SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4037N

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Reaffirmed MAY 2008

Superseding AMS 4037M

Aluminum Alloy, Sheet and Plate
4.4Cu - 1.5Mg - 0.60Mn (2024; -T3 Flat Sheet, -T351 Plate)
Solution Heat Treated

(Composition similar to UNS A92024)

1. SCOPE:

1.1 Form:

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

1.2 Application:

These products have been used typically for formed structural parts of good strength. Plate is also suitable for structural machined parts where warpage during machining, due to residual stresses must be minimized, but usage is not limited to such applications.

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 supplied 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.

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

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, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
AMS 2772	Heat Treatment of Aluminum Alloy Raw Materials
ARP823	Minimizing Stress-Corrosion Cracking in Wrought Heat-Treatable Aluminum Alloy Products
AS1990	Aluminum Alloy Tempers

2.2 ASTM Publications:

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

ASTM B 660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/B 666M	Identification of Aluminum and Magnesium Alloy 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 percentages by weight shown in Table 1, 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
Aluminium	remainder	

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Sheet: Solution heat treated in accordance with AMS 2772 and cold worked to the T3 temper (see AS1990).

3.2.2 Plate: Solution heat treated in accordance with AMS 2772 and stretched to produce a nominal permanent set of 2% but not less than 1-1/2% nor more than 3% to the T31 temper (see AS1990).

3.2.2.1 Plate shall receive no further straightening operations after stretching.

3.3 Properties:

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

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 %
0.008 to 0.009, incl	63.0	42.0	10
Over 0.009 to 0.020, incl	63.0	42.0	12
Over 0.020 to 0.128, incl	63.0	42.0	15
Over 0.128 to 0.249, incl	64.0	42.0	15
Over 0.249 to 0.499, incl	64.0	42.0	12
Over 0.499 to 1.000, incl	63.0	42.0	8
Over 1.000 to 1.500, incl	62.0	42.0	7
Over 1.500 to 2.000, incl	62.0	42.0	6
Over 2.000 to 3.000, incl	60.0	42.0	4
Over 3.000 to 4.000, incl	57.0	41.0	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 %
	0.20 to	0.23, incl	434	290	10
Over	0.23 to	0.51, incl	434	290	12
Over	0.51 to	3.25, incl	434	290	15
Over	3.25 to	6.32, incl	441	290	15
Over	6.32 to	12.67, incl	441	290	12
Over	12.67 to	25.40, incl	434	290	8
Over	25.40 to	38.10, incl	427	290	7
Over	38.10 to	50.80, incl	427	290	6
Over	50.80 to	76.20, incl	414	290	4
Over	76.20 to	101.60, incl	393	283	4

3.3.2 Bending: Product 0.008 to 0.499 inch (0.20 to 12.67 mm), inclusive, in nominal thickness 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 product with axis of bend parallel to the direction of rolling.

TABLE 3 - Bending Parameters

Nominal Thickness Inch			Nominal Thickness Millimeters			Bend Factor
	0.008 to 0.020, incl			0.20 to 0.51, incl		4
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

3.3.2.1 Bending requirements for product over 0.499 inch (12.67 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

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.