



Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Synthetic Blood Using a Mechanical Pressure Technique¹

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INTRODUCTION

Workers, primarily those in the health care profession, involved in treating and caring for individuals injured or sick, can be exposed to biological liquids capable of transmitting disease. These diseases, which may be caused by a variety of microorganisms, can pose significant risks to life and health. This is especially true of blood-borne viruses which cause Hepatitis (Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV)) and Acquired Immune Deficiency Syndrome (AIDS) (Human Immunodeficiency Viruses (HIV)). Since engineering controls cannot eliminate all possible exposures, attention is placed on reducing the potential for direct skin contact through the use of protective clothing that resists penetration (29 CFR Part 1910.1030). This test method was developed to help assess the effectiveness of materials used in protective clothing for protecting the wearer against contact with body fluids that potentially contain blood-borne pathogens. Using synthetic blood, this test method is intended to determine the amount of mechanical pressure that will cause penetration of a liquid through a material used in protective clothing.

1. Scope

1.1 This test method is used to evaluate the resistance of materials used in protective clothing to synthetic blood under the conditions of liquid contact and increasing direct mechanical pressure. The penetration resistance of protective clothing is based on visual detection of synthetic blood penetration at a specific applied mechanical pressure.

1.2 This test method does not apply to all forms or conditions of blood-borne pathogen exposure. Users of the test method must review modes for work/clothing exposure and assess the appropriateness of this test method for their specific application.

1.3 This test method addresses only the performance of materials or certain material constructions (for example, seams) used in protective clothing. This test method does not address the design, overall construction, components, or interfaces of garments, or other factors which may affect the overall protection offered by the protective clothing.

1.4 The values in SI units or in other units shall be regarded separately as standard. The values stated in each system must be used independently of the other, without combining values in any way.

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.*

2. Referenced Documents

2.1 ASTM Standards:²

- [D1331 Test Methods for Surface and Interfacial Tension of Solutions of Paints, Solvents, Solutions of Surface-Active Agents, and Related Materials](#)
- [D1777 Test Method for Thickness of Textile Materials](#)
- [D3776 Test Methods for Mass Per Unit Area \(Weight\) of Fabric](#)
- [E105 Practice for Probability Sampling of Materials](#)
- [E171 Practice for Conditioning and Testing Flexible Barrier Packaging](#)

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 F23.40 on Biological.

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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.