SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS4467

Issued 2011-12

Aluminum Alloy, Sheet and Plate, Alclad
4.4Cu - 1.5Mg - 0.60Mn (Alclad 2024, -T861 Sheet & Plate)
Solution Heat Treated, 6% Cold Worked and Artificially Aged
(Composition similar to UNS A82024)

RATIONALE

AMS4467 is a new specification for normal 2024-T861 alclad sheet and plate to facilitate cancellation of AMS-QQ-A-250/5.

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of alclad sheet and plate supplied in the -T861 temper.

1.2 Application

These products have been used typically for high strength parts requiring higher yield strength than is afforded by naturally aged tempers of this alloy and maximum corrosion resistance and whose fabrication does not involve welding, 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 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

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/AMS4467

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 594 Ultrasonic Inspection of Aluminum-Alloy Products for Aerospace Applications

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 American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

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 as shown in Tables 1 and 2, determined in accordance with AMS2355.

TABLE 1 - COMPOSITION, CORE (2024)

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	

TABLE 2 - COMPOSITION, CLADDING (1230)

Element	min	max
Iron + Silicon	--	0.70
Copper	--	0.10
Manganese	--	0.05
Magnesium	--	0.05
Zinc	--	0.10
Titanium	--	0.03
Other Elements, each	--	0.03
Aluminum	99.30	--

3.2 Condition

The product shall be supplied in the following condition:

3.2.1 Sheet

Solution heat treated, cold worked approximately 6% and artificially aged to the T361 temper in accordance with AMS2772 (See AS1990).

3.2.2 Plate

Solution heat treated, cold worked approximately 6%, stretched to produce a nominal permanent set of 2% but not less than 1-1/2% nor more than 3%, and artificially aged to the T361 temper in accordance with AMS2772 (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 AMS2355 on the mill produced size.

3.3.1 Tensile Properties

Shall be as shown in Table 3 (See 8.3).

TABLE 3A - MINIMUM TENSILE PROPERTIES, INCH/POUND UNITS

Temper	Nominal Thickness, Inches	Tensile Strength, ksi	Yield Strength at 0.2% Offset, ksi	Elongation in 2 inches or 4D, %
-T861	0.020 to 0.062, incl	64.0	58.0	3
	Over 0.062 to 0.249, incl	69.0	64.0	4
	Over 0.249 to 0.499, incl	68.0	62.0	4
	0.500	70.0	64.0	4

TABLE 3B - MINIMUM TENSILE PROPERTIES, SI UNITS

Temper	Nominal Thickness, Millimeters	Tensile Strength, MPa	Yield Strength at 0.2% Offset, MPa	Elongation in 50.8 mm or 4D, %
-T861	0.508 to 1.575, incl	441	400	3
	Over 1.575 to 6.325, incl	476	441	4
	Over 6.325 to 12.675, incl	469	427	4
	12.70	483	441	4

3.4 Cladding Thickness

3.4.1 Thickness of Cladding Plates

The aluminum alloy plates that are bonded to the two sides of the aluminum alloy (2024) ingot or slab, to form a composite that is to be rolled, shall each have a thickness as specified in Table 4.

TABLE 4 - CLADDING THICKNESS

Nominal Thickness, Inch	Nominal Thickness, mm	Nominal Cladding Thickness Per Side, % of Thickness	Average Cladding Thickness Per Side, % of Thickness, Minimum
0.010 to 0.062, incl	0.25 to 1.57, incl	5	4
Over 0.062	Over 1.57	2.5	2

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 Ultrasonic Inspection

When specified, each 0.500 inch (12.70 mm) plate shall be ultrasonically inspected in accordance with ASTM B 594 and shall meet the requirements for ultrasonic class B.

3.7 Tolerances

Shall conform to all applicable requirements of ANSI H35.2/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. 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 (3.8) and, when specified, ultrasonic soundness (3.7.1) are acceptance tests and except for composition, shall be performed on each lot.

4.2.2 Periodic Tests

Cladding thickness (3.4.1) is a periodic test 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.