Society of Automotive Engineers, Inc.
485 LEXINGTON AVENUE, NEW YORK, N.Y. 10017

AEROSPACE MATERIAL SPECIFICATION

AMS 4434G
Superseding AMS 4434F
Issued 9-1-41
Revised 5-1-68

MAGNESIUM ALLOY CASTINGS, SAND
9Al - 2Zn (AZ92A-T6)

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

2. APPLICATION: Primarily for parts operating at temperatures up to 300 F (149 C).

3. COMPOSITION: Castings shall conform to the following:

	min	max
Aluminum	8.3	9.7
Zinc	1.6	2.4
Manganese	0.10	--
Silicon	--	0.30
Copper	--	0.10
Nickel	--	0.01
Other Impurities, total	--	0.30
Magnesium	remainder	

4. CONDITION: Solution and precipitation heat treated.

5. TECHNICAL REQUIREMENTS:

5.1 Casting: Castings shall be produced in lots from metal conforming to Section 3. Metal remelted from previously analyzed ingot may be poured directly into castings. Furnace or ladle additions of grain refining elements are permissible. If grain refining elements are not added, the molten ø metal shall be subjected to superheating or other grain refining treatment. 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 until the composition of a sample taken after the last addition to the melt has been found to conform to Section 3.

5.1.1 A melt shall be the metal withdrawn from a batch furnace charge of 2000 lb or less as melted for pouring castings or, when permitted by purchaser, a melt shall be 4000 lb or less of metal withdrawn from one continuous furnace in not more than 8 consecutive hours.

5.1.2 A lot shall consist of castings poured from a single melt in not more than 8 consecutive hours.

5.2 Cast Test Specimens: Tensile test specimens, and chemical analysis specimens when required, shall be cast as follows and, when requested, shall be supplied with the castings.

5.2.1 Tensile Test Specimens: Shall be cast with each lot of castings, shall be standard (0.5 in. diameter at the reduced parallel section), and shall be cast to size in molds made with the regular foundry mix of green sand, without using chills. Metal for the specimens shall be part of the melt which is used for the castings and shall be subjected to the same grain-refining or alloying treatment given the metal for the castings.

5.2.2 Chemical Analysis Specimens: When required by purchaser, shall be cast from each melt and shall be of size and shape agreed upon by purchaser and vendor.

Printed in U.S.A.

5.3 Heat Treatment: All castings and tensile test specimens shall be heat treated as follows:

5.3.1 Tensile test specimens from each lot, together with production castings, shall be heated to the proper temperature and for the proper time for solution heat treatment and cooled in air. At least one set of tensile test specimens shall be put into a batch-type furnace with each load of castings or into a continuous furnace at intervals of not longer than 3 hours.

5.3.2 Tensile test specimens from each lot, together with production castings, shall, after solution heat treatment as in 5.3.1, be heated to the proper temperature and for the proper time for precipitation heat treatment. At least one set of tensile test specimens shall be put into a batch-type furnace with each load of castings or into a continuous furnace at intervals of not longer than 3 hours.

5.4 Tensile Properties:

5.4.1 Cast Tensile Test Specimens:

Tensile Strength, psi	34,000 min
Yield Strength at 0.2% Offset or at 0.0095 in. in 2 in. Extension Under Load (E = 6,500,000), psi	18,000 min
Elongation, % in 2 in.	1 min

5.4.2 Specimens Cut From Castings:

5.4.2.1 When tensile properties of actual castings are determined for acceptance, not less than 4, and preferably 10, tensile test specimens shall be cut from thick and thin sections. The average value of all specimens selected shall conform to the following:

Tensile Strength, psi	25,500 min
Yield Strength at 0.2% Offset or at 0.0089 in. in 2 in. Extension Under Load (E = 6,500,000), psi	16,000 min
Elongation, % in 2 in. of 4D	0.75 min

5.4.2.1.1 Any specimen cut from a casting shall conform to the following:

Tensile Strength, psi	17,000 min
Yield Strength at 0.2% Offset or at 0.0082 in. in 2 in. Extension Under Load (E = 6,500,000), psi	13,500 min

5.4.2.2 Conformance to these requirements may be used as basis for acceptance of castings.

5.4.2.3 When specified, tensile test specimens taken in locations indicated on the drawing, from a casting chosen at random to represent the lot, shall have the properties indicated on the drawing for each specimen.

5.4.3 When a dispute occurs between purchaser and vendor over the yield strength values, yield strength determined by the offset method shall apply.

5.5 Hardness of Castings: Except at sprues and risers, castings shall have hardness of Brinell 70 - 95 using 500 kg load and 10 mm ball or 1000 kg load and 9/16 in. ball, or Brinell 80 - 105 using 1000 kg load and 10 mm ball.

5.6 Grain Size: Shall be as agreed upon by purchaser and vendor.