



Designation: **D5795 – 95 (Reapproved 2008) D5795 – 16**

Standard Test Method for Determination of Liquid Water Absorption of Coated Hardboard Wood and Other Composite Wood Based Products Via “Cobb Ring” Apparatus¹

This standard is issued under the fixed designation D5795; 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.

1. Scope

1.1 This test method is intended to serve as a means for measurement of liquid water that passes through a wetted paint film, and which is subsequently absorbed and retained by the underlying wood or wood-based substrate. Alternative techniques for the use of the “Cobb Ring” apparatus are described.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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:*²

D9 [Terminology Relating to Wood and Wood-Based Products](#)

D16 [Terminology for Paint, Related Coatings, Materials, and Applications](#)

D1193 [Specification for Reagent Water](#)

D5235 [Test Method for Microscopic Measurement of Dry Film Thickness of Coatings on Wood Products](#)

D6132 [Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Coating Thickness Gage](#)

E177 [Practice for Use of the Terms Precision and Bias in ASTM Test Methods](#)

E691 [Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

<https://standards.iteh.ai/catalog/standards/sist/49336e74-807d-4d14-9218-68ed87795317/astm-d5795-16>

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *Cobb unit (C.U.), n*—The weight of distilled water absorbed by the underlying wood substrate in grams per 645 cm² (100 in.²) of surface area (discounting additional areas contributed by texturing or grooves) per 24-h time period.

3.1.2 *Cobb unit (C.U.) factor, n*—a dimensionless mathematical term which, for a given ring size, may be multiplied times the weight change after 24 h to calculate the Cobb unit value.

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.52 on Factory Coated Wood Products.

Current edition approved June 1, 2008; July 15, 2016. Published June 2008; October 2016. Originally approved in 1995. Last previous edition approved in 2000 as D5795 – 95 (2000); D5795 – 95 (2008). DOI: 10.1520/D5795-95R08; 10.1520/D5795-16.

² 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.

3.1.2.1 Discussion—

The C.U. factor is calculated as follows:

SI Units

$$C.U. \text{ Factor} = \frac{100}{\text{Area (ring)}} = \frac{100}{\pi r^2} \quad (1)$$

$$C.U. Factor = \frac{64516}{RingArea(mm^2)} = \frac{64516}{\pi r^2} \quad (1)$$

Imperial Units

$$C.U. Factor = \frac{100}{RingArea(in.^2)} = \frac{100}{\pi r^2} \quad (2)$$

where:

r = radius, mm (in.)

where:

r = radius

For example, for ~~101.6 mm (4 in.)~~ 100 mm (4 in.) inside diameter ring or 50

$$C.U. Factor = \frac{100}{3.14(2)^2} = \frac{100}{12.56} = 7.96 \quad (2)$$

mm (2 in.) internal radius ring:

$$C.U. Factor = \frac{64516}{3.14(50)^2} = \frac{64516}{7850} = 8.22 \quad (3)$$

3.1.3 composite wood based products, n—boards or other form of structured or decorative materials manufactured from wood fibers, flakes or strands or veneers and various resin binders. binders otherwise known as engineered wood products or wood composite.

~~3.1.3.1 Discussion~~

One example is hardboard.

~~3.1.4 hardboard—a generic term for a panel manufactured primarily from interfelted lignocellulose fibers consolidated under heat and pressures in a hot press to density of at least 31 lbs (13.95 kg) per cubic foot (cubic metre).³~~

4. Summary of Test Method

4.1 Suitable size rings of metal or plastic are adhered or clamped to the flat, coated surface of composite wood panels to be tested.

4.2 The assembly is equilibrated at a constant temperature and humidity and weighed.

4.3 The weighed assembly is placed on horizontal surface³ surface in a controlled temperature and humidity room or environmental chamber. Water is placed in the ring and left in contact with the board face for 24 h.

4.4 After 24 h the remaining water is removed from the ring, the assembly blotted dry and reweighed.

4.5 The increase in weight of the assembly due to water uptake is calculated by simple subtraction and then converted to Cobb units through the use of the C.U. factor (see 3.1.2).

5. Significance and Use

5.1 This test method provides a simple quantitative measure of water absorption by coated ~~composite wood products. Although primarily used to evaluate factory-primed composite wood products, this test method may be of service for other wood substrates and coating systems.~~ wood or wood based products.

5.2 This test method has demonstrated utility for ~~composite wood siding~~ wood or wood based products ranging in thickness from approximately ~~6.356 to 25.425~~ mm ($\frac{1}{4}$ to 1 in.). ~~Extension of this test method to wood substrates of other types and thickness may be useful.~~

5.3 Conditioning of substrate, coated sample preparation, application method, dry film thickness, cure conditions, and number of replicate specimens should be agreed upon between the purchaser and the supplier of the coating material.

5.4 Such measurements are used as indicators or predictors of the anticipated performance of coated ~~composite wood~~ wood or wood based products during exterior exposure. They may be used for developmental evaluation of coatings, substrates, or both. They may also be useful for quality control or monitoring of the production of coated ~~composite wood~~ wood and wood based products.

³ The specification of a solid, continuous horizontal surface or a discontinuous (wire rack, expanded metal, etc.) is required. Surface must be consistent from laboratory to laboratory since this can influence the rate of evaporation of moisture and, thus, retention of moisture and Cobb values.