



AEROSPACE MATERIAL SPECIFICATION

AMS4225™**REV. E**Issued 1968-11
Revised 2018-03

Superseding AMS4225D

Aluminum Alloy, Heat-Resistant, Castings
5.0Cu - 1.5Ni - 0.25Mn - 0.25Sb - 0.25Co - 0.20Ti - 0.20Zr (203.0-T6)
Solution Heat Treated and Precipitation Heat Treated
(Composition similar to UNS A02030)

RATIONALE

AMS4225E revises Composition (3.1, Table 1 to add footnote), Quality (3.7) and Reports (4.5.1), and results from a Five-Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers an aluminum alloy in the form of castings.

1.2 Application

These castings have been used typically for components requiring moderate strength and good stability up to 600 °F (316 °C) with resistance to stress-corrosion cracking, 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 International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2175	Casting, Classification and Inspection of
AMS2360	Room Temperature Tensile Properties of Castings
AMS2361	Elevated Temperature Tensile Properties of Castings
AMS2694	In-Process Welding of Castings
AMS2771	Heat Treatment of Aluminum Alloy Castings

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Documents
Document Sharing Hub

AMS2804 Identification, Castings

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B557	Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products
ASTM B557M	Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products (Metric)
ASTM B660	Packaging/Packing of Aluminum and Magnesium Products
ASTM E10	Brinell Hardness of Metallic Materials
ASTM E21	Elevated Temperature Tension Tests of Metallic Materials
ASTM E29	Using Significant Digits in Test Data to Determine Conformance with Specifications
ASTM E139	Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials
ASTM E716	Sampling and Sample Preparation of Aluminum and Aluminum Alloys for Determination of Chemical Composition by Spark Atomic Emission Spectrometry
ASTM E1251	Analysis of Aluminum and Aluminum Alloys by Spark Atomic Emission Spectrometry
ASTM E1417/E1417M	Liquid Penetrant Testing
ASTM E1742/E1742M	Radiographic Examination
ASTM E3061	Analysis of Aluminum and Aluminum Alloys by Inductively Coupled Plasma Atomic Emission Spectrometry (Performance Based Method)

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined by spectrochemical methods in accordance with ASTM E1251 or ASTM E3061 or by other analytical methods acceptable to purchaser (see 3.4.1).

Table 1 - Composition (1)

Element	Min	Max
Copper	4.5	5.5
Nickel	1.3	1.8
Manganese	0.20	0.30
Antimony	0.10	0.40
Cobalt	0.10	0.40
Titanium	0.15	0.25
Zirconium	0.10	0.30
Antimony + Cobalt	--	0.6
Titanium + Zirconium	--	0.50
Iron	--	0.30
Silicon	--	0.20
Zinc	--	0.10
Other Elements, each	--	0.05
Other Elements, total	--	0.30
Aluminum	remainder	

(1) The composition of AMS4225 does not strictly conform to that registered in the Aluminum Association Pink Sheets (Castings).

3.1.1 Test results may be rounded by the “rounding off” method of ASTM E29.

3.2 Condition

Solution heat treated and precipitation heat treated.

3.3 Castings

Castings shall be produced from metal conforming to 3.1, determined by analysis of a specimen (3.4.1) cast after the last melt addition.

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 after the last melt addition and shall be tested to qualify the melt lot as in 3.1. Spectrochemical sample shall be prepared in accordance with ASTM E716.

3.4.2 Tensile Specimens

3.4.2.1 Unless specimens cut from a casting are specified by purchaser, separately-cast specimens, conforming to ASTM B557 or ASTM B557M shall be cast from each melt after the last melt addition. Specimens shall be cast in molds representing the mold formulation used for castings. Chills are not permitted on test specimen cavity except on the end face of the specimen when approved in accordance with 4.4.2. A tensile specimen shall be processed with each heat treat lot and tested for conformance to 3.6.1.

3.4.2.2 When purchaser specifies specimens cut from a casting or from integrally-cast coupons, such specimens shall be removed after heat treatment, shall be machined to conform to ASTM B557 or ASTM B557M and shall be either 0.500 inch (12.70 mm) diameter at the reduced parallel gage section, sub size specimens proportional to the standard, or standard sheet-type specimens, as required by 3.6.1.