



# Standard Test Method for Determining the Ignitability of Non-flame-Resistant Materials for Clothing by Electric Arc Exposure Method Using Mannequins<sup>1</sup>

This standard is issued under the fixed designation F1958/F1958M; 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.

## 1. Scope

1.1 This test method is used to identify materials that are ignitable and that can continue to burn when exposed to an electric arc, and determines (a) the incident exposure energy that causes ignition, and (b) the probability of ignition.

1.2 The specimens tested in this test method are materials fabricated in the form of shirts.

1.3 This test method shall be used to measure and describe the properties of materials, products, or assemblies in response to convective and radiant energy generated by an electric arc under controlled laboratory conditions.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.5 *This standard shall 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 assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.*

1.6 *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.*

1.7 For specific precautions, see Section 7.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

D123 Terminology Relating to Textiles

D4391 Terminology Relating to The Burning Behavior of Textiles

F1494 Terminology Relating to Protective Clothing

F1506 Performance Specification for Flame Resistant and Arc Rated Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards

F1959/F1959M Test Method for Determining the Arc Rating of Materials for Clothing

### 2.2 ANSI/IEEE Standards:<sup>3</sup>

Standard Dictionary of Electrical and Electronics Terms<sup>3</sup>

## 3. Terminology

### 3.1 Definitions:

3.1.1 See also Terminology D4391.

3.1.2 *arc duration, n*—time duration of the arc, s.

3.1.3 *arc energy, vi dt, n*—sum of the instantaneous arc voltage values multiplied by the instantaneous arc current values multiplied by the incremental time values during the arc, J.

3.1.4 *arc gap, n*—distance between the arc electrodes, cm [in.].

3.1.5 *arc voltage, n*—voltage across the gap caused by the current flowing through the resistance created by the arc gap, V.

3.1.6 *asymmetrical arc current, n*—the total arc current produced during closure; it includes a direct component and a symmetrical component, A.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee F18 on Electrical Protective Equipment for Workers and is the direct responsibility of Subcommittee F18.65 on Wearing Apparel.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from the Institute of Electrical and Electronic Engineers, Inc., 345 E. 47th St., New York, NY 10017.