



Standard Test Methods for Structural Panels in Shear Through-the-Thickness¹

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^{€1} NOTE—Metric conversions were added in 5.3 in May 2002.

1. Scope

1.1 These test methods determine the shear through-the-thickness properties of structural panels associated with shear distortion of the major axis. Structural panels in use include plywood, wafer board, oriented strand board, and composites of veneer and of wood based layers. Three test methods are included which differ somewhat in their application:

Test Method	Section
A. Small Panel Shear Test	5
B. Large Panel Shear Test	6
C. Two Rail Shear Test	7

The choice of test method will be determined in part by the purpose of the tests, characteristics of test material, and equipment availability. In general, Test Method B or C for large specimens is preferred when equipment, amount of test material, and experimental plan permit.

1.1.1 *Test Method A: Small Panel Shear Test*—This test method is suitable for testing small samples of uniform material including investigations of the effects of grain direction or orientation and of many raw materials and manufacturing process variables which influence shear properties uniformly throughout the specimen. The test method is unsuited for determining effects of grade and manufacturing features such as density variations, knots, and core gaps within the specimen.

1.1.2 *Test Method B: Large Panel Shear Test*—This test method is regarded as giving the most accurate modulus of rigidity and is therefore recommended for elastic tests of materials to be used in stress analysis studies of test structures. This test method also yields excellent shear strength values for clear material. However, in spite of the large size of the specimen, failures generally occur only in narrow zones at the perimeter of the test area. This characteristic, a result of the heavy perimeter framing, causes this test method to be generally unsuited for determining grade and manufacturing effects such as density variations, core gaps, and knots that are not uniformly distributed throughout the panel. Generally, only in

cases where effects of these factors under conditions of heavy perimeter framing are desired, should the test method be applied.

1.1.3 *Test Method C: Two-Rail Shear Test*—This test method is applicable to a wide variety of materials and problems. The specimen fabrication and test procedures are somewhat simpler than in Test Methods A and B. The specimen is free to shear parallel to its 24-in.(610-mm) length dimension anywhere within the 8-in.(203-mm) width between rails. Thus, the test method is well suited for determining grade and manufacturing effects such as core gaps and knots occupying and affecting small areas. The test method is not so ideally suited for determination of modulus of rigidity, but when adjusted for strain distribution effects, values approximating those obtained by Test Method B result. The test method simulates effects of heavy framing when expected planes of weakness are oriented perpendicular to rails and no framing at all when parallel to rails.

1.2 Significant differences, moderate to small in magnitude, among the three test methods have been found to exist when these test methods are applied to plywood of clear straight-grained veneers. Therefore, when comparisons are made among test results, it is recommended that the same test method be used throughout.

1.3 *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:

D 2395 Test Methods for Specific Gravity of Wood and Wood-Base Materials²

D 4442 Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials²

3. Significance and Use

3.1 The strength and modulus of rigidity of structural panels in shear through-the-thickness obtained by these test methods

¹ These test methods are under the jurisdiction of ASTM Committee D7 on Wood and are the direct responsibility of Subcommittee D07.03 on Panel Products.

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² *Annual Book of ASTM Standards*, Vol 04.10.