

## **TERMS AND CLARIFICATIONS PERTAINING TO THE FLORIDA BUILDING CODE**

### **Wind Speed vs. Design Pressure**

- Windows and doors are not rated by wind speed they are rated by how much pressure (force) they can withstand. This pressure is measured in Pounds Per Square Foot (PSF).
- All openings in a building have a design pressure and they aren't always the same.
- There are Interior Zones and End Zones and in buildings over 60 feet there is an Intermediate Zone.
  - These zones are often given numbers
    - Zone 4 = +xx.x / -xx.x PSF
    - Zone 5 = +xx.x / -xx.x PSF
- Design pressures are calculated using the mean roof height, wind speed, building dimensions and zones just to name a few. These calculations are done by a Design Professional (licensed architect or engineer).
- In light of this, PGT cannot tell you what your design pressures are but rather what our products can do.

### **Structural Pressures vs. Design Pressures**

- All units must be tested to 1.5 times the "Design" Pressure, which is known as the "Structural" Pressure.
  - If we want to achieve a +/- 60 PSF design pressure at the lab we would have to test the unit to 90 pounds of pressure ( $60 \times 1.5 = 90$ ). 90 is our Structural Pressure.
- When we talk "pressures" at PGT we always talk "design pressures".
- Be sure your design professional specifies Design Pressure.

### **Positive and Negative Pressures**

- All openings will be specified with a Positive and a Negative pressure.
- Positive and negative pressures occur during high winds and cyclic winds.
- Positive pressure is the force applied to an opening on the side of the building the wind is blowing against.
- Negative pressure is the force applied to the side of the building the wind is blowing away from, in other words, it tries to suck the window out of the opening rather than blow it into the building.
- This is why there is such an emphasis on design pressures in the Florida Building Code.

### **Comparative Analysis**

- Using the tested design pressure, largest size unit tested, glazing, etc., an engineer can analyze the information for smaller sized units to determine the pressure it would be. Through this analysis we find that smaller units have a higher pressure.
- These calculations are put in the form of a chart called the Comparative Analysis. Comparative Analysis is not allowed on impact resistant glass. Impact resistant glass cannot exceed the "tested" pressure.

### Water Limited Pressure

- Water pressure is 15% of the design pressure.
  - If you wanted to achieve a 60 PSF design pressure at the test lab you would have to get a 9 on the water ( $60 \times 15\% = 9$ ) to eliminate water limited pressure.
- Sometimes, during testing, a unit will have water come over the sill and inside the opening before reaching 15% of the design pressure. When this occurs the positive design pressure is reduced to the water pressure.
  - If you started to get water over the sill at 7.5 your water limited positive design pressure would be 50 ( $7.5 / 15\% = 50$ ).
- Regardless of the tested design pressure, the best Positive pressure in this example is 50 PSF even if the unit passed a design load test that was higher.
  - So in our sample unit we can say it tested to a +50 PSF and a -60 PSF design pressure.
- AAMA, SFBC (South Florida Building Code - Miami-Dade's) and the FBC are all water limited so PGT can only do a comparative analysis on the water-limited pressure.

### Glass Table E1300

- Glass is tested (just as windows and doors are tested) which generates a table or scale of acceptable pressure for each thickness and strength.
- New glass tables were generated when testing changed to the use of 20-year-old glass. This is known as Glass Table E1300.
- When a unit is tested to a 60 PSF Design Pressure and the glass that it was tested with, according to E1300, has a lower pressure, say 50 PSF, then this would be your Glass Limited Design Pressure.
  - Let's put all the examples together: A product is tested to +/- 60 PSF Design, its has a Water of 7.5, that is 50 PSF, and the glass is limited to 50 PSF. The resulting Design pressure for that specific product is +/- 50 PSF.
  - Take it one step further. The Water limited pressure was 45 PSF. The resulting design pressure would be +45 PSF and -50 PSF.
- So what can you do about all these limitations?
  - The glass can be upgraded to a greater thickness and/or strength or both. This will help overcome the limitations on the glass; however, there isn't much that can be done with the water limitations aside from putting on a sill adapter where they are available.
- E1300 has been in effect for a number of years but has not been enforced. SBCCI and AAMA adopted it several years ago and it is in their current codes.
- Product approvals issued after January 1, 2001 have the ASTM E1300 calculations included.
- The new Florida Building Code (FBC) has also adopted E1300 and will be enforced statewide.
- Glass limitations affect both the positive and negative design pressures.

### **But, I Don't Have To Meet Miami-Dade County Code!**

- For non-impact products that is correct.
- Under the FBC all products must meet the minimum test requirements of AAMA.
- Miami-Dade exceeds the AAMA test requirements.
- The product approval issued by Miami-Dade is not a "code". It is a report to show how a product performed under their rigorous test requirements.
- Under the new Florida Building Code, Miami-Dade is an "approved evaluation entity" and the Product Approvals are to be accepted statewide.
- For years, Miami-Dade has had to have each project independently engineered in order to know the design pressure requirements. The rest of Florida will now follow a similar procedure.
- The difference is that Miami-Dade County customers are only allowed to use a product that has passed their test criteria and is approved by Miami-Dade County. The rest of Florida will be allowed to use any product that has passed either AAMA or Miami-Dade testing.
- It is important to note that the Miami-Dade approvals issued after January 1, 2001 have the ASTM E1300 and water limitations already calculated and the test reports do not. These calculations will have to be done by a licensed engineer.

### **How Does The New Code Affect Us?**

- As a manufacturer, PGT does not calculate structural / design requirements for window and door openings.
- The code says that the design pressures must be on the plans prior to submitting for a permit.
- You can use Table 1606.2 to get design pressures. This table is in Chapter 16 of the FBC for Single Family Residential Homes only up to 30-foot mean roof height.
- Once the design pressure requirement is known it can be matched against our product's design pressures to determine if they meet (remember glass upgrades are possible).
- Our design pressures are contained in the NOA's (Notice of Acceptance).
  - The NOAs are on the Architect CD or we can fax them to you.
  - We will be happy to help you understand the info (where to find the design pressures, anchor spacing and sizes, etc.).
  - NOA's have an expiration date. As renewals occur you may contact us for a copy of the new approval to keep your records up to date.
  - Read the NOAs carefully to watch for special meeting rails, hi-rise sill adapters, min & max sizes, etc.

### **Wind-Borne Debris – Impact Resistance**

- In the zones that require impact resistance many people don't realize that they also have to meet the design pressure part of the code.
- There are actually two hurdles to overcome; a product that meets the engineers design pressures and a product that protects from wind-borne debris. We can do both - - - -  
The key is to know the required design pressures.

### **Anchorage and Design Pressures**

- Anchor spacing, size and embedment indicated in the Miami-Dade NOA and are required to achieve the design pressures stated therein.
- Test Reports also contain specific anchor size and spacing, however, the water and glass limitations will have to be done manually.
  
- **Mulls**
  - FBC says, All Mulls Must Be Anchored to the Substrate. This is required so that when pressure is applied to the windows it will transfer to the mull and then to the building. This is referred to as Load Transfer.
  - This can only be accomplished by using a tube mull WITH CLIPS.

### **Points of Reference:**

Building Code on-line

<http://www.floridabuilding.org>

Miami-Dade County

<http://www.dca.state.fl.us/fhcd/fbc>

<http://www.buildingcodeonline.com>