



Standard Test Method for Evaluating Heat Transfer through Materials for Protective Clothing Upon Contact with a Hot Liquid Splash¹

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INTRODUCTION

This test method is for materials used to protect workers in the event of a hot liquid splash incident. The intent of this test method is to test materials or assemblies of materials that will prevent hot liquid from penetrating through the materials to avoid direct contact of the hot liquid with the heat sensors used to simulate human tissue response. The test method determines whether there is sufficient heat transmitted through the material or assemblies of materials to cause a second degree burn injury during a controlled splash of hot liquid at a specified temperature. The test method utilizes similar equipment and a similar test set-up to that of Test Method **F955** for Molten Substances, but the temperatures of the hot liquid hazards are limited to a much lower level than the molten substances tested in accordance with Test Method **F955**. The specimens of this test method are expected to remain impermeable to the hot liquids during the test exposure.

1. Scope

1.1 This test method is used to measure the heat energy transmission through materials used in protective clothing and gloves that are exposed to a Hot Liquid Splash. This test method is applicable to woven fabrics, knit fabrics, battings, and sheet structures with permeable or impermeable coatings or laminations intended for use as clothing or gloves for protection against brief exposures to hot liquid splash hazards.

1.2 This test method is used to measure and describe the properties of materials or assemblies of materials in response to hot liquids under controlled laboratory conditions.

1.3 This test method is applicable to materials from which finished protective apparel articles are made.

1.4 This test method is limited to the hot liquid temperatures that are 40°C (72°F) below the flash point of the specific hot liquid used for testing.

NOTE 1—Specific thermally stable silicone liquids are available with flash points in the range of 315°C (599°F). When these thermally stable silicone liquids are used, a maximum hot liquid temperature of 260°C (500°F) is achievable. The intent of specifying the maximum temperature at 40°C (72°F) below the liquid flash point is to reduce the hot liquid fire hazard which increases significantly at temperatures equal to or above the flash point of the liquid.

¹ This test method is under the jurisdiction of ASTM Committee **F23** on Personal Protective Clothing and Equipment and is the direct responsibility of Subcommittee **F23.80** on Flame and Thermal.

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1.5 This test method does not measure the flammability of materials, nor is it intended for use in evaluating materials exposed to any other thermal exposure other than hot liquid exposures.

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

1.7 *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.* Specific hazard statements are given in Section 8.

2. Referenced Documents

2.1 ASTM Standards:²

D93 Test Methods for Flash Point by Pensky-Martens Closed Cup Tester

D123 Terminology Relating to Textiles

E457 Test Method for Measuring Heat-Transfer Rate Using a Thermal Capacitance (Slug) Calorimeter

F955 Test Method for Evaluating Heat Transfer through Materials for Protective Clothing Upon Contact with Molten Substances

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.