Designation: D 1490 – 96ε1

Standard Test Method for Nonvolatile Content of Urea-Formaldehyde Resin Solutions[1]

This standard is issued under the fixed designation D 1490; 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.

ε[1] NOTE—Paragraph 3.1.1 was corrected editorially in March 1997.

1. Scope

1.1 This test method covers the determination of the apparent nonvolatile content of urea-formaldehyde resin solutions intended for use as wood adhesives. Due to the chemical nature of such resins, the nonvolatile content determined varies markedly according to the type of test used. In order to minimize this condition, this test method is designed to yield reasonably uniform agreement among different laboratories testing specimens from the same sample.

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:*

D 907 Terminology of Adhesives[2]

3. Terminology

3.1 *Definitions*—Many terms in this test method are defined in Terminology D 907.

3.1.1 *nonvolatile content, n*—the portion of a material that remains after volatile matter has been evaporated under specified ambient or accelerated conditions. (Sometimes called *solids content*.)

3.1.1.1 *Discussion*—The percentage by weight of the nonvolatile matter in an adhesive will vary depending on the analytical procedure. A standard test method must be used to obtain consistent results.

3.1.2 *solids content, n*—See *nonvolatile content*.

4. Significance and Use

4.1 Wood adhesive performance and cost is often related to the solids level (nonvolatile content).

4.2 This test method determines the apparent nonvolatile content for urea-formaldehyde resins.

5. Apparatus

5.1 *Analytical Balance*, accurate to ±1.0 mg (0.000002 lb).

5.2 *Thermometer*—A glass thermometer having a range from 0 to 110 or 150°C (32 to 230 or 302°F) and accurate to ±1°C (±2°F) at the required immersion.

5.3 *Constant-Temperature Oven*, capable of maintaining a temperature of 105 ± 1°C (221 ± 2°F) and an air turnover of 15 to 17 times per min. Use only one shelf for supporting the specimens. Position this shelf in the upper third of the oven, as near one third from the ceiling as possible. Level the shelf to within 0.025 mm (0.001 in.) from edge to edge in all directions. Place the thermometer bulb as close to the center of the shelf as possible.

5.4 *Tared Lunge Weighing Pipet*, stoppered weighing bottle, or equivalent dispenser for accurately weighing by difference.

5.5 *Drying Dishes*—Aluminum foil dishes, with 57 to 58-mm (2.25-in.) inside diameter and 17 mm (0.7 in.) deep, with flat bottoms, having a tolerance of ±0.076 mm (±0.003 in.).

5.6 *Desiccator*, with tray, containing active anhydrous calcium chloride desiccant.

6. Sampling

6.1 Take a sufficient quantity of a sample representative of the lot being evaluated to conduct the test. While the test consumes less than 10 g (0.02 lb) of sample, a sample of approximately 0.23 L (½ pt) is suggested to ensure that it is representative and will permit rechecks, if necessary.

6.2 As urea-formaldehyde resin solutions have a varying tendency toward mild settling or stratification, agitate the lot thoroughly before sampling, and mix the sample well before it is used in the test.

7. Procedure

7.1 *Preparation of Test Specimens*—Place a portion of the resin solution in the weighing dispenser and weigh to ±1 mg. Transfer a sufficient amount of the solution to yield 0.45 ± 0.05 g (0.001 lb) of dried residue, from the dispenser to a tared drying dish which has been previously dried for 1 h at 105 ± 1°C (221 ± 2°F), and cooled and held in the desiccator until

[1] This test method is under the jurisdiction of ASTM Committee D-14 on Adhesives and is the direct responsibility of Subcommittee D14.30 on Wood Adhesives.

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[2] *Annual Book of ASTM Standards*, Vol 15.06.