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Standard Specification for Lock-Strip Gaskets[1]

This standard is issued under the fixed designation C 542; 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 defines the required properties of lock-strip gaskets where resistance to sunlight, weathering, flame, oxidation, permanent deformation under load, and diminution of gripping pressure are prime essentials.

NOTE 1—The requirement of flame propagation may be waived by the architect or professional engineer when doing so does not conflict with local codes or ordinances.

1.2 This specification applies only to the "locking" compression type of gasket, sometimes referred to as the "zipper" type.

NOTE 2—Structural integrity and weather-tightness of the wall requires the sound design and installation of the entire system of which the gasket is only one component.

1.3 The values stated in inch-pound units are to be regarded as the standard.

1.4 *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.*

1.5 The following precautionary caveat pertains only to the test method portion, Section 8, of this specification: *This standard does not purport to address 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 Sealants[2]

C 1166 Test Method for Flame Propagation of Dense and Cellular Elastomeric Gaskets and Accessories[2]

D 15 Methods of Compound and Sample Preparation for Physical Testing of Rubber Products[3]

D 395 Test Methods for Rubber Property—Compression Set[4]

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension[4]

D 573 Test Method for Rubber—Deterioration in an Air Oven[4]

D 624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers[4]

D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact[5]

D 1149 Test Method for Rubber Deterioration—Surface Ozone Cracking in a Chamber[4]

D 1566 Terminology Relating to Rubber[4]

D 2240 Test Method for Rubber Property—Durometer Hardness[4]

2.2 *Other Standard:*

Rubber Handbook, Specifications for Rubber Products[6]

3. Terminology

3.1 *Definitions:*

3.1.1 For the definition of the term elastomer, and other definitions of terms used in this specification, see Terminology C 717.

3.1.2 *hardness*—the resistance to indentation (Terminology D 1566).

3.2 *Definitions of Terms Specific to This Standard:*

[1] This specification is under the jurisdiction of ASTM Committee C-24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C24.73 on Compression Seal and Lock-Strip Gaskets.

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

[3] Discontinued; see 1975 *Annual Book of ASTM Standards*, Part 37. Replaced by Practice D 3182, Test Methods D 3190, and Test Methods D 3192.

[4] *Annual Book of ASTM Standards*, Vol 09.01.

[5] *Annual Book of ASTM Standards*, Vol 08.01.

[6] Available from Rubber Manufacturers Association, 444 Madison Ave., New York, NY.

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3.2.1 *bite*—the width by which the flanges of a lock-strip gasket overlap the edges of supported or supporting material.

3.2.2 *clamping pressure*—the pressure exerted by the lip of the lock-strip gasket on material installed in the channel, when the lock-strip is in place.

3.2.3 *durometer*—*(1)* an instrument for measuring the hardness of rubber-like materials. *(2)* a term used to identify the relative hardness of rubber-like materials, for example "low durometer" (relatively soft) or "high durometer" (relatively hard).

3.2.4 *edge clearance*—the distance between the bottom of a channel of a lock-strip gasket and the edge of material installed in the channel.

3.2.5 *elongation*—increase in length (expressed as a percentage of the original length).

3.2.6 *filler strip*—see *lock-strip,* the preferred term.

3.2.7 *flange*—that part of a lock-strip gasket which extends to form one side of a channel (see Fig. 1 and Fig. 2).

3.2.8 *gasket*—any preformed deformable device designed to be placed between two adjoining parts to prevent the passage of liquid or gas between the parts.

3.2.9 *gasket, lock-strip*—a gasket in which the sealing pressure is produced internally by forcing a keyed lock-strip into a groove (referred to as the lock-strip cavity) in one face of the gasket.

3.2.9.1 *H-type*—two channel recesses, of equal or unequal sizes, one on either side of a central web (see Fig. 1).

3.2.9.2 *reglet-type*—a channel recess on the inner edge and a tongue, or spline, on the outer edge, the latter being designed for insertion in a reglet (see Fig. 2).

3.2.10 *gasket, structural*—see *gasket, lock-strip,* the preferred term.

3.2.11 *gasket, zipper*—see *gasket, lock-strip,* the preferred term.

3.2.12 *H-gasket*—see *gasket, lock-strip, H-type.*

3.2.13 *hinge*—the minimum thickness of gasket material between the channel recess and the lock-strip cavity; the plane at which bonding occurs when the flange is bent open to receive or release installed material.

3.2.14 *ladder gasket*—a lock-strip gasket in the form of a subdivided frame having one or more integrally formed intermediate cross members.

3.2.15 *lip*—the inner face of the tip of a flange on a lock-strip gasket (see Fig. 1 and Fig. 2).

3.2.16 *lip pressure*—the pressure exerted by the lip of a lock-strip gasket on material installed in the channel, when the lock-strip is in place.

3.2.17 *lip seal pressure*—the lip pressure required to effect a seal against the passage of water and air.

3.2.18 *lock-strip or locking strip*—the strip which is designed to be inserted in the lock-strip cavity to force the lips against material placed in the channel.

3.2.19 *lock-strip cavity*—the groove in the face of a lock-strip gasket, designed to receive and retain the lock-strip.

3.2.20 *reglet*—a groove or recess formed in material such as concrete or masonry to receive the spline, or tongue, of a reglet-type lock-strip gasket.

3.2.21 *reglet gasket*—see *gasket, lock-strip, reglet type.*

3.2.22 *setting block*—a short length of suitable material placed in the gasket channel to maintain proper edge clearance.

3.2.23 *spline or tongue*—that part of a reglet-type lock-strip gasket which is designed to be installed in a reglet in supporting material.

3.2.24 *web*—that part of an H-type lock-strip gasket which extends between the flanges, forming two channels.

4. Materials and Manufacture

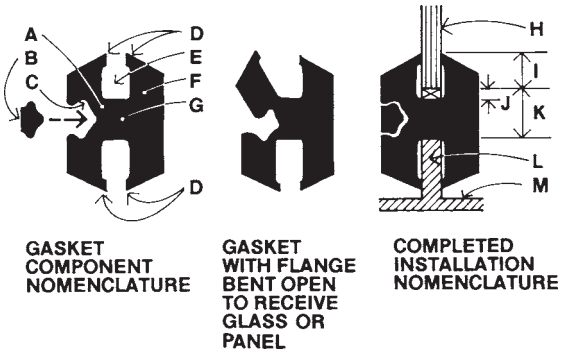
4.1 All materials and workmanship shall be in accordance with good commercial practice.

4.2 Gaskets shall be manufactured from an ozone-resistant compound and shall not be dependent for ozone resistance on surface protection which can be removed by abrasion, detergents, or other means.

4.3 Gaskets shall be free of porosity, surface defects, and dimensional irregularities, particularly in the sealing area.

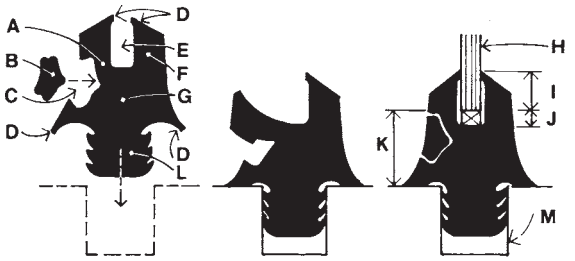
4.4 Unless otherwise specified, the material shall be black.

4.5 Lubricants used in installation, shall be as recommended by the gasket manufacturer.



A Hinge
B Lock-strip
C Lock-strip cavity
D Lip (sealing edge)
E Channel recess
F Flange
G Web
H Glass or panel
I Bite
J Edge clearance
K Frame to glass or panel dimension
L Frame lug
M Frame

FIG. 1 Basic H-Type Gasket, Its Functional Principles and Nomenclature



A Hinge
B Lock-strip
C Lock-strip cavity
D Lip (sealing edge)
E Channel recess
F Flange
G Web
H Glass or panel
I Bite
J Edge clearance
K Frame to glass or panel dimension
L Spline
M Reglet

FIG. 2 Reglet Type Gasket, Its Functional Principles and Nomenclature

5. Physical Properties

5.1 The physical properties of the gasket shall conform to the requirements specified in Table 1.

6. Dimensions and Permissible Variations

6.1 Minimum thickness of material between the locking strip cavity and the panel or rail channel shall be 0.10 in. (2.5 mm).

6.2 All cross-sectioned dimensions shall have an RMA Class 2 tolerance, as specified in Table 2 unless otherwise agreed by the purchaser and seller.

7. Sampling

7.1 When proof of conformance with this specification is required, the samples shall be taken from the finished product whenever possible.

7.2 When the thickness or shape of the finished product makes sampling, as specified in Section 7, impossible, the manufacturer shall, upon request of the purchaser at the time of ordering, furnish a sufficient number of test slabs or blocks prepared in accordance with Methods D 15 for the proper performance of the required tests. The slabs or blocks shall be prepared from the compound of the same source production lot used in the gasket.

8. Test Methods

8.1 *Tensile Strength and Elongation*—Test in accordance with Test Methods D 412. Determine percentage change in tensile strength and elongation after oven aging for 70 h at 212 ± 2°F (100 ± 1°C).

8.2 *Tear Resistance*—Test in accordance with Test Method D 624 using Die C.

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TABLE 1 Physical Requirements and Test Methods for Gaskets

Property	Requirements	Test Method
Tensile strength, min[A]	2000 psi (14 MPa)	D 412
Elongation at rupture, min, %	175	D 412
Tear resistance, min	120 lbf/linear in. (214 N/linear cm)	D 624 (Die C)
Hardness, durometer A[A]	75 ± 5	D 2240
Compression set, max, %, 22 h at 212°F (100°C)	35	D 395 (Method B)
Brittleness temperature, min	–40°F (–40°C)	D 746
Ozone resistance, 100 mPa ozone	...	...
100 h at 40°C (104°F), 20 % elongation	no cracks @ 7× magnification	D 1149 (Specimen A)
Heat aging, 70 h at 212°F (100°C)		D 573
Change in hardness, max	0 to + 10 Durometer points	
Loss in tensile strength, max, %	15	
Loss in elongation, max, %	40	
Flame propagation[B]	100 mm (4 in.), max.	C 1166
Lip pressure[C]		
Extruded section, min	4 lbf/linear in. (7 N/linear cm)	as specified (see 8.9)
Corners, min	4 lbf/linear in. (7 N/linear cm)	

[A] If a separate stock is used for the locking strip, it may have a hardness of 80 ± 5 durometer points, and a minimum tensile strength of 1800 psi (12.5 MPa). In all other respects, it must meet these specifications.

[B] This requirement may be waived (see Note 1).

[C] In the case of molded corners with integral sealing devices, the requirement for corner lip pressure may be lowered by the architect or professional engineer.