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Standard Test Method for Melting Point of Waxes[1]

This standard is issued under the fixed designation F 766; 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.

ε[1] NOTE—Keywords were added in February 2000.

1. Scope

1.1 This test method covers the determination of the initial and final melting points and recovery point of waxes using a hot stage and microscope.

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 the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* See Section 8 for a specific precautionary statement.

2. Referenced Documents

2.1 *ASTM Standards:*

E 105 Practice for Probability Sampling of Materials[2]

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process[2]

3. Descriptions of Terms Specific to This Standard

3.1 *initial melting point*—the temperature in degrees celsius observed on the hot-stage thermometer at the time the first movement is noted in the wax.

3.2 *final melting point*—the temperature in degrees celsius observed on the hot-stage thermometer at the time the wax is completely melted into droplets.

3.3 *recovery point*— the temperature in degrees celsius observed on the hot-stage thermometer at the time the first crystal is observed forming in the melted wax during cooling.

4. Summary of Test Method

4.1 A few shavings or granules from representative wax sample are placed on a microscope slide and covered with a cover glass. The slide assembly is set up on the hot stage with the microscope lighted and focused for best viewing. The hot stage is heated rapidly at first and then adjusted so that its temperature will increase approximately 2°C/min during the last 10°C preceding the expected melting point. The wax shavings or granules are observed through the microscope, and the temperature at which first movement of wax is noted is recorded as initial melting point. The temperature at the time the wax is observed to be completely melted is recorded as the final melting point. The hot stage is slowly cooled and the temperature at which the first crystal appears in the melted wax is recorded as the recovery point. The recorded temperatures are adjusted, where applicable, by appropriate temperature correction factors.

5. Significance and Use

5.1 This test method determines the initial melting point and melting range of waxes. The data obtained are important in the application of waxes in one-time carbon inks.

6. Apparatus

6.1 *Controlled Micro Hot Stage and Microscope*, 40 to 50× power[3] or suitable alternative[4].

6.2 *Microscope Slides*, 1 by 1½ in.

6.3 *No. 2 Cover Slides* (glasses), 18 mm square.

7. Materials

7.1 *Test Reagent Set*, containing substances with known melting points for checking the accuracy of the hot-stage thermometer[5].

8. Precautions

8.1 Not all waxes exhibit a uniform flow. Some waxes exhibit a sharp initial flow while others may exhibit a slower, gradual plastic flow.

9. Sampling

9.1 Ensure that the sample represents the material tested and that the portion of the test sample is representative of the whole sample. (Practices E 122 and E 105.)

9.2 Prepare sufficient wax to give 10 ± 2 mg of sample for each melting point determination. Brittle wax (such as carnauba) is prepared by grinding the sample in a mortar and pestle or other suitable means and passing the wax through a

[1] This test method is under the jurisdiction of ASTM Committee F-5 on Business Copy Products and is the direct responsibility of Subcommittee F05.02 on Carbon Paper and Inked Ribbons.

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[2] *Annual Book of ASTM Standards*, Vol 14.02.

[3] A Kofler Micro Hot Stage, available from Arthur Thomas Co., Philadelphia, PA, has been found suitable for use. All equipment necessary for this test including the microscope and the variable transformer are included.

[4] The Fisher-Johns instrument, operated in accord with the manufacturer's instructions and used with a microscope of 40 to 50× power, has also been found suitable for use.

[5] Also available from Arthur Thomas Co., Philadelphia, PA.

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