850	1562
-5.0	23	73.4	16.7	62	143.6	38.3	101	213.8	482	900	1652
-4.4	24	75.2	17.2	63	145.4	38.9	102	215.6	510	950	1742
-3.9	25	77.0	17.8	64	147.2	39.4	103	217.4	538	1000	1832
-3.3	26	78.8	18.3	65	149.0	40.0	104	219.2	593	1100	2012
-2.8	27	80.6	18.9	66	150.8	40.6	105	221.0	649	1200	2192
-2.2	28	82.4	19.4	67	152.6	41.1	106	222.8	704	1300	2372
-1.7	29	84.2	20.0	68	154.4	41.7	107	224.6	760	1400	2552
-1.1	30	86.0	20.6	69	156.2	42.2	108	226.4	816	1500	2732
-0.6	31	87.8	21.1	70	158.0	42.8	109	228.2	871	1600	2912

Appendix Table 5 Viscosity Conversion Table

Kinematic Viscosity mm ² /s	Saybolt Universal SUS (sec)		No.1 Type Redwood R (sec)		Engler E (degree)	Kinematic Viscosity mm ² /s	Saybolt Universal SUS (sec)		No.1 Type Redwood R (sec)		Engler E (degree)
	100°F	210°F	50°C	100°C			100°F	210°F	50°C	100°C	
2	32.6	32.8	30.8	31.2	1.14	35	163	164	144	147	4.70
3	36.0	36.3	33.3	33.7	1.22	36	168	170	148	151	4.83
4	39.1	39.4	35.9	36.5	1.31	37	172	173	153	155	4.96
5	42.3	42.6	38.5	39.1	1.40	38	177	178	156	159	5.08
6	45.5	45.8	41.1	41.7	1.48	39	181	183	160	164	5.21
7	48.7	49.0	43.7	44.3	1.56	40	186	187	164	168	5.34
8	52.0	52.4	46.3	47.0	1.65	41	190	192	168	172	5.47
9	55.4	55.8	49.1	50.0	1.75	42	195	196	172	176	5.59
10	58.8	59.2	52.1	52.9	1.84	43	199	201	176	180	5.72
11	62.3	62.7	55.1	56.0	1.93	44	204	205	180	185	5.85
12	65.9	66.4	58.2	59.1	2.02	45	208	210	184	189	5.98
13	69.6	70.1	61.4	62.3	2.12	46	213	215	188	193	6.11
14	73.4	73.9	64.7	65.6	2.22	47	218	219	193	197	6.24
15	77.2	77.7	68.0	69.1	2.32	48	222	224	197	202	6.37
16	81.1	81.7	71.5	72.6	2.43	49	227	228	201	206	6.50
17	85.1	85.7	75.0	76.1	2.54	50	231	233	205	210	6.63
18	89.2	89.8	78.6	79.7	2.64	55	254	256	225	231	7.24
19	93.3	94.0	82.1	83.6	2.76	60	277	279	245	252	7.90
20	97.5	98.2	85.8	87.4	2.87	65	300	302	266	273	8.55
21	102	102	89.5	91.3	2.98	70	323	326	286	294	9.21
22	106	107	93.3	95.1	3.10	75	346	349	306	315	9.89
23	110	111	97.1	98.9	3.22	80	371	373	326	336	10.5
24	115	115	101	103	3.34	85	394	397	347	357	11.2
25	119	120	105	107	3.46	90	417	420	367	378	11.8
26	123	124	109	111	3.58	95	440	443	387	399	12.5
27	128	129	112	115	3.70	100	464	467	408	420	13.2
28	132	133	116	119	3.82	120	556	560	490	504	15.8
29	137	138	120	123	3.95	140	649	653	571	588	18.4
30	141	142	124	127	4.07	160	742	747	653	672	21.1
31	145	146	128	131	4.20	180	834	840	734	757	23.7
32	150	150	132	135	4.32	200	927	933	816	841	26.3
33	154	155	136	139	4.45	250	1 159	1 167	1 020	1 051	32.9
34	159	160	140	143	4.57	300	1 391	1 400	1 224	1 241	39.5

Remark 1mm²/s=1cSt

Appendix Table 6 inch - mm Conversion Table

1"=25.4 mm

inch		0	1	2	3	4	5	6	7	8	9	10
Fraction	Decimal	mm										
0	0.000000	0.000	25.400	50.800	76.200	101.600	127.000	152.400	177.800	203.200	228.600	254.000
1/64	0.015625	0.397	25.797	51.197	76.597	101.997	127.397	152.797	178.197	203.597	228.997	254.397
1/32	0.031250	0.794	26.194	51.594	76.994	102.394	127.794	153.194	178.594	203.994	229.394	254.794
3/64	0.046875	1.191	26.591	51.991	77.391	102.791	128.191	153.591	178.991	204.391	229.791	255.191
1/16	0.062500	1.588	26.988	52.388	77.788	103.188	128.588	153.988	179.388	204.788	230.188	255.588
5/64	0.078125	1.984	27.384	52.784	78.184	103.584	128.984	154.384	179.784	205.184	230.584	255.984
3/32	0.093750	2.381	27.781	53.181	78.581	103.981	129.381	154.781	180.181	205.581	230.981	256.381
7/64	0.109375	2.778	28.178	53.578	78.978	104.378	129.778	155.178	180.578	205.978	231.378	256.778
1/8	0.125000	3.175	28.575	53.975	79.375	104.775	130.175	155.575	180.975	206.375	231.775	257.175
9/64	0.140625	3.572	28.972	54.372	79.772	105.172	130.572	155.972	181.372	206.772	232.172	257.572
5/32	0.156250	3.969	29.369	54.769	80.169	105.569	130.969	156.369	181.769	207.169	232.569	257.969
11/64	0.171875	4.366	29.766	55.166	80.566	105.966	131.366	156.766	182.166	207.566	232.966	258.366
3/16	0.187500	4.762	30.162	55.562	80.962	106.362	131.762	157.162	182.562	207.962	233.362	258.762
13/64	0.203125	5.159	30.559	55.959	81.359	106.759	132.159	157.559	182.959	208.359	233.759	259.159
7/32	0.218750	5.556	30.956	56.356	81.756	107.156	132.556	157.956	183.356	208.756	234.156	259.556
15/64	0.234375	5.953	31.353	56.753	82.153	107.553	132.953	158.353	183.753	209.153	234.553	259.953
1/4	0.250000	6.350	31.750	57.150	82.550	107.950	133.350	158.750	184.150	209.550	234.950	260.350
17/64	0.265625	6.747	32.147	57.547	82.947	108.347	133.747	159.147	184.547	209.947	235.347	260.747
9/32	0.281250	7.144	32.544	57.944	83.344	108.744	134.144	159.544	184.944	210.344	235.744	261.144
19/64	0.296875	7.541	32.941	58.341	83.741	109.141	134.541	159.941	185.341	210.741	236.141	261.541
5/16	0.312500	7.938	33.338	58.738	84.138	109.538	134.938	160.338	185.738	211.138	236.538	261.938
21/64	0.328125	8.334	33.734	59.134	84.534	109.934	135.334	160.734	186.134	211.534	236.934	262.334
11/32	0.343750	8.731	34.131	59.531	84.931	110.331	135.731	161.131	186.531	211.931	237.331	262.731
23/64	0.359375	9.128	34.528	59.928	85.328	110.728	136.128	161.528	186.928	212.328	237.728	263.128
3/8	0.375000	9.525	34.925	60.325	85.725	111.125	136.525	161.925	187.325	212.725	238.125	263.525
25/64	0.390625	9.922	35.322	60.722	86.122	111.522	136.922	162.322	187.722	213.122	238.522	263.922
13/32	0.406250	10.319	35.719	61.119	86.519	111.919	137.319	162.719	188.119	213.519	238.919	264.319
27/64	0.421875	10.716	36.116	61.516	86.916	112.316	137.716	163.116	188.516	213.916	239.316	264.716
7/16	0.437500	11.112	36.512	61.912	87.312	112.712	138.112	163.512	188.912	214.312	239.712	265.112
29/64	0.453125	11.509	36.909	62.309	87.709	113.109	138.509	163.909	189.309	214.709	240.109	265.509
15/32	0.468750	11.906	37.306	62.706	88.106	113.506	138.906	164.306	189.706	215.106	240.506	265.906
31/64	0.484375	12.303	37.703	63.103	88.503	113.903	139.303	164.703	190.103	215.503	240.903	266.303
1/2	0.500000	12.700	38.100	63.500	88.900	114.300	139.700	165.100	190.500	215.900	241.300	266.700
33/64	0.515625	13.097	38.497	63.897	89.297	114.697	140.097	165.497	190.897	216.297	241.697	267.097
17/32	0.531250	13.494	38.894	64.294	89.694	115.094	140.494	165.894	191.294	216.694	242.094	267.494
35/64	0.546875	13.891	39.291	64.691	90.091	115.491	140.891	166.291	191.691	217.091	242.491	267.891
9/16	0.562500	14.288	39.688	65.088	90.488	115.888	141.288	166.688	192.088	217.488	242.888	268.288
37/64	0.578125	14.684	40.084	65.484	90.884	116.284	141.684	167.084	192.484	217.884	243.284	268.684
19/32	0.593750	15.081	40.481	65.881	91.281	116.681	142.081	167.481	192.881	218.281	243.681	269.081
39/64	0.609375	15.478	40.878	66.278	91.678	117.078	142.478	167.878	193.278	218.678	244.078	269.478
5/8	0.625000	15.875	41.275	66.675	92.075	117.475	142.875	168.275	193.675	219.075	244.475	269.875
41/64	0.640625	16.272	41.672	67.072	92.472	117.872	143.272	168.672	194.072	219.472	244.872	270.272
21/32	0.656250	16.669	42.069	67.469	92.869	118.269	143.669	169.069	194.469	219.869	245.269	270.669
43/64	0.671875	17.066	42.466	67.866	93.266	118.666	144.066	169.466	194.866	220.266	245.666	271.066
11/16	0.687500	17.462	42.862	68.262	93.662	119.062	144.462	169.862	195.262	220.662	246.062	271.462
45/64	0.703125	17.859	43.259	68.659	94.059	119.459	144.859	170.259	195.659	221.059	246.459	271.859
23/32	0.718750	18.256	43.656	69.056	94.456	119.856	145.256	170.656	196.056	221.456	246.856	272.256
47/64	0.734375	18.653	44.053	69.453	94.853	120.253	145.653	171.053	196.453	221.853	247.253	272.653
3/4	0.750000	19.050	44.450	69.850	95.250	120.650	146.050	171.450	196.850	222.250	247.650	273.050
49/64	0.765625	19.447	44.847	70.247	95.647	121.047	146.447	171.847	197.247	222.647	248.047	273.447
25/32	0.781250	19.844	45.244	70.644	96.044	121.444	146.844	172.244	197.644	223.044	248.444	273.844
51/64	0.796875	20.241	45.641	71.041	96.441	121.841	147.241	172.641	198.041	223.441	248.841	274.241
13/16	0.812500	20.638	46.038	71.438	96.838	122.238	147.638	173.038	198.438	223.838	249.238	274.638
53/64	0.828125	21.034	46.434	71.834	97.234	122.634	148.034	173.434	198.834	224.234	249.634	275.034
27/32	0.843750	21.431	46.831	72.231	97.631	123.031	148.431	173.831	199.231	224.631	250.031	275.431
55/64	0.859375	21.828	47.228	72.628	98.028	123.428	148.828	174.228	199.628	225.028	250.428	275.828
7/8	0.875000	22.225	47.625	73.025	98.425	123.825	149.225	174.625	200.025	225.425	250.825	276.225
57/64	0.890625	22.622	48.022	73.422	98.822	124.222	149.622	175.022	200.422	225.822	251.222	276.622
29/32	0.906250	23.019	48.419	73.819	99.219	124.619	150.019	175.419	200.819	226.219	251.619	277.019
59/64	0.921875	23.416	48.816	74.216	99.616	125.016	150.416	175.816	201.216	226.616	252.016	277.416
15/16	0.937500	23.812	49.212	74.612	100.012	125.412	150.812	176.212	201.612	227.012	252.412	277.812
61/64	0.953125	24.209	49.609	75.009	100.409	125.809	151.209	176.609	202.009	227.409	252.809	278.209
31/32	0.968750	24.606	50.006	75.406	100.806	126.206	151.606	177.006	202.406	227.806	253.206	278.606
63/64	0.984375	25.003	50.403	75.803	101.203	126.603	152.003	177.403	202.803	228.203	253.603	279.003

1"=25.4 mm

inch		11	12	13	14	15	16	17	18	19	20
Fraction	Decimal	mm									
0	0.0000	279.400	304.800	330.200	355.600	381.000	406.400	431.800	457.200	482.600	508.000
1/16	0.0625	280.988	306.388	331.788	357.188	382.588	407.988	433.388	458.788	484.188	509.588
1/8	0.1250	282.575	307.975	333.375	358.775	384.175	409.575	434.975	460.375	485.775	511.175
3/16	0.1875	284.162	309.562	334.962	360.362	385.762	411.162	436.562	461.962	487.362	512.762
1/4	0.2500	285.750	311.150	336.550	361.950	387.350	412.750	438.150	463.550	488.950	514.350
5/16	0.3125	287.338	312.738	338.138	363.538	388.938	414.338	439.738	465.138	490.538	515.938
3/8	0.3750	288.925	314.325	339.725	365.125	390.525	415.925	441.325	466.725	492.125	517.525
7/16	0.4375	290.512	315.912	341.312	366.712	392.112	417.512	442.912	468.312	493.712	519.112
1/2	0.5000	292.100	317.500	342.900	368.300	393.700	419.100	444.500	469.900	495.300	520.700
9/16	0.5625	293.688	319.088	344.488	369.888	395.288	420.688	446.088	471.488	496.888	522.288
5/8	0.6250	295.275	320.675	346.075	371.475	396.875	422.275	447.675	473.075	498.475	523.875
11/16	0.6875	296.862	322.262	347.662	373.062	398.462	423.862	449.262	474.662	500.062	525.462
3/4	0.7500	298.450	323.850	349.250	374.650	400.050	425.450	450.850	476.250	501.650	527.050
13/16	0.8125	300.038	325.438	350.838	376.238	401.638	427.038	452.438	477.838	503.238	528.638
7/8	0.8750	301.625	327.025	352.425	377.825	403.225	428.625	454.025	479.425	504.825	530.225
15/16	0.9375	303.212	328.612	354.012	379.412	404.812	430.212	455.612	481.012	506.412	531.812

Appendix Table 7 Hardness Conversion Table (Reference)

Rockwell C Scale Hardness (1 471N) (150kgf)	Vickers Hardness	Brinell Hardness		Rockwell Hardness		Shore Hardness
		Standard Ball	Tungsten Carbide Ball	A Scale Load 588.4N (60kgf) Brale Indenter	B Scale Load 980.7N (100kgf) 1.588 mm Ball (1/16in)	
68	940	—	—	85.6	—	97
67	900	—	—	85.0	—	95
66	865	—	—	84.5	—	92
65	832	—	739	83.9	—	91
64	800	—	722	83.4	—	88
63	772	—	705	82.8	—	87
62	746	—	688	82.3	—	85
61	720	—	670	81.8	—	83
60	697	—	654	81.2	—	81
59	674	—	634	80.7	—	80
58	653	—	615	80.1	—	78
57	633	—	595	79.6	—	76
56	613	—	577	79.0	—	75
55	595	—	560	78.5	—	74
54	577	—	543	78.0	—	72
53	560	—	525	77.4	—	71
52	544	500	512	76.8	—	69
51	528	487	496	76.3	—	68
50	513	475	481	75.9	—	67
49	498	464	469	75.2	—	66
48	484	451	455	74.7	—	64
47	471	442	443	74.1	—	63
46	458	432	432	73.6	—	62
45	446	421	421	73.1	—	60
44	434	409	409	72.5	—	58
43	423	400	400	72.0	—	57
42	412	390	390	71.5	—	56
41	402	381	381	70.9	—	55
40	392	371	371	70.4	—	54
39	382	362	362	69.9	—	52
38	372	353	353	69.4	—	51
37	363	344	344	68.9	—	50
36	354	336	336	68.4	(109.0)	49
35	345	327	327	67.9	(108.5)	48
34	336	319	319	67.4	(108.0)	47
33	327	311	311	66.8	(107.5)	46
32	318	301	301	66.3	(107.0)	44
31	310	294	294	65.8	(106.0)	43
30	302	286	286	65.3	(105.5)	42
29	294	279	279	64.7	(104.5)	41
28	286	271	271	64.3	(104.0)	41
27	279	264	264	63.8	(103.0)	40
26	272	258	258	63.3	(102.5)	38
25	266	253	253	62.8	(101.5)	38
24	260	247	247	62.4	(101.0)	37
23	254	243	243	62.0	100.0	36
22	248	237	237	61.5	99.0	35
21	243	231	231	61.0	98.5	35
20	238	226	226	60.5	97.8	34
(18)	230	219	219	—	96.7	33
(16)	222	212	212	—	95.5	32
(14)	213	203	203	—	93.9	31
(12)	204	194	194	—	92.3	29
(10)	196	187	187	—	90.7	28
(8)	188	179	179	—	89.5	27
(6)	180	171	171	—	87.1	26
(4)	173	165	165	—	85.5	25
(2)	166	158	158	—	83.5	24
(0)	160	152	152	—	81.7	24

Appendix Table 8 Physical and Mechanical Properties of Materials

Materials	Specific Gravity	Coefficient of Linear Expansion (0° to 100°C) (K ⁻¹)	Hardness (Brinell)	Young's modulus (MPa) (kgf/mm ²)	Tensile Strength (MPa) (kgf/mm ²)	Yield Point (MPa) (kgf/mm ²)	Elongation (%)
Bearing Steel (hardened)	7.83	12.5×10 ⁻⁶	650 to 740	208 000 {21 200}	1 570 to 1 960 {160 to 200}	—	—
Martensitic Stainless Steel SUS 440C	7.68	10.1×10 ⁻⁶	580	200 000 {20 400}	1 960 {200}	1 860 {190}	—
Mild Steel (C=0.12 to 0.20%)	7.86	11.6×10 ⁻⁶	100 to 130	206 000 {21 000}	373 to 471 {38 to 48}	216 to 294 {22 to 30}	24 to 36
Hard Steel (C=0.3 to 0.5%)	7.84	11.3×10 ⁻⁶	160 to 200	206 000 {21 000}	539 to 686 {55 to 70}	333 to 451 {34 to 46}	14 to 26
Austenitic Stainless Steel SUS 304	8.03	16.3×10 ⁻⁶	150	193 000 {19 700}	588 {60}	245 {25}	60
Cast Iron Gray Iron FC200	7.3	10.4×10 ⁻⁶	223	98 100 {10 000}	More than 200 {20}	—	—
Spheroidal graphite Iron FCD400	7.0	11.7×10 ⁻⁶	Less than 201	169 000 {17 200}	More than 400 {41}	—	More than 12
Aluminum	2.69	23.7×10 ⁻⁶	15 to 26	70 600 {7 200}	78 {8}	34 {3.5}	35
Zinc	7.14	31×10 ⁻⁶	30 to 60	92 200 {9 400}	147 {15}	—	30 to 40
Copper	8.93	16.2×10 ⁻⁶	50	123 000 {12 500}	196 {20}	69 {7}	15 to 20
Brass (Annealed)	8.5	19.1×10 ⁻⁶	45	103 000 {10 500}	294 to 343 {30 to 35}	—	65 to 75
(Machined)			85 to 130		363 to 539 {37 to 55}		15 to 50

Remark The hardness of hardened bearing steel and martensitic stainless steel is usually expressed using the Rockwell C Scale, but for comparison, here it is converted into Brinell hardness.

Appendix Table 9 Tolerances

Diameter Classification (mm)		Single Plane Mean B.D. Deviation (Normal) Δ_{dmp}	d6	e6	f6	g5	g6	h5	h6	h7	h8	h9	h10	js5	js6
over	incl.														
3	6	0 - 8	- 30 - 38	- 20 - 28	- 10 - 18	- 4 - 4 - 9 - 12	0 - 5	0 - 8	0 - 12	0 - 18	0 - 30	0 - 48	± 2.5	± 4	
6	10	0 - 8	- 40 - 49	- 25 - 34	- 13 - 22	- 5 - 5 - 11 - 14	0 - 6	0 - 9	0 - 15	0 - 22	0 - 36	0 - 58	± 3	± 4.5	
10	18	0 - 8	- 50 - 61	- 32 - 43	- 16 - 27	- 6 - 6 - 14 - 17	0 - 8	0 - 11	0 - 18	0 - 27	0 - 43	0 - 70	± 4	± 5.5	
18	30	0 - 10	- 65 - 78	- 40 - 53	- 20 - 33	- 7 - 7 - 16 - 20	0 - 9	0 - 13	0 - 21	0 - 33	0 - 52	0 - 84	± 4.5	± 6.5	
30	50	0 - 12	- 80 - 96	- 50 - 66	- 25 - 41	- 9 - 9 - 20 - 25	0 - 11	0 - 16	0 - 25	0 - 39	0 - 62	0 - 100	± 5.5	± 8	
50	80	0 - 15	- 100 - 119	- 60 - 79	- 30 - 49	- 10 - 10 - 23 - 29	0 - 13	0 - 19	0 - 30	0 - 46	0 - 74	0 - 120	± 6.5	± 9.5	
80	120	0 - 20	- 120 - 142	- 72 - 94	- 36 - 58	- 12 - 12 - 27 - 34	0 - 15	0 - 22	0 - 35	0 - 54	0 - 87	0 - 140	± 7.5	± 11	
120	180	0 - 25	- 145 - 170	- 85 - 110	- 43 - 68	- 14 - 14 - 32 - 39	0 - 18	0 - 25	0 - 40	0 - 63	0 - 100	0 - 160	± 9	± 12.5	
180	250	0 - 30	- 170 - 199	- 100 - 129	- 50 - 79	- 15 - 15 - 35 - 44	0 - 20	0 - 29	0 - 46	0 - 72	0 - 115	0 - 185	± 10	± 14.5	
250	315	0 - 35	- 190 - 222	- 110 - 142	- 56 - 88	- 17 - 17 - 40 - 49	0 - 23	0 - 32	0 - 52	0 - 81	0 - 130	0 - 210	± 11.5	± 16	
315	400	0 - 40	- 210 - 246	- 125 - 161	- 62 - 98	- 18 - 18 - 43 - 54	0 - 25	0 - 36	0 - 57	0 - 89	0 - 140	0 - 230	± 12.5	± 18	
400	500	0 - 45	- 230 - 270	- 135 - 175	- 68 - 108	- 20 - 20 - 47 - 60	0 - 27	0 - 40	0 - 63	0 - 97	0 - 155	0 - 250	± 13.5	± 20	
500	630	0 - 50	- 260 - 304	- 145 - 189	- 76 - 120	- 22 - 66	- 44	0 - 70	0 - 110	0 - 175	0 - 280	-	± 22		
630	800	0 - 75	- 290 - 340	- 160 - 210	- 80 - 130	- 24 - 74	- 50	0 - 80	0 - 125	0 - 200	0 - 320	-	± 25		
800	1 000	0 - 100	- 320 - 376	- 170 - 226	- 86 - 142	- 26 - 82	- 56	0 - 90	0 - 140	0 - 230	0 - 360	-	± 28		
1 000	1 250	0 - 125	- 350 - 416	- 195 - 261	- 98 - 164	- 28 - 94	- 66	0 - 105	0 - 165	0 - 260	0 - 420	-	± 33		
1 250	1 600	0 - 160	- 390 - 468	- 220 - 298	- 110 - 188	- 30 - 108	- 78	0 - 125	0 - 195	0 - 310	0 - 500	-	± 39		
1 600	2 000	0 - 200	- 430 - 522	- 240 - 332	- 120 - 212	- 32 - 124	- 92	0 - 150	0 - 230	0 - 370	0 - 600	-	± 46		

for Shaft Diameters

Units : μm

Diameter Classification (mm)		j5	j6	j7	k5	k6	k7	m5	m6	n6	p6	r6	r7	over	incl.
over	incl.														
3	6	+ 3 - 2	+ 6 - 2	+ 8 - 4	+ 6 + 1	+ 9 + 1	+ 13 + 1	+ 9 + 4	+ 12 + 4	+ 16 + 8	+ 20 + 12	+ 23 + 15	+ 27 + 15	3	6
6	10	+ 4 - 2	+ 7 - 2	+ 10 - 5	+ 7 + 1	+ 10 + 1	+ 16 + 1	+ 12 + 6	+ 15 + 6	+ 19 + 10	+ 24 + 15	+ 28 + 19	+ 34 + 19	6	10
10	18	+ 5 - 3	+ 8 - 3	+ 12 - 6	+ 9 + 1	+ 12 + 1	+ 19 + 1	+ 15 + 7	+ 18 + 7	+ 23 + 12	+ 29 + 18	+ 34 + 23	+ 41 + 23	10	18
18	30	+ 5 - 4	+ 9 - 4	+ 13 - 8	+ 11 + 2	+ 15 + 2	+ 23 + 2	+ 17 + 8	+ 21 + 8	+ 28 + 15	+ 35 + 22	+ 41 + 28	+ 49 + 28	18	30
30	50	+ 6 - 5	+ 11 - 5	+ 15 - 10	+ 13 + 2	+ 18 + 2	+ 27 + 2	+ 20 + 9	+ 25 + 9	+ 33 + 17	+ 42 + 26	+ 50 + 34	+ 59 + 34	30	50
50	80	+ 6 - 7	+ 12 - 7	+ 18 - 12	+ 15 + 2	+ 21 + 2	+ 32 + 2	+ 24 + 11	+ 30 + 11	+ 39 + 20	+ 51 + 32	+ 60 + 41	+ 71 + 41	50	65
65	80	—	—	—	—	—	—	—	—	—	—	+ 62 + 43	+ 73 + 43	65	80
80	100	+ 6 - 9	+ 13 - 9	+ 20 - 15	+ 18 + 3	+ 25 + 3	+ 38 + 3	+ 28 + 13	+ 35 + 13	+ 45 + 23	+ 59 + 37	+ 73 + 51	+ 86 + 51	80	100
100	120	—	—	—	—	—	—	—	—	—	—	+ 76 + 54	+ 89 + 54	100	120
120	140	+ 7 - 11	+ 14 - 11	+ 22 - 18	+ 21 + 3	+ 28 + 3	+ 43 + 3	+ 33 + 15	+ 40 + 15	+ 52 + 27	+ 68 + 43	+ 88 + 63	+ 103 + 63	120	140
140	160	—	—	—	—	—	—	—	—	—	—	+ 90 + 65	+ 105 + 65	140	160
160	180	—	—	—	—	—	—	—	—	—	—	+ 93 + 68	+ 108 + 68	160	180
180	200	+ 7 - 13	+ 16 - 13	+ 25 - 21	+ 24 + 4	+ 33 + 4	+ 50 + 4	+ 37 + 17	+ 46 + 17	+ 60 + 31	+ 79 + 50	+ 106 + 77	+ 123 + 77	180	200
200	225	—	—	—	—	—	—	—	—	—	—	+ 109 + 80	+ 126 + 80	200	225
225	250	—	—	—	—	—	—	—	—	—	—	+ 113 + 84	+ 130 + 84	225	250
250	280	+ 7 - 16	± 16	± 26	+ 27 + 4	+ 36 + 4	+ 56 + 4	+ 43 + 20	+ 52 + 20	+ 66 + 34	+ 88 + 56	+ 126 + 94	+ 146 + 94	250	280
280	315	—	—	—	—	—	—	—	—	—	—	+ 130 + 98	+ 150 + 98	280	315
315	355	+ 7 - 18	± 18	+ 29 - 28	+ 29 + 4	+ 40 + 4	+ 61 + 4	+ 46 + 21	+ 57 + 21	+ 73 + 37	+ 98 + 62	+ 144 + 108	+ 165 + 108	315	355
355	400	—	—	—	—	—	—	—	—	—	—	+ 150 + 114	+ 171 + 114	355	400
400	450	+ 7 - 20	± 20	+ 31 - 32	+ 32 + 5	+ 45 + 5	+ 68 + 5	+ 50 + 23	+ 63 + 23	+ 80 + 40	+ 108 + 68	+ 166 + 126	+ 189 + 126	400	450
450	500	—	—	—	—	—	—	—	—	—	—	+ 172 + 132	+ 195 + 132	450	500
500	560	—	—	—	—	+ 44 0	+ 70 0	—	+ 70 + 26	+ 88 + 44	+ 122 + 78	+ 194 + 150	+ 220 + 150	500	560
560	630	—	—	—	—	—	—	—	—	—	—	+ 199 + 155	+ 225 + 155	560	630
630	710	—	—	—	—	+ 50 0	+ 80 0	—	+ 80 + 30	+ 100 + 50	+ 138 + 88	+ 225 + 175	+ 255 + 175	630	710
710	800	—	—	—	—	—	—	—	—	—	—	+ 235 + 185	+ 265 + 185	710	800
800	900	—	—	—	—	+ 56 0	+ 90 0	—	+ 90 + 34	+ 112 + 56	+ 156 + 100	+ 266 + 210	+ 300 + 210	800	900
900	1 000	—	—	—	—	—	—	—	—	—	—	+ 276 + 220	+ 310 + 220	900	1 000
1 000	1 120	—	—	—	—	+ 66 0	+ 105 0	—	+ 106 + 40	+ 132 + 66	+ 186 + 120	+ 316 + 250	+ 355 + 250	1 000	1 120
1 120	1 250	—	—	—	—	—	—	—	—	—	—	+ 326 + 260	+ 365 + 260	1 120	1 250
1 250	1 400	—	—	—	—	+ 78 0	+ 125 0	—	+ 126 + 48	+ 156 + 78	+ 218 + 140	+ 378 + 300	+ 425 + 300	1 250	1 400
1 400	1 600	—	—	—	—	—	—	—	—	—	—	+ 408 + 330	+ 455 + 330	1 400	1 600
1 600	1 800	—	—	—	—	+ 92 0	+ 150 0	—	+ 150 + 58	+ 184 + 92	+ 262 + 170	+ 462 + 370	+ 520 + 370	1 600	1 800
1 800	2 000	—	—	—	—	—	—	—	—	—	—	+ 492 + 400	+ 550 + 400	1 800	2 000

Appendix Table 10

Diameter Classification (mm)		Single Plane Mean O.D. Deviation (Normal) ΔD_{mp}	E6	F6	F7	G6	G7	H6	H7	H8	J6	J7	JS6	JS7
over	incl.													
10	18	0 - 8	+ 43 + 32	+ 27 + 16	+ 34 + 16	+ 17 + 6	+ 24 + 6	+ 11 0	+ 18 0	+ 27 0	+ 6 - 5	+ 10 - 8	± 5.5	± 9
18	30	0 - 9	+ 53 + 40	+ 33 + 20	+ 41 + 20	+ 20 + 7	+ 28 + 7	+ 13 0	+ 21 0	+ 33 0	+ 8 - 5	+ 12 - 9	± 6.5	± 10.5
30	50	0 - 11	+ 66 + 50	+ 41 + 25	+ 50 + 25	+ 25 + 9	+ 34 + 9	+ 16 0	+ 25 0	+ 39 0	+ 10 - 6	+ 14 - 11	± 8	± 12.5
50	80	0 - 13	+ 79 + 60	+ 49 + 30	+ 60 + 30	+ 29 + 10	+ 40 + 10	+ 19 0	+ 30 0	+ 46 0	+ 13 - 6	+ 18 - 12	± 9.5	± 15
80	120	0 - 15	+ 94 + 72	+ 58 + 36	+ 71 + 36	+ 34 + 12	+ 47 + 12	+ 22 0	+ 35 0	+ 54 0	+ 16 - 6	+ 22 - 13	± 11	± 17.5
120 150	150 180	0 - 18 0 - 25	+ 110 + 85	+ 68 + 43	+ 83 + 43	+ 39 + 14	+ 54 + 14	+ 25 0	+ 40 0	+ 63 0	+ 18 - 7	+ 26 - 14	± 12.5	± 20
180	250	0 - 30	+ 129 + 100	+ 79 + 50	+ 96 + 50	+ 44 + 15	+ 61 + 15	+ 29 0	+ 46 0	+ 72 0	+ 22 - 7	+ 30 - 16	± 14.5	± 23
250	315	0 - 35	+ 142 + 110	+ 88 + 56	+ 108 + 56	+ 49 + 17	+ 69 + 17	+ 32 0	+ 52 0	+ 81 0	+ 25 - 7	+ 36 - 16	± 16	± 26
315	400	0 - 40	+ 161 + 125	+ 98 + 62	+ 119 + 62	+ 54 + 18	+ 75 + 18	+ 36 0	+ 57 0	+ 89 0	+ 29 - 7	+ 39 - 18	± 18	± 28.5
400	500	0 - 45	+ 175 + 135	+ 108 + 68	+ 131 + 68	+ 60 + 20	+ 83 + 20	+ 40 0	+ 63 0	+ 97 0	+ 33 - 7	+ 43 - 20	± 20	± 31.5
500	630	0 - 50	+ 189 + 145	+ 120 + 76	+ 146 + 76	+ 66 + 22	+ 92 + 22	+ 44 0	+ 70 0	+ 110 0	—	—	± 22	± 35
630	800	0 - 75	+ 210 + 160	+ 130 + 80	+ 160 + 80	+ 74 + 24	+ 104 + 24	+ 50 0	+ 80 0	+ 125 0	—	—	± 25	± 40
800	1 000	0 - 100	+ 226 + 170	+ 142 + 86	+ 176 + 86	+ 82 + 26	+ 116 + 26	+ 56 0	+ 90 0	+ 140 0	—	—	± 28	± 45
1 000	1 250	0 - 125	+ 261 + 195	+ 164 + 98	+ 203 + 98	+ 94 + 28	+ 133 + 28	+ 66 0	+ 105 0	+ 165 0	—	—	± 33	± 52.5
1 250	1 600	0 - 160	+ 298 + 220	+ 188 + 110	+ 235 + 110	+ 108 + 30	+ 155 + 30	+ 78 0	+ 125 0	+ 195 0	—	—	± 39	± 62.5
1 600	2 000	0 - 200	+ 332 + 240	+ 212 + 120	+ 270 + 120	+ 124 + 32	+ 182 + 32	+ 92 0	+ 150 0	+ 230 0	—	—	± 46	± 75
2 000	2 500	0 - 250	+ 370 + 260	+ 240 + 130	+ 305 + 130	+ 144 + 34	+ 209 + 34	+ 110 0	+ 175 0	+ 280 0	—	—	± 55	± 87.5

Tolerances for Housing Bore Diameters

Units : μm														Diameter Classification (mm)
K5	K6	K7	M5	M6	M7	N5	N6	N7	P6	P7	over		incl.	
+ 2 - 6	+ 2 - 9	+ 6 - 12	- 4 - 12	- 4 - 15	0 - 18	- 9 - 17	- 9 - 20	- 5 - 23	- 15 - 26	- 11 - 29	10	18		
+ 1 - 8	+ 2 - 11	+ 6 - 15	- 5 - 14	- 4 - 17	0 - 21	- 12 - 21	- 11 - 24	- 7 - 28	- 18 - 31	- 14 - 35	18	30		
+ 2 - 9	+ 3 - 13	+ 7 - 18	- 5 - 16	- 4 - 20	0 - 25	- 13 - 24	- 12 - 28	- 8 - 33	- 21 - 37	- 17 - 42	30	50		
+ 3 - 10	+ 4 - 15	+ 9 - 21	- 6 - 19	- 5 - 24	0 - 30	- 15 - 28	- 14 - 33	- 9 - 39	- 26 - 45	- 21 - 51	50	80		
+ 2 - 13	+ 4 - 18	+ 10 - 25	- 8 - 23	- 6 - 28	0 - 35	- 18 - 33	- 16 - 38	- 10 - 45	- 30 - 52	- 24 - 59	80	120		
+ 3 - 15	+ 4 - 21	+ 12 - 28	- 9 - 27	- 8 - 33	0 - 40	- 21 - 39	- 20 - 45	- 12 - 52	- 36 - 61	- 28 - 68	120	180		
+ 2 - 18	+ 5 - 24	+ 13 - 33	- 11 - 31	- 8 - 37	0 - 46	- 25 - 45	- 22 - 51	- 14 - 60	- 41 - 70	- 33 - 79	180	250		
+ 3 - 20	+ 5 - 27	+ 16 - 36	- 13 - 36	- 9 - 41	0 - 52	- 27 - 50	- 25 - 57	- 14 - 66	- 47 - 79	- 36 - 88	250	315		
+ 3 - 22	+ 7 - 29	+ 17 - 40	- 14 - 39	- 10 - 46	0 - 57	- 30 - 55	- 26 - 62	- 16 - 73	- 51 - 87	- 41 - 98	315	400		
+ 2 - 25	+ 8 - 32	+ 18 - 45	- 16 - 43	- 10 - 50	0 - 63	- 33 - 60	- 27 - 67	- 17 - 80	- 55 - 95	- 45 - 108	400	500		
—	0 - 44	0 - 70	—	- 26 - 70	- 26 - 96	—	- 44 - 88	- 44 - 114	- 78 - 122	- 78 - 148	500	630		
—	0 - 50	0 - 80	—	- 30 - 80	- 30 - 110	—	- 50 - 100	- 50 - 130	- 88 - 138	- 88 - 168	630	800		
—	0 - 56	0 - 90	—	- 34 - 90	- 34 - 124	—	- 56 - 112	- 56 - 146	- 100 - 156	- 100 - 190	800	1 000		
—	0 - 66	0 - 105	—	- 40 - 106	- 40 - 145	—	- 66 - 132	- 66 - 171	- 120 - 186	- 120 - 225	1 000	1 250		
—	0 - 78	0 - 125	—	- 48 - 126	- 48 - 173	—	- 78 - 156	- 78 - 203	- 140 - 218	- 140 - 265	1 250	1 600		
—	0 - 92	0 - 150	—	- 58 - 150	- 58 - 208	—	- 92 - 184	- 92 - 242	- 170 - 262	- 170 - 320	1 600	2 000		
—	0 - 110	0 - 175	—	- 68 - 178	- 68 - 243	—	- 110 - 220	- 110 - 285	- 195 - 305	- 195 - 370	2 000	2 500		

Appendix Table 11 Values of

Basic Size (mm)		Standard										
		IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10	IT11
over	incl.	Tolerances (μm)										
—	3	0.8	1.2	2	3	4	6	10	14	25	40	60
3	6	1	1.5	2.5	4	5	8	12	18	30	48	75
6	10	1	1.5	2.5	4	6	9	15	22	36	58	90
10	18	1.2	2	3	5	8	11	18	27	43	70	110
18	30	1.5	2.5	4	6	9	13	21	33	52	84	130
30	50	1.5	2.5	4	7	11	16	25	39	62	100	160
50	80	2	3	5	8	13	19	30	46	74	120	190
80	120	2.5	4	6	10	15	22	35	54	87	140	220
120	180	3.5	5	8	12	18	25	40	63	100	160	250
180	250	4.5	7	10	14	20	29	46	72	115	185	290
250	315	6	8	12	16	23	32	52	81	130	210	320
315	400	7	9	13	18	25	36	57	89	140	230	360
400	500	8	10	15	20	27	40	63	97	155	250	400
500	630	9	11	16	22	32	44	70	110	175	280	440
630	800	10	13	18	25	36	50	80	125	200	320	500
800	1 000	11	15	21	28	40	56	90	140	230	360	560
1 000	1 250	13	18	24	33	47	66	105	165	260	420	660
1 250	1 600	15	21	29	39	55	78	125	195	310	500	780
1 600	2 000	18	25	35	46	65	92	150	230	370	600	920
2 000	2 500	22	30	41	55	78	110	175	280	440	700	1 100
2 500	3 150	26	36	50	68	96	135	210	330	540	860	1 350

Remarks 1. Standard tolerance grades IT14 to IT18 must not be used for basic sizes less than or equal to 1 mm.
2. Values for standard tolerance grades IT1 to IT5 for basic sizes over 500 mm are included for experimental use.

IT Standard Tolerance Grades

Grades							Basic Size (mm)	
IT12	IT13	IT14	IT15	IT16	IT17	IT18		
Tolerances (mm)							over	incl.
0.10	0.14	0.25	0.40	0.60	1.00	1.40	—	3
0.12	0.18	0.30	0.48	0.75	1.20	1.80	3	6
0.15	0.22	0.36	0.58	0.90	1.50	2.20	6	10
0.18	0.27	0.43	0.70	1.10	1.80	2.70	10	18
0.21	0.33	0.52	0.84	1.30	2.10	3.30	18	30
0.25	0.39	0.62	1.00	1.60	2.50	3.90	30	50
0.30	0.46	0.74	1.20	1.90	3.00	4.60	50	80
0.35	0.54	0.87	1.40	2.20	3.50	5.40	80	120
0.40	0.63	1.00	1.60	2.50	4.00	6.30	120	180
0.46	0.72	1.15	1.85	2.90	4.60	7.20	180	250
0.52	0.81	1.30	2.10	3.20	5.20	8.10	250	315
0.57	0.89	1.40	2.30	3.60	5.70	8.90	315	400
0.63	0.97	1.55	2.50	4.00	6.30	9.70	400	500
0.70	1.10	1.75	2.80	4.40	7.00	11.00	500	630
0.80	1.25	2.00	3.20	5.00	8.00	12.50	630	800
0.90	1.40	2.30	3.60	5.60	9.00	14.00	800	1 000
1.05	1.65	2.60	4.20	6.60	10.50	16.50	1 000	1 250
1.25	1.95	3.10	5.00	7.80	12.50	19.50	1 250	1 600
1.50	2.30	3.70	6.00	9.20	15.00	23.00	1 600	2 000
1.75	2.80	4.40	7.00	11.00	17.50	28.00	2 000	2 500
2.10	3.30	5.40	8.60	13.50	21.00	33.00	2 500	3 150

Appendix Table 12 Speed Factor f_n

Speed n (min ⁻¹)	Speed Factor f_n		Speed n (min ⁻¹)	Speed Factor f_n	
	Ball Bearings	Roller Bearings		Ball Bearings	Roller Bearings
10	1.49	1.44	180	0.570	0.603
11	1.45	1.39	190	0.560	0.593
12	1.41	1.36	200	0.550	0.584
13	1.37	1.33	220	0.533	0.568
14	1.34	1.30	240	0.518	0.553
15	1.30	1.27	260	0.504	0.540
16	1.28	1.25	280	0.492	0.528
17	1.25	1.22	300	0.481	0.517
18	1.23	1.20	320	0.471	0.507
19	1.21	1.18	340	0.461	0.498
20	1.19	1.17	360	0.452	0.490
21	1.17	1.15	380	0.444	0.482
22	1.15	1.13	400	0.437	0.475
23	1.13	1.12	420	0.430	0.468
24	1.12	1.10	440	0.423	0.461
25	1.10	1.09	460	0.417	0.455
26	1.09	1.08	480	0.411	0.449
27	1.07	1.07	500	0.405	0.444
28	1.06	1.05	550	0.393	0.431
29	1.05	1.04	600	0.382	0.420
30	1.04	1.03	650	0.372	0.410
31	1.02	1.02	700	0.362	0.401
32	1.01	1.01	750	0.354	0.393
33.3	1.00	1.00	800	0.347	0.385
34	0.993	0.994	850	0.340	0.378
36	0.975	0.977	900	0.333	0.372
38	0.957	0.961	950	0.327	0.366
40	0.941	0.947	1 000	0.322	0.360
42	0.926	0.933	1 050	0.317	0.355
44	0.912	0.920	1 100	0.312	0.350
46	0.898	0.908	1 150	0.307	0.346
48	0.886	0.896	1 200	0.303	0.341
50	0.874	0.885	1 250	0.299	0.337
55	0.846	0.861	1 300	0.295	0.333
60	0.822	0.838	1 400	0.288	0.326
65	0.800	0.818	1 500	0.281	0.319
70	0.781	0.800	1 600	0.275	0.313
75	0.763	0.784	1 700	0.270	0.307
80	0.747	0.769	1 800	0.265	0.302
85	0.732	0.755	1 900	0.260	0.297
90	0.718	0.742	2 000	0.255	0.293
95	0.705	0.730	2 100	0.251	0.289
100	0.693	0.719	2 200	0.247	0.285
110	0.672	0.699	2 300	0.244	0.281
120	0.652	0.681	2 400	0.240	0.277
130	0.635	0.665	2 500	0.237	0.274
140	0.620	0.650	2 600	0.234	0.271
150	0.606	0.637	2 700	0.231	0.268
160	0.593	0.625	2 800	0.228	0.265
170	0.581	0.613	2 900	0.226	0.262

$$\text{Ball Bearings } f_n = (0.03 n)^{-1/3}$$

$$\text{Roller Bearings } f_n = (0.03 n)^{-3/10}$$

Speed n (min ⁻¹)	Speed Factor f_n		Speed n (min ⁻¹)	Speed Factor f_n	
	Ball Bearings	Roller Bearings		Ball Bearings	Roller Bearings
3 000	0.223	0.259	4 000	0.203	0.238
3 200	0.218	0.254	4 200	0.199	0.234
3 400	0.214	0.250	4 400	0.196	0.231
3 600	0.210	0.245	4 600	0.194	0.228
3 800	0.206	0.242	4 800	0.191	0.225
5 000	0.188	0.222	5 200	0.186	0.220
5 400	0.183	0.217	5 600	0.181	0.215
5 800	0.179	0.213	6 000	0.177	0.211
6 200	0.175	0.209	6 400	0.173	0.207
6 600	0.172	0.205	6 800	0.170	0.203
7 000	0.168	0.201	7 200	0.167	0.199
7 400	0.165	0.198	7 600	0.164	0.196
7 800	0.162	0.195	8 000	0.161	0.193
8 500	0.158	0.190	9 000	0.155	0.186
9 500	0.152	0.183	10 000	0.149	0.181
11 000	0.145	0.176	12 000	0.141	0.171
12 000	0.141	0.167	13 000	0.137	0.167
14 000	0.134	0.163	15 000	0.130	0.160
16 000	0.128	0.157	17 000	0.125	0.154
18 000	0.123	0.151	19 000	0.121	0.149
20 000	0.119	0.147	22 000	0.115	0.143
24 000	0.112	0.139	26 000	0.109	0.136
28 000	0.106	0.133	30 000	0.104	0.130
32 000	0.101	0.127	34 000	0.099	0.125
36 000	0.097	0.123	38 000	0.096	0.121
40 000	0.094	0.119			

Appendix Table 13 Fatigue Life Factor f_h and Fatigue Life L - L_h

$$\text{Ball Bearings } L = (C / P)^3 \quad L_h = 500 f_h^3$$

$$\text{Roller Bearings } L = (C / P)^{10/3} \quad L_h = 500 f_h^{10/3}$$

C/P or f _h	Ball Bearing Life		Roller Bearing Life		C/P or f _h	Ball Bearing Life		Roller Bearing Life	
	L	L _h	L	L _h		L	L _h	L	L _h
	(10 ⁶ rev)	(h)	(10 ⁶ rev)	(h)		(10 ⁶ rev)	(h)	(10 ⁶ rev)	(h)
0.70	0.34	172	0.30	152	3.45	41.1	20 500	62.0	31 000
0.75	0.42	211	0.38	192	3.50	42.9	21 400	65.1	32 500
0.80	0.51	256	0.48	238	3.55	44.7	22 400	68.2	34 100
0.85	0.61	307	0.58	291	3.60	46.7	23 300	71.5	35 800
0.90	0.73	365	0.70	352	3.65	48.6	24 300	74.9	37 400
0.95	0.86	429	0.84	421	3.70	50.7	25 300	78.3	39 200
1.00	1.00	500	1.00	500	3.75	52.7	26 400	81.9	41 000
1.05	1.16	579	1.18	588	3.80	54.9	27 400	85.6	42 800
1.10	1.33	665	1.37	687	3.85	57.1	28 500	89.4	44 700
1.15	1.52	760	1.59	797	3.90	59.3	29 700	93.4	46 700
1.20	1.73	864	1.84	918	3.95	61.6	30 800	97.4	48 700
1.25	1.95	977	2.10	1 050	4.00	64.0	32 000	102	50 800
1.30	2.20	1 100	2.40	1 200	4.05	66.4	33 200	106	52 900
1.35	2.46	1 230	2.72	1 360	4.10	68.9	34 500	110	55 200
1.40	2.74	1 370	3.07	1 530	4.15	71.5	35 700	115	57 400
1.45	3.05	1 520	3.45	1 730	4.20	74.1	37 000	120	59 800
1.50	3.38	1 690	3.86	1 930	4.25	76.8	38 400	124	62 200
1.55	3.72	1 860	4.31	2 150	4.30	79.5	39 800	129	64 600
1.60	4.10	2 050	4.79	2 400	4.35	82.3	41 200	134	67 200
1.65	4.49	2 250	5.31	2 650	4.40	85.2	42 600	140	69 800
1.70	4.91	2 460	5.86	2 930	4.45	88.1	44 100	145	72 500
1.75	5.36	2 680	6.46	3 230	4.50	91.1	45 600	150	75 200
1.80	5.83	2 920	7.09	3 550	4.55	94.2	47 100	156	78 000
1.85	6.33	3 170	7.77	3 890	4.60	97.3	48 700	162	80 900
1.90	6.86	3 430	8.50	4 250	4.65	101	50 300	168	83 900
1.95	7.41	3 710	9.26	4 630	4.70	104	51 900	174	87 000
2.00	8.00	4 000	10.1	5 040	4.75	107	53 600	180	90 100
2.05	8.62	4 310	10.9	5 470	4.80	111	55 300	187	93 300
2.10	9.26	4 630	11.9	5 930	4.85	114	57 000	193	96 600
2.15	9.94	4 970	12.8	6 410	4.90	118	58 800	200	99 900
2.20	10.6	5 320	13.8	6 920	4.95	121	60 600	207	103 000
2.25	11.4	5 700	14.9	7 460	5.00	125	62 500	214	107 000
2.30	12.2	6 080	16.1	8 030	5.10	133	66 300	228	114 000
2.35	13.0	6 490	17.3	8 630	5.20	141	70 300	244	122 000
2.40	13.8	6 910	18.5	9 250	5.30	149	74 400	260	130 000
2.45	14.7	7 350	19.8	9 910	5.40	157	78 700	276	138 000
2.50	15.6	7 810	21.2	10 600	5.50	166	83 200	294	147 000
2.55	16.6	8 290	22.7	11 300	5.60	176	87 800	312	156 000
2.60	17.6	8 790	24.2	12 100	5.70	185	92 600	331	165 000
2.65	18.6	9 300	25.8	12 900	5.80	195	97 600	351	175 000
2.70	19.7	9 840	27.4	13 700	5.90	205	103 000	371	186 000
2.75	20.8	10 400	29.1	14 600	6.00	216	108 000	392	196 000
2.80	22.0	11 000	30.9	15 500	6.50	275	137 000	513	256 000
2.85	23.1	11 600	32.8	16 400	7.00	343	172 000	656	328 000
2.90	24.4	12 200	34.8	17 400	7.50	422	211 000	826	413 000
2.95	25.7	12 800	36.8	18 400	8.00	512	256 000	1 020	512 000
3.00	27.0	13 500	38.9	19 500	8.50	614	307 000	1 250	627 000
3.05	28.4	14 200	41.1	20 600	9.00	729	365 000	1 520	758 000
3.10	29.8	14 900	43.4	21 700	9.50	857	429 000	1 820	908 000
3.15	31.3	15 600	45.8	22 900	10.0	1 000	—	2 150	—
3.20	32.8	16 400	48.3	24 100	11.0	1 330	—	2 960	—
3.25	34.3	17 200	50.8	25 400	12.0	1 730	—	3 960	—
3.30	35.9	18 000	53.5	26 800	13.0	2 200	—	5 170	—
3.35	37.6	18 800	56.3	28 100	14.0	2 740	—	6 610	—
3.40	39.3	19 700	59.1	29 600	15.0	3 380	—	8 320	—

Appendix Table 14 Index of Inch Series Tapered Roller Bearings

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages	Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages	Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages	Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
332	<i>D</i> 80.000	C214, C218, C220	497	<i>d</i> 85.725	C236	657	<i>d</i> 73.025	C232	1328	<i>D</i> 52.388	C210
336	<i>d</i> 41.275	C220	498	<i>d</i> 84.138	C236	658	<i>d</i> 74.612	C232	1329	<i>D</i> 53.975	C210
342	<i>d</i> 41.275	C220	522	<i>D</i> 101.600	C222, C224	659	<i>d</i> 76.200	C232	1380	<i>d</i> 22.225	C210
342 S	<i>d</i> 42.875	C220	528	<i>d</i> 47.625	C222	661	<i>d</i> 79.375	C234	1620	<i>D</i> 66.675	C216
344	<i>d</i> 40.000	C218	529	<i>d</i> 50.800	C224	663	<i>d</i> 82.550	C234	1680	<i>d</i> 33.338	C216
344 A	<i>d</i> 40.000	C218	529 X	<i>d</i> 50.800	C224	664	<i>d</i> 84.138	C236	1729	<i>D</i> 56.896	C210, C212
346	<i>d</i> 31.750	C214	532 X	<i>D</i> 107.950	C226	665	<i>d</i> 85.725	C236	1755	<i>d</i> 22.225	C210
354 A	<i>D</i> 85.000	C222	539	<i>d</i> 53.975	C226	665 A	<i>d</i> 85.725	C236	1779	<i>d</i> 23.812	C212
359 S	<i>d</i> 46.038	C222	552 A	<i>D</i> 123.825	C226, C228, C230	672	<i>D</i> 168.275	C236, C238, C240	1922	<i>D</i> 57.150	C212
362 A	<i>D</i> 88.900	C222, C224	553 X	<i>D</i> 122.238	C228, C230	677	<i>d</i> 85.725	C236	1988	<i>d</i> 28.575	C212
366	<i>d</i> 50.000	C224	555 S	<i>d</i> 57.150	C226	681	<i>d</i> 92.075	C238	1997 X	<i>d</i> 26.988	C212
368	<i>d</i> 50.800	C224	557 S	<i>d</i> 53.975	C226	683	<i>d</i> 95.250	C238	A2047	<i>d</i> 12.000	C210
368 A	<i>d</i> 50.800	C224	558	<i>d</i> 60.325	C228	685	<i>d</i> 98.425	C238	A2126	<i>D</i> 31.991	C210
369 A	<i>d</i> 47.625	C222	559	<i>d</i> 63.500	C228	687	<i>d</i> 101.600	C240	2523	<i>D</i> 69.850	C214, C216
372	<i>D</i> 100.000	C224	560	<i>d</i> 66.675	C230	742	<i>D</i> 150.089	C230, C234, C236	2558	<i>d</i> 30.162	C214
374	<i>D</i> 93.264	C222	560 S	<i>d</i> 68.262	C230	743	<i>D</i> 150.000	C234	2559	<i>d</i> 30.162	C214
376	<i>d</i> 45.000	C222	563	<i>D</i> 127.000	C228, C230, C232	745 A	<i>d</i> 69.850	C230	2580	<i>d</i> 31.750	C214
377	<i>d</i> 52.388	C224	563 X	<i>D</i> 127.000	C230	749	<i>d</i> 85.026	C236	2582	<i>d</i> 31.750	C214
382	<i>D</i> 98.425	C226	565	<i>d</i> 63.500	C228	749 A	<i>d</i> 82.550	C234	2585	<i>d</i> 33.338	C216
382 A	<i>D</i> 96.838	C226	566	<i>d</i> 69.850	C230	749 S	<i>d</i> 85.026	C236	2631	<i>D</i> 66.421	C214
382 S	<i>D</i> 96.838	C226	567	<i>d</i> 73.025	C232	750	<i>d</i> 79.375	C234	2690	<i>d</i> 29.367	C214
385	<i>d</i> 55.000	C226	567 A	<i>d</i> 71.438	C232	752	<i>D</i> 161.925	C234, C236	2720	<i>D</i> 76.200	C218
387	<i>d</i> 57.150	C226	567 S	<i>d</i> 71.438	C232	753	<i>D</i> 168.275	C234, C236	2729	<i>D</i> 76.200	C218
387 A	<i>d</i> 57.150	C226	568	<i>d</i> 73.817	C232	757	<i>d</i> 82.550	C234	2735 X	<i>D</i> 73.025	C218
388 A	<i>d</i> 57.531	C226	569	<i>d</i> 64.963	C228	758	<i>d</i> 85.725	C236	2788	<i>d</i> 38.100	C218
390 A	<i>d</i> 63.500	C228	570	<i>d</i> 68.262	C230	759	<i>d</i> 88.900	C236	2789	<i>d</i> 39.688	C218
394 A	<i>D</i> 110.000	C228, C230	572	<i>D</i> 139.992	C232, C234	760	<i>d</i> 90.488	C236	2820	<i>D</i> 73.025	C216
395	<i>d</i> 63.500	C228	572 X	<i>D</i> 139.700	C234	766	<i>d</i> 88.900	C236	2877	<i>d</i> 34.925	C216
395 A	<i>d</i> 66.675	C230	575	<i>d</i> 76.200	C232	772	<i>D</i> 180.975	C238, C240	2924	<i>D</i> 85.000	C222
395 S	<i>d</i> 66.675	C230	580	<i>d</i> 82.550	C234	776	<i>d</i> 95.250	C238	2984	<i>d</i> 46.038	C222
397	<i>d</i> 60.000	C228	581	<i>d</i> 80.962	C234	779	<i>d</i> 98.425	C238	3120	<i>D</i> 72.626	C214, C216
399 A	<i>d</i> 68.262	C230	582	<i>d</i> 82.550	C234	780	<i>d</i> 101.600	C240	3188	<i>d</i> 31.750	C214
414	<i>D</i> 88.501	C218	590 A	<i>d</i> 76.200	C232	782	<i>d</i> 104.775	C240	3197	<i>d</i> 33.338	C216
418	<i>d</i> 38.100	C218	592	<i>D</i> 152.400	C238	787	<i>d</i> 104.775	C240	3320	<i>D</i> 80.167	C218
432	<i>D</i> 95.250	C220	592 A	<i>D</i> 152.400	C232, C236, C238	792	<i>D</i> 206.375	C242	3386	<i>d</i> 39.688	C218
432 A	<i>D</i> 95.250	C222	593	<i>d</i> 88.900	C236	795	<i>d</i> 120.650	C242	3420	<i>D</i> 79.375	C216, C218
436	<i>d</i> 46.038	C222	594	<i>d</i> 95.250	C238	797	<i>d</i> 130.000	C242	3478	<i>d</i> 34.925	C216
438	<i>d</i> 44.450	C220	596	<i>d</i> 85.725	C236	799	<i>d</i> 128.588	C242	3479	<i>d</i> 36.512	C218
453 A	<i>D</i> 107.950	C222	597	<i>d</i> 93.662	C238	799 A	<i>d</i> 130.175	C242	3490	<i>d</i> 38.100	C218
453 X	<i>D</i> 104.775	C226	598	<i>d</i> 92.075	C238	832	<i>D</i> 168.275	C234, C236	3525	<i>D</i> 87.312	C220
460	<i>d</i> 44.450	C222	598 A	<i>d</i> 92.075	C238	837	<i>d</i> 76.200	C234	3576	<i>d</i> 41.275	C220
462	<i>d</i> 57.150	C226	614 X	<i>D</i> 115.000	C226	842	<i>d</i> 82.550	C234	3578	<i>d</i> 44.450	C220
469	<i>d</i> 57.150	C226	622 X	<i>d</i> 55.000	C226	843	<i>d</i> 76.200	C234	3720	<i>D</i> 93.264	C220
472	<i>D</i> 120.000	C230, C232	632	<i>D</i> 136.525	C228, C232	850	<i>d</i> 88.900	C236	3730	<i>D</i> 93.264	C224
472 A	<i>D</i> 120.000	C230	633	<i>D</i> 130.175	C228, C230, C232	854	<i>D</i> 190.500	C236, C238, C240	3775	<i>d</i> 50.800	C224
478	<i>d</i> 65.000	C230	637	<i>d</i> 60.325	C228	855	<i>d</i> 88.900	C236	3780	<i>d</i> 50.800	C224
480	<i>d</i> 68.262	C230	639	<i>d</i> 63.500	C228	857	<i>d</i> 92.075	C238	3782	<i>d</i> 44.450	C220
484	<i>d</i> 70.000	C232	643	<i>d</i> 69.850	C230	861	<i>d</i> 101.600	C240	3820	<i>D</i> 85.725	C220
492 A	<i>D</i> 133.350	C234, C236	644	<i>d</i> 71.438	C232	864	<i>d</i> 95.250	C238	3877	<i>d</i> 41.275	C220
493	<i>D</i> 136.525	C232, C234, C236	645	<i>d</i> 71.438	C232	866	<i>d</i> 98.425	C238	3920	<i>D</i> 112.712	C228, C230
495	<i>d</i> 82.550	C234	652	<i>D</i> 152.400	C232, C234	932	<i>D</i> 212.725	C240	3926	<i>D</i> 112.712	C226, C228
495 A	<i>d</i> 76.200	C232	653	<i>D</i> 146.050	C230, C232, C234, C236	938	<i>d</i> 114.300	C240	3981	<i>d</i> 58.738	C226
495 AX	<i>d</i> 76.200	C232	653 X	<i>D</i> 150.000	C232	1220	<i>d</i> 57.150	C210	3982	<i>d</i> 63.500	C228
496	<i>d</i> 80.962	C234	655	<i>d</i> 69.850	C230	1280	<i>d</i> 22.225	C210	3984	<i>d</i> 66.675	C230

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
3994 A4050 A4059	<i>d</i> 66.675 <i>d</i> 12.700 <i>d</i> 15.000	C230 C210 C210
A4138 4335 4388	<i>D</i> 34.988 <i>D</i> 90.488 <i>d</i> 41.275	C210 C220 C220
4535 4595 A5069	<i>D</i> 104.775 <i>d</i> 53.975 <i>d</i> 17.455	C226 C226 C210
A5144 5335 5356	<i>D</i> 36.525 <i>D</i> 103.188 <i>d</i> 44.450	C210 C222 C222
5535 5566 5582	<i>D</i> 122.238 <i>d</i> 55.562 <i>d</i> 60.325	C226, C228 C226 C228
5584 5735 5760	<i>d</i> 63.500 <i>D</i> 135.733 <i>d</i> 76.200	C228 C232, C234 C232
5795 A6062 A6067	<i>d</i> 77.788 <i>d</i> 15.875 <i>d</i> 16.993	C234 C210 C210
A6075 A6157 6220	<i>d</i> 19.050 <i>D</i> 39.992 <i>D</i> 127.000	C210 C210 C224, C226
6279 6280 6320	<i>d</i> 50.800 <i>d</i> 53.975 <i>D</i> 135.755	C224 C226 C228, C230
6376 6379 6420	<i>d</i> 60.325 <i>d</i> 65.088 <i>D</i> 149.225	C228 C230 C226, C230, C232
6454 6455 6460	<i>d</i> 69.850 <i>d</i> 57.150 <i>d</i> 73.025	C230 C226 C232
6461 6535 6536	<i>d</i> 76.200 <i>D</i> 161.925 <i>D</i> 161.925	C232 C232, C234, C236 C232
6559 6575 6576	<i>d</i> 82.550 <i>d</i> 76.200 <i>d</i> 76.200	C234 C232 C232
6580 9121 9180	<i>d</i> 88.900 <i>D</i> 152.400 <i>d</i> 61.912	C236 C228, C230 C228
9185 9220 9285	<i>d</i> 68.262 <i>D</i> 161.925 <i>d</i> 76.200	C230 C232 C232
9320 9321 9378	<i>D</i> 177.800 <i>D</i> 171.450 <i>d</i> 76.200	C234 C234, C236 C234
9380 9385 02420	<i>d</i> 76.200 <i>d</i> 84.138 <i>D</i> 68.262	C234 C236 C212, C214
02473 02474 02475	<i>d</i> 25.400 <i>d</i> 28.575 <i>d</i> 31.750	C212 C212 C214

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
02820 02872 02878	<i>D</i> 73.025 <i>D</i> 28.575 <i>d</i> 34.925	C212, C216 C212 C216
03062 03162 05062	<i>d</i> 15.875 <i>D</i> 41.275 <i>d</i> 15.875	C210 C210 C210
05068 05075 05079	<i>d</i> 17.462 <i>d</i> 19.050 <i>d</i> 19.990	C210 C210 C210
05175 05185 07079	<i>D</i> 44.450 <i>D</i> 47.000 <i>d</i> 20.000	C210 C210 C210
07087 07097 07098	<i>d</i> 22.225 <i>d</i> 25.000 <i>d</i> 24.981	C210 C212 C212
07100 07100SA 07196	<i>d</i> 25.400 <i>d</i> 25.400 <i>D</i> 50.005	C212 C212 C210, C212
07204 07205 08118	<i>D</i> 51.994 <i>D</i> 52.001 <i>d</i> 30.162	C210, C212 C212 C214
08125 08231 09062	<i>d</i> 31.750 <i>D</i> 58.738 <i>d</i> 15.875	C214 C214 C210
09067 09074 09078	<i>d</i> 19.050 <i>d</i> 19.050 <i>d</i> 19.050	C210 C210 C210
09081 09194 09195	<i>d</i> 20.625 <i>D</i> 49.225 <i>D</i> 49.225	C210 C210 C210
09196 11162 11300	<i>D</i> 49.225 <i>d</i> 41.275 <i>D</i> 76.200	C210 C220 C220
11520 11590 LM11710	<i>D</i> 42.862 <i>d</i> 15.875 <i>D</i> 39.878	C210 C210 C210
LM11749 LM11910 LM11949	<i>d</i> 17.462 <i>D</i> 45.237 <i>d</i> 19.050	C210 C210 C210
12168 12303 12520	<i>d</i> 42.862 <i>D</i> 76.992 <i>D</i> 49.225	C220 C220 C210
12580 M12610 M12648	<i>d</i> 20.638 <i>D</i> 50.005 <i>d</i> 22.225	C210 C210 C210
M12649 LM12710 LM12711	<i>d</i> 21.430 <i>D</i> 45.237 <i>D</i> 45.975	C210 C210 C210
LM12749 13175 13181	<i>d</i> 22.000 <i>d</i> 44.450 <i>d</i> 46.038	C210 C220 C222
13318 13620 13621	<i>D</i> 80.962 <i>D</i> 69.012 <i>D</i> 69.012	C220, C222 C218 C218

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
13685 13687 13830	<i>d</i> 38.100 <i>d</i> 38.100 <i>D</i> 63.500	C218 C218 C218
13889 14123 A 14125 A	<i>d</i> 38.100 <i>d</i> 31.750 <i>d</i> 31.750	C218 C214 C214
14130 14131 14137 A	<i>d</i> 33.338 <i>d</i> 33.338 <i>d</i> 34.925	C216 C216 C216
14138 A 14139 14274	<i>d</i> 34.925 <i>d</i> 34.976 <i>D</i> 69.012	C216 C216 C214, C216
14276 14283 15100	<i>D</i> 69.012 <i>D</i> 72.085 <i>d</i> 25.400	C214, C216 C216 C212
15101 15106 15112	<i>d</i> 25.400 <i>d</i> 26.988 <i>d</i> 28.575	C212 C212 C212
15113 15116 15117	<i>d</i> 28.575 <i>d</i> 30.112 <i>d</i> 30.000	C212 C214 C214
15118 15119 15120	<i>d</i> 30.213 <i>d</i> 30.213 <i>d</i> 30.213	C214 C214 C214
15123 15125 15126	<i>d</i> 31.750 <i>d</i> 31.750 <i>d</i> 31.750	C214 C214 C214
15245 15250 15250 X	<i>D</i> 62.000 <i>D</i> 63.500 <i>D</i> 63.500	C212, C214 C214 C212
15520 15523 15578	<i>D</i> 57.150 <i>D</i> 60.325 <i>d</i> 25.400	C212 C212 C212
15580 16150 16284	<i>d</i> 26.988 <i>d</i> 38.100 <i>D</i> 72.238	C212 C218 C218
16929 16986 17098	<i>D</i> 74.988 <i>d</i> 43.000 <i>d</i> 24.981	C220 C220 C212
17118 17244 17520	<i>d</i> 30.000 <i>D</i> 62.000 <i>D</i> 42.862	C214 C212, C214 C210
17580 17831 17887	<i>d</i> 15.875 <i>D</i> 79.985 <i>d</i> 45.230	C210 C222 C222
18200 18337 18520	<i>d</i> 50.800 <i>D</i> 85.725 <i>D</i> 73.025	C224 C224 C218
18590 18620 18690	<i>d</i> 41.275 <i>D</i> 79.375 <i>d</i> 46.038	C218 C222 C222
18720 18790 19138	<i>D</i> 85.000 <i>D</i> 50.800 <i>d</i> 34.976	C224 C224 C216

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
19150 19268 21075	<i>d</i> 38.100 <i>D</i> 68.262 <i>d</i> 19.050	C218 C216, C218 C210
21212 L21511 L21549	<i>D</i> 53.975 <i>D</i> 34.988 <i>d</i> 15.875	C210 C210 C210
22168 22325 23100	<i>d</i> 42.862 <i>D</i> 82.550 <i>d</i> 25.400	C220 C220 C212
23256 23621 23691	<i>D</i> 65.088 <i>D</i> 73.025 <i>d</i> 35.000	C212 C216 C216
24720 24721 24780	<i>D</i> 76.200 <i>D</i> 76.200 <i>d</i> 41.275	C220 C220 C220
25520 25521 25523	<i>D</i> 82.931 <i>D</i> 83.058 <i>D</i> 82.931	C220, C222 C220 C220, C222
25577 25578 25580	<i>d</i> 42.875 <i>d</i> 42.862 <i>d</i> 44.450	C220 C220 C220
25584 25590 25820	<i>d</i> 44.983 <i>d</i> 45.618 <i>D</i> 73.025	C222 C222 C216
25821 25877 25878	<i>D</i> 73.025 <i>d</i> 34.925 <i>d</i> 34.925	C216, C218 C216 C216
25880 26118 26131	<i>d</i> 36.487 <i>d</i> 30.000 <i>d</i> 33.338	C218 C214 C216
26283 26820 26822	<i>D</i> 72.000 <i>D</i> 80.167 <i>D</i> 79.375	C214, C216 C220 C220
26823 26882 26884	<i>D</i> 76.200 <i>d</i> 41.275 <i>d</i> 42.875	C220 C220 C220
27620 27687 27689	<i>D</i> 125.412 <i>d</i> 82.550 <i>d</i> 83.345	C234 C234 C234
27690 27820 27880	<i>d</i> 83.345 <i>D</i> 80.035 <i>d</i> 38.100	C234 C218 C218
28138 28315 28521	<i>d</i> 34.976 <i>D</i> 80.000 <i>D</i> 92.075	C216 C216 C224
28580 28584 28622	<i>d</i> 50.800 <i>d</i> 52.388 <i>D</i> 97.630	C224 C224 C226
28680 28920 28921	<i>d</i> 55.562 <i>D</i> 101.600 <i>D</i> 100.000	C226 C228 C228
28985 29520 29586	<i>d</i> 60.325 <i>D</i> 107.950 <i>d</i> 63.500	C228 C228 C228

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
29620	<i>D</i> 112.712	C230, C232
29630	<i>D</i> 120.650	C230
29675	<i>d</i> 69.850	C230
29685	<i>d</i> 73.025	C232
LM29710	<i>D</i> 65.088	C218
LM29711	<i>D</i> 65.088	C218
LM29748	<i>d</i> 38.100	C218
LM29749	<i>d</i> 38.100	C218
31520	<i>D</i> 76.200	C216
31594	<i>d</i> 34.925	C216
33262	<i>d</i> 66.675	C230
33275	<i>d</i> 69.850	C230
33281	<i>d</i> 71.438	C232
33287	<i>d</i> 73.025	C232
JHM33410	<i>D</i> 55.000	C212
JHM33449	<i>d</i> 24.000	C212
33462	<i>D</i> 117.475	C230, C232
33821	<i>D</i> 95.250	C224
33889	<i>d</i> 50.800	C224
34300	<i>d</i> 76.200	C232
34306	<i>d</i> 77.788	C234
34478	<i>D</i> 121.442	C232, C234
36620	<i>D</i> 193.675	C242
36690	<i>d</i> 146.050	C242
36920	<i>D</i> 227.012	C244
36990	<i>d</i> 177.800	C244
37425	<i>d</i> 107.950	C240
37625	<i>D</i> 158.750	C240
M38510	<i>D</i> 66.675	C216
M38511	<i>D</i> 65.987	C216
M38547	<i>d</i> 35.000	C216
M38549	<i>d</i> 34.925	C216
39236	<i>d</i> 60.000	C228
39250	<i>d</i> 63.500	C228
39412	<i>D</i> 104.775	C228
39520	<i>D</i> 112.712	C228, C230
39521	<i>D</i> 112.712	C230
39585	<i>d</i> 63.500	C228
39590	<i>d</i> 66.675	C230
41100	<i>d</i> 25.400	C212
41125	<i>d</i> 28.575	C212
41126	<i>d</i> 28.575	C212
41286	<i>D</i> 72.626	C212
42350	<i>d</i> 88.900	C236
42362	<i>d</i> 92.075	C238
42368	<i>d</i> 93.662	C238
42375	<i>d</i> 95.250	C238
42376	<i>d</i> 95.250	C238
42381	<i>d</i> 96.838	C238
42584	<i>D</i> 148.430	C238
42587	<i>D</i> 149.225	C236, C238
42620	<i>D</i> 127.000	C232, C234
42687	<i>d</i> 76.200	C232
42688	<i>d</i> 76.200	C232

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
42690	<i>d</i> 77.788	C234
43118	<i>d</i> 30.162	C214
43131	<i>d</i> 33.338	C216
43300	<i>D</i> 76.200	C214
43312	<i>D</i> 79.375	C216
44143	<i>d</i> 36.512	C218
44150	<i>d</i> 38.100	C218
44157	<i>d</i> 40.000	C218
44162	<i>d</i> 41.275	C220
44348	<i>D</i> 88.501	C218, C220
L44610	<i>D</i> 50.292	C212
L44640	<i>d</i> 23.812	C212
L44643	<i>d</i> 25.400	C212
L44649	<i>d</i> 26.988	C212
45220	<i>D</i> 104.775	C226
45221	<i>D</i> 104.775	C226
45289	<i>d</i> 57.150	C226
L45410	<i>D</i> 50.292	C214
L45449	<i>d</i> 29.000	C214
46143	<i>d</i> 36.512	C218
46162	<i>d</i> 41.275	C220
46176	<i>d</i> 44.450	C220
46368	<i>D</i> 93.662	C218, C220
46720	<i>D</i> 225.425	C242
46780	<i>d</i> 158.750	C242
47420	<i>D</i> 120.000	C230, C232
47487	<i>d</i> 69.850	C230
47490	<i>d</i> 71.438	C232
47620	<i>D</i> 133.350	C232, C234
47680	<i>d</i> 76.200	C232
47685	<i>d</i> 82.550	C234
47686	<i>d</i> 82.550	C234
47687	<i>d</i> 82.550	C234
47820	<i>D</i> 146.050	C238
47890	<i>d</i> 92.075	C238
47896	<i>d</i> 95.250	C238
48120	<i>D</i> 161.925	C240
48190	<i>d</i> 107.950	C240
48220	<i>D</i> 182.562	C242
48282	<i>d</i> 120.650	C242
48286	<i>d</i> 123.825	C242
48290	<i>d</i> 127.000	C242
48320	<i>D</i> 190.500	C242
48385	<i>d</i> 133.350	C242
48393	<i>d</i> 136.525	C242
LM48510	<i>D</i> 65.088	C216
LM48511	<i>D</i> 65.088	C216
LM48548	<i>d</i> 34.925	C216
48620	<i>D</i> 200.025	C242
48685	<i>d</i> 142.875	C242
49175	<i>d</i> 44.450	C220
49176	<i>d</i> 44.450	C220
49368	<i>D</i> 93.662	C220
49520	<i>D</i> 101.600	C224

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
49585	<i>d</i> 50.800	C224
52387	<i>d</i> 98.425	C238
52393	<i>d</i> 100.012	C238
52400	<i>d</i> 101.600	C240
52618	<i>D</i> 157.162	C238, C240
52637	<i>D</i> 161.925	C238, C240
53150	<i>d</i> 38.100	C218
53162	<i>d</i> 41.275	C220
53176	<i>d</i> 44.450	C222
53177	<i>d</i> 44.450	C222
53178	<i>d</i> 44.450	C222
53375	<i>D</i> 95.250	C218, C222
53387	<i>D</i> 98.425	C220, C222
55175	<i>d</i> 44.450	C222
55187	<i>d</i> 47.625	C222
55200	<i>d</i> 50.800	C224
55200 C	<i>d</i> 50.800	C224
55206	<i>d</i> 52.388	C224
55437	<i>D</i> 111.125	C222, C224
55443	<i>D</i> 112.712	C222
56418	<i>d</i> 106.362	C240
56425	<i>d</i> 107.950	C240
56650	<i>D</i> 165.100	C240
59200	<i>d</i> 50.800	C224
59429	<i>D</i> 108.966	C224
64433	<i>d</i> 109.992	C240
64450	<i>d</i> 114.300	C240
64700	<i>D</i> 177.800	C240
65200	<i>d</i> 50.800	C224
65212	<i>d</i> 53.975	C226
65237	<i>d</i> 60.325	C228
65320	<i>D</i> 114.300	C222
65385	<i>d</i> 44.450	C222
65500	<i>D</i> 127.000	C224, C226, C228
66187	<i>D</i> 47.625	C222
66462	<i>D</i> 117.475	C222
66520	<i>D</i> 122.238	C226, C228
66584	<i>d</i> 53.975	C226
66585	<i>d</i> 60.000	C228
66587	<i>d</i> 57.150	C226
LM67010	<i>D</i> 59.131	C212, C214
LM67043	<i>D</i> 28.575	C212
LM67048	<i>d</i> 31.750	C214
67320	<i>D</i> 203.200	C242
67322	<i>D</i> 196.850	C242
67388	<i>d</i> 127.000	C242
67389	<i>d</i> 130.175	C242
67390	<i>d</i> 133.350	C242
67720	<i>D</i> 247.650	C242, C244
67780	<i>d</i> 165.100	C242
67787	<i>d</i> 174.625	C244
67790	<i>d</i> 177.800	C244
67820	<i>D</i> 266.700	C244
67885	<i>d</i> 190.500	C244

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
67920	<i>D</i> 282.575	C244
67983	<i>d</i> 203.200	C244
67985	<i>d</i> 206.375	C244
L68110	<i>D</i> 59.131	C216
L68111	<i>D</i> 59.975	C216
L68149	<i>d</i> 35.000	C216
68450	<i>d</i> 114.300	C240
68462	<i>d</i> 117.475	C240
68709	<i>D</i> 180.000	C240
68712	<i>D</i> 180.975	C240
JL69310	<i>D</i> 63.000	C218
JL69349	<i>d</i> 38.000	C218
71412	<i>d</i> 104.775	C240
71425	<i>d</i> 107.950	C240
71437	<i>d</i> 111.125	C240
71450	<i>d</i> 114.300	C240
71453	<i>d</i> 115.087	C240
71750	<i>D</i> 190.500	C240
72187	<i>d</i> 47.625	C222
72200	<i>d</i> 50.800	C224
72200 C	<i>d</i> 50.800	C224
72212	<i>d</i> 53.975	C226
72212 C	<i>d</i> 53.975	C226
72218	<i>d</i> 55.562	C226
72218 C	<i>d</i> 55.562	C226
72225 C	<i>d</i> 57.150	C226
72487	<i>D</i> 123.825	C222, C224, C226
LM72810	<i>D</i> 47.000	C212
LM72849	<i>d</i> 22.606	C212
74500	<i>d</i> 127.000	C242
74525	<i>d</i> 133.350	C242
74537	<i>d</i> 136.525	C242
74550	<i>d</i> 139.700	C242
74850	<i>D</i> 215.900	C242
74856	<i>D</i> 217.488	C242
77375	<i>d</i> 95.250	C238
77675	<i>D</i> 171.450	C238
78225	<i>d</i> 57.150	C226
78250	<i>d</i> 63.500	C228
LM78310	<i>D</i> 62.000	C216
LM78310 A	<i>D</i> 62.000	C216
LM78349	<i>d</i> 35.000	C216
78537	<i>D</i> 136.525	C228
78551	<i>D</i> 140.030	C226, C228
78571	<i>D</i> 144.983	C226
HM81610	<i>D</i> 47.000	C210
HM81649	<i>d</i> 16.000	C210
M84210	<i>D</i> 59.530	C212
M84249	<i>d</i> 25.400	C212
M84510	<i>D</i> 57.150	C212
M84548	<i>d</i> 25.400	C212
M86610	<i>D</i> 64.292	C212, C214
M86643	<i>d</i> 25.400	C212
M86647	<i>d</i> 28.575	C212

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
M86648A M86649 M88010	<i>d</i> 30.955 <i>d</i> 30.162 <i>D</i> 68.262	C214 C214 C214, C216
M88043 M88046 M88048	<i>d</i> 30.162 <i>d</i> 31.750 <i>d</i> 33.338	C214 C214 C216
HM88510 HM88542 HM88547	<i>D</i> 73.025 <i>d</i> 31.750 <i>d</i> 33.338	C214, C216 C214 C216
HM88610 HM88630 HM88638	<i>D</i> 72.233 <i>d</i> 25.400 <i>d</i> 32.000	C212, C214, C216, C218 C212 C214
HM88648 HM88649 HM89410	<i>d</i> 35.717 <i>d</i> 34.925 <i>D</i> 76.200	C218 C216 C216, C218
HM89411 HM89443 HM89444	<i>D</i> 76.200 <i>d</i> 33.338 <i>d</i> 33.338	C216 C216 C216
HM89446 HM89446A HM89449	<i>d</i> 34.925 <i>d</i> 34.925 <i>d</i> 36.512	C216 C216 C218
99100 99550 99575	<i>D</i> 254.000 <i>d</i> 139.700 <i>d</i> 146.050	C242 C242 C242
99587 99600 LM102910	<i>d</i> 149.225 <i>d</i> 152.400 <i>D</i> 73.431	C242 C242 C222
LM102949 JLM104910 LM104911	<i>d</i> 45.242 <i>D</i> 82.000 <i>D</i> 82.550	C222 C224 C224
LM104911A LM104912 LM104947A	<i>D</i> 82.550 <i>D</i> 82.931 <i>d</i> 50.000	C224 C224 C224
JLM104948 LM104949 M201011	<i>d</i> 50.000 <i>d</i> 50.800 <i>D</i> 73.025	C224 C224 C218
M201047 JM205110 JM205149	<i>d</i> 39.688 <i>D</i> 90.000 <i>d</i> 50.000	C218 C224 C224
JM207010 JM207049 JH211710	<i>D</i> 95.000 <i>d</i> 55.000 <i>D</i> 120.000	C226 C226 C230
JH211749 HM212010 HM212011	<i>d</i> 65.000 <i>D</i> 122.238 <i>D</i> 122.238	C230 C228, C230 C228, C230
HM212044 HM212046 HM212047	<i>d</i> 60.325 <i>d</i> 63.500 <i>d</i> 63.500	C228 C228 C228
HM212049 JH217210 JH217249	<i>d</i> 66.675 <i>D</i> 150.000 <i>d</i> 85.000	C230 C236 C236
HM218210 HM218248 HH221410	<i>D</i> 147.000 <i>d</i> 90.000 <i>D</i> 190.500	C236 C236 C236, C238, C240

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
HH221432 HH221434 HH221440	<i>d</i> 87.312 <i>d</i> 88.900 <i>d</i> 95.250	C236 C236 C238
HH221442 HH221447 HH221449	<i>d</i> 98.425 <i>d</i> 99.982 <i>d</i> 101.600	C238 C238 C240
HH224310 HH224335 HH224340	<i>D</i> 212.725 <i>d</i> 101.600 <i>d</i> 107.950	C240 C240 C240
HH224346 M224710 M224748	<i>d</i> 114.300 <i>D</i> 174.625 <i>d</i> 120.000	C240 C242 C242
LL225710 LL225749 HM231110	<i>D</i> 165.895 <i>d</i> 127.000 <i>D</i> 236.538	C242 C242 C242
HM231140 M236810 M236849	<i>d</i> 146.050 <i>D</i> 260.350 <i>d</i> 177.800	C242 C244 C244
LM300811 LM300849 L305610	<i>D</i> 68.000 <i>d</i> 41.000 <i>D</i> 80.962	C218 C218 C224
L305649 JH307710 JH307749	<i>d</i> 50.800 <i>D</i> 110.000 <i>d</i> 55.000	C224 C226 C226
JHM318410 JHM318448 L327210	<i>D</i> 155.000 <i>d</i> 90.000 <i>D</i> 177.008	C236 C236 C242
L327249 LM328410 LM328448	<i>d</i> 133.350 <i>D</i> 187.325 <i>d</i> 139.700	C242 C242 C242
H414210 H414245 H414249	<i>D</i> 136.525 <i>d</i> 68.262 <i>d</i> 71.438	C230, C232 C230 C232
JH415610 JH415647 LM501310	<i>D</i> 145.000 <i>d</i> 75.000 <i>D</i> 73.431	C232 C232 C218
LM501314 LM501349 LM503310	<i>D</i> 73.431 <i>d</i> 41.275 <i>D</i> 75.000	C218 C218 C222
LM503349 HH506310 HH506348	<i>d</i> 46.000 <i>D</i> 114.300 <i>d</i> 49.212	C222 C224 C224
JLM506810 JLM506849 JLM508710	<i>D</i> 90.000 <i>d</i> 55.000 <i>D</i> 95.000	C226 C226 C228
JLM508748 JM511910 JM511946	<i>d</i> 60.000 <i>D</i> 110.000 <i>d</i> 65.000	C228 C230 C230
JM515610 JM515649 HM516410	<i>D</i> 130.000 <i>d</i> 80.000 <i>D</i> 133.350	C234 C234 C234
HM516448 JHM516810 JHM516849	<i>d</i> 82.550 <i>D</i> 140.000 <i>d</i> 85.000	C234 C236 C236

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
HM518410 HM518445 LM522510	<i>D</i> 152.400 <i>d</i> 88.900 <i>D</i> 159.987	C236 C236 C240
LM522546 LM522548 LM522549	<i>d</i> 107.950 <i>d</i> 109.987 <i>d</i> 109.987	C240 C240 C240
JHM522610 JHM522649 JHM534110	<i>D</i> 180.000 <i>d</i> 110.000 <i>D</i> 230.000	C240 C240 C244
JHM534149 LM603011 LM603012	<i>d</i> 170.000 <i>D</i> 77.788 <i>D</i> 77.788	C244 C222 C222
LM603049 L610510 L610549	<i>d</i> 45.242 <i>D</i> 94.458 <i>d</i> 63.500	C222 C228 C228
JM612910 JM612949 LM613410	<i>D</i> 115.000 <i>d</i> 70.000 <i>D</i> 112.712	C232 C232 C230
LM613449 HM617010 HM617049	<i>d</i> 69.850 <i>D</i> 142.138 <i>d</i> 85.725	C230 C236 C236
L623110 L623149 JLM710910	<i>D</i> 152.400 <i>d</i> 114.300 <i>D</i> 105.000	C240 C240 C230
JLM710949 JLM714110 JLM714149	<i>d</i> 65.000 <i>D</i> 115.000 <i>d</i> 75.000	C230 C232 C232
JM714210 JM714249 H715311	<i>D</i> 120.000 <i>d</i> 75.000 <i>D</i> 136.525	C232 C232 C228, C230, C232
H715334 H715340 H715341	<i>d</i> 61.912 <i>d</i> 65.088 <i>d</i> 66.675	C228 C230 C230
H715343 H715345 JM716610	<i>d</i> 68.262 <i>d</i> 71.438 <i>D</i> 130.000	C230 C232 C236
JM716648 JM716649 JM718110	<i>d</i> 85.000 <i>d</i> 85.000 <i>D</i> 145.000	C236 C236 C236
JM718149 JM719113 JM719149	<i>d</i> 90.000 <i>D</i> 150.000 <i>d</i> 95.000	C236 C238 C238
JM720210 JHM720210 JM720249	<i>D</i> 155.000 <i>D</i> 160.000 <i>d</i> 100.000	C238 C238 C238
JHM720249 JL724314 JL724348	<i>d</i> 100.000 <i>D</i> 170.000 <i>d</i> 120.000	C238 C242 C242
JL725316 JL725346 JM734410	<i>D</i> 175.000 <i>d</i> 125.000 <i>D</i> 240.000	C242 C242 C244
JM734449 JM738210 JM738249	<i>d</i> 170.000 <i>D</i> 260.000 <i>d</i> 190.000	C244 C244 C244

Designation INNER RING, OUTER RING	Nominal Dimension (mm) d: I. R. (Bore Dia.) D: O. R. (Outside Dia.)	Pages
HM801310 HM801346 M802011	<i>D</i> 82.550 <i>d</i> 38.100 <i>D</i> 82.550	C218 C218 C220
M802048 HM803110 HM803145	<i>d</i> 41.275 <i>D</i> 88.900 <i>d</i> 41.275	C220 C220 C220
HM803146 HM803149 M804010	<i>d</i> 41.275 <i>d</i> 44.450 <i>D</i> 88.900	C220 C220 C222
M804049 HM804810 HM804840	<i>d</i> 47.625 <i>D</i> 95.250 <i>d</i> 41.275	C222 C220, C222, C224 C220
HM804843 HM804846 HM804848	<i>d</i> 44.450 <i>d</i> 47.625 <i>d</i> 48.412	C222 C222 C224
HM804849 HM807010 HM807011	<i>d</i> 48.412 <i>D</i> 104.775 <i>D</i> 104.775	C224 C222, C224 C224
JHM807012 HM807040 HM807044	<i>D</i> 105.000 <i>d</i> 44.450 <i>d</i> 49.212	C224 C222 C224
JHM807045 HM807046 JLM813010	<i>d</i> 50.000 <i>d</i> 50.800 <i>D</i> 110.000	C224 C224 C232
JLM813049 JLM820012 JLM820048	<i>d</i> 70.000 <i>D</i> 150.000 <i>d</i> 100.000	C232 C238 C238
JM822010 JM822049 JHM840410	<i>D</i> 165.000 <i>d</i> 110.000 <i>D</i> 300.000	C240 C240 C244
JHM840449 HM903210 HM903247	<i>d</i> 200.000 <i>D</i> 95.250 <i>d</i> 44.450	C244 C222 C222
HM903249 HM911210 HM911242	<i>d</i> 44.450 <i>D</i> 130.175 <i>d</i> 53.975	C222 C226 C226
H913810 H913842 H913849	<i>D</i> 146.050 <i>d</i> 61.912 <i>d</i> 69.850	C228, C230 C228 C230

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