



Standard Test Method for Petroleum Wax in Paper¹

This standard is issued under the fixed designation D 590; 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 determines quantitatively the total amount of petroleum wax in wax-impregnated papers, including papers referred to as “dry waxed” or simply “waxed” papers, and paper products made from such papers.

1.2 This test method is not intended for use with wax-sized papers, because these generally contain such quantities of rosin or other materials soluble under the conditions of this test method, or both, that the accuracy for quantitatively measuring wax is seriously impaired.

1.3 This test method does not differentiate between “surface wax” and “total wax.” It measures the total amount of wax materials extracted under the conditions specified.

1.4 *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.* Specific precautionary statements are given in Section 8.

2. Referenced Documents

2.1 ASTM Standards:

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

D 685 Practice for Conditioning Paper and Paper Products for Testing²

D 1968 Terminology Relating to Paper and Paper Products²

E 122 Practice for Calculating Sample Size to Estimate, with a Specified Tolerable Error, the Average for a Characteristic of a Lot or Process³

2.2 TAPPI Standard:

T 208 Test method for moisture in paper by toluene distillation⁴

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 *Annual Book of ASTM Standards*, Vol 14.02.

⁴ Available from Technical Association of the Pulp and Paper Industry, Technology Park/Atlanta, PO Box 105113, Atlanta, GA 30348.

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology D 1986 or the *Dictionary of Paper*.⁵

4. Summary of Test Method

4.1 The wax is extracted from a test specimen using a Soxhlet-type extraction assembly and toluene as the extraction solvent. The solvent is evaporated, and the extracted wax or the extracted specimen, or both, are dried at 105°C and then weighed. The percentage of wax present is calculated based on the dry weight of the extracted wax or the dry weight of the extracted specimen and either the dry sample weight or a conditioned sample weight basis, as agreed upon between the users of this test method.

5. Significance and Use

5.1 The percentage of wax present in wax-impregnated papers may be an indicator of the degree to which these papers resist penetration of aqueous liquids.

6. Apparatus

6.1 *Extraction Assembly*—Either of the following styles of extraction assembly are suitable for performing this test method.

6.1.1 *Soxhlet Extraction Apparatus*—Consisting of the widely recognized Soxhlet glassware assembly, including a Soxhlet extraction tube, pure cellulose extraction thimble, condenser, solvent reservoir, and in addition, an electric heating mantle, and variable power source. Such equipment is in general use and available from numerous suppliers of laboratory glassware and apparatus.

6.1.2 *High-Efficiency Extraction Assembly*—One such assembly found satisfactory is the Soxtec System HT®.⁶ Other similar high-efficiency extraction assemblies may also be suitable and may be used as described in 11.6 and 11.7.

⁵ Formerly published by American Paper and Pulp Assoc. (currently API), New York, NY.

⁶ The Soxtec System HT® is manufactured by Tecator, Hoganas, Sweden, and may be purchased in the United States through Fisher Scientific.