

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.

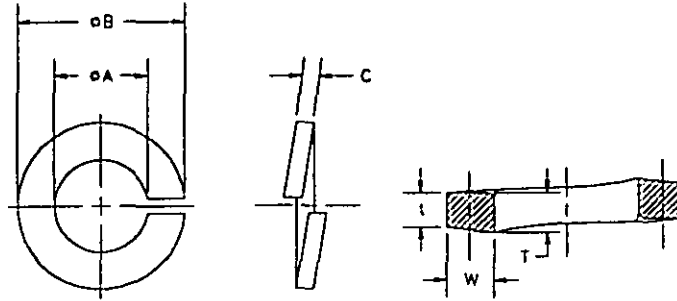


TABLE I. DASH NUMBERS AND DIMENSIONS

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

DISTRIBUTION STATEMENT
A. Approved for public release; distribution is unlimited.

Page 1 of 3

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Form Approved
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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 MS35338K 13 DEC 93 (SEE NOTE 2.)
REVIEW: AT, AV, ER, GL, MC, ME, MI, NS, B2		AMSC- N/A FSC 5310
USER:		
PROJECT NUMBER: 5310-1975		
DISTRIBUTION STATEMENT		Page 2 of 3
A. Approved for public release; distribution is unlimited.		

DD Form 672, MAY 88

PREVIOUS EDITIONS ARE OBSOLETE.

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TABLE II. INTERCHANGABILITY.

After 21 March 1966, (1) washers given on MS16214, MS35337, NAS1061, and this standard in part, are inactive for design and are canceled, but their existing stocks should be used for maintenance purposes until depleted and (2) washers are 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	MS35338-135	MS35337-37	MS35338-56	MS35337-108	MS35338-108	AN935-2	MS35338-39
MS16214-2	MS35338-136	MS35337-38	MS35338-57	MS35337-109	MS35338-109	AN935-3	MS35338-10
MS16214-3	MS35338-137	MS35337-39	MS35338-58	MS35337-110	MS35338-110	AN935-4	MS35338-41
MS16214-4	MS35338-138	MS35337-40	MS35338-59	MS35337-111	MS35338-111	AN935-5	MS35338-1
MS16214-5	MS35338-139	MS35337-41	MS35338-60	MS35337-112	MS35338-112	AN935-6	MS35338-41
MS16214-6	MS35338-140	MS35337-42	MS35338-61	MS35337-113	MS35338-113	AN935-8	MS35338-42
MS16214-7	MS35338-141	MS35337-43	MS35338-62	MS35337-114	MS35338-114	AN935-10	MS35338-43
MS16214-8	MS35338-142	MS35337-44	MS35338-63			AN935-12	MS35338-1/
MS16214-9	MS35338-143	MS35337-45	MS35338-64	MS35338-1	MS35338-39	AN935-416	MS35338-44
MS16214-10	MS35338-145	MS35337-46	MS35338-65	MS35338-2	MS35338-40	AN935-516	MS35338-45
MS16214-11	MS35338-146	MS35337-47	MS35338-66	MS35338-3	MS35338-41	AN935-616	MS35338-46
MS16214-12	MS35338-147	MS35337-48	MS35338-67	MS35338-4	MS35338-42	AN935-716	MS35338-47
MS16214-13	MS35338-148	MS35337-49	MS35338-68	MS35338-5	MS35338-43	AN935-816	MS35338-48
MS16214-14	MS35338-149	MS35337-50	MS35338-69	MS35338-6	MS35338-44	AN935-916	MS35338-49
MS16214-15	MS35338-150	MS35337-51	MS35338-70	MS35338-7	MS35338-45	AN935-1016	MS35338-50
MS16214-16	MS35338-151	MS35337-52	MS35338-71	MS35338-8	MS35338-46	AN935-1216	MS35338-51
MS16214-17	MS35338-152	MS35337-53	MS35338-72	MS35338-9	MS35338-47	AN935-2L	MS35338-52
MS16214-18	MS35338-97	MS35337-54	MS35338-73	MS35338-10	MS35338-48	AN935-3L	MS35338-39
MS16214-19	MS35338-98	MS35337-55	MS35338-74	MS35338-11	MS35338-49	AN935-4L	MS35338-40
MS16214-20	MS35338-99	MS35337-56	MS35338-75	MS35338-12	MS35338-50	AN935-5L	MS35338-1/
MS16214-21	MS35338-100	MS35337-57	MS35338-76	MS35338-13	MS35338-51	AN935-6L	MS35338-41
MS16214-22	MS35338-101	MS35337-58	MS35338-77	MS35338-14	MS35338-52	AN935-8L	MS35338-42
MS16214-23	MS35338-102	MS35337-59	MS35338-78	MS35338-15	MS35338-53	AN935-10L	MS35338-43
MS16214-24	MS35338-103	MS35337-60	MS35338-79	MS35338-16	MS35338-54	AN935-12L	MS35338-1/
MS16214-25	MS35338-104	MS35337-61	MS35338-80	MS35338-17	MS35338-55	AN935-416L	MS35338-44
MS16214-26	MS35338-105	MS35337-62	MS35338-81	MS35338-18	MS35338-56	AN935-516L	MS35338-45
MS16214-27	MS35338-106	MS35337-63	MS35338-82	MS35338-19	MS35338-57	AN935-616L	MS35338-46
MS16214-28	MS35338-107	MS35337-64	MS35338-83	MS35338-20	MS35338-58	AN935-716L	MS35338-47
MS16214-29	MS35338-108	MS35337-65	MS35338-84	MS35338-21	MS35338-59	AN935-816L	MS35338-48
MS16214-30	MS35338-110	MS35337-66	MS35338-85	MS35338-22	MS35338-60	AN935-916L	MS35338-49
MS16214-31	MS35338-111	MS35337-67	MS35338-86	MS35338-23	MS35338-61	AN935-1016L	MS35338-50
MS16214-32	MS35338-112	MS35337-68	MS35338-87	MS35338-24	MS35338-62	AN935-1216L	MS35338-51
MS16214-33	MS35338-113	MS35337-69	MS35338-88	MS35338-25	MS35338-63	AN935-8L	MS35338-96
MS16214-34	MS35338-114	MS35337-70	MS35338-89	MS35338-26	MS35338-64	AN935-8L	MS35338-91
		MS35337-71	MS35338-90	MS35338-27	MS35338-65	AN935-8L	MS35338-1/
MS35337-1	MS35338-39	MS35337-72	MS35338-91	MS35338-28	MS35338-66	AN935-8L	MS35338-67
MS35337-2	MS35338-40	MS35337-73	MS35338-92	MS35338-29	MS35338-67	AN935-85	MS35338-1/
MS35337-3	MS35338-41	MS35337-74	MS35338-93	MS35338-30	MS35338-68	AN935-86	MS35338-98
MS35337-4	MS35338-42	MS35337-75	MS35338-94	MS35338-31	MS35338-69	AN935-88	MS35338-99
MS35337-5	MS35338-43	MS35337-76	MS35338-95	MS35338-32	MS35338-70	AN935-810	MS35338-100
MS35337-6	MS35338-44	MS35337-77	MS35338-96	MS35338-33	MS35338-71	AN935-812	MS35338-1/
MS35337-7	MS35338-45	MS35337-78	MS35338-97	MS35338-34	MS35338-72	AN935-8416	MS35338-101
MS35337-8	MS35338-46	MS35337-79	MS35338-98	MS35338-35	MS35338-73	AN935-8516	MS35338-102
MS35337-9	MS35338-47	MS35337-80	MS35338-99	MS35338-36	MS35338-74	AN935-8616	MS35338-103
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MS35337-13	MS35338-51	MS35337-84	MS35338-103	MS35338-40	MS35338-78	AN935-9016	MS35338-107
MS35337-14	MS35338-52	MS35337-85	MS35338-104	MS35338-41	MS35338-79	AN935-9116	MS35338-108
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MS35337-16	MS35338-54	MS35337-87	MS35338-106	MS35338-43	MS35338-81	AN935-9316	MS35338-110
MS35337-17	MS35338-55	MS35337-88	MS35338-107	MS35338-44	MS35338-82	AN935-9416	MS35338-1/
MS35337-18	MS35338-56	MS35337-89	MS35338-108	MS35338-45	MS35338-83	AN935-9516	MS35338-88
MS35337-19	MS35338-57	MS35337-90	MS35338-109	MS35338-46	MS35338-84	AN935-9616	MS35338-89
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MS35337-21	MS35338-59	MS35337-92	MS35338-111	MS35338-48	MS35338-86	AN935-9816	MS35338-91
MS35337-22	MS35338-60	MS35337-93	MS35338-112	MS35338-49	MS35338-87	AN935-9916	MS35338-92
MS35337-23	MS35338-61	MS35337-94	MS35338-113	MS35338-50	MS35338-88	AN935-10016	MS35338-93
MS35337-24	MS35338-62	MS35337-95	MS35338-114	MS35338-51	MS35338-89	AN935-10116	MS35338-94
MS35337-25	MS35338-63	MS35337-96	MS35338-115	MS35338-52	MS35338-90	AN935-10216	MS35338-95
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MS35337-28	MS35338-66	MS35337-99	MS35338-118	MS35338-55	MS35338-93	AN935-10516	MS35338-98
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MS35337-35	MS35338-73	MS35337-106	MS35338-125	MS35338-62	MS35338-100	AN935-11216	MS35338-105
MS35337-36	MS35338-74	MS35337-107	MS35338-126	MS35338-63	MS35338-101	AN935-11316	MS35338-106

1/ No replacement.

PREPARING ACTIVITY: DLA - IS	MILITARY SPECIFICATION SHEET	SPECIFICATION SHEET NUMBER
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AIR FORCE- 99 DLA-	WASHER, LOCK-SPRING, HELICAL, REGULAR (MEDIUM) SERIES	7 APR 94 REV L
REVIEW: AT, AV, ER, GL, MC, ME, MI, NS, B2		SUPERSEDING
USER:		MS35338K 13 DEC 93 (SEE NOTE 2.)
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DISTRIBUTION STATEMENT	A. Approved for public release; distribution is unlimited.	Page 3 of 3

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