



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

AEROSPACE MATERIAL SPECIFICATION

AMS 3251E

Superseding AMS 3251D

Issued 11-1-44

Revised 7-15-77

SYNTHETIC RUBBER AND CORK COMPOSITION General Purpose Medium

1. SCOPE:

- 1.1 Form: This specification covers a synthetic rubber and cork composition in the form of sheet, strip, and molded shapes.
- 1.2 Application: Primarily for parts such as packings, seals, grommets, line support blocks, tank strap pads, and wherever cushioning and vibration damping are of prime importance.

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 - Effects of Liquids

ASTM D573 - Rubber Deterioration in An Air Oven

ASTM D2137 - Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics

ASTM F36 - Compressibility and Recovery of Gasket Materials

ASTM F104 - Classification System for Nonmetallic Gasket Materials

- 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 granulated cork uniformly dispersed in a synthetic rubber compound suitably cured to produce a product meeting the requirements of 3.2. Joints shall be vulcanized and the joint section shall have essentially the same strength and size as the solid section.

SAE Technical Board rules provide that: "All technical reports, including standards applications, and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

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	Compressibility	45% \pm 5	ASTM F36
3.2.1.2	Elongation, min	100%	ASTM D412, Die B or C
3.2.1.3	Density	0.83 to 1.05 Mg/m ³	ASTM D297

3.2.2 Aliphatic Fuel Resistance:

(Immediate Deteriorated Properties)

ASTM D471

Medium: ASTM Ref. Fuel A
 Temperature: 20° - 30°C
 (68° - 86°F)
 Time: 24 hr \pm 0.5

3.2.2.1	Compressibility Change (See 8.2)	-10 to +20%
3.2.2.2	Volume Change	-5 to +25%
3.2.2.3	Weight Change	
3.2.2.3.1	Upon removal from fuel	0 to +25%
3.2.2.3.2	After 24 hr \pm 0.5 air drying at 20° - 30°C (68° - 86°F), max (based on unimmersed weight)	-8%

3.2.3 Petroleum Lubricating Oil Resistance:
(Immediate Deteriorated Properties)

ASTM D471

Medium: ASTM Oil No. 1
 Temperature: 100°C \pm 1
 (212°F \pm 2)
 Time: 24 hr \pm 0.5

3.2.3.1	Compressibility Change (See 8.2)	-5 to +20%
3.2.3.2	Volume Change	-15 to +15%
3.2.3.3	Decomposition	None
3.2.3.4	Surface Tackiness	None

3.2.4 Water Absorption:

(Immediate Deteriorated Properties)

ASTM D471

Medium: Distilled Water
 Temperature: 100°C \pm 1
 (212°F \pm 2)
 Time: 1 hr \pm 0.2

3.2.4.1	Compressibility Change (See 8.2)	0 to +15%
3.2.4.2	Volume Change	0 to +10%
3.2.4.3	Weight Change	0 to +15%

3.2.5 Dry Heat Resistance:

ASTM D573

Temperature: 100°C \pm 1
 (212°F \pm 2)
 Time: 70 hr \pm 0.5

3.2.5.1	Compressibility Change (See 8.2)	-15 to +5%
3.2.5.2	Flexibility	Pass

ASTM F104

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- 3.2.6 Compression Set: ASTM D395, Method B
Temperature: 70°C + 1
(158°F ± 2)
 - 3.2.6.1 Percent of Original Deflection, max 80
Time: 22 hr ± 0.5
- 3.2.7 Low-Temperature Brittleness: ASTM D2137, Method B
Temperature: -35°C + 1
(-31°F ± 2)
 - Ø Pass
Specimen to be
0.060 - 0.125 in. (1.52 - 3.18 mm)
thick
- 3.2.8 Weathering: When specified, the product shall have weather resistance acceptable to the purchaser, determined by a procedure agreed upon by purchaser and vendor.
- 3.2.9 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.
- 3.3 Quality: The product shall be uniform in quality and condition, clean, smooth, as free from foreign material 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

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.
- 4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to the following requirements are classified as acceptance tests and shall be performed on each lot of product:

Ø	Requirement	Paragraph
	Compressibility, as received	3.2.1.1
	Elongation, as received	3.2.1.2
	Density, as received	3.2.1.3
	Volume Change in Oil	3.2.3.2
	Compression Set	3.2.6

4.2.2 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as qualification tests and may be the basis for approval of the compound (See 4.4.1)

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, qualification test material shall be submitted to the cognizant qualification agency as directed by the procuring activity, the contracting officer, or the request for procurement.

Ø 4.3 Sampling: Sufficient product shall be taken from each lot to perform all required tests in triplicate.

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

Ø 4.3.2 A batch shall be the quantity of compound run through a mill or mixer at one time.

4.4 Approval:

4.4.1 Sample material shall be approved by purchaser before material for production use is supplied, unless such approval be waived. Results of tests on production material shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production material which are essentially the same as those used on the approved sample material. If any change is necessary in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material and processing and, when requested, sample material. Production material made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports:

4.5.1 The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, vendor's compound number, form and size or part number, and quantity.

4.5.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of material, supplier's compound number, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.