



# **Verizon NEBS™ Compliance: Wind Driven Rain Calibration**

**Verizon Technical Purchasing Requirements  
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## 1.0 PURPOSE

The purpose of this document is to define the procedures that should be followed to qualify the test set-up that can be used for Wind Driven Rain Testing for several Telcordia GR's, such as GR-487-CORE, GR-2898-CORE, and GR-771-CORE etc. GR-487-CORE refers to MIL-STD-810E that discusses issues such as the drop size. GR-487-CORE also includes the Rainfall Rate of 15cm/hr (5.8 in/hr) and Wind Velocity of 31m/sec (70 mph).

## 2.0 SCOPE

NEBS & FOC Products

## 3.0 REFERENCES

<b>GR-487-CORE, Issue 2, March 2000</b>	Generic Requirements for Electronic Equipment Cabinets
<b>GR-771-CORE, Issue 1, July 1994</b>	Generic Requirements for Fiber Optic Splice Closures
<b>FOC Memo # 17, rev 3</b>	Wind Driven Rain Test Set-Up Calibration Procedure
<b>MIL-STD-810E</b>	Test Method Standard for Environmental Engineering Consideration and Laboratory Tests
<b>UL-497C</b>	Protectors for Coaxial Communication Circuits

## 4.0 ACRONYMS

<b>EUT</b>	Equipment Under Test
<b>FOC</b>	Fiber Optic Components
<b>ITL</b>	Independent Testing Laboratory

## 5.0 CALIBRATION REQUIRMENTS FOR WIND DRIVEN RAIN TEST APPARATUS



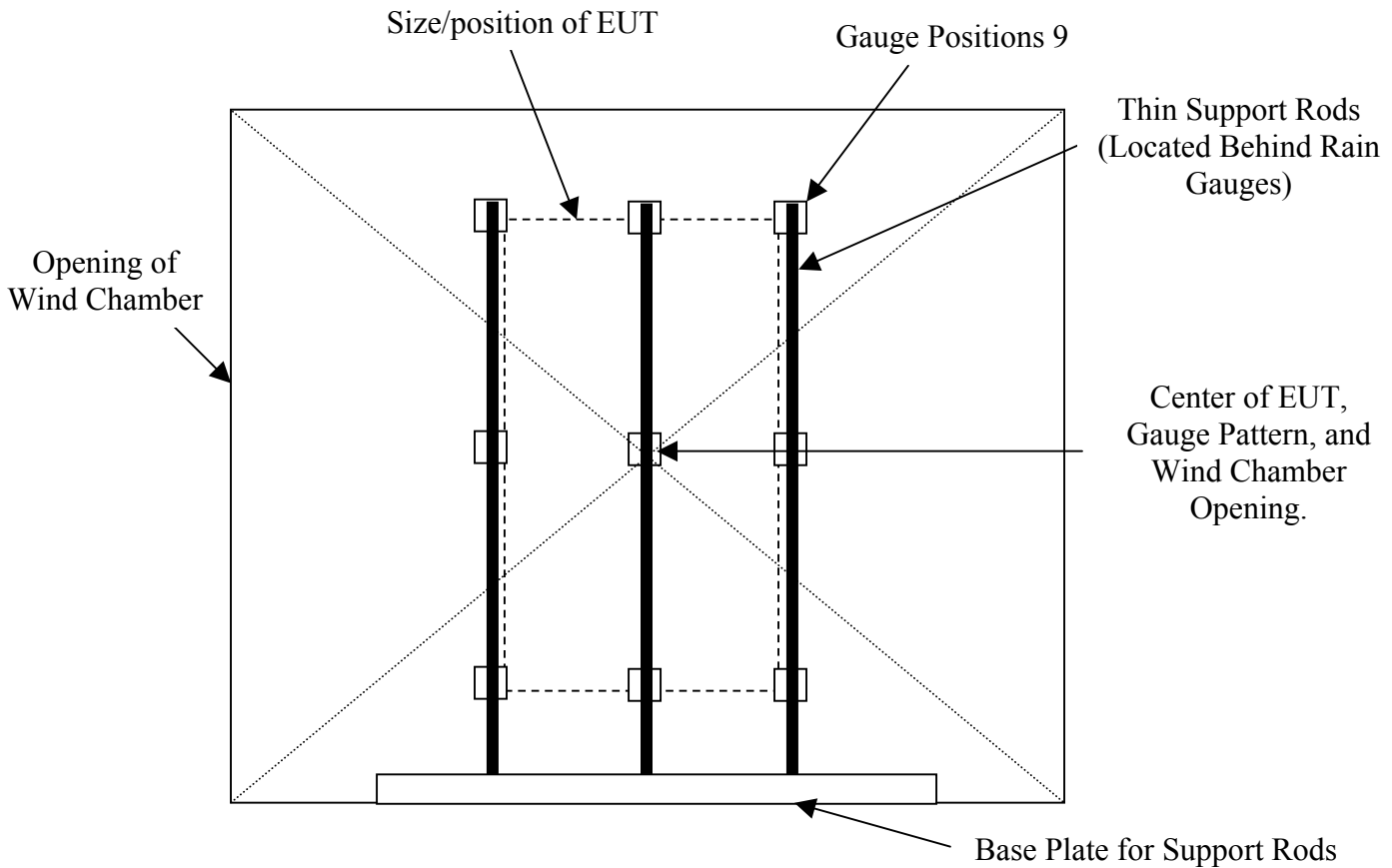
Verizon requires Wind Driven Rain evaluations to be performed on many of the products introduced into the network. The following method was introduced to provide clarity and consistency across all standards for the calibration of this equipment. All testing of this type must utilize the following Verizon approved calibration method and must be performed by a Verizon approved ITL.

### **Test Set-up Calibration**

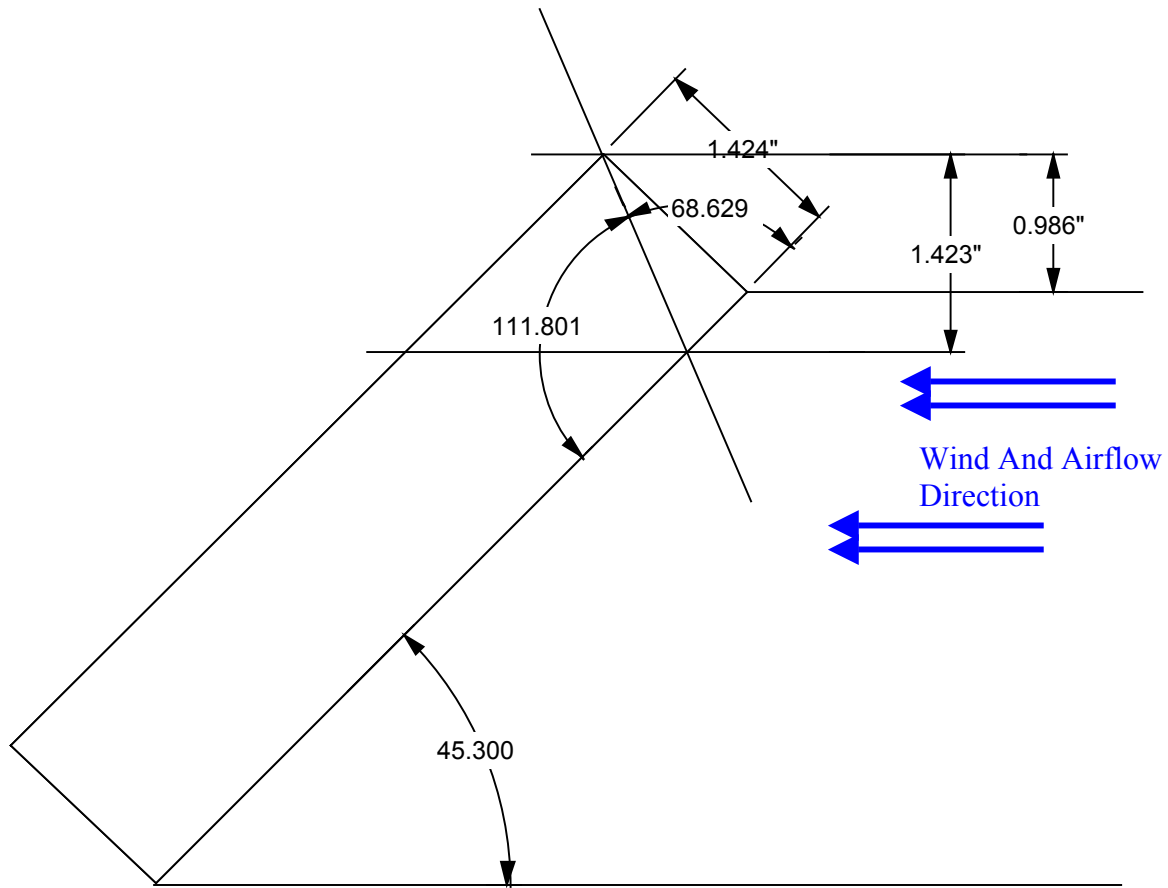
Determine the center of the wind tunnel opening and the outline of the equipment sample under test (EUT) centered over the tunnel opening.

1. Adjust the positions of the gauges (#90107 Springfield Rain Gauges) on the adjustable rod assembly (see Figure 1) to coincide with the 4 corners and centerline of the EUT. The gauges (see Figure 2) will be both air velocity in miles per hour or rainfall gauges. Rainfall and air velocity can be measured separately. The method of gauging wind velocity shall provide a means of averaging wind speed data.
2. The water shall be dispersed using the UL nozzles as defined in UL-497C Figure 25.2.
3. Place the gauge matrix in front of the wind tunnel opening and start the test blower(s).
4. Place an air velocity gauge at each gauge position, measure the air velocity in miles per hour in each of the positions and average the readings to arrive at an average test velocity. Adjust the wind tunnel opening and/or blower speed and repeat step 4 as necessary to arrive at the desired average wind velocity.
5. Remove the air velocity gauges, install rain gauges at a 45-degree angle, and turn on the blower and water spray nozzles. Collect water in each of the gauges for 30 minutes and turn off the water source and blower power.
6. Measure and average the rain gauge contents to arrive at an average rainfall rate. After completion of the 1-2 hour rain collection test, the amount of rain in each gauge tilted 45° during the test be measured with the gauge placed in a vertical position and factored by 1.44238 to indicate the actual collection rate of an untilted gauge. Example: 1.35 inches collected x 1.4423 = 1.947 inches in 1/2 hour or 3.89 inches per hour. Adjust the water pressure/flow and repeat step 5 as necessary to arrive at the desired rainfall rate. The specified levels are a rainfall rate of 5.8 inches/hour at a wind velocity of 70 miles/hour. So for a 30 minute test the rainfall rate is approximately 2.9 inches/30 minutes. It is required that the test set-up minimums are a rainfall rate of 5.8 inches/hour at a wind velocity of 70 miles/hour. The test set-up measured levels may exceed the required

minimums by 15%. If agreed to by the vendor and test lab the required minimums may exceed the required levels by more than 15%.



**Figure 1- Wind Speed and Rainfall Verification Fixture**



**Figure 2 -Sketch Depicting Reduction of Water Collection Aperture With An Inclined Rain Gauge During Wind-Drive Rain Testing**