AEROSPACE MATERIAL SPECIFICATION

AMS4477

Issued 2014-05

Aluminum Alloy, Coiled Sheet
4.4Cu - 1.5Mg - 0.60Mn (2024-T4)
Solution Treated
(Composition similar to UNS A82024)

RATIONALE

AMS4477 is a new specification for bare, coiled 2024-T4 sheet, created to facilitate /stabilization of AMS QQ-A-250/4.

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of coiled sheet supplied in the –T4 temper.

1.2 Application

These products have been used typically for medium strength parts requiring formability and whose fabrication does not involve welding, 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 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 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

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/AMS4477

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

AS1990 Aluminum Alloy Tempers

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 B 660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B 666/B666M Identification of Aluminum and Magnesium Alloy Products

2.3 ANSI Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, 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 as 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	0.30	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

The product shall be supplied in the following condition:

3.2.1 Coiled sheet

Solution heat treated and naturally aged to the T4 temper in accordance with AMS2772 (See AS1990).

3.3 Properties

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

3.3.1 Tensile Properties

Shall be as shown in Table 2 (See 8.4)

TABLE 2A - TENSILE PROPERTIES, INCH/POUND UNITS

Temper	Nominal Thickness, inches	Tensile Strength ksi	Minimum Yield Strength at 0.2% Offset ksi	Minimum Elongation in 2 Inches or 4D %
-T4	0.010 thru 0.020	62	40	12
	0.021 thru 0.249	62	40	15

TABLE 2B - TENSILE PROPERTIES, SI UNITS

Temper	Nominal Thickness, mm	Tensile Strength MPa	Minimum Yield Strength at 0.2% Offset MPa	Minimum Elongation in 2 Inches or 4D %
-T4	0.25 thru 0.51	427	276	12
	0.53 thru 6.32	427	276	15

3.3.2 Response to Heat Treatment (-T62)

The product, as received by purchaser, shall meet the following properties shown in Table 3 after artificial aging to the -T62 condition in accordance with AMS2772 (See 8.4).

TABLE 3A - TENSILE PROPERTIES, INCH/POUND UNITS

Temper	Nominal Thickness, inches	Tensile Strength ksi	Minimum Yield Strength at 0.2% Offset ksi	Minimum Elongation in 2 Inches or 4D %
-T62	0.010 thru 0.249	64	50	5

TABLE 3B - TENSILE PROPERTIES, SI UNITS

Temper	Nominal Thickness, mm	Tensile Strength MPa	Minimum Yield Strength at 0.2% Offset MPa	Minimum Elongation in 2 Inches or 4D %
-T62	0.25 thru 6.32	441	345	5

3.4 Bending

Product as received by purchaser 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 4 times the nominal thickness of the product with axis of bend parallel to the direction of rolling.

TABLE 4 – BENDING PARAMETERS

Nominal Thickness, inch	Nominal Thickness, millimeters	Bend Factor
0.010 to 0.020, incl	0.25 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

3.5 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.

3.6 Tolerances

Shall conform to the applicable requirements of ANSI H35.2/H35.2M.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor 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 product conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), tensile properties (3.3.1), and tolerances (3.6) are acceptance tests and, except for composition, shall be performed on each lot.

4.2.2 Periodic Tests

Response to heat treatment (3.3.2) and bending (3.4) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing

Shall be in accordance with AMS2355.

4.4 Reports

The vendor of the product shall furnish with each shipment a report stating that the product conforms to the composition and tolerances, and showing numerical results of tests for the acceptance test requirements. This report shall include the purchase order number, lot number, AMS4477, 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 ASTM B 666/B 666M.

5. PREPARATION FOR DELIVERY

5.1 Identification

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