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Standard Practice for Coating/Adhesive Weight Determination¹

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1. Scope

1.1 This practice covers a procedure for determining the amount of coating applied to a substrate, (for example, film, paper, nonwoven). The amount of coating is expressed as a weight per given area, (for example, g/m^2 , lb/ream).

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:*²

D1898 Practice for Sampling of Plastics (Withdrawn 1998)³

D4332 Practice for Conditioning Containers, Packages, or Packaging Components for Testing

3. Terminology

3.1 *coating*—a material applied to enhance the characteristics of the base substrates. For this practice, the coating must be soluble in the chosen solvent.

3.2 *ream*—500 sheets of 609.6 by 914.4 mm (24 by 36 in.) equal to 278.7 m^2 (3000 ft^2).

NOTE 1—Other ream sizes may be in use. If using a ream size other than 278.7 m^2 (3000 ft^2), the conversion factor K (located in the appendix) must be recalculated if reporting results as lb/ream .

4. Summary of Practice

4.1 Representative samples of coated material are weighed, coating is removed using a solvent appropriate for the coating, samples are dried and weighed again. The differential obtained is the coating weight.

¹ This practice is under the jurisdiction of ASTM Committee F02 on Flexible Barrier Packaging and is the direct responsibility of Subcommittee F02.20 on Physical 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.

4.2 Typical methodology is as follows:

4.2.1 Cut representative samples using a cutting device and a template of known unit area “ A ” mm^2 (in.^2), for example, 203.2 by 50.8 mm (8 by 2 in.) template.

4.2.2 Weigh each sample on the analytical balance to the nearest 0.0001 g and record the value “ W_1 .” Samples may be folded and placed on to the analytical balance.

NOTE 2—If sample is conditioned weigh immediately.

4.2.3 Using solvent in which the coating is soluble and the substrate is insoluble, remove coating from substrate. Typical methods are wiping with solvent saturated cloth, immersing samples in solvent to soften, then wiping with cloth or brush, if needed, or immersing sample, agitating to soften, then wiping with cloth or brush. For specific recommendations contact the coated substrate supplier.

NOTE 3—Accumulated coating in solvent, cloth or brush can reduce the ability to clean sample properly and may affect test results.

4.2.4 Thoroughly dry the substrate with a drying appliance. A timer should be used to ensure consistency in immersion, cleaning and drying time. Drying of hygroscopic materials should be consistent with conditioning parameters.

4.2.5 Re-weigh each sample on the analytical balance to the nearest 0.0001 g and record the value “ W_2 .”

4.2.6 Calculate and report the adhesive coat weight using the following equation:

$$\text{Adhesive Coat Weight} = \left(\frac{K (W_1 - W_2)}{AP} \right) \quad (1)$$

where:

W_1 = weight of coated substrate, g,

W_2 = weight of uncoated substrate, g,

A = area of substrate, mm^2 (in.^2),

P = fraction of substrate that is coated ($P = 1$ except for zone coated materials), and

K = constant (see below).

4.2.7 When coat weight is expressed in g/m^2 :

$$K = 1 \times 10^6 \text{ mm}^2/\text{m}^2 \quad (2)$$

4.2.8 When coat weight is expressed in lb/ream :

$$K = 952.4 \left(\frac{\text{in.}^2 \cdot \text{lb}}{\text{ream} \cdot \text{g}} \right) \quad (3)$$

NOTE 4—For explanation of how K is determined, see Appendix X1.