



Designation: D 4500 – 95

Standard Test Method for Determining Grit, Lumps, or Undissolved Matter in Water- Borne Adhesives¹

This standard is issued under the fixed designation D 4500; 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 test method covers the determination of grit, lumps, or undissolved matter in water-borne adhesives such as starch, dextrin, casein, resin base, and other liquid adhesives, excluding mastics and pressure sensitive adhesives. It is intended to replace Federal Standard 175A Method 4041.

1.2 The values stated in inch-pound units are to be regarded as the 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.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 907 Terminology of Adhesives²

D 3460 Specification for White Watermarked and Unwatermarked Bond, Mimeo, Spirit Duplicator, Xerographic, and Laser Printer Cut-Sized Office Papers³

3. Terminology

3.1 *Definitions*—Many of the terms in this test method are defined in Terminology D 907.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *grit*—particles detectable by touch as described in this test method that may be irregular in shape, abrasive, and/or resistant to disintegration; and may or may not be foreign to the adhesive system in which they are found.

4. Summary of Test Method

4.1 White bond paper is coated with a liquid adhesive which is pressed into contact with a glass plate surface to observe for grit, lumps, or undissolved matter in the adhesive.

5. Significance and Use

5.1 This test method determines the presence of gross particulates in an adhesive sample. It is useful for the control of uniformity between lots of an adhesive.

6. Apparatus

6.1 *White Bond Paper*—Sufficient quantity of white bond paper conforming to Grade No. 1, Type I of Specification D 3460.

6.2 *Glass Panels*—Clean and of suitable dimensions.

6.3 *Roller*—A steel roller,⁴ 3.25 ± 0.1 in. (82.5 ± 2.5 mm) in diameter and 1.75 ± 0.05 in. (44.4 ± 1.1 mm) in width covered with rubber approximately 0.25 in. (6 mm) in thickness, having a Shore scale A durometer hardness of 80 ± 5 . The surface of the roller is to be a true cylinder, void of concave or convex deviations. The mass of the roller is to be 4.5 ± 0.1 lb. (2041 ± 45 g).

7. Sampling

7.1 Unless otherwise specified in the material specification, test three specimens from each adhesive sample.

8. Test Specimen

8.1 Unless otherwise specified in the material specification, use a test specimen which weighs approximately 10 g.

9. Procedure

9.1 Obtain an adhesive sample and mix according to the manufacturer's recommendations. Using any convenient technique, cover the white bond paper by applying the adhesive at a thickness recommended by the manufacturer or selected by the user. Immediately lay the sheet face down on a glass panel and roll with the roller sufficiently to eliminate air bubbles and wrinkling. Using hand pressure, feel the exposed side of the paper carefully to determine any unevenness caused by grit or undissolved matter.

10. Report

10.1 The report shall include the following information:

¹ This test method 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 March 15, 1995. Published May 1995. Originally published as D 4500 – 85. Last previous edition D 4500 – 94.

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

³ *Annual Book of ASTM Standards*, Vol 15.09.

⁴ The roller available from The Pressure Sensitive Tape Council, 104 Wilmot Rd., Suite 201, Deerfield, IL 60015, has been found suitable.



D 4500

10.1.1 Complete identification of the material tested, including form, type, source, manufacturer's code number, etc.

10.1.2 Thickness of the adhesive as applied.

10.1.3 Presence and extent of grit, lumps, and undissolved matter.

10.1.4 Surface area tested and the number of lumps in the paper caused by grit or undissolved matter.

10.1.5 Number of tests conducted.

11. Precision and Bias

11.1 No statement of precision and bias is possible, because number of defects per unit weight of adhesive is not determined in this test method.

12. Keywords

12.1 grit; gross particulates; lumps; undissolved matter; water-borne adhesive

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

This standard is copyrighted by ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (<http://www.astm.org>).