AEROSPACE MATERIAL SPECIFICATION

AMS4347™	REV. E
Issued 1987-10 Revised 2020-08 Superseding AMS4347D	

Aluminum Alloy Sheet
1.0Mg - 0.8Si - 0.8Cu - 0.5Mn (6013-T4)
Solution Heat Treated and Naturally Aged
(Composition similar to UNS A96013)

RATIONALE

AMS4347E prohibits unauthorized exceptions (3.6), and revises condition (3.2), properties (3.3.3), reports (4.4.1) and identification (5.1.1), and results from a Five-Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of sheet from 0.020 to 0.249 inch (0.51 to 6.32 mm), inclusive, in thickness (see 8.6).

1.2 Application

This product has been used typically for formed structural parts where good stretch formability is required and where, after precipitation heat treatment, good strength, toughness, and fatigue properties and maximum corrosion resistance are inherent, 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 +1 724-776-4970 (outside USA), www.sae.org.

AMS2355	Quality Assurance, Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock), and Rolled, Forged, or Flash Welded Rings
AMS2772	Heat Treatment of Aluminum Alloy Raw Materials
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

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**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS4347E/

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 B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

2.3 ANSI Accredited Publications

Copies of these documents are available online at http://webstore.ansi.org/.

ANSI H35.1/H35.1M Standard Alloy and Temper Designation System for Aluminum

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 AMS2355.

Table 1 - Composition

Element	Min	Max
Silicon	0.6	1.0
Iron	--	0.50
Copper	0.6	1.1
Manganese	0.20	0.8
Magnesium	0.8	1.2
Chromium	--	0.10
Zinc	--	0.25
Titanium	--	0.10
Other Elements, each	--	0.05
Other Elements, total	--	0.15
Aluminum	remainder	

3.2 Condition

Solution heat treated and naturally aged to the T4 temper (refer to ANSI H35.1/H35.1M) in accordance with AMS2772.

3.3 Tensile Properties

Sheet, 0.020 to 0.249 inch (0.51 to 6.32 mm), inclusive, in nominal thickness, shall conform to the requirements of Tables 2 and 3, determined in the long-transverse direction in accordance with AMS2355 on the mill produced size.

3.3.1 Mechanical properties for product outside the range covered by 1.1 shall be agreed upon between purchaser and producer.

3.3.2 As Solution Heat Treated and Naturally Aged

Shall be as shown in Table 2.

Table 2 - Minimum long transverse tensile properties

Property	Value
Tensile Strength	40.0 ksi (276 MPa)
Yield Strength at 0.2% Offset	21.0 ksi (145 MPa)
Elongation in 2 Inches (50.8 mm)	20%

3.3.3 Response to Temper Conversion

Sheet in the T4 temper, precipitation heat treated to the T62 temper (refer to ANSI H35.1/H35.1M) in accordance with AMS2772 shall have the properties shown in Table 3.

Table 3 - Minimum long transverse tensile properties

Property	Value
Tensile Strength	52.0 ksi (359 MPa)
Yield Strength at 0.2% Offset	46.0 ksi (317 MPa)
Elongation in 2 Inches (50.8 mm)	8%

3.4 Quality

Sheet, 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 sheet.

3.5 Tolerances

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

3.6 Exceptions

Any exceptions shall be authorized by purchaser and reported as in 4.4.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of sheet shall supply all samples for producer'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 sheet conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), tensile properties (3.3), response to temper conversion (3.3.3), and tolerances (3.5) are acceptance tests and, except for composition, shall be performed on each lot.

4.3 Sampling and Testing

Shall be in accordance with AMS2355.

4.4 Reports

The producer of sheet shall furnish with each shipment a report stating that the sheet conforms to the composition and tolerances and showing the numerical results of tests on each inspection lot to determine conformance to the other test requirements. This report shall include the purchase order number, inspection lot number, AMS4347E, size, and quantity. The report shall also identify the producer, product form, and the size of the mill product.

4.4.1 When material produced to this specification has exceptions authorized by purchaser taken to the technical requirements listed in Section 3, the report shall contain a statement “This material is certified as AMS4347E(EXC) because of the following exceptions:” and the specific exceptions shall be listed.

4.5 Resampling and Retesting

Shall be in accordance with AMS2355.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with ASTM B666/B666M.

5.1.1 When technical exceptions are taken (see 4.4.1), the material shall be marked with AMS4347(EXC).

5.2 Protective Treatment

Sheet shall be protected from damage during storage and shipment by a method determined by producer unless specified by purchaser. Examples of typical protective methods include but are not limited to interleaving with paper or oiling of the surfaces.

5.3 Packaging

Sheet shall be prepared for shipment in accordance with ASTM B660 and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the sheet to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A producer shall include this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Sheet not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES

8.1 Revision Indicator

A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 Alloy 6013 demonstrates good formability in the -T4 temper and is most successful in applications where parts are formed in the -T4 temper and aged to -T62. User manufacturing operations involving re-solution heat treatment of material after forming should be evaluated for potential changes in material microstructure and properties.

8.3 Terms used in AMS are clarified in ARP1917.