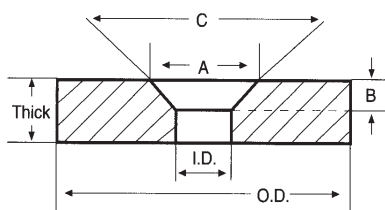


HIGH STRENGTH-HEAT TREATED, PLAIN AND COUNTERSUNK WASHERS



MS 20002 - This specification replaced specification NAS 143 in 1954 and includes washers made from 4130 Chrome Molybdenum Steel. They are available with both flat and a 45° counter-sink, heat treated and

plated. They are primarily for use with 160,000 psi bolts.

MS 17811 - these are case hardened 1020 steel thrust washers, available in 23 sizes from WCL. They are designed primarily for supporting end load thrust bearings. Call for information.

MS 21206 - Washers available in this series are both plain and countersunk, made from Alloy Steel, heat treated and plated. They are normally used with MS21134 and MA 21297 bolts and with MS 21133 and MS 21804 nuts.

MS 9320 - Washers are made from AMS 6350 Corrosion Resistant Steel with Diffused Cadmium Nickel Plate.

NAS 1587 - Available both flat and with a 45° countersunk, these washers are made from Corrosive Resistant Steel with 75,000 psi, UTS min.

10910174 Ordnance Washers - This specification covers 46 various sizes of washers made from Alloy Steel, heat treated and Cadmium Plated for military use. All are stocked by WCL. These washers also account for many commercial applications.

Available but not listed - The following Double Countersunk 45° MS Series washers are available from WCL, but space limitations prevent their listing: MS 9482, MS 9768, MS 14155, and MS 14177. Also available but not shown are countersunk washers with 100° angles and other special configurations.

Many other sizes of unlisted hardened washers are also in stock. If not listed here, call WCL to check availability and get samples and a quotation.

Screw/Bolt Size	Nominal Dimensions			Countersunk Dimensions				MS-NAS Ordnance Dash Numbers		
	I.D.	O.D.	Thick	CTSK P/N	A CTSK I.D.	B CTSK Depth	C CTSK Degree	Reference Part Numbers	Steel Plated P/N	Stainless Steel P/N
3	.093	.187	.019					2W1G-6-6-	19	
3	.119	.250	.031					MS9320	04	
4	.124	.245	.040					ALLOY 4	X	
4	.135	.312	.031					MS9320	05	
5	.150	.312	.043					MS9320	06	
6	.159	.375	.043					MS9320	07	
8	.184	.375	.050					MS9320	08	
10	.193	.367	.062	C3	.285	.063	45°	MS21206	3	
10	.193	.377	.062					MS21299	3	
10	.195	.469	.032					NAS1587	3	
10	.213	.438	.062					MS9320	09	
1/4	.253	.465	.062	C4	.345	.063	45°	MS21206	4	
1/4	.253	.481	.062					MS21299	4	
1/4	.255	.485	.057					BACW10BP	4P	
1/4	.255	.531	.062	C4	.339	.078	45°	MS20002	4	
1/4	.256	.531	.062	4C	.339	.078	45°	NAS1587		4
1/4	.265	.500	.065					NAS1149	G0463P	
1/4	.276	.500	.062					MS9320	10	
1/4	.281	.500	.089					10910174	1	
1/4	.281	.625	.089					10910174	34	
1/4	.281	1.000	.089					10910174	20	
5/16	.316	.568	.062	C5	.407	.063		MS21206	5	
5/16	.319	.593	.062	C5	.401	.078	45°	MS20002	5	
5/16	.319	.593	.062	5C	.401	.078	45°	NAS1587		5
5/16	.328	.562	.063					NAS1149	G0563P	
5/16	.338	.625	.062					MS9320	11	
5/16	.343	.625	.062					10910174	17	
5/16	.343	.625	.104					10910174		
5/16	.343	.875	.119					10910174	19	
3/8	.378	.674	.062	C6	.502	.078	45°	MS21206	6	

HIGH STRENGTH-HEAT TREATED, PLAIN AND COUNTERSUNK WASHERS

Screw/Bolt Size	Nominal Dimensions			Countersunk Dimensions				MS-NAS Ordnance Dash Numbers		
	I.D.	O.D.	Thick	CTSK P/N	A CTSK I.D.	B CTSK Depth	C CTSK Degree	Reference Part Numbers	Steel Plated P/N	Stainless Steel P/N
3/8	.383	.687	.062	C6	.489	.078	45°	MS20002	6	
3/8	.383	.687	.062	6C	.489	.078	45°	NAS1587		6
3/8	.390	.625	.063					NAS1149	G0663P	
3/8	.390	.937	.045					S6135-64028-	3	
3/8	.401	.750	.078					MS9320	12	
3/8	.406	.700	.158					10910174	33	
3/8	.406	.750	.119					10910174	3	
3/8	.406	.875	.134					10910174	22	
3/8	.406	1.125	.199					10910174	16	
7/16	.438	.922	.065					ASTM A-325	X	
7/16	.441	.778	.062	C7	.564	.078	45°	MS21206	7	
7/16	.446	.781	.062	C7	.550	.078	45°	MS20002	7	
7/16	.446	.781	.062	7C	.550	.078	45°	NAS1587		7
7/16	.453	.750	.063	7C	.550	.078	45°	NAS1149	G07636P	
7/16	.463	.875	.094					MS9320	13	
7/16	.468	.750	.119					10910174	26	
7/16	.468	.875	.119					10910174	4	
7/16	.468	.875	.250					10910174	35	
7/16	.482	.905	.290					12376084		
1/2	.501	.888	.062					4130	X	
1/2	.503	.893	.062	C8	.627	.078	45°	MS21206	8	
1/2	.509	.875	.062	C8	.612	.078	45°	MS20002	8	
1/2	.509	.875	.062	C8	.612	.078	45°	NAS1587		8
1/2	.515	.875	.063					NAS1149	G0863P	
1/2	.516	.875	.125					11678182		
1/2	.526	1.000	.109					MS9320	14	
1/2	.531	.875	.060					10910174	37	
1/2	.531	.875	.089					10910174	30	
1/2	.531	.875	.127					10910174	43	
1/2	.531	1.000	.134					10910174	5	
1/2	.531	1.500	.060					10910174	40	
1/2	.531	2.000	.209					10910174	28	
1/2	.562	1.500	.160					9152386	X	
9/16	.566	1.004	.062	C9	.689	.078	45°	NS21206	9	
9/16	.570	.968	.062	C9	.677	.078	45°	MS20002	9	
9/16	.570	.968	.062	C9	.677	.078	45°	NAS1587		9
9/16	.578	1.062	.063					NAS1149	G0963P	
9/16	.588	1.125	.125					MS9320	15	
9/16	.594	1.125	.164					10910174	6	
5/8	.626	1.182	.062					MS21299	10	
5/8	.629	1.120	.062	C10	.783	.078	45°	MS21206	10	
5/8	.638	1.062	.062	C10	.775	.078	45°	MS20002	10	
5/8	.638	1.062	.062	C10	.775	.078	45°	NAS1587		10
5/8	.640	1.188	.063	C10	.775	.078	45°	NAS1587	G1063P	
5/8	.651	1.250	.141					MS9320	16	
5/8	.656	1.000	.119					10910174	31	
5/8	.656	1.000	.250					10910174	21	
5/8	.656	1.250	.164					10910174	7	

HIGH STRENGTH-HEAT TREATED, PLAIN AND COUNTERSUNK WASHERS

Screw/Bolt Size	Nominal Dimensions			Countersunk Dimensions				MS-NAS Ordnance Dash Numbers		
	I.D.	O.D.	Thick	CTSK P/N	A CTSK I.D.	B CTSK Depth	C CTSK Degree	Reference Part Numbers	Steel Plated P/N	Stainless Steel P/N
5/8	.656	1.250	.250					10910174	18	
5/8	.656	1.500	.089					10910174	44	
5/8	.656	1.750	.179					10941915	7	
5/8	.656	1.750	.250					10910174	38	
5/8	.656	2.500	.125					10910174	25	
5/8	.687	1.312	.093					A-325	X	
3/4	.754	1.345	.062	C12	.908	.078	45°	MS21206	X	
3/4	.765	1.250	.062	C12	.900	.078	45°	MS20002	12	
3/4	.765	1.250	.062	C12	.900	.078	45°	NAS1587		12
3/4	.765	1.312	.090					NAS1149	G1290P	
3/4	.765	1.380	.125					4130	X	
3/4	.776	1.500	.172					MS9320	17	
3/4	.780	1.500	.062					10910174	41	
3/4	.781	1.500	.093					10910174	24	
3/4	.781	1.500	.125					10910174	42	
3/4	.781	1.687	.250					10910174	23	
3/4	.812	2.000	.179					10910174	15	
3/4	.812	2.000	.194					10910174	8	
7/8	.879	1.567	.062	C14	1.033	.078	45°	MS21206	14	
7/8	.877	2.250	.187					MS17811	18	
7/8	.888	1.437	.062	C14	1.025	.078	45°	MS20002	14	
7/8	.888	1.437	.062	C14	1.025	.078	45°	NAS1587		14
7/8	.890	1.500	.090					NAS1149	G1490P	
7/8	.901	1.750	.203					MS9320	18	
7/8	.938	1.781	.194					10910174	9	
1"	1.015	1.625	.062	C16	1.150	.078	45°	MS2002	16	
1"	1.015	1.625	.062	C16	1.150	.078	45°	NAS1587		16
1"	1.015	1.750	.090					NAS1149	G1690P	
1"	1.020	1.720	.060					10910174	29	
1"	1.026	2.000	.234					MS9320	19	
1"	1.062	2.031	.209					10910174	10	
1-1/16	1.078	1.812	.090					NAS1149	G1890P	
1-1/8	1.145	1.875	.062	C18	1.275	.078	45°	MS20002	18	
1-1/8	1.145	1.875	.062	C18	1.275	.078	45°	NAS1587		18
1-1/4	1.265	2.000	.090					NAS1149	G2090P	
1-1/4	1.269	2.125	.062	C20	1.437	.094	45°	MS20002	20	
1-1/4	1.269	2.125	.094	C20	1.437	.094	45°	NAS1587		20
1-5/16	1.328	2.062	.090					NAS1149	G2190P	
1-3/8	1.395	2.313	.062	C22	1.562	.094	45°	MS20002	22	
1-1/2	1.515	2.500	.062	C24	1.687	.094	45°	MS20002	24	

WCL Part Numbers - reference part example: 10910174-42 above is WCL part: FW-0781-1500-125-ST4-CD2

FW .781 1.500 .025 ST4 CD2
 Type I.D. O.D. THK MAT FIN

FW = Flat Washer
 MAT = material ST4 = Alloy steel - QQ-S-635
 FIN = Finish CD2 = Cadmium QQ-P-416-Type2

Use Reference and/or MilSpec part numbers when needed. Specify hardness requirements as needed. See page 53 for a complete listing of materials, finishes and applicable WCL codes.