

REVIEWER SYMBOLS:  
ARMY - EA, AV  
NAVY -  
AIR FORCE - 82  
DLA - IS

NOTICE: When Government drawings, specifications or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have furnished, borrowed, or in any way supplied the said drawings, specifications, or other data is not to be interpreted as an admission of authority or in any manner binding the contractor in any other portion or interpretation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

REQUIREMENTS:

- 1. MATERIAL: CARBON STEEL PER MIL-S-7952 - NO CODE
- CORROSION RESISTANT STEEL PER MIL-S-5059, AMS 5510 OR AMS 5512. - C CODE
- ALUMINUM ALLOY 2024 (ALCLAD) PER QQ-A-250/5, CONDITION T3 OR T4 - D CODE
- BRASS PER QQ-B-613, COMPOSITION I OR II - B CODE
- 2. COATING: CADMIUM PLATE PER QQ-P-416, TYPE II, CLASS 2 (FOR CARBON STEEL ONLY) - NO CODE
- ANODIZE PER MIL-A-8625 - K CODE
- CHEMICAL SURFACE TREAT PER MIL-C-5541, CLASS 3 - J CODE
- BLACK OXIDE COAT PER MIL-C-13924 (FOR CRES ONLY) - X CODE
- NATURAL BRASS - NO CODE
- PASSIVATE PER QQ-P-35 (FOR UNCOATED CPES ONLY) - NO CODE
- ANODIZE PER MIL-A-8625 OR CHEM SURFACE TREAT PER MIL-C-5541, CLASS 1A - P CODE

DISCONTINUED/REPLACEMENT: Approved for public release, distribution is unlimited.  
NOTE: This drawing was prepared by joint action of the Air Force and Navy Divisions of the Air Force. Many drawings for this product. This drawing contains all applicable standard drawings for this product. The drawing is not a replacement for the standard drawings for this product. It is not a new drawing but is a replacement of the standard drawings for this product. It is not a replacement for the standard drawings for this product. It is not a replacement for the standard drawings for this product. It is not a replacement for the standard drawings for this product.

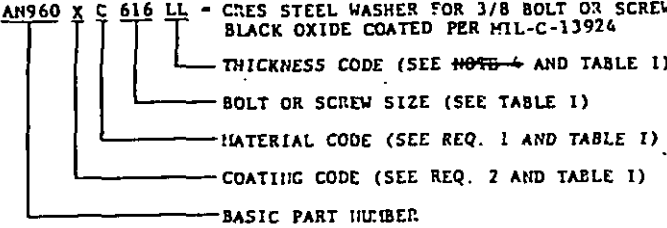
**21** INACTIVE FOR NEW DESIGN. NAS 1149 MAY BE SUBSTITUTED IN ALL APPLICATIONS.

**21** DENOTES CHANGES

P.A. NAVY-AS CUSTODIANS: ARMY-AV NAVY-AS AIR FORCE-99 PROCUREMENT SPECIFICATION FF-W-92	AIR FORCE-NAVY AERONAUTICAL STANDARD	AN 960  SHEET 1 OF 3
	WASHER, FLAT	

APPROVED 18 FEB 42      REVISED 16 14 DEC 81 17 31 JAN 83 18 20 JULY 84 19 31 JAN 86 20 1 APR 86 21 06 AUG 92

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.
2. DIMENSIONS IN INCHES - TOLERANCES ON THICKNESS:  
FOR ALUMINUM ALLOY WASHER:  
.016 + .003; .032 + .004; .042 + .004; .049 + .005;  
.063 ± .006; .090 ± .007.  
ALL OTHER MATERIALS: ± .010.
3. PARALLELISM AND FLATNESS:  
WASHER FACES SHALL BE PARALLEL WITHIN .002 INCH.  
WASHER FACES SHALL BE FLAT WITHIN:  
.007 INCH FOR SIZES UP TO AND INCLUDING THE 1/2 INCH SIZE.  
.010 INCH FOR 9/16 TO 1-1/4 INCH SIZES, INCLUSIVE AND  
.015 INCH FOR 1-5/16 INCH AND LARGER SIZES.
4. ~~THICKNESS CODES:~~  
~~REGULAR SERIES - NO CODE~~  
~~LIGHT SERIES - L CODE~~  
~~EXTRA LIGHT SERIES - LL CODE (DESIGNATES .016 THICKNESS WHERE L DESIGNATES .032 THICKNESS)~~  
~~MEDIUM SERIES - M CODE (DESIGNATES .032 THICKNESS WHERE L DESIGNATES .016 THICKNESS)~~
5. J CODE WASHERS ARE INTENDED FOR USE WHEN LOW ELECTRICAL RESISTANCE IS REQUIRED.
6. K CODE WASHERS ARE INTENDED FOR USE WHERE CORROSION PROTECTION IS THE PRIME CONSIDERATION.
7. P CODE WASHERS ARE REINSTATED FROM "CANCELLED" TO "INACTIVE FOR NEW DESIGN" AS OF 30 JUNE 1982. USE J OR K CODE WASHERS. P CODE WASHERS MAY BE USED UNTIL STOCK IS DEPLETED.
8. BRASS WASHERS ARE REINSTATED FROM "CANCELLED" TO "INACTIVE FOR NEW DESIGN", AS OF 30 JUNE 1982
9. NO. 2 THREAD SIZES ARE REINSTATED FROM "CANCELLED" TO "INACTIVE FOR NEW DESIGN" AS OF 30 JUNE 1982.
10. EXAMPLE OF PART NUMBER:  
AN960 X C 616 LL - CRES STEEL WASHER FOR 3/8 BOLT OR SCREW SIZE, .016 INCH THICK,  
BLACK OXIDE COATED PER MIL-C-13924  

11. MEDIUM SERIES - M CODE CANCELLED AFTER 20 JULY 1984

REV 16 PART NO. DESIGNATION:	SUPERSEDING REV 17 PART NO. DESIGNATION:
(a) AN960XC10LL AN960JD10LL AN960KD10LL AN960XC10L AN960JD10L AN960KD10L	(b) <del>AN960XC10L</del> <del>AN960JD10L</del> <del>AN960KD10L</del> <del>AN960XC10M</del> <del>AN960JD10M</del> <del>AN960KD10M</del>

(a) REINSTATED AFTER 20 JULY 1984  
(b) CANCELLED AFTER 20 JULY 1984

APPROVED 18 FEB 82 REVISED (21) FOR CHANGES SEE SHEET 1

P.A. NAVY-AS CUSTODIANS: ARMY-AV NAVY-AS AIR FORCE-99	AIR FORCE-NAVY AERONAUTICAL STANDARD	AN 960
	WASHER , FLAT	
PROCUREMENT SPECIFICATION FF-W-92		SHEET 2 OF 3

TABLE 1. WASHER DIMENSIONS AND DASH NUMBERS

FED. SUP CLASS  
5310

BOLT OR SCREW SIZE	A DIA .010	D +.070 -.005 DIA	T	DASH NUMBERS								
				CARBON STEEL	CORROSION RESISTANT STEEL		ALUMINUM ALLOY CHEMICAL CONVERSION COATING	ALUMINUM ALLOY ANODIZED SURFACES		TREATED SURFACES	UNTREATED	BRASS
					UNCOATED PASSIVATED C2L	COATED XC2L		KD2L	PD2L			
NO. 2	.099	.250	.016 .032	2L 2	C2L C2	XC2L XC2	JD2L JD2	KD2L KD2	PD2L PD2	U2L U2	B2	
NO. 3	.105	.250	.016 .032	3L 3	C3L C3	XC3L XC3	JD3L JD3	KD3L KD3	PD3L PD3	U3L U3	B3	
NO. 4	.125	.312	.016 .032	4L 4	C4L C4	XC4L XC4	JD4L JD4	KD4L KD4	PD4L PD4	U4L U4	B4	
NO. 5	.140	.438	.042	5	C5	XC5	JD5	KD5	PD5	U5	B5	
NO. 6	.149	.375	.016 .032	6L 6	C6L C6	XC6L XC6	JD6L JD6	KD6L KD6	PD6L PD6	U6L U6	B6	
NO. 8	.174	.375	.016 .032	8L 8	C8L C8	XC8L XC8	JD8L JD8	KD8L KD8	PD8L PD8	U8L U8	B8	
NO. 9	.188	.500	.049	9	C9	XC9	JD9	KD9	PD9	U9	B9	
NO. 10	.203	.438	.016 .032 .063	10L 10	C10L C10	XC10LL XC10L XC10	JD10LL JD10L JD10	KD10LL KD10L KD10	PD10L	U10L	B10	
NO. 11	.234	.625	.065	11	C11	XC11	JD11	KD11	PD11	U11	B11	
1/4	.265	.500	.016 .032 .063	416L 416	C416L C416	XC416L XC416	JD416L JD416	KD416L KD416	PD416L PD416	U416L U416	B416	
5/16	.328	.562	.016 .032 .063	516L 516	C516L C516	XC516L XC516	JD516L JD516	KD516L KD516	PD516L PD516	U516L U516	B516	
3/8	.390	.625	.016 .032 .063	616LL 616L 616	C616LL C616L C616	XC616LL XC616L XC616	JD616L JD616	KD616L KD616	PD616L PD616	U616L U616	B616	
7/16	.453	.750	.016 .032 .063	716L 716	C716L C716	XC716LL XC716L XC716	JD716L JD716	KD716L KD716	PD716L PD716	U716L U716	B716	
1/2	.515	.875	.016 .032 .063	816L 816	C816L C816	XC816L XC816	JD816L JD816	KD816L KD816	PD816L PD816	U816L U816	B816	
9/16	.578	1.062	.016 .032 .063	916L 916	C916L C916	XC916L XC916	JD916L JD916	KD916L KD916	PD916L PD916	U916L U916	B916	
5/8	.640	1.188	.016 .032 .063	1016L 1016	C1016L C1016	XC1016L XC1016	JD1016L JD1016	KD1016L KD1016	PD1016L PD1016	U1016L U1016	B1016	
3/4	.765	1.312	.016 .032 .090	1216L 1216	C1216L C1216	XC1216L XC1216	JD1216L JD1216	KD1216L KD1216	PD1216L PD1216	U1216L U1216	B1216	
7/8	.890	1.500	.016 .032 .090	1416L 1416	C1416L C1416	XC1416L XC1416	JD1416L JD1416	KD1416L KD1416	PD1416L PD1416	U1416L U1416	B1416	
1	1.015	1.750	.016 .032 .090	1616L 1616	C1616L C1616	XC1616L XC1616	JD1616L JD1616	KD1616L KD1616	PD1616L PD1616	U1616L U1616	B1616	
1-1/16	1.078	1.812	.016 .032 .090	1716L 1716	C1716L C1716	XC1716L XC1716	JD1716L JD1716	KD1716L KD1716	PD1716L PD1716	U1716L U1716	B1716	
1-1/8	1.140	1.875	.016 .032 .090	1816L 1816	C1816L C1816	XC1816L XC1816	JD1816L JD1816	KD1816L KD1816	PD1816L PD1816	U1816L U1816	B1816	
1-1/4	1.265	2.000	.016 .032 .090	2016L 2016	C2016L C2016	XC2016L XC2016	JD2016L JD2016	KD2016L KD2016	PD2016L PD2016	U2016L U2016	B2016	
1-5/16	1.328	2.062	.016 .032 .090	2116L 2116	C2116L C2116	XC2116L XC2116	JD2116L JD2116	KD2116L KD2116	PD2116L PD2116	U2116L U2116	B2116	
1-3/8	1.640	2.375	.016 .032 .090	2516L 2516	C2516L C2516	XC2516L XC2516	JD2516L JD2516	KD2516L KD2516	PD2516L PD2516	U2516L U2516	B2516	
1-7/8	1.890	2.625	.016 .032 .090	3016L 3016	C3016L C3016	XC3016L XC3016	JD3016L JD3016	KD3016L KD3016	PD3016L PD3016	U3016L U3016	B3016	
2-1/4	2.265	3.000	.016 .032 .090	3616L 3616	C3616L C3616	XC3616L XC3616	JD3616L JD3616	KD3616L KD3616	PD3616L PD3616	U3616L U3616	B3616	
2-1/2	2.515	3.250	.016 .032 .090	4016L 4016	C4016L C4016	XC4016L XC4016	JD4016L JD4016	KD4016L KD4016	PD4016L PD4016	U4016L U4016	B4016	

APPROVED 18 FEB 42 REVISED 21 FOR CHANGES SEE SHEET 1

P.A.:  
NAVY-AS  
CUSTODIANS:  
ARMY-AV  
NAVY-AS  
AIR FORCE-99  
PROCUREMENT SPECIFICATION  
FF-N-99

AIR FORCE-NAVY AERONAUTICAL STANDARD  
WASHER, FLAT

AN 960

SHEET 3 OF 3