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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3361B

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Superseding AMS 3361A

Silicone Potting Compound, Elastomeric Two-Part, General Purpose 150 to 400 Poise (15 to 40 Pa·s) Viscosity

1. SCOPE:

1.1 Form:

This specification covers a room-temperature-vulcanizing, elastomeric silicone compound in the form of a base compound and a catalyst.

1.2 Application:

This compound has been used typically for potting and encapsulating electronic products for service from -50 to +260 °C (-58 to +500 °F) where resistance to reversion is not required, but usage is not limited to such applications.

1.3 Safety Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS:

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

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.1 ASTM Publications:

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

ASTM D 149	Dielectric Breakdown Voltage and Dielectric Strength of Solid Electric Insulating Materials at Commercial Power Frequencies
ASTM D 150	A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials
ASTM D 257	D-C Resistance or Conductance of Insulating Materials
ASTM D 412	Rubber Properties in Tension
ASTM D 573	Rubber-Deterioration in an Air Oven
ASTM D 792	Specific Gravity (Relative Density) and Density of Plastics by Displacement
ASTM D 1084	Viscosity of Adhesives
ASTM D 2137	Rubber Property-Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D 2240	Rubber Property - Durometer Hardness

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-2073-1	DOD Materiel, Procedures for Development and Application of Packaging Requirements

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 red.

3.2.1.2 Viscosity: Shall be 150 to 400 poises (15 to 40 Pa.s), determined at 25 °C ± 1 (77 °F ± 2) in accordance with ASTM D 1084, Method B, using a No. 3 spindle at 5 rpm or a No. 5 spindle at 10 rpm on a Brookfield Model HAF viscometer or equivalent instrument.

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 to 5 hours, determined in accordance with 4.5.2.

3.2.5 Mixed, Cured Product: The product shall conform to requirements shown in Table 1; 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 to 55% relative humidity.

TABLE 1 - Properties of Cured Product

Paragraph	Property	Requirement	Test Method
3.2.5.1	Hardness, Durometer “A” or equivalent, min	60	ASTM D 2240
3.2.5.2	Tensile Strength, min	625 psi (4.31 MPa)	ASTM D 412, Die C
3.2.5.3	Elongation, min	100%	ASTM D 412, Die C
3.2.5.4	Specific Gravity	1.44 to 1.52	ASTM D 792, Method A
3.2.5.5	Dielectric Strength, short time test, min	450 Volts per mil (17.7 kV/mm)	ASTM D 149
3.2.5.6	Volume Resistivity, min	1×10^{14} ohm cm	ASTM D 257
3.2.5.7	Dielectric Constant, max		ASTM D 150
	At 100 Hz	4.0	
	At 100,000 Hz	4.0	
3.2.5.8	Dissipation Factor, max		ASTM D 150
	At 100 Hz	0.04	
	At 100,000 Hz	0.01	

TABLE 1 - (Continued)

Paragraph	Property	Requirement	Test Method
3.2.5.9	Dry Heat Resistance:		ASTM D 573 250 °C ± 3 (482 °F ± 5) 70 hours ± 05
3.2.5.9.1	Hardness Change Durometer "A" or equivalent	-10 to +10	
3.2.5.9.2	Tensile Strength Change, max	-20%	
3.2.5.9.3	Elongation Change, max	-25%	
3.2.5.9.4	Bend (flat)	No cracking or checking	
3.2.5.10	Low-Temperature Resistance:		ASTM D 2137, Method A -50 °C ± 3 (-58 °F ± 5)
3.2.5.10.1	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 manufacturer of the compound shall supply all samples for required tests and shall be responsible for performing all required tests. 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 for requirements shown in Table 2 are acceptance tests and shall be performed on each lot:

TABLE 2 - Acceptance Tests

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
Tensile Strength	3.2.5.2
Elongation	3.2.5.3
Specific Gravity	3.2.5.4
Dielectric Strength	3.2.5.5

4.2.2 Preproduction Tests: Tests for all technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of compound to a purchaser, when a change in ingredients and/or processing 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 requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient compound shall be taken at random from 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 A lot shall be all compound from the same batch of raw materials processed in one continuous run and presented for manufacturer's inspection at one time.

4.3.1.2 When a statistical sampling plan has been agreed upon by purchaser and manufacturer, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6 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 Manufacturer 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. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing 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 Test specimens of the mixed cured compound shall be a slab nominally 6inches (152 mm) square and 0.075 inch ± 0.005 (1.90 mm ± 0.13) 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 hours at 25 °C ± 1 (77 °F ± 2) and 45 to 55% relative humidity.

4.5.2 Pot Life: Place approximately 50 grams of mixed, uncured compound in a suitable container so that a layer of compound approximately 1/2 inch (12.7 mm) thick is formed. Using a micro-spatula having a flat tip approximately 1/4 inch (6.4 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 inch (25 mm) shall be recorded as the pot life.

4.6 Reports:

The supplier of the compound shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the compound conforms to the other technical requirements. This report shall include the purchase order number, lot number, AMS 3361B, formula number, and quantity.

4.7 Resampling and Retesting:

If any specimen used in the above tests fails to meet the specified requirements, disposition of the compound may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the compound represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

Each tube or container shall be identified with not less than AMS 3361B, manufacturer's name and compound number, lot number, date of expiration, method of storage, and net quantity.

5.2 Packaging:

5.2.1 Base compound shall be supplied in 1-pound (454-gram), 10-pound (4.5-kg), 50-pound (23-kg), or 450-pound (204-kg) containers, as ordered.