



Designation: D3043 – 17

Standard Test Methods for Structural Panels in Flexure¹

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1. Scope

1.1 These test methods determine the flexural properties of strips cut from structural panels or panels up to 4 by 8 ft in size. Structural panels in use include plywood, waferboard, oriented strand board, and composites of veneer and of wood-based layers. Four methods of tests are included:

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Method A—Center-Point Flexure Test	5
Method B—Two-Point Flexure Test	6
Method C—Large Panel Test	7
Method D—Flexure Test for Quality Assurance	8

The choice of method will be dictated by the purpose of the test, type of material, and equipment availability. All methods are applicable to material that is relatively uniform in strength and stiffness properties. Only Method C should be used to test material suspected of having strength or stiffness variations within a panel caused by density variations, knots, knot-holes, areas of distorted grain, fungal attack, or wide growth variations. However, Method B may be used to evaluate certain features such as core gaps and veneer joints in plywood panels where effects are readily projected to full panels. Method C generally is preferred where size of test material permits. Moments applied to fail specimens tested by Method A, B or D in which large deflections occur can be considerably larger than nominal. An approximate correction can be made.

1.2 *Method A, Center-Point Flexure Test*—This method is applicable to material that is uniform with respect to elastic and strength properties. Total deflection, and modulus of elasticity computed from it, include a relatively constant component attributable to shear deformation. It is well suited to investigations of many variables that influence properties uniformly throughout the panel in controlled studies and to test small, defect-free control specimens cut from large panels containing defects tested by the large-specimen method.

1.3 *Method B, Two-Point Flexure Test*—This method, like Method A, is suited to the investigation of factors that influence strength and elastic properties uniformly throughout the panel,

in controlled studies, and to testing small, defect free control specimens cut from large specimens tested by Method C. However, it may be used to determine the effects of finger joints, veneer joints and gaps, and other features which can be placed entirely between the load points and whose effects can be projected readily to full panel width. Deflection and modulus of elasticity obtained from this method are related to flexural stress only and do not contain a shear component. Significant errors in modulus of rupture can occur when nominal moment is used (see [Appendix X1](#)).

1.4 *Method C, Large Panel Test*—This method is ideally suited for evaluating effects of knots, knot-holes, areas of sloping grain, and patches for their effect on standard full-size panels. It is equally well suited for testing uniform or clear material whenever specimen size is adequate. Specimen size and span above certain minimums are quite flexible. It is preferred when equipment is available.

1.5 *Method D, Flexure Test for Quality Assurance*—This method, like Method A, is well suited to the investigation of factors that influence bending strength and stiffness properties. Also like Method A, this method uses small specimens in a center-point simple span test configuration. This method uses a span to depth ratio, specimen width, test fixture and test speed that make the method well suited for quality assurance. The method is frequently used for quality assurance testing of oriented strand board.

1.6 All methods can be used to determine modulus of elasticity with sufficient accuracy. Modulus of rupture determined by Methods A, B or D is subject to errors up to and sometimes exceeding 20 % depending upon span, loading, and deflection at failure unless moment is computed in the rigorous manner outlined in [Appendix X1](#) or corrections are made in other ways. These errors are not present in Method C.

1.7 When comparisons are desired between results of specimen groups, it is good practice to use the same method of test for all specimens, thus eliminating possible differences relative to test method.

1.8 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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

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