SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3316

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Reaffirmed JUN 2007

Silicone Rubber, Fiberglass Fabric Reinforced

RATIONALE

This document has been reaffirmed to comply with the SAE 5-year Review policy.

1. SCOPE:

1.1 Form:

This specification covers a fiberglass reinforced silicone rubber in the form of sheet, strip, and molded parts, color coded light blue per ARP1527.

1.2 Application:

These products have been used typically for grommets or anti-chafing cushions between metal surfaces operating at temperatures between -55 to +260 °C (-67 to +500 °F), but usage is not limited to such applications. Each application should be considered individually.

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.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: custsvc@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

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

AMS 4943 Titanium Alloy, Hydraulic, Seamless Tubing 3.0Al - 2.5V, Annealed

ARP1527 Color Coding - Elastomers for Tube Clamp Cushions

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 235 Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)
ASTM D 297 Rubber Products - Chemical Analysis
ASTM D 395 Rubber Property - Compression Set
ASTM D 412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
ASTM D 471 Rubber Property - Effect of Liquids
ASTM D 573 Rubber- Deterioration in an Air Oven
ASTM D 624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D 2240 Rubber Property - Durometer Hardness

2.3 U.S. Government Publications:

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

MIL-C-85052 Clamp, Loop, Cushion, General Specification for
Federal Aviation Regulations, Part 25, Fire Protection, Section 25.853 Compartment Interiors

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a fiberglass fabric reinforced silicone rubber compound suitably cured to produce a product meeting the requirements of 3.2, and colored light blue in accordance with ARP1527.

3.2 Properties:

The product shall conform to the requirements in Table 1; tests shall be performed on the product supplied and in accordance with specified ASTM methods, insofar as practicable.

TABLE 1 - Properties

	Property	Requirement	Test Method
3.2.1	Hardness, Durometer “A” or equivalent	65-75	ASTM D 2240
3.2.2	Tensile Strength, min	8.2 MPa (1200 psi)	ASTM D 412
3.2.3	Elongation, min	30%	ASTM D 412
3.2.4	Tear Strength, min	52.5 kN/m (300 pounds force/inch)	ASTM D 624, Die B
3.2.5	Specific Gravity	Preproduction value ±0.2	ASTM D 297
3.2.6	Dry Heat Resistance		ASTM D 573 Temperature: 260 °C ± 3 (500 °F ± 5) Time: 70 hours ± 0.5
3.2.6.1	Hardness Change, Durometer “A” or equivalent	0 to +10	ASTM D 2240
3.2.6.2	Tensile Strength, min	6.9 MPa (1000 psi)	ASTM D 412
3.2.6.3	Elongation, min	30%	ASTM D 412
3.2.6.4	Tear Strength, min	52.5 kN/m (300 pounds force/inch)	ASTM D 624
3.2.6.5	Weight Change, max	-5%	ASTM D 471
3.2.7	Lubricating Oil Resistance		ASTM D 471 Medium: MIL-L-7808 Temperature: 150 °C ± 3 (302 °F ± 5) Time: 70 hours ± 0.5
3.2.7.1	Hardness Change, Durometer “A” or equivalent	-30 max	ASTM D 2240
3.2.7.2	Tensile Strength, min	2.0 MPa (300 psi)	ASTM D 412
3.2.7.3	Elongation, min	30%	ASTM D 412

TABLE 1 - Properties (Continued)

	Property	Requirement	Test Method
3.2.7.4	Tear Strength, min	52.5 kN/m (300 pounds force/inch)	ASTM D 624
3.2.7.5	Volume Change, max	+45%	ASTM D 471
3.2.8	Cleaning Fluid, Splash Resistance		ASTM D 471 Medium: A-A-711 or ASTM D 235 Temperature: 24 °C ± 3 (75 °F ± 5) Dip test specimens in fluid for 60 seconds. Allow to dry in ambient air for 24 hours ± 0.5. Repeat cycle 10X and measure properties.
3.2.8.1	Hardness Change, Durometer “A” or equivalent	+5	ASTM D 2240
3.2.8.2	Tensile Strength, min	5.5 MPa (800 psi)	ASTM D 412
3.2.8.3	Elongation, min	30%	ASTM D 412
3.2.8.4	Tear Strength, min	52.5 kN/m (300 pounds force/inch)	ASTM D 624
3.2.8.5	Volume Change, max	-5%	ASTM D 471
3.2.9	Compression Set		ASTM D 395, Method B Temperature: 150 °C ± 3 (302 °F ± 5) Time: 70 hours ± 0.5
3.2.9.1	Percent of Original Deflection, max	30%	
3.2.10	Flammability - Vertical Burn Test		MIL-C-85052, Para 4.5.3.3.2 or FAA FAR 25.853, Appendix F
3.2.10.1	Flame Time, max	15 seconds	
3.2.10.2	Burn Length, max	3.8 cm (1.5 inch)	
3.2.10.3	Drippings, max	5 seconds	
3.2.11	Titanium Compatibility Appearance	No cracking or pitting	MIL-C-85052, Para 3.5.1.4 and 4.5.3.4 AMS 4943

3.3 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, smooth, as free from foreign material as commercially practicable, and free of imperfections detrimental to usage of the product.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The manufacturer shall supply all samples and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the specified requirements.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Hardness (3.2.1), tensile strength (3.2.2), elongation (3.2.3), tear strength (3.2.4), and dry heat resistance (3.2.6) are acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of product by the manufacturer, when a change in ingredients and/or processing requires reapproval as in 4.4.1, and when purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient product 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.

4.3.1.1 A lot shall be all product from the same batch of compound processed in one continuous run and presented for manufacturer's inspection at one time.

4.3.1.2 A statistical sampling plan, acceptable to purchaser, may be used in lieu of sampling as in 4.3.1.

4.3.2 For Preproduction Tests: Acceptable to purchaser or as stated in the contract.