Designation: D 5536 – 94 (Reapproved 2004)

Standard Practice for Sampling Forest Trees for Determination of Clear Wood Properties[1]

This standard is issued under the fixed designation D 5536; 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 everyday use of wood for many different purposes creates a continual need for data on its mechanical properties. Small clear specimen testing to characterize a species has historically been employed for such property determination, and related methods of test are outlined in Methods D 143.

Because wood is a biological material, its mechanical properties are subject to considerable natural variation. Thus, the results of tests to evaluate the mechanical properties of a species depend to a great extent upon how the forest trees are sampled for test material. Ideally, if the results of mechanical property evaluations are to be representative of the forest sampled, probability sampling of materials such as outlined in Practice E 105 must be used. However, true probability sampling of the forest trees for determination of mechanical properties can be extremely complex and expensive because of the broad geographic range and topographic conditions under which a tree species grows. In some instances, direct probability sampling may be impractical, necessitating the need for alternative sampling procedures.[2, 3]

1. Scope

1.1 This practice offers two alternative physical sampling procedures: cruciform sampling and random sampling. The choice of procedure will depend upon the intended use for the test results, the resources available for sampling and testing, and the availability of existing data on the mechanical properties and specific gravity of the species of interest.

1.2 A third procedure, double sampling, is included primarily by reference. This procedure applies the results of cruciform or random samples through correlation to improve or update property values.

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:* [4]

D 143 Methods of Testing Small Clear Specimens of Timber

D 2555 Method for Establishing Clear-Wood Strength Values

E 105 Practice for Probability Sampling of Materials

3. Significance and Use

3.1 This practice covers procedures of sampling for obtaining small clear wood specimens which, when tested in accordance with Methods D 143 and, in conjunction with full-size product tests, will provide mechanical properties for use in deriving design properties for lumbar, panels, poles, house logs, and other products.

3.2 Data obtained by testing specimens sampled in accordance with these methods also provide information on the influence on mechanical properties of such factors as density, locality of growth, position in cross section, height in the tree, and moisture content.

[1] This practice is under the jurisdiction of ASTM Committee D07 on Wood and is the direct responsibility of Subcommittee D07.01 on Fundamental Test Methods and Properties.

Current edition approved May 15, 1994. Published July 1994.

[2] Bendtsen, B. A.; Freese, Frank; Ethington, R. L., "A Forest Sampling Method for Wood Strength," *Forest Products Journal*, Vol 20, No. 11, 1970, pp. 38–47.

[3] Pearson, R. G., and Williams, E. J., "A Review of Methods for Sampling of Timber," *Forest Products Journal*, Vol 8, No. 9, 1958, pp. 263–268.

[4] 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.

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