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An American National Standard

Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding with Foam Plastic Backing (Backed Vinyl Siding)[1]

This standard is issued under the fixed designation D7445; 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 for vinyl siding with integral foam plastic backing, where the siding is manufactured from rigid PVC compound. Performance requirements and test methods addressed by this standard include materials properties and dimensions, warp, shrinkage, impact strength, expansion, appearance, and wind load resistance. Methods of indicating compliance with this specification are also provided.

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

1.2 Backed vinyl siding shall be tested with the backing 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 Rigid PVC soffit is covered in Specification D4477.

1.5 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.

NOTE 2—Information with regard to siding maintenance shall be obtained from the manufacturer.

1.6 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.

1.7 *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 3—There is no known ISO equivalent to this standard.

1.8 *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]

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

D1042 Test Method for Linear Dimensional Changes of Plastics Caused by Exposure to Heat and Moisture

D1435 Practice for Outdoor Weathering of 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

D4477 Specification for Rigid (Unplasticized) Poly(Vinyl Chloride) (PVC) Soffit

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

[1] 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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[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.

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

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)[3]
E84 Test Method for Surface Burning Characteristics of Building Materials
E631 Terminology of Building Constructions
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 *ASCE Standard:*[4]
ASCE 7-10 Minimum Design loads for Buildings and Other Structures

2.3 *International Code Council:*[5]
International Building Code
International Residential Code

2.4 *Vinyl Siding Institute, Inc.:*[6]
VSI Vinyl Siding Installation Manual (2015)

2.5 *Structural Building Components Association:*[7]
ANSI/SBCA FS 100-2012 Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies

3. Terminology

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

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *backed vinyl siding*—a vinyl cladding product sold with manufacturer-installed foam plastic backing material as an integral part of the cladding product. The vinyl cladding portion of backed vinyl siding meets the definition of vinyl siding. Backed vinyl siding is intended to be installed only with the integral backing.

3.2.2 *backing material; foam plastic backing*—a layer or layers of plastic that has been intentionally expanded to produce a reduced-density plastic containing voids consisting of open or closed cells distributed throughout the plastic.

3.2.3 *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.

3.2.4 *process average thickness*—the rolling, arithmetic mean of average specimen thicknesses measured according to 6.5 for a specific product during all productions runs for the most recent six month period.

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

3.2.5.1 *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.

3.2.5.2 *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.

3.2.5.3 *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 ratings apply only when the specified sheathing and fastening conditions are used. See Annex A1 for information on differences between the standard wind load design pressure rating and alternative wind load design pressure ratings, and how to determine standard and alternative design pressure ratings.

3.2.6 *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.

3.2.7 *vinyl siding*—a shaped material, made principally from rigid poly(vinyl chloride) (PVC), that is used to clad exterior walls of buildings.

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

4. Materials and Manufacture

4.1 The vinyl siding, exclusive of backing material, shall be made of one or more layers of poly(vinyl chloride) (PVC) compound. Any layers of materials other than poly (vinyl chloride) (PVC) compound shall be kept to less than 20 % by volume. This limitation does not apply to the backing material.

4.2 Where rigid PVC recycled plastic as defined in Guide D7209 is used, the siding containing the PVC recycled plastic shall meet all of the requirements of 3,Terminology; 4, Materials and Manufacture; and 5, Physical Requirements.

4.3 The poly(vinyl chloride) siding material, exclusive of backing 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 0.035 in. (0.9 mm) is required. **Warning—**The flammability testing data, conclusions, and

[3] The last approved version of this historical standard is referenced on www.astm.org.
[4] Available from American Society of Civil Engineers (ASCE), 1801 Alexander Bell Dr., Reston, VA 20191, http://www.asce.org.
[5] Available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, http://www.iccsafe.org.
[6] National Housing Center, 1201 15th Street NW, Suite 220, Washington, DC 20005, http://www.vinylsiding.org
[7] 6300 Enterprise Lane, Madison, WI 53719, http://www.sbcindustry.com

recommendations of Test Method D635 relate solely to the measurement and description of properties for classification of the poly(vinyl chloride) siding 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 siding under actual fire conditions.

4.4 The foam plastic backing shall have a Flame Spread Index not greater than 75 and a Smoke Developed Index not greater than 450 when tested separately under method E84.

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

4.6 The PVC compound shall be compounded so as to provide the heat stability and weather exposure stability required for the siding market application.

4.7 Backed vinyl siding shall not contain elemental lead (Pb) or compounds of that material other than traces incidental to raw materials or the manufacturing process. This limitation applies to both PVC substrate and to any cap or film material, as well as the backing material. Compliance with this requirement shall be demonstrated by one of the methods in 6.16.

5. Physical Requirements

5.1 *Requirements Applicable to Vinyl Siding*—The provisions of 5.1.1 – 5.1.9 apply only to the vinyl siding, exclusive of any backing material. Where necessary to perform testing, the backing material shall be removed.

5.1.1 *Length and Width*—The nominal length and width of the siding 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 ± 1⁄16 in. (1.6 mm) of the nominal width when measured in accordance with 6.3 and 6.4.

5.1.2 *Thickness*—These requirements pertain only to measurements of the portions of the siding that are exposed after installation of the panel, measured in accordance with the procedure in 6.5. The average thickness of each specimen shall be no less than 0.035 in. No individual measurement shall be thinner than 0.003 in. below the nominal thickness. The process average thickness as defined in 3.2.4 shall be no thinner than 0.001 in. below the nominal thickness.

5.1.3 *Camber*—A full length of siding (typically 10 or 12 ft (3.05 or 3.61 m)) shall not have a camber greater than ⅛ in. (3.2 mm) when measured in accordance with 6.6.

5.1.4 *Heat Shrinkage*—The average heat shrinkage shall not exceed 3.0 % when determined by the method described in 6.7.

5.1.5 *Impact Resistance*—Siding shall have a minimum impact strength of 60 in.·lbf (6.78 J) when tested in accordance with 6.8.

5.1.6 *Coefficient of Linear Expansion*—The siding 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 6.9.

5.1.7 *Gloss*—The gloss of smooth and embossed siding shall be uniform across the exposed surface. Variations in the glossmeter readings for smooth siding shall not be more than ±10 % or ±5.0 points (whichever is greater). Variations for embossed siding shall not be more than ±20 % or ±10.0 points (whichever is greater). Gloss of smooth and embossed siding shall be tested in accordance with 6.11.

5.1.8 *Color*—The color of the siding 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 siding panels, except in the case of multicolored woodgrain panels.

5.1.9 *Uniformity of Color*—When tested in accordance with 6.13, the total color change, ΔE, 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 thereof shall not change by more than $\pm\Delta a_H = 1.0$ and $\pm\Delta b_H = 1.0$.

5.2 *Requirements Applicable to Backed Vinyl Siding*—The provisions of 5.2.1 – 5.2.4 apply to backed vinyl siding, including the integral foam backing material. Testing shall be conducted with the backing material in place, as described in the referenced test method.

5.2.1 *Surface Distortion*—The siding shall be free of bulges, waves, and ripples when tested to a minimum temperature of 120°F (49°C) in accordance with the procedure in 6.12. This distortion is called "oil-canning."

5.2.2 *Weathering:*

5.2.2.1 The siding shall maintain a uniform color and be free of any visual surface or structural changes such as peeling, chipping, cracking, flaking, and pitting when tested in accordance with 6.10.

NOTE 4—Weathering-conformance-testing requirements are to reflect performance of a "typical" extrusion siding profile representing a specific color of PVC compound and a specific extrusion technology. In no case is there an implied requirement for testing all the various shaped and sized siding profiles produced in this color. The lengthy outdoor weatherability testing for new products may be performed concurrently with market development and sales of siding to existing markets. Completion of weatherability testing prior to marketing of the product is not required.

5.2.3 *Wind Load Resistance*—The siding shall withstand a minimum static test pressure and a standard wind load design pressure rating shall be determined.

5.2.3.1 *Minimum Test Pressure*—Backed siding shall be able to withstand a minimum test pressure of 22.5 lbf/ft^2 (1077 Pa) when tested in accordance with 6.14. The average maximum sustained static test pressure determined in 6.14 shall be equal to or greater than this value. If the manufacturer of backed siding provides documentation to support compensation for pressure equalization, the test pressure shall be determined from Annex A1 using the documented pressure equalization factor.

NOTE 5—The static test pressure of 22.5 lbf/ft^2 (1077 Pa) for backed siding was established to withstand structural loading conditions that occur in wind exposures of approximately 110 mph (177 km/h) (V_{ASD}) for mean roof heights of 30 ft (9.1 m) and less in exposure category B, and corresponds to 30.0 lbf/ft^2 (1436 Pa) negative design pressure, to match the default wind design conditions of Table R703.3(1) in the 2015 International Residential Code. Provision is made for compensation for pressure equalization specific to the product if supporting documentation is provided, using procedures in Annex A1.

NOTE 6—Refer to Annex A1 for an explanation as to how the negative design pressure was established, and for applications where the effective

negative design pressure as specified in ASCE 7-10 is different from 30.0 lbf/ft^2 (1436 Pa) (for example, wind-zone areas greater than about 110 mph (177 km/h) (V_{ASD}) (225 km/h (V_{ULT})) or mean roof height above 30 ft (9.1 m), or exposures other than exposure category B).

(1) The design-pressure values can be negative (suction loads) or positive. The negative values are the largest in magnitude and are the values used in this specification.

NOTE 7—In that the siding is being tested as a weather-resistant exterior product applied to an existing exterior structural wall, forces (negative) working to pull the siding off the wall, fasteners, or disengage locks will be the most important criteria for testing. Positive wind forces test the integrity of the total wall sections, and do not provide a measure of the performance of the siding.

5.2.3.2 *Standard Wind Load Design Pressure Rating*—The standard wind load design pressure rating shall be determined from the results of testing in accordance with 6.14, using the procedures described in A1.3.

NOTE 8—The standard design pressure rating is valid for applications where the siding is installed over sheathing and its fastening that are capable of independently resisting both positive and negative wind pressures occurring under design conditions at the building location. For applications over other sheathing, a different design pressure rating is applicable, and is determined in accordance with A1.3. Determination of a rating other than the standard design pressure rating is not required by this section.

5.2.3.3 *Alternative Design Pressure Ratings*—Design pressure ratings other than the standard wind load design pressure rating, for use with different sheathing materials or using different installation or fastening, are permitted to be determined in accordance with testing under 6.14, using the procedures in Annex A1.

5.2.4 *Nail Slot Allowance for Thermal Expansion*—For siding panels utilizing nail slots to allow for thermal expansion and contraction, the nail slot shall be sized to allow for the expected range of expansion and contraction over a range of 100°F. Compliance with this requirement shall be demonstrated either by the test method in 6.15 or by sizing of the nail slots according to the specifications in the following sections. The instrument used shall be capable of measuring to the nearest 0.01 in. The manufacturing tolerance shall not exceed -0.030 in.

5.2.4.1 For panels shorter than 6 ft (1829 mm) in length, the minimum nail slot width shall be ⅜ in. (11.4 mm).

5.2.4.2 For panels 6 ft (1829 mm) in length or longer the minimum nail slot width shall be determined according to the following formula. The minimum width shall be the width resulting from application of the formula, rounded to the next lower quarter-inch. Regardless of the results of the calculation, the minimum nail slot width for panels 6 feet or longer shall be 1 in (25.4 mm).

$$WS = P_c \times (\alpha \times 100\,°F \times L) + T_c \quad (1)$$

WS = minimum width of nail slot, in.,
P_c = center-pinning coefficient: 1 if manufacturer's instructions require panel to be center-pinned; 1.5 if center-pinning is not required,
α = coefficient of linear thermal expansion, 4.5 × 10^{-5} in./in./°F or actual known coefficient for material used, as determined by 6.9,
L = length of panel, inches, and
T_c = centering tolerance: 0.25 in.

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 the 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 siding 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 2-ft (610-mm) long specimens 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. Make a measurement at one end of the specimens and at 6-in. (152.4-mm) intervals along the entire length, making sure that the measurement is made perpendicular to the butt edge. Average the measurements. The average constitutes the exposed width of siding.

6.5 Thickness shall be measured in accordance with Test Method A of Test Method D5947. The micrometer shall be calibrated in accordance with Section 8 of Test Method D5947. The thickness of the siding shall be measured at a minimum of 5 locations equally spaced across the entire portion of the siding that will be exposed after installation. All measurements shall be taken to the nearest 0.001 in. Calculate and report the average of these measurements. Also report the thinnest individual measurement.

6.6 *Camber*—Place a full length of siding (typically 10 or 12 ft (3.05 or 3.61 m)) on a flat surface alongside a straightedge at least as long as the siding specimen. Measure the maximum space between edge of the siding specimen and the straightedge for each edge to the nearest 1/16 in. (1.6 mm).

6.7 *Heat Shrinkage:*

6.7.1 *Apparatus:*

6.7.1.1 *Scriber,* similar to that described in Test Method D1042, with the exception that the needle points shall be separated by 10 ± 0.01 in. (254 ± 0.254 mm).

6.7.1.2 *Test Media,* a controlled-temperature water bath of 5 gal (10 L) or more, equipped with an efficient stirrer that will maintain uniform temperature throughout. Heater and temperature-control devices must maintain the water at 160 ±

1°F (71 ± 0.5°C). Use a wire rack to raise and lower specimens into the water bath. As an alternative to the use of a water bath, the specimens may be heated for 30 min in a uniformly heated forced-air oven maintained at a temperature of 160 ± 1°F (71 ± 0.5°C).

6.7.1.3 Make measurements with any device capable of measuring the distance between two scribe marks to the nearest 0.01 in. (0.254 mm).

6.7.2 *Procedure:*

6.7.2.1 Cut three specimens from the siding panel, each 1 in. (25.4 mm) wide by 12 in. (305 mm) long. Cut one specimen from the center and one from each of the extreme edges of the flat surface. The long axis shall be parallel to the machine direction.

6.7.2.2 Condition specimens at 73.4 ± 3.6°F (23 ± 2°C) and 50 ± 5 % relative humidity for at least 24 h.

6.7.2.3 Make a slight mark with the scribe on each specimen so that a reference point will be clearly visible.

6.7.2.4 Place specimens in the test medium.

6.7.2.5 Remove specimens after 30 min and place on a flat surface until cool.

6.7.2.6 Repeat conditioning in accordance with 6.7.2.2.

6.7.2.7 Make a second mark with the scribe on each specimen, using the same center.

6.7.2.8 Measure the distance, *D*, between the scribe marks to the nearest 0.01 in. (0.254 mm).

6.7.2.9 Calculate the percent shrinkage as (*D*/10) × 100.

6.7.2.10 Report the average shrinkage of the three specimens tested.

6.8 *Impact Resistance*—Test impact resistance of siding in accordance with Test Method D4226, Procedure A, impactor head configuration H.25. 4 in.-lb increments (0.5 in. height increments with 8 lb falling weight) shall be used. Minimum sample dimensions shall be 1.5 by 1.5 in. Samples shall be tested with the normally exposed surface facing up. Backed siding shall be tested with any backing material removed. Conditioning time for quality-control tests shall be at least 1 h.

6.8.1 For purposes of evaluating failure of the specimen under section 3.2.1 of Test Method D4226, a ductile tear of less than 0.2 in. (5 mm) in length shall not be considered a failure. Any brittle break of any dimensions is considered a failure.

6.9 *Coefficient of Linear Expansion*—Conduct this test in accordance with Test Method D696.

6.10 *Weatherability:*

6.10.1 A minimum of three samples shall be exposed at each of at least three test sites. Test sites shall be located in a northern temperate climate, represented by Cleveland, Ohio or Louisville, Kentucky; a hot, humid climate represented by Miami, Florida; and a hot, dry climate represented by Phoenix, Arizona. The samples shall be exposed for a minimum of 24 months.

6.10.2 Samples shall consist of a flat section of siding with minimum dimensions of 2 in. by 3 ¾ in. (25 mm by 95 mm).

6.10.3 Samples shall be representative of the product to be evaluated.

NOTE 9—Samples prepared in the laboratory in the same manner as commercial samples are permitted to be used as an alternative to a commercial part. If the commercial product is extruded, the laboratory specimen must be extruded; if the commercial product is injection molded, the laboratory specimen must be injection molded, and so forth.

6.10.4 Select a minimum of 4 specimens per sample per test site to allow for 3 test specimens and 1 file specimen for each sample evaluated.

6.10.5 Mark each specimen permanently to ensure retention of identity during and after exposure testing.

NOTE 10—Use of a vibratool leaves a permanent mark that satisfies this criterion.

6.10.6 All exposures shall be conducted at an angle of 45° South, plywood backed, in accordance with Practice D1435 and G147.

6.10.7 After a minimum of 24 months of exposure, remove the samples and inspect each exposed test specimen for appearance and surface condition. Record observations and inspection date in a permanent record.

6.11 *Gloss:*

6.11.1 *Apparatus*—Measure gloss using a 75° geometry glossmeter that meets the requirements of the Apparatus section of D2457.

6.11.2 *Procedure:*

6.11.2.1 Gloss measurements shall be made in accordance with the procedure in Section 9 of D2457, unless otherwise specified herein.

6.11.2.2 Measure gloss on one piece of siding on at least three widely separated sections across the width of the exposed surface of the panel. Care needs to be taken to ensure that a new surface area is used for each reading since instrument contact may leave scratches on the specimen surface. The area tested must be flat.

6.11.2.3 Measure gloss parallel to the direction of embossing. When the embossing pattern is not apparent, measure the gloss in the direction of extrusion.

6.11.2.4 Each reading shall be within the appropriate limit specified in 5.1.7.

6.11.2.5 The average reading of all readings shall be used to represent the gloss of the sample.

6.12 *Surface Distortion:*

6.12.1 *Test Specimen/Apparatus:*

6.12.1.1 The test specimen shall consist of three courses of siding, a minimum of 6 ft (1.83 m) in length, mounted on a flat rigid frame in accordance with the manufacturer's recommended installation instructions.

6.12.1.2 Heat-sensing elements shall be located at the midpoint of the backside of the second course of siding. For backed siding, the heat-sensing element shall be in contact with the back of the vinyl cladding. Any backing material removed to facilitate placement of the heat sensing element shall be replaced.

6.12.1.3 *Radiant-Heat Rod,* 600 W for each linear foot (0.31 m), mounted parallel to the middle course and approximately 32 in. (810 mm) away from the surface of the siding.

6.12.1.4 *Temperature-Control Device,* used to regulate the temperature of the radiant-heat rod, shall be able to maintain the conditions specified in 6.12.2.1.

6.12.2 *Procedure:*

6.12.2.1 Heat the test panel (second course of siding) at a rate of 3.0 to 6.0°F/min (1.7 to 3.3°C/min) until a minimum temperature of 120°F (49°C) is achieved as measured by the heat-sensing element on the midpoint of the backside of the second course. During this heating period, observe the test panel for surface distortion.

6.12.2.2 Failure is defined as the appearance of bulges, waves, or ripples before a temperature of 120°F (49°C) is reached.

6.13 *Color Uniformity*—Calculate the difference between the L_H, a_H, and b_H color coordinates for a production specimen to those of either the appropriate reference specimen or the agreed upon color coordinates for that specific color product in accordance with Test Method D2244. Calculate the total difference ΔE between the production specimen and the reference specimen in accordance with Test Method D2244.

6.14 *Wind Load Resistance*—Conduct the test on wind load resistance of finished siding in accordance with Test Method D5206. The average maximum sustained static test pressure determined from this testing is used in 5.2.3. For purposes of determining compliance with the minimum test pressure and standard design pressure requirements in 5.2.3, the test structure shall be constructed with vertical studs 16 in. on center. The siding shall be tested with the foam plastic backing attached to the vinyl siding. The siding in the test installation shall be installed over wood sheathing with a nominal thickness of 7⁄16 to ½ in., and fastened as follows:

6.14.1 *Fastener type*—Roofing nail, smooth shank, 0.120 in. (⅛ in. nominal; 3.2 mm) shank diameter, 5⁄16 in. (7.9 mm) head diameter, length as necessary to penetrate into sheathing and stud a total of 1 ¼ in. (32 mm). For vertical siding, length as necessary to penetrate the thickness of the sheathing plus ¼ in. (6.4 mm).

6.14.2 *Fastener Spacing*—Every 16 in. (406 mm) into center of stud for horizontal siding. For vertical siding, every 12 in. into sheathing only.

6.14.3 Fasteners shall not be driven tightly against the siding. Allow approximately 1⁄32 in. (0.8 mm) clearance between the fastener head and siding surface.

NOTE 11—The installation details described 6.14 conform to the minimum requirements of the 2015 International Residential Code and the VSI Vinyl Siding Installation Manual.

6.15 *Nail Slot Allowance for Thermal Expansion*—As an alternative to conformance with the nail slot width specification in 5.2.4.1 or 5.2.4.2, provision for thermal expansion and contraction shall be demonstrated through the following test procedure.

6.15.1 *Samples*—At least 3 samples of each profile in which the siding is produced shall be provided. The length of each sample shall be at least 50 % of the longest length in which the profile is produced, and not shorter than 12 ft (3658 mm).

6.15.2 *Test Chamber*—The test chamber shall consist of an environmentally controlled room or compartment capable of providing an air temperature range of at least 0°F to 100°F (-18°C to 38°C) without exposure of the panel to radiant energy from heating or cooling elements. Air temperature shall be controlled such that a rate of temperature change of 2°F (1.11°C) per minute can be achieved over the full temperature range, and the minimum and maximum temperatures can be maintained for at least 15 minutes. Means for circulating air to provide a uniform air temperature throughout the chamber shall be provided. A vertical wall shall be provided for mounting of samples. The wall shall be insulated such that, with no panels mounted, the inner surface of the wall does not deviate more than 10°F (5.5°C) from the air temperature at the high and low temperature extremes after a holding period of 5 minutes. The test chamber shall be of sufficient size to accommodate the longest panel to be tested, including expected thermal expansion of the panel. Means shall be provided to measure the actual temperature of the surface of each panel at a minimum of 3 evenly-spaced locations along the length of the panel.

6.15.3 *Length Measurement*—A means for measuring the length of each sample throughout the temperature range shall be provided. The method utilized for length measurement shall not be influenced by the temperature of the chamber and shall have a minimum resolution of no greater than 0.0625 in. (1.59 mm).

6.15.4 *Procedure*—Install the sample panels on the wall inside the test chamber, following the manufacturer's instructions for fastener type, spacing, location and tightness. At ambient temperature measure and record the length of each panel and the temperature of the panel, averaged from a minimum of 3 locations along the length of the panel.

6.15.4.1 *Test Cycle*—Test cycles shall be performed by raising the air temperature to 100°F ± 5°F (38°C ± 2.75°C) at an average rate of 2°F (1.11°C) per minute, holding the air temperature at 100°F (38°C ± 2.75°C) for 15 minutes, lowering the air temperature to 0°F ± 5°F (-18°C ± 2.75°C) at an average rate of 2°F (1.11°C) per minute, holding at 0 °F (-18°C ± 2.75°C) for 15 minutes, and returning to ambient temperature at an average rate of 2 °F per minute.

6.15.4.2 *Conditioning*—Close the test chamber and perform at least 2 conditioning cycles using the procedure in 6.15.1. No interruption is required between conditioning cycles.

6.15.4.3 *Test*—Following completion of the conditioning cycles, conduct 3 test cycles using the procedure in 6.15.4.1. It is acceptable for the test cycles to follow immediately upon completion of the final conditioning cycle, and no interruption is required between test cycles. After a minimum holding period of 15 minutes at the high and low extremes of each test cycle, measure and record the length of each panel and the temperature of the panel, averaged from a minimum of 3 locations along the length of the panel.

6.15.5 *Normalization*—From among the length measurements recorded for all three cycles, identify the shortest and longest length of each panel, and the average panel temperature at the time that length was recorded. Determine the maximum difference in length, ΔL, and the maximum difference in temperature, ΔT, by subtracting the smaller from the larger. Normalize the change in length to the full length of the panel over a 100 °F (38 °C) temperature range using the following formula:

$$E_t = \Delta L \times (100/\Delta T) \times (L_f/L_t) \quad (2)$$

E_t = total thermal expansion and contraction of a full length panel over a range of 100°F (38°C),
ΔL = maximum change in length of the tested panel,
ΔT = maximum change in temperature of the tested panel,
L_f = longest length in which the panel is produced, and
L_t = actual length of the panel as tested.

6.15.6 *Acceptable Performance*—When tested according to this procedure, the result of $(E_t \times 2) + 0.25$ in. for each of the 3 samples for each profile shall not be greater than the width of the nail slot. If the manufacturer's installation instructions require the panel to be center-pinned, the result of $E_t + 0.25$ in. for each of the 3 samples for each profile shall not be greater than the width of the nail slot.

6.16 *Lead Content:*

6.16.1 Testing for lead content shall be conducted on extruded siding using a rhodizinate-type lead swab test kit conforming to Practice E1753. Testing shall be performed in accordance with the test kit manufacturer's instructions. The siding shall be deemed to comply with 4.6 if the test shows a negative or not-detected result; that is, the test does not indicate the presence of lead. The test shall be conducted separately on the substrate and on any cap or film material.

6.16.2 As an alternative to the method in 6.15.1, and as a means of resolving any ambiguous results from that method, an analytical method capable of detecting lead at least as low as 0.02 percent by sample weight shall be employed. Under this alternative, neither the substrate nor any cap or film shall contain a concentration of lead in excess of 0.02 percent by weight.

7. Packaging and Package Marking

7.1 The siding shall be packed in such a manner as to provide reasonable protection against damage in ordinary handling, transportation, and storage.

7.2 Provisions of Practice D3892 shall apply to this specification.

7.3 To aid identification of siding conforming to all requirements of this specification, producers and distributors shall include a statement of compliance in conjunction with their name and address on product labels, invoices, sales literature, and the like. The following statement is suggested when sufficient space is available:

This PVC siding conforms to all the requirements established in ASTM Specification D7445, developed cooperatively with the industry and published by ASTM.

Full responsibility for the conformance of this product to the specification is assumed by (name and address of producer or distributor).

7.4 The following abbreviated statement is suggested when available space on labels is insufficient for the full statement: Conforms to ASTM Specification D7445 (name and address of producer or distributor).

7.5 The standard wind load design pressure rating determined in accordance with 5.2.3.2 shall be stated on the product or on the product package by one of the means in 7.5.1 or 7.5.2.

7.5.1 The package shall be marked or labeled with the standard wind load design pressure rating. The marking shall be in the format "Standard Wind Load Design Pressure Rating: ##.# psf (ASD)".

7.5.2 The standard design pressure rating shall be included on a line imprint or other marking on the front (outward-facing) surface of all siding panels. It is not required that the marking be visible after installation, provided that the marking can be revealed and read by detaching the lower edge lock of an adjacent course, without removal of any fasteners. The standard design pressure marking shall be stated at least once per panel. The marking shall be in the format "Std Design Pressure Rating: ##.# psf (ASD)".

7.5.3 At the option of the manufacturer, additional marking or labeling of the package or product with alternative wind load design pressure ratings determined in accordance with 5.2.3.3 for use with alternative sheathings, wall configurations or fastening methods is permitted. The marking shall use the format specified in 7.5, shall indicate the type of sheathing or wall configuration for which it is applicable, and shall refer to the manufacturer's instructions for more information and any installation requirements.

8. Keywords

8.1 plastic building products; plastic weatherability; recycled plastic; rigid PVC siding; specification

ANNEX

(Mandatory Information)

A1. WIND LOAD RESISTANCE TEST DESIGN FACTORS

A1.1 *Wind Load Criteria:*

A1.1.1 ASCE 7-10 is the basis for determining the design pressures used in this specification. Design wind loads are determined on an ASD basis in this specification.

NOTE A1.1—In previous editions of ASCE 7, wind loads were determined using wind speed maps based on a 50-year return period. In ASCE 7-10, maps based on a 700-year return period are used which, for any given location, produce a wind speed approximately 30 % greater than that of the previous maps. This larger magnitude (higher return period) wind speed, referred to as the ultimate wind speed, (V_{ULT}), is used directly (with a load factor of 1.0) to determine nominal wind loads on a Strength Design (LRFD) or "ultimate" wind load basis. When Allowable Stress Design (ASD) is used, ASCE 7-10 provides for these ultimate wind loads, determined from the ultimate wind speed map velocities, to be multiplied by a load factor of 0.6. Alternatively, the adjustment can be made directly to the wind velocity, which is the approach taken in this method (see A1.1.2). This procedure produces results consistent with past ASD wind loads.

A1.1.2 It is necessary to determine whether the wind velocity to be used is based on the maps in ASCE 7-10 or on older maps designed for direct application of ASD. Wind velocity, V, based on ASD is used in this method. Wind speeds determined using the maps in ASCE7-10, referred to as V_{ULT}, are converted to ASD wind speeds, V_{ASD}, by multiplying by the square root of 0.6. Wind speeds based on maps using an ASD basis do not require conversion (see A1.3). Thus:

$$V = V_{ASD} = V_{ULT} \times \sqrt{0.6} \qquad \text{(A1.1)}$$

The V determined in this section is used in the following calculations.

A1.1.3 The velocity pressures, q, used in this specification have been computed using the following equation:

$$q = 0.00256\, K_z K_d V^2 I\,(\,lb/sq\,ft\,) = 0.613\, K_z\, K_d\, V^2 I\,(N/m^2) \qquad \text{(A1.2)}$$

V = wind velocity, mph (km/h). The basic wind speed corresponds to a 3-s gust speed at 33 ft (10.1 m) above ground in exposure category C, as described in ASCE 7-10. A velocity of $V = V_{ASD}$ = 110 mph (177 km/h) was used in this specification. (See Note A1.2and Note A1.3.)

I = "importance factor" as described in editions of ASCE 7 prior to ASCE 7-10. A value of 1.0 is used. This factor is not used where the wind speed has been determined from a map in ASCE 7-10. (See Note A1.4.)

K_z = "velocity pressure coefficient" as described in ASCE 7-10. A "K_z" of 0.70 was used in the wind pressure calculations, which is the value from ASCE 7-10 for a mean roof height of 30 ft (9.1 m) above ground level and Exposure Category B.

K_d = "wind directionality factor" as described in ASCE 7-10. A "K_d" of 0.85 is used.

A1.1.4 Thus, for the given velocity and factors, the velocity pressure = 18.43 lbf/ft^2 (882 Pa).

NOTE A1.2—As explained in Note A1.1, the wind velocity used in this method is converted from the V_{ULT} given by wind speed maps in ASCE 7-10 to V_{ASD} using the equation in A1.1.2. A V_{ULT} wind speed of approximately 140 mph from the maps is equivalent to a V_{ASD} of 110 mph, which is the velocity V used in this specification.

NOTE A1.3—In ASCE 7-10 the default wind speeds are given for exposure category C, and a table is provided to adjust this wind speed for other exposure categories. Since most backed vinyl siding is installed on buildings located in exposure category B, the velocity pressure coefficient, K_z is included in the equation to make this adjustment.

NOTE A1.4—Editions of ASCE 7 prior to ASCE 7-10 included an importance factor to represent the relative significance of the building and the consequences of its loss. Because most backed vinyl siding is installed on residential and light commercial buildings, the importance factor was set at 1.0 by default. ASCE 7-10 has removed the importance factor from the velocity pressure equation, and instead provides a different wind speed map for each of the building importance categories (referred to as risk categories in ASCE 7-10). Thus the importance factor will already have been incorporated into the wind speed determined from the appropriate map, and the importance factor is not used for determining velocity pressure using wind speeds from ASCE 7-10 maps.

A1.1.5 ASCE 7-10 recommends various internal and external pressure coefficients, which include gust response factors. These coefficients vary with the effective area of the cladding component, the location of the cladding component relative to building corners, and the configuration of the building (open versus enclosed). The internal and external pressure coefficients are taken from Table 26.11-1 and Figure 30.4-1 of ASCE 7-10. The effective area is taken as 10 square ft (the area of one piece of siding), an enclosed building is assumed, and factors for the building corners are used. The pressure coefficients are as follows:

$$\textit{Internal Pressure Coefficient} = \pm 0.18 \qquad \text{(A1.3)}$$

$$\textit{External Pressure Coefficient} = +1.00 \textit{ and } -1.40$$

The design pressure is calculated by multiplying the velocity pressures by the algebraic sum of the internal and external pressure coefficients.

A1.2 *Design Pressure:*

NOTE A1.5—Because the wind velocity has already been adjusted from an ultimate basis to an ASD basis at the beginning of these calculations, the design pressure determined in this step is an ASD load. This correlates to the design pressure requirements stated in tables in the 2015 International Residential Code and other codes which have also been adjusted to an ASD basis. However, the required design pressures in some other codes and design standards have not been adjusted to an ASD basis. Where required design pressures are based on ultimate wind loads determined from ASCE 7-10 wind speeds, those loads must be multiplied by 0.60 to match the design pressure determined from this equation.

$$\textit{Positive Design Pressure} = (18.43)(1.00+0.18) = 21.74\ psf \quad \text{(A1.4)}$$

$$\textit{Negative Design Pressure} = (18.43)(-1.40-0.18) = -29.12\ psf$$

A1.2.1 The negative values (suction loads) are the largest in magnitude and are the design values used in this specification. Research conducted by various organizations[8,9] has shown that a certain amount of pressure equalization occurs through residential siding products installed with sheathing under high dynamic pressures. In light of this pressure equalization, the design pressure in the ASCE 7-10 wind load standards is reduced by a factor of 0.5 for backed siding.

A1.2.2 Therefore, the required test pressures are calculated as follows:

$$P_t = D_P \times PEF \times 1.5 \quad \text{(A1.5)}$$

where:

P_t = test pressure, lbf/ft^2 (Pa),
D_P = design pressure, lbf/ft^2 (Pa),
PEF = pressure equalization factor, backed siding, 0.5, and
1.5 = safety factor.

A1.2.2.1 If documentation in support of the use of compensation for pressure equalization other than 0.5 is provided, use the calculation in A1.2.2, substituting the appropriate pressure equalization factor.

A1.2.3 Using the above equations, in a 110 mph (177 km/h) (V_{ASD}) wind zone area specifying a design pressure of -29.12 lbf/ft^2 (1394 Pa) for a building 30 ft (9.1 m) in height or less, the required minimum uniform load test pressure for backed siding is 21.84 lbf/ft^2 (1046 Pa).

A1.2.3.1 For compliance with 5.2.3, the referenced design pressure has been rounded to -30.0 lbf/ft^2 (1436 Pa) to match the standard design conditions specified by the 2015 International Residential Code. When tested under Test Method D5206, the siding must attain an average maximum sustained static test pressure equal to or greater than the corresponding minimum test pressure of 22.5 lb/ft^2 (1077 Pa).

A1.2.4 For applications where the effective design pressure is greater than -30.0 lbf/ft^2 (1436 Pa) (for example, wind zone areas greater than 110 mph (177 km/h) (V_{ASD}), mean roof height over 30 ft (9.1 m), or exposure conditions other than Exposure B), refer to ASCE 7-10 for the effective design pressure. To be shown to be suitable for the application, when tested under Test Method D5206 the siding must attain an average maximum sustained static test pressure equal to or greater than the minimum test pressure determined by the formula in A1.2.2, using the design pressure, D_P, determined for the application using the procedure in A1.1.2 through A1.2.

A1.2.5 These loading conditions apply only to siding installed without an air space directly over sheathing of a type and fastening method that is capable of independently resisting both positive and negative wind design pressures at the building location. Examples of such sheathing include oriented strand board (OSB) and plywood fastened to resist the design wind pressures. For applications where the siding is installed over open studding, without sheathing, rapid pressure equalization does not occur. In these applications, the load the siding will see is equal to the total design pressure and the pressure equalization factor (PEF) is set to 1.0. The static test pressure required for products used under these conditions is as follows:

$$P_t = D_P \times PEF \times 1.5 \quad \text{(A1.6)}$$

where:

P_t = static test pressure, lbf/ft^2 (Pa),
D_P = design pressure, lbf/ft^2 (Pa),
PEF = pressure equalization factor, 1.0, and
1.5 = safety factor.

A1.2.5.1 Therefore in a 110 mph (177 km/h) wind zone area specifying a design pressure of -29.12 lbf/ft^2 (1394 Pa) for a building 30 ft (9.1 m) in height or less, siding installed without sheathing would require a uniform load test pressure of 43.72 lbf/ft^2 (2093 Pa).

NOTE A1.6—Building codes and backed vinyl siding installation instructions require backed vinyl siding to be installed over sheathing, so calculation of minimum test pressure for siding installed without sheathing is essentially moot. However, the calculation has been retained for completeness and comparison with other installation conditions.

A1.2.6 When siding is installed over sheathing that is not capable of independently resisting both positive and negative wind pressures occurring under design conditions at the building location, a greater percentage of the total wind pressure is transferred to the siding and its fasteners. This has the effect of partially or completely countering the effect of the pressure equalization factor. In these cases a value between 0.5 and 1.0 is used for the pressure equalization factor (PEF).

A1.2.6.1 In addition, in cases where failure of the siding would result in failure of the exterior wall covering assembly (that is, siding and sheathing) a safety factor of greater than 1.5 is indicated.

A1.2.6.2 If the adjusted PEF for a given combination of siding and sheathing is known, and an appropriate safety factor is used, a minimum test pressure can be determined using the equation in A1.2.1. However, it is normally more appropriate to make an adjustment for alternative sheathings when determining the design pressure rating, as discussed in A1.3.

NOTE A1.7—Where the sheathing is not capable of independently resisting both positive and negative wind pressures occurring under design conditions at the building location, the layer of siding over the sheathing, and its fastening through the sheathing, act to reinforce the sheathing such that the whole wall covering (siding-sheathing) assembly is capable of resisting such wind pressures. Because siding is tested by itself (not as part of a siding-sheathing assembly) in Test Method D5206, the adjustment of test pressure (before the test) or of the design pressure (after the test) ensures that the wind load resistance of the assembly as a whole is reflected in the rating of the siding.

NOTE A1.8—In some high wind hazard regions, such as south Florida, the exterior wall covering assembly may also be required to meet wind-borne debris impact resistance criteria which would affect the choice of sheathing material to be used together with siding. Such considerations are beyond the scope of this standard.

[8] Vinyl Siding Pressure Equalization Factor, Architectural Testing, Inc. Report No. 01–40776.01, September 2002.

[9] Morrison M.J., Cope A.D. "Wind Performance and Evaluation Methods of Multi-Layered Wall Assemblies." Structures Congress, 2735-2748, Portland, OR, 2015.

A1.3 *Wind Design Pressure Rating (Maximum Allowable Pressure):*

A1.3.1 A design pressure rating is the maximum wind pressure that a particular backed vinyl siding product is rated to be able to withstand. It is used in building design and building codes to determine the acceptability of a siding product for use under the design wind conditions for a specific application. To be acceptable, a siding's design pressure rating must be equal to or greater than the design pressure for the specific building at the specific location. The design pressure rating is determined from the average maximum sustained static test pressure for a siding product produced by testing under Test Method D5206, the pressure equalization factor, and a safety factor.

A1.3.2 *Standard Design Pressure Rating*—The standard design pressure rating is used for applications where the siding is installed over a sheathing type and fastening method that is capable of independently resisting both positive and negative wind pressures occurring under design conditions at the building location.

A1.3.2.1 The standard design pressure rating assumes that the siding is fastened to the building in the standard manner, with the minimum fastener type, size, spacing, and penetration depth prescribed in Chapter 7 of the International Residential Code and the VSI Vinyl Siding Installation Manual. The installation of the siding for testing under Test Method D5206 must be consistent with these minimum fastening requirements. However, this does not prevent additional testing, using different fastening, to support design pressure ratings for other applications, such as special high wind installations.

A1.3.2.2 The pressure equalization factor and safety factor are the same as those used to determine the test pressure in A1.2.1, using the following equation:

$$D_{Rstd} = \frac{P_m}{(PEF \times SF)} \quad (0)$$

where:

D_{Rstd} = standard design pressure rating, lbf/ft^2 (Pa),
P_m = average maximum sustained static test pressure, lbf/ft^2 (Pa),
PEF = pressure equalization factor, 0.5, and
SF = safety factor, 1.5.

A1.3.3 *Alternative Design Pressure Ratings*—Design pressure ratings for applications other than the standard conditions described above can be developed. Common circumstances where this is done include the use of alternative fastening methods in order to achieve a higher design pressure rating, and cases where the sheathing is not capable of independently resisting wind pressures under design conditions, which necessitates a reduction in the siding's design pressure rating.

A1.3.3.1 *Alternative Fastening*—Where an alternative fastening method is specified by the manufacturer, the siding is permitted to be tested under Test Method D5206 using the specified fastening. The resulting average maximum sustained static test pressure is used in the above equation to determine the alternative design pressure rating. In order for this alternative rating to be realized, the siding must be installed using the alternative method, and the rating must be clearly tied to installation requirements in manufacturer's literature and instructions.

A1.3.3.2 *Alternative Sheathing*—An adjusted design pressure rating for use of the siding over sheathings not capable of independently resisting both positive and negative wind pressures occurring under design conditions at the building location, as discussed in A1.2.6, can be calculated using the above equation if the appropriate PEF and safety factor are specified.

A1.3.3.3 Alternative PEF and safety factor values have been documented (see 2009 and 2012 International Residential Code, section R703.11.2) for one type of sheathing, foam plastic insulating sheathing complying with ANSI/SBCA FS 100. Two wall assembly cases are considered: 1) where the interior surface of the wall is covered with gypsum wall board or equivalent; and 2) where the interior surface of the wall is not covered with gypsum wall board or equivalent. In both cases the siding is installed directly over foam sheathing, which is then attached directly to framing, without intervening sheathing. The PEF and safety factor for each case are as follows:

Case	PEF	Safety Factor
Case 1	0.7	2.0
Case 2	1.0	2.0

A1.3.3.4 Adjustment of the standard design pressure rating is not necessary when foam plastic insulating sheathing is installed directly over sheathing that is capable of independently resisting both positive and negative wind pressures occurring under design conditions at the building location, or where the sheathing is fastened in a way that allows it to independently resist the design wind pressure. For such cases the standard design pressure rating is applied.

A1.4 *Design Wind Speeds:*

A1.4.1 The wind velocity maps in ASCE 7-10 provide one source of design wind pressures for particular geographic regions. The velocities on these maps are stated in terms of "ultimate", 700-year return interval speeds. To be used in the procedure in this Annex, those velocities need to be converted to the ASD equivalent in accordance with A1.1.2, and the resulting velocity V used in the equation in A1.1.3. The 2012 and 2015 International Building Code and 2015 International Residential Code also contain maps based on ultimate wind speeds.

A1.4.2 Other maps are available that do not require conversion of wind velocities. Examples include the wind map in the 2012 International Residential Code, on which the velocities have already been converted from those on the ASCE 7-10 maps. Maps from previous editions of ASCE 7 used ASD velocities and do not require conversion. However, only editions since 1995 used the 3-second gust basis that is used in this annex. The 1998, 2002, and 2005 editions of ASCE 7 continued the use of 3-second gust wind basis, but with improved hazard modeling of hurricane wind speeds first made in the 1998 edition. These previous editions also do not have the benefit of further improved hurricane hazard modeling that was incorporated into the maps used in ASCE 7-10.

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SUMMARY OF CHANGES

Committee D20 has identified the location of selected changes to this standard since the last issue (D7445–09) that may impact the use of this standard. (June 1, 2017)

(1) Section 2 was revised to update the reference to ASCE 7 and to add references referred to elsewhere in the standard.
(2) Section 2 was revised to add references to building codes and to the VSI Vinyl Siding Installation Manual.
(3) Section 3 was revised to add definitions of design wind load pressure rating, standard wind load design pressure rating, and alternative wind load design pressure rating.
(4) Subsection 5.2.3 was revised to clarify current requirements and put non-mandatory information in Notes, and to provide for the determination of standard and alternative wind load design pressure ratings.
(5) In subsection 5.2.3, the minimum static test pressure was changed to reflect the change in pressure equalization factor in A1.2.1.
(6) Subsection 6.14 was revised to provide the standard test conditions for determining compliance with the minimum test pressure and standard wind load design pressure rating.
(7) Section 7 was deleted and its content merged into a new Section 7 dealing with packaging and package marking. Provisions specifying marking of the standard design pressure and alternative design pressures were added.
(8) Annex A1 was revised to reflect recent changes in ASCE 7 and to improve clarity.
(9) Subsection A1.2 was revised to add provisions for adjusting the minimum required test pressure for applications of siding over certain alternative sheathing types.
(10) In subsection A1.2.1, the pressure equalization factor was changed and a reference added to research supporting this change.
(11) Subsection A1.2.1.1 was added to provide for the use of alternative pressure equalization factors.
(12) In subsections A1.2.3 and A1.2.3.1 the minimum test pressures were changed to reflect the change in pressure equalization factor in A1.2.1.
(13) Subsection A1.3 was added to describe the procedures for determining design pressure ratings.