SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS4200 | REV. B

Issued 1978-01
Revised 2005-02
Reaffirmed 2012-03

Superseding AMS4200A

Aluminum Alloy Plate
7.7Zn - 2.4Mg - 1.6Cu - 0.16Cr (7049-T7351)
Solution Heat Treated, Stress Relieved, and Precipitation Heat Treated
(Composition similar to UNS A97049)

RATIONALE

AMS4200B 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 plate.

1.2 Application:

This product has been used typically for parts requiring high strength and resistance to stress-corrosion, but usage is not limited to such applications.

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, 400 Commonwealth Drive, Warrendale, PA 15096-0001 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
AS1990	Aluminum Alloy Tempers

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS4200B

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 B 660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/666M	Identification Marking of Aluminum and Magnesium Alloy Products
ASTM B 594	Ultrasonic Inspection of Aluminum-Alloy Products for Aerospace Applications

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 percentages by weight shown in Table 1, determined in accordance with AMS 2355.

TABLE 1 - Composition

Element	min	max
Silicon	--	0.25
Iron	--	0.35
Copper	1.2	1.9
Manganese	--	0.20
Magnesium	2.0	2.9
Chromium	0.10	0.22
Zinc	7.2	8.2
Titanium	--	0.10
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition:

Solution heat treated, stress-relieved by stretching to produce a nominal permanent set of 2%, but not less than 1-1/2% nor more than 3%, and precipitation heat treated to the T7351 temper (See AS1990).

3.2.1 Plate shall receive no further straightening operations after stretching.

3.3 Heat Treatment:

Plate shall be heat treated in accordance with AMS 2772 to the T7351 temper (See AS1990).

3.4 Properties:

Plate shall conform to the listed requirements determined in accordance with AMS 2355 on the mill produced size and as specified herein:

3.4.1 Tensile Properties: Shall be as specified in Table 2 .

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

Nominal Thickness Inches	Specimen Orientation	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
0.750 to 1.000, incl	Long Trans.	74.0	65.0	8
Over 1.000 to 1.500, incl	Long Trans.	73.0	64.0	8
Over 1.500 to 2.000, incl	Long Trans.	73.0	64.0	7
Over 2.000 to 2.500, incl	Long Trans.	73.0	63.0	6
Over 2.500 to 3.000, incl	Long Trans.	72.0	62.0	6
Over 3.000 to 4.000, incl	Longitudinal	70.0	60.0	6
	Long Trans.	70.0	60.0	5
	Short Trans.	65.0	56.0	2
Over 4.000 to 4.500, incl	Longitudinal	68.0	58.0	6
	Long Trans.	68.0	58.0	5
	Short Trans.	63.0	54.0	2
Over 4.500 to 5.000, incl	Longitudinal	68.0	58.0	5
	Long Trans.	68.0	58.0	5
	Short Trans.	63.0	54.0	2

TABLE 2B – Minimum Tensile Properties, SI Units

Nominal Thickness Millimeters	Specimen Orientation	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 40.8 mm or 4D %
19.05 to 25.40, incl	Long Trans.	510	448	8
Over 25.40 to 38.10, incl	Long Trans.	503	441	8
Over 38.10 to 50.80, incl	Long Trans.	503	441	7
Over 50.80 to 63.50, incl	Long Trans.	503	434	6
Over 63.50 to 76.20, incl	Long Trans.	496	427	6
Over 76.20 to 101.60, incl	Longitudinal	483	414	6
	Long Trans.	483	414	5
	Short Trans.	448	386	2
Over 101.60 to 114.30, incl	Longitudinal	469	400	6
	Long Trans.	469	400	5
	Short Trans.	434	372	2
Over 114.30 to 127.00, incl	Longitudinal	469	400	5
	Long Trans.	469	400	5
	Short Trans.	434	372	2

3.4.2 Corrosion Resistance: Resistance to stress-corrosion cracking and to exfoliation-corrosion shall be acceptable if the plate conforms to the requirements of 3.4.2.1 and 3.4.2.2.

3.4.2.1 If the conductivity is 38.0% IACS (International Annealed Copper Standard) or higher, tensile properties meet the requirements of Table 2, and the long-transverse yield strength does not exceed the specified minimum value by more than 11.9 ksi (82.0 MPa), the plate is acceptable.

3.4.2.2 If the requirements of 3.4.2.1 are not met, the plate is unacceptable but may be re-heat treated or given additional precipitation heat treatment and if, upon completion of such treatment, the plate develops tensile property/conductivity relationship conforming to 3.4.2.1, the plate shall be acceptable.

3.4.3 Stress-Corrosion Resistance: Specimens from plate shall show no evidence of stress-corrosion cracking when stressed in the long-transverse direction to 45.0 ksi (310 MPa).

3.4.4 Ultrasonic Soundness: When specified, each plate shall be inspected in accordance with ASTM B 594.

3.4.4.1 Plates weighing 2000 pounds (907 kg) or under shall meet the requirements for ultrasonic class shown in Table 3.

TABLE 3 - Ultrasonic Parameters

Plate Thickness Inch	Plate Thickness Millimeters	Ultrasonic Class
0.500 to 1.500, excl	12.70 to 38.10 excl	B
Over 1.500 to 3.000, incl	Over 38.10 to 76.20 incl	A
Over 3.000 to 4.500, incl	Over 76.20 to 114.30, incl	B

3.5 Quality:

Plate, 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 plate.

3.6 Tolerances:

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

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of plate shall supply all samples for vendor'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 plate conforms to specified requirements.