



Designation: C 509 – 00

Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material¹

This standard is issued under the fixed designation C 509; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification applies to those elastomeric cellular materials of a firm grade that are manufactured in preformed shapes for use as gaskets and for use as sealing materials, in the form of compression seals or gaskets, or both, for glazing other building joint applications.

NOTE 1—For softer cellular elastomeric materials used in secondary sealing applications, refer to Specification D 1056.

1.2 *Test Method C 1166, as referenced in this specification, should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.*

1.3 The following precautionary caveat pertains only to the test method portion, Section 11, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- C 717 Terminology of Building Seals and Sealants²
- C 1083 Test Method for Water Absorption of Cellular Elastomeric Gaskets and Sealing Materials²
- C 1166 Test Method for Flame Propagation of Dense and

Cellular Elastomeric Gaskets and Accessories²

- D 395 Test Methods for Rubber Property—Compression Set³
- D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension³
- D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact⁴
- D 865 Test Method for Rubber—Deterioration by Heating in Air (Test Tube Enclosure)³
- D 925 Test Methods for Rubber Property—Staining of Surfaces (Contact, Migration, and Diffusion)³
- D 1056 Specification for Flexible Cellular Materials—Sponge or Expanded Rubber⁴
- D 1149 Test Method for Rubber Deterioration—Surface Ozone Cracking in Chamber³

3. Terminology

3.1 *Definitions*—Refer to Terminology C 717 for the following terms used in this specification: cellular material, elastomeric, gasket glazing, seal, and sealing material.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *compression seal*—a type of joint seal in which weathertightness is maintained by the exertion of compressive pressure on the gasket or sealing material.

3.2.2 *gasket glazing*—a method of setting glass or panels in prepared openings, using a preformed gasket to obtain a weathertight seal.

3.2.3 *preformed gasket*—an elastomeric compound molded in the form of a continuous strip, channel, or other shape, for use in filling joints and providing weathertight seals in glazing or between building components.

4. Materials and Manufacture

4.1 Elastomeric cellular materials furnished to this specification shall be manufactured from natural rubber, synthetic rubber, rubber-like materials, or mixtures of these, with added

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² *Annual Book of ASTM Standards*, Vol 04.07.

³ *Annual Book of ASTM Standards*, Vol 09.01.

⁴ *Annual Book of ASTM Standards*, Vol 08.01.

compounding ingredients of such nature and quality that, with proper curing, the finished product will comply with this specification.

4.2 The cured compounds shall be suitable for use where resistance to sunlight, weathering, oxidation, and permanent deformation under load are of prime importance.

4.3 The manufacturing process shall be such to ensure a homogeneous cellular material free of defects that may affect serviceability.

4.4 Although under this specification the manufacturer is permitted to choose constituent materials, there is no implication that the several compounds are equivalent in all physical properties. Any special characteristics other than those required by this specification, which may be needed for specific applications, shall be specified by the purchaser, since such characteristics may influence the choice of base materials and other ingredients.

5. Physical Properties

5.1 The material shall conform to the requirements prescribed in Table 1.

6. Dimensional Tolerances

6.1 Permissible variation in cross-sectional dimensions shall be as specified in Table 2 unless otherwise agreed upon between the purchaser and the supplier.

7. Workmanship, Finish, and Appearance

7.1 The elastomeric cellular materials shall be manufactured and processed in a careful and workmanlike manner in accordance with the best commercial practices.

7.2 The surfaces of the finished material shall be reasonably smooth and free of excessive talc or bloom.

7.3 Unless otherwise specified, the material shall be black. When colored material is desired, it is recommended that other tests, agreed upon between the purchaser and the supplier, be conducted to ensure color stability.

TABLE 2 Standards for Cross-Sectional Tolerance

NOTE 1—Dimensional tolerances for outside diameters, inside diameters, wall thickness, width, height, and general cross-sectional dimensions of extrusions

Rubber Manufacturers Association ^A						
RMA Class		1	RMA Class		1	
Drawing Designation		BEC 1	Drawing Designation		BEC 1	
Dimensions (in inches)			Dimensions (in Millimeters)			
Above 0	Up To 0.25	±0.016	Above 0	Up To 6.3	±0.4	
0.25	0.50	0.025	6.3	12.5	0.63	
0.50	1.00	0.050	12.5	25.0	1.25	
1.00	1.60	0.080	25.0	40.0	2.0	
1.60 & over multiply by		0.060	40.0 & over multiply by			0.06

^AAdapted from Rubber Manufacturers Association Handbook, Table 36, Fifth Ed., 1992

8. Number of Tests and Retests

8.1 Any material that fails in one or more of the test requirements may be retested by making two additional tests for the requirements in which failure occurs. Failure in one such retest shall be cause for final rejection.

8.2 Rejected material shall be disposed of as directed by the supplier.

9. Significance and Use

9.1 Flame Propagation:

9.1.1 This specification has two options:

9.1.1.1 *Option I*—Flame propagation test is required.

9.1.1.2 *Option II*—Flame propagation test is not required.

9.1.2 In case no option is specified, Option I will apply.

9.2 This specification has two classifications as related to ozone resistance. These are Type I and Type II, with the latter having the greater resistance to ozone. The type should be specified when making reference to this specification but in the event that the type is not specified, Type II shall apply.

NOTE 2—Type II is included in this specification for use where greater

TABLE 1 Physical Requirements of Cellular Elastomeric Materials

Property	Limit	ASTM Test Method ^A
Compression-deflection, 25 % deflection limits: kPa (psi)	91 to 168 (13 to 24)	D 1056
Compression set, 22 h @ 70°C (158°F) max, %	30	D 395, Method B
Heat aging ^B , 70 h @ 100°C (212°F), change in compression-deflection values: kPa (psi)	0 to + 70 (0 to + 10)	D 865 and D1056
Dimensional stability, change, max %, after heat aging, 70 h @ 100°C (212°F)	4	11.4
Ozone resistance ^C at 40 % elongation, 100 h @ 40°C (104°F): Type I 100 mPa ozone	no cracks @ 7× magnification	D 1149
Type II 300 mPa ozone	no cracks @ 7× magnification	D 1149
Low-temperature brittleness @ - 40°C (-40°F)	pass	see Appendix X1
Water absorption, max, % weight	5.0	C 1083
Flame propagation: Option I	100 mm (4 in.) max.	C 1166
Option II	no limit	
Nonstaining ^D	no migratory stain	D 925

^ASee Section 11.

^BAfter heat aging, surfaces of the specimen shall be neither hard nor brittle. A150-mm (6-in.) length of the finished extrusion shall exhibit no surface cracks when bent on itself 180°.

^CThe specimen shall exhibit no surface cracks when in the extended condition.

^DThis requirement may be waived, subject to agreement between the purchaser and the supplier.