AEROSPACE MATERIAL SPECIFICATION

AMS4000	REV. F

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Superseding AMS4000E

Aluminum Sheet and Plate
(1060-0)

UNS A91060

RATIONALE

AMS4000F stabilizes this document because this document contains mature technology that is not expected to change and thus no further revisions are anticipated

STABILIZATION NOTICE

AMS4000F has been declared "STABILIZED" by AMS Committee D. This document will no longer be updated and may no longer represent standard industry practice.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. Previously this document was non-current. The last technical update of this document occurred in January, 1987. Users of this document should refer to the cognizant engineering organization for disposition of any issues with reports/certifications to this specification; including exceptions listed on the certification. NOTE: In many cases, the purchaser may represent a sub tier supplier and not the cognizant engineering organization.

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1. SCOPE:

1.1 Form: This specification covers aluminum in the form of sheet and plate.

1.2 Application: Primarily for metallic gaskets and washers.

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.

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

2.1.1 Aerospace Material Specifications:

AMS 2202 - Tolerances, Aluminum-Base and Magnesium-Base Alloy Sheet and Plate
AMS 2350 - Standards and Test Methods
AMS 2355 - Quality Assurance Sampling and Testing of Aluminum-Base and Magnesium-Base Alloys, Wrought Products (Except Forgings Stock) and Flash Welded Rings

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

2.2.1 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 with AMS 2355:

	min	max
Aluminum	99.60	--
Iron	--	0.35
Silicon	--	0.25
Copper	--	0.05
Zinc	--	0.05
Magnesium	--	0.03
Manganese	--	0.03
Titanium	--	0.03
Other Impurities, each	--	0.03

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3.2 Condition: Annealed.

3.3 Properties: The product shall conform to the following requirements, determined in accordance with AMS 2355:

3.3.1 Tensile Properties: Shall be as shown in Table I and 3.3.1.1.

TABLE I

Nominal Thickness Inches	Tensile Strength psi	Elongation in 2 in. or 4 %, min
0.006 to 0.019, incl	8,000 - 14,000	15
Over 0.019 to 0.050, incl	8,000 - 14,000	22
Over 0.050 to 3.000, incl	8,000 - 14,000	25

TABLE I (SI)

Nominal Thickness Millimetres	Tensile Strength	Elongation in 50.8 mm or 4D %, min
0.15 to 0.48, incl	55 - 97	15
Over 1.48 to 1.27, incl	55 - 97	22
Over 1.27 to 76.20, incl	55 - 97	25

3.3.1.1 Ø Tensile property requirements for plate over 3.000 in. (76.20 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3.2 Bending: Product 0.249 in. (6.32 mm) and under in nominal thickness shall withstand, without cracking, bending at room temperature flat on itself with axis of bend parallel to the direction of rolling.

3.3.2.1 Ø Bending requirements for plate over 0.249 in. (6.32 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.4 Ø Quality: The product, as received by the purchaser, shall be uniform in quality and condition, sound and free from foreign materials and from internal and external imperfections detrimental to usage of the product.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of AMS 2202.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Ø Responsibility for Inspection: The vendor of the product 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 product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Ø Acceptance Tests: Tests to determine conformance to composition (3.1), tensile property (3.3.1), and tolerance (3.5) requirements are classified as acceptance tests.

4.2.2 Ø Periodic Tests: Tests to determine conformance to bending (3.3.2) requirements are classified as periodic tests.

4.3 Ø Sampling: Shall be in accordance with AMS 2355. Frequency of sampling for periodic tests shall be as agreed upon by purchaser and vendor.

4.4 Reports:

4.4.1 Ø The vendor of the product shall furnish with each shipment three copies of a report stating that the product conforms to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, size, and quantity.

4.4.2 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 material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material 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 Identification: Each sheet and plate shall be marked on one face, in the respective location indicated below, with the alloy number and temper, AMS 4000, manufacturer's identification, and nominal Ø thickness. The characters shall be of such size as to be clearly legible, shall be applied using suitable marking fluid, and shall be sufficiently stable to withstand normal handling. The markings shall have no deleterious effect on the product or its performance.

5.1.1 Flat Sheet and Plate Under 6 In. (152 mm) Wide: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 ft (914 mm),

5.1.2 Flat Sheet and Plate 0.375 In. (9.52 mm) and Under Thick, 6 - 60 In. (152 - 1524 mm), Incl, Wide, and 36 - 200 In. (914 - 5080 mm), Incl, Long: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 ft (914 mm), the rows being spaced approximately 6 in. (152 mm) on centers across the width and staggered. Every third row shall show the manufacturer's identification and nominal thickness. The other rows shall show the alloy number and temper and AMS 4000.

5.1.3 Flat Sheet and Plate Over 0.375 In. (9.52 mm) Thick, or Over 60 In. (1524 mm) wide, or Over 200 In. (5080 mm) Long: Shall be marked as in 5.1.2 or, at vendor's discretion, shall be marked in one or two rows of characters recurring at intervals not greater than 3 ft (914 mm) and running around the periphery of the piece. If one row is used, it shall show all information of 5.1. If two rows are used, one row shall show the alloy number and temper and AMS 4000; the second row shall show the manufacturer's identification and nominal thickness.

5.1.3.1 If peripheral marking is applied to the full piece as produced but partial sheets or plates are supplied, an arrow shall also be applied near one corner indicating the direction of rolling.

5.1.4 Coiled Sheet: Shall be marked near both the outside and inside ends of the coil; the markings shall Ø be applied as in 5.1 or shall appear on a durable tag or label attached to the coil and marked with the information of 5.1. When the inside end of the coil is inaccessible, as when the sheet is wound on cords, the tag or label may be attached to the core.

5.1.5 Circles: Shall be marked with the information of 5.1 if the circle is 24 in. (610 mm) or more in nominal diameter. Circles less than 24 in. (610 mm) in nominal diameter shall be identified as agreed upon by purchaser and vendor.

5.2 Protective Treatment: Flat sheet, plate, and circles 12 in. (305 mm) and over in nominal diameter shall be protected, during shipment and storage, by interleaving with suitable paper sheets. Circles less than 12 in. (305 mm) in nominal diameter shall be protected as agreed upon by purchaser and vendor.