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# **Standard Method of Test for Flash Point of Asphalt Binder by Cleveland Open Cup**

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**AASHTO Designation: T 48-22<sup>1</sup>**

**Technically Revised: 2022**

**Technical Subcommittee: 2b, Liquid Asphalt**



**American Association of State Highway and Transportation Officials  
555 12<sup>th</sup> Street NW, Suite 1000  
Washington, D.C. 20004**

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## 1. SCOPE

- 1.1. This method covers the procedure for the determination of flash point of asphalt binder by the Cleveland open-cup apparatus.
- 1.2. This test method is applicable to asphalt binder with flash point between 219°C (426°F) and 400°C (750°F).  
**Note 1**—Specifications commonly designate the Tag Open-Cup method (T 79) for asphalt binders and cutback asphalts having flash points below 93°C (200°F).
- 1.3. The values stated in SI units are to be regarded as the standard.
- 1.4. *This test may involve hazardous materials, operations, and equipment. This test does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*
- 1.5. *The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

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## 2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- M 339M/M 339, Thermometers Used in the Testing of Construction Materials
  - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
  - R 66, Sampling Asphalt Materials
  - T 79, Flash Point with Tag Open-Cup Apparatus for Use with Material Having a Flash Point Less Than 93°C (200°F)
- 2.2. *ASTM Standards:*

- C670, Standard Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
- E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
- E1137/E1137M, Standard Specification for Industrial Platinum Resistance Thermometers

2.3. *NCHRP Report:*

- D.W. Christensen, and R. F. Bonaquist. *National Cooperative Highway Research Program Report 530: Evaluation of Indirect Tensile Test (IDT) Procedures for Low-Temperature Performance of Hot Mix Asphalt*. NCHRP, Transportation Research Board, Washington, DC, 2004.

2.4. *International Electrotechnical Commission Standards:*

- IEC 60584-1: 2013 Thermocouples - Part 1: EMF Specifications and Tolerances
- IEC 60751: 2008 Industrial Platinum Resistance Thermometers and Platinum Temperature Sensors

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### 3. SUMMARY OF TEST METHOD

- 3.1. The sample is placed in the tester and heated rapidly to begin with then at a slow rate. A small test flame is passed at a uniform rate in a level plane across the cup at specified intervals. The flash point is the lowest temperature at which application of the test flame causes the vapor at the surface of the liquid to flash.

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### 4. APPARATUS

- 4.1. *Cleveland Open-Cup Tester*—Consisting of the following parts; the parts must conform to the dimensions shown and have the additional characteristics as noted. (See Figure 1.) The Cleveland open-cup tester may be manual or automated. If automated, the flash point instrument shall perform the test in accordance with Section 7.