

TABLE 1. DASH NUMBERS AND DIMENSIONS

NOMINAL SIZE	CARBON STEEL					PH BRZ OR TIN BRZ	NICKEL COPPER ALLOY	CRES 300 SERIES	CRES 420	OR (ID)		ØD (OD)		WASHER SECTION	
	PLAIN 2/	CAD OR ZN 2/	CAD	PHOS 2/	CRES 302 OR 420 2/					MIN	MAX	MAX	MIN	C THICK T + t 2	
															DASH NUMBERS
NO. 2 (.086)	1	20	39	58	77	96	115	134	153	.088	.094	.172	.035	.020	
NO. 4 (.112)	2	21	40	59	78	97	116	135	154	.114	.120	.209	.040	.025	
NO. 6 (.138)	3	22	41	60	79	98	117	136	155	.141	.148	.250	.047	.031	
NO. 8 (.164)	4	23	42	61	80	99	118	137	156	.167	.174	.293	.055	.040	
NO. 10 (.190)	5	24	43	62	81	100	119	138	157	.193	.200	.334	.062	.047	
1/4 (.250)	6	25	44	63	82	101	120	139	156	.252	.260	.487	.109	.062	
5/16 (.312)	7	26	45	64	83	102	121	140	159	.314	.322	.583	.125	.078	
3/8 (.375)	8	27	46	65	84	103	122	141	160	.377	.385	.680	.141	.094	
7/16 (.437)	9	28	47	66	85	104	123	142	161	.440	.450	.776	.156	.109	
1/2 (.500)	10	29	48	67	86	105	124	143	162	.502	.512	.869	.171	.125	
9/16 (.562)	11	30	49	68	87	106	125	144	163	.564	.574	.965	.188	.141	
5/8 (.625)	12	31	50	69	88	107	126	145	164	.628	.640	1.072	.203	.156	
3/4 (.750)	13	32	51	70	89	108	127	146	165	.753	.765	1.264	.234	.188	
7/8 (.875)	14	33	52	71	90	109	128	147	166	.878	.890	1.455	.266	.219	
1 (1.000)	15	34	53	72	91	110	129	148	167	1.003	1.015	1.647	.297	.250	
1-1/8 (1.125)	16	35	54	73 ^{2/}	92	111	130	149	168	1.129	1.144	1.838	.328	.281	
1-1/4 (1.250)	17	36	55	74 ^{2/}	93	112	131	150	169	1.254	1.272	2.028	.359	.312	
1-3/8 (1.375)	18	37	56	75 ^{2/}	94	113	132	151	170	1.379	1.399	2.210	.391	.344	
1-1/2 (1.500)	19	38	57	76 ^{2/}	95	114	133	152	171	1.504	1.524	2.409	.422	.375	

1/ SEE REQUIREMENT 4
2/ SEE NOTE 2

(J) ENTIRE STANDARD REVISED

INCH - POUND

PREPARING ACTIVITY: ARMY-AR CUSTODIANS: ARMY- AR NAVY- AS AIR FORCE- 99 DLA- REVIEW: AT,AV,GLM,JS,NS USER: ER,ME,MC PROJECT NUMBER: 5310-1609 DISTRIBUTION STATEMENT	MILITARY SPECIFICATION SHEET TITLE WASHER, LOCK - SPRING, HELICAL, REGULAR (MEDIUM) SERIES	SPECIFICATION SHEET NUMBER MS35338J 30 MARCH 1990 SUPERSEDING MS35338H 29 NOV 1983 (SEE NOTE 3) AMSC- N/A FSC - 5310
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A. Approved for public release; distribution is unlimited.

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DODISS SPECIFIED IN THE SOLICITATION: FF-W-84

 THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.

REQUIREMENTS:

1. MATERIALS:

- a. STEEL, CARBON, GRADE 1060 (UNS G10600) THRU 1080 (UNS G10800), IN ACCORDANCE WITH ASTM A229.
- b. CORROSION-RESISTANT STEEL (NON-MAGNETIC) WASHERS SHALL BE TYPE 316 (UNS S31600) THRU 1/4 (.250) ANI TYPE 300 SERIES (UNS S30200 TO UNS S31600) FOR ALL OTHER SIZES, AND CORROSION-RESISTANT STEEL (MAGNETIC) WASHERS SHALL BE TYPE 420 (UNS S42000).
- c. PHOSPHOR BRONZE, COPPER ALLOY NO. 510 (UNS C51000), IN ACCORDANCE WITH ASTM B159.
- d. TIN-BRASS, COMPOSITION 425 (UNS C42500), IN ACCORDANCE WITH ASTM B591.
- e. NICKEL-COPPER-ALUMINUM ALLOY, FOR: 2 (UNS N05500) IN ACCORDANCE WITH QQ-N-286.

2. PROTECTIVE FINISHES:

a. CARBON STEEL WASHERS:

- 1. PHOSPHATE COATING SHALL BE IN ACCORDANCE WITH MIL-P-16232, TYPE 2, CLASS 2.
- 2. CADMIUM PLATING SHALL BE IN ACCORDANCE WITH QQ-P-416, TYPE II, CLASS 2, OR MIL-C-81562, TYPE II, CLASS 2 (NO SUBSTITUTES ALLOWED).

b. CORROSION-RESISTANT STEEL WASHERS:

- 1. PASSIVATION SHALL BE IN ACCORDANCE WITH QQ-P-35.
- 2. BLACK OXIDE COATING (FOR CRES 300 SERIES ONLY) SHALL BE IN ACCORDANCE WITH MIL-C-13924, CLASS 4. (SEE REQUIREMENT 6).

c. PHOSPHOR BRONZE AND TIN-BRASS WASHERS SHALL BE CADMIUM PLATED IN ACCORDANCE WITH QQ-P-416, TYPE II, CLASS 3 AND SHALL BE DYED PREDOMINANTLY YELLOW TO MATCH COLOR 13415 OR 13432 OR 13507 OR 13538 IN ACCORDANCE WITH FED-STD-595.

d. NICKEL-COPPER-ALUMINUM ALLOY WASHERS - UNCOATED.

3. HARDNESS:

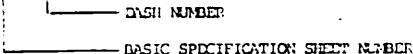
- a. CARBON STEEL WASHERS SHALL HAVE A HARDNESS OF 38 TO 46HRC.
- b. CORROSION-RESISTANT STEEL WASHERS TYPE 420 (UNS S42000) SHALL HAVE A HARDNESS OF 45-52HRC, AND TYPE 300 (UNS S30200) SERIES WASHERS SHALL HAVE A HARDNESS OF 35-42HRC.
- c. PHOSPHOR BRONZE AND TIN-BRASS WASHERS SHALL HAVE A MINIMUM HARDNESS OF 90HRC.
- d. NICKEL-COPPER-ALUMINUM ALLOY WASHERS SHALL HAVE A HARDNESS OF 33-40HRC.

4. MAXIMUM TOLERANCE FOR NOMINAL SERIES .006 THRU .190 SHALL BE +.006, .250 THRU .750 SHALL BE +.010, AND .875 THRU 1.500 SHALL BE .020 (SEE TABLE I).

5. MAGNETIC PERMEABILITY: CORROSION-RESISTANT STEEL WASHERS (300 SERIES ONLY) SHALL HAVE A MAGNETIC PERMEABILITY OF 2.0 MAXIMUM: (AIR = 1.0) FOR FIELD STRENGTH OF H = 200 OERSTEDS USING A MAGNETIC INDICATOR IN ACCORDANCE WITH MIL-I-17214.

6. PART NUMBER: THE PART NUMBER SHALL CONSIST OF THE BASIC SPECIFICATION SHEET NUMBER FOLLOWED BY A DASH NUMBER TAKEN FROM TABLE I. WHEN BLACK OXIDE COATING IS REQUIRED, THE DASH NUMBER SHALL BE FOLLOWED BY THE LETTER "B".

EXAMPLE: MS35338-40



MS35338-40 INDICATES - WASHER, LOCK-SPRING, HELICAL-SPRING, REGULAR (MEDIUM) SERIES, 1/2 (1.500) NOMINAL DIAMETER, CARBON STEEL, CADMIUM PLATED

NOTES:

- 1. ALL DIMENSIONS ARE IN INCHES.
- 2. CANCELLED, IN PART, AND INACTIVE FOR DESIGN. FOR SUBSTITUTION SEE TABLE II.
- 3. MS35338 SUPERSEDES MS16214, MS35337, AN935, MS1061, BECK1 AND BECK2, SEE TABLE II.
- 4. 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.
- 5. REFERENCED GOVERNMENT (OR NON-GOVERNMENT) DOCUMENTS OF THE ISSUE LISTED IN THAT ISSUE OF THE DEPARTMENT OF DEFENSE INDEX OF SPECIFICATIONS AND STANDARDS (DoDSS) SPECIFIED IN THE SOLICITATION FORM A PART OF THIS STANDARD TO THE EXTENT SPECIFIED HEREIN.

PREPARING ACTIVITY: ARMY-AR CUSTODIANS: ARMY-AR NAVY-AS AIR FORCE-99 DLA- REVIEW: AT,AV,GL,MII,IS,NS USER: ER,ME,MC PROJECT NUMBER: 5310-1609	MILITARY SPECIFICATION SHEET TITLE WASHER, LOCK - SPRING, HELICAL REGULAR (MEDIUM) SERIES	SPECIFICATION SHEET NUMBER MS35338J 30 MARCH 1990 SUPERSEDING MS35338H 29 NOV 1983 (SEE NOTE 3) AMSC- N/A FSC - 5310
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited		Page <u>2</u> of <u>3</u>

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TABLE II. INTERCHANGEABILITY.

After 21 March 1966, (1) washers given on MS16214, MS35337, NAS1061, and this standard in part, are inactive for design and are cancelled, but their existing stocks should be used for maintenance purposes until depleted and (2) washers given on AN935 are inactivated for new design. Use only the following substitutive washers for new design and replacement.

CROSS REFERENCE OF PART NUMBERS							
CANCELLED/INACTIVATED	SUBSTITUTIVE	CANCELLED/INACTIVATED	SUBSTITUTIVE	CANCELLED/INACTIVATED	SUBSTITUTIVE	CANCELLED/INACTIVATED	SUBSTITUTIVE
MS16214-1	MS35337-100	MS35337-100	MS35337-100	MS35337-100	MS35337-100	AN935-1	MS35337-100
2	136	78	57	100	100	-1	136
3	137	79	58	110	110	-2	137
4	138	40	40	111	111	-3	138
5	139	41	41	112	112	-4	139
6	140	42	42	113	113	-5	140
7	141	43	43	114	114	-16	141
8	142	44	44			-12	142
9	143	45	45	MS35338-1	MS35338-39	-116	143
10	144	46	46	2	40	-516	144
11	145	47	47		41	-616	145
12	147	48	48	4	42	-716	147
13	148	49	49	5	43	-816	148
14	149	50	50	6	44	-916	149
15	150	51	51	7	45	-1016	150
16	151	52	52	8	46	-1216	151
17	152	53	53	9	47	-3L	152
18	97	54	54	10	48	-3L	157
19	98	55	55	11	49	-4L	160
20	99	56	56	12	50	-5L	161
21	100	57	57	13	51	-6L	161
22	101	58	58	14	52	-8L	162
23	102	59	59	15	53	-10L	163
24	103	60	60	16	54	-12L	164
25	104	61	61	17	55	-116L	165
26	105	62	62	18	56	-516L	165
27	107	63	63	19	57	-616L	166
28	108	64	64	20	58	-716L	167
29	109	65	65	21	59	-816L	168
30	110	66	66	22	60	-916L	168
31	111	67	67	23	61	-1016L	169
32	112	68	68	24	62	-1216L	170
33	113	69	69	25	63	R1	171
34	114	70	70	26	64	R2	172
		71	71	27	65	R3	173
MS35337-1	MS35338-39	72	72	28	66	R4	174
2	40	73	73	29	67	PF	97
3	41	74	74	30	68	PF	98
4	42	75	75	31	69	PF	99
5	43	76	76	32	70	P10	100
6	44	77	77	33	71	P12	101
7	45	78	134 OF 153	34	72	R416	102
8	46	79	135 OF 154	35	73	P516	102
9	47	80	136 OF 155	36	74	P616	103
10	48	81	137 OF 156	37	75	P716	104
11	49	82	138 OF 157	38	76	P816	105
12	50	83	140 OF 159	39	77	P916	106
13	51	84	141 OF 160	40	78	P1016	107
14	52	85	142 OF 161	41	79	P1216	108
15	53	86	143 OF 162	42	80	P2L	96
16	54	87	144 OF 163	43	81	P3L	17
17	55	88	145 OF 164	44	82	R4L	8
18	56	89	146 OF 165	45	83	P5L	17
19	57	90	147 OF 166	46	84	P6L	98
20	58	91	148 OF 167	47	85	P7L	99
21	59	92	149 OF 168	48	86	P8L	100
22	60	93	150 OF 169	49	87	P9L	101
23	61	94	151 OF 170	50	88	R416L	102
24	62	95	152 OF 171	51	89	P516L	103
25	63	96	OF	52	90	P616L	104
26	64	97	OF	53	91	P716L	105
27	65	98	OF	54	92	P816L	106
28	66	99	OF	55	93	P916L	107
29	67	100	OF	56	94	P1016L	108
30	68	101	OF	57	95	P1216L	109
31	69	102	OF	58	96		109
32	70	103	OF	59	97	NAS1061-6	MS35337-100
33	71	104	OF	60	98	10	136
34	72	105	OF	61	99	416	137
35	73	106	OF	62	100	151	138
36	74	107	OF	63	101	152	139
				64	102	516	140
				65	103	616	141

1/ for replacement

PREPARING ACTIVITY: ARMY-AR
 CUSTODIANS: ARMY- AR NAVY- AS
 AIR FORCE- 99 DLA-
 REVIEW: AT,AV,GL,MJS,NS
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 DISTRIBUTION STATEMENT

MILITARY SPECIFICATION SHEET
 TITLE
 WASHER, LOCK - SPRING, HELICAL
 REGULAR (MEDIUM) SERIES

SPECIFICATION SHEET NUMBER
MS35338J 30 MARCH 1990
 SUPERSEDING
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