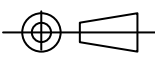


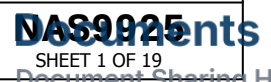
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THIRD ANGLE PROJECTION	
PROCUREMENT SPECIFICATION	
NONE	

CUSTODIAN	NATIONAL AEROSPACE STANDARDS COMMITTEE
TITLE	FASTENER, RECESS DRIVE, 180 KSI, GENERAL SPECIFICATION FOR

REVISION	NEW
CLASSIFICATION SPECIFICATION	NAS9925
SHEET 1 OF 19	



AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
1000 WILSON BLVD.
ARLINGTON, VA 22209

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

FORM 12-01

ISSUE DATE: JULY 31, 2013

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1. SCOPE

This specification describes requirements for aerospace externally threaded fasteners (see 6.3) of ultimate tensile stress 180 KSI Ft_u and 108 KSI Fs_u. It is intended as a replacement for MIL-B-87114 for NAS part standards at the 180 KSI strength level that previously called out MIL-B-87114 as the procurement specification. It is highly recommended that this specification not be called out on any new part standards either at the Standards Development Organization level or at the user community (company standard) level.

1.1 General Notes

- (1) Dimensions in inches.
- (2) This specification takes precedence over documents referenced herein.
- (3) Unless otherwise specified, part inventory manufactured to previous revisions of the applicable drawing or specification may be procured and used until stock is depleted.
- (4) Unless otherwise specified herein, referenced documents shall be the issue in effect on date of manufacture. However, existing material inventory certified to a previous revision of the applicable material specification(s) is acceptable for use until depletion.

2. APPLICABLE DOCUMENTS

2.1 Issue of Documents

The following documents of the issue in effect on the date of invitation for bids or request for proposal form a part of this specification to the extent specified herein.

2.1.1 Specifications

2.1.1.1 Military

MIL-F-8961	Fastener Element, Self-locking, Externally Threaded, 450°F and 1,200°F
MIL-DTL-18240	Fastener Element, Self-locking, Threaded Fastener, 250 °F Maximum

2.1.2 Standards

2.1.2.1 Federal

FED-STD-H28	Screw-thread Standards for Federal Services
-------------	---

2.1.2.2 Military

MIL-STD-2073-1	Standard Practice for Military Packaging
----------------	--

2.2 Industry Standards

The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of invitation for bids or request for proposal shall apply. Technical society and technical association specifications and standards are generally available for reference in libraries. They are also distributed among technical groups and using Federal agencies.

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2.2.1 American Society for Quality

ASQ Z1.4 Sampling Procedures and Tables for Inspection by Attributes

Copies can be obtained from American Society for Quality, 600 North Plankinton, Milwaukee, Wisconsin 53203.
www.asq.org

2.2.2 American Society of Mechanical Engineers

ASME B46.1 Surface Texture (Surface Roughness, Waviness, and Lay)

Copies can be obtained from American Society of Mechanical Engineers, Two Park Ave, New York, NY 10016-5990.
www.asme.org

2.2.3 ASTM International

ASTM E112 Standard Test Methods for Determining Average Grain Size
ASTM D3951 Standard Practice for Commercial Packaging
ASTM E1417/E1417M Standard Practice for Liquid Penetrant Testing
ASTM E1444/E1444M Standard Practice for Magnetic Particle Testing
ASTM A342/A342M Standard Test Methods for Permeability of Feebly Magnetic Materials
ASTM E 1447 Standard Test Method for Determination of Hydrogen in Titanium and Titanium Alloys by Inert Gas Fusion Thermal Conductivity/Infrared Detection Method

Copies can be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.
www.astm.org

2.2.4 Aerospace Industries Association

NAS9800 Head Protrusion Gaging, 100° Flush Head Fasteners, Gage Block, Gage Diameters and Stylus
NAS1347 Identification of Male Threaded Fasteners
NASM1312 Fastener Test Methods

Copies can be obtained from Aerospace Industries Association, 1000 Wilson Blvd., Arlington, VA 22209.
www.aia-aerospace.org

2.2.5 SAE International

AMS2759 Heat Treatment of Carbon and Low-Alloy Steel Parts Minimum Tensile Strength Below 220 KSI (1517 MPa)
AS8879 Screw Threads – UNJ Profile, Inch Controlled Radius Root with Increased Minor Diameter
AMS-H-81200 Heat Treatment of Titanium and Titanium Alloys
AMS2801 Heat Treatment of Titanium Alloy Parts

Copies can be obtained from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096. www.sae.org

2.2.6 Battelle Memorial Institute

MMPDS Metallic Materials Properties Development and Standardization

Copies can be obtained from Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201. www.battelle.org

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3. REQUIREMENTS

3.1 Specification Sheets and Standards

The individual item requirements shall be as specified herein and in accordance with the applicable detail specifications, hereafter called part standards. In the even of any conflict between requirements of this specification and the part standard, the latter shall govern.

3.2 Material

3.2.1 Composition

Chemical composition of the fastener material shall be in accordance with the material specification listed on the part standard. (See 4.3.1)

3.2.1.1 Hydrogen

(Applicable to titanium alloy fasteners only.) Hydrogen content shall be not greater than .0125 % (125 parts per million [ppm]). (See 4.2.2.1 and 4.3.1.1)

3.2.2 Metallurgical Properties

3.2.2.1 Discontinuities

3.2.2.1.1 Cracks

There shall be no cracks in any location. A crack is defined as a clean, crystalline break passing through grain or grain boundary. (See 4.3.2)

3.2.2.1.2 Inclusions

Inclusions are only permitted in recess surfaces and nonbearing surfaces of the head to a depth not greater than .003. Inclusions are particles of non-metallic impurities (such as oxides, sulphides, or silicates) which are in the metal during solidification. (See 4.3.3)

3.2.2.1.3 Surface Irregularities

Laps, seams and similar surface irregularities are permitted as shown in Figure 1 and listed in Table I. Laps and seams are material discontinuities (folded metal) which do not cross grain boundaries. (See 4.3.2)

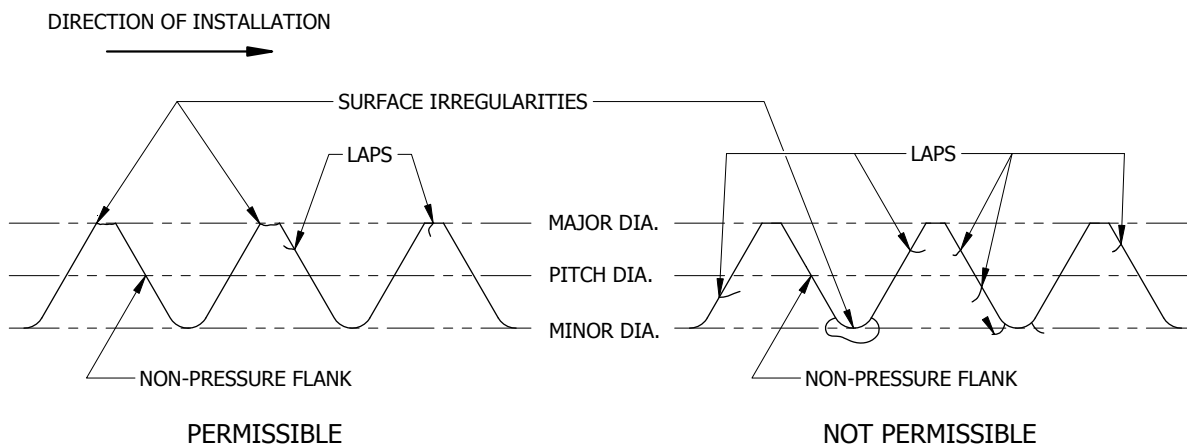


FIGURE 1 – DISCONTINUITIES IN THREAD AREA

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TABLE I – PERMISSIBLE SURFACE IRREGULARITIES

Location	Permissible irregularity	Maximum depth normal to the surface			
		Shank Dia ≤ .312	.312 < Shank Dia ≤ .438	.438 < Shank Dia ≤ .875	Shank Dia > .875
Head to shank fillet	None	—	—	—	—
Thread	Root	None	—	—	—
	Flank	/a/	.005	.006	.008
	Crest	Laps, seams, and other irregularities	.005	.006	.008
Head	Bearing surface	Seams	.005	.006	.008
	Nonbearing surface	Folds, seams, or nicks	.010	.012	.016
	Pan head	Overheating /b/	.080	.080	.140
	100° head	Overheating /b/	.060	.060	.110
Shank	Seams	.005	.006	.008	.010

/a/ Laps, seams and other surface irregularities are not permissible on the pressure flank, on the nonpressure flank below the pitch diameter, or on the nonpressure flank above the pitch diameter on two or more consecutive pitches. They are permissible on the nonpressure flank above the pitch diameter. (See Figure 1)

/b/ See 3.2.2.5.2.

3.2.2.2 Microstructure

3.2.2.2.1 Grain Size

(Applicable to austenitic steels only.) The austenitic grain size, as defined in ASTM E112, shall be predominantly number 5 or finer with grains as large as number 3 permissible. (See 4.3.3)

3.2.2.2.2 Grain Flow

Grain flow in the threads shall be continuous and shall follow the general thread contour as illustrated on Figure 2. The maximum density of flow lines shall be at the bottom of the thread root radius. Grain flow in the head shall be continuous as illustrated on Figure 3 but may show minor interruption resulting from finish machining operation. Grain flow lines shall not terminate in the head to shank fillet. (See 4.3.3)

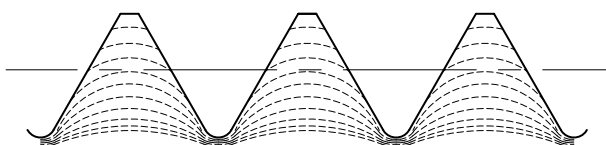


FIGURE 2 – GRAIN FLOW IN THREADS

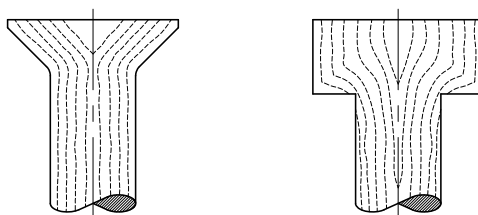


FIGURE 3 – GRAIN FLOW IN HEADS

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