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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3352A

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Superseding AMS 3352

Silicone Rubber, Fiberglass Fabric Reinforced

1. SCOPE:

1.1 Form:

This specification covers a fiberglass reinforced silicone rubber in the form of sheet, strip, and molded parts.

1.2 Application:

These products have been used typically for grommets or anti-chafing cushions between metal surfaces operating at temperatures between -55 to +290 °C (-67 to +554 °F), with occasional short time exposure to 315 °C (599 °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.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order form 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 cancelled and no superseding document has been specified, the last published issue of that document shall apply.

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 SAE Publications:

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

AMS 4943 Titanium Alloy Hydraulic, Seamless, Tubing, 3.0A1 - 2.5V, Annealed

AS1241 Fire Resistant Phosphate Ester Hydraulic Fluid for Aircraft

2.2 ASTM Publications:

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

ASTM D 395 Rubber Property-Compression Set
ASTM D 412 Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
ASTM D 471 Rubber Property-Effect of Liquids
ASTM D 573 Rubber-Deterioration in Air Oven
ASTM D 624 Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D 2240 Rubber Property-Durometer Hardness

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 3.2.1 through 3.2.9, inclusive, and, when specified by purchaser, the requirements of 3.2.10, 3.2.11, and 3.2.12.

3.2 Properties:

The product shall conform to requirements shown in Table 1, determined on parts or on sheet product representative of the parts, as applicable.

TABLE 1 - Properties

	Property	Requirement	Test Method
3.2.1	Hardness, Durometer "A"	55 to 70	ASTM D 2240
3.2.2	Tensile Strength, min	600 psi (4.14 MPa)	ASTM D 412,
3.2.3	Elongation, min	30%	ASTM D 412
3.2.4	Tear Strength, min	250 pounds force/inch (43.8 kN/m)	ASTM D 624, Die B
3.2.5	Dry Heat Resistance:		ASTM D 573 315 °C ± 3 (599 °F ± 5) 168 hours ± 0.5
3.2.5.1	Hardness Change, Durometer "A"	0 to +25	ASTM D 2240
3.2.5.2	Tensile Strength, min	600 psi (4.14 MPa)	ASTM D 412
3.2.5.3	Elongation, min	25%	ASTM D 412
3.2.5.4	Tear Strength, min	200 pounds force/inch (35.0 kN/m)	ASTM D 624, Die B
3.2.5.5	Weight Change, max	-30%	ASTM D 471
3.2.5.6	Test specimen bent through an angle of 180 degrees around a mandrel with diameter equal to four times the thickness of the specimen (4T)	Shall exhibit no cracks	
3.2.6	Hydraulic Fluid Resistance:		ASTM D 471 AS1241, Type IV, CL 1, Grade A 24 °C ± 3 (75 °F ± 5) 24 hours ± 0.5
3.2.6.1	Hardness Change, Durometer "A"	-15 to 0	ASTM D 2240
3.2.6.2	Volume Change, max	+15%	ASTM D 471
3.2.6.3	Test specimen bent through an angle of 180 degrees around a 4T diameter mandrel	Shall exhibit no cracks	

TABLE 1 - Properties (Continued)

	Property	Requirement	Test Method
3.2.7	Hydraulic Fluid Splash Resistance:		ASTM D 471 AS1241, Type IV, CL 1, Grade A 24 °C ± 3 (75 °F ± 5) 5 minutes ± 1
3.2.7.1	Test specimen bent through an angle of 180 degrees around a 4T diameter mandrel after 10 wetting/heating cycles	Shall exhibit no cracks	Test condition of 3.2.7 Plus Air 260 °C ± 3 (500 °F ± 5) 2 hours ± 0.1
3.2.8	Compression Set:		ASTM D 395, Method B 250 °C ± 3 (500 °F ± 5) 24 hours ± 0.5
3.2.8.1	Percent of Original Thickness, max	25	
3.2.9	Flammability: Dripping Flame time, max Burn length, max	 None 30 seconds 3.8 cm (1.5 inch)	4.5.1
3.2.10	Lubricating Oil Splash Resistance		ASTM D 471 AMS 3023 (ARM 200) 24 °C ± 3 (75 °F ± 5) 5 minutes ± 1
3.2.10.1	Hardness Change, Durometer "A"	-6 to 0	
3.2.10.2	Volume Change, max	+20%	
3.2.10.3	Test specimen bent through an angle of 180 degrees around a 4T diameter mandrel after 10 wetting/heating cycles	Shall exhibit no cracks	Test conditions of 3.2.10 Plus Air 150 °C ± 3 (302 °F ± 5) 2 hours ± 0.1

TABLE 1 - Properties (Continued)

	Property	Requirement	Test Method
3.2.11	Fuel Splash Resistance		ASTM D 471 ASTM Ref. Fuel B 24 °C ± 3 (75 °F ± 5) 5 minutes ± 1
3.2.11.1	Hardness Change, Durometer "A"	-5 to 0	
3.2.11.2	Volume Change, max	-3%	
3.2.11.3	Test specimen bent through an angle angle of 180 degrees around a 4T diameter mandrel after 10 wetting/heating cycles.	Shall exhibit no cracks	Test conditions of 3.2.11 Plus Air 39 °C ± 0.6 (100 °F ± 1) 2 hours ± 0.1
3.2.12	Titanium Compatibility, Appearance	No cracking or pitting	4.5.2

3.6 Quality:

Product, as received by purchaser, shall be uniform in quality and condition, smooth, as free of 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 for required tests 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), and tear strength (3.2.4) 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 produced 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: Shall be acceptable to purchaser or as stated in the contract.

4.4 Approval:

4.4.1 Sample product shall be approved by purchaser before product for production use is supplied, unless such approval is waived by purchaser. Results of tests on production product shall be essentially equivalent to those on the approved sample. Production product made by a revised procedure shall not be shipped prior to receipt of reapproval. If necessary to make any change in parameters for the process control factors, manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample product.

4.4.2 Manufacturer of the product shall make no significant change in material, processes, or control factors from those on which the approval was based, unless the change is approved by the cognizant engineering organization. A significant change is one which, in the judgment of the cognizant engineering organization, could affect the properties or performance of the product.

4.4.2.1 Control factors for producing products include, but are not limited to, the following:

Compound ingredients and proportions thereof within established limits
Sequence of mixing compound ingredients
Type of mixing equipment
Method and equipment for preparing preforms
Basic molding procedure (compression, transfer, injection)
Curing time and pressure; variations of ±10% are permissible
Finishing methods
Methods of inspection.

4.4.2.2 Any of the above process control factors for which parameters are considered proprietary by the manufacturer may be assigned a code designation. Each variation in such parameters shall be assigned a modified code designation.