



Standard Test Method for Determining the Protective Performance of a Shield Attached on Live Line Tools or on Racking Rods for Electric Arc Hazards¹

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1. Scope

1.1 This test method is used to determine the heat attenuation factor (HAF), the effective heat attenuation factor (EHAF), and the shields mechanical strength (SMS) of a shield attached on live line tools or racking rods intended for protection of workers exposed to electric arcs.

1.2 The materials used in this test method of worker protection are in the form of a shield attached on live line tools or on the racking rods.

1.3 The protective shield described in this test method shall be transparent and shall be easily attached and removed from live line tools or from racking rods.

1.4 The protective shield described in this test method has 24-in. (0.61-m) diameter and can be used for most applications, however for special cases, the shield can have different sizes to suit the protective requirements of the application.

1.5 This standard shall be used to measure and describe the properties of materials, products, or assemblies in response to incident energies (thermal-convective, and radiant and pressure wave) generated by an electric arc under controlled laboratory conditions and does not purport to predict damage from light, resultant pressure impact other than the pressure and thermal aspects measured.

1.6 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.7 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 This test method is under the jurisdiction of ASTM Committee F18 on Electrical Protective Equipment for Workers and is the direct responsibility of Subcommittee F18.35 on Tools & Equipment.

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1.8 *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 specific precautions, see Section 7.

2. Referenced Documents

2.1 *ASTM Standards:*²

D4391 Terminology Relating to The Burning Behavior of Textiles

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

3. Terminology

3.1 *Definitions:*

3.1.1 *arc, n*—conductive path in air for the electric current caused by ionization of air between two electrodes.

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

3.1.3 *arc energy, $\int i dt$, 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. See also Terminology **D4391**.

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

3.1.7 *blowout, n*—the extinguishing of the arc caused by a magnetic field.

3.1.8 *closure, n*—point on supply current wave form where arc is initiated.

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.