



Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases Under Conditions of Continuous Contact¹

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INTRODUCTION

Workers involved in the production, use, and transportation of liquid and gaseous 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 is used to measure the resistance to permeation under the conditions of continuous contact of the clothing material by the test chemical. Resistance to permeation under the condition of intermittent contact with the test chemical should be determined by Test Method F 1383. Resistance to penetration should be determined by Test Method F 903. Procedures for measuring the effects of liquid chemicals on the physical properties (that is, degradation) of rubbers, plastics, and coated fabrics are found in Test Method D 471, Test Method D 543, and Test Method D 751, respectively.

1. Scope

1.1 This test method measures the resistance of protective clothing materials to permeation by liquid or gaseous chemicals under the condition of continuous contact.

1.1.1 *Procedure A*—For use when the test chemical is a liquid that is either volatile or soluble in water.

1.1.2 *Procedure B*—For use when the test chemical is a gas.

1.2 *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 precautionary statements are given in Section 7.*

2. Referenced Documents

2.1 ASTM Standards:

D 471 Test Method for Rubber Property—Effect of Liquids²

D 543 Test Method for Evaluating the Resistance of Plastics

to Chemical Reagents³

D 751 Test Methods for Coated Fabrics⁴

E 105 Practice for Probability Sampling of Materials⁵

E 171 Specification for Standard Atmospheres for Conditioning and Testing Flexible Barrier Materials⁶

E 177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods⁵

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁵

F 903 Test Method for Resistance of Materials Used In Protective Clothing Materials to Penetration by Liquids⁷

F 1001 Guide for Selection of Chemicals to Evaluate Protective Clothing Materials⁷

F 1194 Guide for Documenting the Results of Chemical Permeation Testing on Materials Used In Protective Clothing Materials⁷

F 1383 Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases Under Conditions of Intermittent Contact⁷

2.2 Federal Standard:

Fed. Std. No. 191, Method 5030.2 Measurement of the

¹ This test method is under the jurisdiction of ASTM Committee F-23 on Protective Clothing and is the direct responsibility of Subcommittee F23.30 on Chemical Resistance.

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² *Annual Book of ASTM Standards*, Vol 09.01.

³ *Annual Book of ASTM Standards*, Vol 08.01.

⁴ *Annual Book of ASTM Standards*, Vol 09.02.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.

⁶ *Annual Book of ASTM Standards*, Vol 15.09.

⁷ *Annual Book of ASTM Standards*, Vol 11.03.

