

AEROSPACE MATERIAL SPECIFICATION

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Superseding	AMS 4231F

Castings, Sand
4.5Cu - 1.1Si
Solution and Precipitation Heat Treated

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1. SCOPE:

1.1 Form: This specification covers an aluminum alloy in the form of sand castings.

1.2 Application: Primarily for components where a combination of moderate strength, good ductility, and resistance to shock is desired.

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 SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

AMS 2360 - Room Temperature Tensile Properties of Castings

AMS 2635 - Radiographic Inspection

AMS 2645 - Fluorescent Penetrant Inspection

AMS 2646 - Contrast Dye Penetrant Inspection

AMS 2694 - Repair Welding of Aerospace Castings

AMS 2804 - Identification, Castings

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

ASTM B557 - Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products

ASTM E10 - Brinell Hardness of Metallic Materials

ASTM E34 - Chemical Analysis of Aluminum and Aluminum Alloys

ASTM E155 - Reference Radiographs for Inspection of Aluminum and Magnesium Castings, Series III

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 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 by wet chemical methods in accordance with ASTM E34, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

Copper	4.0 - 5.0
Silicon	0.7 - 1.5
Iron	-- 1.0
Manganese	-- 0.35
Zinc	-- 0.35
Titanium	-- 0.25
Magnesium	-- 0.03
Other Impurities, each	-- 0.05
Other Impurities, total	-- 0.15
Aluminum	remainder

- 3.2 Condition: Solution and precipitation heat treated.

- 3.3 Castings: Castings shall be produced in lots from metal conforming to 3.1. Metal remelted from previously analyzed ingot may be poured directly into castings. Furnace or ladle additions of grain-refining elements or alloys are permissible. Unless otherwise agreed upon by purchaser and vendor, molten metal taken from alloying furnaces, with or without additions of foundry operating scrap (gates, sprues, risers, and rejected castings), shall not be poured into castings unless first converted to ingot, analyzed, and remelted or unless the composition of a sample taken after the last addition to the melt has been found to conform to 3.1.

- 3.3.1 A melt shall be the metal withdrawn from a batch-furnace charge of 2000 lb (900 kg) or less as melted for pouring castings or, when permitted by purchaser, a melt shall be 4000 lb (1800 kg) or less of metal withdrawn from one continuous furnace in not more than 8 consecutive hours.

- 3.3.2 A lot shall be all castings poured from a single melt in not more than 8 consecutive hours and solution and precipitation heat treated in the same heat treatment batch.

- 3.4 Cast Test Specimens: Chemical analysis specimens and tensile specimens shall be cast as follows:

- 3.4.1 Chemical Analysis Specimens: Shall be cast from each melt and shall be of a size and shape agreed upon by purchaser and vendor.