

FED SUP CLASS  
5310USER ACTIVITIES:  
ARMY-ME  
NAVY-MCREVIEWER ACTIVITIES:  
ARMY-AV, EA, ER, GL  
AIR FORCE-15, B2  
DLA-IS  
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AMSC N/A

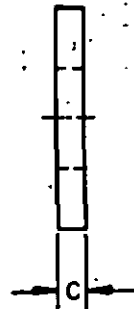
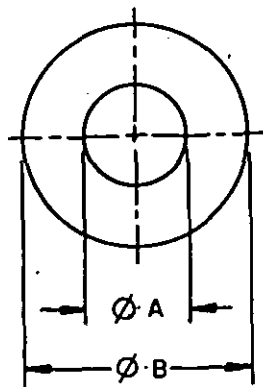


TABLE I. DASH NUMBERS AND DIMENSIONS.

DASH NUMBERS		Ø A ID	TOLERANCE		Ø B OD	TOLERANCE		C THICKNESS		
CARBON STEEL	ALLOY STEEL		+	-		+	-	NOMINAL	MAX	MIN
19	19A	.109	.000	.008	.281	.010	.010	.028	.033	.023
20	20A	.156	.000	.015	.281	.005	.015	.020	.025	.016
1	1A	.156	.008	.005	.375	.015	.005	.049	.065	.036
18	18A	.188	.008	.005	.438	.015	.005	.049	.065	.036
2	2A	.219	.008	.005	.500	.015	.005	.049	.065	.036
3	3A	.250	.015	.005	.562	.015	.005	.049	.065	.036
21	21A	.219	.005	.005	.656	.010	.010	.062	.069	.055
22	22A	.234	.000	.010	.375	.010	.010	.049	.051	.043
23	23A	.266	.000	.005	.612	.010	.010	.109	.119	.075
24	24A	.266	.010	.000	1.000	.015	.015	.064	.069	.059
4	4A	.281	.015	.005	.625	.025	.005	.065	.080	.051
36	36A	.281	.015	.005	.968	.015	.007	.046	.065	.036
37	37A	.281	.015	.005	2.000	.030	.007	.062	.080	.051
5	5A	.312	.015	.005	.734	.015	.007	.065	.080	.051
38	38A	.312	.015	.005	.750	.015	.007	.066	.080	.051
25	25A	.344	.000	.020	1.000	.010	.005	.062	.067	.059
26	26A	.375	.010	.005	.625	.010	.010	.100	.114	.090
6	6A	.375	.015	.005	.875	.030	.007	.083	.104	.064
27	27A	.406	.000	.010	1.250	.010	.010	.132	.202	.075
7	7A	.438	.015	.005	1.000	.030	.007	.065	.080	.051
39	39A	.438	.015	.005	1.000	.030	.007	.084	.104	.064
35	35A	.438	.010	.010	1.375	.010	.010	.083	.104	.064
8	8A	.500	.015	.005	1.250	.030	.007	.083	.104	.064
28	28A	.500	.015	.005	.688	.000	.030	.031	.034	.029
9	9A	.531	.015	.005	1.062	.030	.007	.095	.121	.074
29	29A	.562	.005	.000	.734	.015	.000	.062	.067	.057
40	40A	.562	.015	.005	1.375	.030	.007	.099	.132	.066
10	10A	.562	.015	.005	1.375	.030	.007	.109	.132	.086
41	41A	.625	.015	.005	1.500	.030	.007	.109	.132	.086
11	11A	.656	.030	.007	1.312	.030	.007	.095	.121	.074
30	30A	.656	.000	.015	1.250	.010	.000	.109	.119	.099

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P.A.  
ARMY-AR  
Other Com  
NAVY-SH  
AIR FORCE-99INTERNATIONAL  
INTEREST

TITLE

WASHER, FLAT (ROUND, STEEL,  
GENERAL PURPOSE)

MILITARY STANDARD

MS51412

PROCUREMENT SPECIFICATION  
FF-W-92

SUPERSEDES:

PAGE 1 OF 2

DD FORM 672-1 (COORDINATED)

PREVIOUS EDITIONS FOR THIS TITLE ARE OBSOLETE 6310-1592

APPROVED 18 OCT 82 REVISED 16 DEC 87

FED. SUP. CLASS  
5310

TABLE 1. DASH NUMBERS AND DIMENSIONS -CONTINUED

DASH NUMBERS		Ø A ID	TOLERANCE		Ø B OD	TOLERANCE		C THICKNESS		
CARBON STEEL	ALLOY STEEL		+	-		+	-	NOMINAL	MAX	MIN
31	31A	.656	.030	.005	2.500	.030	.007	.192	.202	.162
12	12A	.688	.030	.007	1.750	.030	.007	.134	.160	.108
13	13A	.812	.030	.007	1.469	.030	.007	.134	.160	.108
14	14A	.812	.030	.007	2.000	.030	.007	.148	.177	.122
32	32A	.812	.010	.010	1.250	.000	.015	.031	.035	.028
33	33A	.938	.030	.007	1.375	.000	.010	.032	.034	.028
42	42A	.938	.030	.007	2.250	.030	.007	.171	.192	.136
15	15A	1.062	.030	.007	2.500	.030	.007	.164	.192	.136
34	34A	1.125	.025	.000	1.750	.010	.010	.090	.095	.085
43	43A	1.125	.030	.007	2.500	.030	.007	.164	.192	.136
44	44A	1.250	.030	.007	2.750	.030	.007	.171	.192	.136
16	16A	1.375	.030	.007	3.000	.030	.007	.165	.192	.136
45	45A	1.500	.030	.007	3.250	.045	.010	.187	.213	.153
17	17A	1.625	.045	.010	3.500	.045	.010	.180	.213	.153
46	46A	1.750	.045	.010	3.750	.045	.010	.187	.213	.153
47	47A	1.875	.045	.010	4.000	.045	.010	.187	.213	.153
48	48A	2.125	.045	.010	4.500	.045	.010	.187	.213	.153
49	49A	2.375	.045	.010	4.750	.045	.010	.218	.248	.193
50	50A	2.625	.045	.010	5.000	.045	.010	.234	.280	.210

## REQUIREMENTS:

- MATERIAL:** STEEL, CARBON, GRADES 1008 (UNS G10080) THRU 1020 (UNS G10200), IN ACCORDANCE WITH ASTM A108 OR ASTM A109.  
STEEL, ALLOY, GRADE 4130 (UNS G41300) IN ACCORDANCE WITH ASTM A331 OR ASTM A506.
- PROTECTIVE COATING:** ZINC COAT IN ACCORDANCE WITH ASTM B633 TYPE II, CLASS Fe/Zn 13.
- HARDNESS:** ALLOY STEEL WASHERS SHALL HAVE A HARDNESS OF 34-38HRC.
- FLATNESS:** WASHERS WITH UP TO .875 INCLUSIVE OUTSIDE DIAMETER SHALL BE FLAT WITHIN .005; WITH LARGER THAN .875 OUTSIDE DIAMETER SHALL BE FLAT WITHIN .010.
- SURFACE ROUGHNESS:** WASHERS SHALL HAVE A MAXIMUM SURFACE ROUGHNESS OF 125 MICROINCHES DETERMINED IN ACCORDANCE WITH ANSI/ASME B46.1.
- BURRS AND SHARP EDGES:** REMOVE ALL BURRS AND SHARP EDGES.
- PART NUMBER:** THE PART NUMBER SHALL CONSIST OF THE BASIC MS NUMBER, FOLLOWED BY A DASH NUMBER FROM TABLE 1.

EXAMPLE: MS51412-20

DASH NUMBER

BASIC MS NUMBER

MS51412-2 - WASHER, FLAT, CARBON STEEL, INSIDE DIAMETER .219, OUTSIDE DIAMETER .500, THICKNESS .049.

MS51412-19A - WASHER, FLAT, ALLOY STEEL, INSIDE DIAMETER .109, OUTSIDE DIAMETER .281, THICKNESS .028.

## NOTES:

- ALL DIMENSIONS ARE IN INCHES.
- IN THE EVENT OF A CONFLICT BETWEEN THE TEXT OF THIS STANDARD AND THE REFERENCES CITED HEREIN, THE TEXT OF THIS STANDARD SHALL TAKE PRECEDENCE.
- REFERENCED GOVERNMENT (OR NON-GOVERNMENT) DOCUMENTS OF THE ISSUE LISTED IN THAT ISSUE OF THE DEPARTMENT OF DEFENSE INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) SPECIFIED IN THE SOLICITATION FORM A PART OF THIS STANDARD TO THE EXTENT SPECIFIED HEREIN.
- THIS DOCUMENT WAS PREPARED FOR USE IN NON-AEROSPACE, HIGH TEMPERATURE/PETROLEUM ENVIRONMENT.

This Military Standard is approved for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document when applicable.

REVIEWER ACTIVITIES:  
ARMY-AV,EA,ER,GL  
AIR FORCE-15,82  
DIA-15  
NSA-NS

USER ACTIVITIES:  
ARMY-ME  
NAVY-MC

ARMY-AR Other Cont: NAVY-SH AIR FORCE-99	INTERNATIONAL INTEREST	TITLE WASHER, FLAT (ROUND, STEEL, GENERAL PURPOSE)	MILITARY STANDARD MS51412
PROCUREMENT SPECIFICATION FRANCE-FF-W-92	SUPERSEDES:	PAGE 2 OF 2	

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