Designation: D1874 – 16

Standard Specification for Water- or Solvent-Soluble Liquid Adhesives for Automatic Machine Sealing of Top Flaps of Fiberboard Shipping Cases[1]

This standard is issued under the fixed designation D1874; 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 specification covers starch, dextrin, casein, resin base, and other liquid adhesives (excepting pressure-sensitive types) used for sealing the top flaps of fiberboard shipping cases. It includes provisions for adhesive selection based on: (*1*) satisfactory machining characteristics on specific equipment, and (*2*) adequate adhesion under specified storage conditions. This specification further provides for the control of uniformity between lots of an adhesive selected on the above bases by limiting variations in nonvolatile content and viscosity.

1.2 This specification provides bases for adhesive selection as well as product uniformity control. Test methods are specified for measuring (*1*) nonvolatile content, (*2*) consistency, and (*3*) bonding permanency under specified storage conditions.

1.3 The values stated in acceptable metric units are to be regarded as the standard. The values given in parentheses are provided for information purposes only.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D907 Terminology of Adhesives

D1084 Test Methods for Viscosity of Adhesives

D1489 Test Method for Nonvolatile Content of Aqueous Adhesives

D1581 Method of Test for Bonding Permanency of Water- or Solvent-Soluble Liquid Adhesives for Labeling Glass Bottles (Withdrawn 1991)[3]

D1714 Test Method for Water Absorptiveness of Fiberboard Specimens for Adhesives (Withdrawn 1990)[3]

3. Terminology

3.1 Many terms in this specification are defined in Terminology D907.

4. Physical Properties

4.1 The general consistency shall be uniform, and the adhesive shall be free of lumps and particles.

4.2 The machining properties shall be such that the adhesive (when diluted in accordance with to the manufacturer's instructions) shall not string when machine transfer surfaces are separated, shall not build up excessively on machine parts, and shall not foam.

4.3 The bonding permanency of the adhesive shall provide a minimum of 75 % paper fiber tear when tested under the exposure conditions specified in the contract or purchase order. The exposure conditions shall be selected from those in Table 1 of Test Method D1581.

5. Permissible Variations

5.1 The nonvolatile content of the adhesive shall be within ±1.5 % of that specified in the contract or purchase order.

5.2 The consistency of the adhesive shall be within ±20 % of that specified in the contract or purchase order.

6. Sampling

6.1 The adhesive sample shall be a 0.9-L (1-qt) aliquot consisting of a composite taken when possible from three or more separate containers chosen at random. Samples also shall be taken from containers that appear to be nonrepresentative and shall be tested separately. Before a sample is withdrawn, mix the contents in the container to uniform consistency. Place the sample immediately in an airtight glass jar until tested.

6.2 Samples of adhesives used on fiberboard cases shall be of the same type used on the production line. Samples of boards used for all bonding permanency tests shall be within a defined range of water absorptiveness to eliminate this variable

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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.

from the test. The specific range shall be selected by the purchaser and shall be based upon the adhesive for shipping cases used on the production line.

6.3 Test a minimum of six board or board-facing materials samples in selecting the sample for each adhesion study. Reject samples that fail to fall within ±50 % of the selected water absorptiveness values.

6.4 Condition samples at 23 ± 1°C (73.4 ± 1.8°F) and 50 ± 2 % relative humidity prior to each adhesion test to ensure uniformity.

7. Test Methods

7.1 *Nonvolatile Content*—Test Method D1489.

7.2 *Consistency*—Method B (rotational viscometer) or Method C (Stormer viscometer) of Test Methods D1084.

7.3 *Bonding Permanency*—Test Method D1581.

7.4 *Water Absorptiveness*—Test Method D1714.

8. Number of Tests

8.1 The number of test specimens shall be as specified in each method of test designated in Section 7. The average result for the specimens tested shall conform to the requirements prescribed in this specification.

9. Retest and Rejection

9.1 If the results of any test do not conform to the requirements prescribed in this specification, at the option of the manufacturer, that test shall be repeated on two additional sets of specimens from the same lot of adhesive, each of which shall conform to the requirements specified. If either of these two additional sets of specimens fails, the lot or batch of material may be rejected at the option of the purchaser. Notice of failure of material based on tests made in accordance with this specification shall be reported to the manufacturer.

10. Packaging and Marking

10.1 *Packaging*—The material shall be packaged in standard commercial containers, so constructed as to ensure acceptance by common or other carrier for safe transportation at the lowest rate to the point of delivery, unless otherwise specified in the contract or order.

10.2 *Marking*—Shipping containers shall be marked with the following information:

10.2.1 Manufacturer's name, product code number, and batch or lot number,

10.2.2 Date of manufacture of product,

10.2.3 Special handling instructions during product transfer, for example, "Ship in heated transfer," and

10.2.4 Special precautions required because of product toxicity, flammability, or such information pertinent to the proper handling and storage of the product.

11. Keywords

11.1 adhesives; automatic machine sealing; rotational viscometer; solvent soluble; stormer viscometer; top flaps; viscosity; water soluble