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Standard Test Method for Melting Point of Petroleum Wax (Cooling Curve)¹

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This test method was adopted as a joint ASTM-IP standard in 1966.

1. Scope

1.1 This test method covers the determination of the melting point (cooling curve) of petroleum wax. It is unsuitable for waxes of the petrolatum group, microcrystalline waxes, or blends of such waxes with paraffin wax or scale wax.

NOTE 1—For additional methods used for testing petroleum waxes, see Test Method D 127 and Test Method D 938. Results may differ, depending on the method used. For pharmaceutical petrolatum, Test Method D 127 usually is used.

1.2 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

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 127 Test Method for Drop Melting Point of Petroleum Wax, Including Petrolatum²

D 938 Test Method for Congealing Point of Petroleum Waxes, Including Petrolatum²

E 1 Specification for ASTM Thermometers³

3. Terminology

3.1 Definition:

3.1.1 *melting point (cooling curve) of petroleum wax*—temperature at which melted petroleum wax first shows a minimum rate of temperature change when allowed to cool under prescribed conditions.

¹ This test method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.10 on Properties of Petroleum Wax.

In the IP, this test method is under the jurisdiction of the Standardization Committee.

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² *Annual Book of ASTM Standards*, Vol 05.01.

³ *Annual Book of ASTM Standards*, Vol 14.03.

NOTE 2—The so-called “American Melting Point” is arbitrarily 1.65°C (3°F) above the Melting Point (Cooling Curve) of Petroleum Wax.

4. Summary of Test Method

4.1 A specimen of molten wax in a test tube fitted with a thermometer is placed in an air bath, which in turn is surrounded by a water bath held at 16 to 28°C (60 to 80°F). As the molten wax cools, periodic readings of its temperature are taken. When solidification of the wax occurs, the rate of temperature decreases, yielding a plateau in the cooling curve. The temperature at that point is recorded as the melting point (cooling curve) of the sample.

5. Significance and Use

5.1 Melting point (cooling curve) is a test that is widely used by wax suppliers and consumers. It is particularly applied to petroleum waxes that are rather highly paraffinic or crystalline in nature. A plateau occurs with specimens containing appreciable amounts of hydrocarbons that crystallize at the same temperature, giving up heat of fusion, thus temporarily retarding the cooling rate. In general, petroleum waxes with large amounts of non-normal hydrocarbons or with amorphous solid forms will not show the plateau.

6. Apparatus

6.1 The necessary apparatus is described in Annex A1.

7. Test Specimen

7.1 Obtain a sample of wax representative of the shipment to be tested. From each test unit obtain a portion of wax weighing at least 25 g for each melting point determination.

8. Procedure

8.1 Support the air bath in its proper position in the water bath. Fill the water bath to within 13 mm (½ in.) of the top with water at a temperature of 16 to 28°C (60 to 80°F). The bath temperature is kept within these limits throughout the test.

8.2 Heat the wax sample to at least 8°C (15°F) above its expected melting point (see Note 3). To heat the wax sample use a suitable container in an oven or water bath which is held