Designation: F 509 – 86 (Reapproved 2004)

# Standard Practice for Testing One-Time Carbonizing Tissue for Pinholes[1]

This standard is issued under the fixed designation F 509; 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 practice covers the determination of the existence of pinholes in one-time carbonizing tissues.

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 whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 *ASTM Standards:* [2]

D 585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Products

F 221 Terminology Relating to Carbon Paper and Inked Ribbon Products and Images Made Therefrom

## 3. Terminology

3.1 *Definitions*—For other definitions relating to carbon paper and inked ribbon products, see Terminology F 221.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *carbonizing bond*—a white opaque paper that is used for one-time carbon ink coatings.

3.2.2 *control one-time carbon tissue*—a tissue that is of known quality and performance for one-time carbon ink coatings.

3.2.3 *one-time carbonizing tissue*—a tissue that is used for one-time carbon ink coatings.

3.2.4 *pinhole*—an opening in the carbon tissue that permits the coating to penetrate through to the uncoated side.

## 4. Summary of Practice

4.1 Across-the-web samples are taken from the outside wraps of a roll of tissue and 4.25 by 11.00-in. (107.9 by 279.4-mm) test specimens are cut from these samples so that their length is parallel to the cross direction. The specimens are identified and checked for ink penetration using special test ink, a draw-down rod instrument and special receptor paper on which a lined rectangular pattern is drawn. The same check is repeated with an acceptable control tissue and the test results from the specimens and the control are compared visually, using the rectangular area.

## 5. Significance and Use

5.1 This practice is to be used to provide a visual means of determining the existence of pinholes by penetration of a dye solution through the pinhole into a white receptor paper.

5.2 The practice is suitable for manufacturing control and will give close correlation with the end product.

5.3 This practice is suitable for comparative service evaluation and development.

5.4 The initial appearance will change with time due to continued migration of dye solution into the receptor paper and the size of the colored areas will not represent the actual size of the pinholes through which the solution was exuded.

## 6. Apparatus

6.1 *Weight*, 2-lb (907-g).

6.2 *Draw-Down Rod Instrument* (see Fig. 1).

6.3 *Paper Cutter*, 18 by 18-in. (457.2 by 457.2-mm), that has an attachment for ensuring parallelism of opposite edges.

## 7. Reagents and Materials

7.1 *Test Ink*—The test ink is a solution of 33 % methylviolet base "B" in Oleic Acid.

7.2 *Pad*—A minimum of ten sheets of white forms bond paper.

7.3 *Control Carbon Tissue* (3.2), 4.25 by 11.00-in. (107.9 by 279.4-mm) sheets, of the same type, grade, and basis weight as the test specimens.

7.4 *Special Receptor Paper* (3.1), 8.5 by 11.0-in. (215.9 by 279.4-mm), 12 lb (17 x 22 – 500 or 45.1 g/m$^2$) white, coated, pigmented carbonizing bond for receiving dye solution transferred through tissue. A rectangular-lined area 2.5 by 8 in. (63.5 by 203.2 mm) is ruled in the center of the sheet.

7.5 *Tissue Specimens* (See 7.3), 4.25 by 11-in. (107.9 by 279.4-mm).

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[1] This practice is under the jurisdiction of ASTM Committee F05 on Business Imaging Products and is the direct responsibility of Subcommittee F05.02 on Inked Transfer Imaging Products.

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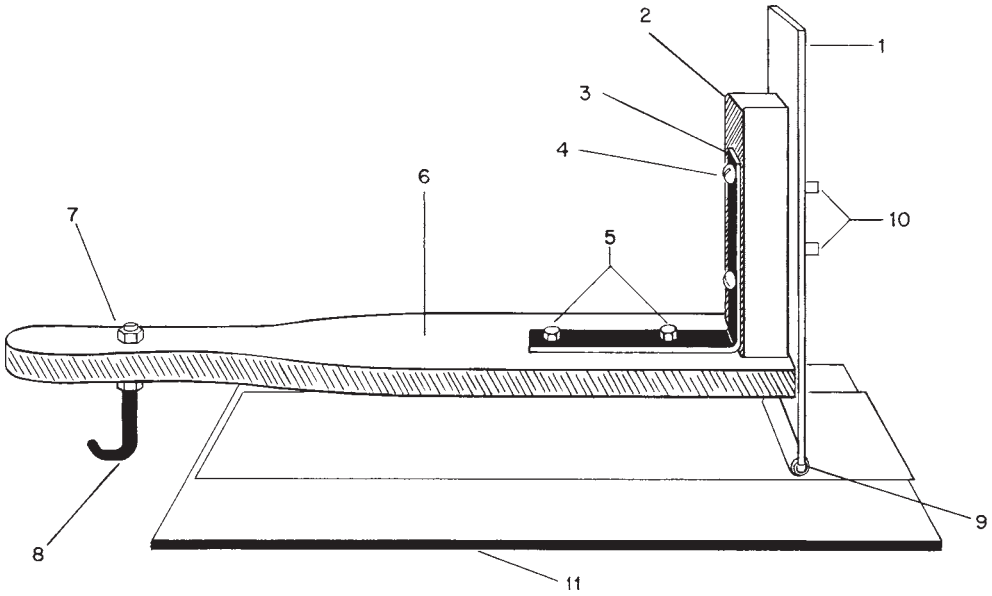
[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.




NOTE 1—The overall weight of the instrument should be 4.00 ± 0.25 lb (1.81 ± 0.11 kg), and the hook bolt should be long enough to adjust the handle level with the surface.

*1) Sheet Metal Plate*—Brass, 3.0 by 6.5 by 3.2 in. (76.2 by 165.1 by 3.2 mm)

*2) Weight*—3-lb (1.36-kg) steel block, 2.75 by 4.00 by 0.88 in. (69.9 by 101.6 by 22.2 mm), drilled and tapped to accommodate socket-head and round-head machine screws.

*3) Right-Angle Bracket,* 3.0 by 0.5 in. (76.2 by 6.4 mm) wide.

*4) Round-Heat Machine Screws,* 2

*5) Round-Head Wood Screws,* 4.

*6) Wooden Handle,* 3.00 by 12.25 by 0.50 in. (76.2 by 311.2 by 12.7 mm), shaped as shown.

*7) Nuts,* 2.

*8) Hook Bolt.*

9) *Stainless Steel Rod,* 3⁄16 in. (4.8 mm) in diameter, by 3.0 in. (76.2 mm) long. Cut to length and silver-solder to brass plate above.

*10) Socket-Head Machine Screws,* 2.

*11) Pad of Paper*—Forms bond.

**FIG. 1 Draw-Down Rod Instrument**

## 8. Sampling

8.1 The material shall be sampled in accordance with Methods D 585.

## 9. Test Specimens

9.1 Representative samples, 4.25 by 11.00-in. (107.9 by 279.4-mm) with the 11.0-in. (279.4-mm) side parallel to the

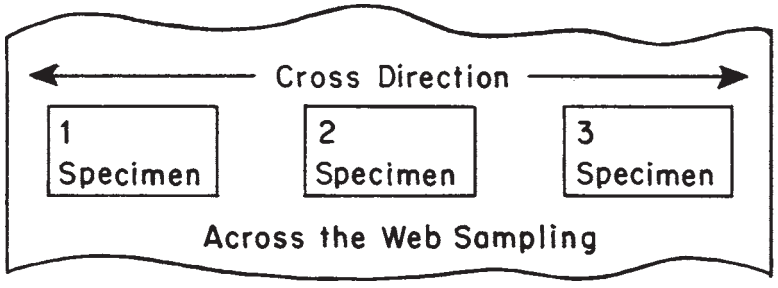



**FIG. 2 Sample and Test Specimens**

cross direction, shall be cut from an across-the-web sampling so that they are representative of the full width of the roll of tissue (Fig. 2). The number of specimens taken shall be determined by the width of the roll. Avoid folds, creases, or punctures that would permit the dye solution to penetrate through the tissue.

## 10. Calibration

10.1 No calibration is required.

## 11. Conditioning

11.1 It is not necessary to condition the paper or perform the test at standard humidity and temperature.

## 12. Procedure

12.1 Obtain the specimens as described in 8.1 and 9.1, and identify them in the position across the web.

12.2 Place the pad of forms bond paper on a hard surface and place the receptor paper with ruled rectangular pattern side up, on top of the pad.

12.3 Place the tissue specimen, wire side up, on the receptor paper so that it covers the 2.5 by 8.0-in. (63.5 by 203.2-mm) ruled pattern and overlaps slightly at the bottom.

12.4 Secure the top of the tissue specimen to the receptor paper with a 2-lb (0.9-kg) weight and insert a sheet of forms bond paper under the portion of the tissue that overlaps the bottom of the test form so as to catch any excess ink.

12.5 Place dye solution on the specimen tissue immediately above the ruled pattern outlined on the receptor paper in sufficient quantity to be drawn down the full width of the rod and the length of the paper.

12.6 Place the draw-down rod instrument on the tissue with the rod close to the 2-lb (0.9-kg) weight and hook off the pad on the surface of the table. The ink should be in position between the rod and the lined pattern on the receptor paper.

12.7 Draw ink down the full length of specimen over the lined pattern using the draw-down rod instrument with a smooth steady motion and then remove the specimen from the test form to prevent additional bleed-through due to excessive contact time.

12.7.1 *Do not* apply any downward pressure when using the draw-down rod.

12.7.2 Make sure the hook is off the pad of paper, and the handle is parallel to the pad of paper; if not, adjust the hook to assure parallelism.

12.7.3 Total time for draw down shall be 2 s.

12.7.4 Remove the tissue from receptor within 1 to 2 s.

12.8 Repeat the procedure on the remaining tissue specimens and also on the control tissue, using a separate receptor paper for each tissue.

## 13. Interpretation of Results

13.1 Inspect the receptor papers for ink penetration and visually compare the test results of the specimens with the control. Compare the tissue test specimen to the control tissue with respect to both pinhole size and frequency to determine whether the specimen has pinholes to a similar, lesser, or greater degree.

13.2 The size, number, and distribution of the dye solution received on the special test paper does not indicate the pinholes in the tissues are the same size as the colored spots. The spots are an amplification of the actual pinhole diameter caused by migration of the dye solution on the coated test paper.

## 14. Precision and Bias

14.1 Repeatable ranking order is obtained that is reproducible within a laboratory and between laboratories. This test is a comparative test, is subjective, and no quantitative data are intended.

## 15. Keywords

15.1 carbon tissue; carbonizing tissue; pinholes