



AEROSPACE STANDARD

AS7220™**REV. A**

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Reaffirmed 2022-03

Superseding AS7220

(R) Aluminum Rivets, UNS A91100
99Al (1100-H14)

FSC 5320

RATIONALE

General revision, delete AQLs and MIL-STD-105 sampling requirements, add drivability requirement, update references, and editorial update.

1. SCOPE

1.1 Type

This procurement specification covers rivets fabricated from an aluminum alloy designated as 1100-H14, strain hardened.

1.2 Application

Primarily for joining aluminum parts where a low shear strength is adequate.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2355 Quality Assurance, Sampling and Testing Aluminum Alloys and Magnesium Alloy Wrought Products (Except Forging Stock), and Rolled, Forged, or Flash Welded Rings

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2.1.2 AIA/NAS Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

NASM1312-13 Fastener Test Methods, Method 13 Double Shear

NASM1312-20 Fastener Test Methods, Method 20, Single Shear

2.1.3 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

ASME Y14.5M Dimensioning and Tolerancing

2.1.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B565 Standard Test Method for Shear Testing of Aluminum and Aluminum-Alloy Rivets and Cold-Heading Wire and Rods

2.1.5 U.S. Government Publications

Copies of these documents are available online at <http://quicksearch.dla.mil>.

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

2.2 Definitions

NON-CONFORMANCE: A departure from a specified requirement for any characteristic.

NON-CONFORMING UNIT: A unit of production that has one or more non-conformances.

PRODUCTION INSPECTION LOT: A production inspection lot shall be all finished parts of the same part number, made from a single heat of alloy, heat treated at the same time to the same specified condition, produced as one continuous run, and submitted for vendor's inspection at the same time.

3. TECHNICAL REQUIREMENTS

3.1 Material

The rivets shall be made from material conforming to the following:

3.1.1 Composition

Shall conform to the percentages by weight in Table 1 determined in accordance with AMS2355.

Table 1 - Composition, percentages by weight

Element	Min	Max
Aluminum	99.0	---
Iron + Silicon	---	0.95
Copper	0.05	0.20
Zinc	---	0.10
Manganese	---	0.05
Other Impurities, each	---	0.05
Other Impurities, total	---	0.15



3.1.2 Heading Stock

Shall be wire or rod in the half hard temper.

3.2 Design

Rivet design shall be as specified on the applicable drawing.

3.3 Mechanical Properties

Rivets shall conform to the following requirements:

3.3.1 Shear Strength

The undriven strength of rivets greater than 0.094 inch in nominal diameter shall be not less than 10200 psi in single shear or not less than 20400 psi in double shear at room temperature and shall be tested as specified in 4.6.2.1, unless shear strength is otherwise specified on the part drawing.

3.3.2 Material Tensile Strength

For rivets 0.094 inch in nominal diameter or smaller or for nonstandard diameters for which a shear test fixture is not available, tensile test shall be made as specified in 4.6.2.2. The wire or rod samples shall be taken from the same material lot that the rivets are made. Room temperature tensile strength shall be not less than 16000 psi, unless otherwise specified on the part drawing.

3.4 Circular Runout of Head

The circular runout (see ASME Y14.5M) of rivet head relative to the shank, from a maximum shank length equal to two nominal shank diameters from the head, shall not vary by an amount which will produce a full indicator movement (FIM) greater than the value specified in Table 2 for the corresponding rivet diameter, unless otherwise specified on the part drawing. The indicator reading shall be taken with the indicator stylus touching the periphery of the head as the rivet is rotated with the shank as an axis.

Table 2 - Rivet head circular runout tolerance

Rivet Shank, Ø NOM Inch	Rivet Head Circular Runout Tolerance (FIM) Flush Head	Rivet Head Circular Runout Tolerance (FIM) Protruding Head
	Inch	Inch
0.062	0.010	0.010
0.094	0.010	0.010
0.125	0.010	0.010
0.156	0.010	0.015
0.188	0.010	0.015
0.250	0.010	0.020
0.312	0.015	0.020
0.375	0.015	0.020

3.5 Drivability

The driven rivet head shall drive satisfactorily with head diameter of not less than 1.4 times the rivet diameter and head height not less than 0.3 times the rivet diameter when tested in accordance with 4.6.2.3. After driving, rivets shall show no cracks when visually inspected.