



Designation: D 3941 – 90 (Reapproved 2001)

## Standard Test Method for Flash Point by the Equilibrium Method With a Closed-Cup Apparatus<sup>1</sup>

This standard is issued under the fixed designation D 3941; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the Department of Defense.*

### INTRODUCTION

Test Methods **D 56** and **D 93** describe procedures using the Tag Closed Tester and the Pensky-Martens Tester, respectively. Both test methods depend on a definite rate of temperature increase to control the precision of the test method. The rate of heating may not in all cases give the accuracy expected because of low thermal conductivity of certain materials. To reduce this effect, ISO/TC 35, Paints and Varnishes, and ISO/TC 28, Petroleum Products and Lubricants, have issued **ISO 1523** in which the heating rate is considerably slower. This test method is similar to **ISO 1523**, but uses standard ASTM cups, style, and format. Due to the slower heating rate, the time required to make a determination of a flash point is considerably longer than for Test Methods **D 56** and **D 93** but the accuracy is improved.

### 1. Scope

1.1 This test method covers the determination of the flash point of liquids in which the specimen and the air/vapor mixture above it are approximately in temperature equilibrium.

1.2 This test method is limited to a temperature range from 32 to 230°F (0 to 110°C).

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *This standard should be used to measure and describe the properties of material, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.*

1.5 *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 56** Test Method for Flash Point by Tag Closed Tester<sup>2</sup>

**D 93** Test Methods for Flash Point by Pensky-Martens Closed Tester<sup>3</sup>

**E 1** Specification for ASTM Thermometers<sup>4</sup>

2.2 *ISO Standard:*

**ISO 1523** Paints, varnishes, petroleum, and related products—Determination of flash point—Closed cup equilibrium method<sup>4</sup>

### 3. Terminology

3.1 *Definitions:*

3.1.1 *flash point, n*—the lowest temperature corrected to a pressure of 760 mm Hg (101.3 kPa) (1013 millibars) at which application of an ignition source causes the vapor of the specimen to ignite under specified conditions of test.

### 4. Summary of Test Method

4.1 A specimen is heated in a closed cup of standard design in a suitable liquid bath at the rate of 1.0°F (0.5°C) in not less than 1.5 min so that the difference in temperature between the

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 05.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 14.03.

<sup>4</sup> Available from American National Standards Institute, 13th Floor, 11 W. 42nd St., New York, NY 10036.