AERONAUTICAL
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

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Revised

SILICONE RUBBER
Lubricating Oil and Compression Set Resistant, Electrical Grade
(55 - 65)

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1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. FORM: Molded or extruded shapes, sheet, tubing, or as ordered.

3. APPLICATION: Primarily for rubber-like parts required to operate or seal at temperatures from -65 to +450 F, compounded especially for lubricating oil resistance, low compression set, and controlled dielectric strength. Silicone rubber 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 low aniline point petroleum base fluids, including fuels, due to excessive swelling. This material may produce toxic vapors when heated and should not be used where air contamination would be undesirable.

4. TECHNICAL REQUIREMENTS:

4.1 General:

4.1.1 Condition: Unless otherwise specified, a suitably cured product shall be furnished.

4.1.2 Weathering: When specified, the product shall have weather resistance acceptable to the purchaser as determined by a procedure agreed upon by purchaser and vendor.

4.1.3 Corrosion: The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.

4.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with listed ASTM methods, insofar as practicable. When the product supplied is an extrusion of such shape that suitable test specimens cannot be cut from the product, a separate flat strip test sample shall be supplied upon request. This strip shall be prepared from 1 in. ± 1/16 OD by 0.075 in. ± 0.008 thick wall tubing which shall be mechanically split and flattened into a strip while being extruded and then cured in the same manner as production material.

4.2.1 As Received:

4.2.1.1	Hardness, Durometer "A" or equiv.	60 ± 5	
4.2.1.2	Tensile Strength, psi, min	600	ASTM D412-51T, Die B or C

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4.2.1.3	Elongation, %, min	175	ASTM D412-51T, Die B or C
4.2.1.4	Tensile Stress at 50% Elongation, psi, max	250	ASTM D412-51T, Die B or C
4.2.1.5	Tear Resistance, lb per in., min	50	ASTM D624-54, Die B
4.2.1.6	Dielectric Strength, v per mil, min	350	ASTM D149-44, Continuous Voltage Rise Method Electrode Diameter: 2 in. Specimen Thickness: 0.075 - 0.080 in.
4.2.2	**Lubricating Oil Resistance:** **(Immediate Deteriorated Properties)**		ASTM D471-55T Medium: ASTM Oil No. 1 Temperature: 350 F ± 5 Time: 70 hr
4.2.2.1	Hardness Change, Durometer "A" or equiv.	-15 to +5	
4.2.2.2	Tensile Strength Change, %, max (based on area before immersion)	-35	
4.2.2.3	Elongation Change, %, max	-20	
4.2.2.4	Volume Change (Method A), %	0 to +15	
4.2.2.5	Decomposition	None	
4.2.2.6	Surface Tackiness	None	
4.2.3	Water Resistance: (Immediate Deteriorated Properties)		ASTM D471-55T Medium: Distilled Water Temperature: 77 F ± 2 Time: 48 hr
4.2.3.1	Volume Change (Method A), %	0 to +5	
4.2.3.2	Dielectric Strength Change, %, max	-15	
4.2.4	Dry Heat Resistance:		ASTM D573-53 Temperature: 450 F ± 5 Time: 24 hr
4.2.4.1	Hardness Change, Durometer "A" or equiv.	0 to +10	
4.2.4.2	Tensile Strength Change, %, max	-15	
4.2.4.3	Elongation Change, %, max	-20	
4.2.4.4	Bend (flat)	No cracking or checking	
4.2.5	Compression Set:		ASTM D395-55, Method B Temperature: 300 F ± 5 Time: 70 hr Compressed to 70% of original thickness
4.2.5.1	Per cent of original deflection, max	40	
4.2.5.2	Per cent of original thickness, max	12	

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4.2.6 Low Temperature Resistance:

4.2.6.1	Brittleness	Pass	ASTM D746-55T, Procedure B Temperature: -65 F ± 2
4.2.6.2	Young's Modulus, psi, max (See Note 1)	10,000	ASTM D797-46 Temperature: -65 F ± 2

Note 1. This test is not normally required but may be used in case of disagreement on the results of the brittleness test.

5. QUALITY: The product shall be uniform in quality and condition, clean, smooth, and free from chalky spots, foreign materials, and imperfections detrimental to fabrication, appearance, or performance of parts.

6. TOLERANCES: Unless otherwise specified, the following tolerances apply:

6.1 Sheet and Strip:

Nominal Thickness Inches	Tolerance, Inch Plus and Minus
1/8 and under	1/64
Over 1/8 to 1/2, incl	1/32
Over 1/2	3/64

6.2 Tubing:

6.2.1

Nominal OD or ID (not both), Inches	Tolerance Plus and Minus	Ovality, % (See Note 2)
1/2 and under	0.020 in.	10
Over 1/2 to 1, incl	0.030 in.	15
Over 1	4%	15

Note 2. Ovality applies to tubing ordered in straight lengths with wall thickness of 1/16 in. and over, and shall be computed from the difference of the minor and major axis diameter measurements, taken at the same location on the tube, expressed as a percentage of the nominal diameter.

6.2.2

Nominal Wall Thickness Inch	Tolerance Plus and Minus
Under 1/16	0.005 in.
1/16 and over	10%

7. REPORTS:

7.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product meets the requirements of this specification. This report shall include the purchase order number, material specification number, vendor's compound number, form or part number, and quantity.

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