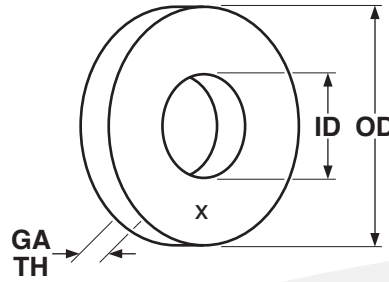


# Washers

# USS Flat

Low Carbon Steel /  
18-8 Stainless /  
316 Stainless



USS LOW CARBON & STAINLESS WASHERS										ASME B18.21.1-2009
Bolt Size	Outside Diameter			Inside Diameter			Thickness			Approximate Number of STEEL washers per 50 Pounds
	Nominal	Max	Min	Nominal	Max	Min	American Standard (Gauge)	Max	Min	
3/16	9/16	0.577	0.557	1/4	0.265	0.245	18 (3/64)	.065	.036	18050
1/4	3/4	0.749	0.727	5/16	0.327	0.307	16 (1/16)	.080	.051	7450
5/16	7/8	0.905	0.868	3/8	0.390	0.370	14 (5/64)	.104	.064	4350
3/8	1	1.030	0.993	7/16	0.453	0.433	14 (5/64)	.104	.064	3350
7/16	1-1/4	1.280	1.243	1/2	0.515	0.495	14 (5/64)	.104	.064	2050
1/2	1-3/8	1.405	1.368	9/16	0.577	0.557	12 (7/64)	.132	.086	1300
9/16	1-1/2	1.499	1.462	5/8	0.640	0.620	21 (7/64)	.132	.086	1100
5/8	1-3/4	1.780	1.743	11/16	0.718	0.681	10 (9/64)	.160	.108	650
3/4	2	2.030	1.993	13/16	0.842	0.805	9 (5/32)	.177	.122	455
7/8	2-1/4	2.280	2.243	15/16	0.968	0.931	8 (11/64)	.192	.136	325
1	2-1/2	2.530	2.493	1-1/16	1.092	1.055	8 (11/64)	.192	.136	265
1-1/8	2-3/4	2.780	2.743	1-1/4	1.280	1.243	8 (11/64)	.192	.136	225
1-1/4	3	3.030	2.993	1-3/8	1.405	1.368	8 (11/64)	.192	.136	190
1-3/8	3-1/4	3.295	3.240	1-1/2	1.545	1.490	7 (3/16)	.213	.153	150
1-1/2	3-1/2	3.545	3.490	1-5/8	1.670	1.615	7 (3/16)	.213	.153	130
1-5/8	3-3/4	3.795	3.740	1-3/4	1.795	1.740	7 (3/16)	.213	.153	115
1-3/4	4	4.045	3.990	1-7/8	1.920	1.865	7 (3/16)	.213	.153	100
1-7/8	4-1/4	4.295	4.240	2	2.045	1.990	7 (3/16)	.213	.153	90
2	4-1/2	4.545	4.490	2-1/8	2.170	2.115	7 (3/16)	.213	.153	79
2-1/4	4-3/4	4.795	4.740	2-3/8	2.420	2.365	5 (7/32)	.248	.193	60
2-1/2	5	5.045	4.990	2-5/8	2.670	2.615	4 (15/64)	.280	.210	52
2-3/4	5-1/4	5.315	5.240	2-7/8	2.940	2.865	3 (1/4)	.310	.228	45
3	5-1/2	5.565	5.490	3-1/8	3.190	3.115	2 (5/32)	.327	.249	43

<b>Description</b>	A thin, flat, circular metal part with a centrally located hole.		
<b>Applications/ Advantages</b>	Washers are designed for assembly around a bolt or screw, between the bearing surface of the fastener and the part to which it is attached. Flat washers are used to improve stress distribution, and to span large clearance holes. USS washers are designed to meet the majority of industrial applications in manufacturing, maintenance and repair.		
<b>Material</b>	<b>Steel</b>		<b>Stainless</b>
	Plain washers shall be punched from hot-rolled, hot-rolled and pickled, or cold-rolled steel, or shall be machined from bar stock or tubing, or may be forged at the manufacturer's option.		18-8 Stainless      316 Stainless
<b>Plating</b>	See Appendix-A for information about the plating of low carbon flat washers.		Stainless USS flat washers are typically furnished plain or with a black oxide finish.