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Draft Jamaican Standard

Method of Test

for

Hurricane Impact Resistance

BUREAU OF STANDARDS JAMAICA

PUBLIC COMMENT PERIOD:

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DJS 384: 2026

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CERTIFICATION MARKS

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Plant Certification Mark

Certification of Agricultural Produce (CAP) Mark

Jamaica-Made Mark

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This standard was circulated in the draft form for comment under the reference DJS 384: 2026.

Jamaican Standards establish requirements in relation to commodities, processes and practices, but do not purport to include all the necessary provisions of a contract.

The attention of those using this standard specification is called to the necessity of complying with any relevant legislation.

Amendments

No.	Date of Issue	Remarks	Entered by and date

Contents

Foreword

The increasing frequency and intensity of hurricanes affecting Jamaica and the wider Caribbean underscore the need for reliable and standardized test methods to evaluate the performance of construction systems under extreme wind conditions.

This standard has been developed to establish a uniform method for assessing the resistance of building materials, components, and assemblies to hurricane-induced impact forces.

This standard is voluntary.

Committee representation

Related Documents

This standard makes reference to the following:

a) Testing Application Standard (TAS) 201-94
b) The Florida Building Code, Building

Acknowledgement

Acknowledgement is made to the International Council Code for permission to reproduce material from their standard.

Jamaican Standard Method of Test for Hurricane Impact Resistance

1. Scope

This standard outlines a method of test to determine whether specific building products—such as wall cladding, exterior windows, glazing, exterior doors, skylights, glass block, shutters, and other similar devices used to maintain the integrity of the building envelope—provide adequate resistance to windborne debris.

2. Normative references

The Florida Building Code, Building TAS 301

3. Definitions

For the purpose of this standard the following definition applies:

3.1
maximum deflection
The maximum displacement of the specimen measured to the nearest 1/8 of an inch attained from the original position while the maximum test load is being applied.

3.2
permanent deformation
The permanent displacement of the specimen measured to the nearest 1/8 of an inch from the original position to final position that remains after maximum test load has been removed.

3.3
specimen
The entire assembled unit submitted for test, including but not limited to anchor-age devices, and structure to which product is to be mounted.

3.4
specimen failure
A change in condition of the specimen indicative of deterioration under repeated load or incipient failure, such as cracking, fastener loosening, local yielding, or loss of adhesive bond.

3.5
test chamber
An airtight enclosure of sufficient depth to allow unobstructed deflection of the specimen during pressure cycling, including ports for air supply and removal, and equipped with instruments to measure test pressure differentials.

3.6
test load
As determined by Sections 1625 and 1626 of the Florida Building Code, Building.

NOTE 1 Such preparations may contain one or more types of alcohol, other active ingredients with excipients, and humectants.

4. Test specimen

4.1 All parts of the test specimen shall be full size, using the same materials, details, methods of construction and methods of attachment as proposed for actual use. The specimen shall consist of the entire assembled unit attached to a given type of structural framing of the building and shall contain all devices used to resist wind forces and windborne debris. When testing glazed products, the material used to make such glazed product windborne debris resistant (i.e., fillers, film and similar) shall be an integral part, factory applied, of such glazed product. In the case of windows, doors, and sliding glass doors, a pressure treated nominal 2 × 4 wood buck #3 Southern Pine shall be used for attachment of the specimen to the test frame/stand/chamber. Such wood bucks will become part of the approval. In the case of storm panels, they must be tested in worst case scenarios where attachments are directly to Concrete Masonry Units (CMU). Figure 1, on the following page, shows the basic three (3) configurations that shall be required; one per each of the three (3) required specimens. Each storm panel specimen shall consist of minimum three (3) panels.

4.1.1 Locking mechanisms shall be permanently mounted on the specimen. Such locking mechanism shall require no tools to be latched in the locked position. Devices such as pins shall be permanently secured to the specimen through the use of chains or wires which must be of corrosion resistant material. This section does not apply to specimens referenced in Section 2413 of the Florida Building Code, Building.

4.1.2 Products that are not categorized as means of egress/escape and are provided with more than one single action locking mechanism, shall be provided with permanently posted instructions on latching for high wind pressures.

4.1.3 Specimen and fasteners, when used, shall not become disengaged during test procedure.

5. Apparatus:

5.1 The description of the apparatus is general in nature. Any equipment, properly certified, calibrated, and approved by the Authority Having Jurisdiction capable of performing this test within the allowable tolerance is permitted.

5.2 Major Components

5.2.1 Cyclic Wind—Pressure Loading As described in protocol DJS 383: 20XX. (Number of cycles and amount of pressure are indicated in Section 1625.4 and Table 1626 of the Florida Building Code, Building. Design wind pressure is to be determined by using Section 1620 of the Florida Building Code, Building.)

5.2.1.1 Test Chamber—The test chamber, to which the specimen is mounted, shall be provided with pressure taps to measure the pressure difference across the test specimen and shall be so located that the reading is unaffected by the velocity of air supplied to or from the chamber. The specimen mounting frame (including the mullion and transom) must not deflect under test load in such a manner that the performance of the specimen will be affected.

5.2.1.2 Air System—A controllable blower, a compressed-air supply, an exhaust system, or reversible controllable blower designed to provide the required maximum air pressure difference across the specimen. The system shall provide an essentially constant air-pressure difference for the required test period.

5.2.1.3 Test temperature—The test shall be conducted at a test temperature range of 59 to 95°F (15 to 35° C).

5.3 Missile Impact

5.3.1 Timing System—The timing system, which is comprised of two, through-beam photoelectric sensors spaced at a known distance apart and used to start and stop an electronic clock, shall be capable to measure speeds accurate to ±2%. The speed of the missile shall be measured anywhere between the point where 90% of the missile is outside of the cannon, to the point where the missile is 30.5 cm away from the test specimen. The missile speed shall not be measured while the missile is accelerating. The through-beam photoelectric sensors shall be of the same model. The electronic clock shall be activated when the reference point of the missile passes through the timing system. The electronic clock shall have an operating frequency of no less than 10 kHz with a response time not to exceed 0.15 milliseconds. The speed of the missile shall be determined by dividing the distance between the two through-beam photoelectric sensors by the total time interval counted by the electronic clock.

5.3.1.1 Calibration of Timing Equipment—The timing system shall be calibrated and certified by the Authority Having Jurisdiction, at six-month intervals using one of the following methods:

1. Photographically, using a stroboscope,
2. Photographically, using a high-speed camera with a frame rate exceeding 500 frames per second,
3. Photographically, using a high-speed video camera with a frame rate exceeding 500 frames per second, or
4. Any other certified timing system calibration device used by an independent certified agency approved by this office.

The calibration report shall include: the date of the calibration, the name of the agency conducting the calibration, the distance between the through-beam photoelectric sensors (if used), the speed of the missile as measured by the timing system, the speed of the missile as determined from the calibration system, and the percentage difference in speeds. The system shall be determined to be accurate if the speed of the missile measured by the timing system and the speed measured by the calibration system agree within 2%.

5.1.2 Reserved

5.3.2.1 LARGE MISSILE—The large missile shall be a solid S4S nominal 2 × 4 wood buck of #2 surface dry Southern Pine. The weight of the missile shall be as specified in Section 1626.2.3 of the Florida Building Code, Building and shall have a length of not less than 213 cm (7 feet) and not more than 274 cm (9 feet). The missile shall be marked/ticked in dark ink at one-inch intervals on center and congruently numbered every three inches. A sabot shall be attached to the trailing edge of the missile to facilitate launching. The weight of the sabot shall not exceed 1.12 kg. The combined weight of the timber and sabot, which constitutes the missile, shall be between 4.08 kg (9 lb) and 4.31 kg (9.5 lb). The missile shall be propelled through a cannon as described in Section 6.3.3 of this protocol.

5.3.2.2 When testing any specimen with more than one component, in addition to complying with the impacts required by Section 1626.2 of the Florida Building Code, Building the framing member connecting these components shall be impacted at one half the span of such member with the large missile at a speed indicated in Section 1626.2.4 of the Florida Building Code, Building.

5.3.2.3 Any specimen that passes the large missile impact test need not be tested for the small missile impact test if the specimen has no opening that a 0.48 cm (3/16 inch) sphere can pass through.

5.3.3 LARGE MISSILE CANNON—The large missile cannon shall use compressed air to propel the large missile. The cannon shall be capable of producing impact at the speed specified in Section 1626.2.4 of the Florida Building Code, Building. The missile cannon shall consist of four major components: a compressed air supply, a pressure release valve, a pressure gauge, a barrel and support frame, and a timing system for determining the missile speed. The barrel of the missile cannon shall consist of a 4-inch inside diameter pipe and shall be at least as long as the missile. The barrel of the large missile cannon shall be mounted on a support frame in a manner to facilitate aiming the missile so that it impacts the specimen at the desired location. The distance from the end of the cannon to the specimen shall be 274 cm (9 feet) plus the length of the missile.

5.3.4 SMALL MISSILE—The missiles shall be propelled through cannon as described in Section 6.3.5 of this protocol. The small missile shall be launched in such a manner that each specimen shall be impacted over an area not to exceed 60.96 cm (two square feet) per impact as described in Section 1626.3.5 of the Florida Building Code, Building. Small missiles should be stainless steel or coated steel to avoid corrosion contamination.

5.3.5 SMALL MISSILE CANNON—A compressed air cannon shall be used that is capable of propelling missiles of the size and speed defined in Sections 1626.3.3 and 1626.3.4 of the Florida Building Code, Building. The cannon assembly shall be comprised of a compressed air supply and gauge, a remote firing device and valve, a barrel, and a timing system. The small missile cannon shall be mounted to prevent movement of the cannon so that it can propel missiles to impact the test specimen at points defined in Section 1626.3.5 of the Florida Building Code, Building. The timing system shall be positioned to measure missile speed within 5 feet of the impact point on the test specimen.

6. Hazards:

Testing facilities must take all necessary precautions to protect the observers during the entire test procedure. All observers shall always be at a safe distance away from specimen and apparatus. Safety regulations must be followed in order to avoid any injuries to all observers.

7. Testing Facilities (for a more detailed description refer to TAS 301-94).

7.1 Any testing facility wishing to perform this test must first obtain the approval of the Authority Having Jurisdiction. Such approval shall only be given to those facilities which show that they are properly equipped to perform the complete test, including the cyclic loading and the small and large missile impact test. Testing facilities shall request, in writing, approval of their facilities. Such request shall contain the ability of the facility to perform all aspects of the test, all equipment used in the performance of the test, name of independent agency calibrating their equipment, location of facilities, personnel involved in the testing, a quality control program, a safety program and any other pertinent information which will clearly indicate that such facility is in the business of performing independent testing. The Authority Having Jurisdiction will visit the site and reserve the right to order any changes necessary to accept the facility for testing.

7.2 Approval of facilities to perform the test described in this protocol, does not constitute an approval of such facilities to perform other tests not specifically mentioned in this protocol.

8. Format of Test:

The manufacturer shall notify the Authority Having Jurisdiction fourteen (14) working days prior to the performance of the test. The Authority Having Jurisdiction reserves the right to observe the test. The Authority Having Jurisdiction must be notified of the place and time the test will take place. The test must be recorded on video and retained by the laboratory per TAS 301.

9. Test Reports:

The following minimum information shall be included in the submitted report:

a) Date of the test and the report, and report number.
b) Name and location of facilities performing the test.
c) Name and address of requester of the test.
d) Identification of the specimen (manufacturer, source of supply, dimension, model types, material, procedure of selection and any other pertinent information).
e) Detailed drawings of the specimen showing dimensioned section profiles, type of framing specimen was attached to, panel arrangement, installation and spacing of

anchorage, locking arrangement, sealants, hardware, product markings and their location, and any other pertinent construction details. Any deviation from the drawings or any modifications made to the specimen to obtain the reported values shall be noted in the drawings and in the report.

f) Maximum deflection recorded and mechanism used to make such determination.

g) Permanent deformation (provide cross section diagram to show where it occurred).

h) Name, address, signature and seal of a professional engineer, witnessing the test and preparing the report. Engineer shall be part of the laboratory's permanent staff or under laboratory's contract.

i) The results for all three specimens shall be reported, each specimen being properly identified, particularly with respect to distinguishing features or differing adjustments. A separate drawing for each specimen will not be required if all differences between them are noted on the drawings provided.

j) Location of impacts on each test specimen.

k) The large and small missile velocities.

l) The weight of the missiles.

m) Maximum positive and negative pressures are used in the cyclic wind pressure loading.

n) A description of the condition of the test specimens after testing, including details of any damage and any other pertinent observations.

o) When the tests are made to check conformity of the specimen to a particular specification, an identification or description of that specification.

p) A statement that the tests were conducted in accordance with this test method.

q) A statement of whether or not, upon completion of all testing, the specimens meet the requirements of Section 1626 of the Florida Building Code, Building.

r) A statement as to whether or not tape or film, or both were used to seal against air leakage, and whether in the judgment of the test engineer, the tape or film influenced the results of the test.

s) Signatures of persons responsible for supervision of the tests and a list of official observers.

t) All data not required herein, but useful for a better understanding of the test results, conclusions or recommendations, should be appended to the report.

10. Recording Deflections:

Maximum Deflection

Permanent Deformation

11. Additional Testing:

11.1 Following successful completion of this test, all specimens must then be successfully tested as per DJS 383: 20XX.

11.2 Any product, when installed that is subjected to weathering, where such weathering can affect the integrity of the product, the manufacturer shall contact the Authority Having Jurisdiction for additional testing requirements such as but not limited to moisture, U.V., accelerated aging, and other similar tests.

11.3 The Authority Having Jurisdiction reserves the right to require any additional testing necessary to assure full compliance.

11.4 Some products, such as, but not limited to exterior doors, exterior windows, skylights, and wall cladding shall be required to be successfully tested under JS 384: 20XX prior to conducting tests under this protocol.

12. Product Marking:

12.1 Any and all approved products shall be permanently labeled with the manufacturer's name, and location and the following statement: "Product Approved."

12.2 Permanently labeled shall be a metallic label fixed permanently to the frame of the specimen by rivets or permanent adhesive. See Section 13.2.1 of this protocol for storm panels.

12.2.1 Permanent label on storm panels could be printed directly on each panel at intervals not to exceed 91 cm (36 inches) with non-removable paint or ink.

12.3 Any instructions for operations shall be permanently mounted on the specimen in an area not subject to be painted or concealed. Storm panels may be excluded from this section.

Standards Council

The Standards Council is the controlling body of the Bureau of Standards Jamaica and is responsible for the policy and general administration of the Bureau.

The Council is appointed by the Minister in the manner provided for in the Standards Act, 1969. Using its powers in the Standards Act, the Council appoints committees for specified purposes.

The Standards Act, 1969 sets out the duties of the Council and the steps to be followed for the formulation of a standard.

Preparation of standards documents

The following is an outline of the procedure which must be followed in the preparation of documents:

1. The preparation of standards documents is undertaken upon the Standard Council's authorisation. This may arise out of representation from national organisations or existing Bureau of Standards' Committees of Bureau staff. If the project is approved it is referred to the appropriate sectional committee or if none exists a new committee is formed, or the project is allotted to the Bureau's staff.

2. If necessary, when the final draft of a standard is ready, the Council authorises an approach to the Minister in order to obtain the formal concurrence of any other Minister who may be responsible for any area which the standard may affect.

3. The draft document is made available to the general public for comments. All interested parties, by means of a notice in the Press, are invited to comment. In addition, copies are forwarded to those known, interested in the subject.

4. The Committee considers all the comments received and recommends a final document to the Standards Council

5. The Standards Council recommends the document to the Minister for publication.

6. The Minister approves the recommendation of the Standards Council.

7. The declaration of the standard is gazetted and copies placed on sale.

8. On the recommendation of the Standards Council the Minister may declare a standard compulsory.

9. Amendments to and revisions of standards normally require the same procedure as is applied to the preparation of the original standard.

Overseas standards documents

The Bureau of Standards Jamaica maintains a reference library which includes the standards of many overseas standards organisations. These standards can be inspected upon request.

The Bureau can supply on demand copies of standards produced by some national standards bodies and is the agency for the sale of standards produced by the International Organization for Standardization (ISO) members.

Application to use the reference library and to purchase Jamaican and other standards documents should be addressed to:

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