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

AEROSPACE MATERIAL SPECIFICATION

AMS 4363B
Superseding AMS 4363A
Issued 9-1-65
Revised 5-1-68

MAGNESIUM ALLOY FORGINGS
2.0Th - 0.78Mn (HM21A-T5)

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

2. FORM: Die forgings, hand forgings, rolled rings, and forging stock.

3. APPLICATION: Primarily for parts requiring weldability and good strength-to-weight ratio at temperatures up to 700 F (371 C).

4. COMPOSITION:

	min	max
Thorium	1.5	2.5
Manganese	0.45	1.1
Impurities, total	--	0.30
Magnesium	remainder	

5. CONDITION:

5.1 Die Forgings, Hand Forgings, and Rolled Rings: Precipitation heat treated.

5.2 Forging Stock: As fabricated.

6. TECHNICAL REQUIREMENTS:

6.1 Die and Hand Forgings:

6.1.1 Tensile Properties:

6.1.1.1 Forgings 4 in. and Under in Thickness: Test specimens machined from forgings after heat treatment with axes approximately parallel to forging flow lines or from prolongations on the heat treated forgings shall conform to the following requirements:

Tensile Strength, psi	33,000 min
Yield Strength at 0.2% Offset or at 0.0117 in. in 2 in. Extension Under Load (E = 6,500,000), psi	25,000 min
Elongation, % in 2 in. or 4D	3 min

6.1.1.1.1 Tensile properties in directions other than parallel to the forging flow lines shall be as agreed upon by purchaser and vendor.

6.1.1.2 Tensile properties of forgings over 4 in. in thickness shall be as agreed upon by purchaser and vendor.

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

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6.2 Rolled Rings: Test specimens machined from rolled rings after heat treatment shall conform to the following requirements:

Specimen Orientation	Nominal Radial Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 6,500,000)		Elongation % in 2 in. or 4D, min
			psi, min	Extension Under Load in. in 2 in.	
Circumferential	All	32,000	26,000	0.0120	4.0
Axial	Up to 2.000, incl	28,000	13,000	0.0080	6.0
	Over 2.000	26,000	10,000	0.0071	6.0

6.3 Forging Stock:

6.3.1 When a sample of stock is forged to a test coupon and heat treated in the same manner as forgings, specimens taken from the heat treated coupon shall conform to the requirements of 6.1.1.1. If specimens taken from the stock after heat treatment in the same manner as forgings have properties not lower than those specified in 6.1.1.1, the test shall be accepted as equivalent to the test of a forged coupon. This test is not required in routine inspection.

6.3.2 Unless otherwise specified, tolerances shall be in accordance with all applicable requirements of the latest issue of AMS 2201 for the class ordered.

7. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of forgings shall furnish with each shipment three copies of a report stating that the chemical composition and tensile properties of the forgings conform to the requirements specified. This report shall include the purchase order number, material specification number and its revision letter, size or part number, and quantity.

8.2 Unless otherwise specified, the vendor of forging stock shall furnish with each shipment three copies of a report stating that the chemical composition of the stock conforms to the requirements specified. This report shall include the purchase order number, material specification number and its revision letter, size, and quantity.

8.3 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

9. IDENTIFICATION:

9.1 Die Forgings and Rolled Rings: Shall be identified in accordance with the latest issue of AMS 2808.

9.2 Hand Forgings: Shall be marked with the alloy designation followed by the temper designation, the characters recurring at intervals not exceeding 6 inches. The marking shall be in the longitudinal grain direction.

9.3 Forging Stock: Shall be identified as agreed upon by purchaser and vendor.