



Designation: **D139—07 D139 – 12**

Standard Test Method for Float Test for Bituminous Materials¹

This standard is issued under the fixed designation D139; 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 covers the float test for bituminous materials.

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

1.3 **Warning**—Mercury has been designated by EPA and many state agencies as a hazardous material that can cause central nervous system, kidney, and liver damage. Mercury, or its vapor, may be hazardous to health and corrosive to materials. Caution should be taken when handling mercury and mercury-containing products. See the applicable product Material Safety Data Sheet (MSDS) for details and EPA's website (<http://www.epa.gov/mercury/faq.htm>) for additional information. Users should be aware that selling mercury or mercury-containing products, or both, in your state may be prohibited by state law.

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.* For a specific precaution statement, see 6.1.

2. Referenced Documents

2.1 *ASTM Standards*:²

[C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials](#)

[D244 Test Methods and Practices for Emulsified Asphalts](#)

[D3666 Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials](#)

[D6997 Test Method for Distillation of Emulsified Asphalt](#)

[E1 Specification for ASTM Liquid-in-Glass Thermometers](#)

2.2 *IEC Standard*:

[IEC 60854 Methods of Measuring the Performance of Ultrasonic Pulse-Echo Diagnostic Equipment](#)³

3. Summary of Test Method

3.1 A plug of bitumen is cast in a tapered collar. The assembled float and collar is then floated in the testing bath at the specified temperature. The time, in seconds, between placing the apparatus on the water and the water breaking through the material shall be taken as a measure of the consistency of the material under examination.

4. Significance and Use

4.1 The float test characterizes the flow behavior or consistency of certain bituminous materials.

4.2 This test method is useful in determining the consistency of bitumen as one element in establishing the uniformity of certain shipments or sources of supply.

5. Apparatus

5.1 *Float*—The float ([Fig. 1](#)) shall be made of aluminum or aluminum alloy and shall be in accordance with the following requirements:

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.44 on Rheological Tests.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

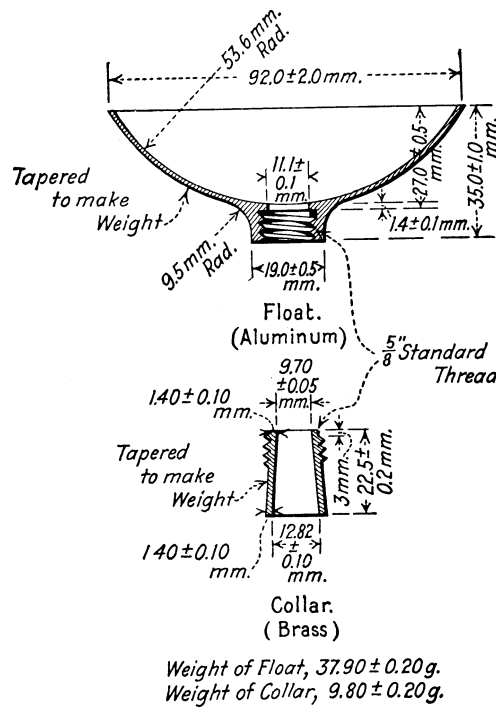


FIG. 1 Float Test Apparatus

	Min	Normal	Max
Mass of float, g	37.70	37.90	38.10
Total height of float, mm	34.0	35.0	36.0
Height of rim above lower side of shoulder, mm	26.5	27.0	27.5
Thickness of shoulder, mm	1.3	1.4	1.5
Diameter of opening, mm	11.0	11.1	11.2

5.2 Collar—The collar (Fig. 1) shall be made of brass and shall be in accordance with the following requirements:

	Min	Normal	Max
Mass of collar, g	9.60	9.80	10.00
Over-all height of collar, mm	22.3	22.5	22.7
Inside diameter at bottom, mm	12.72	12.82	12.92
Inside diameter at top, mm	9.65	9.70	9.75

The top of the collar shall screw up tightly against the lower side of the shoulder.

5.3 Verification of Assembly—The assembled float and collar, with the collar filled flush with the bottom and weighted to a total mass of 53.2 g, shall float upon water with the rim 8.5 ± 1.5 mm above the surface of the water. This adjustment of the total mass of the assembly is for the purpose only of standardizing the depth of immersion in the testing bath.

5.4 Thermometric Device—An ASTM Low Softening Point Thermometer, graduated in either Celsius or Fahrenheit degrees as specified, having a range from -2 to $+80^\circ\text{C}$ or $+30$ to $+180^\circ\text{F}$ and conforming to the requirements for Thermometer 15C or 15F, respectively, as prescribed in Specification E1, or equivalent thermometric device.

5.4.1 A thermometer consisting of K type 30 AWG gauge thermocouple and a meter capable of reading 25°C (77°F) to 260°C (500°F). The thermocouple shall be 61 to 76 cm (24 to 30 in.) in length. This thermometer shall conform to the temperature/voltage tables of the National Institute of Standards and Technology and to the IEC 60854 standards for K-, J-, and T-type thermocouples.

5.5 Testing Bath—A circular bath of at least 185 mm in internal diameter and containing water at least 185 mm in depth; or a rectangular bath with minimum internal dimensions of 150 mm width and 300 mm length, and containing water at least 110 mm in depth. The height of the surface of the container above the water shall be at least 40 mm. The bath shall be heated by electric, gas, or other suitable means. A stand or other suitable support shall be available to hold the thermometric device in the proper position in the bath during the test.

5.6 Water Bath at 5°C (41°F)—A water bath of suitable dimensions maintained at $5.0 \pm 1.0^\circ\text{C}$ ($41.0 \pm 1.8^\circ\text{F}$) which may be accomplished by means of melting ice.

5.7 Brass Pouring Plate—A flat, smooth brass plate approximately 75 by 50 mm that has been treated to prevent the bituminous material from adhering to it. A suitable treatment is to coat the plate just before use with a thin layer of a mixture of glycerin and dextrin, talc, or kaolin (china clay). Other plates or coatings, or both, may be used, providing similar results are achieved.