



AEROSPACE MATERIAL SPECIFICATION	AMS4402™	REV. B
	Issued 2006-09 Reaffirmed 2017-11 Revised 2018-02 Stabilized 2024-09 Superseding AMS4402A	
Aluminum Alloy, Extruded Profiles (2024-T432) 4.4Cu - 1.5Mg - 0.6Mn Annealed, Stretch Formed, Solution Heat Treated and Stress Relieved by Stretching (Composition similar to UNS A92027)		

RATIONALE

AMS4402B has been declared "STABILIZED" by AMS Committee D Nonferrous Alloys Committee. This document will no longer be updated and may no longer represent standard industry practice. This document was stabilized because Committee D can find no producers for this document.

NOTE: Previously this document was revised. The last technical update of this document occurred in February, 2018. Users of this document should refer to the cognizant engineering organization for disposition of any issues with reports/certifications to the specification; including exceptions listed on the certification. In many cases, the purchaser may represent a sub tier supplier and not the cognizant engineering organization.

STABILIZED NOTICE

AMS4402B has been declared "STABILIZED" by SAE AMS Committee D Nonferrous Alloys and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of extruded profiles (shapes) 0.063 to 0.375 inch (1.6 to 10 mm), inclusive, in nominal thickness (see 8.6).

1.2 Application

These extrusions have been used typically for machined parts requiring dimensional stability during machining processes, with high strength and damage tolerance, but usage is not limited to such applications. This product maintains fine unrecrystallized peripheral grain even though significant cold work precedes the solution heat treatment.

1.2.1 Certain processing procedures may cause this product to become susceptible to stress-corrosion cracking; ARP823 recommends practices to minimize such conditions.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 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

AMS2772 Heat Treatment of Aluminum Alloy Raw Materials

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ARP823 Minimizing Stress-Corrosion Cracking in Wrought Heat-Treatable Aluminum Alloy Products

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

2.2 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 B594 Ultrasonic Inspection of Aluminum Alloy Wrought Products

ASTM B660 Packaging Of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

2.3 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ANSI H35.1/ H35.1M Standard Alloy and Temper Designation System For Aluminum

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

ANSI H35.2M Dimensional Tolerances for Aluminum Mill Products (Metric)

3. TECHNICAL REQUIREMENTS

3.1 Composition

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

Table 1 - Composition

Element	Min	Max
Silicon	--	0.50
Iron	--	0.50
Copper	3.8	4.9
Manganese	0.3	0.9
Magnesium	1.2	1.8
Chromium	--	0.10
Zinc	--	0.25
Titanium	--	0.15
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

Extruded, annealed, stretch formed not to exceed 10%, solution heat treated and stress relieved by stretching to produce a nominal permanent set of 2%, but not less than 1% nor more than 3%, to the -T432 temper (see ANSI H35.1/H35.1M).

3.2.1 Product shall be supplied with an as-extruded surface finish; light polishing to remove minor surface conditions is permissible provided such conditions can be removed within specified dimensional tolerances.

3.2.2 Product may receive minor straightening, after stretching, of an amount necessary to meet the requirements of 3.6.

3.3 Heat Treatment

Shall be in accordance with the requirements of AMS2772.

3.4 Properties

Product shall conform to the following requirements, determined on the mill produced size in accordance with AMS2355.

- 3.4.1 Longitudinal tensile properties of extrusions shall be as specified in Table 2. Products exceeding the stated size limits shall have properties as agreed upon by purchaser and producer.

Table 2

Table 2A - Minimum tensile properties, inch/pound units

Nominal Thickness Inch	Specimen Orientation	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
0.063 to 0.375, incl.	Longitudinal	68.0	48.0	14

Table 2B - Minimum tensile properties, SI units

Nominal Thickness Millimeters	Specimen Orientation	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 5D %
1.6 to 10, incl.	Longitudinal	470	330	14

- 3.4.2 Mechanical property requirements for product outside the size range of 1.1 shall be as agreed upon by purchaser and producer.

3.5 Quality

Products, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from conditions detrimental to usage of the extrusions.

3.6 Tolerances

Shall conform to all applicable requirements of ANSI H35.2 or ANSI H35.2M.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for producer's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the products conform to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), longitudinal tensile properties (3.4.1), and tolerances (3.6) are acceptance tests and, except for composition, shall be performed on each Inspection lot.

4.3 Sampling and Testing

Shall be in accordance with AMS2355.