

AEROSPACE MATERIAL SPECIFICATION

SAE AMS4193

REV. C

Issued 1970-11
Revised 2005-01
Reaffirmed 2012-03

Superseding AMS4193B

Aluminum Alloy Sheet and Plate
4.4Cu - 1.5Mg - 0.60Mn (2024-T861)
Solution Heat Treated, Cold Worked, and Precipitation Heat Treated
(Composition Similar to UNS A92024)

RATIONALE

AMS4193C has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of flat sheet and plate 0.500 inch (12.70 mm) and under in nominal thickness.

1.2 Application:

These products are used primarily for structural parts requiring good strength. These products, when re-heat treated by the user, may not have the tensile properties shown.

- 1.2.1 Certain design and processing procedures may cause these products 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.

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on this Technical Report, please visit
<http://www.sae.org/technical/standards/AMS4193C>**

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096 or www.sae.org.

AMS 2355	Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings
AMS 2772	Heat Treatment of Aluminum Alloy Raw Materials
ARP823	Minimizing Stress-Corrosion Cracking in Wrought Heat Treatable Aluminum Alloy Products
AS 1990	Aluminum Alloy Tempers

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM B660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/B 666M	Identification Marking of Aluminum and Magnesium Products

2.3 ANSI Publications:

Available from ANSI, 25 West 43rd Street, New York, NY 10036 or www.ansi.org.

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 following percentages by weight, determined in accordance with AMS 2355:

TABLE 1 - Composition

Element	min	max
Silicon	--	0.50
Iron	--	0.50
Copper	3.8	4.9
Manganese	0.30	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:

Solution heat treated, cold reduced approximately 6% in thickness, and precipitation heat treated to the T861 Temper (See AS 1990). Heat treatments shall be performed in accordance with AMS 2772.

3.3 Properties:

The product shall conform to the following requirements, determined in accordance with AMS 2355 on the mill product:

3.3.1 Tensile Properties: Shall be as specified in Table 2:

TABLE 2A - Minimum Tensile Properties, Inch/Pound Units

Nominal Thickness Inches				Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 in. or 4D %
0.020	to	0.062,	incl	70	62	3
Over 0.062	to	0.249,	incl	71	66	4
Over 0.249	to	0.500,	incl	70	64	4

TABLE 2B - Minimum Tensile Properties, SI Units

Nominal Thickness Millimeters				Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
0.51	to	1.57,	incl	483	427	3
Over 1.57	to	6.32,	incl	490	455	4
Over 6.32	to	12.70,	incl	483	441	4

3.4 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 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 vendor of the product shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests:

Composition (3.1) tensile properties (3.3.1) and tolerances are classified as acceptance tests and except for composition, shall be performed on each lot.

4.3 Sampling:

Shall be in accordance with AMS 2355.

4.4 Reports:

The vendor of the product shall furnish with each shipment a report stating that the product conforms to the composition and other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 4193C, size, and quantity. The report shall also identify the producer, the product form, and the size of the mill product.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2355.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

Shall be in accordance with ASTM B 666/B 666M.

5.2 Protective Treatment:

Product shall be protected from damageduring storage and shipment by a method determined by vendor unless specified by purchaser. Examples of typical methods include but are not limited to interleaving with paper or oiling of the surface.

5.3 Packaging:

The product shall be prepared for shipment in accordance with ASTM B 660 and in compliance with applicable rules and regulations pertaining to the handling, packaging and transportation of the product to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT:

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS:

Product not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.