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400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 4113B

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Superseding AMS 4113A

ALUMINUM ALLOY EXTRUDED STRUCTURAL 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: Primarily for structural parts requiring moderate strength, especially where such parts and assemblies require brazing or welding during fabrication.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications 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 2204 - Tolerances, Aluminum Alloy Standard Structural Shapes
MAM 2204 - Tolerances, Metric, Aluminum Alloy Standard Structural Shapes
AMS 2350 - Standards and Test Methods
AMS 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings
MAM 2355 - Quality Assurance Sampling and Testing of Aluminum Alloys and Magnesium Alloys, Wrought Products (Except Forging Stock) and Flash Welded Rings, Metric (SI) Units

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B660 - Packaging/Packing of Aluminum and Magnesium Products

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 Specifications:

MIL-H-6088 - Heat Treatment of Aluminum Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined in accordance with AMS 2355 or MAM 2355:

	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 Ø polishing to remove minor surface imperfections is permissible provided extrusions remain within the dimensional tolerances of 3.5.

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 I:

TABLE I

Nominal Diameter or Least Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, minimum	Elongation in 2 Inches or 4D % minimum
Up to 0.250, excl	38,000	35,000	8
0.250 and over	38,000	35,000	10

TABLE I (SI)

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

3.3.2 Hardness: Should be not lower than 80 HB/10/500 or 85 HB/10/1000 but the Ø shapes shall not be rejected on the basis of hardness if the tensile property requirements are met.

3.4 Quality: 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 Responsibility for Inspection: The vendor of the shapes shall supply all Ø samples for vendor's tests and shall be 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 sample and to perform any confirmatory testing deemed necessary to ensure that the shapes conform to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for 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 hardness (3.3.2) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency or testing is specified by purchaser.

4.3 Sampling: Shall be in accordance with AMS 2355 or MAM 2355.

4.4 Reports:

4.4.1 Ø The vendor of shapes shall furnish with each shipment a report stating that the shapes conform to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, AMS 4113B, lot number, size or section identification number, 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 4113B, contractor or other direct supplier of shapes, part number, and quantity. When shapes for making parts are produced or purchased by the parts vendor, that vendor shall inspect each lot of shapes to determine conformance to the requirements of this specification and shall include in the report either a statement that the shapes conform 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 or MAM 2355.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each shape shall be marked near one end with the alloy number and temper, AMS 4113 or applicable Federal specification designation, and manufacturer's identification. The characters shall be of such size as to be legible, shall be applied using a suitable marking fluid, and shall be sufficiently stable to withstand normal handling. The markings shall have no deleterious effect on the shapes or their performance.

5.2 Packaging:

5.2.1 The 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 shapes to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

5.2.2 Ø For direct U.S. Military procurement, packaging shall be in accordance with ASTM B660, 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: Shapes not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES:

8.1 Marginal Indicia: The phi (Ø) symbol is used to indicate technical changes from the previous issue of this specification.