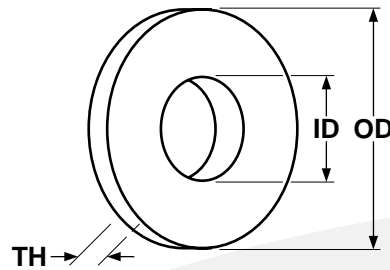


# Washers

# METRIC

# Standard Flat Washers



METRIC - STANDARD FLAT WASHERS (NORMAL SERIES, GRADE A)							ISO 7089
Nominal Size	ID		OD		T		
	Internal Diameter		Outside Diameter		Thickness		
	Max	Min	Max	Min	Max	Min	
1.6	1.84	1.7	4	3.7	0.35	0.25	
2	2.34	2.2	5	4.7	0.35	0.25	
2.5	2.84	2.7	6	5.7	0.55	0.45	
3	3.38	3.2	7	6.64	0.55	0.45	
3.5	3.88	3.7	8	7.64	0.55	0.45	
4	4.48	4.3	9	8.64	0.9	0.7	
5	5.48	5.3	10	9.64	1.1	0.9	
6	6.62	6.4	12	11.57	1.8	1.4	
8	8.62	8.4	16	15.57	1.8	1.4	
10	10.77	10.5	20	19.48	2.2	1.8	
12	13.27	13	24	23.48	2.7	2.3	
14	15.27	15	28	27.48	2.7	2.3	
16	17.27	17	30	29.48	3.3	2.7	
20	21.33	21	37	36.38	3.3	2.7	
24	25.33	25	44	43.38	4.3	3.7	
30	31.39	31	56	55.26	4.3	3.7	
36	37.62	37	66	64.8	5.6	4.4	

	Steel	Stainless
<b>Description</b>	A thin, flat circular part with a centrally located hole. Class 300 HV washers are also hardened and tempered.	
<b>Applications/ Advantages</b>	<p>Washers are 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.</p> <p><u>Class 140 HV &amp; Class 200 HV</u> metric washers meet the majority of industrial applications in manufacturing, maintenance and repair.</p> <p><u>Class 300 HV</u> metric washers are best suited for use with through-hardened cap-screws, bolts and nuts.</p>	<p>Washers are 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.</p> <p><u>Stainless washers</u> are for use with austenitic stainless steel screws and nuts in general industrial applications where parts are subject to corrosion.</p>
<b>Material</b>	Low or medium carbon steel	Austenitic stainless steel
<b>Hardness</b>	<p><u>Class 140 HV</u>: HV 140 minimum (Rockwell B 75 minimum)</p> <p><u>Class 200 HV</u>: HV 200-300 (Rockwell B 91.5 - C 29.8)</p> <p><u>Class 300 HV</u>: HV 300-400 (Rockwell C 29.8 - 40.8)</p>	<p><u>Class A 140</u>: HV 140 minimum (Rockwell B 75 minimum)</p> <p><u>Class A 200</u>: HV 200-300 (Rockwell B 91.5 - C 29.8)</p> <p><u>Class A 350</u>: HV 350-400 (Rockwell C 35.5 - 40.8)</p>
<b>Plating</b>	See Appendix-A for information about the plating of flat washers.	