



Atlantic Shutter Systems™

A HEADWATERS COMPANY

Storm Rated Shutter Certification

Atlantic Shutter Systems is proud to announce the recent approval of our four distinct shutter styles for use as a hurricane protection device for window and door openings. They include three traditional styles: Raised Panel, Board and Batten, and Louvered. The fourth style is Bahama. The approved system utilizes Atlantic's current 400 series stainless steel hardware accompanied by a patented vertical storm bar system for traditional shutters. The Bahama shutter utilizes its own unique mounting system. The complete shutter system provides the same high quality authentic shutter with the added strength to withstand high intensity storms.

The shutter system was designed and tested in accordance with the 2000 International Building Code (Wind Loads - 1609.1.4 Protection of Openings) and the 2001 Florida Building Code (Wind Loads – 1606.1.4 Protection of Openings). The completed assembly went through extensive testing at a certified testing facility and passed ASTM 330-97 for static air pressure and ASTM E1886-97/E1996-02 for large missile impact and cyclic pressure loading, (missile level "D", 9 lb yellow pine 2x4 at 50 ft/sec & 9000 pressure cycles). Certified engineering drawings and copies of the laboratory results are available for review and submittal to code officials and building inspectors.

Below is a brief summary of both of the above mentioned building codes in regards to storm protection products and the associated standards that are referenced. Please read through this section to gain a more complete understanding of the entire process related to storm protection devices. If there are any additional questions regarding these products or their application, feel free to contact the Atlantic Shutter Systems factory at 1-877-437-0608.

Code Summary

The discussion of Wind Loads and the requirements that a product must meet begin in section 1609 (pg. 305 2000 IBC) of the 2000 International Building Code. This section covers in detail all of the requirements that a building, structure or component must meet to be code approved.

The first item that must be established is the wind load rating of the building or structure. The determination of the wind loads on any building or structure should be calculated by one of the three methods detailed in ASCE 7-98 (pg. 23 ASCE 7-98). The professional engineer who is responsible for the building or structure often completes this calculation. It is important to note that there are four unique exposure categories to be aware of. The majority of the residential housing and light commercial applications normally fall within areas B or C (pg. 28 ASCE 7-98). These exposure areas each require unique wind loads that the design and testing of components must meet or exceed to be code approved. Along the Atlantic and Gulf coast areas specific wind regions have been established ranging from 90 to 150 miles per hour. Figure 6-1 (pg. 35 ASCE 7-98) shows a detailed map of the eastern United States and how the wind regions are distributed. Other isolated states or US territories are listed in a table

format below the map. Please consult each individual state or local government code office for a detailed map of the respective area. Once the wind load requirement of the building or structure has been calculated and the wind region is defined, the type of protection can be determined.

In section 1609.1.4 (pg. 309 2000 IBC) of the 2000 IBC, Protection of Openings is addressed. This section specifies that any glazed opening located within 30 feet of grade must meet the requirements of the Large Missile Test of ASTM E 1996-02.

Within ASTM E 1996-02 the detailed specifications for various levels of protection are explained. Depending on the type of protection that is desired and the physical location of the building or structure, different missile sizes are required. The missiles are defined in Table 2, Applicable Missiles (pg. 3 ASTM E 1996-02). All Atlantic Shutter products are tested to missile level “D”, which is the highest missile level for all residential and commercial buildings and structures. The impact testing is then followed by 9000 pressure cycles defined in Table 1, Cyclic Static Air Pressure Loading. All Atlantic Shutter products have also passed the Static Air Pressure Differential test up to 60 pounds per square foot (psf) on the traditional shutters and 58.9 psf for the Bahama shutter (pg. 1 ASTM E330-97). Both the missile level and pressure loading are noted on the engineering drawings listed below, all of which are included in this book.

- Atlantic Shutter Systems Raised Panel Shutter, pg. 1
- Atlantic Shutter Systems Board and Batten Shutter, pg. 1
- Atlantic Shutter Systems Louvered Shutter, pg. 1
- Atlantic Shutter Systems Bahama Shutter, pg. 1

It is important to note that ASTM E 1996-02 has a unique definition for wind zones that differs from the ASCE 7-98 wind regions. Table A (at right) helps clarify the relationship between the ASTM E 1996-02 and ASCE 7-98 wind definitions. Although the two standards have different names, the 10 mph ranges are the same.

**Table A
Wind Data Conversion Chart**

Actual Wind Speed Range	ASTM E 1996-02 Wind Zone	ASCE 7-98 Wind Region
≤ 90 mph	NA	90 mph
91 – 100 mph	NA	100 mph
101 – 110 mph	NA	110 mph
111 – 120 mph	1	120 mph
121 – 130 mph	2	130 mph
131 – 140 mph	3	140 mph
141 ≥ mph	4	150 mph

Table 3, Description of Levels (pg. 3 ASTM E 1996-02) defines the wind zones and type of protection that is required by each missile level. The Atlantic Shutter products are applicable for Basic Protection up to 31 feet in height within Wind Zones 1-4 and Enhanced Protection up to 31 feet in height within Wind Zones 1 & 2.

Within ASTM E 1996-02 the complete **specification** for the definition, test methods, pass/fail criteria, product qualification and compliance statement are defined. Within ASTM E 330-97 and ASTM E 1886-97 the required **testing** methods for the above mentioned topics are defined. Please refer to these documents if necessary for further clarification.

Definitions/References

ASCE 7-98	American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
ASTM E330-97	American Society for Testing and Materials, Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
ASTM E 1886-97	American Society for Testing and Materials, Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
ASTM E 1996-02	American Society for Testing and Materials, Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes
IBC 2000	International Building Code 2000 Edition
FBC 2001	Florida Building Code 2001 Edition