# AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

**AMS 4434**

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Revised

## C A S T  M A G N E S I U M  A L L O Y
Solution Precipitation Heat Treated

1. ACKNOWLEDGMENT: A vendor must mention this specification number 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. |
| 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 and precipitation heat treatments. Cooling after each treatment shall be in air.

(b) Heat treated castings shall have a Brinell hardness of 70-95. If the hardness of the castings is outside of these limits, one casting may be rejected and examined as in 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 minimum physical properties:

| | |
|---|---|
| Tensile Strength, lb. per sq. in. | 34,000 |
| Yield Strength, lb. per sq. in. | 18,000 |
| Elongation, % in 2 in. | 1 |
| Brinell Hardness | 70 |

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.

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