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Standard Practice for Evaluating Allowable Properties for Grades of Structural Lumber[1]

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INTRODUCTION

The mechanical properties of structural lumber depend upon natural growth characteristics and manufacturing practices. Several procedures can be used to sort lumber into property classes or stress grades, the most widely used being the visual methods outlined in Practice D 245. With each, a modulus of elasticity and a set of from one to five allowable stresses may be associated with each stress grade. The allowable stresses are extreme fiber stress in bending, tension parallel to the grain, compression parallel to the grain, shear, and compression perpendicular to the grain. This test method for evaluation of the properties of structural lumber defines an allowable property as the value of the property that would normally be published with the grade description.

This practice is useful in assessing the appropriateness of the assigned properties and for checking the effectiveness of grading procedures.

For situations where a manufactured product is sampled repeatedly or lot sizes are small, alternative test methods as described in Ref **(1)**[2] may be more applicable.

1. Scope

1.1 This practice covers sampling and analysis procedures for the investigation of specified populations of stress-graded structural lumber. Depending on the interest of the user, the population from which samples are taken may range from the lumber from a specific mill to all the lumber produced in a particular grade from a particular geographic area, during some specified interval of time. This practice generally assumes that the population is sufficiently large so that, for sampling purposes, it may be considered infinite. Where this assumption is inadequate, that is, the population is assumed finite, many of the provisions of this practice may be employed but the sampling and analysis procedure must be designed to reflect a finite population. The statistical techniques embodied in this practice provide procedures to summarize data so that logical judgments can be made. This practice does not specify the action to be taken after the results have been analyzed. The action to be taken depends on the particular requirements of the user of the product.

1.2 The values stated in inch-pound units are to be regarded as the standard.

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 198 Test Methods of Static Tests of Timber in Structural Sizes[3]

D 245 Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber[3]

D 1990 Practice for Establishing Allowable Properties for Visually-Graded Dimension Lumber from In-Grade Tests of Full-Size Specimens[3]

E 105 Practice for Probability Sampling of Materials[4]

3. Statistical Methodology

3.1 Two general analysis procedures are described under this practice, parametric and nonparametric. The parametric approach assumes a known distribution of the underlying population, an assumption which, if incorrect, may lead to

[1] This practice is under the jurisdiction of ASTM Committee D07 on Wood and is the direct responsibility of Subcommittee D07.02 on Lumber and Engineered Wood Products.

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[2] The boldface numbers in parentheses refer to the list of references at the end of this practice.

[3] *Annual Book of ASTM Standards*, Vol 04.10.

[4] *Annual Book of ASTM Standards*, Vol 14.02.

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