



Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Liquids¹

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INTRODUCTION

Workers involved in the production, use, and transportation of liquid chemicals can be exposed to numerous compounds capable of causing harm upon contact with the human body. The deleterious effects of these chemicals can range from acute trauma such as skin irritation and burn to chronic degenerative disease, such as cancer. Since engineering controls may not eliminate all possible exposures, attention is often placed on reducing the potential for direct skin contact through the use of protective clothing that resists permeation, penetration, and degradation.

This test method determines resistance to penetration only. Resistance to permeation and degradation should be determined by other test methods.

1. Scope

1.1 This test method is used to test specimens of protective clothing and candidate materials and constructions to be used in protective clothing. The resistance to visible penetration of the test liquid is determined with the liquid in continuous contact with the normally outside surface of the test specimen.

1.2 In some cases, significant amounts of hazardous materials will permeate specimens that pass the penetration tests. For more sensitive analysis use Test Method **F739** to determine permeation.

1.3 This test method is not applicable to finger tips or crotch areas of gloves, which are possible failure points.

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

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. Specific hazards are given in Section 7.*

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 **F23.30** on Chemicals.

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2. Referenced Documents

2.1 *ASTM Standards:*²

D1777 Test Method for Thickness of Textile Materials

E105 Practice for Probability Sampling of Materials

F104 Classification System for Nonmetallic Gasket Materials

F739 Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact

3. Terminology

3.1 *Definitions:*

3.1.1 *degradation, n*—a deleterious change in one or more properties of a material.

3.1.2 *penetration, n*—for chemical protective clothing, the movement of substances through voids in a protective clothing material or item on a non-molecular level.

3.1.2.1 *Discussion*—Voids include gaps, pores, holes, and imperfections in closures, seams, interfaces, and protective clothing materials. Penetration does not require a change of state; solid chemicals move through voids in the material as solids, liquids as liquids, and gases as gases. Penetration is a distinctly different mechanism from permeation.

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.