![intertek Total Quality. Assured.]

STANDARDS UPDATE NOTICE (SUN)
ISSUED: June 4, 2018

STANDARD INFORMATION

Standard Number: ASTM D7254
Standard Name: Standard Specification for Polypropylene (PP) Siding
Standard Edition and Issue Date: 2017 Edition Dated June 1, 2017
Date of Revision: June 1, 2017
Date of Previous Revision of Standard: 2015 Edition Dated April 1, 2015

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: October 5, 2019

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revised requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.

Overview of Changes:

- Subsection 5.11 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.
- In 5.11, the minimum static test pressure was changed to reflect the change in pressure equalization factor in A1.2.1.
- 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.
- 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.
- Subsection A1.2 was revised to add provisions for adjusting the minimum required test pressure for applications of siding over certain alternative sheathing types.
- In A1.2.1, the pressure equalization factor was changed and a reference added to research supporting this change.
- Added A1.2.1.1 to provide for the use of alternative pressure equalization factors.
- In 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.
- Subsection A1.3 was added to describe the procedures for determining design pressure ratings.

Specific details of new/revised requirements are found in table below.

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action Required:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revised paragraphs noted in the attached or explain why these new/revised requirements do not apply to your product (s).

 Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		Additions to existing requirements are <u>underlined</u> and deletions are shown ~~lined out~~ below.
5	Info	**Physical Requirements**
5.4		Wind Load Resistance—The siding ~~panel(s) shall be able to~~ <u>shall</u> withstand a minimum static test pressure ~~of 15.73 lbf/ft 2 (753 Pa) when tested in accordance with 6.4.~~ <u>and a standard wind load design pressure rating shall be determined.</u>
5.4.1		~~The static pressure of 15.73 lbf/ft2 (753 Pa) was established to withstand structural loading conditions that occur in 110 mph (177 km/h) wind-zone areas for elevations of 30 ft (9.1 m) and less in exposure category B, and is equivalent to 29.12 lbf/ft2 (1394 Pa) design pressure.~~ <u>Minimum Test Pressure—The siding panel(s) shall be able to withstand a minimum static test pressure of 16.2 lbf/ft2 (776 Pa) when tested in accordance with 6.4. The average maximum sustained static pressure determined in 6.4 shall be equal to or greater than this value.</u> <u>Note 3: The static pressure of 16.2 lbf/ft2 (776 Pa) was established to withstand structural loading conditions that occur in wind exposures of approximately 110 mph (177 km/h) (VASD) for mean roof heights of 30 ft (9.1 m) and less in exposure category B, and corresponds to 30.0 lbf/ft2 (1436 Pa) design pressure, to match the default wind design conditions of Table R703.3(1) in the 2015 International Residential Code.</u> <u>Note 4: 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/ft2 (1436 Pa) (for</u>

	example, wind-zone areas greater than about 110 mph (177 km/h) (VASD) (225 km/h (VULT)) or mean roof height above 30 ft (9.1 m), or exposures other than exposure category B).
5.4.2	*New clause added;* Standard Wind Load Design Pressure Rating—The standard wind load design pressure rating shall be determined from the results of testing in accordance with 6.4, using the procedures described in Annex A1, section A1.3. Note 5: 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 Annex A1, section A1.3. Determination of a rating other than the standard design pressure rating is not required by this section.
6.4	Wind Load Resistance—Conduct the test on wind load resistance of the finished siding in accordance with Test Method D5206. The average maximum sustained static test pressure determined from this testing is used in 5.4. For purposes of determining compliance with the minimum test pressure and standard design pressure requirements in 5.4, the test structure shall be constructed with vertical studs 16 inches on center, the siding in the test installation shall be installed over wood sheathing with a nominal thickness of 7/16 to 1/2 in., and fastened as follows:
6.4.1	*New clause added;* Fastener Type—Roofing nail, smooth shank. Unless greater dimensions are specified in the manufacturer's instructions, 0.120 in. (1/8 in. nominal; 3.2 mm) shank diameter, 5/16 in. (7.9 mm) head diameter, length as necessary to penetrate the thickness of the sheathing plus 1/4 in. (6.4 mm).
6.4.2	*New clause added;* Fastener Spacing—As specified by the manufacturer's installation instructions.
6.4.3	*New clause added;* 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 8: The installation details described 6.4 conform to the minimum requirements of the 2015 International Residential Code and polypropylene-specific provisions of the VSI Vinyl Siding Installation Manual. For installation methods that are inherently stronger than the minimum requirements (such as closer fastener spacing, longer or thicker fasteners, or greater penetration), no additional testing should be necessary, and the standard design pressure rating would apply to such installations. If the manufacturer desires a higher design

pressure rating using inherently stronger installation, or for installations that are inherently less strong (such as greater fastener spacing or smaller fasteners), additional testing is needed. See 5.4.3.

7	Info	**Packaging and Package Marking**

New clause added;

7.5 The standard wind load design pressure rating determined in accordance with 5.4.2 shall be stated on the product or on the product package by one of the means in 7.5.1 or 7.5.2.

New clause added;

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)".

New clause added;

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)".

New clause added;

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 5.4.3 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.

A1	Info	**WIND LOAD RESISTANCE TEST DESIGN FACTORS**
A.1.1	Info	**Wind Load Criteria:**

A1.1.1 ASCE ~~7-02~~ 7-10 is the basis for determining the design pressures used in this ~~test method. The velocity pressures, q, used in this test method have been computed using the following equation:~~ 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, (VULT),

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	***New section added;*** 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 VULT, are converted to ASD wind speeds, VASD, by multiplying by the square root of 0.6. Wind speeds based on maps using an ASD basis do not require conversion (see A1.4) Thus: $$V = V_{ASD} = V_{ULT} \times \sqrt{0.6}$$ The V determined in this section is used in the following calculations.
A1.1.3	***New clause added;*** The velocity pressures, q, used in this test method have been computed using the following equation: $$q = 0.0256 K_Z K_d V^2 I \text{ (N/m}^2)$$ Where: 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 A1.2 and 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 is 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/ft2 (882 Pa). Note A1.2: As explained in Note A1.1, the wind velocity used in this method is converted from the VULT given by wind speed maps in ASCE 7-10 to VASD using the equation in A1.1.2. A VULT wind speed of approximately 140 mph from the maps is equivalent to a VASD 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 siding is installed on buildings located in exposure category B, the velocity pressure coefficient, Kz 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 polypropylene 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 ~~6–5 and Figure 6–11A of ASCE 7-02~~ 30.4-1 of ASCE 7-10. The effective area is taken as 10 ft2 (the area of one piece of siding), an enclosed building is assumed,
A1.2	**Design Pressure** Positive Design Pressure = (18.43)(1.00 + 0.18) = 21.74 psf Negative Design Pressure = (18.43)(−1.40 − 0.18) = -29.12 psf 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.
A1.2.1	The negative values (suction loads) are the largest in magnitude and are the design values used in this test method. specification. Based on research conducted by Architectural Testing, Inc. for the Vinyl Siding Institute,58 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 0.36.

	Therefore, the required test pressures are calculated as follows:
A1.2.2	$$\cancel{P_T = D_P \times 0.36 \times 1.5}$$ $$\underline{P_t = D_P \times PEF \times 1.5}$$ Where: P_t = test pressure, lbf/ft^2 (Pa), D_P = design pressure, lbf/ft^2 (Pa), PEF ~~0.36~~ = pressure equalization factor, <u>0.36</u>, and 1.5 = safety factor.
A1.2.2.1	***New clause added;*** If documentation in support of the use of compensation for pressure equalization other than 0.36 is provided, use the calculation in A1.2.2, substituting the appropriate pressure equalization factor.
A1.2.3	~~In~~ <u>Using the above equations in</u> a 110 mph (177 km/h) <u>(V_{ASD})</u> wind zone area specifying a design pressure of -29.12 lbf/ft2 (1394 Pa) for a building 30 ft (9.1 m) in height or less, the required <u>minimum</u> siding uniform load test pressure is 15.73 lbf/ft^2 (753 Pa). ~~For applications where the effective design pressure is greater than –29.12 lbf/ft² (1394 Pa) (for example, wind zone areas greater than 110 mph (177 km/h), elevations over 30 ft (9.1 m), or exposure conditions other than Exposure B), refer to ASCE 7-02 for the effective design pressure. The product shall be subjected to a static test pressure determined by the formula in A1.2.2. These loading conditions apply only to siding installed to solid walls, with internal or external sheathing. For applications where the siding is installed over open studding, rapid pressure equalization does not occur. In these applications, the load the siding will see is equal to the total design pressure. The static test pressure required for products used under these conditions is as follows:~~ ~~$P_t = 1.5 \times DP$~~ ~~Where:~~ ~~P_t = static pressure, lb/ft² (Pa)~~ ~~DP = design pressure, lb/ft² (Pa), and~~ ~~1.5 = safety factor.~~
A1.2.3.1	***New clause added;*** For compliance with section 5.4, 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 16.2 lb/ft^2 (776 Pa).

A1.2.4	*New clause added;* 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), 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, DP, determined for the application using the procedure in A1.1.2 through A1.2.
A1.2.5	*New clause added;* 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 pressure equalization factor (PEF) is set to 1.0. The static test pressure required for products used under these conditions is as follows: $$P_t = D_P \times PEF \times 1.5$$ Where: P_t = static pressure, lbf/ft^2 (Pa) D_P = design pressure, lbf/ft^2 (Pa) PEF = pressure equalization factor, 1.0, and 1.5 = safety factor. Note A1.6: Building codes and siding installation instructions require polypropylene 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	***New section added;*** Because polypropylene siding is normally attached to nailable sheathing rather than building framing, it is typically used over sheathing such as plywood or OSB that is capable of independently resisting both positive and negative wind pressures occurring under design conditions at the building location. In any case where polypropylene siding is installed over sheathing that does not have that capability, 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 0.36 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 A1.4. 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.
A1.3	***New section added;*** This section contains requirements for the wind design pressure rating (see standard for details).
	CUSTOMERS PLEASE NOTE: This Table and column "Verdict" can be used in determining how your current or future production is or will be in compliance with new/revised requirements.