

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
1250 EYE STREET, N.W.
WASHINGTON, D.C. 20006

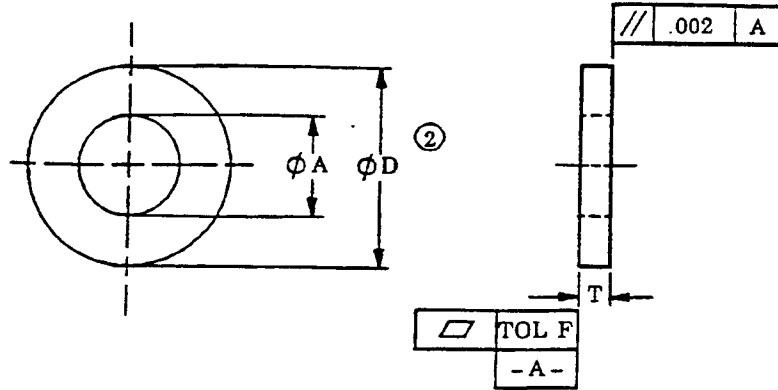


TABLE I

SIZE OR NOM DIA	ϕA $\pm .010$	ϕD $+.020$ $-.005$	SIZE AND THICKNESS CODE							F MAX
			T THICKNESS							
			.016	.032	.042 (a)	.049 (a)	.063	.065 (a)	.090	
(c) NO. 0	.068	.188	N016	N032	(b)	(b)	(b)	(b)	(b)	.007
(a) NO. 2	.099	.250	N216	N232	(b)	(b)	(b)	(b)	(b)	
(a) NO. 3	.105	.250	N316	N332	(b)	(b)	(b)	(b)	(b)	
(a) NO. 4	.125	.312	N416	N432	(b)	(b)	(b)	(b)	(b)	
NO. 5	.140	.438	N516	N532	N542	(b)	(b)	(b)	(b)	
NO. 6	.149	.375	N616	N632	(b)	(b)	(b)	(b)	(b)	
NO. 8	.174	.375	N816	N832	(b)	(b)	(b)	(b)	(b)	
(a) NO. 9	.188	.500	(b)	(b)	(b)	N949	(b)	(b)	(b)	
NO. 10	.203	.438	0316	0332	(b)	(b)	0363	(b)	(b)	
(a) NO. 11	.234	.625	(b)	(b)	(b)	(b)	(b)	1165	(b)	
	.250	.265	.500	0416	0432	(b)	(b)	0463	(b)	.010
	.312	.328	.562	0516	0532	(b)	(b)	0563	(b)	
	.375	.390	.625	0616	0632	(b)	(b)	0663	(b)	
	.437	.453	.750	0716	0732	(b)	(b)	0763	(b)	
	.500	.515	.875	0816	0832	(b)	(b)	0863	(b)	
	.562	.578	1.062	0916	0932	(b)	(b)	0963	(b)	
	.625	.640	1.188	1016	1032	(b)	(b)	1063	(b)	
	.750	.765	1.312	1216	1232	(b)	(b)	(b)	1290	
	.875	.890	1.500	1416	1432	(b)	(b)	(b)	1490	
	1.000	1.015	1.750	1616	1632	(b)	(b)	(b)	1690	
	1.062	1.078	1.812	1716	1732	(b)	(b)	(b)	1790	
	1.125	1.140	1.875	1816	1832	(b)	(b)	(b)	1890	
	1.250	1.265	2.000	2016	2032	(b)	(b)	(b)	2090	
	1.312	1.328	2.062	2116	2132	(b)	(b)	(b)	2190	
	1.375	1.390	2.125	2216	2232	(b)	(b)	(b)	2290	
	1.500	1.515	2.250	2416	2432	(b)	(b)	(b)	2490	
	1.625	1.640	2.375	2616	2632	(b)	(b)	(b)	2690	
	1.875	1.890	2.625	3016	3032	(b)	(b)	(b)	3090	
	2.250	2.265	3.000	3616	3632	(b)	(b)	(b)	3690	
	2.500	2.515	3.250	4016	4032	(b)	(b)	(b)	4090	

- (a) SEE NOTE 7.
- (b) OVERCODING OF PART NUMBERS TO SPECIFY WASHER SIZES NOT LISTED IN THIS STANDARD IS PROHIBITED.
- (c) TOLERANCE: ϕA AND ϕD $+.000 - .005$

LIST OF CURRENT SHEETS

SHT.	REV.
1	2
2	2
3	1
4	NEW
5	NEW
6	NEW

THIS DRAWING SUPERSEDES ALL ANTECEDENT STANDARD DRAWINGS FOR THE SAME PRODUCT AND SHALL BECOME EFFECTIVE NO LATER THAN SIX MONTHS FROM THE LAST DATE OF APPROVAL SHOWN HEREON.

CUSTODIAN NATIONAL AEROSPACE STANDARDS COMMITTEE		THIRD ANGLE PROJECTION
PROCUREMENT SPECIFICATION NONE	TITLE WASHER, FLAT	CLASSIFICATION STANDARD PART
		NAS1149
SHEET 1 OF 6		

USE OF OR RELIANCE UPON THIS DOCUMENT OR ANY NATIONAL AEROSPACE STANDARD IS ENTIRELY VOLUNTARY. AIA DOES NOT QUALIFY SUPPLIERS OR CERTIFY PERFORMANCE OF ITEMS PROCURED UNDER NATIONAL AEROSPACE STANDARDS. AIA MAKES NO REPRESENTATION OR CLAIM RESPECTING (1) THE SUITABILITY OF ITEMS FOR ANY PARTICULAR APPLICATION, OR (2) THE EXISTENCE OF OR APPLICABILITY THERETO OF PATENT OR TRADEMARK RIGHTS.

APPROVAL DATE MARCH 1990 REVISION 1 9 OCTOBER 1991 2 29 APRIL 1994



TABLE II

MATERIAL			FINISH		
MATERIAL	SPECIFICATION	CODE	FINISH	SPECIFICATION	CODE
ALLOY STEEL	4130 (UNS G41300) PER MIL-S-18729, COND N (90 KSI MIN UTS)	G	CADMIUM PLATE	QQ-P-416, TYPE II, CLASS 2	P
ALUMINUM ALLOY	2024-T3 (UNS A82024) PER QQ-A-250/5 (58 KSI MIN UTS)	D	NONE	N/A	H
			ANODIZE	MIL-A-8625, CLASS 2 (ELECTRICALLY NON-CONDUCTIVE)	K
			CHEMICAL TREAT	MIL-C-5541, CLASS 3 (ELECTRICALLY CONDUCTIVE)	J
BRASS	COOPER ALLOY NO. 260 (UNS C26000) OR 268 (UNS C26800) PER ASTM B36 (49 KSI MIN UTS)	B	NONE	N/A	H
CARBON STEEL	1020 (UNS G10200) OR 1025 (UNS G10250) PER MIL-S-7952 OR 1025 (UNS K02500) PER ASTM A109, TEMPER 2 (55 KSI MIN UTS)	F	BLACK OXIDE	MIL-C-13924	B
			CADMIUM PLATE	QQ-P-416, TYPE II, CLASS 2	P
CORROSION RESISTANT STEEL (CRES)	.016 THICKNESS ONLY: 301 (UNS 30100) PER MIL-S-5059, 1/4 HARD (125 KSI MIN UTS) ALL OTHER THICKNESSES: 300 SERIES (UNS S30100, S30200, S30400, OR S31600) PER MIL-S-5059, ANNEALED, 321 (UNS S32100) PER AMS 5510 OR 347 (UNS S34700) PER AMS 5512 (75 KSI MIN UTS)	C	BLACK OXIDE	MIL-C-13924	B
			PASSIVATE	QQ-P-35	R
	A286 (UNS S66286) PER AMS 5525 (160 KSI MIN UTS)	E	CADMIUM PLATE	QQ-P-416, TYPE II, CLASS 2	P
TITANIUM	COMMERCIALLY PURE (UNS R50700) UNALLOYED PER MIL-T-9046, CLASS CP-1 OR AMS 4901 (80 KSI MIN UTS)	T	NONE	N/A	H
			ANODIZE	AMS 2483, TYPE 2; COLOR DEEP BLUE	L
	6AL-4V (UNS R56400) ALLOY PER MIL-T-9046, CLASS AB-1, AMS 4911 OR AMS 4928, SOLUTION TREATED AND AGED TO 160 KSI MIN UTS	V	NONE	N/A	H
			ANODIZE	AMS 2488, TYPE 2; COLOR BLUE -VIOLET	M
			OR DYED	PERMANENT, NON-DETRIMENTAL COLOR LIGHT BLUE	

(a) SEE NOTE 7.

NAS1149

SHEET 2

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APPROVAL DATE MARCH 1990 (1) 9 OCTOBER 1981 (2) 29 APRIL 1994



TABLE III

THICKNESS	.016	.032	.042 (a)	.049 (a)	.063	.065 (a)	.090
MATERIAL	TOLERANCE						
ALLOY STEEL	±.002	±.003	±.004	±.004	±.005	±.005	±.006
ALUMINUM ALLOY	±.003	±.004	±.004	±.005	±.006	±.006	±.007
BRASS	±.005	±.006	±.007	±.007	±.008	±.008	±.010
CARBON STEEL	±.002	±.003	±.004	±.004	±.004	±.004	±.004
CRES	±.002	±.004	±.005	±.005	±.006	±.006	±.008
TITANIUM	±.002	±.004	±.005	±.005	±.006	±.006	±.008

(a) SEE NOTE 7.

EXAMPLE OF PART NUMBER:

NAS1149 D 0432 K

DOCUMENT NUMBER _____ FINISH CODE (SEE TABLE II)
 MATERIAL CODE _____ SIZE AND THNICKNESS CODE (SEE TABLE I)
 (SEE TABLE II)

NAS1149D0432K = ALUMINUM WASHER, ANODIZE FINISH, .250 NOMINAL DIAMETER, .032 THICK
 NAS1149BN816H = BRASS WASHER, NO FINISH, NO. 8 SIZE, .016 THICK.
 NAS1149F1290B = CARBON STEEL WASHER, BLACK OXIDE FINISH, .750 NOMINAL DIAMETER, .090 THICK.

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.
2. DIMENSIONS ARE IN INCHES.
3. SURFACE TEXTURE REQUIREMENTS PER ANSI/ASME B46.1. UNLESS OTHERWISE SPECIFIED, SURFACES TO BE 125 MICROINCHES.
4. CONCENTRICITY: THE INSIDE AND OUTSIDE DIAMETER SHALL BE CONCENTRIC WITHIN THE TOLERANCE OF THE INSIDE DIAMETER.
5. GEOMETRIC TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M.
- ① 6. COLORING: FOR IDENTIFICATION, CP AND 6AL-4V TITANIUM MAY BE COLORED. LOCAL DISCOLORATION IS PERMITTED WHERE WASHER MAKES CONTACT WITH WIRE WHICH SUSPENDS WASHER IN SOLUTION.
- ① 7. THIS STANDARD PROVIDES SUBSTITUTES FOR ALL AN960 WASHERS, REVISION 20 AND SUBSEQUENT REGARDLESS OF STATUS. CAUTION SHOULD BE EXERCISED WHEN SPECIFYING PREVIOUSLY INACTIVE SIZES, MATERIALS OR FINISHES ON NEW DESIGN. SEE TABLE IV FOR INTERCHANGEABILITY.
8. MAGNETIC PERMEABILITY OF CORROSION RESISTANT STEEL SHALL BE LESS THAN 2.0 (AIR = 1.0) FOR A FIELD STRENGTH H = 200 OERSTEDS USING MAGNETIC PERMEABILITY INDICATOR PER ASTM A342.
9. SAMPLING: A RANDOM SAMPLE OF WASHERS SHALL BE SELECTED FROM EACH LOT IN ACCORDANCE WITH MIL-STD-105 AND INSPECTED AS FOLLOWS:
 - (1) EXAMINATION: THE SAMPLE SELECTED SHALL BE VISUALLY EXAMINED FOR MATERIAL, PROTECTIVE FINISH, DIMENSIONS, AND WORKMANSHIP (SEE NOTE 1). CORROSION RESISTANT STEEL WASHERS SHALL BE CHECKED FOR MAGNETIC PERMEABILITY (SEE NOTE 8). ANY WASHERS CONTAINING ONE OR MORE DEFECTS SHALL BE REJECTED. IF THE NUMBER OF DEFECTIVE WASHERS EXCEED THE ACCEPTABLE QUALITY LEVEL (AQL) OF 4.0 PERCENT PER MIL-STD-105 INSPECTION LEVEL S-2, THE LOT REPRESENTED BY THE SAMPLE SHALL BE REJECTED.
 - (2) TESTS: TESTS AND AQL'S FOR ALL PROTECTIVE FINISHES EXCEPT ANODIZED TITANIUM SHALL BE IN ACCORDANCE WITH THEIR APPLICABLE FINISH SPECIFICATION'S SAMPLING REQUIREMENTS. TITANIUM WASHERS SHALL BE TESTED IN ACCORDANCE WITH SECTION 4.5 OF AMS 2488. ANY WASHER CONTAINING ONE OR MORE DEFECTS SHALL BE REJECTED. IF THE NUMBER OF DEFECTIVE WASHERS EXCEED AN AQL OF 2.5 PERCENT PER MIL-STD-105 INSPECTION LEVEL S-1, THE LOT REPRESENTED BY THE SAMPLE SHALL BE REJECTED.
10. PACKAGING AND PACKING: PACKAGING SHALL BE LEVEL A OR C AND PACKING SHALL BE LEVEL A, B, OR C IN ACCORDANCE WITH PPP-H-1581.
11. MARKING: IN ADDITION TO MARKING REQUIRED BY PURCHASE ORDER, ALL INTERIOR PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129.

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NAS1149

SHEET 3



**TABLE IV INTERCHANGEABILITY
AFTER 6 AUGUST 1992, AN960 WASHERS ARE INACTIVE FOR
NEW DESIGN. EXISTING STOCK MAY BE USED UNTIL
DEPLETED. SUBSTITUTION SHALL BE IN ACCORDANCE
WITH THE FOLLOWING TABLE.**

PART NUMBERS					
INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER	INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER	INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER
AN960-2L	NAS1149FN216P	AN960C2L	NAS1149CN216R	AN960XC2L	NAS1149CN216B
AN960-2	NAS1149FN232P	AN960C2	NAS1149CN232R	AN960XC2	NAS1149CN232B
AN960-3L	NAS1149FN316P	AN960C3L	NAS1149CN316R	AN960XC3L	NAS1149CN316B
AN960-3	NAS1149FN332P	AN960C3	NAS1149CN332R	AN960XC3	NAS1149CN332B
AN960-4L	NAS1149FN416P	AN960C4L	NAS1149CN416R	AN960XC4L	NAS1149CN416B
AN960-4	NAS1149FN432P	AN960C4	NAS1149CN432R	AN960XC4	NAS1149CN432B
AN960-5	NAS1149FN542P	AN960C5	NAS1149CN542R	AN960XC5	NAS1149CN542B
AN960-6L	NAS1149FN616P	AN960C6L	NAS1149CN616R	AN960XC6L	NAS1149CN616B
AN960-6	NAS1149FN632P	AN960C6	NAS1149CN632R	AN960XC6	NAS1149CN632B
AN960-8L	NAS1149FN816P	AN960C8L	NAS1149CN816R	AN960XC8L	NAS1149CN816B
AN960-8	NAS1149FN832P	AN960C8	NAS1149CN832R	AN960XC8	NAS1149CN832B
AN960-9	NAS1149FN949P	AN960C9	NAS1149CN949R	AN960XC9	NAS1149CN949B
AN960-10L	NAS1149F0332P	AN960C10L	NAS1149C0332R	AN960XC10LL	NAS1149C0316B
AN960-10	NAS1149F0363P	AN960C10	NAS1149C0363R	AN960XC10L	NAS1149C0332B
AN960-11	NAS1149F1165P	AN960C11	NAS1149C1165R	AN960XC10	NAS1149C0363B
AN960-416L	NAS1149F0432P	AN960C416L	NAS1149C0432R	AN960XC11	NAS1149C1165B
AN960-416	NAS1149F0463P	AN960C416	NAS1149C0463R	AN960XC416L	NAS1149C0432B
AN960-516L	NAS1149F0532P	AN960C516L	NAS1149C0532R	AN960XC416	NAS1149C0463B
AN960-516	NAS1149F0563P	AN960C516	NAS1149C0563R	AN960XC516L	NAS1149C0532B
AN960-616LL	NAS1149F0616P	AN960C616LL	NAS1149C0616R	AN960XC516	NAS1149C0563B
AN960-616L	NAS1149F0632P	AN960C616L	NAS1149C0632R	AN960XC616LL	NAS1149C0616B
AN960-616	NAS1149F0663P	AN960C616	NAS1149C0663R	AN960XC616L	NAS1149C0632B
AN960-716L	NAS1149F0732P	AN960C716L	NAS1149C0732R	AN960XC616	NAS1149C0663B
AN960-716	NAS1149F0763P	AN960C716	NAS1149C0763R	AN960XC716LL	NAS1149C0716B
AN960-816L	NAS1149F0832P	AN960C816L	NAS1149C0832R	AN960XC716L	NAS1149C0732B
AN960-816	NAS1149F0863P	AN960C816	NAS1149C0863R	AN960XC716	NAS1149C0763B
AN960-916L	NAS1149F0932P	AN960C916L	NAS1149C0932R	AN960XC816L	NAS1149C0832B
AN960-916	NAS1149F0963P	AN960C916	NAS1149C0963R	AN960XC816	NAS1149C0863B
AN960-1016L	NAS1149F1032P	AN960C1016L	NAS1149C1032R	AN960XC916L	NAS1149C0932B
AN960-1016	NAS1149F1063P	AN960C1016	NAS1149C1063R	AN960XC916	NAS1149C0963B
AN960-1216L	NAS1149F1232P	AN960C1216L	NAS1149C1232R	AN960XC1016L	NAS1149C1032B
AN960-1216	NAS1149F1290P	AN960C1216	NAS1149C1290R	AN960XC1016	NAS1149C1063B
AN960-1416L	NAS1149F1432P	AN960C1416L	NAS1149C1432R	AN960XC1216L	NAS1149C1232B
AN960-1416	NAS1149F1490P	AN960C1416	NAS1149C1490R	AN960XC1216	NAS1149C1290B
AN960-1616L	NAS1149F1632P	AN960C1616L	NAS1149C1632R	AN960XC1416L	NAS1149C1432B
AN960-1616	NAS1149F1690P	AN960C1616	NAS1149C1690R	AN960XC1416	NAS1149C1490B
AN960-1716L	NAS1149F1732P	AN960C1716	NAS1149C1732R	AN960XC1616L	NAS1149C1632B
AN960-1716	NAS1149F1790P	AN960C1816	NAS1149C1890R	AN960XC1616	NAS1149C1690B
AN960-1816L	NAS1149F1832P	AN960C2016	NAS1149C2090R	AN960XC1716	NAS1149C1790B
AN960-1816	NAS1149F1890P	AN960C2116	NAS1149C2190R	AN960XC1816	NAS1149C1890B
AN960-2016L	NAS1149F2032P	AN960C2616	NAS1149C2690R	AN960XC2016	NAS1149C2090B
AN960-2016	NAS1149F2090P	AN960C3016	NAS1149C3090R	AN960XC2116	NAS1149C2190B
AN960-2116L	NAS1149F2132P	AN960C3616	NAS1149C3690R	AN960XC2616	NAS1149C2690B
AN960-2116	NAS1149F2190P	AN960C4016	NAS1149C4090R	AN960XC3016	NAS1149C3090B
AN960-2616L	NAS1149F2632P			AN960XC3616	NAS1149C3690B
AN960-2616	NAS1149F2690P			AN960XC4016	NAS1149C4090B
AN960-3016L	NAS1149F3032P				
AN960-3016	NAS1149F3090P				
AN960-3616L	NAS1149F3632P				
AN960-3616	NAS1149F3690P				
AN960-4016L	NAS1149F4032P				
AN960-4016	NAS1149F4090P				

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APPROVAL DATE APRIL 1994 REVISION

NAS1149
SHEET 4

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TABLE IV INTERCHANGEABILITY (CONTINUED)
AFTER 6 AUGUST 1992, AN960 WASHERS ARE INACTIVE
FOR NEW DESIGN. EXISTING STOCK MAY BE USED UNTIL
DEPLETED. SUBSTITUTION SHALL BE IN ACCORDANCE
WITH THE FOLLOWING TABLE.

PART NUMBERS					
INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER	INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER	INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER
AN960JD2L	NAS1149DN216J	AN960B2	NAS1149BN232H	AN960KD2L	NAS1149DN216K
AN960JD2	NAS1149DN232J	AN960B3	NAS1149BN332H	AN960KD2	NAS1149DN232K
AN960JD3L	NAS1149DN316J	AN960B4	NAS1149BN432H	AN960KD3L	NAS1149DN316K
AN960JD3	NAS1149DN332J	AN960B5	NAS1149BN542H	AN960KD3	NAS1149DN332K
AN960JD4L	NAS1149DN416J	AN960B6	NAS1149BN632H	AN960KD4L	NAS1149DN416K
AN960JD4	NAS1149DN432J	AN960B8	NAS1149BN832H	AN960KD4	NAS1149DN432K
AN960JD5	NAS1149DN542J	AN960B9	NAS1149BN949H	AN960KD5	NAS1149DN542K
AN960JD6L	NAS1149DN616J	AN960B10	NAS1149B0363H	AN960KD6L	NAS1149DN616K
AN960JD6	NAS1149DN632J	AN960B11	NAS1149B1165H	AN960KD6	NAS1149DN632K
AN960JD8L	NAS1149DN816J	AN960B416	NAS1149B0463H	AN960KD8L	NAS1149DN816K
AN960JD8	NAS1149DN832J	AN960B516	NAS1149B0563H	AN960KD8	NAS1149DN832K
AN960JD9	NAS1149DN949J	AN960B616	NAS1149B0663H	AN960KD9	NAS1149DN949K
AN960JD10LL	NAS1149D0316J	AN960B716	NAS1149B0763H	AN960KD10LL	NAS1149D0316K
AN960JD10L	NAS1149D0332J	AN960B816	NAS1149B0863H	AN960KD10L	NAS1149D0332K
AN960JD10	NAS1149D0363J	AN960B916	NAS1149B0963H	AN960KD10	NAS1149D0363K
AN960JD11	NAS1149D1165J	AN960B1016	NAS1149B1063H	AN960KD11	NAS1149D1165K
AN960JD416L	NAS1149D0416J	AN960B1216	NAS1149B1290H	AN960KD416L	NAS1149D0416K
AN960JD416	NAS1149D0463J	AN960B1416	NAS1149B1490H	AN960KD416	NAS1149D0463K
AN960JD516L	NAS1149D0516J	AN960B1616	NAS1149B1690H	AN960KD516L	NAS1149D0516K
AN960JD516	NAS1149D0563J	AN960B1716	NAS1149B1790H	AN960KD516	NAS1149D0563K
AN960JD616L	NAS1149D0616J	AN960B1816	NAS1149B1890H	AN960KD616L	NAS1149D0616K
AN960JD616	NAS1149D0663J	AN960B2016	NAS1149B2090H	AN960KD616	NAS1149D0663K
AN960JD716L	NAS1149D0716J	AN960B2116	NAS1149B2190H	AN960KD716L	NAS1149D0716K
AN960JD716	NAS1149D0763J	AN960B2616	NAS1149B2690H	AN960KD716	NAS1149D0763K
AN960JD816L	NAS1149D0816J	AN960B3016	NAS1149B3090H	AN960KD816L	NAS1149D0816K
AN960JD816	NAS1149D0863J	AN960B3616	NAS1149B3690H	AN960KD816	NAS1149D0863K
AN960JD916L	NAS1149D0916J	AN960B4016	NAS1149B4090H	AN960KD916L	NAS1149D0916K
AN960JD916	NAS1149D0963J			AN960KD916	NAS1149D0963K
AN960JD1016L	NAS1149D1016J			AN960KD1016L	NAS1149D1016K
AN960JD1016	NAS1149D1063J			AN960KD1016	NAS1149D1063K
AN960JD1216L	NAS1149D1216J			AN960KD1216L	NAS1149D1216K
AN960JD1216	NAS1149D1290J			AN960KD1216	NAS1149D1290K
AN960JD1416L	NAS1149D1416J			AN960KD1416L	NAS1149D1416K
AN960JD1416	NAS1149D1490J			AN960KD1416	NAS1149D1490K
AN960JD1616L	NAS1149D1616J			AN960KD1616L	NAS1149D1616K
AN960JD1616	NAS1149D1690J			AN960KD1616	NAS1149D1690K
AN960JD1716L	NAS1149D1716J			AN960KD1716L	NAS1149D1716K
AN960JD1716	NAS1149D1790J			AN960KD1716	NAS1149D1790K
AN960JD1816L	NAS1149D1816J			AN960KD1816L	NAS1149D1816K
AN960JD1816	NAS1149D1890J			AN960KD1816	NAS1149D1890K
AN960JD2016L	NAS1149D2016J			AN960KD2016L	NAS1149D2016K
AN960JD2016	NAS1149D2090J			AN960KD2016	NAS1149D2090K
AN960JD2116L	NAS1149D2116J			AN960KD2116L	NAS1149D2116K
AN960JD2116	NAS1149D2190J			AN960KD2116	NAS1149D2190K
AN960JD2616L	NAS1149D2616J			AN960KD2616L	NAS1149D2616K
AN960JD2616	NAS1149D2690J			AN960KD2616	NAS1149D2690K
AN960JD3016L	NAS1149D3016J			AN960KD3016L	NAS1149D3016K
AN960JD3016	NAS1149D3090J			AN960KD3016	NAS1149D3090K
AN960JD3616L	NAS1149D3616J			AN960KD3616L	NAS1149D3616K
AN960JD3616	NAS1149D3690J			AN960KD3616	NAS1149D3690K
AN960JD4016L	NAS1149D4016J			AN960KD4016L	NAS1149D4016K
AN960JD4016	NAS1149D4090J			AN960KD4016	NAS1149D4090K

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TABLE IV INTERCHANGEABILITY (CONCLUDED)
AFTER 6 AUGUST 1992, AN960 WASHERS ARE INACTIVE FOR
NEW DESIGN. EXISTING STOCK MAY BE USED UNTIL
DEPLETED. SUBSTITUTION SHALL BE IN ACCORDANCE
WITH THE FOLLOWING TABLE.

PART NUMBERS					
INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER	INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER	INACTIVE PART NUMBER	SUBSTITUTE PART NUMBER
AN960PD2L	NAS1149DN216J	AN960PD2L	NAS1149DN216K	AN960D2L	NAS1149DN216H
AN960PD2	NAS1149DN232J	AN960PD2	NAS1149DN232K	AN960D2	NAS1149DN232H
AN960PD3L	NAS1149DN316J	AN960PD3L	NAS1149DN316K	AN960D3L	NAS1149DN316H
AN960PD3	NAS1149DN332J	AN960PD3	NAS1149DN332K	AN960D3	NAS1149DN332H
AN960PD4L	NAS1149DN416J	AN960PD4L	NAS1149DN416K	AN960D4L	NAS1149DN416H
AN960PD4	NAS1149DN432J	AN960PD4	NAS1149DN432K	AN960D4	NAS1149DN432H
AN960PD5	NAS1149DN542J	AN960PD5	NAS1149DN542K	AN960D5	NAS1149DN542H
AN960PD6L	NAS1149DN616J	AN960PD6L	NAS1149DN616K	AN960D6L	NAS1149DN616H
AN960PD6	NAS1149DN632J	AN960PD6	NAS1149DN632K	AN960D6	NAS1149DN632H
AN960PD8L	NAS1149DN816J	AN960PD8L	NAS1149DN816K	AN960D8L	NAS1149DN816H
AN960PD8	NAS1149DN832J	AN960PD8	NAS1149DN832K	AN960D8	NAS1149DN832H
AN960PD9	NAS1149DN949J	AN960PD9	NAS1149DN949K	AN960D9	NAS1149DN949H
AN960PD10L	NAS1149D0316J	AN960PD10L	NAS1149D0316K	AN960D10L	NAS1149D0316H
AN960PD10	NAS1149D0363J	AN960PD10	NAS1149D0363K	AN960D10	NAS1149D0363H
AN960PD11	NAS1149D1165J	AN960PD11	NAS1149D1165K	AN960D11	NAS1149D1165H
AN960PD416L	NAS1149D0416J	AN960PD416L	NAS1149D0416K	AN960D416L	NAS1149D0416H
AN960PD416	NAS1149D0463J	AN960PD416	NAS1149D0463K	AN960D416	NAS1149D0463H
AN960PD516L	NAS1149D0516J	AN960PD516L	NAS1149D0516K	AN960D516L	NAS1149D0516H
AN960PD516	NAS1149D0563J	AN960PD516	NAS1149D0563K	AN960D516	NAS1149D0563H
AN960PD616L	NAS1149D0616J	AN960PD616L	NAS1149D0616K	AN960D616L	NAS1149D0616H
AN960PD616	NAS1149D0663J	AN960PD616	NAS1149D0663K	AN960D616	NAS1149D0663H
AN960PD716L	NAS1149D0716J	AN960PD716L	NAS1149D0716K	AN960D716L	NAS1149D0716H
AN960PD716	NAS1149D0763J	AN960PD716	NAS1149D0763K	AN960D716	NAS1149D0763H
AN960PD816L	NAS1149D0816J	AN960PD816L	NAS1149D0816K	AN960D816L	NAS1149D0816H
AN960PD816	NAS1149D0863J	AN960PD816	NAS1149D0863K	AN960D816	NAS1149D0863H
AN960PD916L	NAS1149D0916J	AN960PD916L	NAS1149D0916K	AN960D916L	NAS1149D0916H
AN960PD916	NAS1149D0963J	AN960PD916	NAS1149D0963K	AN960D916	NAS1149D0963H
AN960PD1016L	NAS1149D1016J	AN960PD1016L	NAS1149D1016K	AN960D1016L	NAS1149D1016H
AN960PD1016	NAS1149D1063J	AN960PD1016	NAS1149D1063K	AN960D1016	NAS1149D1063H
AN960PD1216L	NAS1149D1216J	AN960PD1216L	NAS1149D1216K	AN960D1216L	NAS1149D1216H
AN960PD1216	NAS1149D1290J	AN960PD1216	NAS1149D1290K	AN960D1216	NAS1149D1290H
AN960PD1416L	NAS1149D1416J	AN960PD1416L	NAS1149D1416K	AN960D1416L	NAS1149D1416H
AN960PD1416	NAS1149D1490J	AN960PD1416	NAS1149D1490K	AN960D1416	NAS1149D1490H
AN960PD1616L	NAS1149D1616J	AN960PD1616L	NAS1149D1616K	AN960D1616L	NAS1149D1616H
AN960PD1616	NAS1149D1690J	AN960PD1616	NAS1149D1690K	AN960D1616	NAS1149D1690H
AN960PD1716L	NAS1149D1716J	AN960PD1716L	NAS1149D1716K	AN960D1716L	NAS1149D1716H
AN960PD1716	NAS1149D1790J	AN960PD1716	NAS1149D1790K	AN960D1716	NAS1149D1790H
AN960PD1816L	NAS1149D1816J	AN960PD1816L	NAS1149D1816K	AN960D1816L	NAS1149D1816H
AN960PD1816	NAS1149D1890J	AN960PD1816	NAS1149D1890K	AN960D1816	NAS1149D1890H
AN960PD2016L	NAS1149D2016J	AN960PD2016L	NAS1149D2016K	AN960D2016L	NAS1149D2016H
AN960PD2016	NAS1149D2090J	AN960PD2016	NAS1149D2090K	AN960D2016	NAS1149D2090H
AN960PD2116L	NAS1149D2116J	AN960PD2116L	NAS1149D2116K	AN960D2116L	NAS1149D2116H
AN960PD2116	NAS1149D2190J	AN960PD2116	NAS1149D2190K	AN960D2116	NAS1149D2190H
AN960PD2616L	NAS1149D2616J	AN960PD2616L	NAS1149D2616K	AN960D2616L	NAS1149D2616H
AN960PD2616	NAS1149D2690J	AN960PD2616	NAS1149D2690K	AN960D2616	NAS1149D2690H
AN960PD3016L	NAS1149D3016J	AN960PD3016L	NAS1149D3016K	AN960D3016L	NAS1149D3016H
AN960PD3016	NAS1149D3090J	AN960PD3016	NAS1149D3090K	AN960D3016	NAS1149D3090H
AN960PD3616L	NAS1149D3616J	AN960PD3616L	NAS1149D3616K	AN960D3616L	NAS1149D3616H
AN960PD3616	NAS1149D3690J	AN960PD3616	NAS1149D3690K	AN960D3616	NAS1149D3690H
AN960PD4016L	NAS1149D4016J	AN960PD4016L	NAS1149D4016K	AN960D4016L	NAS1149D4016H
AN960PD4016	NAS1149D4090J	AN960PD4016	NAS1149D4090K	AN960D4016	NAS1149D4090H

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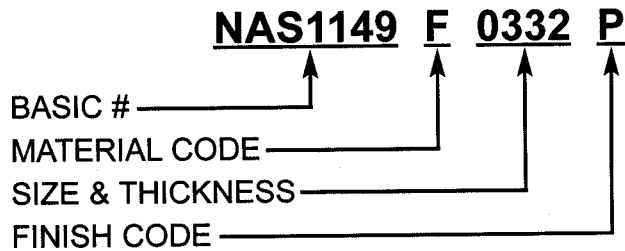
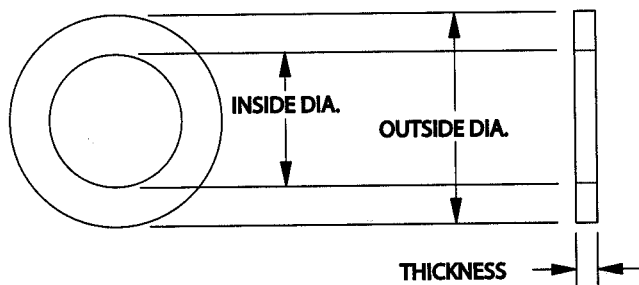
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Genuine Aircraft Hardware Co.

Washers Aircraft

NAS1149 Series, Replaces AN960 Series

See next page for Crossover Chart



MATERIAL SPECIFICATION	CODE	FINISH SPECIFICATION (color)	CODE
300 STAINLESS, (75 KSI MN UTS) .032 thru .090	C	PASSIVATE per QQ-P-35 (plain)	R
301 STAINLESS, (125 KSI MN UTS) .016 ONLY	C	PASSIVATE per QQ-P-35 (plain)	R
2024 T3 ALUMNUM (58 KSI MN UTS)	D	CHEMICAL TREAT per MIL-C-5541 Class 3, Conductive (gold)	J
2024 T3 ALUMNUM (58 KSI MN UTS)	D	ANODIZE per MIL-A-8625 Class 2, non conductive (gray)	K
2024 T3 ALUMNUM (58 KSI MN UTS)	D	NONE, (natural appearance of material)	H
A286 HIGH TEMP STAINLESS, (160 KSI MN UTS)	E	CADMIUM PLATE per QQ-P-416, Type II Class 2, (gold)	P
A286 HIGH TEMP STAINLESS, (160 KSI MN UTS)	E	PASSIVATE per QQ-P-35 (plain)	R
1020 CARBON STEEL, (55 KSI MN UTS)	F	CADMIUM PLATE per QQ-P-416, Type II Class 2, (gold)	P
4130 ALLOY STEEL, (90 KSI MN UTS)	G	CADMIUM PLATE per QQ-P-416, Type II Class 2, (gold)	P

Important Note: When asking for washers to fit most screws, see nominal I.D.s that start with (#) / For bolts see fractional I.D.'s
 I.E. a 3/8" bolt does **NOT USE** a #6 washer Many washers are ordered incorrectly such as when ordering as a washer that will fit a #4 bolt instead of a 1/4" bolt.

Fastener Type	NOMINAL INSIDE DIA.	INSIDE DIA. + or - .010	OUTSIDE DIA. +.020, -.005	SIZE AND THICKNESS NUMBER			
				.016 Thick	.032 Thick	.063 Thick	.090 Thick
SCREWS	# 2	.099	0.25	N216	N232		
	# 3	.105	.250	N316	N332		
	# 4	.125	.312	N416	N432		
	# 5	.140	.438	N516	N532	N542 (.042 Thickness)	
	# 6	.149	.375	N616	N632		
	# 8	.174	.375	N816	N832		
	# 9	.188	.500	N949 (.049 Thickness)			
	# 10 or 3/16	.203	.438	0316	0332	0363	
	# 11	.234	.625	N1165 (.065 Thickness)			
	1/4	.265	.500	0416	0432	0463	
	BOLTS	5/16	.328	.562	0516	0532	0563
3/8		.390	.625	0616	0632	0663	
7/16		.453	.750	0716	0732	0763	
1/2		.515	.875	0816	0832	0863	
9/16		.578	1.062	0916	0932	0963	
5/8		.640	1.188	1016	1032	1063	
3/4		.765	1.312	1216	1232		1290
7/8		.890	1.500	1416	1432		1490
1"		1.015	1.750	1616	1632		1690
1 1/16		1.078	1.812	1716	1732		1790
1 1/8		1.140	1.875	1816	1832		1890
1 1/4	1.265	2.000	2016	2032		2090	

Genuine Aircraft Hardware Co.

Cross Reference Chart

AN960 to NAS1149 Washers

ORDER BY AN960 or NAS1149 #; we will supply the AN960s until depleted.

SEE PREVIOUS PAGE FOR PART NUMBER BREAKDOWN

OLD AN960 DASH NUMBER	NEW NAS1149 SIZE NUMBER	OLD AN960 DASH NUMBER	NEW NAS1149 SIZE NUMBER	OLD AN960 DASH NUMBER	NEW NAS1149 SIZE NUMBER	OLD AN960 DASH NUMBER	NEW NAS1149 SIZE NUMBER
AN960- 2	NAS1149F N232P	AN960C 2	NAS1149C N232R	AN960JD 2	NAS1149D N232J	AN960KD 2	NAS1149D N232K
AN960- 2L	NAS1149F N216P	AN960C 2L	NAS1149C N216R	AN960JD 2L	NAS1149D N216J	AN960KD 2L	NAS1149D N216K
AN960- 3	NAS1149F N332P	AN960C 3	NAS1149C N332R	AN960JD 3	NAS1149D N332J	AN960KD 3	NAS1149D N332K
AN960- 3L	NAS1149F N316P	AN960C 3L	NAS1149C N316R	AN960JD 3L	NAS1149D N316J	AN960KD 3L	NAS1149D N316K
AN960- 4	NAS1149F N432P	AN960C 4	NAS1149C N432R	AN960JD 4	NAS1149D N432J	AN960KD 4	NAS1149D N432K
AN960- 4L	NAS1149F N416P	AN960C 4L	NAS1149C N416R	AN960JD 4L	NAS1149D N416J	AN960KD 4L	NAS1149D N416K
AN960- 5	NAS1149F N542P	AN960C 5	NAS1149C N542R	AN960JD 5	NAS1149D N542J	AN960KD 5	NAS1149D N542K
AN960- 6	NAS1149F N632P	AN960C 6	NAS1149C N632R	AN960JD 6	NAS1149D N632J	AN960KD 6	NAS1149D N632K
AN960- 6L	NAS1149F N616P	AN960C 6L	NAS1149C N616R	AN960JD 6L	NAS1149D N616J	AN960KD 6L	NAS1149D N616K
AN960- 8	NAS1149F N832P	AN960C 8	NAS1149C N832R	AN960JD 8	NAS1149D N832J	AN960KD 8	NAS1149D N832K
AN960- 8L	NAS1149F N816P	AN960C 8L	NAS1149C N816R	AN960JD 8L	NAS1149D N816J	AN960KD 8L	NAS1149D N816K
AN960- 9	NAS1149F N949P	AN960C 9	NAS1149C N949R	AN960JD 9	NAS1149D N949J	AN960KD 9	NAS1149D N949K
AN960- 10	NAS1149F 0363P	AN960C 10	NAS1149C 0363R	AN960JD 10	NAS1149D 0363J	AN960KD 10	NAS1149D 0363K
AN960- 10L	NAS1149F 0332P	AN960C 10L	NAS1149C 0332R	AN960JD 10L	NAS1149D 0332J	AN960KD 10L	NAS1149D 0332K
				AN960JD 10LL	NAS1149D 0316J	AN960KD 10LL	NAS1149D 0316K
AN960- 11	NAS1149F N1165P	AN960C 11	NAS1149C N1165R	AN960JD 11	NAS1149D N1165J	AN960KD 11	NAS1149D N1165K
AN960- 416	NAS1149F 0463P	AN960C 416	NAS1149C 0463R	AN960JD 416	NAS1149D 0463J	AN960KD 416	NAS1149D 0463K
AN960- 416L	NAS1149F 0432P	AN960C 416L	NAS1149C 0432R	AN960JD 416L	NAS1149D 0416J	AN960KD 416L	NAS1149D 0416K
AN960- 516	NAS1149F 0563P	AN960C 516	NAS1149C 0563R	AN960JD 516	NAS1149D 0563J	AN960KD 516	NAS1149D 0563K
AN960- 516L	NAS1149F 0532P	AN960C 516L	NAS1149C 0532R	AN960JD 516L	NAS1149D 0516J	AN960KD 516L	NAS1149D 0516K
AN960- 616	NAS1149F 0663P	AN960C 616	NAS1149C 0663R	AN960JD 616	NAS1149D 0663J	AN960KD 616	NAS1149D 0663K
AN960- 616L	NAS1149F 0632P	AN960C 616L	NAS1149C 0632R	AN960JD 616L	NAS1149D 0616J	AN960KD 616L	NAS1149D 0616K
AN960- 616LL	NAS1149F 0616P	AN960C 616LL	NAS1149C 0616R	AN960JD 616LL	NAS1149D 0616J	AN960KD 616LL	NAS1149D 0616K
AN960- 716	NAS1149F 0763P	AN960C 716	NAS1149C 0763R	AN960JD 716	NAS1149D 0763J	AN960KD 716	NAS1149D 0763K
AN960- 716L	NAS1149F 0732P	AN960C 716L	NAS1149C 0732R	AN960JD 716L	NAS1149D 0716J	AN960KD 716L	NAS1149D 0716K
				AN960JD 716LL	NAS1149D 0716J	AN960KD 716LL	NAS1149D 0716K
AN960- 816	NAS1149F 0863P	AN960C 816	NAS1149C 0863R	AN960JD 816	NAS1149D 0863J	AN960KD 816	NAS1149D 0863K
AN960- 816L	NAS1149F 0832P	AN960C 816L	NAS1149C 0832R	AN960JD 816L	NAS1149D 0816J	AN960KD 816L	NAS1149D 0816K
AN960- 916	NAS1149F 0963P	AN960C 916	NAS1149C 0963R	AN960JD 916	NAS1149D 0963J	AN960KD 916	NAS1149D 0963K
AN960- 916L	NAS1149F 0932P	AN960C 916L	NAS1149C 0932R	AN960JD 916L	NAS1149D 0916J	AN960KD 916L	NAS1149D 0916K
AN960- 1016	NAS1149F 1063P	AN960C 1016	NAS1149C 1063R	AN960JD 1016	NAS1149D 1063J	AN960KD 1016	NAS1149D 1063K
AN960- 1016L	NAS1149F 1032P	AN960C 1016L	NAS1149C 1032R	AN960JD 1016L	NAS1149D 1016J	AN960KD 1016L	NAS1149D 1016K
AN960- 1216	NAS1149F 1290P	AN960C 1216	NAS1149C 1290R	AN960JD 1216	NAS1149D 1290J	AN960KD 1216	NAS1149D 1290K
AN960- 1216L	NAS1149F 1232P	AN960C 1216L	NAS1149C 1232R	AN960JD 1216L	NAS1149D 1216J	AN960KD 1216L	NAS1149D 1216K
AN960- 1416	NAS1149F 1490P	AN960C 1416	NAS1149C 1490R	AN960JD 1416	NAS1149D 1490J	AN960KD 1416	NAS1149D 1490K
AN960- 1416L	NAS1149F 1432P	AN960C 1416L	NAS1149C 1432R	AN960JD 1416L	NAS1149D 1416J	AN960KD 1416L	NAS1149D 1416K
AN960- 1616	NAS1149F 1690P	AN960C 1616	NAS1149C 1690R	AN960JD 1616	NAS1149D 1690J	AN960KD 1616	NAS1149D 1690K
AN960- 1616L	NAS1149F 1632P	AN960C 1616L	NAS1149C 1632R	AN960JD 1616L	NAS1149D 1616J	AN960KD 1616L	NAS1149D 1616K
AN960- 1716	NAS1149F 1790P	AN960C 1716	NAS1149C 1790R	AN960JD 1716	NAS1149D 1790J	AN960KD 1716	NAS1149D 1790K
AN960- 1716L	NAS1149F 1732P			AN960JD 1716L	NAS1149D 1716J	AN960KD 1716L	NAS1149D 1716K
AN960- 1816	NAS1149F 1890P	AN960C 1816	NAS1149C 1890R	AN960JD 1816	NAS1149D 1890J	AN960KD 1816	NAS1149D 1890K
AN960- 1816L	NAS1149F 1832P			AN960JD 1816L	NAS1149D 1816J	AN960KD 1816L	NAS1149D 1816K
AN960- 2016	NAS1149F 2090P	AN960C 2016	NAS1149C 2090R	AN960JD 2016	NAS1149D 2090J	AN960KD 2016	NAS1149D 2090K
AN960- 2016L	NAS1149F 2032P			AN960JD 2016L	NAS1149D 2016J	AN960KD 2016L	NAS1149D 2016K