

# AERONAUTICAL MATERIAL SPECIFICATION

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AMS 4422A

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## CAST MAGNESIUM ALLOY Solution Heat Treated

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

Aluminum	5.3 - 6.7
Zinc	2.5 - 3.5
Manganese	0.15 min
Silicon	0.30 max
Copper	0.05 max
Nickel	0.01 max
Iron	0.03 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) The molten metal for making tensile test bars of the standard size for testing shall be taken from the same melt as the castings immediately before or after the metal for the castings is taken. The mold shall be made with the regular foundry mix of green sand without using chills.
4. HEAT TREATMENT: (a) The test bars, together with the castings which they represent, shall be given the solution heat treatment. Cooling after the treatment shall be in air.  
  
(b) Heat treated castings shall have a hardness of Brinell 48-60, 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: (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.  
  
(b) The test bars, poured and treated as specified in sections 3 and 4, shall conform to the following physical properties:

Tensile Strength, lb per sq in.	32,000 min
Elongation, % in 2 in.	7 min
Brinell Hardness	48-60
6. QUALITY: (a) Castings must be homogeneous and free from shrinkage defects, cracks blowholes, sand holes, hard spots, foreign matter, and other injurious defects, and must not disclose defects in machining. The castings shall be smooth and well cleaned.