



Standard Test Methods for Specific Gravity of Wood and Wood-Based Materials¹

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This standard has been approved for use by agencies of the Department of Defense.

INTRODUCTION

The specific gravity is the weight of any given volume of a substance divided by the weight of an equal volume of water. As both the weight and volume of wood vary with the amount of moisture contained in the wood, specific gravity as applied to wood is an indefinite quantity unless the conditions under which it is determined are clearly specified. The specific gravity of wood is generally based on the weight when oven-dry, but the volume may be that in the oven-dry, partially dry, or green condition. The amount of moisture retained at any equilibrium condition is proportional to the dry weight of the specimen, and for this reason moisture content is normally expressed as a percent of the oven-dry weight of the wood.

1. Scope

1.1 These test methods cover the determination of the specific gravity of wood and wood-based materials to generally desired degrees of accuracy and for specimens of different sizes, shapes, and moisture content conditions. The method title is indicative of the procedures used or the specific area of use.

	Section
Method A—Volume by Measurement	6
Method B—Volume by Water Immersion	9
Method C—Flotation Tube	12
Method D—Forstner Bit	15
Method E—Increment Core	18
Method F—Chips	21

1.2 *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 9 Terminology Relating to Wood²

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

D 4444 Test methods for Use and Calibration of Hand-Held Moisture Meters²

3. Summary of Test Methods

3.1 The accuracy of the specific gravity value obtained on a representative specimen will depend upon the accuracy of the measurements made. If the specimens are carefully prepared and regular in shape, the volume determined by Method A can be quite exact. The volume of irregularly shaped specimens can best be determined by immersion in water and if due care is taken to prevent absorption of water, Method B will give results of great precision. Method C is an approximate method but a procedure that can be very useful, particularly as part of a production procedure. Methods D and E are especially adapted to gravity measurements of living trees or of in-place elements and the accuracy of the result is dependent upon the care used in obtaining the specimen. Method F is a specific procedure for wood chips.

3.2 *Conversion of Values*—It may often be desirable to convert the specific gravity obtained at one moisture content to that at some other moisture content condition. This may be approximated by the use of the chart in Fig. 1. The values of specific gravity based on oven-dry volume or volume at the current moisture content, less than the fiber saturation value, are read on the left-hand scale. The specific gravity values based on green volume are plotted on the diagonal lines. All values are based on oven-dry weight.

3.2.1 To illustrate the use of the chart, assume the specific gravity on an oven-dry weight and green volume basis is 0.55 and it is desired to find the specific gravity for a 12 % moisture content condition. Enter the chart at the 12 % moisture content

¹ These test methods are under the jurisdiction of ASTM Committee D07 on Wood and are the direct responsibility of Subcommittee D07.01 on Fundamental Test Methods and Properties.

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