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400 Commonwealth Dr., Warrendale, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 3359A

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Superseding AMS 3359

SILICONE POTTING COMPOUND, ELASTOMERIC
Two-Part, General Purpose
200 - 400 Poise Viscosity

1. SCOPE:

1.1 Form: This specification covers a room-temperature-vulcanizing, elastomeric silicone compound.

1.2 Application: Primarily for potting and encapsulating electronic products for use from -65° to +260°C (-85° to +500°F) where resistance to reversion is not required.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications 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
AMS 2825 - Material Safety Data Sheets

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 Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D150 - A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials
ASTM D257 - D-C Resistance or Conductance of Insulating Materials
ASTM D412 - Rubber Properties in Tension
ASTM D573 - Rubber-Deterioration in an Air Oven

REAFFIRMED
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2.2 (Continued):

ASTM D792 - Specific Gravity and Density of Plastics by Displacement
ASTM D1084 - Viscosity of Adhesives
ASTM D2137 - Rubber Property-Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D2240 - Rubber Property - Durometer Hardness

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: Shall consist of two parts, a base compound and a separate catalyst which, when mixed in proper proportions, will cure at room temperature to a rubbery solid.

3.1.1 Base Compound: Shall be an uncatalyzed silicone polymer with necessary fillers.

3.1.2 Catalyst: Shall be a paste consisting of dibutyl tin dilaurate and inert filler in a silicone polymer (See 8.2).

3.2 Properties: Compound shall conform to the following requirements:

3.2.1 Base Compound:

3.2.1.1 Color: Shall be white.

3.2.1.2 Viscosity: Shall be 200 - 400 poises (20 - 40 Pa•s), determined at 25°C ± 1 (77°F ± 2) in accordance with ASTM D1084, Method B, using a No. 3 spindle at 5 rpm on a Brookfield Model HAF viscometer.

3.2.2 Catalyst:

3.2.2.1 Color: Shall be of a contrasting color to that of the base compound.

3.2.3 Unmixed Compound:

3.2.3.1 Storage Life: The base compound and the catalyst, stored in closed containers at not higher than 32°C (90°F), when mixed in proper proportions at any time up to one year from date of shipment, shall meet the requirements of 3.2.4 and 3.2.5.

3.2.4 Mixed, Uncured Product:

3.2.4.1 Pot Life: Shall be 2 - 5 hr, determined in accordance with 4.5.2.

3.2.5 Mixed, Cured Product: The product shall conform to the following requirements; tests shall be performed on specimens cut from air-free slabs prepared as in 4.5.1 and tested in accordance with specified test methods at 25°C ± 1 (77°F ± 2) and 45 - 55% relative humidity:

3.2.5.1 As Received:

3.2.5.1.1	Hardness, Durometer "A" or equiv., min	55	ASTM D2240
3.2.5.1.2	Tensile Strength, min	550 psi (3.80 MPa)	ASTM D412, Die C
3.2.5.1.3	Elongation, min	100%	ASTM D412, Die C
3.2.5.1.4	Specific Gravity	1.33 - 1.43	ASTM D792, Method A
3.2.5.1.5	Dielectric Strength, short time test, min	400 V per mil (15,750 V/mm)	ASTM D149
3.2.5.1.6	Volume Resistivity, min	1×10^{13} ohm•cm	ASTM D257
3.2.5.1.7	Dielectric Constant, max		ASTM D150
	At 100 Hz	3.5	
	At 100,000 Hz	3.5	
3.2.5.1.8	Dissipation Factor, max		ASTM D150
	At 100 Hz	0.04	
	At 100,000 Hz	0.04	
3.2.5.2	Dry Heat Resistance:		ASTM D573
			Temperature: 250°C + 3 (480°F + 5)
3.2.5.2.1	Hardness Change, Durometer "A" or equiv.	-10 to +10	Time: 70 hr ± 0.5
3.2.5.2.2	Tensile Strength Change, max	-20%	
3.2.5.2.3	Elongation Change, max	-25%	
3.2.5.2.4	Bend (flat)	No cracking or checking	
3.2.5.3	Low-Temperature Resistance:		ASTM D2137, Method A
			Temperature: -65°C + 3 (-85°F + 5)
3.2.5.3.1	Brittleness:	Pass	

3.3 Quality: Compound, as received by purchaser, shall be uniform in quality and condition and free from foreign materials and from imperfections detrimental to usage of the compound.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the compound shall supply all Ø samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.6. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the compound conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to the following Ø requirements are classified as acceptance tests and shall be performed on each lot:

Requirement	Paragraph Reference
Base Compound	3.2.1
Catalyst	3.2.2
Mixed, Uncured Product	3.2.4
Mixed, Cured Product	
Hardness	3.2.5.1.1
Tensile Strength	3.2.5.1.2
Elongation	3.2.5.1.3
Specific Gravity	3.2.5.1.4
Dielectric Strength	3.2.5.1.5

4.2.2 Preproduction Tests: Tests to determine conformance to all technical Ø requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of compound to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when Ø requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient compound shall be taken at random from Ø each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three, with the exception that the viscosity of base compound and pot life of mixed compound shall require only one determination.

4.3.1.1 Ø A lot shall be all compound from the same batch of raw materials processed in one continuous run and presented for vendor's inspection at one time. An inspection lot shall not exceed 500 lb (225 kg). A lot may be packaged and delivered in smaller quantities under the basic lot approval provided lot identification is maintained.

4.3.1.2 Ø When a statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6.1 shall state that such plan was used.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample compound shall be approved by purchaser before compound for production use is supplied, unless such approval be waived by purchaser. Results of tests on production compound shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production compound which are essentially the same as those used on the approved sample compound. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material, processing, or both and, when requested, sample compound. Production compound made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Ø Test specimens of the mixed cured compound shall be cut from slabs nominally 6 x 6 in. (150 x 150 mm) and 0.075 in. ± 0.008 (1.90 mm ± 0.20) thick, prepared from a mixture of 100 parts by weight of base compound and 10 parts by weight of catalyst, cured for not less than 72 hr at 25°C ± 1 (77°F ± 2) and 45 - 55% relative humidity.

4.5.2 Pot Life: Place approximately 50 g of mixed, uncured compound in a suitable container so that a layer of compound approximately 1/2 in. (12 mm) thick is formed. Using a micro-spatula having a flat tip approximately 1/4 in. (6 mm) wide, probe the compound periodically by dipping the tip of the spatula well below the surface of the compound, withdrawing the spatula slowly, and observing the strings of the compound. The time required for the strings to break without stretching more than 1 in. (25 mm) shall be recorded as the pot life.