

September Is Historically the Busiest Month for Hurricanes

Atlantic hurricane activity historically peaks around Sept. 10, with most tropical cyclone activity occurring between mid-August and mid-October.

Even in a season with fewer storms, that historical peak is significant for manufacturers whose products are specified for hurricane-prone regions. Performance requirements do not change with the seasonal forecast, and hurricane resistance involves more than whether a product can withstand windborne debris.

Impact, cyclic pressure, structural loading, air infiltration and water penetration can all factor into how exterior building products and assemblies are evaluated. The applicable tests and performance criteria depend on the product, its intended use, design pressures, installation location and approval requirements.

Impact Is Only the Beginning

One of the most recognizable parts of hurricane testing involves firing a piece of lumber at a building product to simulate windborne debris.

Large-missile testing can involve a 9-pound 2 by 4 propelled at speeds specified by the applicable test requirements. But the impact itself is only one part of the evaluation.

Following impact, the product may be subjected to thousands of positive and negative pressure cycles based on its design pressure.

"Hurricane resistance depends on more than impact testing. Product performance can also involve cyclic pressure, air infiltration, water penetration, and structural loading."

This sequence evaluates whether the assembly can continue to perform after impact while undergoing the repeated pressure changes associated with hurricane winds.

Design Pressure Drives the Test

The pressure used during testing is based on the product's design pressure.

Design pressures are established for the building and application based on factors such as wind speed, building height, exposure, location on the building, and applicable code requirements. Those pressures help determine how a product is tested and the performance level the results can support.

This is especially relevant when a manufacturer wants test results to cover multiple product sizes, configurations or design pressures.

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Testing a single specimen does not automatically qualify every possible variation of that product. Selecting the appropriate configurations for testing is therefore an important part of planning the test program.

The Tested Configuration

For fenestration and curtain wall systems, hurricane performance is based on an assembly, not an individual component.

Glass type and thickness, framing members, glazing materials, reinforcement, anchors, fasteners, hardware, mullion configurations, and installation details can all affect performance.

Changes to these components can affect what the test results support.

Manufacturers should consider the intended product range before specimens are fabricated. Product sizes, configurations, anchorage and other variables can help determine which specimens should be tested to support the intended product range.

The Market Determines the Path

Where a product will be installed can be as important as what the product is.

Products intended for Florida's High-Velocity Hurricane Zone (HVHZ) are subject to specific testing and product approval requirements. Other jurisdictions and applications may reference different standards and performance criteria.

The applicable test methods address different aspects of hurricane performance:

- ASTM E1886 and ASTM E1996 address impact and cyclic-pressure performance for exterior windows, curtain walls, doors and impact-protective systems.
- TAS 201 addresses impact resistance.
- TAS 202 addresses air infiltration, water penetration and structural loading.
- TAS 203 addresses cyclic wind-pressure loading.

Understanding the intended market, code requirements and approval path before testing can help manufacturers develop a program that addresses the performance and documentation they will ultimately need.

Testing Beyond Impact and Cycling

Impact resistance and cyclic pressure are important parts of hurricane evaluation, but the building envelope also has to manage air, water and structural loads.

Air infiltration testing measures air movement through an assembly under specified pressure differentials. Water penetration testing evaluates the assembly's ability to resist water intrusion under defined conditions. Structural testing evaluates how the product responds to positive and negative design pressures.

Depending on the product and approval path, these evaluations may be conducted as part of a broader test program rather than as isolated tests.

Intertek provides hurricane testing for windows, doors, curtain walls, shutters, roofing and other building products. Capabilities include missile impact and cyclic pressure testing, along with air, water and structural testing. Intertek also supports manufacturers pursuing Florida Product Approval and Miami-Dade Notice of Acceptance requirements.

With Atlantic hurricane activity historically peaking in September, it is a timely reminder to look beyond the storm forecast and consider the performance requirements products are designed and tested to meet.

Click here to learn more about Intertek's hurricane testing solutions.

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