



Standard Test Method for Windload Resistance of Rigid Plastic Siding¹

This standard is issued under the fixed designation D5206; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope*Scope

1.1 This test method describes methods for testing and evaluating windload resistance of rigid plastic siding when fastened in accordance with Practice **D4756**.

1.2 The proper use of this test method requires a knowledge of the principles of pressure measurement.

1.3 This test method describes the apparatus and the procedures to be used for either a specific static test pressure (Procedure A) to determine an average maximum sustained static test pressure, or ultimate test pressure values (Procedure B) values, or both, with static pressure applied uniformly to a specimen.

NOTE 1—There is no known ISO equivalent to this test method.

1.4 The values expressed in inch-pound units are to be regarded as the standard. The SI equivalents in parentheses are for information only.

1.5 *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.* For specific precautionary statements, see Section 7.

2. Referenced Documents

2.1 *ASTM Standards:*²

D883 Terminology Relating to Plastics

D1600 Terminology for Abbreviated Terms Relating to Plastics

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

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

E631 Terminology of Building Constructions

3. Terminology

3.1 *General*—Definitions are in accordance with Terminologies **D883** and **E631** and abbreviations are in accordance with Terminology **D1600** unless otherwise indicated.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *maximum sustained static test pressure*—the greatest difference in static air pressure (negative or positive) that a test specimen withstands without failure, expressed as force per square foot (or pascals).

3.2.2 *nail hem thickness*—the average thickness of the nail hem as measured between the nail slots.

3.2.3 *specimen*—the entire assembled siding panel as described in Section 8.

3.2.4 *static test pressure*—the specific difference in static air pressure (positive or negative) for which the specimen is to be tested expressed as force per square foot (or pascals).

3.2.5 *ultimate test pressure*—the difference in static air pressure (positive or negative) at which failure occurs expressed as force per square foot (or pascals).

¹ This test method is under the jurisdiction of ASTM Committee **D20** on Plastics and is the direct responsibility of Subcommittee **D20.24** on Plastic Building Products. Current edition approved Dec. 1, 2006/Jan. 1, 2013. Published December 2006/January 2013. Originally approved in 1991. Last previous edition approved in 2006 as **D5602—06**:**D5602 – 06a**. DOI: 10.1520/D5206-06A:10.1520/D5206-13.

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

4. Summary of Test Method

4.1 This test method can be used to determine either the maximum sustained static test pressure or the ultimate pressure, or both, for the siding specimen. The procedure consists of sealing the test specimen with or against one face of a test chamber, supplying air to or exhausting air from the chamber at a rate required to maintain a specific static air pressure across the specimen for a specific time period. After removal of the pressure, the specimen is observed for failure, and the nature of any failure established. At the manufacturer's option, reapply test pressure in increments until failure occurs, to measure ultimate pressure. Pressure is applied in increments and the sample observed for failure at each stage, to determine the maximum sustained static test pressure, the ultimate test pressure, or both.

5. Significance and Use

5.1 This test method is a standard procedure for determining windload resistance of rigid plastic siding under specified uniform static pressure difference. This typically is intended to represent the effects of wind loads on exterior building surfaces. The actual loading on building surfaces is quite complex, varying with wind direction, time, height above ground, building shape, terrain, surrounding structures, and other factors.

5.2 Design wind pressure is selected for specific geographical locations from wind velocity maps prepared by the National Weather Service or other sources. Refer to Annex A1 of Specification D3679 for additional detailed information relating to use of this test method for evaluation of rigid poly(vinyl chloride) (PVC) siding.

NOTE 2—In applying the results of this test method, note that the performance of rigid PVC siding is a function of installation, and the specimen may or may not truly represent the actual application. In service, performance will also depend on the rigidity of supporting construction, and on the resistance of other components to deterioration by various causes, to thermal expansion and contraction, etc.

6. Apparatus

6.1 The description of apparatus is general in nature; any equipment capable of performing the test procedure within the allowable tolerances is permitted.

6.2 Major Components (See Fig. 1):

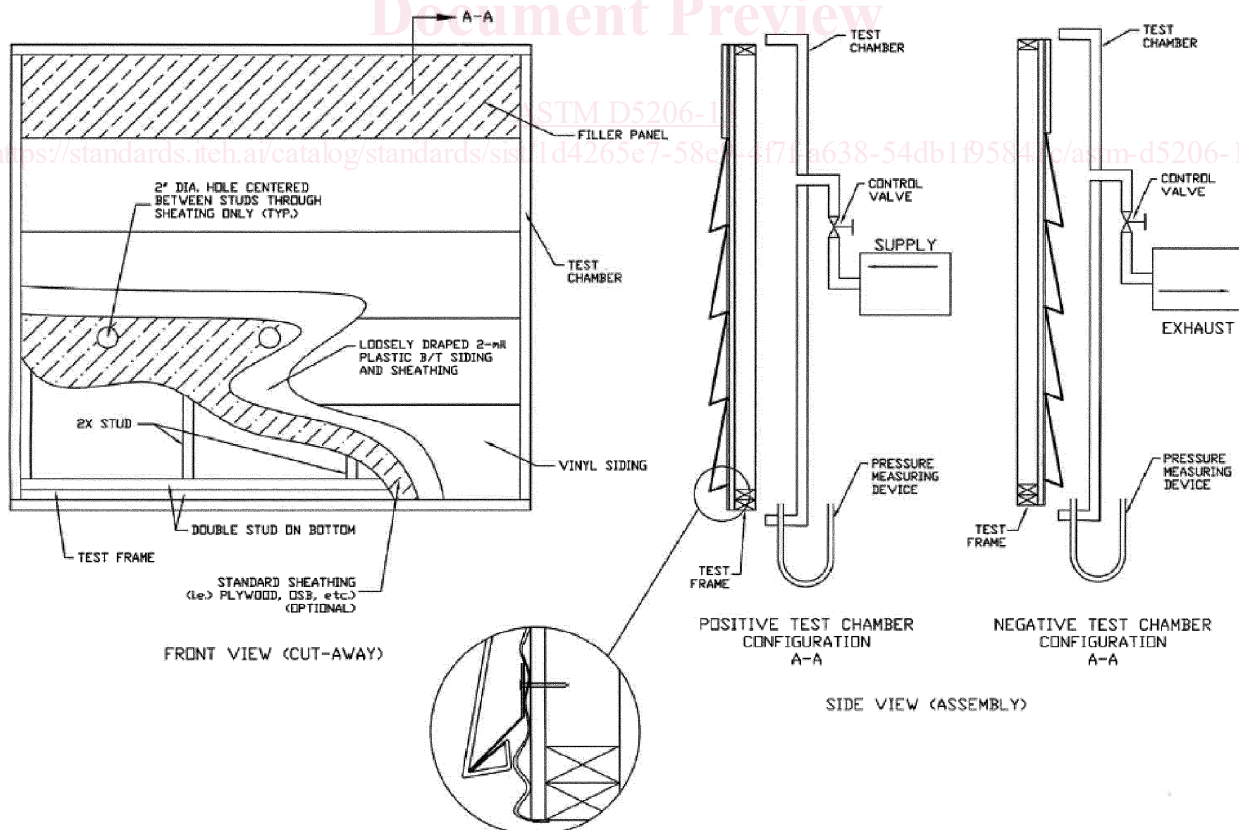


FIG. 1 Test Chamber

6.2.1 *Test Chamber*—A test chamber or box with an opening, a removable mounting panel, or one open side in which or against which the specimen is installed. Either the positive test chamber configuration or the negative test chamber configuration shall be used to perform this test. (See Fig. 1.) At least one static pressure tap shall be provided to measure the chamber pressure and shall be so located that the reading is unaffected by the velocity of the air supply to or from the chamber or any other air movement. The air supply opening into the chamber shall be arranged so that the air does not impinge directly on the test specimen with any significant velocity. A means of access into the chamber to facilitate adjustments, observations, and measurements after the specimen has been installed is permitted.

NOTE 3—The test chamber or the specimen mounting frame, or both, must not deflect under the test load in such a manner that the performance of the specimen will be affected.

6.2.2 *Air System*—A controllable blower, a compressed air supply, an exhaust system, or reversible controllable blower designed to provide the required maximum air pressure difference across the specimen. The system shall provide an essentially constant air pressure difference for the required test period.

6.2.3 *Pressure Measuring Apparatus*—A device to measure the test pressure difference within a tolerance of 62 %.

7. Safety Precautions

7.1 Take proper precautions to protect the observers in the event of any failure. At the pressures used in this test method, considerable energy and hazard are involved. In cases of failure, the hazard to personnel is less with a negative pressure configuration, as the specimen will tend to blow into the test chamber rather than out. Do not permit personnel in such chambers during tests and lockout chambers during tests.

8. Test Specimens

8.1 *Sampling*—Siding samples for test specimens shall be selected at random from production stock.

8.2 Prepare a test specimen frame to simulate construction methods that will be expected in the field. The frame shall be sized to accommodate a minimum of three stud spaces wide and a minimum of four siding panels high. Measure the nail hem thickness at a minimum of 5 locations along the nail hem prior to mounting the panel.

8.2.1 Stud spacing shall have either 16 or 24-in. (406 or 609 mm) centers in accordance with the manufacturer's fastening instructions.

8.2.2 The overall height of the test specimen frame shall be adjusted for siding panels of varying height to keep the distance between the frame and the siding at the top and bottom to a minimum and yet provide clearance between siding and frame. (See Fig. 1.)

8.3 Apply 2-mil (0.0508 mm) maximum thickness plastic film between the siding and the studs or sheathing and seal it to the perimeter of the test frame. If sheathing is applied to the exterior of the studs, 2-in. (50.8 mm) minimum diameter holes centered horizontally and vertically between studs shall be cut through the sheathing to allow pressure application to the plastic film.

8.3.1 Film application must permit full pressure load transfer to the siding test specimen and must not prevent movement or failure of the specimen. Apply film loosely with extra folds of material at each corner and at all offsets and recesses. When load is applied, there shall be no fillet caused by tightness of the plastic film.

8.4 Apply a starter strip and at least four siding panels to the test specimen frame as specified in the section on application of horizontal siding in Practice D4756 (9.1).

8.5 In cases where siding is not designed or configured for use as horizontal panels, the test structure shall be modified to provide a test exposure similar to that described in 8.2 and 8.4, with the siding installed in accordance with the manufacturers instructions.

8.6 Prepare six identical test specimens under uniform preparation conditions by experienced personnel so as to provide adequate specimens for retests or determination of ultimate test pressure (when required) in addition to static test pressure.

9. Procedure

9.1 Position a test specimen frame vertically or horizontally over the opening in the test chamber (box) so as to subject the entire test specimen to the pressure load. The orientation of the siding face will depend upon whether a positive or negative chamber configuration is used. The test configuration shall create a load on the siding in the direction that would tend to pull the siding off the wall.

9.2 Install a filler panel in the test chamber of box opening not covered by the specimen frame.

9.3 Seal all seams in the equipment and test chamber which could permit pressure leakage during the test.

9.4 *Procedure A*—Use the following procedure when a static specified pressure is to be applied to the specimens. Failure of siding specimen has occurred when any of the following criteria are present:

9.4.1 Check the specimen for proper adjustment and lockout the chamber if human entry is possible.