

AEROSPACE
MATERIAL
SPECIFICATION

AMS 3643A

Superseding AMS 3643

Issued 1-31-64
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PLASTIC MOLDINGS, THERMOSETTING
Silicone, Glass Roving Filled,
Heat Resistant

1. SCOPE:

- 1.1 Form: This specification covers a glass-roving-filled silicone resin in the form of compression moldings or transfer moldings.
- 1.2 Application: Primarily for parts requiring good mechanical and electrical properties and thermal stability in continuous service up to 315°C (600°F) or intermittent service up to 370°C (700°F).

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

- 2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade or their use by governmental agencies is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

- 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D149 - Dielectric Breakdown Voltage and Dielectric Strength of Electrical Insulating Materials at Commercial Power Frequencies

ASTM D150 - A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials at Commercial Power Frequencies

ASTM D256 - Impact Resistance of Plastics and Electrical Insulating Materials

ASTM D257 - D-C Resistance or Conductance of Insulating Materials

ASTM D570 - Water Absorption of Plastics

ASTM D635 - Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position

ASTM D648 - Deflection Temperature of Plastics Under Flexural Load

ASTM D651 - Tensile Strength of Molded Electrical Insulating Materials

ASTM D695 - Compressive Properties of Rigid Plastics

ASTM D790 - Flexural Properties of Plastics and Electrical Insulating Materials

- 2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

- 3.1 Material and Fabrication: Shall be a glass-roving-filled silicone resin fabricated by compression molding or transfer molding to meet the requirements of 3.2.

3.1.1 Color: Shall be brown-red opaque, unless otherwise specified.

3.1.2 Glass Filler: The glass roving, prior to being chopped, shall be heat cleaned to a No. 112 finish followed by washing to a neutral pH or shall be subjected to an equivalent procedure which will promote good adhesion to the silicone resin. The length of the chopped glass shall be 1/2 - 5/8 in. (13 - 16 mm).

3.2 Properties: Moldings shall conform to the following requirements; tests shall be performed on the moldings supplied and in accordance with specified test methods, insofar as practicable. Wet tests shall be performed within 1 min. after immersion in water at $23^{\circ}\text{C} \pm 1$ ($73^{\circ}\text{F} \pm 2$) for not less than 24 hours.

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3.2.1	Tensile Strength, min Tested at 25°C (77°F) after 72 hr at 370°C (700°F)	1800 psi (125 MPa)	ASTM D651
3.2.2	Flexural Strength, min		ASTM D790
3.2.2.1	Tested at 25°C (77°F) after 2 hr at 260°C (500°F)	15,000 psi (105 MPa)	
3.2.2.2	Tested at 370°C (700°F) after 72 hr at 370°C (700°F)	8,000 psi (55 MPa)	
3.2.3	Compressive Strength, min		ASTM D695
3.2.3.1	Tested at 25°C (77°F) after 2 hr at 260°C (500°F)	12,000 psi (85 MPa)	
3.2.3.2	Tested at 370°C (700°F) after 72 hr at 370°C (700°F)	4,000 psi (25 MPa)	
3.2.4	Impact Resistance, min		ASTM D256
3.2.4.1	Tested at 25°C (77°F) after 2 hr at 260°C (500°F)	10 ft-lb per in. (535 J/m)	
3.2.4.2	Tested at 370°C (700°F) after 72 hr at 370°C (700°F)	4 ft-lb per in. (215 J/m)	
3.2.5	Heat Deflection Temperature at 264 psi (1.8 MPa) Fiber Stress, min	370°C (700°F)	ASTM D648 Heating Rate 2°C (3.5°F) per min.
3.2.6	Water Absorption (24 hr immersion), wt gain, max	0.30%	ASTM D570
3.2.7	Dielectric Constant at 10 ⁶ Hz, max		ASTM D150
3.2.7.1	As molded		
3.2.7.1.1	Dry	4.7	
3.2.7.1.2	Wet	4.8	
3.2.8	Dissipation Factor at 10 ⁶ Hz, max		ASTM D150
3.2.8.1	As Molded		
3.2.8.1.1	Dry	0.005	

