Designation: F2247 – 11

Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method)[1]

This standard is issued under the fixed designation F2247; 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 test method covers the structural performance of metal doors and frames and their restraining hardware (such as latches and hinges) used as a blast resistant barrier. This method involves applying an equivalent static pressure based on the characteristics of the specified blast pressure and structural properties of the door panel design.

1.2 The static tests are valid for the unit size tested or for smaller units of analogous construction. Extrapolation of test results for units larger than the test specimen are not permitted.

1.3 This standard test method is not applicable to tests where the forces are created by explosive charges, forced air from a shock tube apparatus, or any other method used to generate a dynamic load.

1.4 The proper use of this method requires knowledge of the principles of pressure, deflection, and when applicable, strain gauge measurement.

1.5 Using this method, specimens may be tested to determine ultimate static capacity or tested to specific static test loads.

1.5.1 *Procedure A* shall be used when a load-deflection curve is not required and a single load is applied.

1.5.2 *Procedure B* shall be used when a load-deflection curve is required and a single or multiple loads are applied.

1.6 The values stated in SI units are to be regarded as the standard. The values provided in parenthesis are for information only.

1.7 *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]

E330 Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

2.2 *Other Standard:*

UFC 3-340-02 Unified Facilities Criteria (UFC), Structures to Resist the Effects of Accidental Explosions[3]

3. Terminology

3.1 *Definitions:*

3.1.1 *metal door*—a term used in reference to doors which are built from steel sheets, internally stiffened with cold-formed shapes or structural steel shapes. Materials can be carbon or stainless steel. The materials may be joined together by any fabrication technique (that is, welding, bolting, structural adhesive, etc.). The material voids may be filled with insulation.

3.1.2 *permanent deformation*—the permanent displacement from an original position that remains after an applied load has been removed. Measured in millimetres (mm) (inches (in.)).

3.1.3 *rebound*—stress reversal in the material of the door.

3.1.4 *seating pressure*—an applied pressure that causes the door panel to seat against the frame that is expressed in pascals (Pa) (pounds-force per square foot (psf) or pounds-force per square inch (psi)).

3.1.5 *specifier*—individual or party requesting that a metal door assembly meet specific blast resistance criteria.

3.1.6 *specimen*—the entire assembly unit submitted for test as described in Section 6.

3.1.7 *steady state pressure*—a test pressure held for a minimum of 3 min.

[1] This test method is under the jurisdiction of ASTM Committee F12 on Security Systems and Equipment and is the direct responsibility of Subcommittee F12.10 on Systems Products and Services.

Current edition approved March 1, 2011. Published April 2011. Originally approved in 2003. Last previous edition approved in 2010 as F2247 – 03 (2010). DOI: 10.1520/F2247-11.

[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.

[3] Available from National Institute of Building Sciences, 1090 Vermont Avenue, NW, Suite 700, Washington, DC 20005, http://www.wbdg.org/index.php.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States