Designation: D2423 – 90 (Reapproved 2017)

Standard Test Method for Surface Wax on Waxed Paper or Paperboard[1]

This standard is issued under the fixed designation D2423; 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 determination of the weight of wax on the surface of waxed paper.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Product (Withdrawn 2010)[3]

D646 Test Method for Mass Per Unit Area of Paper and Paperboard of Aramid Papers (Basis Weight)

3. Terminology

3.1 *Definitions:*

3.1.1 *basis weight of paper, n*—basis weight is expressed in grams per square metre. In countries where the metric system is not universal, basis weight is also expressed in pounds per ream.

3.1.2 *ream of paper (news and wrapping), n*—500 sheets each 610 mm by 914 mm (24 in. by 36 in.).

3.1.2.1 *Discussion*—For factors to convert basis weight in grams per square metre to other commercial reams, see Test Method D646.

4. Summary of Test Method

4.1 The quantity of wax present as a surface film on paper or paperboard is determined through the difference in weight of specimens before and after scraping with a razor blade.

5. Significance and Use

5.1 Many of the functional properties of waxed paper and paperboard are related to the amount of wax present as a surface film. Test methods which determine wax load by solvent extraction do not differentiate between the wax present as a surface wax layer and that which has penetrated into the substrate. This test method, which mechanically removes the wax, measures the amount on each surface of the substrate.

6. Apparatus

6.1 *Pad* of paper to be used as a cushion under the waxed paper specimens during the scraping operation.

6.2 *Analytical Balance,* capable of reproducing weights to the nearest 0.001 g.

6.3 *Razor Blade,* single-edged for scraping the wax from the specimen.

6.4 *Trimming Board,* or other device for cutting paper specimens. A paper cutter having an attachment for ensuring parallelism of the opposite edge of the trimmed sheet, or a template, or a die cutter is recommended.

6.5 *Measuring Device,* capable of measuring the size of the specimen to an accuracy 0.5 mm.

7. Sampling

7.1 Select samples that are free of wrinkles, cuts, or other defects in accordance with Practice D585.

8. Procedure

8.1 Prepare a specimen consisting of a 100 mm by 100 mm square of waxed paper. Determine the area (in square millimetres) of each specimen to the nearest 1.0 % of its total area.

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[1] This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.10.0A on Physical/Chemical Properties.

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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.

[3] The last approved version of this historical standard is referenced on www.astm.org.

8.2 Weigh the specimen on the analytical balance to the nearest 0.5 % of its total weight.

8.3 Remove the surface wax from one side of the specimen (side No. 1) by scraping toward each of its four edges as follows: Hold the specimen firmly on the pad to prevent slippage. With a razor blade held vertically, scrape the entire area of one side of the specimen with repeated one-directional strokes of the blade, slightly overlapping the strokes. Rotate the specimen through 90° and repeat the scraping. Continue rotating and scraping twice more to complete the process.

8.4 Reweigh the specimen as described in 8.2. Record the weight of the specimen as the scraped basis weight side No. 1.

8.5 Remove the surface wax from side No. 2 of the specimen by scraping as described in 8.3.

8.6 Reweigh the specimen and record the weight as the scraped basis weight side No. 2.

9. Calculation

9.1 The surface wax weight is determined by weight difference. The weight of surface wax on side No. 1 of the sample is the difference between the initial weight and the scraped weight side No. 1. The weight of the surface wax on side No. 2 of the sample is the difference between the scraped weight side No. 2 and the scraped weight side No. 1. Multiply the weight in grams per square millimetre by 10^6 to convert to grams per square metre.

10. Report

10.1 Report the surface wax weight in grams per square metre. To convert from grams per square metre to pounds per ream, see Test Method D646. To obtain results in terms of pounds per 1000 ft^2, multiply the grams per square metre by 0.205.

11. Precision and Bias

NOTE 1—The precision data were obtained on five replicate specimens (in each laboratory) on samples of commercially waxed paper with a weight range of between 3.25 g/m^2 and 9.76 g/m^2 (2 lb/3000 ft^2 and 6 lb/3000 ft^2) of wax on each surface.

11.1 *Precision*—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 the following values only in one case in twenty:

$$0.976\ \text{g/m}^2\ (0.6\ \text{lb/ream}) \quad (1)$$

11.1.2 *Reproducibility*—The difference between two single and independent results obtained by different operators working in different laboratories on identical test material would, in the long run, in the normal and correct operation of the test method, exceed the following values only in one case in twenty:

$$1.46\ \text{g/m}^2\ (0.9\ \text{lb/ream}) \quad (2)$$

11.2 *Bias*—The procedure in this test method has no bias because the surface wax on waxed paper or paperboard can be defined only in terms of a test method.

12. Keywords

12.1 paper; paperboard; wax