

# Coastal Market Requirements & Compliance

By Steve Berg, Technical Marketing Manager  
Andersen Windows Inc.

Every year we hear of devastating storms impacting the lives of people around the United States. Hurricanes and storm surges along the coast have been the biggest stories, making names like Katrina, Irene, and Sandy synonymous with human suffering and economic loss. Faced with the human and financial impact of catastrophic storms like these, government agencies continue to evaluate wind performance and revise coastal building codes in their jurisdictions – and there are a lot of coastal jurisdictions.

According to the National Coastal Population Report, Population Trends 1970 to 2020 there are 31 coastal states, 452 coastal counties and 275,351 mi<sup>2</sup> of coastal lands, and over 123 million people live in these coastal shoreline counties. That represents 39% of the U.S. population living in coastal regions that represent less than 10% of the land in the U.S. This population density is expected to increase in the years to come, growing 8% between 2010 and 2020. Between the years 2000 to 2010, 1,355 building permits were issued per day in coastal shoreline counties.

This residential construction growth is an opportunity for all who design, specify and build seasonal and year-round homes in these coastal states. Along with this opportunity comes the responsibility to understand the building code changes that government agencies are enacting in these regions. These agencies continue to learn from past storms and define code changes designed to protect the lives of their citizens and the economic well-being of these communities. Below is a timeline identifying some of the most severe coastal storms in the past twenty years and the actions taken by government agencies to improve the performance of new buildings through the revision of building codes in those regions.

## Evolution of Coastal Market Requirements

**1992** – Hurricane Andrew hits South Florida resulting in catastrophic damage. Due to poor construction practices and the building materials used, the insurance industry pushes for building code changes.

**1996** – South Florida building codes mandate wind borne debris protection for windows / doors.

**1997** – North Carolina mandates increased design pressure performance for windows / doors.

**2001** – Florida mandates wind borne debris protection for all coastal areas except Panhandle.

**2002** – New York adopts wind borne debris protection requirements for Long Island, effective 2003.

**2005** – Hurricane Katrina hits Gulf Coast.

**2006** – Gulf coastal states and most of the East Coast states mandate wind borne debris protection or higher window and door performance.

**2007** – Florida mandates wind borne debris protection for Panhandle. New Jersey prohibits the use of plywood panels as a means of wind borne debris protection in most applications.

**2009** – Florida state-funded Citizens Insurance mandates wind borne debris protection for select policy holders.

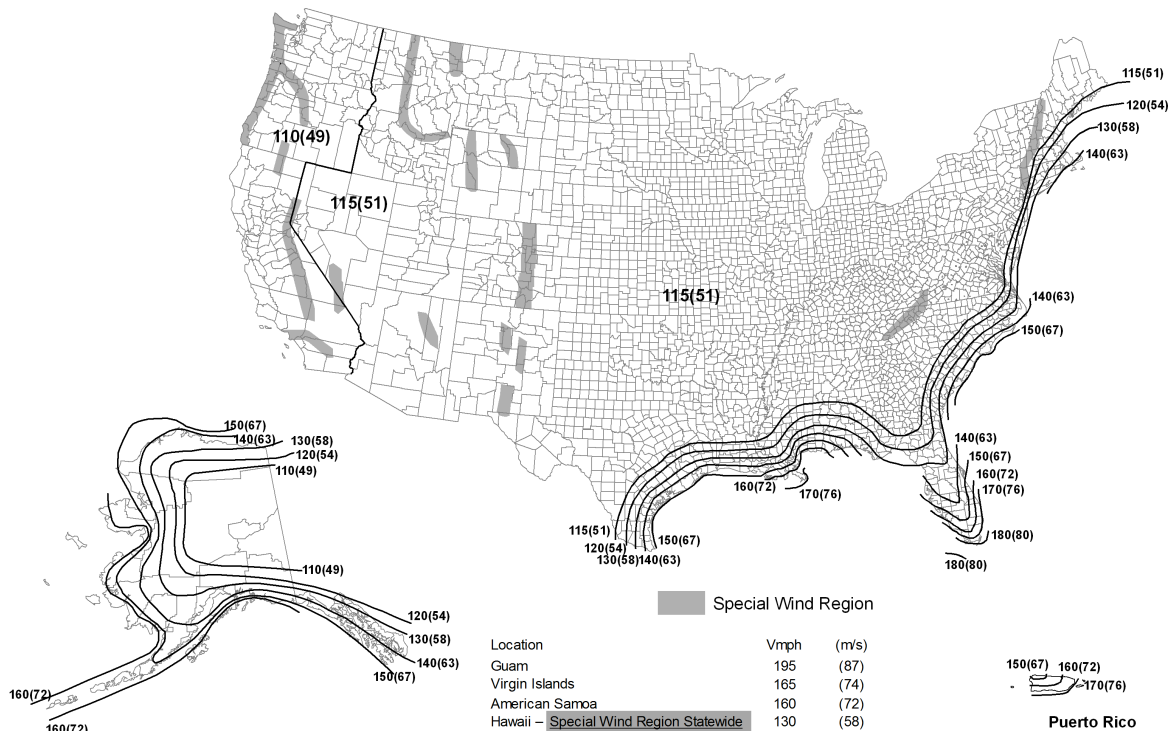
**2010** – Florida Energy Code and U.S. Energy Tax Credit moving demand from monolithic impact glass to dual-pane impact resistant glass.

**2012** – Changes to coastal building codes affecting areas requiring wind borne debris protection. Some areas may no longer require protection. Hurricane Sandy hits East Coast causing some states to reject new code changes.

The changes to coastal building codes in 2012 brought major changes to both design pressure (DP) and opening protection requirements for windows and doors in hurricane-prone coastal regions of the East and Gulf coastal areas of the United States. Opening protection typically includes tested and certified impact resistant glass products or “hurricane” shutters/panels. These changes are a result of the newest version (2010) of the ASCE 7 Standard: *Minimum Design Loads for Buildings and Other Structures* published by the American Society of Civil Engineers. The resulting changes of this updated standard will mean that design pressures for windows and doors will decrease in some areas while increasing in others. It will also mean that some areas in the hurricane prone regions of the East and Gulf coasts will no longer need opening protection from windborne-debris, while areas that did not require opening protection in previous versions, such as the 2006 and 2009 IBC and IRC will now require opening protection.

### Current Coastal Requirements – 2009 International Codes (residential and light commercial)

Wind borne debris protection and higher design pressure (DP) performance is required in all Gulf and East coastal areas where wind speeds are 110mph or greater. Some areas within the 110mph wind speed zone only require higher DP performance. However, opening protection is required if a structure is within one mile of the coast or within 1,500 feet of mean high water line depending on state. In most areas with wind speeds 120mph or greater, opening protection is mandated regardless of distance from coast.







- Notes:
1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
  2. Linear interpolation between contours is permitted.
  3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
  4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
  5. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 Years).

Source: With permission from ASCE

Windows and doors used in most coastal areas where wind speeds are 110mph must have a Design Pressure rating of +50 / -50 or better. Design Pressure rating requirements for the faster wind speed zones can range from +50 / -65 to +70 / -80 or higher depending on structure type and its height. All windows and doors used in coastal areas must be tested and certified to ASTM standards or TAS standards (South Florida). Products sold in Florida must be approved by the Florida Building Code (FBC) and have a Florida Product Approval (FL) number assigned to each product/glass type. Products sold in Texas must be approved by the Texas Department of Insurance (TDI) and have a TDI number assigned to each product/glass type. Both approval numbers must be listed on either the FBC or TDI websites and appear on the unit's Product Performance Label (NFRCC).

Do not remove until final inspection. Please retain for future reference.

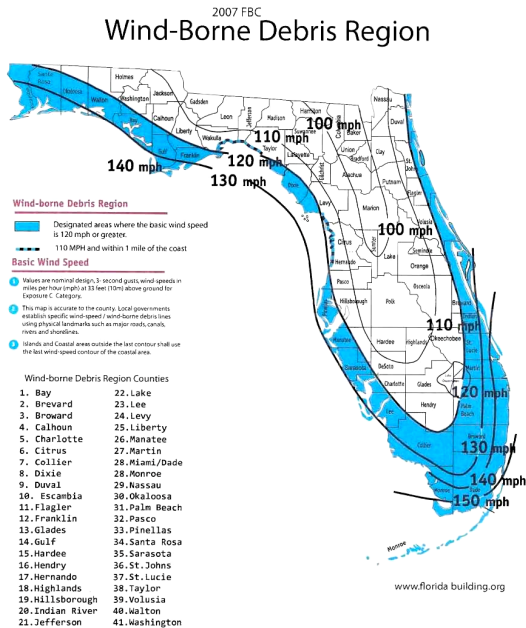
<b>10</b>	Thank you for selecting quality Andersen products										
CSA A440.2 Energy Rating Rendement Énergétique											
 National Fenestration Rating Council® <b>CERTIFIED</b>	 <b>Andersen</b> WINDOWS • DOORS Tilt-Wash Window AND-N-24-01367-00001 Vinyl-Clad Wood Frame, Dual-Pane Low-E Impact Resistant Glazing with Argon and Grilles Product Type: Vertical Sliders										
<b>ENERGY PERFORMANCE RATINGS</b>											
U-Factor <b>0.36</b> (U.S./I-P)	Solar Heat Gain Coefficient <b>0.28</b>										
<b>ADDITIONAL PERFORMANCE RATINGS</b>											
Visible Transmittance <b>0.47</b>	-										
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>											
 WDMA Hallmark Certified www.wdma.com	Licensee: <b>129-H-784</b> <b>Andersen Corporation</b> <b>400 Series Tilt-Wash Window</b> <small>Manufacturer stipulates certification to the applicable standards.</small>										
<table border="1"> <thead> <tr> <th>STANDARD</th> <th>RATING</th> </tr> </thead> <tbody> <tr> <td>AAMA/WDMA/CSA 101/IS2/A440-08</td> <td>Class LC PG20 45 x 77 DP+50/65</td> </tr> <tr> <td>AAMA/WDMA/CSA 101/IS2/A440-05</td> <td>H LC50 45 x 77 DP+50/65</td> </tr> <tr> <td>AAMA/WDMA/CSA 101/IS2/A440-08 A440S1-09</td> <td>Class LC PG240 - 1150001 + 24000 Positive/Negative Design Pressure (DP) = +400 / -1200 ft-lbf Water Penetration Resistance Test Pressure = 300 Cyclone Air Infiltration Coefficient = 6.5</td> </tr> <tr> <td>ASTM E1886-02 A E1896-02</td> <td>Windborne &amp; Missle Level II Cycle Pressure +50/-65</td> </tr> </tbody> </table>	STANDARD	RATING	AAMA/WDMA/CSA 101/IS2/A440-08	Class LC PG20 45 x 77 DP+50/65	AAMA/WDMA/CSA 101/IS2/A440-05	H LC50 45 x 77 DP+50/65	AAMA/WDMA/CSA 101/IS2/A440-08 A440S1-09	Class LC PG240 - 1150001 + 24000 Positive/Negative Design Pressure (DP) = +400 / -1200 ft-lbf Water Penetration Resistance Test Pressure = 300 Cyclone Air Infiltration Coefficient = 6.5	ASTM E1886-02 A E1896-02	Windborne & Missle Level II Cycle Pressure +50/-65	<b>PG/DP rating</b>  <b>Florida FL # and Glass construction</b>
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FL 15752 Glazing: 2.2mm AN outer/6.9mm LG (2.3mm AN/2.3mm AN) inner Laminator: Cardinal Interlayer: Dupont Butacite PVB (.909 L) Complies with HUD UM Bulletin No. 111											
 GREEN SEAL CERTIFIED <small>This product meets the Green Seal® Standard for Windows, DS-13, for generating energy efficiency history records in the frame and sash materials, packaging and consumer education materials.</small>											
<small>Meets or exceeds CEC &amp; IECC Air Infiltration Requirements of 0.2 CFM/sq.ft. or lower. WDMA Hallmark Certification Program</small>											

### Emerging Coastal Requirements – 2012 International Codes (residential and light commercial)

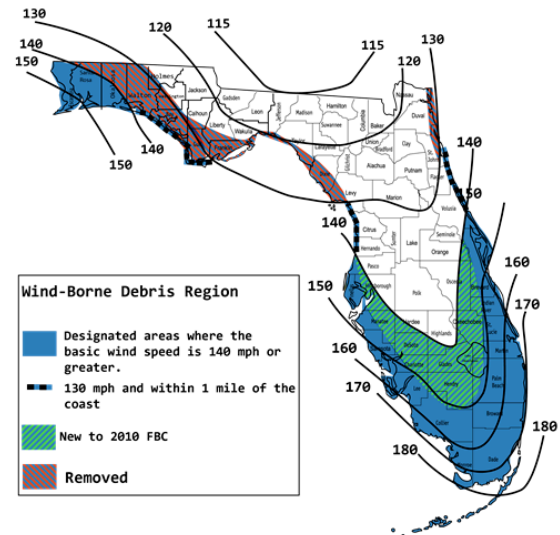
The 2012 International codes still require wind borne debris protection and higher design pressure performance, but the wind speed zones have changed and the level of protection varies by the type of structure. These changes eliminate the need for wind borne debris protection in some areas and mandate it in areas that didn't require it in the past. In some locations these requirements now only apply to

structures such as hospitals, police/fire stations, schools, etc. Also, the method of how design pressures are calculated has changed. Now some areas require higher ratings, while others require lower ratings.

### OLD (2009)



### NEW (2012)



The Florida maps shown above illustrate how the wind speed zones have changed when Florida adopted the 2012 code. These changes now require wind borne debris protection well inland (right map) but removed this requirement from some areas along the Gulf Coast. Changes to wind speed zones such as these could happen all along the East Coast. The New Jersey coastline is in a 110mph wind speed zone based on the 2009 code. If New Jersey adopts the 2012 codes, the wind speed zone changes to 100mph and wind borne debris protection would no longer be required in most residential applications.

**Insurance Industry Pressure** – Due to all the catastrophic high wind events along the Atlantic and Gulf coasts over the past 10 years, the insurance industry may intensify their review of any significant changes to existing coastal building codes that reduce windborne debris areas, especially after Hurricane Sandy caused over \$62B in damages. As part of the effort to manage the financial impact of these catastrophic events, insurance companies have often had to increase insurance rates to policy holders in coastal areas. However, some insurance companies are offering relief with favorable insurance rates if policyholders will build homes with construction practices and materials that exceed what is mandated by code (CodesPlus or Fortified Homes). This has contributed to an increase in demand for higher design pressure products with wind borne debris protection in the Southeast and Texas Gulf coast

### Types of Code Compliant Wind Borne Debris protection

In addition to impact resistant glass, coastal building codes permit other types of wind borne debris protection. These can be in the form of protective screen systems, removable panels, roll-down shutters and even 7/16” wood panels. The cost of these can range from a few dollars to over a thousand. However all types of protection must meet the same large missile impact testing criteria used for windows and doors with impact resistant glass. Click here to see an example of a large missile impact test.

 [Andersen Impact Test - Products with Stormwatch® Protection](#)

When protective screen systems, removable panels, roll-down shutters and even 7/16” wood panels are used, the windows and doors behind these protective systems must meet the higher design pressure requirements mandated by code. If the code requires a rating of DP50, a unit rated at DP30 cannot be used even though it’s located behind a storm panel, protective screen, roll-down shutter or wood panel.

Most of these methods of wind borne debris protection require annual maintenance, manual installation, removal and modifications to the home’s exterior to accommodate code mandated fasteners for securing to the structure. Also storm panels and storm shutters must be stored on site per code. Wood panels must be pre-cut and fastened to the structure with specific fastener types and can only be used for openings 8’ or less. If the correct types of fasteners are not used and/or the spacing of the fasteners is not per code when installing these types of opening protection, insurance coverage may be void.

These methods of protection are falling out of favor for many coastal homeowners due to the manual effort required to install and remove them. They also block out daylight and are an obstacle for ingress and egress in the event of a fire. Wood panels are no longer an acceptable form of opening protection in many coastal areas, including New Jersey. This is due to wood panel availability during approaching storms and the time it takes to cut, install and fasten the panels. Large home builders have switched from using wood panels to impact glass products due to the time and expense it takes to fabricate and install wood panels.

Even though impact resistant glass products are usually more expensive than other forms of opening protection they are preferred in most coastal markets because they offer 24/7 protection against storms and forced entry, reduce outside noise, minimize fading and are more aesthetically pleasing than other forms of opening protection. This has contributed to an increase in demand for impact resistant glass products.

For information on Andersen® products designed to meet the strict requirements of high wind and coastal building codes go to [www.andersenwindows.com/Stormwatch](http://www.andersenwindows.com/Stormwatch).

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