Designation: D5440 – 17

Standard Test Method for Determining the Melting Point of Fats and Oils[1]

This standard is issued under the fixed designation D5440; 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.

1. Scope

1.1 This test method is intended to determine the melting point of all normal animal and vegetable fats and oils. This test method was derived from ALCA H-16.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*
E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

2.2 *American Leather Chemists Association Standard:*
ALCA H-16 Melting Point[2]

3. Significance and Use

3.1 This test method is intended to determine the melting point of all normal animal and vegetable fats.

3.2 The natural fats and oils, that is, those of animal and vegetable origin, are mixtures of glycerides and other substances and consist of a number of components. They do not exhibit either a definite or sharp melting point. Fats pass through a stage of gradual softening before they become completely liquid. The melting point then shall be defined by the specific conditions of the method by which it is determined and, in this case, it shall be the temperature at which the sample becomes perfectly clear and liquid.

4. Apparatus

4.1 *Melting Point Tubes,* capillary globe tubing, with an inside diameter of 1 mm and an outside diameter of 2 mm, max. A convenient length is 50 to 80 mm.

4.2 *Thermometer,* – 2 to 68°C with 0.2°C divisions (S12C or S15C) and conforming to the requirements prescribed in Specification E2251 for thermometers.

4.3 *Glass Beaker,* 600 mL.

4.4 *Heat Source,* gas burner or electric hot plate.

5. Procedure

5.1 The sample shall be melted and filtered through filter paper to remove any impurities and the last traces of moisture. The sample shall be absolutely dry. At least three clean capillary tubes shall be dipped in the completely liquid sample so that the fat stands approximately 10 mm high in each tube. One end of the tube (where the sample is located) shall be fused in a small flame, taking care not to burn the fat.

5.2 The tubes shall be placed in a beaker and held in a refrigerator at 4 to 10°C overnight (16 h).

5.2.1 The samples shall be completely liquid when the tubes are placed in the refrigerator. It is good practice to pass the ends of the tubes containing the sample momentarily through the flame, just before they are taken to the refrigerator.

5.3 After removing the tubes from the refrigerator, they shall be attached to the thermometer, using a rubber band or any suitable means, so that the lower ends of the melting point tubes shall be even with the bottom of the mercury bulb of the thermometer. The thermometer shall be suspended in a 600 mL beaker, which is about half full of clear distilled water and the bottom of the thermometer immersed approximately 30 mm.

5.4 The starting bath temperature shall be adjusted to 8 to 10°C below the melting point of the sample at the beginning of the test. Agitation of the water bath shall be made with a small stream of air or other suitable means, and heat shall be applied so the batch temperature is increased at the rate of approximately 0.5°C per min.

[1] This test method is under the jurisdiction of ASTM Committee D31 on Leather and is the direct responsibility of Subcommittee D31.08 on Fats and Oils

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[2] Available from American Leather Chemists Assn., Texas Tech University, P.O. Box 45300, Lubbock, TX 79409.