



TABLE I. DASH NUMBERS AND DIMENSIONS

NOMINAL SIZE	CARBON STEEL		PH BRZ OR TIN BRZ	NICKEL COPPER ALLOY	CRESS 300 SERIES	CRES 420	oA (ID)		oB (OD)	WASHER SECTION	
	CAD OR ZINC	PHOS					MIN	MAX		W WIDTH	C THICK ±.1 2
	DASH NUMBERS						MIN	MAX	MAX	MIN	MIN 1/
NO.2 (.086)	39	58	96	115	134	153	.088	.094	.172	.035	.020
NO.4 (.112)	40	59	97	116	135	154	.114	.120	.209	.040	.025
NO.6 (.138)	41	60	98	117	136	155	.141	.148	.250	.047	.031
NO.8 (.164)	42	61	99	118	137	156	.167	.174	.293	.055	.040
NO.10 (.180)	43	62	100	119	138	157	.193	.200	.334	.062	.047
1/4 (.250)	44	63	101	120	139	158	.252	.260	.487	.109	.062
5/16 (.312)	45	64	102	121	140	159	.314	.322	.583	.125	.078
3/8 (.375)	46	65	103	122	141	160	.377	.385	.680	.141	.094
7/16 (.437)	47	66	104	123	142	161	.440	.450	.776	.156	.109
1/2 (.500)	48	67	105	124	143	162	.502	.512	.889	.171	.125
9/16 (.562)	49	68	106	125	144	163	.564	.574	.965	.188	.141
5/8 (.625)	50	69	107	126	145	164	.628	.641	1.073	.203	.156
3/4 (.750)	51	70	108	127	146	165	.753	.766	1.265	.234	.168
7/8 (.875)	52	71	109	128	147	166	.878	.894	1.459	.266	.219
1 (1.000)	53	72	110	129	148	167	1.003	1.024	1.656	.297	.250
1-1/8 (1.125)	54	-	111	130	149	168	1.129	1.153	1.847	.328	.281
1-1/4 (1.250)	55	-	112	131	150	169	1.254	1.280	2.036	.359	.312
1-3/8 (1.375)	56	-	113	132	151	170	1.379	1.408	2.219	.391	.344
1-1/2 (1.500)	57	-	114	133	152	171	1.504	1.534	2.419	.422	.375

1/ SEE REQUIREMENT 4.

(L) DENOTES CHANGE(S)

INCH-POUND

PREPARING ACTIVITY: DLA - IS CUSTODIANS: ARMY- AR NAVY- AS AIR FORCE- 99 DLA- REVIEW: AT, AV, ER, GL, MC, ME, MI, NS, 82 USER: PROJECT NUMBER: 5310-1975	MILITARY SPECIFICATION SHEET TITLE WASHER, LOCK-SPRING, HELICAL, REGULAR (MEDIUM) SERIES	SPECIFICATION SHEET NUMBER MS35338 7 APR 94 REV L SUPERSEDING MS35338K 13 DEC 93 (SEE NOTE 2.) AMSC- N/A FSC 5310
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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 DODSS SPECIFIED IN THE SOLICITATION: ASME B18.2.1.1

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

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

Form Approved
OMB No. 0704-0188

REQUIREMENTS:

1. MATERIAL:

- a. STEEL, CARBON, GRADE 1060 (UNS G10600) THRU 1080 (UNS G10800), IN ACCORDANCE WITH ASTM A29.
- b. CORROSION-RESISTANT STEEL (NON-MAGNETIC) WASHERS SHALL BE TYPE 316 (UNS S31600) THRU 1/4 (.250) AND 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, FORM 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 I, 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.
OR MECHANICALLY DEPOSITED ZINC SHALL BE IN ACCORDANCE WITH MIL-C-81562, TYPE II, CLASS 6.
- 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. A MAGNET SHALL BE USED FOR DETECTION VERIFICATION PURPOSES TO DIFFERENTIATE BETWEEN CARBON STEEL WASHERS AND PHOSPHOR BRONZE AND TIN-BRASS WASHERS SPECIFIED HEREIN.
- 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 45-53HRC, AND TYPE 300 (UNS S3XXX) SERIES WASHERS SHALL HAVE A HARDNESS OF 35-43HRC.
- (L) c. PHOSPHOR BRONZE AND TIN-BRASS WASHERS SHALL HAVE A MINIMUM HARDNESS OF 90HRB.
- d. NICKEL-COPPER-ALUMINUM ALLOY WASHERS SHALL HAVE A HARDNESS OF 33-40HRC.
- 4. MAXIMUM TOLERANCE FOR NOMINAL SERIES .086 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 A FIELD STRENGTH OF H = 200 OERSTEDS USING A MAGNETIC INDICATOR IN ACCORDANCE WITH ASTM A342.
- 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: MS35338-48

DASH NUMBER

BASIC SPECIFICATION SHEET NUMBER

MS35338-48 INDICATES - WASHER, LOCK-SPRING, HELICAL-SPRING, REGULAR (MEDIUM) SERIES, 1/2 (.500) NOMINAL DIAMETER, CARBON STEEL; CADMIUM OR ZINC PLATED

7. PACKAGING: PACKAGING SHALL BE IN ACCORDANCE WITH ASTM D3951.

NOTES:

- 1. ALL DIMENSIONS ARE IN INCHES.
- 2. MS35338 SUPERSEDES MS16214, MS35337, AN935, NAS1061, BECX1 AND BECX2, SEE TABLE II.
- (L) 3. IN THE EVENT OF A CONFLICT BETWEEN THE TEXT OF THIS DOCUMENT AND THE REFERENCES CITED HEREIN, THE TEXT OF THIS DOCUMENT SHALL TAKE PRECEDENCE.
- (L) 4. UNLESS OTHERWISE SPECIFIED, ISSUES OF REFERENCED DOCUMENTS ARE THOSE IN EFFECT AT THE TIME OF SOLICITATION.

PREPARING ACTIVITY: DLA - IS	MILITARY SPECIFICATION SHEET	SPECIFICATION SHEET NUMBER
CUSTODIANS: ARMY- AR NAVY- AS	TITLE	MS35338 7 APR 84 REV L
AIR FORCE- 99 DLA-	WASHER, LOCK-SPRING, HELICAL, REGULAR (MEDIUM) SERIES	SUPERSEDING
REVIEW: AT, AV, ER, GL, MC, ME, MI, NS, B2		MS35338K 13 DEC 93 (SEE NOTE 2.)
USER:		AMSC- N/A FSC 5310
PROJECT NUMBER: 5310-1975		
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