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Standard Specification for Preformed Architectural Compression Seals for Buildings and Parking Structures¹

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1. Scope

1.1 This specification covers the physical requirements for the fully cured elastomeric alloy and the movement capabilities of preformed architectural compression seals used for sealing expansion joints in buildings and parking structures. The preformed architectural compression seal is a rectangular elastomeric extrusion, having an internal baffle system produced continuously and longitudinally throughout the material. The architectural compression seal functions under compression and is usually chemically bonded in place with an adhesive.

NOTE 1—Movement capability is defined in Test Method E1399.

1.2 This specification covers all colors of architectural compression seals.

~~1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.~~

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard.

1.4 *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:*²

D395 Test Methods for Rubber Property Compression Set

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension

D471 Test Method for Rubber Property Effect of Liquids

D518 Test Method for Rubber Deterioration Surface Cracking

D624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact

D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

D865 Test Method for Rubber Deterioration by Heating in Air (Test Tube Enclosure)

D1052 Test Method for Measuring Rubber Deterioration Cut Growth Using Ross Flexing Apparatus

D1149 Test Methods for Rubber Deterioration Cracking in an Ozone Controlled Environment

D2000 Classification System for Rubber Products in Automotive Applications

D2240 Test Method for Rubber Property Durometer Hardness

D3183 Practice for Rubber Preparation of Pieces for Test Purposes from Products

E577 Guide for Dimensional Coordination of Rectilinear Building Parts and Systems

E631 Terminology of Building Constructions

E1399 Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems

3. Terminology

3.1 *Definitions*—Terms defined in Terminology E631 will prevail for terms not defined in this specification.

3.2 *Definitions of Terms Specific to This Standard:*

¹ This specification is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.21 on Serviceability.

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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.

3.2.1 *architectural compression seal*—a preformed extrusion, manufactured from a fully cured elastomeric alloy, having an internal baffle system produced continuously and longitudinally throughout the material without flanges or means of securing it mechanically.

3.2.2 *architectural joint system*—any filler or cover, except poured or formed in place sealants, used to span, cover, fill, or seal a joint. ~~Note 2—Joint is defined in Guide~~

3.2.2.1 *Discussion*—Joint is defined in Guide E577.

4. Materials and Manufacture

4.1 The architectural compression seal shall be a preformed extrusion manufactured from a fully cured elastomeric alloy. This alloy shall be classified under Classification System D2000 as either of the following:

4.1.1 M2CE 706 A16B15C12C20F19Z1Z2, or

4.1.2 M2CE 708 A16B15C12C20F19Z1Z2.

4.2 Z1 represents more than 2 000 000 flex cycles as tested under the Ross Flex Test, Test Method D1052.

4.3 Z2 represents a 40 % maximum compression set as per Test Methods D395, Method B, 22 h at 125°C (257°F) at 25 % deflection.

5. Physical Requirements

5.1 The fully cured elastomeric alloy supplied in plaque form shall conform to the material requirements prescribed in Table 1.

5.2 The finished architectural joint seal shall conform to the material requirements prescribed in Table 2.

5.3 The movement capabilities shall be established using Test Method E1399.

6. Dimensions, Mass, and Permissible Variations

6.1 The size, shape, internal structure, and tolerances shall be as agreed upon by the purchaser and the producer or supplier.

7. Workmanship, Color, and Appearance

7.1 The architectural compression seal shall be free of defects in workmanship. Defects in the extrusion shall consist of the following:

7.1.1 Holes,

7.1.2 Air bubbles, and

7.1.3 Parts not conforming to 6.1.

7.2 The cross section of the seal shall be as agreed upon by the purchaser and the producer or supplier.

7.3 The color of the seal shall be as agreed upon by the purchaser and the producer or supplier.

8. Significance and Use

8.1 Architectural compression seals included in this specification shall be those as follows:

8.1.1 Without frames.

8.1.2 Without flanges and nosing material(s).

8.1.3 Used in interior or exterior applications.

8.1.4 Used in any construction of the building.

8.2 This specification will give users, producers, building officials, code authorities, and others a basis for verifying material and performance characteristics of representative specimens under common test conditions. This specification will produce data on the following:

8.2.1 The physical properties of the fully cured elastomeric alloy.

8.2.2 The movement capability in relation to the nominal joint width as defined under Test Method E1399.

8.3 This specification compares similar architectural compression seals but is not intended to reflect the system's application. "Similar" refers to the same type of architectural compression seal within the same subsection under 8.1.

8.4 This specification does not provide information on the following:

TABLE 1 Requirements for Fully Cured Elastomeric Alloy Injection Molded Plaques

Property	Requirement	Test Method
Tensile strength, min, MPa (psi)	4.3 (625)	D412
Elongation at break, min, %	300	D412
Hardness, Type A durometer, points (5 s delay)	61–76	D2240
Specific gravity at 23°C (73°F)	0.93–1.13	D792
100 % modulus, min, MPa (psi)	1.7 (250)	D412
Weight gain, max, % (24 h at 121°C (73°F) ASTM No. 3 Oil)	95	D471

**TABLE 2 Material Requirements for Architectural Compression Seals**

Property	Requirement	Test Method
Tensile strength, min, MPa (psi)	4.3 (625)	D412
Elongation at break, min, %	300	D412
Hardness, Type A durometer, points (5 s delay)	68 ± 8	D2240
Ozone resistance, 1 ppm, 100 h at 40°C (104°F) 7 × magnification	No Cracks	D1149
Compression set, % max, 22 h at 100°C (212°F)	35	D395
Compression set, % max, 70 h at 100°C (212°F)	40	D395
Heat aging, 70 h at 100°C (212°F) change in:		D865
Hardness, Shore A, max, points (5 s delay)	4	
Ultimate tensile strength, max, % loss	15	
Ultimate elongation, max, % loss	15	
Tear resistance, min, N/mm (lb/in.)	21 (120)	D624
Brittleness temperature, min, °C (°F)	-48 (-55)	D746
Water absorption, max, % loss/gain	4	D471

8.4.1 Durability of the architectural compression seal under actual service conditions, including the effects of cycled temperature on the compression seal.

8.4.2 Loading capability of the system and the effects of a load on the functional parameters established by this specification.

8.4.3 Shear and rotational movements of the specimen.

8.4.4 Any other attributes of the specimen, such as fire resistance, wear resistance, chemical resistance, air infiltration, watertightness, and so forth.

8.4.5 Testing or compatibility of substrates.

8.4.6 Strip seals.

8.4.7 Architectural compression seals used with frames.

8.4.8 Architectural compression seals used with flanges and nosing material(s).

8.5 This specification is intended to be used only as one element in the selection of an architectural compression seal for a particular application. It is not intended as an independent pass or fail acceptance procedure. Other standards shall be used in conjunction with this specification to evaluate the importance of other service conditions such as durability, structural loading, and compatibility.

9. Sampling

9.1 The fully cured elastomeric alloy injection-molded plaques shall be sampled and tested to determine material conformance to Table 1.

9.2 The finished part shall also be sampled and tested to determine whether the part conforms to the material requirements given in Table 2, tolerances, design, and the producer's functional parameters per Test Method E1399.

9.3 A lot of material shall consist of the following quantity for each:

9.3.1 A specified mass as manufactured by the producer. Sample each lot.

9.3.2 A cross section as manufactured by the producer. Sample each lot.

9.4 Obtain samples by one of the following methods:

9.4.1 Take samples provided by the producer.

9.4.2 Take samples at random from each shipment.

9.5 A sample constitutes a minimum, as required, to perform the tests but not less than the following:

9.5.1 23 kg (50 lb) of the fully cured elastomeric alloy in pellet form.

9.5.2 2.8 m (9 lf) of each specific size and cross section of the finished part.

10. Specimen Preparation

10.1 Maintain the laboratory at a temperature of $23 \pm 2^\circ\text{C}$ ($73 \pm 4^\circ\text{F}$).

10.2 Maintain the laboratory at a relative humidity of $50\% \pm 5\%$.

10.3 *Test Plaque Specimens:*

10.3.1 Use equipment per Annex A1.

10.3.2 Produce 20 quality assurance test plaques in accordance with Annex A2.

10.4 *Compression Seal Specimens:*

10.4.1 Cut all test specimens from the architectural compression seal sample. Except as otherwise specified in the applicable specifications or test methods given in Table 2, prepare the test specimens in accordance with the requirements of Practice D3183.