Designation: ~~C1115 – 06 (Reapproved 2011)~~ C1115 – 17

Standard Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories[1]

This standard is issued under the fixed designation C1115; 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.

1. Scope

1.1 This specification describes products composed of dense elastomeric silicone rubber that are fabricated into gaskets and accessories (such as setting blocks, spacers, and shims) for use in sealing and glazing applications in building construction. These products are used to seal or serve as components of compression sealing systems between mechanically restrained surfaces in building construction and also as components in structural silicone sealant glazing systems.

~~1.2 The following precautionary statement pertains only to the test method portion, Section 10, 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.*~~

1.2 The following precautionary statement pertains only to the test method portion, Section 10, 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.3 Test Method C1166, 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 that takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.

1.4 The values stated in metric (SI) units are to be regarded as the standard. The inch-pound values given in parentheses are provided for information purposes only.

1.5 The committee with jurisdiction over this standard is not aware of any comparable standards published by other organizations.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C717 Terminology of Building Seals and Sealants

C1087 Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems

C1166 Test Method for Flame Propagation of Dense and Cellular Elastomeric Gaskets and Accessories

D395 Test Methods for Rubber Property—Compression Set

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D573 Test Method for Rubber—Deterioration in an Air Oven

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

Current edition approved ~~June 1, 2011~~Sept. 15, 2017. Published ~~August 2011~~October 2017. Originally approved in 1991. Last previous edition approved in ~~2006~~2011 as ~~C1115 – 06.~~C1115 – 06 (2011). DOI: ~~10.1520/C1115-06R11.~~10.1520/C1115-17.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

D624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
D925 Test Methods for Rubber Property—Staining of Surfaces (Contact, Migration, and Diffusion)
D1149 Test Methods for Rubber Deterioration—Cracking in an Ozone Controlled Environment
D1566 Terminology Relating to Rubber
D2137 Test Methods for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics
D2240 Test Method for Rubber Property—Durometer Hardness
D3182 Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets

2.2 *Rubber Manufacturers Association (RMA) Standard:*
—~~*Rubber*~~*Rubber Handbook*, Fourth Ed., December 1984[3]

2.3 *Other Documents:*
Uniform Freight Classification Rules[4]
National Motor Freight Classification Rules[5]

3. Terminology

3.1 Refer to Terminology C717 for definitions of the following terms used in this specification: compound, compression gasket, edge spacer, elastomer, elastomeric, expansion gasket, gasket, hardness, seal, setting block, shim spacer, and spacer.

3.2 Refer to Terminology D1566 for definitions of the following terms used in this specification: compression set, ultimate elongation, tear strength, tensile strength, and polymer.

4. Classification

4.1 The products described by this specification are classified by type, hardness, class, and surface.

4.2 *Type:*

4.2.1 *Type T, Tear Resistant*—In general these products have a higher level of tear resistance, midrange heat aging characteristics, midrange compression set resistance, and 30 to 70 durometer hardness. This type is applicable where finished products are intended to bridge or to cover a space (for example, expansion joint gaskets), or where high tear strength is required due to conditions of exposure or usage.

4.2.2 *Type C, Compression Set Resistant*—In general, these products have a lower level of tear resistance, above midrange heat aging characteristics, a high level of compression set resistance, and 30 to 85 durometer hardness. This type is applicable where finished products are used as compression gaskets, or where low compression set is required due to conditions of exposure or usage; and as settingblocks, spacers, shims, or other accessories in glazing and sealing systems.

4.3 *Hardness*—Each type described in 4.2 is subdivided into various hardnesses, based on nominal durometer hardness as shown in Table 1 and Table 2. For example, Grade H3 is 30 durometer.

4.4 *Class:*

4.4.1 Flame propagation characteristics of the finished products can be varied depending on the degree of exposure, expected usage, and intended durability desired. Products described by this specification shall be classified as to flame propagation as follows:

4.4.1.1 *Class F*—Resistance to flame propagation is required.

4.4.1.2 When no flame propagation resistance is required, no class designation should be used.

4.5 *Surface:*

4.5.1 Consideration of product surface requirements may be necessary. During the production of these products the use of various lubricants, release agents, dusting agents, and other solutions may be required. It may be necessary after vulcanization to remove these materials from the surfaces of the product because of appearance, fabrication, or usage requirements. All products do not require removal of those materials or removal to the same degree of cleanliness.

4.5.2 Products may also be required to develop adhesion or to not develop adhesion to sealants with which they are in contact.

4.5.3 Products described by this specification shall be classified as to surface condition as follows:

4.5.3.1 *Surface S1*—The surface of the product shall be smooth, clean, free from any foreign matter, and shall not allow adhesion of sealants (see Note 1).

4.5.3.2 *Surface S2*—The surface of the product shall be smooth, clean, free from any foreign matter, and shall allow adhesion of sealants (see Note 1).

NOTE 1—Applied treatments, such as dusting or coating to the adhesion surface may be necessary to meet this requirement.

[3] .Available from Rubber Manufacturers Association (RMA), 1400 K St., NW, Suite 900, Washington, DC 20005, http://www.rma.org.
[4] Available from Western Railroad Assn, Department of Services and Supply, Room 1150, 222 S. Riverside Plaza, Chicago, IL 60606-5945.
[5] Available from National Motor Freight Assn, 2200 Mill Road, Alexandria, VA 22314.

TABLE 1 Requirements for Dense Elastomeric Silicone Rubber Gaskets and Accessories, Type T—Tear Resistant

Property	Hardness					Test Method
	3	4	5	6	7	
Low temperature flexibility	[A]	[A]	[A]	[A]	[A]	D2137
Hardness, Type A durometer, ±5 points	30	40	50	60	70	D2240
Compression set, max %	30	30	30	30	30	D395
Tensile strength, min, MPa (psi)	7 (1015)	8 (1160)	8 (1160)	8 (1160)	7 (1015)	D412
Ultimate elongation, min %	500	500	500	400	200	D412
Heat aging						D573
Hardness change, max durometer points	±10	±10	±10	±10	±10	
Tensile strength change, max %	±20	±20	±20	±20	±20	
Ultimate elongation change, max %	±30	±30	±30	±30	±30	
Ozone resistance	[B]	[B]	[B]	[B]	[B]	D1149 (Specimen A)
Tear Strength, min, kN/m (ppi)	25 (143)	25 (143)	26 (149)	26 (149)	25 (143)	D624
Flame propagation[C], mm (in.)	100 (4)	100 (4)	100 (4)	100 (4)	100 (4)	C1166
Specific gravity	[D]	[D]	[D]	[D]	[D]	D792
Staining	[E]	[E]	[E]	[E]	[E]	D925
Color	[F]	[F]	[F]	[F]	[F]	[G]

[A]No failure.
[B]No cracks at 7× magnification.
[C]If Class F-Resistance to flame propagation is required.
[D]Within ±0.05 of qualified compound.
[E]As specified by purchaser (see 10.11).
[F]As specified by purchaser.
[G]See 10.12.

TABLE 2 Requirements for Dense Elastomeric Silicone Rubber Gaskets and Accessories, Type C—Compression Set Resistant

Property	Hardness							Test Method
	3	4	5	6	7	8	9	
Low temperature flexibility	[A]	[A]	[A]	[A]	[A]	[A]	[A]	D2137
Hardness, Type A durometer, ±5 points	30	40	50	60	70	80	85	D2240
Compression set, max %	15	15	15	15	15	20	25	D395
Tensile strength, min, MPa (psi)	5 (725)	5 (725)	5 (725)	5 (725)	5 (725)	5 (725)	5 (725)	D412
Ultimate elongation, min, %	350	300	250	200	125	100	60	D412
Heat aging								D573
Hardness change, max, durometer points	±05	±05	±05	±05	±05	±05	±05	
Tensile strength change, max, %	±15	±15	±15	±15	±15	±15	±15	
Ultimate elongation change, max, %	±30	±30	±30	±30	±30	±30	±30	
Ozone resistance	[B]	[B]	[B]	[B]	[B]	[B]	[B]	D1149 (Specimen A)
Tear strength, min, kN/m (ppi)	9 (51)	9 (51)	9 (51)	9 (51)	9 (51)	9 (51)	7 (40)	D624
Flame propagation[C], mm (in.)	100 (4)	100 (4)	100 (4)	100 (4)	100 (4)	100 (4)	100 (4)	C1166
Specific gravity	[D]	[D]	[D]	[D]	[D]	[D]	[D]	D792
Staining	[E]	[E]	[E]	[E]	[E]	[E]	[E]	D925
Color	[F]	[F]	[F]	[F]	[F]	[F]	[F]	[G]

[A]No failure.
[B]No cracks at 7× magnification.
[C]If Class F-Resistance to flame propagation is required.
[D]Within± 0.05 of qualified compound.
[E]As specified by purchaser, see 10.11.
[F]As specified by purchaser.
[G]See 10.12.

4.5.3.3 *Surface S3*—The product shall have a surface that is smooth, clean, and free from any foreign matter.

4.5.4 Products not requiring special cleaning for removal of processing agents and materials should not be assigned a surface designation code.

4.6 The following is an illustration of the use of the classification system for a line call-out. Expansion gaskets shall be ASTM C1115, TH5FS3.

Type	Hardness	Class	Surface
T	H5	F	S3