



DESCRIPTION

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Washers

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USS WROUGHT WASHERS

Bolt Size Inches	Estimated Pieces per 100 Lbs	Approx. Lbs. per 1000 Pieces	Outside Diameter Inches	Size of Hole Inches	Thickness U.S. Plate Gauge
#10 (3/16)	36200	2.8	9/16	1/4	#18 (3/64)
1/4	14900	6.7	3/4	5/16	#16 (1/16)
5/16	9000	11.1	7/8	3/8	#14 (5/64)
3/8	6700	14.9	1	7/16	#14 (5/64)
7/16	4100	24.4	1-1/4	1/2	#14 (5/64)
1/2	2600	38.5	1-3/8	9/16	#14 (5/64)
9/16	2200	45.5	1-1/2	5/8	#12 (7/64)
5/8	1300	77.0	1-3/4	11/16	#10 (9/64)
3/4	910	110.0	2	13/16	#9 (5/32)
7/8	650	153.0	2-1/4	15/16	#8 (11/64)
1	530	188.0	2-1/2	1-1/16	#8 (11/64)
1-1/8	450	220.0	2-3/4	1-1/4	#8 (11/64)
1-1/4	380	260.0	3	1-3/8	#8 (11/64)
1-3/8	300	333.0	3-1/4	1-1/2	#7 (3/16)
1-1/2	260	385.0	3-1/2	1-5/8	#7 (3/16)
1-5/8	230	440.0	3-3/4	1-3/4	#7 (3/16)
1-3/4	200	500.0	4	1-7/8	#7 (3/16)
2	159	630.0	4-1/2	2-1/8	#7 (3/16)
2-1/4	121	826.0	4-3/4	2-3/8	#5 (7/32)
2-1/2	104	961	5	2-5/8	.210/.280
2-3/4	90	1100	5-1/4	2-7/8	.228/.310
3	86	1300	5-1/2	3-1/8	.249/.327

NOTE: For structural washers, please see the high-strength structural bolting section (Section 3).



**STAINLESS STEEL COMMERCIAL FLAT WASHERS
18-8 AND 316**

Bolt Size Inches	O.D. Inches	I.D. Inches	Thickness Inches
1/4	5/8	9/32	.050
5/16	3/4	11/32	.050
3/8	7/8	13/32	.050
1/2	1-1/4	17/32	.078
9/16	1-3/8	5/8	.093
5/8	1-1/2	11/16	.078
3/4	1-7/8	13/16	.125
7/8	2	15/16	.125
1	2	1-1/16	.125
1-1/8	2-1/2	1.1875	
1-1/4	2-3/4	1.3120	
1-1/2	3-1/4	1.5620	

**STAINLESS STEEL FLAT WASHERS
AN 960C**

Bolt Size Inches	AN Specification	O.D. Inches	I.D. Inches	Thickness Inches
No. 3	AN-960-C-3	.250	.109	1/32
No. 4	AN-960-C-4	.3125	.125	1/32
No. 6	AN-960-C-6	.375	.149	1/32
No. 8	AN-960-C-8	.375	.174	1/32
No. 10	AN-960-C-10L	.4375	.203	1/32
No. 10	AN-960-C-10	.4375	.203	1/16
1/4	AN-960-C-416L	.500	.265	1/32
1/4	AN-960-C-416	.500	.265	1/16
5/16	AN-960-C-516	.5625	.328	1/16
3/8	AN-960-C-616	.625	.390	1/16
7/16	AN-960-C-716	.750	.453	1/16
1/2	AN-960-C-816	.875	.516	1/16
9/16	AN-960-C-916	1.0625	.578	1/16
5/8	AN-960-C-1016	1.1875	.641	1/16
3/4	AN-960-C-1216	1.3125	.766	3/32
7/8	AN-960-C-1416	1.500	.890	3/32
1	AN-960-C-1616	1.750	1.016	3/32



**STAINLESS STEEL MS FLAT WASHERS
MS 15795**

Bolt Size	I.D. Inches	O.D. Inches	Thickness		MS Dash No.
			Max	Min	
0	.078	.187	.025	.016	-801
2	.093	.250	.025	.016	-802
4	.125	.250	.028	.017	-803
4	.125	.312	.040	.025	-804
6	.156	.312	.048	.027	-805
6	.156	.375	.065	.036	-806
8	.187	.375	.065	.036	-807
10	.218	.437	.065	.036	-808
10	.250	.562	.080	.051	-809
¼	.281	.625	.080	.051	-810
¼	.312	.750	.080	.051	-811
5/16	.343	.687	.080	.051	-812
5/16	.375	.875	.104	.064	-813
3/8	.406	.812	.080	.051	-814
3/8	.437	1.000	.104	.064	-815
7/16	.468	.921	.080	.051	-816
7/16	.500	1.250	1.04	.064	-817
½	.531	1.062	.121	.074	-818
½	.562	1.375	.132	.086	-819
5/8	.656	1.312	.121	.074	-820
5/8	.687	1.750	.160	.108	-821
¾	.812	1.500	.160	.108	-822
¾	.812	2.000	.177	.122	-823
7/8	.937	1.750	.160	.108	-824
7/8	.937	2.250	.192	.136	-825
1	1.062	2.000	.160	.108	-826
1	1.062	2.500	.192	.136	-827



S.A.E. WASHERS

O.D.	I.D.	Thickness Gauge	Size of Bolt	Est. Pcs. per 100 lbs.	Approx. Wt. per 1000
3/8	8/32	#18	#6 (1/8)	79000	1.26
7/16	3/16	#18	#8 (5/32)	58500	1.7
1/2	7/32	#18	#10 (3/16)	43500	2.3
9/16	1/2	#18	#12 (7/32)	36200	2.8
5/8	9/32	#16	1/4	22200	4.5
11/16	11/32	#16	5/16	19200	5.2
13/16	13/32	#16	3/8	14000	7.2
59/64	15/32	#16	7/16	10500	9.5
1-1/16	17/32	#13	1/2	5500	18.3
1-3/16	19/32	#13	9/16	4300	23.4
1-5/16	21/32	#13	5/8	3600	27.7
1-1/2	13/16	#10	3/4	2100	47.4
1-3/4	15/16	#10	7/8	1600	63.0
2"	1-1/16	#10	1"	1200	83.0
2-1/4	1-3/16	#10	1-1/8	920	109.0
2-1/2	1-5/16	#9	1-1/4	630	160.0
2-3/4	1-7/16	#9	1-3/8	525	190.0
3"	1-9/16	#9	1-1/2	425	240.0

BRASS WASHERS

Size of Mach. Screw or Bolt	Outside Diam.	Inside Diam.	Thickness B&S Gauge	Est. Pcs per lb.	Approx. Wt. per 1000
Small Pattern					
No. 0	7/32	.070	.015 (#26)	6670	.15
No. 1	7/32	.083	.018 (#25)	5555	.18
No. 2	7/32	.093	.020 (#24)	5200	.19
No. 3	1/4	.110	.020 (#24)	4200	.24
No. 4	9/32	.125	.025 (#22)	2700	.37
No. 6	5/16	.147	.028 (#21)	1920	.52
No. 8	3/8	.172	.032 (#20)	1190	.84
No. 10	7/16	.200	.036 (#19)	760	1.3
No. 12	1/2	.228	.040 (#18)	525	1.9
No. 14	9/16	.264	.040 (#18)	425	2.36
No. 16	5/8	.283	.040 (#18)	340	3.0
No. 18	11/16	.312	.051 (#16)	230	4.35
No. 20	3/4	.343	.064 (#14)	150	6.7
No. 24	7/8	.393	.064 (#14)	110	9.1
Large Pattern					
No. 6	3/8	.150	.032 (#20)	1100	.91
No. 8	7/16	.172	.036 (#19)	720	1.39
No. 10	1/2	.200	.040 (#18)	490	2.05
No. 12	9/16	.228	.040 (#18)	390	2.57
No. 14	11/16	.264	.051 (#16)	202	4.95
No. 16	3/4	.283	.064 (#14)	135	7.4
No. 18	7/8	.312	.064 (#14)	100	10.0
No. 20	7/8	.343	.064 (#14)	107	9.35
No. 24	1"	.393	.081 (#12)	62	16.1



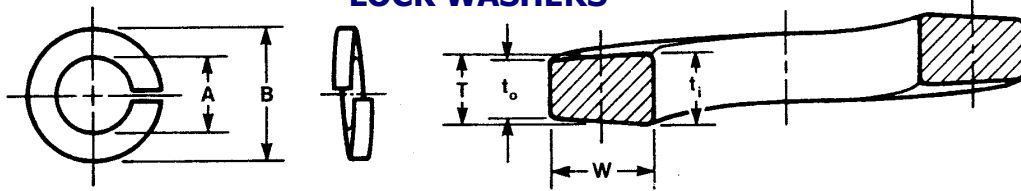
BRASS WASHERS (continued)

Size of Mach. Screw or Bolt	Outside Diam.	Inside Diam.	Thickness B&S Gauge	Est. Pcs per lb.	Approx. Wt. per 1000
Bolt Sizes					
1/8	1/4	.144	.025 (#22)	4000	.25
3/16	1/2	.200	.040 (#18)	490	2.05
1/4	11/16	.264	.051 (#16)	202	4.95
5/16	7/8	.343	.064 (#14)	107	9.35
3/8	1"	.393	.081 (#12)	62	16.1
7/16	1-1/8	.500	.081 (#12)	50	20.0
1/2	1-1/4	.562	.089 (#11)	34	29.0
5/8	1-1/2	.687	.102 (#10)	25	40.0
3/4	1-7/8	.812	.114 (#9)	12	83.0
7/8	2-1/4	.937	.128 (#8)	8	125.0
1"	2-1/2	1.062	.144 (#7)	5.75	125.0
1-1/8	2-3/4	1.187	.162 (#6)	4.15	240.0
1-1/4	3"	1.375	.162 (#6)	3.7	270.0

BEVELED WASHERS

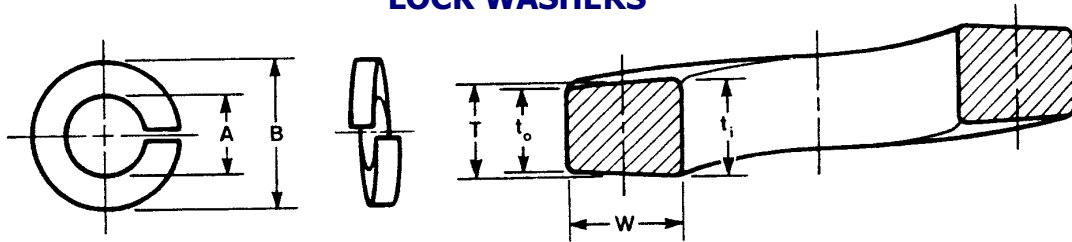
Size of Bolt	Size of Washer	Thickness		Approx. Wt. per 100 Pcs.
		Heavy End	Light End	
3/8	1-1/4 x 1-1/4	11/32	5/32	8.8
1/2	1-1/4 x 1-1/4	11/32	5/32	8.1
5/8	1-1/2 x 1-1/2	13/32	7/32	13
3/4	1-1/2 x 1-1/2	15/32	7/32	14.3
7/8	2 x 2	9/16	7/32	32
1	2 x 2	9/16	7/32	32

REGULAR HELICAL SPRING LOCK WASHERS



Nominal Washer Size		A		B	T	W
		Inside Diameter		Outside Diameter	Mean Section Thickness $\frac{(t_i + t_o)}{2}$	Section Width
		Max	Min	Max ²	Min	Min
No. 2	0.086	0.094	0.088	0.172	0.020	0.035
No. 3	0.099	0.107	0.101	0.195	0.025	0.040
No. 4	0.112	0.120	0.114	0.209	0.025	0.040
No. 5	0.125	0.133	0.127	0.236	0.031	0.047
No. 6	0.138	0.148	0.141	0.250	0.031	0.047
No. 8	0.164	0.174	0.167	0.293	0.040	0.055
No. 10	0.190	0.200	0.193	0.334	0.047	0.062
No. 12	0.216	0.227	0.220	0.377	0.056	0.070
1/4	0.250	0.262	0.254	0.489	0.062	0.109
5/16	0.312	0.326	0.317	0.586	0.078	0.125
3/8	0.375	0.390	0.380	0.683	0.094	0.141
7/16	0.438	0.455	0.443	0.779	0.109	0.156
1/2	0.500	0.518	0.506	0.873	0.125	0.171
9/16	0.562	0.582	0.570	0.971	0.141	0.188
5/8	0.625	0.650	0.635	1.079	0.156	0.203
11/16	0.688	0.713	0.698	1.176	0.172	0.219
3/4	0.750	0.775	0.760	1.271	0.188	0.234
13/16	0.812	0.843	0.824	1.367	0.203	0.250
7/8	0.875	0.905	0.887	1.464	0.219	0.266
15/16	0.938	0.970	0.950	1.560	0.234	0.281
1	1.000	1.042	1.017	1.661	0.250	0.297
1-1/16	1.062	1.107	1.080	1.756	0.266	0.312
1-1/8	1.125	1.172	1.144	1.853	0.281	0.328
1-3/16	1.188	1.237	1.208	1.950	0.297	0.344
1-1/4	1.250	1.302	1.271	2.045	0.312	0.359
1-5/16	1.312	1.366	1.334	2.141	0.328	0.375
1-3/8	1.375	1.432	1.398	2.239	0.344	0.391
1-7/16	1.438	1.497	1.462	2.334	0.359	0.406
1-1/2	1.500	1.561	1.525	2.430	0.375	0.422

HEAVY HELICAL SPRING LOCK WASHERS

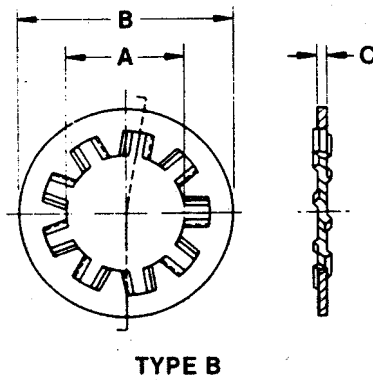
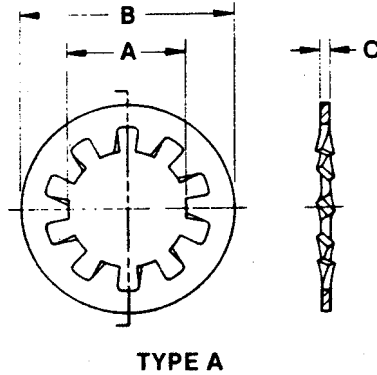


Nominal Washer Size		A		B	T	W
		Inside Diameter		Outside Diameter	Mean Section Thickness $\frac{(t_i + t_o)}{2}$	Section Width
		Max	Min	Max ²	Min	Min
No. 2	0.086	0.094	0.088	0.182	0.025	0.040
No. 3	0.099	0.107	0.101	0.209	0.031	0.047
No. 4	0.112	0.120	0.114	0.223	0.031	0.047
No. 5	0.125	0.133	0.127	0.252	0.040	0.055
No. 6	0.138	0.148	0.141	0.266	0.040	0.055
No. 8	0.164	0.174	0.167	0.307	0.047	0.062
No. 10	0.190	0.200	0.193	0.350	0.056	0.070
No. 12	0.216	0.227	0.220	0.391	0.063	0.077
1/4	0.250	0.262	0.254	0.491	0.077	0.110
5/16	0.312	0.326	0.317	0.596	0.097	0.130
3/8	0.375	0.390	0.380	0.691	0.115	0.145
7/16	0.438	0.455	0.443	0.787	0.133	0.160
1/2	0.500	0.518	0.506	0.883	0.151	0.176
9/16	0.562	0.582	0.570	0.981	0.170	0.193
5/8	0.625	0.650	0.635	1.093	0.189	0.210
11/16	0.688	0.713	0.698	1.192	0.207	0.227
3/4	0.750	0.775	0.760	1.291	0.226	0.244
13/16	0.812	0.843	0.824	1.391	0.246	0.262
7/8	0.875	0.905	0.887	1.494	0.266	0.281
15/16	0.938	0.970	0.950	1.594	0.284	0.298
1	1.000	1.042	1.017	1.705	0.306	0.319
1-1/16	1.062	1.107	1.080	1.808	0.326	0.338
1-1/8	1.125	1.172	1.144	1.909	0.375	0.356
1-3/16	1.188	1.237	1.208	2.008	0.364	0.373
1-1/4	1.250	1.302	1.271	2.113	0.384	0.393
1-5/16	1.312	1.366	1.334	2.211	0.403	0.410
1-3/8	1.375	1.432	1.398	2.311	0.422	0.427
1-7/16	1.438	1.497	1.462	2.406	0.440	0.442
1-1/2	1.500	1.561	1.525	2.502	0.458	0.458

INTERNAL TOOTH LOCK WASHERS

Dimensions of Internal Tooth Lock Washers

Nominal Washer Size		A		B		C	
		Inside Diameter		Outside Diameter		Thickness	
		Max	Min	Max	Min	Max	Min
No. 2	0.086	0.095	0.089	0.200	0.175	0.015	0.010
No. 3	0.099	0.109	0.102	0.232	0.215	0.019	0.012
No. 4	0.112	0.123	0.115	0.270	0.255	0.019	0.015
No. 5	0.125	0.136	0.129	0.280	0.245	0.021	0.017
No. 6	0.138	0.150	0.141	0.295	0.275	0.021	0.017
No. 8	0.164	0.176	0.168	0.340	0.325	0.023	0.018
No. 10	0.190	0.204	0.195	0.381	0.365	0.025	0.020
No. 12	0.216	0.231	0.221	0.410	0.394	0.025	0.020
1/4	0.250	0.267	0.256	0.478	0.460	0.028	0.023
5/16	0.312	0.332	0.320	0.610	0.594	0.034	0.028
3/8	0.375	0.398	0.384	0.692	0.670	0.040	0.032
7/16	0.438	0.464	0.448	0.789	0.740	0.040	0.032
1/2	0.500	0.530	0.512	0.900	0.867	0.045	0.037
9/16	0.562	0.596	0.576	0.985	0.957	0.045	0.037
5/8	0.625	0.663	0.640	1.071	1.045	0.050	0.042
11/16	0.688	0.728	0.704	1.166	1.130	0.050	0.042
3/4	0.750	0.795	0.769	1.245	1.220	0.055	0.047
13/16	0.812	0.861	0.832	1.315	1.290	0.055	0.047
7/8	0.875	0.928	0.894	1.410	1.364	0.060	0.052
1	1.000	1.060	1.019	1.637	1.590	0.067	0.059
1-1/8	1.125	1.192	1.144	1.830	1.799	0.067	0.059
1-1/4	1.250	1.325	1.275	1.975	1.921	0.067	0.059



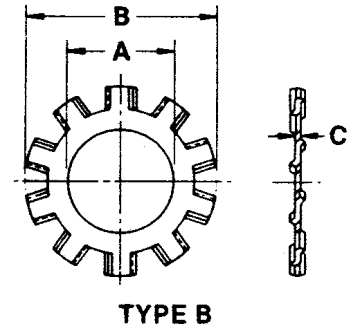
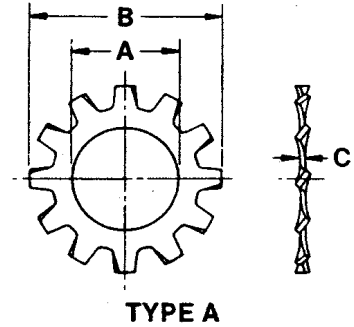
Dimensions of Heavy Internal Tooth Lock Washers

Nominal Washer Size		A		B		C	
		Inside Diameter		Outside Diameter		Thickness	
		Max	Min	Max	Min	Max	Min
1/4	0.250	0.267	0.256	0.536	0.500	0.045	0.035
5/16	0.312	0.332	0.320	0.607	0.590	0.050	0.040
3/8	0.375	0.398	0.384	0.748	0.700	0.050	0.042
7/16	0.438	0.464	0.448	0.858	0.800	0.067	0.050
1/2	0.500	0.530	0.512	0.924	0.880	0.067	0.055
9/16	0.562	0.596	0.576	1.034	0.990	0.067	0.055
5/8	0.625	0.663	0.640	1.135	1.100	0.067	0.059
3/4	0.750	0.795	0.768	1.265	1.240	0.084	0.070
7/8	0.875	0.927	0.894	1.447	1.400	0.084	0.075

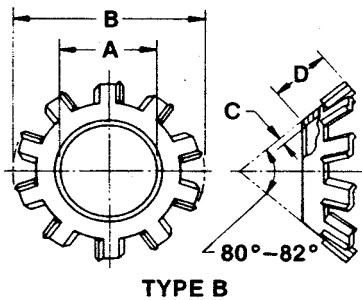
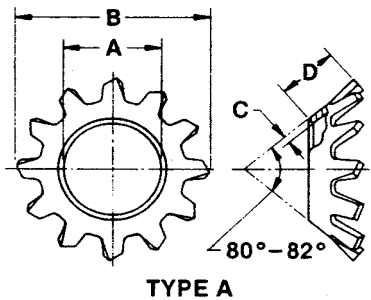
EXTERNAL TOOTH LOCK WASHERS

Dimensions of External Tooth Lock Washers

Nominal Washer Size	A		B		C		
	Inside Diameter		Outside Diameter		Thickness		
	Max	Min	Max	Min	Max	Min	
No. 3	0.099	0.109	0.102	0.235	0.220	0.015	0.012
No. 4	0.112	0.123	0.115	0.260	0.245	0.019	0.015
No. 5	0.125	0.136	0.129	0.285	0.270	0.019	0.014
No. 6	0.138	0.150	0.141	0.320	0.305	0.022	0.016
No. 8	0.164	0.176	0.168	0.381	0.365	0.023	0.018
No. 10	0.190	0.204	0.195	0.410	0.395	0.025	0.020
No. 12	0.216	0.231	0.221	0.475	0.460	0.028	0.023
1/4	0.250	0.267	0.256	0.510	0.494	0.028	0.023
5/16	0.312	0.332	0.320	0.610	0.588	0.034	0.028
3/8	0.375	0.398	0.384	0.694	0.670	0.040	0.032
7/16	0.438	0.464	0.448	0.760	0.740	0.040	0.032
1/2	0.500	0.530	0.513	0.900	0.880	0.045	0.037
9/16	0.562	0.596	0.576	0.985	0.960	0.045	0.037
5/8	0.625	0.663	0.641	1.070	1.045	0.050	0.042
11/16	0.688	0.728	0.704	1.155	1.130	0.050	0.042
3/4	0.750	0.795	0.768	1.260	1.220	0.055	0.047
13/16	0.812	0.861	0.833	1.315	1.290	0.055	0.047
7/8	0.875	0.927	0.897	1.410	1.380	0.060	0.052
1	1.000	1.060	1.025	1.620	1.590	0.067	0.059

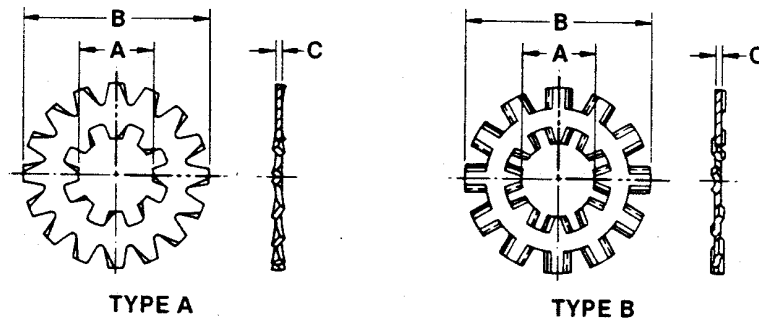


Dimensions of Countersunk External Tooth Lock Washers



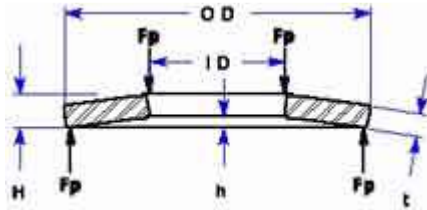
Nominal Washer Size	A		B ¹	C		D	
	Inside Diameter		Outside Diameter	Thickness		Length	
	Max	Min	Approx	Max	Min	Max	Min
No. 4	0.112	0.123	0.113	0.019	0.015	0.065	0.050
No. 6	0.138	0.150	0.140	0.021	0.017	0.092	0.082
No. 8	0.164	0.177	0.167	0.021	0.017	0.105	0.088
No. 10	0.190	0.205	0.195	0.025	0.020	0.099	0.083
No. 12	0.216	0.231	0.220	0.025	0.020	0.128	0.118
1/4	0.250	0.267	0.255	0.025	0.020	0.128	0.113
No. 16	0.268	0.287	0.273	0.028	0.023	0.147	0.137
5/16	0.312	0.333	0.318	0.028	0.023	0.192	0.165
3/8	0.375	0.398	0.383	0.034	0.028	0.255	0.242
7/16	0.438	0.463	0.448	0.045	0.037	0.270	0.260
1/2	0.500	0.529	0.512	0.045	0.037	0.304	0.294

INTERNAL-EXTERNAL TOOTH LOCK WASHERS



Nominal Washer Size	A		B		C		Nominal Washer Size	A		B		C	
	Inside Diameter		Outside Diameter		Thickness			Inside Diameter		Outside Diameter		Thickness	
	Max	Min	Max	Min	Max	Min		Max	Min	Max	Min	Max	Min
No. 4 0.112	0.123	0.115	0.475	0.460	0.021	0.016	5/16 0.312	0.332	0.320	0.900	0.865	0.040	0.032
			0.510	0.495	0.021	0.017				0.985	0.965	0.045	0.037
			0.610	0.580	0.021	0.017				1.070	1.045	0.050	0.042
										1.155	1.130	0.050	0.042
No. 6 0.138	0.150	0.141	0.510	0.495	0.028	0.023	3/8 0.375	0.398	0.384	0.985	0.965	0.045	0.037
			0.610	0.580	0.028	0.023				1.070	1.045	0.050	0.042
			0.690	0.670	0.028	0.023				1.155	1.130	0.050	0.042
										1.260	1.220	0.050	0.042
No. 8 0.164	0.176	0.168	0.610	0.580	0.034	0.028	7/16 0.438	0.464	0.448	1.070	1.045	0.050	0.042
			0.690	0.670	0.034	0.028				1.155	1.030	0.050	0.042
			0.760	0.740	0.034	0.028				1.260	1.220	0.055	0.047
										1.315	1.290	0.055	0.047
No. 10 0.190	0.204	0.195	0.610	0.580	0.034	0.028	1/2 0.500	0.530	0.512	1.260	1.220	0.055	0.047
			0.690	0.670	0.040	0.032				1.315	1.290	0.055	0.047
			0.760	0.740	0.040	0.032				1.410	1.380	0.060	0.052
			0.900	0.880	0.040	0.032				1.620	1.590	0.067	0.059
No. 12 0.216	0.231	0.221	0.690	0.670	0.040	0.032	9/16 0.562	0.596	0.576	1.315	1.290	0.055	0.047
			0.760	0.725	0.040	0.032				1.430	1.380	0.060	0.052
			0.900	0.880	0.040	0.032				1.620	1.590	0.067	0.059
			0.985	0.965	0.045	0.037				1.830	1.797	0.067	0.059
1/4 0.250	0.267	0.256	0.760	0.725	0.040	0.032	5/8 0.625	0.663	0.640	1.410	1.380	0.060	0.052
			0.900	0.880	0.040	0.032				1.620	1.590	0.067	0.059
			0.985	0.965	0.045	0.037				1.830	1.797	0.067	0.059
			1.070	1.045	0.045	0.037				1.975	1.935	0.067	0.059

BELLEVILLE WASHERS



OD Outside Diameter
 t Thickness
 h Deflection
 H Overall Height
 H Rounded Edges
 Fp Edges

Belleville Washer Materials: 6150 High Carbon Alloy Steel, 17-7 PH Stainless Steel, 301 Stainless Steel, Inconel 718, Phosphor Bronze, H-13 Tool Steel

Belleville Washers

This information reprinted from the Manufacturer, Solon Manufacturing.

Bolt Size	Part #	ID	OD	Thickness	Overall Height	Deflection	Load (100%)	APW per 1000 PCs
#10	010H42	0.196"	0.563"	0.043"	0.072"	0.014"	800.0lbs	2.70lbs
1/4	4L42	0.258"	0.563"	0.043"	0.068"	0.012"	870.0lbs	2.40lbs
1/4	4M52	0.258"	0.688"	0.053"	0.089"	0.016"	1200.0lbs	4.80lbs
1/4	4H61	0.258"	0.813"	0.063"	0.083"	0.021"	1600.0lbs	8.30lbs
1/4	4EH70	0.258"	0.938"	0.072"	0.097"	0.025"	2000.0lbs	13.00lbs
5/16	51032	0.317"	0.630"	0.032"	0.053"	0.016"	400.0lbs	2.00lbs
5/16	5L52	0.322"	0.688"	0.053"	0.085"	0.014"	1300.0lbs	4.40lbs
5/16	5M61	0.322"	0.813"	0.063"	0.081"	0.019"	1800.0lbs	7.40lbs
5/16	5H70	0.322"	0.938"	0.072"	0.095"	0.023"	2300.0lbs	12.40lbs
5/16	5EH80	0.322"	1.063"	0.082"	0.110"	0.028"	2800.0lbs	18.70lbs
3/8	61042	0.380"	0.640"	0.043"	0.067"	0.011"	850.0lbs	2.30lbs
3/8	6S33	0.380"	0.730"	0.035"	0.046"	0.018"	500.0lbs	2.80lbs
3/8	61240	0.380"	0.755"	0.043"	0.065"	0.018"	800.0lbs	3.80lbs
3/8	61232	0.382"	0.750"	0.032"	0.055"	0.023"	246.0lbs	2.97lbs
3/8	6L61	0.386"	0.813"	0.063"	0.078"	0.016"	1800.0lbs	7.10lbs
3/8	614112	0.386"	0.875"	0.115"	0.136"	0.012"	6500.0lbs	14.10lbs
7/16	71445	0.442"	0.880"	0.045"	0.067"	0.022"	800.0lbs	5.70lbs
7/16	7L70	0.450"	0.938"	0.072"	0.091"	0.019"	2400.0lbs	10.80lbs
7/16	7M80	0.450"	1.063"	0.082"	0.105"	0.023"	3100.0lbs	16.90lbs
7/16	7H42	0.450"	1.188"	0.043"	0.132"	0.045"	640.0lbs	11.60lbs
7/16	7H89	0.450"	1.188"	0.091"	0.119"	0.028"	3700.0lbs	24.50lbs
1/2	81680	0.505"	1.000"	0.082"	0.100"	0.018"	3200.0lbs	12.30lbs
1/2	81650	0.505"	1.005"	0.050"	0.076"	0.020"	550.0lbs	8.20lbs
1/2	81628	0.505"	1.010"	0.028"	0.060"	0.036"	250.0lbs	4.59lbs
1/2	81635	0.505"	1.010"	0.035"	0.070"	0.032"	450.0lbs	5.90lbs
1/2	820131	0.512"	1.259"	0.134"	0.172"	0.020"	7500.0lbs	36.80lbs
1/2	8L42	0.515"	1.063"	0.043"	0.086"	0.033"	500.0lbs	8.30lbs
1/2	8L80	0.515"	1.063"	0.082"	0.103"	0.021"	3200.0lbs	15.80lbs
1/2	818125	0.515"	1.125"	0.125"	0.142"	0.017"	7700.0lbs	28.50lbs
1/2	8M89	0.515"	1.188"	0.091"	0.117"	0.026"	3800.0lbs	23.20lbs
1/2	82062	0.515"	1.250"	0.065"	0.144"	0.036"	1880.0lbs	19.32lbs
1/2	8H98	0.515"	1.313"	0.101"	0.131"	0.030"	4600.0lbs	32.60lbs
1/2	8H112	0.515"	1.313"	0.115"	0.142"	0.027"	6200.0lbs	37.30lbs
1/2	8EH112	0.515"	1.500"	0.115"	0.152"	0.037"	6000.0lbs	50.70lbs
1/2	828131	0.515"	1.750"	0.134"	0.180"	0.046"	7400.0lbs	83.30lbs
9/16	9L89	0.579"	1.188"	0.091"	0.114"	0.023"	4000.0lbs	21.80lbs
9/16	9M98	0.579"	1.313"	0.101"	0.129"	0.028"	4700.0lbs	31.00lbs
9/16	9H112	0.579"	1.500"	0.115"	0.150"	0.035"	6000.0lbs	48.90lbs



Belleville Washers (continued)

Bolt Size	Part #	ID	OD	Thickness	Overall Height	Deflection	Load (100%)	APW per 1000 PCS
5/8	101860	0.625"	1.125"	0.063"	0.090"	0.025"	1200.0lbs	11.30lbs
5/8	10L98	0.644"	1.313"	0.101"	0.127"	0.026"	4800.0lbs	29.20lbs
5/8	10M112	0.644"	1.500"	0.115"	0.147"	0.032"	6100.0lbs	44.33lbs
5/8	10H131	0.644"	1.750"	0.134"	0.176"	0.042"	8100.0lbs	78.90lbs
5/8	10EH150	0.644"	2.000"	0.154"	0.205"	0.051"	10200.0lbs	122.30lbs
3/4	12L60	0.773"	1.500"	0.063"	0.105"	0.043"	1100.0lbs	22.77lbs
3/4	12L72	0.773"	1.500"	0.072"	0.111"	0.039"	1600.0lbs	26.40lbs
3/4	12L112	0.773"	1.500"	0.115"	0.143"	0.028"	6200.0lbs	39.03lbs
3/4	12M131	0.773"	1.750"	0.134"	0.171"	0.037"	8300.0lbs	73.40lbs
3/4	12H150	0.773"	2.000"	0.154"	0.200"	0.046"	10800.0lbs	116.00lbs
3/4	12EH168	0.773"	2.250"	0.172"	0.228"	0.056"	13000.0lbs	170.70lbs
7/8	14L131	0.901"	1.750"	0.134"	0.167"	0.033"	8500.0lbs	67.00lbs
7/8	14M150	0.901"	2.000"	0.154"	0.196"	0.042"	11100.0lbs	108.80lbs
7/8	14H168	0.901"	2.250"	0.172"	0.223"	0.051"	13600.0lbs	162.50lbs
1	163284	1.005"	2.005"	0.082"	0.141"	0.059"	2600.0lbs	54.90lbs
1	1632131	1.020"	2.000"	0.134"	0.175"	0.041"	8200.0lbs	87.50lbs
1	16L150	1.030"	2.000"	0.154"	0.191"	0.037"	11200.0lbs	100.30lbs
1	16M168	1.030"	2.250"	0.172"	0.219"	0.047"	13800.0lbs	153.00lbs
1	16H187	1.030"	2.500"	0.192"	0.248"	0.056"	17000.0lbs	220.90lbs
1 1/8	18L168	1.155"	2.250"	0.172"	0.214"	0.042"	14000.0lbs	142.50lbs
1 1/8	18M187	1.155"	2.500"	0.192"	0.243"	0.051"	17300.0lbs	209.30lbs
1 1/8	18H206	1.155"	2.750"	0.211"	0.271"	0.060"	20600.0lbs	273.49lbs
1 1/4	204098	1.245"	2.505"	0.101"	0.174"	0.076"	3600.0lbs	101.00lbs
1 1/4	20L187	1.280"	2.500"	0.192"	0.239"	0.047"	17400.0lbs	182.50lbs
1 1/4	20M206	1.280"	2.750"	0.211"	0.267"	0.056"	20900.0lbs	279.00lbs
1 1/4	20H225	1.280"	3.000"	0.231"	0.296"	0.065"	24800.0lbs	378.00lbs
1 3/8	22L206	1.405"	2.750"	0.211"	0.263"	0.052"	21000.0lbs	263.00lbs
1 3/8	22M225	1.405"	3.000"	0.231"	0.292"	0.061"	25000.0lbs	360.00lbs
1 3/8	22H244	1.405"	3.250"	0.250"	0.320"	0.070"	29000.0lbs	479.00lbs
1 1/2	24L225	1.530"	3.000"	0.231"	0.287"	0.056"	25200.0lbs	310.00lbs
1 1/2	24M244	1.530"	3.250"	0.250"	0.315"	0.065"	29400.0lbs	458.00lbs
1 1/2	24H262	1.530"	3.500"	0.262"	0.338"	0.076"	32000.0lbs	591.00lbs
1 5/8	26L244	1.650"	3.250"	0.250"	0.311"	0.061"	29500.0lbs	415.40lbs
1 5/8	26M262	1.650"	3.500"	0.262"	0.334"	0.072"	32100.0lbs	516.10lbs
1 5/8	26H281	1.650"	3.750"	0.281"	0.362"	0.081"	36700.0lbs	697.10lbs
1 3/4	28L262	1.780"	3.500"	0.262"	0.329"	0.067"	32200.0lbs	516.00lbs
1 3/4	28M281	1.780"	3.750"	0.281"	0.358"	0.077"	37000.0lbs	-
1 3/4	28H300	1.780"	4.000"	0.300"	0.386"	0.086"	41900.0lbs	834.60lbs
1 7/8	30L281	1.910"	3.750"	0.281"	0.353"	0.072"	37100.0lbs	-
1 7/8	30M300	1.910"	4.000"	0.300"	0.381"	0.081"	42100.0lbs	-
1 7/8	30H318	1.910"	4.250"	0.318"	0.409"	0.091"	47100.0lbs	471.50lbs
2	32L300	2.063"	4.000"	0.300"	0.376"	0.076"	42300.0lbs	715.00lbs
2 1/4	36L318	2.281"	4.250"	0.318"	0.400"	0.077"	48000.0lbs	846.00lbs
2 1/4	36M356	2.281"	4.750"	0.356"	0.462"	0.096"	59000.0lbs	0.00lbs
2 1/2	40L356	2.531"	4.750"	0.356"	0.452"	0.087"	59600.0lbs	0.00lbs