



Designation: E3347/E3347M – 22

# Standard Specification for Ballistic-Resistant Shields Used by Law Enforcement Officers<sup>1</sup>

This standard is issued under the fixed designation E3347/E3347M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This standard specifies minimum performance requirements and test methods for the ballistic resistance of shields used by U.S. law enforcement officers to protect against handgun and rifle ammunition.

1.2 Products addressed by this specification include hand-held or hand-carried shields (having single or multiple panels, multi-fold shields) and person-portable shields with wheels.

1.2.1 Shields may be stand-alone or may incorporate in conjunction with (ICW) armor appliques.

1.3 Products not addressed by this specification include fixed or mobile barriers not intended to move during an operation and flexible shields that drape across the surfaces upon which they are placed (for example, ballistic blankets).

NOTE 1—The above products are addressed by Specification E3236/E3236M.

1.4 This specification addresses ballistic performance in terms of resistance to penetration (RTP) of the shield body, body edges, viewports, fasteners, and weak points.

1.5 Shields covered by this specification are classified into ASTM shield ballistic protection levels (see Section 10).

1.6 This specification is applicable for certification testing, verification testing, or research and development testing.

1.7 Values stated in either the International System of Units (metric) or U.S. Customary units [inch-pound] are to be regarded separately as standard. The values stated in each system may not be exact equivalents. Both units are referenced to facilitate acquisition of materials internationally and minimize fabrication costs. Tests conducted using either system maintain repeatability and reproducibility of the test method and results are comparable.

1.8 This specification is divided into the following sections:

Section	Title
1	Scope
2	Referenced Documents
3	Terminology
4	Significance and Use
5	Equipment and Materials
6	Conditioning Requirements
7	Test Requirements
8	Test Item Requirements
9	Procedure for Visual Examination
10	Ballistic Protection Levels and Test Threats
11	Ballistic Performance Requirements for Handgun-rated Shields
12	Ballistic Performance Requirements for Rifle-rated Shields
13	Product Documentation Requirements
14	Product Label and Package Label Requirements
15	Test Report
16	Keywords

1.9 *The tests required by this standard have inherent hazards. 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:<sup>2</sup>

E3005 Terminology for Body Armor

E3141/E3141M Test Method for Ballistic Resistant Shields for Law Enforcement

E3236/E3236M Specification for Ballistic-resistant Barriers Used in Homeland Security or Public Safety Applications

2.2 ANSI/SAAMI Standards:<sup>3</sup>

ANSI/SAAMI Glossary of Industry Terms

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and is the direct responsibility of Subcommittee E54.04 on Public Safety Equipment.

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<sup>2</sup> 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.

<sup>3</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

### 2.3 ISO/IEC Standards:<sup>4</sup>

ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories

## 3. Terminology

3.1 *Definitions*—The following terms and definitions from Terminology E3005 are applicable:

3.1.1 *ammunition, n*—one or more loaded cartridges consisting of case, primer, propellant, and one or more projectiles.

3.1.2 *backface deformation, n*—the indentation in the backing material caused by a projectile impact on the test item during testing; synonymous with *backface signature*.

3.1.3 *backing assembly, n*—a backing fixture filled with backing material; for example, a clay block is a type of a backing assembly.

3.1.4 *ballistic resistance, n*—a characteristic of protective equipment or materials describing their ability to provide protection from projectiles.

3.1.5 *complete penetration, n*—the result of a test threat impact if one or more of the following conditions are met: (1) any portion of a test threat, a fragment of a test threat, or a fragment of the test item passes through the wear face of the test item; (2) a hole is created through the test item; (3) the presence of a test threat, a fragment of a test threat, or a fragment of the test item is embedded or passes into the backing material; or (4) a hole is created through the witness panel; synonymous with *perforation*.

3.1.5.1 *Discussion*—The conditions for complete penetration are specified in individual test methods.

3.1.6 *conditioning, n*—a process that exposes an item, prior to testing, to a specified controlled environment or physical stresses, or both.

3.1.7 *controlled ambient, n*—conditions with temperature of 68 °F ± 10 °F (20 °C ± 5.6 °C) and 50 % ± 20 % relative humidity (RH).

3.1.8 *fair hit, n*—a test threat impact (on a test item) that meets all specified requirements in a particular test method.

3.1.9 *model, n*—the manufacturer's design, with unique specifications and characteristics, of a particular item.

3.1.10 *partial penetration, n*—any result of a test threat impact that is not a complete penetration; synonymous with *stop*.

3.1.11 *shot-to-edge distance, n*—the distance from the center of the projectile impact to the nearest test item edge; for soft armor, the test item edge shall be the edge of the ballistic material.

3.1.12 *shot-to-shot distance, n*—the distance from the center of the projectile impact to the center of any other projectile impact on the test item.

3.1.13 *supplier, n*—the party that is responsible for ensuring that products meet and, if applicable, continue to meet, the requirements on which the certification is based.

3.1.14 *stop, n*—see *partial penetration*.

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

3.1.16 *test series, n*—the set of all shots necessary to obtain the required number of fair hits on a single test item or the set of all shots necessary over multiple test items to generate the required data.

3.1.17 *unfair hit, n*—a test threat impact that does not meet the specified requirements in a particular test method for impact location and spacing, velocity, obliquity, or yaw.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *armor applique, n*—a removable unit of protective material (soft armor or hard armor) intended to be placed over the strike face of a protective product, such as a ballistic-resistant helmet or shield, to enhance ballistic protection in a localized area.

3.2.2 *in conjunction with armor applique, n*—an armor applique that is designed to provide a specific level of ballistic protection only when layered with a specified model(s) of ballistic-resistant shield, helmet, or other protective product.

## 4. Significance and Use

4.1 The purpose of this specification is to provide performance requirements and test methods for the evaluation of ballistic-resistant shields used by law enforcement officers.

4.2 This specification may be used by suppliers, certification bodies, verification bodies, testing laboratories, research and development organizations, and others assessing the performance of ballistic-resistant shields.

4.3 The specification may be used by purchasers in their evaluation of products to meet their needs and requirements.

## 5. Equipment and Materials

5.1 The test range shall meet the requirements of Test Method E3141/E3141M, subsection 5.1, *Test Range Configuration*.

5.1.1 No firearms shall be used for testing.

5.2 Equipment for test item temperature and submersion conditioning shall meet the requirements of Test Method E3141/E3141M, Section 6, *Conditioning Procedures*.

5.3 Test item mounting shall be as described in Test Method E3141/E3141M, subsection 5.6.1, *Test Item Mounting*.

5.4 The witness panel shall be as described in Test Method E3141/E3141M, subsection 5.6.2, *Witness Panel*.

## 6. Conditioning Requirements

6.1 Controlled ambient conditioning shall be done in accordance with Test Method E3141/E3141M, subsection 6.1, *Controlled Ambient Conditioning*.

6.2 High and low temperature conditioning shall be done in accordance with Test Method E3141/E3141M, subsection 6.2, *Temperature Extremes Procedure*.

6.3 Thermal shock conditioning shall be done in accordance with Test Method E3141/E3141M, subsection 6.3, *Temperature Shock Procedure*.

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