

SD-STD-01.01, Revision G (Amended)
April 30, 1993

(Supersedes all earlier revisions of
SD-STD-01.01 & SD-STD-01.02)

CERTIFICATION STANDARD
FORCED ENTRY AND BALLISTIC RESISTANCE
OF STRUCTURAL SYSTEMS



U.S. DEPARTMENT OF STATE
BUREAU OF DIPLOMATIC SECURITY
OFFICE OF PHYSICAL SECURITY PROGRAMS
PHYSICAL SECURITY DIVISION
WASHINGTON, D.C. 20520-1403

PREFACE

Revision G (Amended) accomplishes the following (See Table II: Forced Entry Test Resources):

- Replaces the Fire Ax, Pick Head, 5-1/2 lb. Head Weight, 35-inch Handle, with a Wood Ax, Single Bit, 3-1/2 lb. Head Weight, 36-inch Handle.
- Changes the quantity of axes from two to one for 15-minute FE testing.
- Limits the use of the Wood Ax to the final five minutes of FE testing for transparent portions of a test sample.
- Limits the use of the Wood Splitting Maul, 8 lb. Head Weight, to opaque portions of FE test samples.

Revision G accomplished the following:

- Eliminated the general impacting phase of forced entry testing.
- Provided more detailed guidance, including specific criteria, regarding certification based upon a technical review in lieu of testing.
- Eliminated superfluous information.
- Clarified the roles of Test Director and Test Personnel.
- Provided for Quality Assurance/Quality Control (QA/QC) measures.
- Established procedures for suspension and revocation of certification.
- Complied with the metrication requirements of DOS Procurement Policy Directive No. 10-B.

SD-STD-01.01, Revision G (Amended), is part of the DOS program to ensure forced entry and ballistic resistant equipment which meet DOS standards are placed in DOS buildings overseas. This program accomplishes:

- Establishing standards for forced entry and ballistic resistant levels of protection as a function of potential threat levels.
- Establishing test criteria to ensure equipment meets the forced entry and ballistic resistant needs of the DOS.
- Ensuring products also meet the Office of Foreign Building Operations (FBO) *Specifications for Forced Entry/Ballistic Resistance Doors, Windows, Modular Panels, Glazings and Louvers*.

Requests for copies, questions, concerns, or comments concerning this Standard may be directed to the U.S. Department of State, DS/PSP/PSD, SA-14, Washington, DC 20522-1403.

1.0 SCOPE AND REQUIREMENTS

1.1 GENERAL

This standard supersedes all prior versions of SD-STD-01.01 and SD-STD-01.02. It sets forth the requirements and testing procedures to certify forced entry (FE) and ballistic resistant (BR) systems which are intended for use by the U.S. Department of State (DOS) in its facilities throughout the world. The certification of FE and BR systems is mandatory and indicates that the systems will provide the level of FE and BR protection required by DOS standards for specific facilities in certain threat environments.

1.1.1 Users

This standard is intended primarily for manufacturers to test and certify the manufacturer's product. The standard also can be used to test and certify DOS designed walls, seismic joints, doors, grilles, etc. Section 1.11 details considerations for testing DOS designed FE/BR equipment.

1.1.2 Exceptions

This standard does not apply to items of personal protection (helmets, visors, vests, etc.) or to materials intended for installation in automobiles or other mobile structures.

1.1.3 Implementation

a. This standard will take effect as of September 1, 1993. All FE/BR products procured pursuant to DOS physical security standards on or after that date will require certification to Revision G (Amended) of this standard.

b. Products certified to previous revisions of this standard may be procured if the procurement action was initiated prior to the implementation date.

1.2 CERTIFICATION

Certifications will be granted to systems which meet one of the following requirements:

(Note 1: This section also addresses the recertification of previously certified products.)

Note 2: Systems certified to Revision G do not require recertification to Revision G (Amended.)

a. Candidate systems which successfully completed the testing requirements specified in Revision G (Amended), SD-STD-01.01.

b. Candidate opaque systems which were previously certified to Revisions E, F, or F (Amended), SD-STD-01.01. See Section 1.2.3.

c. Candidate systems incorporating a transparency which have successfully completed the testing requirements and have been certified to Revisions F or F (Amended), SD-STD-01.01. See Section 1.2.3.

1.2.1 Certification Submission

Certification submissions for both testing or technical review of candidate systems must comply with the documentation requirements as specified in Section 1.8; however, certification submissions for technical review (see Section 5.0) need not include a Test-To-Failure Agreement.

1.2.2 Modifications

Once a system is certified to this Standard, no design change or change in component material shall be made without the written approval of DS/PSP/PSD. All systems that are approved for modification must bear a model number change to reflect this modification (See Section 1.12.2).

1.2.3 Previously Certified Systems

Candidate systems eligible for certification to this standard under the provisions of Sections 1.2b & c above will be issued a Certification Letter upon request of the manufacturer. See Section 4.3.

1.3 SYSTEM TESTING CONCEPTS

1.3.1 Forced Entry (FE) Resistance

DOS policy establishes the following three levels of forced entry protection for primary hardlines:

- a. 5 minutes,
- b. 15 minutes,
- c. 60 minutes.

1.3.2 Ballistic Resistance (BR)

- a. DOS policy establishes military rifles (R) as the level of ballistic protection required.
- b. The shotgun (see Section 2.4.2 and Table VI) is used to test the ballistic vulnerability of any convoluted passages, such as deal trays, which a candidate system may possess.

1.3.3 Concurrent Testing

This standard may be used to evaluate the resistance of a system to either a ballistic threat or a forced entry threat. Concurrent testing evaluates the resistance of the system to both types of threat.

1.3.4 Certification Limits

- a. Transparencies, louvers and grilles will not be limited to a specific size.
- b. Door sizes shall not exceed 7.0' x 3.0' (2135 x 915 *mm*) and 7.0' x 6.0' (2135 x 1830 *mm*) (double doors only) without DS/PSP/PSD approval.
- c. Certification will not apply to sizes of the certified system which exceed the size of the sample tested by more than 10% in any dimension. Larger sizes may only be certified through additional testing or certification according to Section 5.0.
- d. Certification will apply to any smaller size provided the design remains the same.
- e. Door systems must provide undercuts which meet the following:
 - (1) If the door has a threshold, the undercut between the bottom edge of the door and the top of the threshold, shall not exceed 1/4-inch (6 *mm*). The total distance from the bottom edge of the door to the top of the slab shall not exceed 3/4-inch (19 *mm*).
 - (2) If the door has no threshold, the undercut shall not exceed 1/4-inch (6 *mm*).
- f. No door system will be certified which locates a forced entry lock actuating device (e.g., door handle, thumb turn, or keyway) less than 10 inches (250 *mm*) from the bottom of the door and which locates a forced entry lock actuating device more than 30 inches (760 *mm*) above the passage lock set unless specific DS/PSP/PSD approval is obtained.

1.3.5. Mullied Systems

- a. The manufacturer may mull individual systems together into the test frame and can request certification for the individual systems, mullions, and mullied joints.
- b. If this option is elected, the manufacturer shall provide a schematic of the proposed test configuration as part of the drawings submitted in Section 1.8.2.

1.3.6 Test Complete Systems

Only complete systems shall be tested; the deal tray in a teller window, for example, cannot be tested separately from the window without specific DS/PSP/PSD approval. However, not all testing must be performed on only one sample; separate samples may be submitted for testing of dissimilar portions.

1.3.7 1/4-inch (6 mm) Gap Certification

Concrete structures require a rough opening for a system, door, window, etc. to be 1/4-inch (6 mm) larger per side than the frame. Certification to this standard requires that FE and BR resistance of the gap is the same as demonstrated by the system itself. The following two procedures meet this requirement:

a. Procedure One.

- (1) BR - Test according to section 3.2.
- (2) FE - Test according to section 3.3.5; or

b. Procedure Two. Include a flange design, attached or integral with the frame, which extends past the gap. This option must be specifically requested by the manufacturer or DOS designer, and the design shall be reviewed by DS/PSP/PSD who will determine the adequacy of the design.

1.4 REVOCATION OF CERTIFICATION

Certification may be revoked for cause at the discretion of DOS for the following reasons:

- a. Minor anomalies and/or imperfections in manufactured systems.
- b. Significant material or design modifications to a certified product which reduce DOS confidence in the performance characteristics of that system.
- c. Substitution of non-certified components (e.g., hardware, locking devices, etc.) in a finished product.
- d. Failure of a system to pass any DOS Quality Assurance/Quality Control (QA/QC) testing or evaluation (see Section 1.4.3).
- e. Failure of a system to pass any subsequent test which would be sufficient cause for concern about the results of test upon which certification was based.

1.4.1 Procurement of Decertified Products

Systems whose certified status changes as a result of:

- a. Modification in test criteria; or
- b. Revocation of certification,

may be procured by DOS or its contractor, at their discretion, if the certification were valid when the procurement action was initiated.

1.4.2 Revocation Procedures

Should there be cause to revoke the certification of a DOS certified system, DOS will take the following actions:

- a. Notify the manufacturer that it has 30 calendar days to meet with DOS to discuss its plans to redress the shortcomings of the system in question. The manufacturer should come prepared to discuss the deficiencies with appropriate drawings and specifications.
- b. Meet with the manufacturer. DOS will review the manufacturer's proposal to correct system deficiencies by material change or design modification and make a determination within 10 working days, based upon a technical review, as to its adequacy of the proposed improvement/remedy.
- c. If the manufacturer's proposal is determined by DOS to be adequate, DOS will so notify the manufacturer and no further action will be taken, provided that the manufacturer provides the complete up-to-date drawings which depict the proposed fixes.
- d. If the manufacturer's proposal is determined by DOS to be inadequate, DOS will then issue a **Letter of Suspension** notifying the manufacturer of DOS intent to decertify the system(s) in question.
- e. The manufacturer will be granted a period of 60 calendar days (with extensions at the discretion of DOS) to correct deficiencies by material change or design modification. A technical review or retesting (at the manufacturer's expense and at the discretion of DOS) will be required to obtain recertification. Extensions to the grace period, at the discretion of DOS, must be obtained from DS/PSP/PSD ***in advance and in writing.***
- f. Issue a **Letter of Revocation** at the conclusion of the grace period if identified deficiencies have not been corrected to the satisfaction of DOS. Once a **Letter of Revocation** has been issued, subject systems must be retested, at the manufacturer's expense, in order to be eligible for certification.

1.4.3 Quality Assurance/Quality Control (QA/QC)

- a. DOS reserves the right to procure from the manufacturer at its own expense certified systems for quality assurance/control (QA/QC) purposes.
- b. Certified systems procured by DOS for QA/QC or other purposes which are materially different from the approved design will be grounds for suspension and revocation of certification. See Sections 1.4a-c and 1.4.2.
- c. Certified systems procured by DOS for QA/QC or other purpose which fail independent testing, for whatever reason, will be grounds for suspension and revocation of certification. See Sections 1.4c and 1.4.2.

1.5 REVISIONS

Revisions of any portion of this standard must be approved by the Physical Security Division, Bureau of Diplomatic Security. All requests for revisions will be forwarded to the addressee listed in Paragraph 1.6.

1.6 AVAILABILITY

Additional copies of this standard may be obtained from, and questions, comments, or suggestions should be directed to:

U.S. Department of State
DS/PSP/PSD
SA-14
Washington, DC 20522-1403

1.7 TEST SAMPLE

1.7.1 System Sample

Systems submitted for testing shall be full-size systems complete with all required anchor bolt system hardware. The door systems shall include all forced entry locks, a functional approved passage set, and the standard approved door closer. In addition, the test sample will be "ready to purchase" (i.e., fabricated, painted, and prepared to meet the requirement of FBO's *Specification For Forced Entry/Ballistic Resistant Doors, Windows, Modular Panels, Glazings and Louvers*).

1.7.2 Independent Evaluation

Each system shall be individually evaluated. Two or more systems may be mulled together for test purposes but each of the systems and mullions will be evaluated independently of one another.

1.8 CERTIFICATION DOCUMENTATION

Submission of the test sample shall include the following documentation. At the time of the submission, two additional copies of all documentation will be furnished to DS/PSP/PSD.

1.8.1 Request for Certification

The manufacturer shall submit a letter to DS/PSP/PSD specifying the levels of intended protection sought and what tests are to be performed. Manufacturers may also request certification by technical review in lieu of testing as outlined in Section 5.0.

1.8.2 Engineering Drawings and Specifications

These documents shall meet the following requirements:

- a. Each sheet shall include the model number of the system, the drawing number, and the date of the drawing or revision and shall be submitted in 8-1/2" x 11" (215 x 280 *mm*) format.
- b. Each assembly drawing shall show the arrangement and locations of all bolts, fasteners, sealants, gaskets, weeps, glazing stops, glazing (including spacers, etc.), and dimensions (including frame size, vision opening, etc).
- c. Specifications for material used in the system (i.e. hot rolled steel - ASTM A36) shall be included in the documents.
- d. The documentation shall include dimensions of pieces, location and type of welds, size and type of bolts, and glazing lay up, including material, sizes, spacing, and arrangement.
- e. Documentation shall be professional in appearance. Rough sketches are not acceptable.
- f. Each test sample will have documentation which complies with this section.
- g. Documentation of mulled test samples shall include an assembly drawings depicting the mullions between the systems.
- h. The manufacturer shall clearly indicate all proprietary information in the document.

NOTE: All such information submitted will be treated as company confidential and will not be disclosed to unauthorized personnel.

1.8.3 Installation Instructions

The manufacturer's recommended field installation and users instructions will be submitted as part of the certification documentation.

1.8.4 FBO Specification Guarantee

The manufacturer or DOS Architectural and Engineering (A&E) designer will submit a letter certifying that Foreign Building Operations' (FBO) *Specifications for Forced Entry/Ballistic Resistant Doors, Windows, Modular Panels, Glazings and Louvers*, have been met or complied with.

1.8.5 Test-to-Failure Agreement

Manufacturer's agreement to permit the system to be tested to failure after the minimum certification testing required by this standard has been successfully completed. If DOS exercises the test-to-failure option, DOS will be responsible for the additional testing and reporting costs.

1.9 SCHEDULING

- a. The manufacturer shall be responsible for arranging and scheduling tests which are required by this standard. These tests must be made at an independent, DS/PSP/PSD-approved test facility.
- b. All certification testing shall be witnessed by a representative of DS/PSP/PSD, and the manufacturer will notify DS/PSP/PSD at least 10 working days in advance of the scheduled test date.
- c. The manufacturer shall submit the test sample and required documentation according to the following schedule:
 - (1) The documents which are required by Section 1.8 shall be submitted to the Test Director and DS/PSP/PSD ten (10) working days prior to any scheduled testing.
 - (2) The test sample shall be submitted to the test facility at least five (5) working days prior to any scheduled testing.
 - (3) Because the DOS certification program is very dependent on accurate drawings, the testing to this standard may not begin until DS/PSP/PSD and the test laboratory are satisfied the drawings are neat, accurate, and complete.

1.10 REPORTING

Once a system or device has been tested for official DOS approval, a report of all testing conducted on the system must be provided by the manufacturer, regardless of the outcome, to DS/PSP/PSD at the address below within 30 days of test completion.

U.S. Department of State
DS/PSP/PSD
SA-14
Washington, D.C. 20522-1403

1.11 TESTING AND CERTIFICATION OF DOS DESIGNED FE/BR EQUIPMENT

All DOS or A&E designed FE/BR equipment, which requires certification to this standard, will comply with all requirements herein, amended as follows:

a. Section 1.7.1: A representative size of the sample must be chosen for testing. DS/PSP/PSD must approve the chosen size.

b. Section 5.0: "DOS" shall be used instead of the manufacturer's three-letter symbol.

c. Section 2.3.2: A 1/4-inch (6 *mm*) mounting clearance is not usually required for walls; however, DS/PSP/PSD must approve the elimination of the gap.

d. Section 3.3.2: DS/PSP/PSD shall establish the testing criteria for walls and other specialized FE/BR equipment. Tools, test sequencing, and testing location shall follow the intent of this section but may be modified to ensure FE/BR criteria are met for nonstandard systems.

1.12 MODEL NUMBERING CONVENTION

a. All systems which satisfy the requirements for certification will be assigned a model number. Test samples need not be assigned a model number until they have satisfied all testing and all documentation requirements of this standard.

b. Assignment of the model number shall follow FE/BR testing when the Certification Letter is issued. The Test Director shall ensure that the model number of all tested systems is clearly applied to all documentation submitted with the certification testing report (Section 4.0), using the manufacturer's model number until such time as a DS model number is assigned.

1.12.1 Interim Number

a. Should it be necessary to assign a number to a system which has not satisfied all testing for any reason (prior to testing, pending waiver approval, correction of documentation, etc.) the basic number will be prescribed with the letter "X".

b. Once the experimental nature of the assembly has been resolved, the experimental designator (X) shall be replaced with the letter of the latest revision of this standard to which the assembly has been certified.

1.12.2 Modification Numbering

If a certified system is changed in design or material and is certified per Section 1.1, the model number shall be postscripted with the letter "A". Subsequent changes shall be indicated by the postscripts "B", "C", etc.

1.12.3 Prior Revision Certifications

Systems which have been certified according to Section 1.2b & c will be reassigned model numbers.

2.0 TEST PREPARATION

2.1 TEST DIRECTOR

A Test Director will be assigned to each test to ensure, at a minimum, the following:

a. Ammunition is provided per Table I.

b. Only authorized tools are employed (see Table II).

c. The required iterative times are met (Tables III, IV, and V).

d. Ballistic testing requirements of Table VI are observed.

- e. Design or other observed weakness(es) of the test sample is (are) consistently exploited.
- f. The test sample and its engineering drawings and specification are analyzed before the test.
- g. All test data is collected and recorded.
- h. The test team is selected in accordance with Section 2.5.
- i. All reasonable safety precautions are employed during testing.
- j. That before a sample is tested, all system hardware, to include lock assemblies, function in the manner intended by the manufacturers.
- k. Under certain circumstances, such as QA/QC testing, the DOS may test equipment at a Government facility, using Government personnel, and will assign its own DOS Test Director.

2.2 TEST SAMPLE DOCUMENTATION

- a. The Test Director shall examine the test sample documentation and confirm its completeness and accuracy (Section 1.8). Testing will not be initiated until the documentation is complete and correct. Test personnel may not examine test sample documentation once testing has commenced.
- b. Upon receipt of the proper drawings and documentation specified in Section 1.8, the Test Director will identify which dissimilar portions of the system require testing. From these determinations, a formal test plan will be produced within 5 working days.
- c. The Test Director will submit the formal test plan to DS/PSP/PSD for approval. DS/PSP/PSD will review the formal test plan to determine if any dissimilar portion may forgo testing due to previous testing or certification.
- d. Upon approval of the test plan by DS/PSP/PSD, the Test Director will submit the formal test plan to the manufacturer, after which test scheduling will be finalized. The Test Director will ensure that DS/PSP/PSD is given at least 10 working days notice prior to any scheduled testing so that it may arrange for representation.

2.3 TEST SAMPLE MOUNTING

Test samples shall be rigidly mounted in accordance with the following:

2.3.1 Limited Ballistic Testing

Samples for ballistic testing only must be rigidly mounted in a manner appropriate to the configuration and purpose of the sample.

2.3.2 Forced Entry Testing

- a. Test samples which require forced entry or concurrent testing shall provide a 1/4-inch (6 *mm*) mounting clearance over the entire periphery of the assembly.
- b. The test sample shall be mounted in a test fixture which is constructed so that its' resistance to deformation and distortion is greater than the resistance of the system. If a FE test on the 1/4-inch (6 *mm*) mounting clearance is to be conducted, it is recommended that the test fixture be constructed of 1/2-inch (13 *mm*) thick structural steel components.

- c. The test fixture shall simulate installation in a permanent steel or concrete structure which neither enhances nor degrades the forced entry and ballistic resistance of the system.
- d. The test sample shall be mounted in accordance with the manufacturers instructions with particular attention paid to the threat and protected side orientation.
- e. The test sample shall not be marked to indicate the dimensions necessary for the passage of the rigid rectangular shape (see Section 3.4.2) used to determine forced entry test failure.
- f. The test frame mounting must give no leverage advantages over the expected mounting conditions in the field.
- g. If the test system cannot be mounted according to mounting instructions required in Section 1.8.3, the test shall not be conducted.

2.3.3 Test Samples Which Require Footers

Test samples shall be erected (including cast in place) on footers and either back braced or capped with a simulated roof or ceiling panel to ensure that the bracing and capping do not affect the FE resistance of the system.

2.4 BALLISTIC TEST SET-UP

2.4.1 Rifle

- a. The plane of the threat surface of the test sample shall be positioned 20 feet (6095 *mm*) from the muzzle of the gun or test barrel to produce zero degree obliquity impacts.
- b. Velocity screens shall be positioned at 5 feet (1525 *mm*) and 15 feet (4570 *mm*) from the muzzle which, in conjunction with an elapsed time counter, will be used to determine bullet velocities at 10 feet (3050 *mm*). Penetrations will be determined by visual examination of a witness panel (see Table VI) 6 inches (150 *mm*) behind and parallel to the system.
- c. With the exception of the witness panel mounting for convoluted passages, witness panels should be contoured to match the test sample.

2.4.2 Shotgun

- a. Barrel placement must be 8 inches (plus or minus 2 inches) (200 ± 50 *mm*) from the point of impact. Impact obliquity shall be determined by the Test Director consistent with both the maximum exploitation of the sample and safety.
- b. For deal trays the witness panel will be composed of 0.020 inches (0.5 *mm*) thick aluminum sheet mounted to the test sample deal tray in the following manner: (1) tape the sheet to the inner edge (concave portion) of the tray, and (2) tape the sheet to the protected side of the transparency at a 45-degree angle.
- c. For other convoluted passages the witness panel will consist of 0.020 inch (0.5 *mm*) thick aluminum mounted on the test fixture so that the witness panel should maintain a 6 inch (150 *mm*) parallel standoff contoured to conform to the shape (on the protected side) of the test sample.

2.5 FORCED ENTRY TEST PERSONNEL

- a. The Test Director shall assign a team of muscular, test personnel in good health between the ages of 18 and 34 years, whose body weight is not less than 160 pounds (72.6 *kg*) nor greater than 250 pounds (113.5 *kg*).

- b. During the test, the number of active members of the test team (not including data recorders and supervisors) shall not exceed the specifications in Table II.
- c. The manufacturer may request that test personnel not be involved in the installation of the test sample or in the construction of samples which are manufactured at the test facility site.

2.6 TOOLS AND SUPPORT INSTRUMENTATION

2.6.1 Ballistic Testing

Ammunition to be used in Ballistic Resistance Testing is listed in Table I and shall comply with Section 2.7. In addition, the following equipment is required:

- a. Firearms or tests barrels chambered for the ammunition in Table I.
- b. Chronograph, MV Model 4010 or equivalent.
- c. Screens, Velocity, Oehler Model 55 or equal.
- d. Witness panel, Al, 2024T3, .020 (0.5 *mm*) inch thick.
- e. Witness panel, Al, Foil, 0.001-0.002 (0.025 – 0.050 *mm*) inch thick.

2.6.2 Forced Entry Tools

The tools to be used in Forced Entry Testing are listed in Table II.

2.6.3 General Support

The following general support instrumentation shall be available for documentation of all testing:

- a. Chronometer, 60 minute with sweep second hand or digital equivalent.
- b. Camera, 35 *mm* single lens reflex with 50 *mm*, f2.0 lens.
- c. Camcorder, Video, VHS format.

2.7 AMMUNITION

The test laboratory will certify:

- a. Commercial ammunition used in conducting these tests will conform to the configuration and performance standards established for that cartridge by the Sporting Arms and Ammunition Manufacturers' Institute (SAAMI).
- b. Military ammunition used in conducting these tests will conform to the configuration and performance standards established by United States Military Specifications.

2.8 DS/PSP/PSD REPRESENTATION

- a. DS/PSP/PSD will have its representative(s) present for and witness to all testing. Therefore, the Test Director and the manufacturer or Contracting Officer will provide DS/PSP/PSD at least 10 working days advance notice prior to any scheduled testing (See Section 2.2d).
- b. Controversies or questions which arise during testing will be resolved by the DS/PSP/PSD representative whose decisions will be final.

- c. The DS/PSP/PSD representative will work through the Contracting Officer or the Contracting Officer's Representative (COR) for resolution of non-test issues for DOS or A&E designed systems.

3.0 TEST PROCEDURES

3.1 GENERAL

The requirements and procedures presented herein are the minimum required for certification by DOS.

3.1.1 Geometric Commonality/Physical Construction

DOS reserves the right to forego portions of the test requirements (both FE and BR) for reasons of geometric commonality within the test sample, such as the identical design of the right and left edges of a wall panel. Any changes to the application of the test criteria must be approved by DS/PSP/PSD representative and documented in the test report.

3.1.2 Test Variations

The requirements, procedures, or authorized tools of this standard may be varied to reflect unique configurations of the system to be tested. Any such variation must be approved in writing by DS/PSP/PSD whose guideline for granting approval shall be for conditions or design variations unforeseen in establishing these requirements.

3.1.3 Data

The data shall be recorded on the appropriate Data Table and photos shall be taken per Section 4.2.7.

3.1.4 Concurrent FE/BR Testing

When a test sample is to be tested for both forced entry and ballistic resistant protection, the ballistic resistance test shall be conducted first.

3.1.5 Door Operability Testing

- a. After mounting and plumbing the door to the manufacturer's instructions, record the force (measured in pounds) required to pull and/or push the door open from a fully closed, unlatched, unlocked position.
- b. The pull/push force should be measured with a force gauge attached to the door pull handle or applied on the exit (crash) bar, at a point not exceeding 1 foot (305 mm) from the edge of the lock side of the door. The door closer may be removed once this test has been performed.
- c. The pull/push force should not exceed 12lbs (5.5kg).

3.2 BALLISTIC TESTING

3.2.1 Firing Procedure

Ammunition of the appropriate caliber and type (See Table I) shall be single-fired in accordance with the minimum requirements in Table VI. The firings will be conducted to:

- a. Examine the ballistic resistance of all features of the test sample (frame, seams, locks, hinges, etc.)

Note: (1) The manufacturer is responsible for the ballistic resistant protection of the 1/4-inch (6 mm) gap between the test sample and the test fixture. (2) Firing shall be directed at the undercut gap if the gap exceeds 3/4-inch (19 mm).

- b. Examine the ballistic resistance of all variations in the ballistic cross section of the test samples.
- c. Examine the ballistic resistance of convoluted design passages (deal trays, louvers, passive speak through features, etc.) to angled and ricocheted fire from a 12-gauge shotgun.

Note: The shotgun test is a required additional test for convoluted passages.

3.2.2 Additional Firings

a. The number and location of ballistic impacts of Table VI are minimum requirements. The Test Director and/or representative of DS/PSP/PSD may require unlimited additional firings, subject to the following conditions:

- (1) Transparencies. The separation between any two ballistic impacts on a single contiguous area of transparent armor shall be no less than 4 inches (100 *mm*) between centers, and total impacts shall not exceed six.
- (2) Opaque Panels and Fittings. The separation between any two ballistic impacts on a single contiguous area of opaque material or fitting will be no less than 1.5 inches (38 *mm*) on center regardless of the area of disturbed material surrounding each impact.
- (3) There is no limit to the number of oblique-angle shots required to examine all possible penetration paths of convoluted passages.
- (4) Ammunition meets performance requirements of Table I.

b. These shots must be made within the constraints of range and personnel safety (see Sections 2.4.1, 2.4.2, and 3.7). The results of oblique shots will be photographed and diagrammed as necessary to ensure consistent repeatability.

3.2.3 Inspection of Witness Panel

a. After each firing, the witness panel shall be visually inspected from the protected side by holding a 60-watt light close to the other side. Only a perforation of the witness panel, whether by bullet fragments or material from the test sample (spall), shall be classified as a "Penetration".

b. Impacts which produce any other results will be classified as "No Penetration". These definitions apply whether or not the test sample has been completely perforated. Ballistic rejection criteria are covered in Section 3.4.1.

3.2.4 Fair Hits

a. For this Standard, a "Fair Hit" is defined as a zero degree oblique ballistic impact of the specified weight and type bullet within specified velocity range on the specified location of the sample (see Table I).

b. All other firings are to be classified as "Unfair", except:

- (1) An impact at less than the minimum acceptable velocity or excessive obliquity or excessive yaw which results in penetration but which is otherwise a fair hit will be classified as a fair hit.
- (2) An impact which does not produce penetration but which exceeds the maximum acceptable velocity will be classified as a fair hit if it so qualifies in all other respects.

c. Oblique shots to exploit convoluted passages.

d. All shots fired in ballistic testing will be chronographed individually to ensure they meet specified velocities. Chronographing of oblique shots may be waived.

3.3 FORCED ENTRY TESTING

3.3.1 General

Forced entry testing shall be conducted on assemblies including, but not necessarily limited to doors, windows, and wall panels of any type; louvers; escape hatches; and protective window grilles. All forced entry testing, regardless of the type of assembly or level of protection, shall consist of a concentrated assault test of edges and other critical locations (Tables III, IV, and V).

- a. Interruptions. Once it is initiated, the test shall be conducted without interruption except for reasons of safety. Rests shall be given only at the end of a test. However, during 60-minute tests, rests may be given every 15 minutes. The test team will not use this time for planning purposes or discussion of attack techniques nor confer with the Test Director as to the progress of the test.
- b. Safety. The test may be interrupted for reasons of safety (imminent danger to or injury of test personnel). This time will not be used for clearing away debris, such as glass fragments which have been produced as a result of the testing, from the test sample. Any modifications to the test sample made for safety reasons must be agreed to by all parties and must not in any way enhance or detract from the sample's resistance to forced entry.
- c. Inspections. Once testing has commenced, time used by the test team to examine the test sample shall be considered part of the test time duration. Team members shall not be allowed behind the test fixture during testing.
- d. Test Personnel. At the manufacturer's request under the provisions of Section 2.5c, anyone involved in the performance of the testing may not be allowed to assist in the installation of the test sample or in the construction of samples which are manufactured at the test facility site.
- e. Test Resources. Except when necessary under Section 3.3.6, Repairs and Replacements, only those resources (tools) specified in Table II may be applied to the test sample once forced entry testing has commenced. Test resources may not be applied to a test sample during any interruption, inspection, or other period of non-activity. Tools which become unserviceable or unsafe during testing may be replaced; however, the test may not be interrupted to effect this replacement.

3.3.2 Concentrated Assault Test

The concentrated assault will begin with the area or dissimilar portion predetermined by the Test Director to be most vulnerable to forced entry.

- a. This test sequence consists of attempting to force an entry through any portion of the sample, to include, but not limited to, the frame, opaque panels, transparency, transparency mounting, flanges, hinges, locks, fittings, mounting devices, etc. using the tools and personnel shown in Table II.
- b. The intent of this test is to attempt to penetrate the panel and/or transparency portions of the assembly or to distort an edge in order to disengage a fitting or device from its mountings in the test sample. This test will be performed on each dissimilar portion of the test sample.
- c. The Test Director should select and exploit any dissimilar portion of the test sample determined to be vulnerable.
- d. If the test sample successfully passes the first test, an analysis of the test sample may be performed by the DS representative and Test Director in order to determine if additional tests are necessary on any of the other dissimilar portions of the test sample. Any tests not performed will be documented in the test report.

- e. The test is timed and the Test Director shall impress test personnel with a sense of urgency. The test times shall be in accordance with Table III. Periods of non-activity (photography, safety inspection, conference with DOS observers, etc.) are not to be charged to the required test times.
- f. The Test Director will ensure that test personnel will neither discuss the progress of the concentrated assault, inspect the test sample, nor will the Test Director discuss the progress of the concentrated assault with the test personnel during any period of non-activity.
- g. No member of the test team may step behind the test fixture or behind a plane parallel and contiguous to the face of the attack side of the test sample once forced entry testing has commenced.
- h. When testing transparent portions of a test sample, the Wood Ax shall be used only during the final five (5) minutes of forced entry testing.
- i. When testing transparent portions of a test sample, the Wood Splitting Maul shall not be used.

3.3.3 Mullered systems

Forced entry testing of test samples consisting of two or more systems mullered to one another shall be conducted in accordance with Table III if the systems are mullered directly together or in accordance with Table IV if the systems are mullered with separate mullions between the systems.

Note: Seismic joints are to be considered as mullered connections.

3.3.4 Double Door Systems

Forced entry testing of double door systems, to include the door framing, shall be conducted in accordance with Table V.

3.3.5 1/4-inch (6 mm) Gap Test

The gap shall be tested per section 3.3 or 3.5 for the specified protection level of Tables III, IV, or V.

3.3.6 Repairs and Replacements

- a. No repairs or replacement of damaged components are permissible during or between the ballistic resistance and any of the forced entry tests.
- b. However, after the completion of the Concentrated Assault Test with respect to one dissimilar edge, the Test Director, with the approval of the DOS representative, may direct limited repairs to features which have been completely evaluated if he judges the repairs necessary to fairly evaluate the yet untested edge. Any such repair must not enhance or detract from the forced entry resistance of the untested edge. All of these repairs shall be documented.

3.4 PASS/FAIL CRITERIA

The results of testing in accordance with this standard will be evaluated as follows:

3.4.1 Ballistic Rejection Criteria

Any penetration of the witness panel by any portion of the bullet or test sample (spall) by a fair impact (see Section 3.2.4) is cause to reject the design of that sample for the level of protection tested, regardless of the number of other non-penetrating shots of the system.

3.4.2 Forced Entry Rejection Criteria

Any failure of the manufacturer's recommended mounting hardware or penetration of any portion of the system sufficient to permit passage of a rigid rectangular shape measuring 12" x 12" x 8" (305 x 305 x 200

mm) or rigid 12" x 12" (305 x 305 *mm*) cylinder within the times of the forced entry Concentrated Assault Test shall be cause to reject that sample design for the level of protection tested.

3.4.3 Door Operability Rejection Criteria

A measured door pull/push force exceeding 12lbs (5.5~~k~~g) measured before commencement of testing shall be cause to reject that sample.

3.4.4 Certification Criteria

Any system which passes the criteria of Sections 3.4.1, 3.4.2, and 3.4.3 of this standard, and also satisfies the documentation requirements of Sections 1.7 and 1.8 will be eligible for DOS certification.

3.5 TEST TO FAILURE

After any system is certified and tested, the DOS may require additional testing with the same or additional tools to determine the limits of protections afforded by a system. It may also test the limits of a feature or subsystem of those systems which failed to satisfy the requirements for certification. No such testing will be initiated until the results of the certification testing are declared conclusive.

3.6 DISPOSITION OF TEST MATERIAL/ASSEMBLY

The manufacturer is responsible for the final disposition of the test sample. After completion of testing (including Test-To-Failure, if appropriate) the manufacturer may abandon the systems to the testing facility or direct the return of the systems to the custody of the manufacturer.

3.7 SAFETY

The Test Director is responsible for safety and will ensure that all reasonable safety precautions are employed.

4.0 TEST DATA

4.1 GENERAL

Once a system has been tested according to the certification requirements of this standard, a final report of the results of all testing shall be submitted to DS/PSP/PSD regardless of the outcome of the testing. All test reports as well as any information concerning the results of each test are considered proprietary and shall not be discussed or released without prior approval of DOS or the manufacturer.

4.2 REPORTING REQUIREMENTS

- a. The reporting requirements presented here are the minimum to support certification to this standard.
- b. The report shall be an all inclusive document which presents the configuration of the system, presents the data and results of all testing, and includes all other documentation required by the standard as follows:

4.2.1 Report Title

The title of the report shall indicate the type of report, *i.e.* "Test Report" or "Report in Lieu of Testing", and the model number of the system including its category and type (see Sections 1.3.1 and 1.3.2). These titles reflect the two types of DOS certification covered in Section 1.3.

4.2.2 Configuration Documentation

- a. The report shall contain complete configuration documentation suitable for binding in an 8-1/2" x 11" (215 x 280 *mm*) format, including drawings and a list of materials not otherwise described by the drawings (see Section 1.8.2).
- b. Comments concerning inconsistencies between the assembly and its documentation will be provided in the test report.

4.2.3 Waivers

Any applicable DOS concession of any requirement of this standard (Section 3.1.1).

4.2.4 Certification of Testing

Certification of Testing issued for any system which has been tested to the requirements of this standard shall specify:

- (1) Model number of system.
- (2) Level of ballistic resistant protection certified.
- (3) Level of forced entry protection certified.
- (4) The maximum acceptable size of the system certified.
- (5) Model numbers of other assemblies to which this system is certified to be mullled.
- (6) A statement whether the certification applies to a single unit, to a single production lot, or to all units produced before or after the date of certification that are identical in design and materials.

4.2.5 Ballistic Test Data

The caliber, bullet weight, bullet type, bullet velocity, impact location, and result of each shot (see Section 3.2).

4.2.6 Forced Entry Test Data

Detailed data records of forced entry testing including tools, times, model number(s) of other mullled assemblies (if any), and results (see Section 3.3).

4.2.7 Photographic Record of Testing

Black and white or color, 8-1/2" x 11" (215 x 280 mm) photographs of the test sample before testing, after ballistic testing, after each phase of the forced entry testing, and at the point at which entry is forced (if applicable). Each photo should include a description of the view (5" x 8" card or equivalent), the time, test, blows, and manufacturer.

4.2.8 Narrative Summary

A narrative summary including the identity of the test facility and any witnesses of testing, description of the sample, description of the testing, description of the results, and a detailed explanation of the basis for any approved waivers.

4.2.9 Video Recording of the Test

The entire Forced Entry Test and the results of Ballistic Tests shall:

- Be recorded on the same video tape (VHS format),
- Include appropriate audio narrative description and comments, and
- Be included as part of the final test documentation.

4.3 CERTIFICATION ISSUANCE

The testing laboratory will provide the Physical Security Division of the Bureau of Diplomatic Security (DS/PSP/PSD) with a test report for each tested system. A certification letter will be issued by DS/PSP/PSD for systems which meet the certification requirements as stated in Section 1.2.

5.0 TECHNICAL REVIEW PROCESS

5.1 CERTIFICATION BY TECHNICAL REVIEW

Certification may also be granted based on a technical review of the system and its full disclosure drawings and specifications (see Section 1.8.2). The following limitations apply to this review:

- a. Modifications or improvements are made to certified systems.
- b. Integration of two or more subassemblies is made from certified systems.
- c. Previously tested non-certified systems which have been modified by material or design upgrade may be certified at the discretion of DS/PSP/PSD.

5.2 REQUESTS FOR CERTIFICATION BY TECHNICAL REVIEW

A request for certification which is based on this section of the Standard must include:

- a. An upgraded set of full disclosure drawings and specifications for the candidate system and a full set for the previously certified system in accordance with Section 1.8.2.
- b. An explanation of merits of the request.
- c. A statement of whether the request applies to the ballistic, forced entry, or both requirements of this Standard.
- d. A statement whether the request applies to a single unit, to a single production lot, or to all units produced after certification date.
- e. Documents required by Section 1.8.
- f. Changes in model numbers to comply with Section 1.12.

5.3 TECHNICAL REVIEW PROCEDURE

- a. The technical review will compare the drawings and specifications of the candidate system with the drawings and specifications of the previously certified system.
- b. A physical inspection of the candidate system may be required.
- c. DOS reserves the right to grant or reject a request for certification under Section 5.1.
- d. Retesting may be required at the discretion of DS/PSP/PSD.

TABLE I. BALLISTIC RESISTANCE TEST AMMUNITION

BALLISTIC RATING	CARTRIDGE	VELOCITY RANGE	
		Minimum	(<i>mps</i>) [*] Maximum
Rifle, Military (R)	7.62 mm, M80, ball, 147 gr. (c)	823.0 <i>mps</i> (2700 fps)	853.5 <i>mps</i> (2800 fps)
	5.56 mm, M193, ball, 55gr. (c)	955.5 <i>mps</i> (3135 fps)	986.0 <i>mps</i> (3235 fps)
	5.56 mm, M855, ball, 63 gr. (c)	899.2 <i>mps</i> (2950 fps)	929.6 <i>mps</i> (3050 fps)
Shotgun (SH)	12 gauge, 2-3/4", No. 4 buckshot (b)	388.6 <i>mps</i> (1275 fps)	419.1 <i>mps</i> (1375 fps)

(a) Optional, additional ballistic threat.

(b) Required for all samples with unobstructed, convoluted ballistic paths such as deal trays, speak-through devices, etc.

(c) Chronographing may be waived for extremely oblique firings.

* *mps*: Meters (*m*) per second (*s*).

** fps: Feet per second.

TABLE II. FORCED ENTRY TEST RESOURCES

Resource	Description*	Quantity Each		
		<u>Specified Protection Level</u>		
		5 min.	15 min.	60 min.
Active Personnel		2	6	6
Sledgehammer	12 lbs., 30 inches long		2	2
Sledgehammer	10 lbs., 30 inches long	2		
Carpenter Hammer	3 lbs.	2	2	2
Carpenter Hammer	1 lb.	2	2	2
Ram (a)	120 lbs., 2 man, 4 x 4 inches	1	1	1
Wood Splitting Maul (b)(d)	9 lbs., 35 inches long		1	1
Wood Ax, Single Bit (b)(e)	3-1/2 lbs., 36 inches long		1	2
Crowbar, Pinch Bar	60 inch		2	2
Crowbar, Ripping Bar	48 inch	1	2	2
Crowbar	24 inch		2	2
Wedge, Wood Splitting (b)	9 x 2-1/2 inches	2	4	4
Hacksaw	12 inch		2	2
Keyhole Saw (c)	Wood, 12 inch	1	1	1
Bolt Cutters	48 inch		1	1
End Nippers	14 inch	1	1	1
Chisel, Cold (b)	1 inch	1	2	2
Chisel, Cold (b)	3/4 inch	1	2	2
Chisel, Masonry (b)	2-1/4 inch	1	2	2
Screwdriver, Flat Blade	10 inch		2	2
Screwdriver, Flat Blade	Medium, 1/4 inch		2	2
Screwdriver, Phillips	10 inch		2	2
Screwdriver, Phillips	No. 1		2	2
Channel Locks	10 inch	1	1	1
Adjustable Wrench	15 inch		1	1
Adjustable Wrench	10 inch		2	1
Punch	3/8 inch		1	1
Punch	1/4 inch		1	1
Torch, Propane (c)	Portable		1	1
Vice Grip	12 inch	1	1	1
Push Broom	Wooden	1	1	1

(a) Impact area: 4 x 4 inches (± 0.25 inches)

(b) Sharp edged tools shall not be resharpened during the test.

(c) Used only during the test to failure phase.

(d) The Wood Splitting Maul shall not be used when testing transparent portions of test samples.

(e) The Wood Ax shall be used only during the final five (5) minutes when testing transparent portions of test samples.

* These tools are sizes commonly available in the U.S. For SI (metric) equivalents, convert as follows: one (1) inch = 25.4 mm; one (1) lb = 0.454 kg. Round in accordance with FED-STD-376A, *Preferred Metric Units for General Use by the Federal Government*, 5 May 1983.

TABLE III. FORCED ENTRY TESTING OF INDIVIDUAL SYSTEMS

	<u>Specified Protection Level</u>		
	5 min.	15min.	60 min.
<u>Concentrated Assault Test</u>			
Required Testing Time (minutes)			
Most vulnerable location (a)	5	15	60
Additional selected locations (a)	5	15	60

TABLE IV. FORCED ENTRY TESTING OF MULLED SYSTEMS

	<u>Specified Protection Level</u>		
	5 min.	15min.	60 min.
<u>Concentrated Assault Test</u>			
Required testing time (minutes)			
Each mullion (b)	5	15	60

(a) See Section 3.3.3 for details.

(b) This does not apply to systems which are connected without the use of a mullion.

TABLE V. FORCED ENTRY TESTING OF DOUBLE DOOR SYSTEMS

	<u>Specified Protection Level</u>		
	5 min.	15 min.	60 min.
<u>Concentrated Assault Test</u>			
Required Testing Time (minutes)			
Seam between the doors	5	15	60
Hinge of active door leaf	5	15	60
Hinge of inactive door leaf	5	15	60
Additional selected locations (a)	5	15	60

(a) See Section 3.3.2 for details.

Placement of Ballistic Witness Panel for Testing of Deal Trays

□

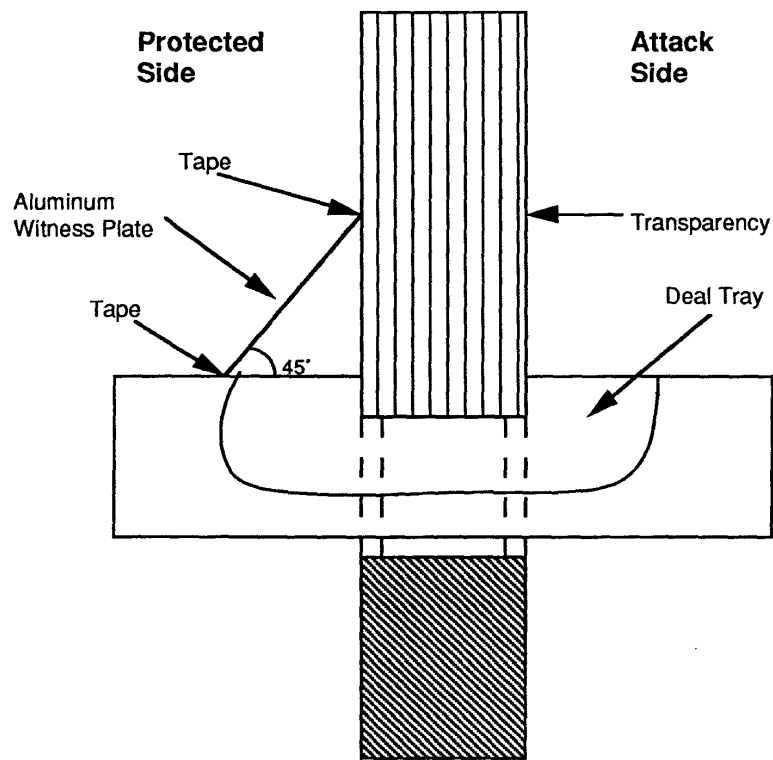


TABLE VI. MINIMUM BALLISTIC TEST REQUIREMENTS (a)

<u>Protection</u>	<u>Impact Locations</u>	<u>Ballistic Threat Caliber</u>	<u>Fair Shots</u>	<u>Witness Panel</u>
Rifle (R)	Opaque Areas: Center of area (c)	5.56 mm, M855	1	(d)
		5.56 mm, M193	1	(d)
		7.62 mm, M80	1	(d)
	Seams, framing, etc. (f)	5.56 mm, M193	1 (g)	(d)
		7.62 mm, M80	1 (g)	(d)
	Transparencies: Center of area (c)	5.56 mm, M855	1	(e)
		5.56 mm, M193	1	(e)
		7.62 mm, M80	1	(e)
	Shotgun (SH)	Unobstructed, convoluted Passages, (deal trays, speak through devices, etc.)	12 gauge	1 (i)
2 - 3/4 " No. 4 buckshot				

- (a) Additional testing is at the Test Director's and DS/PSP/PSD Representative's option (Section 3.2.2).
- (b) 120° ±5° intervals on the periphery of an 8" (205 mm) diameter circle.
- (c) 120° ±5° intervals on the periphery of an 8" (205 mm) diameter circle. The three shots must be shot in the following order: one (1), 7.62 mm, M80; one (1), 5.56 mm, M193; and one (1), 5.56 mm, M855.
- (d) 0.02 inch (0.5 mm) thick 2024T3 aluminum sheet.
- (e) 0.001 - 0.002 inch (0.025 - 0.050 mm) thick aluminum foil.
- (f) Locks, doorknobs, hinges, mullions (between glazings, opaque panels, etc.), speak-through devices, deal trays, electrical fittings, louver vanes, HVAC fittings, etc.
- (g) One shot for each area identified in (f) above.
- (h) This is an optional test reserved for special products. The number of shots and witness panel will be determined on a case specific basis.
- (i) Each dissimilar passage shall be tested.