Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 3357E
Superseding AMS 3357D

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SILICONE RUBBER
Lubricating Oil and Compression Set Resistant
65 - 75

1. SCOPE:

1.1 Form: This specification covers a silicone rubber in the form of sheet, strip, tubing, molded shapes, and extrusions.

1.2 Application: Primarily for rubber-like parts required to operate or seal at temperatures from -55° to +230°C (-65° to +450°F), compounded especially for aircraft piston engine oil resistance and low compression set. Silicone elastomer is resistant to deterioration by weathering and by high-aniline-point petroleum-base oils and remains flexible over the temperature range noted. This material is not normally suitable for use in contact with gasoline or aromatic fuels and low-aniline-point petroleum-base fluids due to excessive swelling of the elastomer.

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 Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 2810 - Identification and Packaging, Elastomeric Products

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

ASTM D297 - Rubber Products - Chemical Analysis
ASTM D395 - Rubber Property - Compression Set
ASTM D412 - Rubber Properties in Tension
ASTM D471 - Rubber Property - Effect of Liquids
ASTM D518 - Rubber Deterioration - Surface Cracking
ASTM D573 - Rubber Deterioration in an Air Oven
ASTM D624 - Rubber Property - Tear Resistance
ASTM D797 - Rubber Property - Young's Modulus at Normal and Subnormal Temperatures
ASTM D1149 - Rubber Deterioration - Surface Ozone Cracking in a Chamber (Flat Specimens)
ASTM D2137 - Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D2240 - Rubber Property - Durometer Hardness
ASTM F64 - Corrosive and Adhesive Effects of Gasket Materials on Metal Surfaces

2.3 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 be a compound based on a silicone rubber, suitably cured to produce a product meeting the requirements of 3.2.

3.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with specified ASTM methods, insofar as practicable:

3.2.1 As Received:

3.2.1.1	Hardness, Durometer "A" or equivalent	70 ± 5	ASTM D2240
3.2.1.2	Tensile Strength, min	800 psi (5.52 MPa)	ASTM D412, Die B or C
3.2.1.3	Elongation, min	150%	ASTM D412, Die B or C
3.2.1.4	Tensile Stress at 50% Elongation, min	200 psi (1.38 MPa)	ASTM D412, Die B or C
3.2.1.5	Tear Strength, min	60 lb per in. (10.5 kN/m)	ASTM D624, Die B
3.2.1.6	Specific Gravity	Qualification Value ±0.03	ASTM D297

3.2.2 Petroleum Lubricating Oil Resistance: (Immediate Deteriorated Properties)

ASTM D471
Medium: ASTM Oil No. 1
Temperature: 175°C ± 3 (347°F ± 5)
Time: 70 hr ± 0.5

3.2.2.1	Hardness Change, Durometer or equivalent	-10 to +5
3.2.2.2	Tensile Strength Change, max	-20%
3.2.2.3	Elongation Change, max	-15%
3.2.2.4	Volume Change, max	0 to +15%
3.2.2.5	Decomposition	None
3.2.2.6	Surface Tackiness	None

3.2.3 Dry Heat Resistance:

ASTM D573
Temperature: 225°C ± 3 (437°F ± 5)
Time: 24 hr ± 0.5

3.2.3.1	Hardness Change, Durometer "A" or equivalent	-5 to +10
3.2.3.2	Tensile Strength Change, max	-15%
3.2.3.3	Elongation Change, max	-25%
3.2.3.4	Bend (flat)	No cracking or checking

3.2.4	Compression Set:		ASTM D395, Method B Temperature: 175°C ± 3 (347°F ± 5) Time: 22 hr ± 0.5
3.2.4.1	Percent of Original Deflection, max	35	
3.2.5	Low-Temperature Resistance:		
3.2.5.1	Brittleness	Pass	ASTM D2137, Method A Temperature: -65°C ± 3 (-85°F ± 5)
3.2.5.2	Young's Modulus, max	10,000 psi (69 MPa)	ASTM D797 Temperature: -50°C ± 3 (-58°F ± 5) Time: 5 hr ± 0.2

3.2.6 Weathering: The product, unless otherwise specified, shall show no evidence of cracking when Ø tested in accordance with ASTM D1149 for 7 days at 40°C + 1 (105°F ± 2). Test specimens shall be prepared and mounted in accordance with ASTM D518, Method B.

3.2.7 Corrosion: The product, unless otherwise specified, shall not have a corrosive effect on other Ø materials, determined in accordance with ASTM F64. Discoloration of metal shall not be considered objectionable.

3.3 Quality: The product shall be uniform in quality and condition, clean, smooth, as free from foreign materials as commercially practicable, and free from imperfections detrimental to fabrication, appearance, or performance of parts.

3.4 Tolerances: Unless otherwise specified, the following tolerances shall apply:

3.4.1 Sheet and Strip:

TABLE I

Nominal Thickness Inches	Tolerance, Inch plus and minus
Up to 0.125, incl	0.016
Over 0.125 to 0.500, incl	0.031
Over 0.500	0.047

TABLE I (SI)

Nominal Thickness Millimetres	Tolerance, Millimetres plus and minus
Up to 3.18, incl	0.41
Over 3.18 to 12.70, incl	0.79
Over 12.70	1.19

3.4.2 Tubing:

3.4.2.1 Diameter:

TABLE II

Nominal OD or ID (not both, Inches)	Tolerance plus and minus	Ovality, % (See 3.4.2.1.1)
Up to 0.500, incl	0.020 in.	10
Over 0.500 to 1.000, incl	0.030 in.	15
Over 1.000	4%	15

TABLE II (SI)

Nominal OD or ID (not both), Millimetres	Tolerance plus and minus	Ovality, % (See 3.4.2.1.1)
Up to 12.70, incl	0.51 mm	10
Over 12.70 to 25.40, incl	0.76 mm	15
Over 25.40	4%	15

3.4.2.1.1 Ovality applies to tubing ordered in straight lengths with wall thickness of 0.063 in. (1.60 mm) and over and shall be computed from the difference between the minor and major axis diameter measurements, taken at the same transverse plane on the tube, expressed as a percentage of the nominal diameter.

3.4.2.2 Wall Thickness:

TABLE III

Nominal Wall Thickness Inches	Tolerance plus and minus
Up to 0.063, excl	0.005 in.
0.063 and over	10%

TABLE III (SI)

Nominal Wall Thickness Millimetres	Tolerance plus and minus
Up to 1.60, excl	0.13 mm
1.60 and over	10%

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the product conforms to the requirements of this specification.