



Designation: D7793 – 17

## Standard Specification for Insulated Vinyl Siding<sup>1</sup>

This standard is issued under the fixed designation D7793; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope\*

1.1 This specification establishes requirements for insulated vinyl siding, which is vinyl siding with integral foam plastic insulating material, where the vinyl siding is manufactured from rigid PVC compound. Compliance with this standard requires insulated vinyl siding to demonstrate a thermal insulation value of R-2.0 or greater. Other performance requirements and test methods addressed by this standard include materials properties and dimensions, warp, shrinkage, impact strength, expansion, appearance, thermal distortion resistance, and windload resistance. Methods of indicating compliance with this specification are also provided.

NOTE 1—Insulated vinyl siding is composed of two major components: the vinyl siding and the insulating material. It is intended that the vinyl siding portion comply with Specification D3679. Applicable portions of Specification D3679 are included in this specification. Additional requirements that pertain only to the insulation as a separate material, or to the combination of vinyl siding and insulation as a whole, are also included. For further explanation, see Appendix X1.

1.2 Insulated vinyl siding shall be tested with the insulation material in place or removed, as specified in the applicable requirement or test method.

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

1.4 Insulated vinyl siding 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.

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 *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.*

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.24 on Plastic Building Products.

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

1.7 *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:<sup>2</sup>

- C297/C297M Test Method for Flatwise Tensile Strength of Sandwich Constructions
- C578 Specification for Rigid, Cellular Polystyrene Thermal Insulation
- C591 Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
- C1199 Test Method for Measuring the Steady-State Thermal Transmittance of Fenestration Systems Using Hot Box Methods
- C1289 Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- C1363 Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
- 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
- D1042 Test Method for Linear Dimensional Changes of Plastics Caused by Exposure to Heat and Moisture
- D1183 Practices for Resistance of Adhesives to Cyclic Laboratory Aging Conditions
- D1435 Practice for Outdoor Weathering of 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

<sup>2</sup> 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.

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

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

D5206 Test Method for Windload Resistance of Rigid Plastic Siding

D5947 Test Methods for Physical Dimensions of Solid Plastics Specimens

D7209 Guide for Waste Reduction, Resource Recovery, and Use of Recycled Polymeric Materials and Products (Withdrawn 2015)<sup>3</sup>

D7445 Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding with Foam Plastic Backing (Backed Vinyl Siding)

E84 Test Method for Surface Burning Characteristics of Building Materials

E1753 Practice for Use of Qualitative Chemical Spot Test Kits for Detection of Lead in Dry Paint Films

G147 Practice for Conditioning and Handling of Nonmetallic Materials for Natural and Artificial Weathering Tests

2.2 American Society of Civil Engineers (ASCE):<sup>4</sup>

ASCE 7-10 Minimum Design Loads for Buildings and Other Structures

2.3 International Code Council

International Building Code

International Residential Code

2.4 International Code Council—Evaluation Services (ICC-ES):

AC05 Acceptance Criteria for Sandwich Panel Adhesives

2.5 International Standards Organization (ISO):

ISO/IEC Guide 65 General requirements for bodies operating product certification systems

2.6 Structural Building Components Association:

ANSI/SBCA FS 100-2012 Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies

2.7 Vinyl Siding Institute, Inc.

VSI Vinyl Siding Installation Manual (2015)

2.8 Federal Standards:

6 CFR Part 460 Labeling and Advertising of Home Insulation

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *center-pinning*—an installation technique in which the siding panel is fastened tightly through the nail slot at the center length of the panel, in order to cause thermal expansion and contraction to occur equally in both directions from the center.

3.1.2 *cohesive failure*—in the context of tensile testing, internal separation of the adhesive within the adhesive layer, resulting in attachment of adhesive material to the surface of both substrates

3.1.3 *insulation; insulating material*—foam plastic material that is combined at the factory with a vinyl siding profile to form insulated vinyl siding.

3.1.4 *insulated vinyl siding*—a vinyl cladding product sold with manufacturer-installed foam plastic insulating material as an integral part of the cladding product. The vinyl cladding portion of insulated vinyl siding meets the definition of vinyl siding.

3.1.5 *nominal*—the value that a manufacturer consistently uses to represent a specific property or dimension of a vinyl siding product in public claims including, but not limited to, product literature, advertisements, quotations, and certificates of conformance.

3.1.6 *process average thickness*—the rolling, arithmetic mean of average specimen thicknesses measured in accordance with 6.5 for a specific product during all productions runs for the most recent six-month period.

3.1.7 *vertical coverage*—The net vertical distance of the wall covered by a single insulated vinyl siding panel, disregarding any portions of the panel that are overlapped by adjacent panels above or below.

3.1.8 *temperate northern climate*—in weather testing, a North American metropolitan area testing site located within 73 to 100°W longitude and 37 to 45°N latitude.

3.1.9 *vinyl siding*—a shaped material, made principally from rigid poly(vinyl chloride) (PVC), that is used to clad exterior walls of buildings. In this standard, vinyl siding refers to the rigid profile to which the insulation is attached.

3.1.10 *wind load design pressure rating*—the maximum wind pressure that an insulated vinyl siding product is rated to withstand, based on testing under Test Method D5206.

3.1.10.1 *standard wind load design pressure rating*—the wind load design pressure rating for a siding product when installed 1) over a sheathing material designed and attached such that it is capable of resisting 100% of positive and negative wind pressures occurring under design conditions at the building location; and 2) with the standard fastening method specified in building codes, general installation instructions, and the siding manufacturer's instructions.

3.1.10.2 *alternative wind load design pressure rating*—the wind load design pressure rating for a siding product when installed over a sheathing not designed and attached such that it is capable of resisting 100% of positive and negative wind pressures occurring under design conditions at the building location, or when the siding is not fastened in the standard way; as specified by the manufacturer.

3.1.10.3 *Discussion*—The standard test conditions, configuration, and fastening method used in this specification are specified in 6.14, while alternative sheathing and installation conditions are specified by the manufacturer and must be reflected in the product's installation instructions. Alternative

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

<sup>4</sup> Available from American Society of Civil Engineers (ASCE), 1801 Alexander Bell Dr., Reston, VA 20191, <http://www.asce.org>.