

FED. SUPPLY CLASS

5320

1. SCOPE

- 1.1 This specification covers the requirements for threaded shear pins requiring high strength at temperatures up to 1,400 °F. 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.

2. APPLICABLE DOCUMENTS

- 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 Governmental

Military

MIL-S-7742 Screw Threads, Standard, Aeronautical
MIL-STD-129 Marking of Shipments

Copies can be obtained from the Department of Defense Single Stock Point (DODSSP). <http://dodssp.daps.dla.mil>

2.1.2 Nongovernmental

American Society for Quality

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

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

ASTM International

ASTM E1417 Inspection Process, Fluorescent Penetrant

Copies can be obtained from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. www.astm.org

SAE International

AMS5712 Nickel Alloy, Corrosion and Heat Resistant, Bars, Forgings, and Rings 53Ni-19Cr-11Co-9.8Mo-3.2Ti-1.6Al-.006B Vacuum Melted, Solution Heat Treated Precipitation Hardenable - UNS N07041

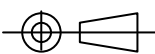
Copies can be obtained from SAE International, 400 Commonwealth Dr., Warrendale, PA 15096-0001. www.sae.org

ASME

ASME B46.1 Surface Roughness, Waviness, and Lay

Copies can be obtained from ASME, Three Park Ave., New York, NY 10016-5990. www.asme.org

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THIRD ANGLE PROJECTION 	CUSTODIAN NATIONAL AEROSPACE STANDARDS COMMITTEE	REVISION 3
PROCUREMENT SPECIFICATION NONE	TITLE PROCUREMENT SPECIFICATION, THREADED SHEAR FASTENER, FLUSH & PROTRUDING TYPE FOR APPLICATIONS UP TO 1,400 °F, CORROSION AND HEAT RESISTANT NICKEL BASE ALLOY	CLASSIFICATION SPECIFICATION NAS1290 SHEET 1 OF 8

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 corrosion and heat resistant alloy conforming to AMS5712.

3.2 Design and Construction

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

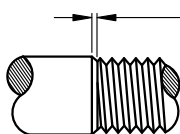
3.2.2 Dimensions. The dimensions of the finished fasteners shall conform to applicable NAS drawings.

3.2.3 Threads

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

3.2.3.2 Rolling. Threads shall be formed per NAS1511.

3.2.3.3 Thread Run-Out. Thread run-out area consisting of a maximum of two thread pitches and a minimum of one imperfect thread, shall fair onto the 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.



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

FIGURE 1 – THREAD RUN-OUT

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.



Major Diameter

Pitch Diameter

Minor Diameter

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 $\pm 0^\circ 10'$, 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 FIM as measured with a V-Block and dial indicator.

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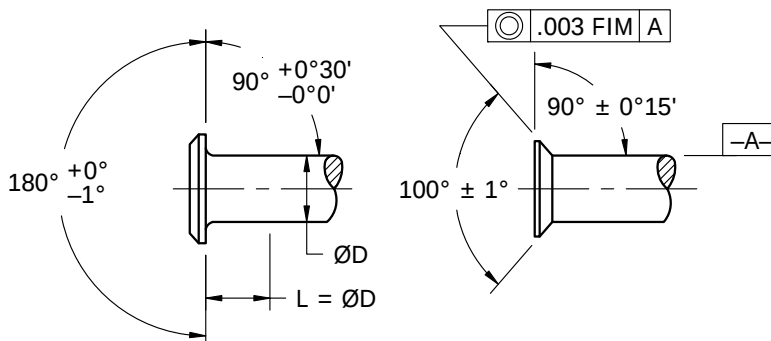


FIGURE 3 – PROTRUDING AND FLUSH TYPE FASTENER HEADS

- 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.

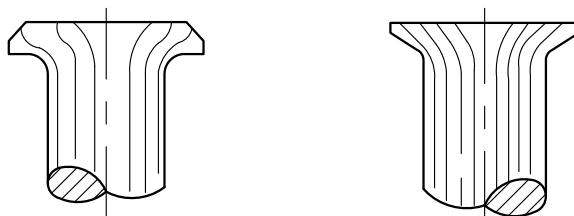


FIGURE 4 – HEAD STRUCTURE AND GRAIN FLOW

- 3.3 **Heat Treatment.** Fasteners shall be heat-treated in accordance with AMS5712 where applicable to develop the shear strength requirements of this specification.
- 3.4 **Mechanical Properties**
- 3.4.1 **Shear Strength.** Primary criteria for acceptance of fasteners shall be based upon shear strength and ductility tests as outlined in Section 4. Hardness requirements shall be used as a guide to facilitate heat treating process, shear and ductility tests.
- 3.5 **Metallurgical Properties**
- 3.5.1 **Work Effect.** The fastener head-to-shank fillet shall show evidence of working, when metallurgically examined as specified in Section 4.
- 3.5.2 **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.
- 3.5.2.1 **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.
- 3.5.2.2 **Laps and Seams.** Fasteners may possess laps and seams, except in locations specified in Paragraph 3.5.2.5. 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)	.005	.005	.005	.005	.006	.007	.008	.008

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