Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4008E
Superseding AMS 4008D

Issued 11-1-41
Revised 1-15-76

UNS A93003

ALUMINUM ALLOY SHEET AND PLATE

1.25Mn - 0.12Cu (3003-H14)

1. SCOPE:

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

1.2 Application: Primarily for parts where moderately severe forming or spinning is required.

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 and Forging 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
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	--	0.15
Aluminum	remainder	

Ø 3.2 Condition: Strain hardened.

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

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

TABLE I

Nominal Thickness Inches	Tensile Strength psi	Elongation in 2 in. or 4D %, min
0.009 to 0.012, incl	20,000 - 26,000	1
Over 0.012 to 0.019, incl	20,000 - 26,000	2
Over 0.019 to 0.031, incl	20,000 - 26,000	3
Over 0.031 to 0.050, incl	20,000 - 26,000	4
Over 0.050 to 0.113, incl	20,000 - 26,000	5
Over 0.113 to 0.161, incl	20,000 - 26,000	6
Over 0.161 to 0.249, incl	20,000 - 26,000	7
Over 0.249 to 0.499, incl	20,000 - 26,000	8
Over 0.499 to 1.000, incl	20,000 - 26,000	10

TABLE I (SI)

Nominal Thickness Millimetres	Tensile Strength MPa	Elongation in 50.8 mm or 4D %, min
0.23 to 0.30, incl	138 - 179	1
Over 0.30 to 0.48, incl	138 - 179	2
Over 0.48 to 0.79, incl	138 - 179	3
Over 0.79 to 1.27, incl	138 - 179	4
Over 1.27 to 2.87, incl	138 - 179	5
Over 2.87 to 4.09, incl	138 - 179	6
Over 4.09 to 6.32, incl	138 - 179	7
Over 6.32 to 12.67, incl	138 - 179	8
Over 12.67 to 25.40, incl	138 - 179	10

3.3.1.1 Tensile properties of plate over 1.000 in. (25.40 mm) in nominal thickness shall be as agreed Ø 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 through an angle of 180 deg (3.14 rad) around a diameter equal to the bend factor shown in Table II times the nominal thickness of the product with axis of bend parallel to the direction of rolling.

TABLE II

Nominal Thickness Inch	Bend Factor
0.009 to 0.113, incl	0
Over 0.113 to 0.248, incl	2

3.3.2 (Continued)

TABLE II (SI)

Nominal Thickness Millimetres	Bend Factor
0.23 to 2.87, incl	0
Over 2.87 to 6.32, incl	2

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

3.4 Quality: The product shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

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

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples and shall be Ø 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 Acceptance Tests: Tests to determine conformance to composition (3.1), tensile property (3.3.1), Ø and tolerance (3.5) requirements are classified as acceptance or routine control tests.

4.2.2 Qualification Tests: Tests to determine conformance to bending (3.3.2) requirements are classified Ø as qualification or periodic control tests.

4.2.2.1 For direct U.S. Military procurement, qualification test material and supporting test data shall Ø be submitted to the cognizant qualification agency as directed by the request for procurement, the procuring activity, or the contracting officer.

Ø 4.3 Sampling: Shall be in accordance with AMS 2355.

4.4 Reports:

4.4.1 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 4008 or applicable Federal or Military specification designation, manufacturer's identification, and nominal thickness. The characters shall be of such size as to be clearly legible, shall be applied using a suitable marking fluid, and shall be sufficiently stable to withstand normal handling. The markings shall have no deleterius effect on the material 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 4008 or applicable Federal or Military specification designation.

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 4008 or applicable Federal or Military specification designation; 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 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 product is wound on cores, 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) or more 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.

5.3 Packaging:

5.3.1 The product 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.

5.3.2 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-649, Level A or Level C, as specified in the request for procurement. Commercial packaging as in 5.3.1 will be acceptable if it meets the requirements of Level C.