

AEROSPACE MATERIAL SPECIFICATION



MAM 4427A

Issued JUL 1992
Reaffirmed OCT 2000
Cancelled MAR 2003

Superseding MAM 4427

Magnesium Alloy Sand Castings
4.0Y - 2.3Nd - 0.7Zr (WE43A - T6)
Solution and Precipitation Heat Treated

UNS M18430

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of March, 2003. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications.

AMS 4427 covers the same material.

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1. SCOPE:

1.1 Form:

This specification covers a magnesium alloy in the form of sand castings.

1.1.1 AMS 4427 is the inch/pound version of this MAM.

1.2 Application:

These castings have been used typically for parts requiring a combination of light weight, high yield strength up to 300 °C, and relatively high corrosion resistance, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2360	Room Temperature Tensile Properties of Castings
AMS 2361	Elevated Temperature Tensile Properties of Castings
AMS 2475	Protective Treatments, Magnesium Alloys
AMS 2635	Radiographic Inspection
AMS 2645	Fluorescent Penetrant Inspection
AMS 2694	Repair Welding of Aerospace Castings

2.1 (Continued):

AMS 2750	Pyrometry
AMS 2804	Identification, Castings

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 557M	Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products (Metric)
ASTM B 660	Packaging/Packing of Aluminum and Magnesium Products
ASTM E 10	Brinell Hardness of Metallic Materials
ASTM E 21	Elevated Temperature Tension Tests of Metallic Materials
ASTM E 35	Chemical Analysis of Magnesium and Magnesium Alloys
ASTM E 155	Reference Radiographs for Inspection of Aluminum and Magnesium Castings

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 35, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Yttrium	3.7	4.3
Neodymium	2.0	2.5
Zirconium	0.40	1.0
Other Rare Earths (3.1.1)	--	1.9
Zinc	--	0.2
Lithium	--	0.2
Manganese	--	0.15
Copper	--	0.03
Iron	--	0.01
Silicon	--	0.01
Nickel	--	0.005
Other Impurities, total (3.1.2)	--	0.30
Magnesium	remainder	

3.1.1 Other rare earths shall be the total of ytterbium, erbium, dysprosium, and gadolinium (See 8.1).

3.1.2 Determination not required for routine acceptance.

3.2 Condition:

Solution and precipitation heat treated to T6 temper.

3.3 Casting:

Castings shall be produced from metal conforming to 3.1. Metal remelted from previously analyzed ingot may be poured directly into castings. Furnace or ladle additions of grain-refining elements or alloys shall be added to the melt. 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 unless the composition of a sample taken after the last addition to the melt conforms to 3.1.