

FED. SUPPLY CLASS

5320

1. SCOPE

1.1 Scope. This specification covers aluminum alloy and titanium columbium alloy rivets.

1.2 Classification.

1.2.1 Composition and condition. The rivets shall be furnished in the following compositions and conditions.

<u>Composition</u>	<u>Temper</u>	<u>Condition</u>
1100 (UNS A91100)	-F	As fabricated.
2017 (UNS A92017)	-T4	Solution heat treated and naturally aged (inactive for new design).
2024 (UNS A92024)	-T4	Solution heat treated and naturally aged (inactive for new design).
2117 (UNS A92117)	-T4	Solution heat treated and naturally aged.
2219 (UNS A92219)	-T81	Solution heat treated and naturally aged; and artificially aged (inactive for new design).
2219 (UNS A92219)	-T62	Solution heat treated and artificially aged.
5056 (UNS A95056)	-H32	Strain hardened and then stabilized.
7050 (UNS A97050)	-T73	Solution heat treated and artificially aged.
45Cb (UNS R58450)		Per AMS4982.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specification, standards and handbooks. The following specifications, standards and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

QQ-A-430 Aluminum Alloy Rod and Wire; for Rivets and Cold Heading

MILITARY

MIL-DTL-5541 Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-A-8625 Anodic Coatings, for Aluminum and Aluminum Alloys

STANDARDS

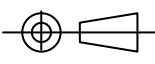
MILITARY

MIL-STD-129 Military Marking for Shipment and Storage

(Unless otherwise indicated, copies of federal and military specifications, standards and handbooks are available from the Defense Printing Service Detachment Office, 700 Robbins Avenue, Bldg. 4-D, Philadelphia, PA 19111-5096.

② <http://quicksearch.dla.mil>.)

THE INITIAL RELEASE OF THIS DOCUMENT SUPERSEDES MIL-R-5674, REVISION F, AMENDMENT 2.

THIRD ANGLE PROJECTION		CUSTODIAN NATIONAL AEROSPACE STANDARDS COMMITTEE	REVISION 2
PROCUREMENT SPECIFICATION NONE		TITLE RIVETS, STRUCTURAL, ALUMINUM ALLOY, TITANIUM COLUMBIUM ALLOY, GENERAL SPECIFICATION FOR	CLASSIFICATION SPECIFICATION NASM5674 SHEET 1 OF 8

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

REVISION DATE: OCTOBER 30, 2015

ISSUE DATE: MARCH 2000

- 2.2 **2** Nongovernment publications. The following documents form a part of this document to the extent specified herein.

SAE International

AMS2770 Heat Treatment of Wrought Aluminum Alloy Parts
AMS4982 Titanium Alloy Wire – 45Cb

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

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 E8/E8M Tension Testing of Metallic Materials
ASTM E112 Standard Test Methods for Determining Average Grain Size
ASTM B565 Shear Testing of Aluminum and Aluminum Alloy Rivets and Cold-Heading Wire Rods
ASTM D3951 Standard Practice for Commercial Packaging

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

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

NASM1312 Fastener Test Methods

Copies can be obtained from the Aerospace Industries Association, 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209 www.aia-aerospace.org

FEDERAL AVIATION ADMINISTRATION

MMPDS Metallic Materials Properties Development and Standardization

Copies can be obtained from the Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591.

(Nongovernment standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

- 2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or NAS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

- 3.1 NAS standards. The individual item requirements shall be as specified herein and in accordance with the applicable standard. In the event of any conflict between the requirements of this specification and the standard, the latter shall govern.
- 3.2 Material. The rivets shall be made from material conforming to QQ-A-430 or AMS4982, as applicable.

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3.2.1 Grain size. Five (5) or finer except for AMS4982 and aluminum alloys 1100 and 5056.

3.3 Design. Rivet design shall be as specified on the applicable standard.

3.4 Shear strength. The undriven shear strength of rivets greater than .0937 inches in diameter shall be as specified in Table I when tested as specified in 4.5.2.2. Shear strength tests on 2017, 2024, 2117, 2219 and 7050 rivets shall be made with the rivets in the heat-treated condition (see 4.4.1 and 4.4.3).

TABLE I – UNDRIVEN SHEAR STRENGTH

Rivet		Shear strength (lb/in ²)	
Composition	Temper	Minimum	Maximum
1100	F	–	N/A
5056	H32	24,000	N/A
2117	T4	26,000	N/A
2219	T81	32,000	N/A
2219	T62	32,000	N/A
2017	T4	35,000	42,000 /a/
2024	T4	37,000	N/A
7050	T73	41,000	46,000
45Cb		50,000	59,000

/a/ See applicable standards for additional requirement.

3.4.1 Tensile strength. In lieu of a shear test, a tensile test shall be performed on rivets smaller than .0937 inches in diameter, on rivet lengths less than 1.5x "ØD", and on nonstandard diameter rivets for which a shear test fixture is not available (see 4.5.2.2). The wire or rod samples shall be taken from the same material lot that the rivets are made from and heat-treated with the rivets it represents. Tensile properties shall be as specified in QQ-A-430, Table III or AMS4982. A tensile test is not required for 1100-F and 5056-H32 aluminum alloy rivets.

3.5 Heat treatment. Heat treatment of aluminum alloy 2017-T4, 2024-T4, 2117-T4, 2219-T62, 2219-T81 and 7050-T73 rivets shall be in accordance with AMS2770 with the exception that both electrical conductivity and hardness testing is not required. Heat treatment for 45Cb rivets shall be in accordance with AMS4982.

3.6 Finishes. Finishes shall be as specified on the applicable standards.

3.7 Roundness and runout. Rivet heads shall not deviate from true roundness and runout with the shank by an amount which will produce a full indicator movement greater than the value specified in Table II for the corresponding rivet diameter. The reading shall be taken with the indicator touching the periphery of the head as the rivet is rotated with the shank as an axis.

TABLE II – TOLERANCES ON ROUNDNESS AND RUNOUT

Nominal diameter of rivet shank (inch)	Total variation in indicator reading on rivet head	
	Flush head (inch)	Protruding head (inch)
.062, .094, .125	.010	.010
.156, .187, .219	.010	.015
.250	.010	.020
.312, .375	.015	.020

3.8 Discontinuities. Rivets shall be cold formed or forged to conform to the requirements of Table III. The rivets shall be free from surface discontinuities except that:

- Indented circles or arc lines concentric to the shank diameter, not greater than .004 inch in depth, are acceptable.

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