



# STANDING SEAM SPOTLIGHT

*An Educational Bulletin for Metal Roofing Professionals*

## Three Wet Threats

By George Jones

*One of the most crucial considerations for any building design is keeping its contents dry. Since the roof is the primary barrier to water penetration,*

*selecting the right roofing system is critical to protecting a structure from the Three Wet Threats: rainfall, wind-driven rain, and standing water.*

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Architects and engineers rely on national test standards to identify and evaluate acceptable building products. The American Society of Testing and Materials (ASTM) and American Aluminum Manufacturer Associates (AAMA) are widely recognized as the authority on product evaluation and testing. Additionally, specific regional applications sometimes require a higher level of performance than indicated by the national standard, such as Miami-Dade County in Florida, who responded to the region's annual hurricane cycle by imposing its own requirements.

With regard to metal roofing systems, the cited national standards for water penetration testing can be classified into three threat categories:

### **Threat 1 - Daily Weather Event (rainfall):**

ASTM E 1646 Standard Test Method for Water Penetration of Exterior Metal Roof Panels by Uniform Static Air Pressure Difference

### **Threat 2 - High Wind Event (wind-driven rain):**

AAMA 501.1 Standard Test Method for Dynamic Pressure Water Infiltration, and Florida Building Code (FBC) TAS 100-95 Test Procedure for Wind and Wind Driven Rain Resistance of Discontinuous Roof Systems

### **Threat 3 - Product Submersion Evaluation (standing water):**

ASTM E 2140 Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head, and Florida Building Code (FBC) TAS 114 Test Procedure for Susceptibility to Leakage of Discontinuous Roof Systems



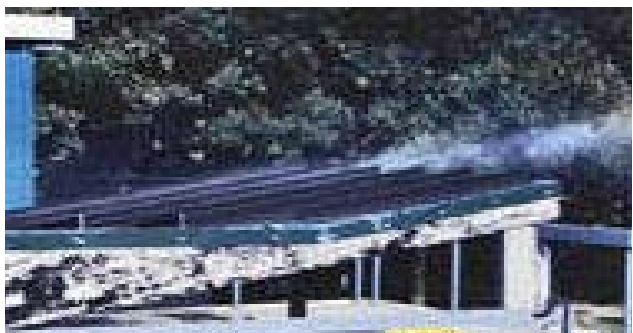
### Daily Weather Event:

In brief, the ASTM E 1646 evaluates how resistant the standing seam panel system is to daily rain events. From moderate to heavy rains with light winds are typically thought of as average daily rain events. To further determine how water-tight or resistant a roof system is to routine rains, the test specimen is subjected to established incremental increases of vacuum pressures being applied from the air chamber. If water penetrates the seams, this specimen would fail the test. If water is not detected, the specimen passes the test.

### High Wind Event:

AAMA 501.1 and FBC - TAS 100-95 evaluates the resistance of the standing seam panel system to high winds combined with wind-driven rain. This test determines how a panel assembly reacts to the dynamics of high winds at a variety speeds, and whether water can be wind-driven into the actual field installation details.

The test specimen is approximately 8' x 10' and is assembled using the manufacturers' standard installation details. A "high wind" event is simulated with wind gusts reaching 70 to 100 miles per hour, with a uniform injection of water into the air stream. Wind speeds are incrementally increased to 100 mph, with water simulating rain fall of 8.8 gallons per hour. During the test, the specimen is continuously inspected from underneath to detect any water penetration. If water is detected, the specimen fails.



### Product Submersion Evaluation

ASTM E 2140 and FBC - TAS 114 evaluates the resistance of the standing seam panel systems to "ponding" water. ASTM E 2140 requires a test specimen of four full-width panels with two partials, and TAS 114 requires nine full-width panels with 2 partials.

The panels are assembled over open purlins and sealed at the perimeter to create a sufficient height to achieve a 6-inch water depth above the panel pan. Once the panels are loaded, the assembly must not leak during the duration of 6 hours for ASTM E 2140, and 7 days (168 hrs) for FBC - TAS 114. If a leak is detected, the specimen fails.

### Summary

As a design professional, one of your basic concerns is keeping the building dry in all weather conditions. These national and regional test standards are your tools to achieve that goal in all weather conditions.

These performance-based tests define the minimum acceptable levels of product performance for your project. Don't run the risk of a product not performing up to national test standards by considering anything less.

*For help determining the right kind of system for your project, contact your IMETCO representative.*

