



Designation: E3113 – 23

Standard Specification for Ballistic-resistant Vehicle Door Panels Used by Public Safety Agencies¹

This standard is issued under the fixed designation E3113; 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 (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification specifies requirements for ballistic-resistant panels to be mounted in or on public safety vehicle doors to protect against complete penetration of projectiles from small arms.²

1.2 The purpose of this specification is to define minimum performance for ballistic-resistant vehicle door panels.

1.2.1 In addition to the required tests, optional tests with specific conditions are provided that allow testing beyond the minimum requirements of this specification. Statements of conformance with this specification do not include any optional test unless the optional test is conducted, and the results are included in the test report.

1.3 This specification requires ballistic testing of vehicle door panels mounted either in a test fixture or mounted on a vehicle door for which the panel is designed.

1.3.1 Door panels intended to be mounted inside a vehicle door shall be assessed in a test fixture with air backing.

1.3.1.1 Two optional ballistic tests are provided for vehicle door panels intended to be mounted inside a vehicle door:

(1) The preferred optional ballistic test assesses the panel in a vehicle door for which the panel is designed.

(2) If a vehicle door for which the panel is designed is not available, a second optional ballistic test assesses the panel in a test fixture with air backing and a door skin simulant in front of the strike face of the panel.

1.3.2 Door panels intended to be mounted on the exterior of a vehicle door shall be assessed on a vehicle door for which the panel is designed.

1.3.3 An optional extreme temperature ballistic test is provided for purchasers concerned with performance of vehicle door panels in very hot or very cold environments.

1.3.4 The optional ballistic tests are provided in [Appendix X1](#).

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 Public Safety Equipment.

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² Small arms are defined as portable firearms, typically including handguns, shotguns, rifles, and light machine guns (Terminology E3005).

1.4 Selection and procurement guidance is provided in [Appendix X2](#) to assist purchasers in using this specification to procure vehicles with ballistic-resistant door panels or to retrofit existing vehicles with ballistic-resistant door panels.

1.5 *Units*—The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to non-SI units that are provided for information only.

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

1.7 *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

E3005 Terminology for Body Armor

E3062 Specification for Indoor Ballistic Test Ranges for Small Arms and Fragmentation Testing of Ballistic-resistant Items

E3078 Practice for Conditioning of Hard Armor Test Items

E3112 Test Method for Ballistic-resistant Products and Shoot Packs

2.2 ISO/IEC Standards:⁴

ISO/IEC 17050-1 Conformity assessment – Supplier’s declaration of conformity – Part 1: General requirements

ISO/IEC 17050-2 Conformity assessment – Supplier’s declaration of conformity – Part 2: Supporting documentation

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.

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>.

ISO/IEC 17065 Conformity assessment – Requirements for bodies certifying products, process and services

3. Terminology

3.1 For terms not defined in this test method, the following definitions apply:

3.1.1 From Terminology **E3005**: *ballistic material, complete penetration, obliquity, small arms, test item, test threat.*

3.1.2 From Practice **E3078**: *controlled ambient.*

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *ballistic layup, n*—the layering and arrangement of ballistic materials through the thickness of a protective product.

3.2.2 *door skin, n*—the metal that comprises the outer surface of a vehicle door.

3.2.3 *shoot pack, n*—a test item prepared with materials, or with materials and construction features, utilized in body armor or other ballistic-resistant products, but not intended to be used as body armor, an accessory, or a protective product.

Adapted from Terminology E3005

3.2.4 *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

3.2.5 *supplier's declaration of conformity (SDOC), n*—the procedure by which a first party or supplier conveys assurance that the object of conformity fulfills specified requirements.⁵

4. Design and Configuration Requirements

4.1 The panel may be single-piece or multiple-piece.

4.2 The panel shall allow for proper operation and functioning of the vehicle door handles, door pulls, door locks, windows, and window controls.

4.3 The panel shall not impede vehicle door operations.

4.4 The panel shall be free of any unintended holes, voids, bulges, protrusions, or dents. The surfaces of the panel shall be free from any blisters, cracks, crazing, chipped corners or edges, sharp edges, or delamination.

5. Test Item Requirements

5.1 *Test Items for Required Testing:*

5.1.1 Two test items are required per test threat. One test item shall be for the left side of the vehicle, and one shall be for the right side of the vehicle.

NOTE 1—It is recommended that spare test items be provided.

5.1.2 The two test items shall be complete door panels representative of the ballistic layup, composition, configuration (for example, shape, with attachments, seams, mounting method), and size as intended for use.

NOTE 2—The composition and configuration of the pieces of a multi-piece panel may or may not be identical to each other.

5.2 *Test Items for Optional Testing:*

5.2.1 One or more additional test items may be needed to fit the necessary shots for testing with a door skin simulant. The additional test item(s) shall be either a 60 cm by 60 cm (24 in. by 24 in.) shoot pack or a complete door panel.

5.2.2 One or more additional test items may be needed to fit the necessary shots for testing at extreme temperatures. The additional test item(s) shall be either a 60 cm by 60 cm (24 in. by 24 in.) shoot pack or a complete door panel.

6. Performance Requirements

6.1 There shall be no visible separation or delamination of the test item upon the completion of each conditioning procedure.

6.2 There shall be no complete penetration of any test item when tested in accordance with this specification.

7. Test Item Conditioning

7.1 The conditioning requirements of this section are not applicable for the optional tests of **Appendix X1**.

7.2 Test items shall be stored at controlled ambient conditions for at least 24 h prior to the start of the required conditioning.

7.3 Each test item shall be subjected sequentially to the conditioning steps below.

7.3.1 Subject the test item to one cycle of Temperature Conditioning as specified in Test Method **E3112** – 17, subsection 9.3.

7.3.2 Subject the test item to conditioning by submersion in plain water as specified in Test Method **E3112** – 17, subsection 9.7.

7.4 Ballistic testing of each test item shall be completed within two hours of the completion of the last conditioning procedure.

8. Required Ballistic Testing

8.1 Each test item shall be installed in a test setup which represents how the panel is mounted in or on the vehicle door, using the panel's mounting holes, mounting points, or attachments.

8.1.1 For door panels intended to be installed inside a vehicle door, the test item shall be mounted in a test fixture and air-backed.

8.1.2 For door panels intended to be installed on the exterior of a vehicle door, the test item shall be mounted on the actual vehicle door for which the panel is designed, with the structural door components and door skin intact. Other vehicle door components shall be removed.

8.1.3 The supplier shall be responsible for providing the test fixture to the test laboratory, unless the test laboratory has a test fixture that is acceptable to the supplier.

8.1.4 The test fixture shall be capable of maintaining the position of the test item, witness panel, and actual vehicle door or door skin simulant (when required) and withstanding the forces from the test.

8.2 The witness panel shall meet the requirements of Test Method **E3112** – 17 with the modifications listed below:

⁵ Definition source: https://www.standardsportal.org/usa_en/conformity_assessment/suppliers_declaration.aspx.