



Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels¹

This standard is issued under the fixed designation D7989; 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 practice establishes a method for alternative shear wall systems to compare seismic equivalency parameters (SEP) derived from cyclic in-plane racking tests to performance targets derived from tests of light-frame shear walls constructed with wood structural panel (WSP) sheathing attached to dimension lumber framing using nails.

1.2 This practice considers only the performance of shear walls subject to cyclic lateral loading, parallel to the plane of the shear wall. Design of walls with openings and performance for other wall functions, such as out-of-plane bending, combined shear and uplift, etc. are not considered.

1.3 This practice is applicable only to shear walls where all vertical-load-supporting elements are intact at the end of the in-plane lateral load test and remain capable of supporting gravity loads. Wall assemblies whose vertical-load-supporting elements buckle or otherwise become incapable of supporting gravity loads during the lateral load test are outside the scope of this practice. In addition, for bearing wall systems, this practice assumes that the shear wall system under evaluation has documented design procedures to ensure that vertical-load-supporting elements have adequate resistance to the combined effect of compression loads caused by overturning and gravity loads.

1.4 This practice does not address height limitations, detailing requirements, wall openings, derivation of design values for strength and stiffness, or other requirements and limitations that may be necessary for an alternative shear wall system. These requirements shall be provided elsewhere, such as by a suitable product standard for the alternative shear wall system.

1.5 This practice assumes that the stiffness or deformation of the alternative shear wall system can be estimated, and that design loads within a structure will be distributed among seismically equivalent wall systems based on their relative stiffness.

1.6 This practice is not intended to preclude other rational means of evaluating seismic performance.

1.7 This practice assumes that the alternative shear wall system may be used alone or in combination with wood-frame shear walls sheathed with wood structural panels.

1.8 *Units*—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.

1.9 *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.*

2. Referenced Documents

2.1 *ASTM Standards*:²

E2126 Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings

F1667 Specification for Driven Fasteners: Nails, Spikes, and Staples

2.2 *Other Documents*:

PS1-09 Structural Plywood, U.S. Department of Commerce Voluntary Product Standard

PS2-10 Performance Standard for Wood-Based Structural Use Panels, U.S. Department of Commerce Voluntary Product Standard

3. Terminology

3.1 *Definitions*—The definitions in Test Methods **E2126** also apply to this practice.

3.2 *Definitions Specific to this Practice*:

3.2.1 *aspect ratio, n*—ratio of a shear wall's height divided by its length.

¹ This test method is under the jurisdiction of ASTM Committee **D07** on Wood and is the direct responsibility of Subcommittee **D07.05** on Wood Assemblies.

Current edition approved Dec. 1, 2015. Published February 2016. DOI: 10.1520/D7989-15.

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.