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AEROSPACE MATERIAL SPECIFICATION

AMS 4376E
Superseding AMS 4376D

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MAGNESIUM ALLOY PLATE
3.0Al - 1.0Zn (AZ31B-H26)
Cold Rolled and Partially Annealed

UNS M11311

1. SCOPE:

1.1 Form: This specification covers a magnesium alloy in the form of plate.

1.2 Application: Primarily for moderate-strength parts requiring rigidity with low density.

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 SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2202 - Tolerances, Aluminum Alloy and Magnesium 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 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E9 - Compression Testing of Metallic Materials at Room Temperature

2.3 U.S. 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 with AMS 2355:

	min	max
Aluminum	2.5	3.5
Zinc	0.7	1.3
Manganese	0.20	--
Silicon	--	0.05
ø Copper	--	0.05
Calcium	--	0.04
Iron	--	0.005
Nickel	--	0.005
Residual Elements, each	--	0.10
Residual Elements, total	--	0.30
Magnesium	remainder	

3.2 Condition: The product shall be supplied in the following condition:

3.2.1 Plate 0.500 In. (12.50 mm) and Under in Nominal Thickness: Cold rolled, partially annealed, and pickled.

3.2.2 Plate Over 0.500 In. (12.50 mm) in Nominal Thickness: Cold rolled and partially annealed.

3.3 Properties: The product shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as specified in Table I and 3.3.1.1, determined in accordance with AMS 2355.

TABLE I

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation in 2 in. or 4D %, min
0.250 to 0.375, incl	39,000	27,000	6
Over 0.375 to 0.500, incl	38,000	26,000	6
Over 0.500 to 0.750, incl	37,000	25,000	6
Over 0.750 to 1.000, incl	37,000	23,000	6
Over 1.000 to 1.500, incl	35,000	22,000	6
Over 1.500 to 2.000, incl	35,000	21,000	6

TABLE I (SI)

Nominal Thickness Millimetres	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa, min	Elongation in 50 mm or 4D %, min
6.25 to 9.50, incl	270	185	6
Over 9.50 to 12.50, incl	260	180	6
Over 12.50 to 18.75, incl	255	170	6
Over 18.75 to 25.00, incl	255	160	6
Over 25.00 to 37.50, incl	240	150	6
Over 37.50 to 50.00, incl	240	145	6

3.3.1.1 Tensile property requirements for plate over 2.000 in. (50.00 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3.2 Compressive Properties: Shall be as specified in Table II and 3.3.2.1, determined in the longitudinal direction in accordance with ASTM E9.

TABLE II

Nominal Thickness Inches	Compressive Yield Strength at 0.2% Offset psi, min
0.250 to 0.375, incl	22,000
Over 0.375 to 0.438, incl	21,000
Over 0.438 to 0.500, incl	18,000
Over 0.500 to 0.750, incl	17,000
Over 0.750 to 1.000, incl	16,000
Over 1.000 to 1.500, incl	15,000
Over 1.500 to 2.000, incl	14,000

TABLE II (SI)

Nominal Thickness Millimetres	Compressive Yield Strength at 0.2% Offset MPa, min
6.25 to 9.50, incl	150
Over 9.50 to 11.00, incl	145
Over 11.00 to 12.50, incl	125
Over 12.50 to 18.75, incl	115
Over 18.75 to 25.00, incl	110
Over 25.00 to 37.50, incl	105
Over 37.50 to 50.00, incl	95

3.3.2.1 Compressive property requirements for plate over 2.000 in. (50.00 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.4 Quality: Plate, as received by 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 plate.

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 plate shall supply all samples for vendor's tests and shall be responsible for performing all required Ø 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 plate conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for Ø composition (3.1), tensile properties (3.3.1), and tolerances (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for Ø compressive properties (3.3.2) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling: Shall be in accordance with AMS 2355.

4.4 Reports:

4.4.1 The vendor of plate shall furnish with each shipment a report stating that the plate conforms to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 4376E, size, and quantity.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 4376E, contractor or other direct supplier of plate, part number, and quantity. When plate for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of plate to determine conformance to the requirements of this specification and shall include in the report either a statement that the plate conforms or copies of laboratory reports showing the results of tests to determine conformance.

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