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Standard Test Methods for Small Clear Specimens of Timber¹

This standard is issued under the fixed designation D143; 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.

INTRODUCTION

The need to classify wood species by evaluating the physical and mechanical properties of small clear specimens has always existed. Because of the great variety of species, variability of the material, continually changing conditions of supply, many factors affecting test results, and ease of comparing variables, the need will undoubtedly continue to exist.

In the preparation of these methods for testing small clear specimens, consideration was given both to the desirability of adopting test methods that would yield results comparable to those already available and to the possibility of embodying such improvements as experience has shown desirable. In view of the many thousands of tests made under a single comprehensive plan by the U.S. Forest Service, the former Forest Products Laboratories of Canada (now FPInnovations), and other similar organizations, these test methods naturally conform closely to the methods used by those institutions. These test methods are the outgrowth of a study of both American and European experience and methods. The general adoption of these test methods will tend toward a world-wide unification of results, permitting an interchange and correlation of data, and establishing the basis for a cumulative body of fundamental information on the timber species of the world. Many of the figures in this standard use sample data and computation sheets from testing done in the 1950s and earlier. These figures remain in the standard because they are still valid depictions of the recording and plotting of test results and also provide a historical link to the large body of test data on small clear specimens already in existence for this long-standing test method.

Descriptions of some of the strength tests refer to primary methods and secondary methods. Primary methods provide for specimens of 2-in. by 2-in. (50 mm by 50 mm) cross section. This size of specimen has been extensively used for the evaluation of various mechanical and physical properties of different species of wood, and a large number of data based on this primary method have been obtained and published.

The 2-in. by 2-in. (50 mm by 50 mm) size has the advantage in that it embraces a number of growth rings, is less influenced by earlywood and latewood differences than smaller size specimens, and is large enough to represent a considerable portion of the sampled material. It is advisable to use primary method specimens wherever possible. There are circumstances, however, when it is difficult or impossible to obtain clear specimens of 2 by 2-in. cross section having the required 30 in. (760 mm) length for static bending tests. With the increasing incidence of smaller second growth trees, and the desirability in certain situations to evaluate a material which is too small to provide a 2-in. by 2-in. cross section, a secondary method which utilizes a 1-in. by 1-in. (25 mm by 25 mm) cross section has been included. This cross section is established for compression parallel to grain and static bending tests, while the 2-in. by 2-in. cross section is retained for impact bending, compression perpendicular to grain, hardness, shear parallel to grain, cleavage, and tension perpendicular to grain. Toughness and tension parallel to grain are special tests using specimens of smaller cross section.

The user is cautioned that test results between two different sizes of specimens are not necessarily directly comparable. Guidance on the effect of specimen size on a property being evaluated is beyond the scope of these test methods and should be sought elsewhere.

Where the application, measurement, or recording of load and deflection can be accomplished using electronic equipment and computerized apparatus, such devices are encouraged. It is important that all data measurement and recording equipment, whether electronic or mechanical, be accurate and reliable to the degree specified.