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AnAmerican National Standard

Standard Specification for Rigid (Unplasticized) Poly(Vinyl Chloride) (PVC) Soffit[1]

This standard is issued under the fixed designation D4477; 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 establishes requirements and test methods for the materials, dimensions, camber, impact strength, expansion, and appearance of extruded single-wall soffit manufactured from rigid (unplasticized) PVC compound. Methods of indicating compliance with this specification are also provided.

1.2 The use of PVC recycled plastic in this product shall be in accordance with the requirements in Section 4.

1.3 Rigid (unplasticized) poly(vinyl chloride) (PVC) siding is covered in Specification D3679.

1.4 Soffit produced to this specification shall be installed in accordance with Practice D4756. Reference shall also be made to the manufacturer's installation instructions for the specific product to be installed.

NOTE 1—Information with regard to soffit maintenance shall be obtained from the manufacturer.

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

1.6 The following precautionary caveat pertains to the test method portion only, Section 6 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.*

NOTE 2—There is no known ISO equivalent to this standard.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D618 Practice for Conditioning Plastics for Testing

D635 Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

D696 Test Method for Coefficient of Linear Thermal Expansion of Plastics Between −30°C and 30°C with a Vitreous Silica Dilatometer

D883 Terminology Relating to Plastics

D1600 Terminology for Abbreviated Terms Relating to Plastics

D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

D2457 Test Method for Specular Gloss of Plastic Films and Solid Plastics

D3679 Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding

D3892 Practice for Packaging/Packing of Plastics

D4226 Test Methods for Impact Resistance of Rigid Poly-(Vinyl Chloride) (PVC) Building Products

D4756 Practice for Installation of Rigid Poly(Vinyl Chloride) (PVC) Siding and Soffit

D5033 Guide for Development of ASTM Standards Relating to Recycling and Use of Recycled Plastics (Withdrawn 2007)[3]

D5947 Test Methods for Physical Dimensions of Solid Plastics Specimens

E631 Terminology of Building Constructions

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminologies D883, D1600, and E631, unless otherwise specified.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *vinyl soffit, n*—a shaped material, made principally from rigid poly(vinyl chloride) (PVC) that is used to clad the underside of a roof overhang.

3.2.2 *Discussion*—Any exception to a homogeneous rigid PVC compound is present in a coextruded or laminated capstock.

4. Materials and Manufacture

4.1 The soffit, shall be made of one or more layers of poly(vinyl chloride) (PVC) compound. Any layers of materials

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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] The last approved version of this historical standard is referenced on www.astm.org.

***A Summary of Changes section appears at the end of this standard**

other than poly (vinyl chloride) (PVC) compound shall be kept to less than 20% by volume.

4.2 Use rigid PVC recycled plastic, as defined in Guide D5033 if all the requirements in the sections on Terminology (Section 3), on Materials and Manufacture (Section 4), and on Physical Requirements (Section 5) are met by the soffit containing PVC recycled plastic.

4.3 The poly(vinyl chloride) soffit material, when tested in accordance with Test Method D635, shall not exceed an average extent of burn of 4 in. (100 mm), with an average time of burn not to exceed 10 s. A minimum sample thickness of 0.030 in. (0.8 mm) is required.

NOTE 3—**Caution:** The flammability testing data, conclusions, and recommendations of Test Method D635 relate solely to the measurement and description of properties for classification of the poly(vinyl chloride) soffit material in response to flame under controlled laboratory conditions and shall not be used for the description or appraisal of the fire hazard of vinyl soffit under actual fire conditions.

4.4 The PVC compound when extruded into soffit shall maintain uniform color and be free of any visual surface or structural changes, such as peeling, chipping, cracking, flaking, or pitting.

5. Physical Requirements

5.1 *Length and Width*—The nominal length and width of the soffit shall be as agreed upon between the purchaser and the seller. The actual length shall not be less than ¼ in. (6.4 mm) of the nominal length and the actual width shall be within ±⅛ in. (3.2 mm) of the nominal width when measured in accordance with 6.3 and 6.4.

5.2 *Thickness*—The minimum thickness of the soffit shall be 0.030 in. (0.8 mm) when measured in accordance with 6.5.

5.3 *Camber*—A full length of soffit, typically 10 or 12 ft (3.05 or 3.66 m), will not have a camber greater than ⅛ in. (3.2 mm) when measured in accordance with 6.6.

5.4 *Initial Impact Resistance*—The soffit shall have a minimum impact strength of 45 in.·lbf (5.34 J) when tested in accordance with 6.7.

5.5 *Coefficient of Linear Expansion*—The soffit shall have a coefficient of linear expansion not greater than 4.5 by 10^{-5} in./in./°F (8.1 by 10^{-5} mm/mm/°C) when tested in accordance with 6.8.

5.6 *Gloss*—This requirement is not applicable to surface ventilated soffit. The gloss of soffit shall be uniform across the exposed face. The average of all readings for a panel determined in 6.9.1.2 shall not differ from the manufacturer's specified gloss value more than the permitted variation in Table 1, and each individual reading shall not vary more than 10 points from the average. Gloss shall be tested in accordance with 6.9.

TABLE 1

Manufacturer's Specified Gloss Value	Permitted difference from Mfg. Spec. Gloss Value
Less than or equal to 35	±8
Greater than 35	±10

5.7 Deflection of the soffit shall not exceed ±⅛ in. (3.2 mm) when installed flat in a horizontal position over a span of 24 in. (610 mm) without intermittent support when tested in accordance with 6.11.

5.8 *Color*—The color of the soffit shall be within the defined color space parameters for the specific color agreed upon between the purchaser and the manufacturer. The color specified shall be uniform on the surface of the soffit panels, except in the case of multi-colored wood grain panels.

5.8.1 *Uniformity of Color*—When tested in accordance with 6.10, the total color change, *E*, between a production specimen and the appropriate reference specimen or agreed-upon color coordinates shall not vary by more than 1.5, and the chromatic coordinates shall not change by more than $\pm\Delta a = 1.0$ and $\pm\Delta b = 1.0$.

6. Test Methods

6.1 *General*—The inspection and test procedures contained in this section are used to determine the conformance of products to the requirements of this specification. Each producer who represents its products as conforming to this specification shall be permitted to use statistically based sampling plans that are appropriate for each manufacturing process, but shall keep the essential records necessary to document, with a high degree of assurance, his claim that all of the requirements of this specification have been met. Additional sampling and testing of the product, as agreed upon between the purchaser and manufacturer, are not precluded by this section.

6.2 *Conditioning and Test Conditions*—Condition the test specimen in accordance with Procedure A of Practice D618 and test under those conditions, unless otherwise specified herein.

6.3 *Length*—Lay the specimen on a flat surface and measure with a steel tape. Measure the length of a soffit panel to the nearest 1/16 in. (1.6 mm) at the center, the butt edge, and the bottom of the top lock. The average of the three measurements is the actual length.

6.4 *Width*—Interlock two long specimens, each at least 26 in. (660 mm) long in the normal mode for installation. Lay the two specimens on a flat surface. Measure to the nearest 1/16 in. (1.6 mm), the distance between the lowest butt edge of the top specimen and the lowest butt edge of the bottom specimen. Commencing approximately 1 in. (25 mm) from one end of the specimens, make 5 measurements at 6 in. (152 mm) intervals, making sure that the measurement is made perpendicular to the butt edge. Average the measurements. The average constitutes the exposed width of soffit.

6.5 *Thickness*—Make a minimum of five equally spaced measurements across the width of the soffit specimen perpendicular to the exposed surface with a micrometer similar to that described in Test Method D5947, Method A or B, with the exception that the vernier reading shall be to 0.001 in. (0.0254 mm). Average the measurements. The average constitutes the thickness of the soffit.

6.6 *Camber*—Place a full length of soffit (typically 10 or 12 ft (3.05 or 3.66 m), on a flat surface alongside a straightedge at