

TAPPI/ANSI T 459 om-13



TENTATIVE STANDARD – 1942
SUGGESTED METHOD – 1965
OFFICIAL STANDARD – 1975
OFFICIAL TEST METHOD – 1983
REVISED – 1988
REVISED – 1993
REVISED – 1993
REVISED – 2003
REAFFIRMED – 2008
REVISED – 2013
©2013 TAPPI

The information and data contained in this document were prepared by a technical committee of the Association. The committee and the Association assume no liability or responsibility in connection with the use of such information or data, including but not limited to any liability under patent, copyright, or trade secret laws. The user is responsible for determining that this document is the most recent edition published.

CAUTION:

This Test Method may include safety precautions which are believed to be appropriate at the time of publication of the method. The intent of these is to alert the user of the method to safety issues related to such use. The user is responsible for determining that the safety precautions are complete and are appropriate to their use of the method, and for ensuring that suitable safety practices have not changed since publication of the method. This method may require the use, disposal, or both, of chemicals which may present serious health hazards to humans. Procedures for the handling of such substances are set forth on Material Safety Data Sheets which must be developed by all manufacturers and importers of potentially hazardous chemicals and maintained by all distributors of potentially hazardous chemicals. Prior to the use of this method, the user must determine whether any of the chemicals to be used or disposed of are potentially hazardous and, if so, must follow strictly the procedures specified by both the manufacturer, as well as local, state, and federal authorities for safe use and disposal of these chemicals.

Surface strength of paper (wax pick test)

1. Scope

This method, applicable to uncoated and coated papers, 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 papers containing materials that soften with heat such as waxes or latex type additives. Light weight papers that lack stiffness may slip under the block during the wax removal step are not suitable for testing by this procedure.

2. Summary

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

3. Significance

3.1 Many printing and converting operations require the surfaces of the paper to have sufficient z-direction strength to give satisfactory results. Since no absolute values are obtained with this method, test results should be correlated with actual performance of the material during the subsequent coating, converting, printing or packaging operation (1).

3.2 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.

Approved by the Standard Specific Interest Group for this Test Method



Documents

Document Sharing Hub

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.

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

4. Definitions

4.1 *Pick*. A pick occurs when the surface of the paper specimen blisters, breaks, or lifts and/or paper or coating substance adheres to the surface of the wax.

4.2 *Critical wax strength number*, the average highest numerical designation of the wax that does not disturb the surface of the paper.

5. Apparatus

5.1 *Heating device*, such as: Bunsen burner, alcohol lamp, propane torch, or electric heat element.

5.2 *Wooden block*, about $90 \times 40 \times 10$ mm ($3\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{8}$ in.) having a 30 mm ($1\frac{1}{4}$ in.) diameter hole with an edge about 3 mm ($\frac{1}{8}$ in.) from one end.

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

6. Materials

*Waxes*¹, a series of hard-resin, non-oily waxes numbered respectively from 2A to 26A. Each wax is made up according to a specific formula and molded to stick form with a cross-sectional area of 18×18 mm ($\frac{11}{16} \times \frac{11}{16}$ in.). Each higher numbered wax in the series is more adhesive than the previous one.

CAUTION: This method involves the use of molten wax. Thus extreme caution should be exercised to avoid the potential of severe burns.

7. Safety

This method involves the use of molten wax. Thus extreme caution should be exercised to avoid the potential of severe burns. The heating procedure may involve the use of an open flame. Be cautious of flammable material in the proximity the flame.

8. Calibration

The sealing wax sticks used in this method are calibrated by the manufacturer against retained wax sticks and paper standards. Not only does each wax stick equal the corresponding standard stick, but each will effectively distinguish the surface strength when compared with adjacent wax numbered sticks. The tester can calibrate any series of wax sticks by noting whether the surface is progressively more ruptured with ascending wax stick numbers and by checking new boxes of waxes against retained wax sticks and/or paper standards.

9. Sampling and test specimens

9.1 Select a number of specimens, usually 10, each 100×100 mm (4×4 in.) or larger, from each test unit of a sample of paper obtained in accordance with TAPPI T 400 "Sampling and Accepting a Single Lot of Paper, Paperboard, Containerboard, or Related Product," so that five replicate critical waxes may be determined for each tested surface (wire and felt).

¹Names of suppliers of testing equipment and materials for this method may be found on the Test Equipment Suppliers list, available as part of the CD or printed set of Standards, or on the TAPPI website general Standards page.