

AEROSPACE MATERIAL SPECIFICATION

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Superseding AMS 4377G

Magnesium Alloy, Sheet and Plate
3.0Al - 1.0Zn - 0.20Mn (AZ31B-H24)
Cold Rolled, Partially Annealed

(Composition similar to UNS M11311)

1. SCOPE:

1.1 Form:

This specification covers a magnesium alloy in the form of sheet and plate.

1.2 Application:

This product has been used typically for parts requiring a combination of moderate strength and rigidity with low density, but usage is not limited to such applications.

1.2.1 Special care is necessary to prevent corrosion.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

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

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2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM E 9	Compression Testing of Metallic Materials at Room Temperature
ASTM B 660	Packaging/Packing of Aluminum and Magnesium Products
ASTM B 666/B 666M	Identification Marking of Aluminum and Magnesium Products

2.3 ANSI Publications:

Available from ANSI, 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSI H 35.2	Dimensional Tolerances for Aluminum Mill Products
ANSI H 35.2M	Dimensional Tolerances for Aluminum Mill Products (Metric)

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS 2355.

TABLE 1 - Composition

Element	min	max
Aluminum	2.5	3.5
Zinc	0.7	1.3
Manganese	0.20	--
Silicon	--	0.05
Copper	--	0.05
Calcium	--	0.04
Iron	--	0.005
Nickel	--	0.005
Other Elements, each (3.1.1)	--	0.10
Other Elements, total (3.1.1)	--	0.30
Magnesium	remainder	

3.1.1 Determination not required for routine acceptance.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Product 0.500 Inch (12.70 mm) and Under in Nominal Thickness: Cold rolled, partially annealed, and pickled.

3.2.2 Product Over 0.500 Inch (12.70 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 2 and 3.3.1.1, determined in accordance with AMS 2355 on the mill produced size.

TABLE 2A - Minimum Tensile Properties

Nominal Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
0.016 to 0.249, incl	39.0	29.0	6
Over 0.249 to 0.374, incl	38.0	26.0	8
Over 0.374 to 0.500, incl	37.0	24.0	8
Over 0.500 to 1.000, incl	36.0	22.0	8
Over 1.000 to 2.000, incl	34.0	20.0	8
Over 2.000 to 3.000, incl	34.0	18.0	8

TABLE 2B - Tensile Properties (SI)

Nominal Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
0.41 to 6.32, incl	269	200	6
Over 6.32 to 9.50, incl	262	179	8
Over 9.50 to 12.70, incl	255	165	8
Over 12.70 to 25.40, incl	248	152	8
Over 25.40 to 50.80, incl	234	138	8
Over 50.80 to 76.20, incl	234	124	8

- 3.3.2 Compressive Properties: Product 0.063 inch (1.60 mm) and over in nominal thickness shall meet the requirements of Table 3, determined in the longitudinal direction in accordance with ASTM E 9.

TABLE 3A - Compressive Properties

Nominal Thickness Inches	Compressive Yield Strength at 0.2% Offset ksi, min
0.063 to 0.249, incl	24.0
Over 0.249 to 0.374, incl	20.0
Over 0.374 to 0.500, incl	16.0
Over 0.500 to 1.000, incl	13.0
Over 1.000 to 2.000, incl	10.0
Over 2.000 to 3.000, incl	9.0

TABLE 3B - Compressive Properties (SI)

Nominal Thickness Millimeters	Compressive Yield Strength at 0.2% Offset
	Mpa, min
1.60 to 6.32, incl	165
Over 6.32 to 9.50, incl	138
Over 9.50 to 12.70, incl	110
Over 12.70 to 25.40, incl	90
Over 25.40 to 50.80, incl	69
Over 50.80 to 76.20, incl	62

3.4 Quality:

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

3.5 Tolerances:

Shall conform to all applicable requirements of ANSI H.35.2 or ANSI H.35.2M.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Composition (3.1), tensile properties (3.3.1), and tolerances (3.5) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Compressive properties (3.3.2) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2355.