

AEROSPACE MATERIAL SPECIFICATION



AMS 4273A

Issued JAN 1997
Revised APR 1999

Superseding AMS 4273

Submitted for recognition as an American National Standard

Aluminum Alloy, Sheet and Plate (2424-T3 Flat Sheet and Plate) Solution Heat Treated and Cold Worked

UNS A92424

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of sheet and plate.

1.2 Application:

This product has been used typically for formed structural parts with good tensile strength, corrosion resistance, toughness, and resistance to fatigue crack growth, but usage is not limited to such applications.

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

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification 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.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

- AMS 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged or Flash Welded Rings
- MAM 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged or Flash Welded Rings, Metric (SI) Units

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright 1999 Society of Automotive Engineers, Inc.
All rights reserved.

Printed in U.S.A.

QUESTIONS REGARDING THIS DOCUMENT:
TO PLACE A DOCUMENT ORDER:
SAE WEB ADDRESS:

(724) 772-7154
(724) 776-4970
<http://www.sae.org>

FAX: (724) 776-0243
FAX: (724) 776-0790

2.1 (Continued):

AMS-H-6088 Heat Treatment of Aluminum Alloys

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

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

| | |
|-------------------|---|
| ASTM B 646 | Fracture Toughness Testing of Aluminum Alloys |
| ASTM B 666/B 666M | Identification Marking of Aluminum and Magnesium Products |
| ASTM E 399 | Plane-Strain Fracture Toughness of Metallic Materials |
| ASTM E 561 | R-Curve Determination |

2.3 ANSI Publications:

Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ANSI H 35.2 Dimensional Tolerances for Aluminum Mill Products
ANSI H 35.2M 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 or MAM 2355.

TABLE 1 - Composition

| Element | min | max |
|-----------------------|-----------|------|
| Silicon | -- | 0.10 |
| Iron | -- | 0.12 |
| Copper | 3.8 | 4.4 |
| Manganese | 0.30 | 0.6 |
| Magnesium | 1.2 | 1.6 |
| Zinc | -- | 0.20 |
| Titanium | -- | 0.10 |
| Other Elements, each | -- | 0.05 |
| Other Elements, total | -- | 0.15 |
| Aluminum | remainder | |

3.2 Condition:

Solution heat treated in accordance with MIL-H-6088 as applicable to 2024-T3 and cold worked.

3.3 Properties:

Sheet and plate shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355:

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 Inches or 4D % |
|-----------------------------|----------------------------|---|--------------------------------------|
| 0.020 to 0.128 | 63.0 | 42.0 | 15 |
| Over 0.128 to 0.249 | 64.0 | 42.0 | 15 |
| Over 0.249 to 0.499 | 64.0 | 42.0 | 12 |

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 3.25 | 434 | 290 | 15 |
| Over 3.25 to 6.32 | 441 | 290 | 15 |
| Over 6.32 to 12.67 | 441 | 290 | 12 |

- 3.3.2 Bending: Product shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the bend factor shown in Table 3 times the nominal thickness of the sheet with axis of bend parallel to the direction of rolling.

TABLE 3 - Bending Parameters

| Nominal Thickness Inch | Nominal Thicknes Millimeters | Bend Factor |
|---------------------------|---------------------------------|-------------|
| Over 0.020 to 0.051, incl | Over 0.51 to 1.30, incl | 5 |
| Over 0.051 to 0.128, incl | Over 1.30 to 3.25, incl | 6 |
| Over 0.128 to 0.249, incl | Over 3.25 to 6.32, incl | 8 |
| Over 0.249 to 0.499, incl | Over 6.32 to 12.67, incl | 10 |

- 3.3.3 Critical-Stress-Intensity Factor (K_{IC}): Shall be not lower than 130 ksi $\sqrt{\text{inch}}$ (143 MPa $\sqrt{\text{m}}$), determined in the T-L direction using a 16-inch (406-mm) wide center-cracked panel in accordance with ASTM B 646 and ASTM E 561.

3.4 Quality:

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.