



Standard Test Method for Measuring Repellency, Retention, and Penetration of Liquid Pesticide Formulation Through Protective Clothing Materials¹

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INTRODUCTION

The health and safety of agricultural workers involved in the mixing, loading and application of liquid pesticides can be affected by dermal exposure to liquid pesticide formulations. Use of protective clothing can assist in minimizing the danger of contact with potentially harmful pesticides. Nonporous materials that provide excellent protection to the user are usually not suitable for many agricultural environments in which there is a potential for heat stress. Therefore, garments made of porous materials that can provide a balance between risk from pesticide exposure and user comfort can also be used as personal protective equipment (PPE) for agricultural workers. The movement of liquid pesticides through these materials is primarily a result of penetration through spaces between fibers and interstices between yarns. As these materials provide protection either by repelling or retaining liquid pesticide, the measurement of these properties is also important. This test method is used to measure repellency, retention, and penetration of liquid pesticides through protective clothing materials.

The degree of contamination depends on numerous factors such as type of exposure, application technique, and pesticide formulation. Worker exposure to liquid pesticides can range from low exposure caused by spray drift to high exposure as in the case of an accidental spill while mixing or handling of concentrates. As the level of exposure can vary considerably, this test method is designed to rate relative performance of PPE materials at two levels of contamination.

1. Scope

1.1 This test method measures repellency, retention and penetration of a known volume of liquid pesticide when applied to protective clothing material. No external hydrostatic or mechanical pressure is applied to the test specimen during or after the application of the liquid pesticide.

1.2 This test method is designed to measure performance of protective clothing materials at two levels of contamination. Low level of contamination is achieved by applying 0.1-mL liquid formulation and high level by applying 0.2 mL.

1.3 This test method does not measure resistance to permeation or degradation.

1.4 This test method is suitable for field strength pesticide formulations. This test method may not be suitable for testing protective clothing materials against volatile pesticides.

1.5 The values stated in SI units are to be regarded as the standard.

1.6 *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

D123 Terminology Relating to Textiles

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 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.