



AEROSPACE MATERIAL SPECIFICATION

AMS4011™**REV. E**

Issued	1968-11
Revised	2009-03
Reaffirmed	2014-12
Stabilized	2022-08

Superseding AMS4011D

Aluminum, Foil and Light Gage Sheet

99.45Al (1145-0)

Annealed

(Composition similar to UNS A91145)

RATIONALE

AMS4011E has been declared "STABILIZED" by AMS Committee D Nonferrous Alloys Committee. This document will no longer be updated and may no longer represent standard industry practice. This document was stabilized because this document contains mature technology that is not expected to change and thus no further revisions are anticipated.

NOTE: Previously, this document was reaffirmed. The last technical update of this document occurred in March, 2009. Users of this document should refer to the cognizant engineering organization for disposition of any issues with reports/certifications to the specification, including exceptions listed on the certification. In many cases, the purchaser may represent a sub-tier supplier and not the cognizant engineering organization.

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Documents

Document Sharing Hub

1. SCOPE

1.1 Form

This specification covers aluminum in the form of foil and light gage sheet.

1.2 Application

These products have been used typically for capacitors, electronic components, and sound/vibration damping tape, 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

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 193 Resistivity of Electrical Conductor Materials
ASTM E 252 Thickness of Thin Foil and Film by Weighing
ASTM E 345 Tension Testing of Metallic Foil

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
Aluminum	99.45	--
Iron + Silicon	--	0.55
Copper	--	0.05
Magnesium	--	0.05
Manganese	--	0.05
Vanadium	--	0.05
Zinc	--	0.05
Titanium	--	0.03
Other Elements, each	--	0.03

3.2 Condition

Product shall be supplied as follows:

3.2.1 Foil

Annealed, having a bright finish on one side and a matte finish on the other side.

3.2.1.1 Foil shall be supplied in rolls with a dry or slick surface condition, as ordered. When a condition is not specified, either a dry or slick surface condition may be supplied.

3.2.1.1.1 The surface condition of the foil may be determined by placing drops of a water-alcohol solution containing various percentages of alcohol on the foil and observing the wetting of the surfaces. The degree of oiliness shall be stated as wettable with 10% alcohol solution, 25% alcohol solution, etc.

3.2.2 Light Gage Sheet

Annealed, with either a bright finish or a matte finish unless a specific condition is specified by purchaser.

3.3 Properties

The product shall conform to the following requirements:

3.3.1 Tensile Properties

3.3.1.1 Foil

Shall be not higher than 14.0 ksi (96.5 MPa), determined in accordance with ASTM E 345 on foil under 0.006 inch (0.15 mm) in nominal thickness.

3.3.1.2 Light Gage Sheet

Shall be as shown in Table 2 for light gage sheet 0.006 to 0.030 inch (0.15 to 0.76 mm), inclusive, in nominal thickness, determined in accordance with AMS2355.

TABLE 2A - TENSILE PROPERTIES, LIGHT GAGE SHEET, INCH/POUND UNITS

Property	Value
Tensile Strength	8.0 to 13.0 ksi
Elongation in 2 inches, min	
Nominal Thickness	
0.006 to 0.019 inch, incl	15%
Over 0.019 to 0.030 inch, incl	20%

TABLE 2B - TENSILE PROPERTIES, LIGHT GAGE SHEET, SI UNITS

Property	Value
Tensile Strength	55.2 to 89.6 MPa
Elongation in 50.8 mm, min	
Nominal Thickness	
0.15 to 0.48 mm, incl	15%
Over 0.48 to 0.76 mm, incl	20%

3.3.2 Breaking Load

Specimens, 1 inch (25 mm) wide, of single thickness product or complete specimens consisting of multiple thicknesses of product shall conform to the breaking load requirements shown in Table 3; splices shall develop not less than 80% of the specified breaking load.

TABLE 3A - MINIMUM BREAKING LOAD, INCH/POUND UNITS

Nominal Inch	Pounds Force per Inch of Width
0.00017	1.1
0.00020	1.3
0.00023	1.4
0.00025	1.6
0.00030	1.9
0.00035	2.2
0.00040	2.6
0.00045	2.9
0.00050	3.2