



Designation: E3109 – 18

Standard Specification for Protective Gloves Worn by Law Enforcement and Corrections Officers¹

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1. Scope

1.1 This specification addresses protective gloves worn by law enforcement and corrections officers.

1.2 This specification and related standards were developed by subject matter experts, including experienced end users, using data from a survey of more than 800 U.S. law enforcement and corrections officers.

1.3 This specification addresses performance requirements, performance ratings, and test methods for whole gloves and for glove components (for example, materials, layers).

NOTE 1—This specification references published ASTM standards.

1.3.1 A glove is not uniform in terms of the protection it provides, and different portions or areas of a glove (for example, palm, fingertip) may offer different protection.

1.3.2 It is not intended that a single glove meet all specified performance requirements within this specification.

1.4 The glove supplier will identify which of the performance requirements a specific glove meets and the performance ratings for the different portions or areas of the glove.

1.5 This specification specifies performance requirements for (1) physical protection, including resistance to cut, puncture, and needle stick, and (2) resistance to abrasion and tearing to ensure protection is maintained during use.

1.5.1 A document outlining dexterity and other physical protection requirements identified by end users as important is being developed.

1.6 It is expected that this specification will be used by suppliers, test laboratories, certification bodies, and purchasers.

1.7 It is intended that two related standards be used in conjunction with this specification:

1.7.1 A Guide for Selection, Procurement, and Use of Protective Gloves Worn by Law Enforcement and Corrections, in development by ASTM.

1.7.2 Practice E3108.

¹ This specification is under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and is the direct responsibility of Subcommittee E54.04 on Personal Protective Equipment (PPE).

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1.8 *Units*—The values stated in SI or CGS² units are to be regarded as standard. The primary units displayed in this standard are consistent with the referenced ASTM test methods. The values given in parentheses are mathematical conversions that are provided for information only.

1.9 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.10 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

NOTE 2—For dated references, only the edition cited applies to prevent unanticipated changes in test method procedures. For undated references, the latest edition of the referenced document applies, including any amendments.

D1424 – 09 (2013) ^{ϵ 1} Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus

D2582 – 09 Test Method for Puncture – Propagation Tear Resistance of Plastic Film and Thin Sheeting

D3884 – 09 (2013) Guide for Abrasion Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)

E3005 – 15 Terminology for Body Armor

E3108 – 18 Practice for Conformity Assessment of Protective Gloves Worn by Law Enforcement and Corrections Officers

F1342/F1342M – 05 (2013) ^{ϵ 1} Test Method for Protective Clothing Material Resistance to Puncture

² The CGS system of units is based on measuring lengths in centimeters, mass in grams, and time in seconds.

³ 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.

F2878 – 10 Test Method for Protective Clothing Material Resistance to Hypodermic Needle Puncture
F2992/F2992M – 15 Test Method for Measuring Cut Resistance of Materials Used in Protective Clothing with Tomodynamometer (TDM-100) Test Equipment

2.2 Other Standards:

ISO EN 388:2003 Gloves Giving Protection from Mechanical Risks⁴
ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories⁵
NIJ Test Protocol 99-114 Test Protocol for Comparative Evaluation of Protective Gloves for Law Enforcement and Corrections Applications⁶

3. Terminology

3.1 Definitions:

3.1.1 *abrasion, n*—the wearing away of any part of a material by rubbing against another surface. **D3884**

3.1.2 *advertised protective area, n*—an area of a glove stated by the supplier as having specific protection.

3.1.3 *cut resistance, n*—in blade cut testing, the property that hinders cut through when a material or a combination of materials is exposed to a sharp-edged device. **F2992/F2992M**

3.1.4 *cut through, n*—in blade cut resistance tests, the penetration of the cutting edge entirely through material as indicated by electrical contact of the cutting edge and the conductive strip or substrate. **F2992/F2992M**

3.1.5 *hypodermic needle, n*—a hollow bore stainless steel cylinder with a beveled tip used to penetrate the skin by cutting; often used in conjunction with a syringe for injecting or withdrawing fluids. **F2878**

3.1.6 *material configuration, n*—an arrangement of materials in a particular form, figure, layering, or combination.

3.1.7 *supplier, n*—the party that is responsible for ensuring that products meet and, if applicable, continue to meet, the requirements. **adapted from ISO/IEC 17065**

3.1.8 *tearing force, n*—in fabric, the force required either (1) to start or (2) to continue or propagate a tear in a fabric under specified conditions. **D1424**

3.1.9 *tear resistance, n*—in fabrics, the resistance to a tearing force. **D1424**

3.1.10 *test item, n*—a single article intended for testing. **E3005**

⁴ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

⁵ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

⁶ Available from National Institute of Justice (NIJ), 810 7th St., NW, Washington, DC 20531, <http://nij.gov>.

4. Significance and Use

4.1 The purpose of this specification is to provide performance requirements and test methods for the evaluation of protective gloves used in law enforcement and corrections applications.

4.2 Test methods and performance ratings are included to aid glove purchasers and end users in their evaluation of whether a protective glove meets their needs. It is not required that a glove meet every performance requirement specified in this specification.

5. Test Item Requirements

5.1 The supplier shall provide to the test laboratory a sufficient number of test items to accomplish the required testing.

5.1.1 The test methods referenced in Section 6 specify the number of test items required for each test.

NOTE 3—It is recommended that spare test items be provided.

5.2 A test item may be any of the following:

5.2.1 a whole glove, if the protective area is of sufficient size for the test,

5.2.2 a portion of a glove (for example, a finger), if the protective area is of sufficient size for the test,

5.2.3 a swatch having the same configuration (that is, material and construction) as the relevant advertised protective area of the glove. If there are multiple different advertised protective areas of the glove with different configurations, swatches shall be provided for each protective area being tested.

5.3 At least one whole glove pair shall be submitted with test items to confirm appearance is consistent with test items. That glove shall have a product label meeting the requirements of Section 8 of this specification.

5.4 Replicate test items shall be identical in appearance, materials of construction, and material configuration.

5.5 Unless otherwise stated, the test threat shall be introduced from the outside of the glove.

6. Performance Requirements

6.1 The glove supplier shall specify which performance requirements are met by the glove and the advertised protective area for each type of protection. The glove supplier shall clearly indicate using a written description, diagrams, photographs, or any combination thereof of the glove to depict the areas offering specific protection in accordance with this specification.

NOTE 4—Appendix X1 provides examples of approaches for depicting protective areas of the glove by performance level in accordance with this specification.

6.2 For each advertised protective area, the glove shall be tested per the relevant test methods below and shall meet the respective requirement(s).

6.2.1 Resistance ratings are specific to Law Enforcement needs and may not reflect the same levels as seen in other industry applications.

6.2.2 *Cut Resistance:*