

# AEROSPACE MATERIAL SPECIFICATION



AMS 4010B

Issued JUN 1952  
Revised AUG 1994  
Superseding AMS 4010A

Submitted for recognition as an American National Standard

ALUMINUM ALLOY FOIL  
1.2Mn - 0.12Cu (3003-H18)

UNS A93003

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of April, 1994. It is recommended, therefore, that this specification not be specified for new designs.

This cover sheet should be attached to the "A" revision of the subject specification.

"NONCURRENT" refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs. Each of these "NONCURRENT" specifications is available from SAE upon request.

PREPARED UNDER THE JURISDICTION OF AMS COMMITTEE "D"

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and stability for any particular use, including my patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your Written comments and suggestions.

**AN AMERICAN NATIONAL STANDARD**



400 Commonwealth Drive, Warrendale, PA 15096-0001

**AEROSPACE  
MATERIAL  
SPECIFICATION**

**AMS 4010A**  
Superseding AMS 4010

Issued 6-15-52  
Revised 1-15-77

ALUMINUM ALLOY FOIL  
1.2Mn - 0.2 Cu (30030H18)

UNS A93003

1. SCOPE:

1.1 Form: This specification covers an aluminum alloy in the form of foil,

1.2 Application: Primarily for corrugated or expanded honeycomb core material for use in sandwich construction.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350, extent specified herein.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc. , 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Materials Specifications:

AMS 2350 - Standards and Test Methods  
AMS 2355 - Quality Assurance Sampling and Testing of Aluminum-Base and Magnesium-Base Alloys, Wrought Products (Except Forgings and Forging Shock) and Flash Welded Rings

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E252 - Thickness of Thin Foil and Film by Weighing  
ASTM E345 - Tension Testing of Metallic Foil

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-649 - Aluminum and Magnesium Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition: shall conform to the following percentages by weight, determined in accordance to  
Ø AMS 2355:

	min	max
Manganese	1.0	- 1.5
Copper	0.05	- 0.20
Iron	--	0.7
Silicon	--	0.6
Zinc	--	0.10
Other Impurities, each	--	0.05
Other Impurities, total	--	0.18
Aluminum		remainder

**REAFFIRMED  
APR 1984**

3.2 Condition: Hard rolled, mill finish.

3.3 Properties: Foil shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as follows, determined in accordance with ASTM E345 on foil 0.002 in. (0.05 mm) and over in nominal thickness:

Tensile Strength, min	25,000 psi (172 MPa)
-----------------------	----------------------

3.4 Quality: Foil, as received by the purchaser, shall be uniform in quality and condition, sound, and free from holes, tears, and other discontinuities and from internal imperfections detrimental to usage of the foil. Dents, ripples, kinks, and sharp bends in the foil shall be unacceptable unless they are located within 0.050 in. (1.27 mm) of an edge or are less than 0.030 in. (0.76 mm) deep.

Ø 3.4.1 Foil shall be free from grease and dirt and as free from oil as is commercially practicable.

3.5 Tolerances:

3.5.1 Thickness: shall not deviate from the thickness ordered by more than  $\pm 10\%$ , determined by instrument measurement or by the weighing method specified for thin foil in ASTM E252.

3.5.1.1 When a dispute occurs between purchaser and vendor over the thickness values, thickness determined by the weighing method of ASTM E252 shall apply. For such calculations, density shall be taken as 0.099 lb per cu in. (2.74 Mg/m<sup>3</sup>).

3.5.2 Width: Shall be within  $\pm 0.032$  in. (0.81 mm) of the width ordered.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of foil shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the foil conforms to the requirements of this specification.

4.2 Classification of Test: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests.

Ø 4.3 Sampling: accordance with AMS 2355 and the following:

4.3.1 Tensile Properties: Specimens shall be cut with the axis of specimen parallel to the direction of rolling; one specimen shall be selected for each 2000 lb (908 kg) or fraction thereof from each lot except that not more than one sample will be required from a coil.

Ø 4.3.2 Thickness: Two Specimens from each nominal thickness.

4.4 Reports:

4.4.1 The vendor of foil shall furnish with each shipment three copies of a report showing the results of tests made on the foil to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, lot number, size, and quantity.

- 4.1.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of foil, part number, and quantity. When foil for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of foil to determine conformance to the requirements of this specification, and shall include in the report a statement that the foil conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

Ø 4.5 Resampling and Retesting: Shall be in accordance with AMS 2355,

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

- 5.1.1 Foil shall be furnished in rolls, wound on 3 in. (76 mm) ID cores; the diameter of the rolls shall be Ø not less than 6 in. (152 mm) nor more than 34 in. (864 mm). The foil in each roll, when possible, shall be in one continuous length but may contain a maximum of one splice for every 3000 lineal ft (914 m) or fraction thereof per roll. Splices shall be made with pressure-sensitive tape or by electric or ultrasonic welding, unless otherwise specified. Splices shall be marked with a colored tape or equivalent that shall extend over the edge of the roll so as to be easily seen at the edges of the roll. Foil condition and coiling shall be such that complete uncoiling may be accomplished with no tearing or other damage to the foil. Each roll shall be wrapped in waterproof paper.
- 5.1.2 Each wrapped coil shall be identified with the following information, either stencilled on the outer layer of the wrapping or on a suitable tag attached to the roll, preferably to the core. The marking shall be of such size as to be clearly legible and shall not be obliterated by normal handling:

ALUMINUM ALLOY FOIL, (3003-H18)  
 AMS 4010A  
 PURCHASE ORDER NUMBER \_\_\_\_\_  
 MANUFACTURER'S IDENTIFICATION \_\_\_\_\_  
 THICKNESS \_\_\_\_\_  
 WIDTH \_\_\_\_\_  
 TOTAL WEIGHT OR LENGTH \_\_\_\_\_

- 5.1.3 Each wrapped coil shall be packed in a suitable shipping container in such a manner that the weight of the coil is supported by the core and the coil is restrained to prevent telescoping. Ø
- 5.1.4 Exterior containers shall be prepared for shipment in accordance with commercial practice to ensure carrier acceptance and safe transportation to the point of delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation. Ø
- 5.1.5 Exterior shipping containers shall be legibly marked with the following information in such a manner that the markings shall not smear or be obliterated during normal handling: Ø

ALUMINUM ALLOY FOIL (3003-H18)  
 AMS 4010A  
 PURCHASE ORDER NUMBER \_\_\_\_\_  
 MANUFACTURER'S IDENTIFICATION \_\_\_\_\_  
 THICKNESS (ES) \_\_\_\_\_  
 WIDTH (S) \_\_\_\_\_  
 TOTAL WEIGHT OR LENGTH \_\_\_\_\_