

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 4434A

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MAGNESIUM ALLOY CASTINGS (Sand) 9 Al 2 Zn (Solution Precipitation)

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

Aluminum	8.3 - 9.7
Zinc	1.7 - 2.3
Manganese	0.10 min
Silicon	0.30 max
Copper	0.05 max
Nickel	0.01 max
Total Other Impurities	0.30 max
Magnesium	remainder
3. CASTING: (a) The metal which is poured into castings shall be given the same superheating or grain refining treatment as that which is given to the metal which is poured into test bars.

(b) Tensile test bars of the standard size for testing shall be cast in molds made with the regular foundry mix of green sand without using chills.
4. HEAT TREATMENT: (a) The test bars, together with any portion of the castings which they represent, shall be given the solution and precipitation heat treatments. Cooling after each treatment shall be in air.

(b) Heat treated castings shall have a Brinell hardness of 70-95, but the impression is not to be taken at a sprue or riser. If the hardness of the castings is outside of these limits, one casting may be rejected and examined as in paragraph 6(c); if all requirements of that paragraph are fulfilled, the lot may be accepted.
5. TEST BARS AND ANALYTICAL SAMPLES: (a) Tensile test bars shall be cast with each melt of castings, unless otherwise specified. A melt shall mean one pot (2000 pounds or less) of metal without additions of magnesium or magnesium alloys as melted for superheating and/or casting. Test bars are to be supplied with the castings when requested. When specified chemical analysis coupons are to be taken on each melt, identified with melt number and supplied with castings.

(b) The test bars, poured and treated as specified in sections 3 and 4, shall conform to the following minimum physical properties:

Tensile Strength, lb per sq in.	34,000
Yield Strength (0.2% Set), lb per sq in.	18,000
Equivalent Extension Under Load, inch in 2 in.	0.0095
Elongation, % in 2 in.	1
Brinell Hardness	70
6. QUALITY: (a) Castings must be homogeneous and free from shrinkage defects, cracks, blowholes, porosity, hard spots, foreign matter, and other injurious defects, and must not disclose defects during machining. The castings shall be smooth and well cleaned.