



Standard Test Method for Surface Strength of Paper (Wax Pick Method)¹

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1. Scope

1.1 This test method covers uncoated and coated papers. It is designed to measure the surface strength of paper or its resistance to picking. It is not applicable to loosely felted papers such as blotters or roofing felts, nor to some coated papers containing thermoplastic resins in the coating adhesive.

1.2 This test method is technically similar to TAPPI T 459.

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 585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Products²

D 685 Practice for Conditioning Paper and Paper Products for Testing²

D 1968 Terminology Relating to Paper and Paper Products²

2.2 TAPPI Documents:

T 459 Surface Strength of Paper (Wax Pick Test)³

Collaborative Reference Program for Paper³

3. Terminology

3.1 **Definitions**—Definitions shall be in accordance with Terminology D 1968 and the *Dictionary of Paper*.³

4. Summary of Test Method

4.1 In this test method, calibrated sealing waxes with increasing adhesive power are pulled from the surface of the specimens. The highest number of the wax in the series that does not disturb the surface of the paper is the numerical rating of the pick.

5. Significance and Use

5.1 Many printing and converting operations require the surfaces of the paper to have sufficient transverse strength to give satisfactory results. Since no absolute values are obtained with this test method, test results should be correlated with actual performance of the material during the subsequent coating, converting, printing, or packaging operation.⁴

5.2 For coated paper, where a significant portion of the casein or starch coating adhesive has been replaced with a thermoplastic resin, there is very little, if any, correlation between printing press performance and wax test results. The molten wax forms a stronger bond with the coating containing thermoplastic resin and the resulting pick causes the paper to appear weak, when in fact it is not.

5.2.1 For those sheets containing latex and similar substances, a more direct method employing the actual medium to be applied is recommended.

6. Apparatus

6.1 **Heating Device**, such as a bunsen burner, alcohol lamp, propane torch, or electric heat element.

6.2 **Wooden Block**, approximately 90 by 40 by 10 mm (3½ by 1½ by ¾ in.) having a 30-mm (1¼-in.) diameter hole with an edge approximately 3 mm (⅜ in.) from one end.

6.3 **Work Surface**, smooth, hard, and a poor conductor of heat, such as wood. (Glass, metal, or artificially cooled surfaces are unsuitable.)

7. Materials

7.1 **Waxes**—A series of hard-resin, non-oily waxes numbered respectively from 2A to 26A. Each wax is made up in accordance with a specific formula and molded in stick form with a cross-sectional area of 18 by 18 mm (⅞ by ⅞ in.). Each higher numbered wax in the series is more adhesive than the previous one.

8. Sampling and Test Specimens

8.1 Select a number of specimens, usually 10, each 100 by 100 mm (4 by 4 in.) or larger, from each test unit of a sample

¹ This test method is under the jurisdiction of ASTM Committee D06 on Paper and Paper Products and is the direct responsibility of Subcommittee D06.92 on Test Methods.

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² *Annual Book of ASTM Standards*, Vol 15.09.

³ Available from the Technical Association of the Pulp and Paper Industry, P.O. Box 105113, Atlanta, GA 30348.

⁴ Kirkpatrick, W. A., "The Use of Waxes and Case Testing Ink in Testing Printing Papers," *Paper Trade Journal*, PTJOA, Vol 109, No. 12, pp 36–38; *Technical Association Papers*, Vol 22, pp 322–324.