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An American National Standard

Standard Test Method for Weight of Wax Applied During Curtain Coating Operation[1]

This standard is issued under the fixed designation D 3708; 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 covers the determination of the weight of hot melt coating applied to corrugated board by curtain coating. It is intended to be used for routine process control in the plant.

NOTE 1—Related methods for determining the weight of wax coating include the following: Test Method D 3521; Test Method D 3522, and Test Method D 3344. [2]

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 may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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 3344 Test Method for Total Wax Content of Corrugated Paperboard[2]

D 3521 Test Method for Surface Wax Coating on Corrugated Board[2]

D 3522 Test Method for Applied Coating Wax and Impregnating (Saturating) Wax in Corrugated Board Facing[2]

3. Terminology

3.1 *Definitions:*

3.1.1 *wax loading*—the weight of wax present primarily as a surface film but including the minor part embedded in the surface fibers of corrugated board. It is expressed as weight per unit area, usually in grams per square metre or pounds per thousand square feet of board.

4. Summary of Test Method

4.1 The amount of wax applied to corrugated board by means of a curtain coater is determined by attaching a folded sheet of paper to production corrugated board, running the combination through the curtain coater, and subsequently determining the applied weight of wax on the sheet of paper.

5. Significance and Use

5.1 Wax coatings are applied to corrugated board to provide a barrier against moisture or other penetrants or to provide improved appearance or abrasion resistance. These functional properties are influenced by the amount of wax present on the surface.

5.2 During curtain coating operations, major portions of the wax will congeal on the surface, while a minor portion will penetrate and become embedded in the fibers of the facing. This method measures the total weight of wax applied to the board. The amount actually remaining on the surface of the corrugated board can be determined by Test Method D 3521.

5.3 The uniformity of application of wax film across the width of the curtain coater may also be determined using this technique by passing test combinations (blanks) under the curtain at various locations, that is, left side, center, right side.

6. Apparatus

6.1 *Sample Trimming Equipment*—A suitable trimming board or template arrangement equipped with a razor edge knife for even cutting of specimens to the required size with parallel edges.

6.2 *Measuring Rule*, steel-edged, for measuring the size of specimens to within 0.5 mm.

6.3 *Test Paper*—Any good quality typing bond with about 25 % cotton fibers approximately 200 by 300 mm (8½ by 11 in.).

6.4 *Pressure-Sensitive Tape*, to attach the test paper to the corrugated carrier board.

6.5 *Carrier Board*—Production uncoated corrugated board, not less than 450 by 750 mm (18 by 30 in.). Die cut, slotted, and printed box blanks are acceptable.

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[1] This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.10 on Properties of Petroleum Wax.

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[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.

6.6 *Analytical Balance*, capable of reproducing weighings to the nearest 0.001 g.

7. Sampling and Test Specimens

7.1 Prepare test blanks by folding the 200 by 300-mm (8½ by 11-in.) sheets of the test paper in half in the 300-mm dimension. Assure that all folded edges are approximately superimposed on each other. Crease the fold firmly with the fingers. Then place the folded sheet about in the center of a suitable piece of corrugated carrier board and tape it firmly to the board around its entire periphery with pressure-sensitive adhesive tape.

7.2 Prepare duplicate test blanks (carrier boards with attached folded sheets as described in 7.1) for each test unit. Prepare a supply of test blanks ahead of time and keep them available at the machine for determining the amount of wax applied.

NOTE 2—The test sheets do not require preconditioning since the paper is only a carrier for the wax, and variations are eliminated in the weighing procedure.

NOTE 3—If the uniformity of application of wax film across the width of the curtain coater is being checked, the folded test sheet can be placed near one of the side edges of the corrugated carrier board to cover the maximum width of curtain. In no case should the test sheet be placed closer than 150 mm (6 in.) to either side edge of the carrier board.

8. Procedure

8.1 Prepare duplicate specimens by running test blanks prepared in 7.1 through the curtain coater in rapid succession. Pass the carrier board through the curtain such that the 450-mm (18-in.) dimension of the carrier board is at right angles to the curtain.

8.2 Place the two corrugated carrier boards with their coated test specimens on a firm work table with the test specimens facing upward. Cut out exact portions of the specimens measuring 100 by 100 mm, to the nearest 0.5 mm. Use a template and cut around the periphery of the template with a razor blade, ensuring that the cut passes cleanly through both layers of folded paper. Each cut specimen consists, therefore, of a pair of 100 by 100-mm sheets, one having a wax surface and the other having no applied wax.

8.3 Determine the weights of the waxed and the unwaxed sheets.

9. Calculation

9.1 For each specimen, record the following data and calculations for the total wax coating:

$$C = 100\,(A - B) \quad (1)$$

where:

A = weight of the waxed sheet (weight of paper plus weight of applied wax), g,
B = weight of the unwaxed sheet, g, and
C = applied wax coating, $g/m^2 = 100\ (A - B)$

NOTE 4—To convert from grams per square metre to pounds per 1000 ft^2 multiply $C \times 0.205$.

10. Report

10.1 Report the weight of wax (average of duplicate specimens) in grams per square metre ($lb/1000\ ft^2$) as the total wax applied by a curtain coater.

11. Precision

11.1 The precision of this test method as determined by statistical examination of interlaboratory results is as follows:

11.1.1 *Repeatability*—The difference between two test results, obtained by the same operator with the same apparatus under constant operating conditions on identical test material would, in the long run, in the normal and correct operation of the test method, exceed 10 % of the mean only in one case in twenty.

NOTE 5—The repeatability data were obtained on test blanks to which wax was applied by a curtain coater at 35 g/m^2(7 $lb/1000\ ft^2$).

11.1.2 *Reproducibility*—Not applicable.

11.2 *Bias*—The procedure in this test method has no bias because the value of weight of wax applied can be defined only in terms of a test method.

12. Keywords

12.1 curtain coating; weight of wax