

AEROSPACE MATERIAL SPECIFICATION

Issued JUL 1947
Reaffirmed MAY 1995
Revised JUL 2005
Superseding AMS 4375J

Sheet and Plate, Magnesium Alloy
3.0Al - 1.0Zn - 0.20Mn (AZ31B-0)
Annealed and Recrystallized
(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 low-strength parts requiring rigidity with low density, but usage is not limited to such applications.

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, West Conshohocken, PA 19428-2959 or www.astm.org.

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

2.3 ANSI Publications:

Available from ANSI, 25 West 43rd Street, New York, NY 10036 or www.ansi.org.

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: Annealed, recrystallized, and pickled.

3.2.2 Product Over 0.500 Inch (12.70 mm) in Nominal Thickness: Annealed and recrystallized.

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 product.

TABLE 2A - Tensile Properties

Nominal Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi, min	Elongation in 2 inches or 4D %, min
0.016 to 0.060, incl	32.0 - 40.0	18.0	12
Over 0.060 to 0.500, incl	32.0 - 40.0	15.0	12
Over 0.500 to 2.000, incl	32.0 - 40.0	15.0	10
Over 2.000 to 3.000, incl	32.0 - 40.0	15.0	9

TABLE 2B - Tensile Properties (SI)

Nominal Thickness Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa, min	Elongation in 50.8 mm or 4D %, min
0.41 to 1.52, incl	221 - 276	124	12
Over 1.52 to 12.70, incl	221 - 276	103	12
Over 12.70 to 50.80, incl	221 - 276	103	10
Over 50.80 to 76.20, incl	221 - 276	103	9

3.3.2 Compressive Properties: Shall be as specified in Table 3 and 3.3.2.1, 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 0.250, incl	12.0
Over 0.250 to 2.000, incl	10.0
Over 2.000 to 3.000, incl	8.0

TABLE 3B - Compressive Properties (SI)

Nominal Thickness Millimeters	Compressive Yield Strength at 0.2% Offset MPa, min
1.60 to 6.35, incl	83
Over 6.35 to 50.80, incl	69
Over 50.80 to 76.20, incl	55

3.4 Quality:

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

3.5 Tolerances:

Shall conform to all applicable requirements of ANSI H35.2/H35.2M.

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.

4.4 Reports:

The vendor of the product shall furnish with each shipment a report stating that the product conforms to the chemical composition and tolerances showing the numerical results of tests on each inspection lot to determine conformance to the other acceptance test requirements and stating that the product conforms to the other specified requirements. This report shall include the purchase order number, inspection lot number, AMS 4375K, size and quantity. The report shall also identify the producer, the mill product form, and the mill produced size.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2355.