



AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
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WASHINGTON, D.C. 20005

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.

1. SCOPE

- 1.1 This specification covers the requirements for threaded shear pins with a minimum single shear strength of 156,000 PSI. Types and sizes are defined by part numbers listed on drawings which refer to this specification. Purchaser may reject any lot which does not conform.

FED. SUP CLASS
GP53

2. APPLICABLE SPECIFICATIONS, OTHER PUBLICATIONS, AND DRAWINGS

- 2.1 The following publications, of the issue in effect on date of invitation for bids, shall form a part of this specification to the extent specified herein:

2.1.1

Specifications

Federal

FEDERAL STANDARD

No. 151

Federal Test Method Standard - Metals; Test Methods,

Military

MIL-S-7742

Screw Threads, Standard, Aeronautical

MIL-S-8879

Screw Threads Controlled Root Radius With Increased Minor Diameter

Other

NAS 1511

Heat Treatment & Processing Requirements for 5% Cr Ultra High Strength Alloy Steel (H-11) Fasteners

AMS6485

Bars, Rods and Wire, 5% CR Alloy Steel, Ultra High Strength, Heat Resistant

AMS2417

Nickel-Zinc Alloy Plating

ANSI/ASME B46.1

Surface Roughness, Waviness, and Lay

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2.1.2

Other Publications

Military Standard (Book)

MIL-STD-105

Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-129

Marking of Shipments

MIL-STD-1949

Inspection, Magnetic Particles

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3. REQUIREMENTS

- 3.1 Conflicts - In the event of a conflict between the drawing and this specification, the drawing will take precedence.

- 3.1.1 The fasteners shall be made from alloy steel conforming to AMS6485 (T20811).

3.2 Design and Construction

- 3.2.1 Workmanship - Fasteners shall be made in conformance with high grade bolt manufacturing practice.

- 3.2.2 Dimensions - The dimensions of the finished fasteners shall conform to applicable NAS drawings.

3.2.3 Threads

- 3.2.3.1 Forms and Dimensions - Threads of all fasteners shall conform to specification MIL-S-7742 or MIL-S-8879 except that the major diameter shall be .001 less than the minimum shank diameter.

- 3.2.3.2 Rolling - Threads shall be formed per NAS 1511.

- 3.2.3.3 Thread Run-Out - Thread run-out area consisting of a maximum of two thread pitches and a minimum of one incomplete thread, shall fair onto shank thereby eliminating an abrupt change in cross sectional area as illustrated in figure 1. Radius or chamfer at end of grip portion of shank may appear in thread run-out area and is to be considered part of that area. Bottom and sides of threads contained in run-out area may deviate from true thread form due to the natural flow of material resulting from the thread rolling operation, but shall be smooth and devoid of tool marks. Threads conforming to MIL-S-8879 shall meet the requirements of MIL-S-8879 for thread run-out.

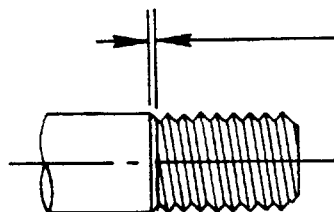


Figure 1

Preferably, thread run-out shall terminate approximately 1/4 of one thread pitch away from grip length.

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**INACTIVE FOR DESIGN AFTER (JUNE 30 1992). NO SUPERSEDING STANDARD.
FOR DESCRIPTION OF STATUS NOTES SEE NAS380.**

CUSTODIAN NATIONAL AEROSPACE STANDARDS COMMITTEE		THIRD ANGLE PROJECTION
PROCUREMENT SPECIFICATION NOTED	TITLE THREADED SHEAR FASTENER, FLUSH & PROTRUDING TYPE FOR APPLICATIONS UP TO 900° F MAXIMUM - 5% CR ULTRA HIGH STRENGTH ALLOY STEEL (H-11) - PROCUREMENT SPECIFICATION	CLASSIFICATION Specification
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NATIONAL AEROSPACE STANDARD

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- 3.2.3.4 **Grain Flow** - The grain flow in the threads shall be continuous and shall follow the general thread contour with the maximum density at the bottom of the root radius as shown in figure 2.

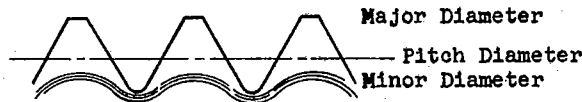


FIGURE 2 - GRAIN FLOW

- 3.2.4 **Heads** - The bolt heads shall be forged.

3.2.4.1 **Bearing Surface**

- 3.2.4.1.1 **Protruding Type** - The bearing surface of protruding type fastener heads shall be at right angles to the shank within limits shown in figure 3. The angular error of the underside of the head must be uniform around the shank within a tolerance of ± 10 minutes, as measured from the bearing surface of the head at length approximately equal to the diameter of the fastener.
- 3.2.4.1.2 **Flush Type** - The bearing surface and the body must be concentric within .003 T.I.R. as measured with a V-Block and dial indicator.

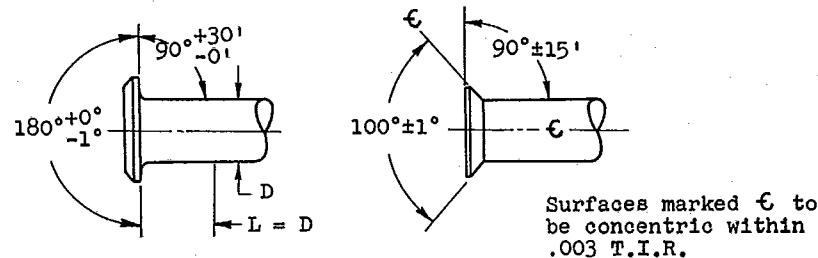


FIGURE 3

- 3.2.4.2 **Head Structure and Grain Flow** - A section of the head, when examined as specified in Section 4, shall show no detrimental defects. Flow lines in the fillet area immediately below the surface shall closely conform to the fillet contour as shown in figure 4. The metal removed from the bearing surface shall be as little as practical to obtain a clean, smooth surface.

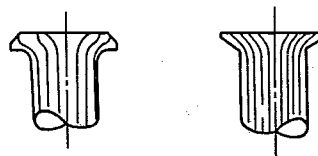


FIGURE 4

- ② 3.3 **Heat Treatment** - Fasteners shall be heat-treated in accordance with Specification NAS 1511 where applicable to develop the shear strength requirements of this specification.

3.4 **Mechanical Properties**

- ② 3.4.1 **Shear Strength** - Primary criteria for acceptance of fasteners shall be based upon Shear Strength and Ductility tests as outlines in Section 4. Hardness requirements shall be used only as a guide to facilitate heat treating process, Shear and Ductility tests.

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PROCUREMENT
SPECIFICATION

TITLE

THREADED SHEAR FASTENER, FLUSH & PROTRUDING TYPE FOR APPLICATIONS UP TO 900° F MAXIMUM - 5% CR ULTRA HIGH STRENGTH ALLOY STEEL (H-11) - PROCUREMENT SPECIFICATION

CLASSIFICATION
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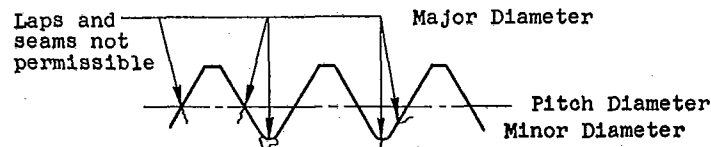
THIS DRAWING SUPERSEDES ALL PRECEDENT STANDARD DRAWINGS FOR THE SAME PRODUCT AND SHALL BECOME EFFECTIVE FOR VENDOR MANUFACTURING NOT LATER THAN 6 MONTHS AFTER THE LATEST DATE OF APPROVAL SHOWN.

- 3.5 Metallurgical Properties
- 3.5.1 Decarburization - The fasteners shall show no decarburization on the bearing surface of the head, head-to-shank fillet, shank, or threads, when examined as specified in Section 4.
- 3.5.2 Carbon Restoration - Carbon restoration is not permitted.
- 3.5.3 Work Effect - The fastener head-to-shank fillet shall show evidence of working, when Metallurgically examined as specified in Section 4.
- 3.5.4 Discontinuities - Fasteners shall be acceptable provided they do not contain discontinuities which equal or exceed the following limitations. Care must be exercised not to confuse cracks with discontinuities, as described herein.
- 3.5.4.1 Cracks - Fasteners shall be free of cracks in any direction or location. A crack is defined as a clean crystalline break passing through the grain or grain boundary, without the inclusion of foreign elements.
- 3.5.4.2 Laps and Seams - Fasteners may possess laps and seams, except in locations specified in paragraph 3.5.4.5. The depths shall not exceed the amounts specified in Table I.

TABLE I
 Discontinuity Depths

Bolt Size (Inches)	#8	#10	1/4	5/16	3/8	7/16	1/2	5/8
Seam Depth Maximum (Inch)	0.005	0.005	0.005	0.005	0.006	0.007	0.008	0.008

- 3.5.4.3 Inclusions - Fasteners shall show no evidence of surface or sub-surface inclusions at the thread root or head-to-shank fillet, when examined as specified in Section 4. Small inclusions in other parts of the fastener not indicative of unsatisfactory quality, shall not be cause for rejection.
- 3.5.4.4 Head Discontinuities (Seams, Inclusions, or Folds) - The fastener heads shall not possess seams, inclusions, or folds along the top or sides exceeding twice the depth limits shown in Table I. Fasteners having seams on the bearing surface exceeding the limits shown shall be rejected. Discontinuities shall not be permitted on the head-to-shank fillet.
- 3.5.4.5 Thread Discontinuities (Laps, Seams, and Surface Irregularities) - Threads shall have no multiple or single laps at the root or on the sides (figure 5) except that laps are permissible at the crest which do not exceed 20% of basic thread depth and on the sides outside the pitch diameter (see figure 6). Slight deviation from the thread contour is permissible at the crest of the thread as shown in figure 6. The incomplete thread at each end of the thread may also deviate slightly from contour.



NOTE: For limits, see paragraph 3.5.4.2

FIGURE 5 - NONPERMISSIBLE LAPS, SEAMS AND SURFACE IRREGULARITIES

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 APPLICATIONS UP TO 900° F MAXIMUM - 5% CR ULTRA HIGH
 STRENGTH ALLOY STEEL (H-11) - PROCUREMENT SPECIFICATION

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Documents
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