Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4113A
Superseding AMS 4113
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UNS A96061

ALUMINUM ALLOY STRUCTURAL SHAPES
1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061-T6)

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 (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2204 - Tolerances, Aluminum Alloy Standard Structural Shapes
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 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.2.1 Military Specifications:

MIL-H-6088 - Heat Treatment of Aluminum Alloys

2.2.2 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:

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	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 of 3.5.

3.3 Properties: Shapes shall conform to the following requirements, determined in accordance with AMS 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, min	Elongation in 2 in. or 4D %, min
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, min	Elongation in 2 in. or 4D %, min
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, 80 HB/14.3/1000, or 85 HB/10/1000, but the 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, Ø and free from foreign materials and from internal and external imperfections detrimental to usage of the shapes.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of AMS 2204.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the shapes shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the Ø purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems 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 Ø 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 Ø classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

Ø 4.3 Sampling: Shall be in accordance with AMS 2355.

4.4 Reports:

4.4.1 The vendor of shapes shall furnish with each shipment three copies of 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, material specification number and its revision letter, size or section identification number, and quantity.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, 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 a statement that the shapes conform, or shall include copies of laboratory reports showing the results of tests to determine conformance.

Ø 4.5 Resampling and Retesting: Shall be in accordance with AMS 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 or Military specification designation, and manufacturer's identification. The characters shall be of such size as to be clearly 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.