Designation: D 899 – 06

Standard Practice for Applied Weight Per Unit Area of Liquid Adhesive[1]

This standard is issued under the fixed designation D 899; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice provides a procedure for the estimation of the quantity of liquid adhesive applied in a spreading or coating operation.

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*—Several terms in this practice are defined in accordance with Terminology D 907.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *spreading or coating weight per unit area, n*—the total quantity of liquid adhesive uniformly applied, expressed in pounds per thousand square feet of joint or surface area. (See *spread* in Terminology D 907.)

3.2.2 *test specimen, n*—the material that is to be coated with adhesive. (See *adherend* in Terminology D 907).

3.2.3 *total quantity of liquid adhesive applied*— the weight of the adhesive on the test specimen as applied on the surface or at the glue joint, whether resulting from a single spread, a double spread, or multiple applications.

4. Significance and Use

4.1 For the bonding of adherends, the amount of adhesive present is critical and it is important to understand that this practice does not ensure sufficient adhesive is present on the adherend surface.

4.2 This practice can be used to supplement industry uses such as that of visually checking the spread or the use of mil-thickness gages.

4.3 In laboratory and industrial operations, hand or mechanical application of adhesives can be duplicated for cost savings using this practice.

5. Apparatus

5.1 The following apparatus is required for this practice:

5.1.1 *A balance*, capable of weighing the material accurately to the nearest 1 %, and

5.1.2 *A suitable instrument* for measuring the linear dimensions of the specimens to the nearest 1 %.

6. Test Specimens

6.1 Select test specimens from portions of the actual material to be coated or spread, or from the same lot or a similar one, having the same physical characteristics such as thickness, density, or texture.

6.2 The size of the specimen may vary with the nature of the substrate.

NOTE 1—Materials of low porosity normally require larger test specimens than materials of high porosity.

6.3 Use simple geometric shapes for the test specimens to facilitate precise measurement of dimensions.

6.4 For operations involving the coating or spreading of sheeted stock, individual plies or lamina of the adherend, a minimum of 5 test specimens is required for determining the average weight of liquid adhesive applied.

6.5 For operations where the test specimen is in continuous form, such as roll stock of paper or fabric, use a test specimen sufficient in size to reflect accurately the average spreading or coating weight of liquid adhesive.

7. Conditioning

7.1 Prior to the application of the adhesive, bring the test specimens to equilibrium with the atmospheric conditions prevailing under actual or contemplated operational use.

8. Procedure

8.1 Determine the linear dimensions of the test specimens and calculate their areas to an accuracy of 1 %. Determine the weight of the test specimens to the nearest 1 %.

8.2 Apply the adhesive to the test specimens in accordance

---

[1] This practice is under the jurisdiction of ASTM Committee D-14 on Adhesives and is the direct responsibility of Subcommittee D14.10 on Working Properties.

Current edition approved May 10, 2006. Published August 2006. Originally published as D 899 – 47 T. Last previous edition D 899 – 00.

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

with the procedure recommended by the manufacturer, and reweigh the specimens immediately.

8.3 Use only test specimens reflecting a normal uniform application of adhesive (by visual inspection) in calculating the weight of liquid adhesive applied.

9. Calculation

9.1 Calculate the weight of liquid adhesive applied as follows:

When W_2 and W_1 are expressed in grams:

$$S = [(W_2 - W_1) \times 317.5]/(N \times A) \quad (1)$$

When W_2 and W_1 are expressed in ounces:

$$S = [(W_2 - W_1) \times 9000]/(N \times A) \quad (2)$$

where:

S = weight of liquid adhesive applied, expressed in pounds per thousand square feet of joint or surface area,

W_2 = weight of specimen immediately after application of the adhesive,

W_1 = weight of specimen before applying the adhesive,

A = area of test specimen in square inches, and

N = number of surfaces spread.

NOTE 2—For bonding operations where both contacting surfaces of the joint are spread with adhesive, the formulas above should be used for each surface spread and the combined weight shall equal the total weight of adhesive applied.

10. Report

10.1 Report the following information:

10.1.1 Complete identification of the adhesive applied,

10.1.2 Method of applying adhesive,

10.1.3 Complete description of the adherend test specimens (composition or type, moisture content, size, source, etc.)

10.1.4 Number of test specimens used (or total area of test specimens if from a continuous operation) and calculated weight of adhesive applied to each specimen,

10.1.5 The average calculated weight of the liquid adhesive applied per thousand square feet of surface of joint area, and

10.1.6 Any qualifying remarks concerning the test procedure.

11. Keywords

11.1 coating weight; spread weight