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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4113C

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Superseding AMS 4113B

Submitted for recognition as an American National Standard

(R) ALUMINUM ALLOY EXTRUDED SHAPES
1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061-T6)
Solution and Precipitation Heat Treated

UNS A96061

1. SCOPE:

1.1 Form:

This specification covers an aluminum alloy in the form of extruded shapes such as angles, channels, tees, zees, I-beams and H-beams.

1.2 Application:

These products have been used typically for parts requiring moderate strength, especially where such parts require brazing or welding during fabrication, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2204 Tolerances, Aluminum Alloy Standard Structural Shapes
MAM 2204 Tolerances, Metric, Aluminum Alloy Standard Structural Shapes
AMS 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings
MAM 2355 Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units
AMS 2811 Identification, Aluminum and Magnesium Alloy Wrought Products

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 660 Packaging/Packing of Aluminum and Magnesium Products

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6088 Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

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

TABLE 1 - Composition

Element	Min	Max
Magnesium	0.8	1.2
Silicon	0.40	0.8
Copper	0.15	0.40
Chromium	0.04	0.35
Iron	--	0.7
Zinc	--	0.25
Manganese	--	0.15
Titanium	--	0.15
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

3.2 Condition:

Extruded and solution and precipitation heat treated in accordance with MIL-H-6088.

3.2.1 Shapes shall be supplied with an as-extruded surface finish; light polishing to remove minor surface imperfections is permissible provided such imperfections can be removed within the dimensional tolerances.

3.3 Properties:

Shapes shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355:

3.3.1 Tensile Properties: Shall be as specified in Table 2.

TABLE 2A - Minimum Tensile Properties, Inch/Pound Units

Nominal Diameter or Least Thickness Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 2 Inches or 4D %
Up to 0.250, excl	38.0	35.0	8
0.250 and over	38.0	35.0	10

TABLE 2B - Minimum Tensile Properties, SI Units

Nominal Diameter or Least Thickness mm	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 50.8 mm or 4D %
Up to 6.35, excl	262	241	8
6.35 and over	262	241	10

3.3.2 (R) Hardness: Should be not lower than 80 HB/10/500, 85 HB/10/1000, or equivalent, but the extruded shapes shall not be rejected on the basis of hardness if the tensile property requirements are met (see 8.2).

3.4 Quality:

Extruded shapes, 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 shapes.

3.5 Tolerances:

Shall conform to all applicable requirements of AMS 2204 or MAM 2204.

4. QUALITY ASSURANCE PROVISIONS:

4.1 (R) Responsibility for Inspection:

The vendor of extruded shapes shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the extruded shapes conform to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for 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: Tests for hardness (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:

(R) Shall be in accordance with AMS 2355 or MAM 2355.

4.4 Reports:

4.4.1 (R) The vendor of extruded shapes shall furnish with each shipment a report stating that the extruded shapes conform to the chemical composition and showing the results of tests on each lot to determine conformance to the tensile property requirements and, when performed, to the periodic test requirements. This report shall include the purchase order number, lot number, AMS 4113C, size or section identification number, and quantity.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2355 or MAM 2355.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

(R) Shall be in accordance with AMS 2811.

5.2 Packaging:

5.2.1 (R) Extruded shapes shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the extruded shapes to ensure carrier acceptance and safe delivery.

5.2.2 For direct U.S. Military procurement, packaging shall be in accordance with ASTM B 660, Commercial Level, unless Level A is specified in the request for procurement.

6. ACKNOWLEDGMENT:

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS:

Extruded shapes not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.