

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 4005B

Issued 11-1-69
Revised 7-1-89

Superseding AMS 4005A

ALUMINUM ALLOY FOIL
5.0Mg - 0.12Mn - 0.12Cr (5056-H191)
Strain Hardened

UNS A95056

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 SAE publications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

AMS 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings

MAM 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings, Metric (SI) units

2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

ASTM B660 - Packaging/Packing of Aluminum and Magnesium Products

ASTM E252 - Thickness of Thin Foil and Film by Weighing

ASTM E345 - Tension Testing of Metallic Foil

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3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined in accordance with AMS 2355 or MAM 2355:

	min	max
Magnesium	4.5	5.6
Manganese	0.05	0.20
Chromium	0.05	0.20
Iron	--	0.40
Silicon	--	0.30
Copper	--	0.10
Zinc	--	0.10
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

3.2 Condition: Strain hardened, 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
Ø ASTM E345 on foil under 0.006 inch (0.15 mm) in nominal thickness:

Tensile Strength, minimum	58,000 psi (400 MPa)
Yield Strength at 0.2% Offset, minimum	52,000 psi (359 MPa)

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

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

3.5 Tolerances: Shall conform to the following:

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 thickness, values determined by the weighing method of ASTM E252 shall apply. For such calculations, density shall be taken as 43.3 grams per cubic inch (2.64 g/cm^3).

3.5.2 Width: Shall be within ± 0.032 inch (0.81 mm) of the width ordered.

4. QUALITY ASSURANCE PROVISIONS:

- 4.1 Responsibility for Inspection: The vendor of foil shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the foil conforms to the requirements of this specification.
- 4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each lot.
- 4.3 Sampling: Shall be in accordance with AMS 2355 or MAM 2355 and the following:
- 4.3.1 Specimens for tensile testing shall be cut with the axis of specimen parallel to the direction of rolling; one specimen shall be selected for each 2000 pounds (907 kg) or fraction thereof from each lot except that not more than one sample will be required from a coil.
- 4.3.2 Thickness: Two specimens from each nominal thickness.
- 4.4 Reports: The vendor of foil shall furnish with each shipment a report showing the results of tests to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 4005B, size, and quantity.
- 4.5 Resampling and Retesting: Shall be in accordance with AMS 2355 or MAM 2355.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

- 5.1.1 Foil shall be furnished in rolls, wound on 3 inch (76 mm) ID cores; the diameter of the rolls shall be not less than 6 inches (152 mm) nor more than 34 inches (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 linear feet (914 m) or fraction thereof per roll. Splices shall be made with pressure-sensitive tape or by electric or ultrasonic welding. 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 roll shall be identified with not less than 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 legible and shall not be obliterated by normal handling.

ALUMINUM ALLOY FOIL, 5056-H191

AMS 4005B

PURCHASE ORDER NUMBER _____

MANUFACTURER'S IDENTIFICATION _____

THICKNESS _____

WIDTH _____

WEIGHT OR LENGTH _____

- 5.1.3 Each-wrapped roll shall be packed in a suitable shipping container in such a manner that the weight of the roll is supported by the core and the roll is restrained to prevent telescoping.

- 5.1.4 Rolls of foil shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the foil to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

- 5.1.5 Exterior shipping containers shall be legibly marked with not less than the following information in such a manner that the markings will not smear or be obliterated during normal handling:

ALUMINUM ALLOY FOIL (5056-H191)

AMS 4005B

PURCHASE ORDER NUMBER _____

MANUFACTURER'S IDENTIFICATION _____

THICKNESS(ES) _____

WIDTH(S) _____

TOTAL WEIGHT OR LENGTH _____

- 5.1.6 For direct U.S. Military procurement, packaging shall be in accordance with
Ø ASTM B660, Commercial Level, unless Level A is specified in the request for procurement.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
7. REJECTIONS: Foil not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.
8. NOTES:
- 8.1 Marginal Indicia: The phi (Ø) symbol is used to indicate technical changes from the previous issue of this specification.