NGA
NATIONAL GLASS ASSOCIATION with GANA

thirsty THURSDAY

Quench your thirst for knowledge!

Hurricane Standards, Testing and the Product Approval Process

Tanya Dolby, PE
Manager, Engineering Services
Intertek

MARK YOUR CALENDAR FOR THESE OTHER UPCOMING EVENTS

GlassBuild America
Oct 31 – Nov 2, 2023 | Atlanta, GA

Glazing Executives Forum
Oct 31, 2023 | Atlanta, GA

NGA Glass Conference: Isle of Palms (Charleston)
Feb 6-8, 2024 | Isle of Palms, SC

Building Envelope Contractors (BEC) Conference
Mar 3-5, 2024 | Nashville, TN

GPAD|Glass Processing Automation Days
Mar 5-6, 2024 | Nashville, TN

NGA CELEBRATING 75 YEARS
NATIONAL GLASS ASSOCIATION with GANA

Register NOW

Wild Dunes Resort | Isle of Palms, SC

February 5-8, 2024

All Glass, Only Glass

glass.org/nga-glass-conference-IOP-2024

NGA CELEBRATING 75 YEARS
NATIONAL GLASS ASSOCIATION with GANA

NGA
NATIONAL GLASS ASSOCIATION with GANA

thirsty
THURSDAY
Quench your thirst for knowledge!

Hurricane Standards, Testing and the Product Approval Process

Tanya Dolby, PE
Manager, Engineering Services
Intertek

CELEBRATING NGA 75 YEARS
NATIONAL GLASS ASSOCIATION with GANA

Hurricane Preparedness

AGENDA

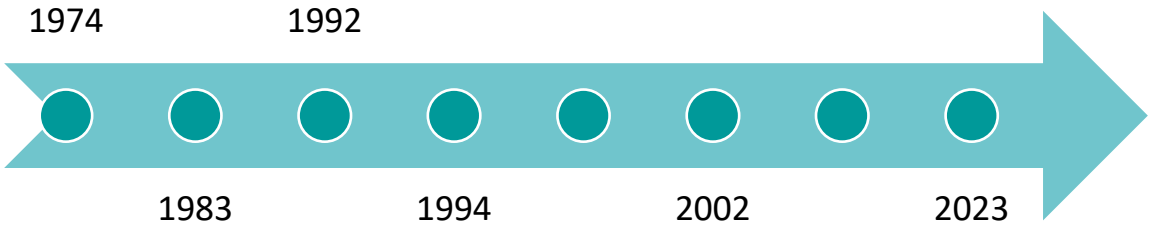
- Hurricane Standards History
- Building Codes
- Standards and Testing
- Product Approvals

Hurricane Standards History

Recent history of hurricane code development

Timeline of events

- 1974 – Tropical Cyclone Tracy – Darwin, Australia
  - First Impact Standard – 9 lb 2 x 4 timber defined in Darwin Area Building Manual
- 1983 - Southern Building Code Congress International (SBCCI 1983)
  - 9 lb 2 x 4 timber defined in the building code
- 1992 – Hurricane Andrew – Florida
  - Estimated $25 billion damages
- 1994 – Enhanced South Florida Building Code (Broward and Dade Counties)
  - Hurricane mitigation provisions defined
- 2002 – First Edition of the Florida Building Code adopted
- 2023 – Upcoming version of the Florida Building Code



Building Codes

Florida Building Code

- Current - 2020 Florida Building Code, 7th Edition
- Upcoming – 2023 Florida Building Code, 8th Edition
  - Effective December 31, 2023
  - Available online at https://codes.iccsafe.org/codes/florida
  - Florida Department of Business & Professional Regulation accepting applications for Florida Product Approvals for pre-2023 Code Version
  - No cost to submit applications through end of year

2023 Florida Building Code, 8th Edition
Chapter 2 Definitions

- DEFINITIONS
  - HIGH VELOCITY HURRICANE ZONE. This zone consists of Broward and Dade counties.
  - HURRICANE-PRONE REGIONS. Areas vulnerable to hurricanes defined as:
    - The U. S. Atlantic Ocean and Gulf of Mexico coasts where the ultimate design wind speed, Vult, for Risk Category II buildings is greater than 115 mph (51.4 m/s);
    - Hawaii, Puerto Rico, Guam, Virgin Islands and American Samoa.
  - WIND-BORNE DEBRIS REGION. Areas within hurricane-prone regions located:
    - Within 1 mile (1.61 km) of the mean high-water line where an Exposure D condition exists upwind at the waterline and the ultimate design wind speed, Vult, is 130 mph (58 m/s) or greater; or
    - In areas where the ultimate design wind speed, Vult, is 140 mph (63.6 m/s) or greater.
    - For Risk Category II buildings and other structures and Risk Category III buildings and other structures, except health care facilities, the wind-borne debris region shall be based on Figure 1609.3(1). For Risk Category III health care facilities, the wind-borne debris region shall be based on Figure 1609.3(2). For Risk Category IV buildings and other structures, the wind-borne debris region shall be based on Figure 1609.3(3).

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

- Section 1609.1.2 Protection of openings

  In wind-borne debris regions, glazed openings in buildings shall be impact resistant or protected with an impact-resistant covering meeting the requirements of ANSI/DASMA 115 (for garage doors and rolling doors) or TAS 201, 202 and 203, AAMA 506, ASTM E1996 and ASTM E1886 referenced herein, or an approved impact-resistant standard as follows:

  1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the large missile test of ASTM E1996.

  2.Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the small missile test of ASTM E1996.

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

- Section 1609.2.2 Application of ASTM E1996

  The text of Section 6.2.2 of ASTM E1996 shall be substituted as follows:

  6.2.2 Unless otherwise specified, select the wind zone based on the strength design wind speed, Vult, as follows:

  6.2.2.1 **Wind Zone 1**—130 mph ≤ ultimate design wind speed, Vult < 140 mph.

  6.2.2.2 **Wind Zone 2**—140 mph ≤ ultimate design wind speed, Vult < 150 mph at greater than one mile (1.6 km) from the coastline. The coastline shall be measured from the mean high water mark.

  6.2.2.3 **Wind Zone 3**—150 mph (58 m/s) ≤ ultimate design wind speed, Vult ≤ 170 mph (63 m/s), or 140 mph (54 m/s) ≤ ultimate design wind speed, Vult ≤ 170 mph (63 m/s) and within one mile (1.6 km) of the coastline. The coastline shall be measured from the mean high water mark.

  6.2.2.4 **Wind Zone 4**— ultimate design wind speed, Vult >170 mph (63 m/s).

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

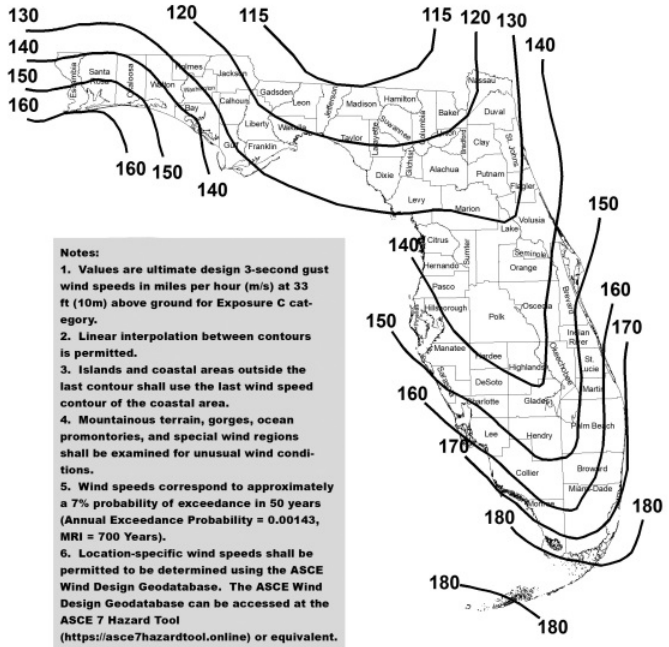


FIGURE 1609.3(1) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES

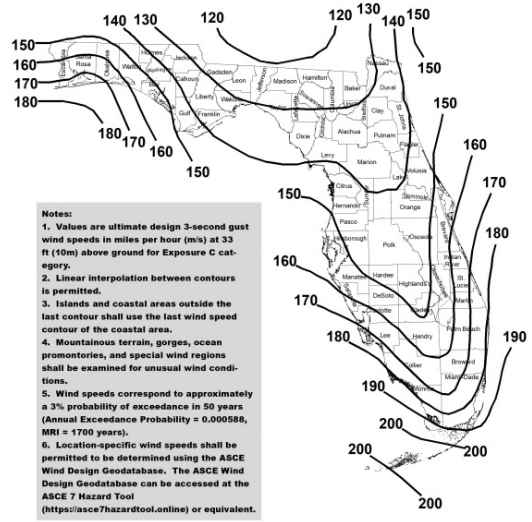


FIGURE 1609.3(2) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY III BUILDINGS AND OTHER STRUCTURES

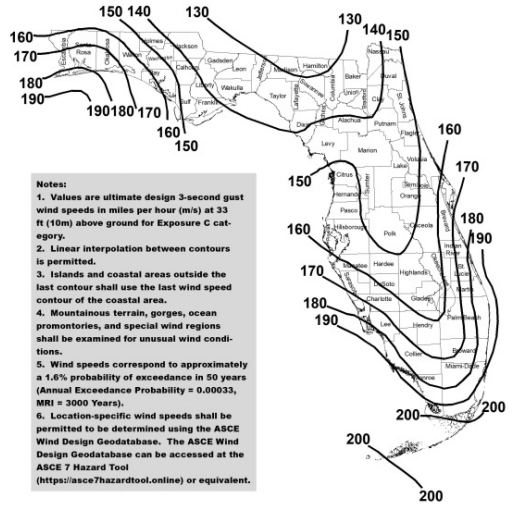


FIGURE 1609.3(3) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY IV BUILDINGS AND OTHER STRUCTURES

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

- Section 1620.2 Wind velocity (3-second gust) used in structural calculations shall be as follows:

Miami-Dade County

Risk Category I Buildings and Structures: 165 mph

Risk Category II Buildings and Structures: 175 mph

Risk Category III Buildings and Structures: 186 mph

Risk Category IV Buildings and Structures: 195 mph

Broward County

Risk Category I Buildings and Structures: 156 mph

Risk Category II Buildings and Structures: 170 mph

Risk Category III Buildings and Structures: 180 mph

Risk Category IV Buildings and Structures: 185 mph

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

- Section 1626.2 Large missile impact tests

1626.2.1

This test shall be conducted on three test specimens in accordance with test protocols TAS 201 and TAS 203. This test shall be applicable to the construction units, assemblies and materials to be used up to and including 30 feet (9.1 m) in height in any and all structures.

1626.2.2

The test specimens shall consist of the entire assembled unit, including frame and anchorage as supplied by the manufacturer for installation in the building, or as set forth in a referenced specification, if applicable. Fasteners used in mounting the test specimen shall be identical in size and spacing to what is used in field installations.

1626.2.3

The large missile shall be comprised of a piece of timber having nominal dimensions of 2 inches by 4 inches (51 mm by 102 m) weighing 9 pounds (4.1 kg).

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

- Section 1626.2 Large missile impact tests (Cont.)

1626.2.4

The large missile shall impact the surface of each test specimen at a speed of 50 feet per second (15.2 m/s); 80 feet per second (24.38 m/s) for Risk Category IV–Essential Facility buildings or structures.

1626.2.5

Each test specimen shall receive two impacts except as noted in Sections 1626.2.5.1 and 1626.2.5.2, the first within a 5-inch (127 mm) radius circle having its center on the midpoint of the test specimen and the second within a 5-inch (127 mm) radius circle in a corner having its center in a location 6 inches (152 mm) away from any supporting members.

1626.2.6

In the case of glazing, if the three test specimens that comprise a test successfully reject the two missile impacts, they shall then be subjected to the cyclic pressure loading defined in Table 1626.

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

- Section 1626.3 Small missile impact test.

1626.3.1

This test shall be conducted on three test specimens in accordance with test protocols TAS 201 and TAS 203. This test shall be applicable to the construction units, assemblies, and materials to be used above 30 feet (9.1 m) in height in any and all structures; Risk Category IV–Essential Facility buildings or structures shall follow the large missile impact testing in Section 1626.2.4 at 50 feet per second (15.2 m/s).

1626.3.2

Each test specimen shall consist of the entire assembled unit, including frame and anchorage as supplied by the manufacturer for installation in the building, or as set forth in a referenced specification, if applicable. The fasteners used in mounting the test specimen shall be identical in size and spacing to those to be used in field installations.

1626.3.3

The missiles shall consist of solid steel balls each having a mass of 2 grams (0.07 oz) (+/-5 percent) with a 5/16-inch (7.9 mm) nominal diameter.

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

- Section 1626.3 Small missile impact test. (Cont.)

  1626.3.4

  Each missile shall impact the surface of each test specimen at a speed of 130 feet per second (40 m/s).

  1626.3.5

  Each test specimen shall receive 30 small missile impacts except as noted in Sections 1626.3.5.1 and 1626.3.5.2 delivered in groups of 10 at a time: the first 10 distributed uniformly over a 2 square foot (0.19 m2) area located at the center of the test specimen, the second 10 distributed uniformly over a 2 square foot area (0.19 m2) located at the center of the long dimension of the specimen near the edge, and the third 10 distributed uniformly over a 2 square foot (0.19 m2) area located at a corner of the specimen.

2023 Florida Building Code, 8th Edition
Chapter 16 Structural Design

- Table 1625.4 Fatigue Loading Sequence

TABLE 1625.4 FATIGUE LOADING SEQUENCE

RANGE OF TEST	NUMBER OF CYCLES[1]
0 to $0.5p_{max}$[2]	600
0 to $0.6p_{max}$	70
0 to $1.3p_{max}$	1

1. Each cycle shall have minimum duration of 1 second and a maximum duration of 3 seconds and must be performed in a continuous manner.
2. p_{max} = 0.6 × ultimate design load in accordance with ASCE 7.

- Table 1626 Cyclic Wind Pressure Loading

TABLE 1626 CYCLIC WIND PRESSURE LOADING

INWARD ACTING PRESSURE		OUTWARD ACTING PRESSURE	
RANGE	NUMBER OF CYCLES[1]	RANGE	NUMBER OF CYCLES[1]
0.2 P_{MAX} to 0.5 P_{MAX}[2]	3,500	0.3 P_{MAX} to 1.0 P_{MAX}	50
0.0 P_{MAX} to 0.6 P_{MAX}	300	0.5 P_{MAX} to 0.8 P_{MAX}	1,050
0.5 P_{MAX} to 0.8 P_{MAX}	600	0.0 P_{MAX} to 0.6 P_{MAX}	50
0.3 P_{MAX} to 1.0 P_{MAX}	100	0.2 P_{MAX} to 0.5 P_{MAX}	3,350

NOTES:

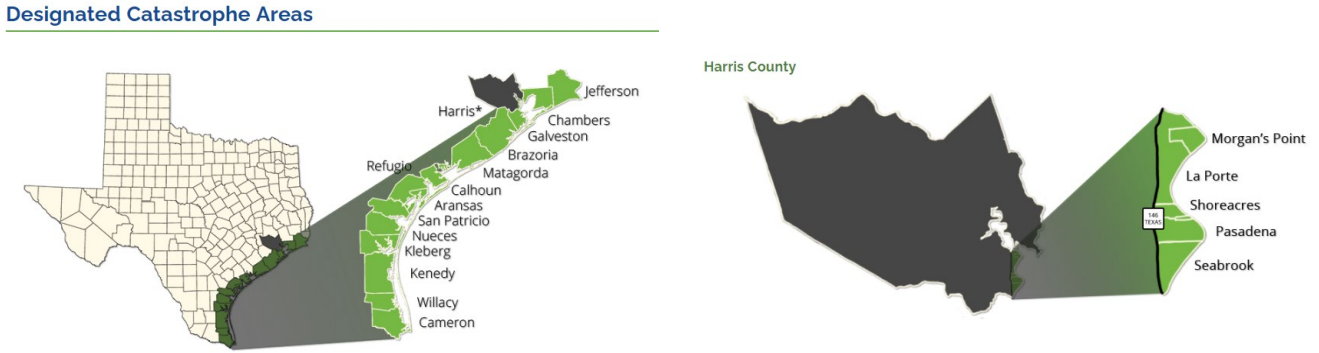
1. Each cycle shall have minimum duration of 1 second and a maximum duration of 3 seconds and must be performed in a continuous manner.
2. p_{max} = 0.6 × ultimate design load in accordance with ASCE 7. The pressure spectrum shall be applied to each test specimen beginning with inward acting pressures followed by the outward acting pressures in the order from the top of each column to the bottom of each column.

Texas Building Code

- Current - 2015 ICC Codes
  - ICC Codes Lists 2015 IBCC and 2015 IRC for Texas. However…..
    - Texas is a home rule state. Building code adoption takes place at the local level. However, Texas' municipal building, residential, fire, plumbing, mechanical, fuel gas and swimming pool and spa codes are promulgated through legislation and found in state statute. A Listing of these codes is referenced at Texas State Law Library at https://www.sll.texas.gov/law-legislation/texas/building-codes/. Municipalities can make local amendments to these respective codes as well as adopt later editions of them at will. To obtain more detailed information on local building code adoption and amendments, contact local municipalities in Texas directly.
    - The energy conservation code is promulgated through the Texas State Energy Conservation Office (SECO) by administrative rule. A municipality or county may establish procedures to adopt local amendments to Texas' commercial and residential energy codes. However, such amendments may not result in less stringent energy efficiency requirements in non-attainment and affected counties. To obtain more detailed information on commercial and residential energy codes adopted in Texas, contact SECO. See https://comptroller.texas.gov/programs/seco/code/adoption.php.
- Windstorm Certificate of Compliance
  - Building Code Starting September 1, 2020, Windstorm Certificate of Compliance applications (WPI-1) must be certified in accordance with either the 2018 International Residential Code (IRC) or the 2018 International Building Code (IBC). Construction must be certified to be eligible for windstorm insurance coverage through TWIA.:

Texas Department of Insurance Windborne Debris Protection

- Windborne Debris Protection
  - Most of the Designated Catastrophe Areas are now located within the windborne debris region. The web-based tools listed under wind speeds can be used to determine if a structure is located in an area where windborne debris protection is required. Requirements for windborne debris protection are as specified in the 2018 IRC and the 2018 IBC.
- 2018 IBC - Section 1609.1.1 Determination of wind loads
  - Wind loads on every building or structure shall be determined in accordance with Chapter 26 to 30 of ASCE 7.
- Designated Catastrophe Areas Map



Standards and Testing

- TAS
- ASTM
- ICC

Florida Testing Application Standards
TAS 201, TAS 202, TAS 203

- TESTING APPLICATION STANDARD **(TAS)201-94** IMPACT TEST PROCEDURES. (Missile Impact)
  - 1.1 This protocol covers procedures for conducting the impact test of materials as required by Section 1626 of the Florida Building Code, Building.
- TESTING APPLICATION STANDARD **(TAS)202-94** CRITERIA FOR TESTING IMPACT & NONIMPACT RESISTANT BUILDING ENVELOPE COMPONENTS USING UNIFORM STATIC AIR PRESSURE. (Air, Water, Structural, Forced Entry)
  - 1.1 This protocol covers procedures for conducting a uniform static air pressure test for materials and products such as wall cladding, glass block, exterior doors, garage doors, skylights, exterior windows, storm shutters, and any other external component which help maintain the integrity of the building envelope. For the purposes of the testing required in TAS 202 Section 5.2, design pressures calculated in accordance with ASCE 7 are permitted to be multiplied by 0.6.
- TESTING APPLICATION STANDARD **(TAS)203-94** CRITERIA FOR TESTING PRODUCTS SUBJECT TO CYCLIC WIND PRESSURE LOADINGWIND-BORNE DEBRIS REGION. (Cyclic)
  - 1.1 This protocol covers procedures for conducting the cyclic wind pressure loading test required by the Florida Building Code, Building and TAS 201-94.
  - 6.3 Load the specimen using the cycles specified in section Table 1625.4 and/or Table 1626 of the Florida Building Code, Building whichever of these apply.
- Other TAS Standards for specific products

ASTM Standards

- ASTM E1886-19 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
  - 1.1 This test method covers the performance of exterior windows, curtain walls, doors, and impact protective systems impacted by missile(s) and subsequently subjected to cyclic static pressure differentials. A1.1 This protocol covers procedures for conducting the impact test of materials as required by Section 1626 of the Florida Building Code, Building.
- ASTM E1996-20 Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes
  - 1.1 This specification covers exterior windows, glazed curtain walls, doors, and impact protective systems used in buildings located in geographic regions that are prone to hurricanes.

TABLE 1 Cyclic Static Air Pressure Loading

Loading Sequence	Loading Direction	Air Pressure Cycles	Number of Air Pressure Cycles
1	Positive	0.2 to 0.5 P_{pos}	3500
2	Positive	0.0 to 0.6 P_{pos}	300
3	Positive	0.5 to 0.8 P_{pos}	600
4	Positive	0.3 to 1.0 P_{pos}	100
5	Negative	0.3 to 1.0 P_{neg}	50
6	Negative	0.5 to 0.8 P_{neg}	1050
7	Negative	0.0 to 0.6 P_{neg}	50
8	Negative	0.2 to 0.5 P_{neg}	3350

TABLE 2 Applicable Missiles

Missile Level	Missile	Impact Speed (m/s)
A	2 g (31 grains) ± 5 % steel ball	39.62 (130 f/s)
B	910 g ± 100 g (2.0 lb ± 0.25 lb) 2 × 4 in. 52.5 cm ± 100 mm (1 ft – 9 in. ± 4 in.) lumber	15.25 (50 f/s)
C	2050 g ± 100 g (4.5 lb ± 0.25 lb) 2 × 4 in. 1.2 m ± 100 mm (4 ft ± 4 in.) lumber	12.19 (40 f/s)
D	4100 g ± 100 g (9.0 lb ± 0.25 lb) 2 × 4 in. 2.4 m ± 100 mm (8 ft ± 4 in.) lumber	15.25 (50 f/s)
E	4100 g ± 100 g (9.0 lb ± 0.25 lb) 2 × 4 in. 2.4 m ± 100 mm (8 ft ± 4 in.) lumber	24.38 (80 f/s)

TABLE 3 Description Levels

NOTE 1—For Missiles B, C, D, and E, also use Missile A for porous impact protective systems (see 8.5).

Level of Protection	Enhanced Protection (Essential Facilities)		Basic Protection		Unprotected	
Assembly Elevation	≤9.1 m (30 ft)	>9.1 m (30 ft)	≤9.1 m (30 ft)	>9.1 m (30 ft)	≤9.1 m (30 ft)	>9.1 m (30 ft)
Wind Zone 1	D	D	C	A	None	None
Wind Zone 2	D	D	C	A	None	None
Wind Zone 3	E	D	D	A	None	None

TABLE X4.1 Description Levels

NOTE 1—For Missiles B, C, D, and E, also use Missile A for porous impact protective systems (see 8.5).

Level of Protection	Enhanced Protection (Essential Facilities)		Basic Protection		Unprotected	
Assembly Elevation	≤9.1 m (30 ft)	>9.1 m (30 ft)	≤9.1 m (30 ft)	>9.1 m (30 ft)	≤9.1 m (30 ft)	>9.1 m (30 ft)
Wind Zone 4	E	D	D	A	None	None

2020 ICC 500
Standard for the Design and Construction of Storm Shelters

101.2 This standard applies to the design, construction, installation and inspection of storm shelters constructed for the purpose of providing protection from tornadoes, hurricanes, and other severe windstorms. Storm shelters shall be constructed as either separate detached buildings or rooms or spaces within new or existing buildings. Design of facilities for use as emergency shelters after the storm is outside the scope of this standard.

305.1.1 Missile criteria for tornado shelters

The missile testing for all components of the *storm shelter envelope* of *tornado shelters* shall be a 15-pound (6.8 kg) sawn lumber 2 by 4 traveling at the speeds shown in Table 305.1.1.

TABLE 305.1.1 MISSILE SPEED FOR TORNADO SHELTERS

DESIGN WIND SPEED	MISSILE SPEED AND IMPACT SURFACE
130 mph	80 mph Vertical Surfaces 53 mph Horizontal Surfaces
160 mph	84 mph Vertical Surfaces 56 mph Horizontal Surfaces
200 mph	90 mph Vertical Surfaces 60 mph Horizontal Surfaces
250 mph	100 mph Vertical Surfaces 67 mph Horizontal Surfaces

For SI: 1 mile per hour = 0.447 m/s.

305.1.2 Missile criteria for hurricane shelters

The test missile for all components of the *storm shelter envelope* of hurricane shelters shall be a 9-pound (4.1 kg) sawn lumber 2 by 4. The speed of the test missile impacting vertical *storm shelter* surfaces shall be a minimum of 0.50 times the design wind speed. The speed of the test missile impacting horizontal surfaces shall be 0.10 times the design wind speed.

805.3 Impact-protective systems

Testing of impact-protective systems shall be conducted in the as-supplied condition as specified in Sections 805.3.1 or 805.3.2.

805.3.1 Tornado shelters

Impact-protective systems for use in tornado shelters shall be tested for static pressure to a pressure of 1.2 times the *design wind pressure* or greater in accordance with ASTM E330.

805.3.2 Hurricane shelters

Impact-protective systems for use in hurricane shelters shall be static pressure tested to a pressure of 1.2 times the *design wind pressure* or greater in accordance with ASTM E330 and subjected to cyclic pressure testing in accordance with ASTM EI886. Cyclic pressure testing shall follow the impact testing required in Section 803.

Exception: Cyclic pressure testing is not required for door assemblies without glazing where such assemblies are static pressure tested to a pressure of 1.5 times the *design wind pressure* or greater in accordance with ASTM E330.

2020 ICC 500
Standard for the Design and Construction of Storm Shelters

- Design Wind Speeds for Tornado and Hurricanes

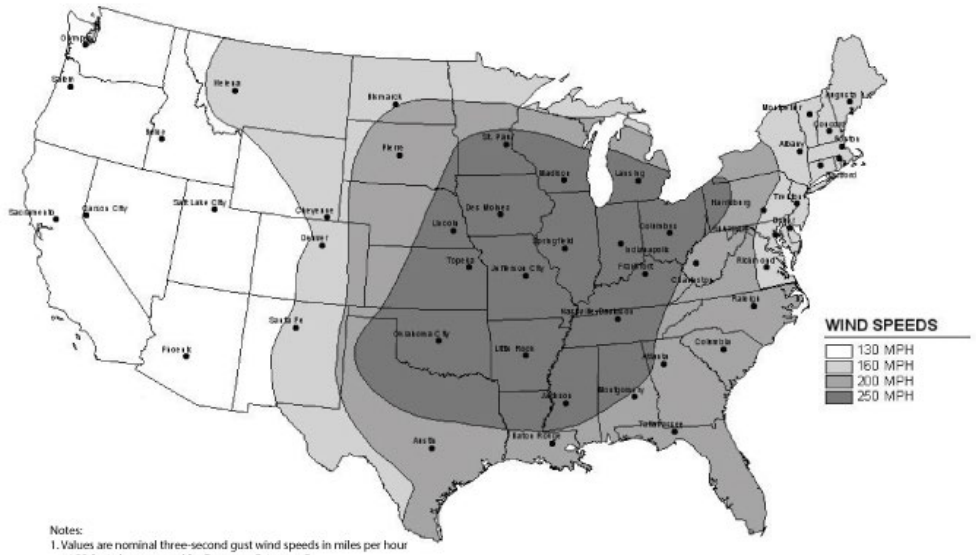


FIGURE 304.2(1)DESIGN WIND SPEEDS, V_T, FOR TORNADOES

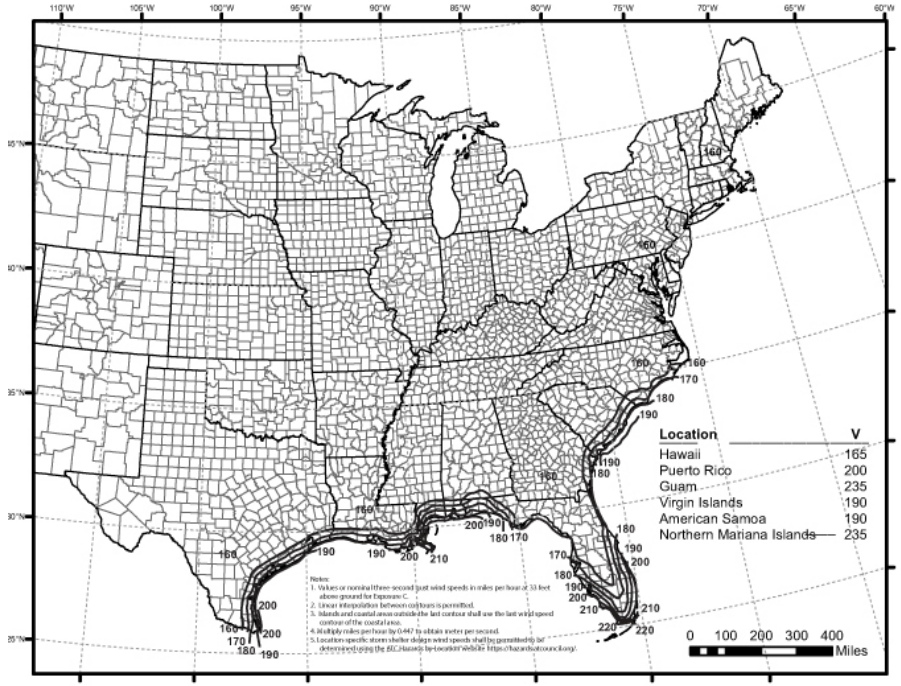


FIGURE 304.2(2)DESIGN WIND SPEEDS, V_H, FOR HURRICANES

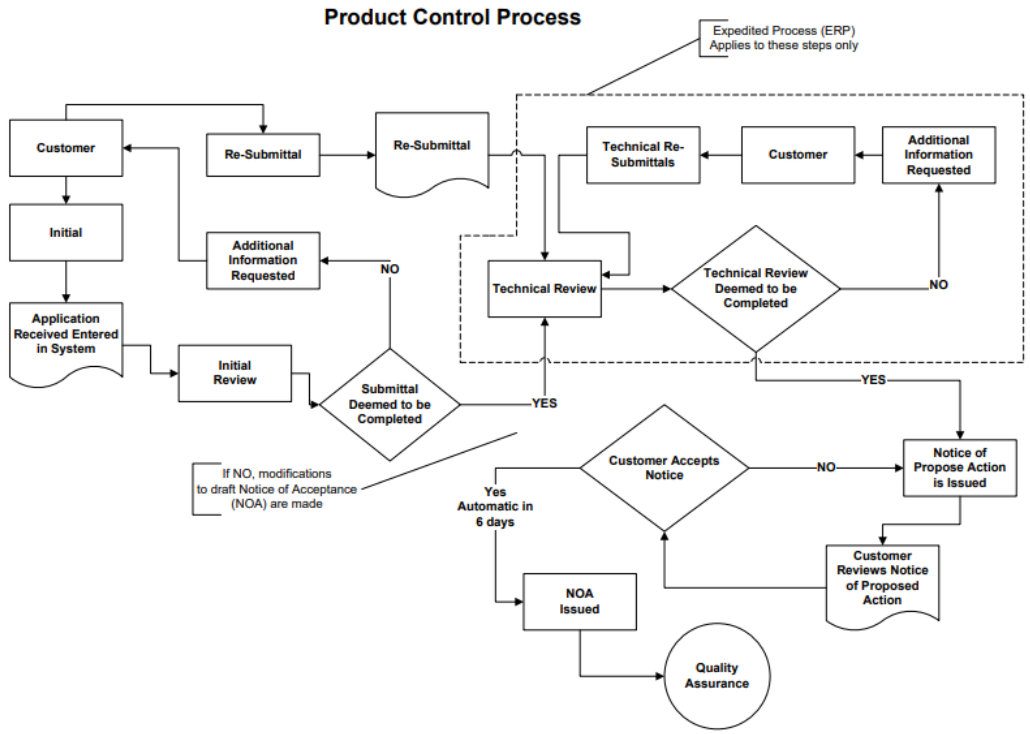
Product Approvals

- Miami-Dade NOA
- Florida FL
- Texas TDI

NOA – Notice Of Acceptance

FLORIDA DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES PRODUCT CONTROL SECTION

- Miami-Dade prefers test plans submitted and approved prior to testing
- Miami-Dade website
  - Applications
  - Instructions for NOA Submittal
  - Checklists for the approval of various product types
  - Distributor Agreement for Manufacturers outside US
- Miami-Dade acts as the Quality Assurance
- NOA submittal consists of required documents
- Package mailed
- NOA's expire on expiration date noted on cover
- Renewal required



FL – Florida Product Approval
FLORIDA DEPARTMENT OF BUSINESS & PROFESSIONAL REGULATION

- Test Plans are not required to be submitted prior to testing, but must meet codes and standards
- Application submitted online
- Requirements include:
  - Manufacturer Information
  - Quality Assurance
  - Installation Instructions verified by a Florida PE
  - Evaluation Report by a Florida PE
  - Validation by 3rd Party
- FL's expire on every new code adoption every 3 years
- Renewal required
- NOA's may be used for FL Applications

TDI – Texas Department Of Insurance

- Test Plans are not required to be submitted prior to testing, but must meet codes and standards
- Application submitted electronically to email address
- Submittal Guidelines online
- Requirements include:
  - Test Reports
  - Certifications
  - Labels
  - Drawings
  - Analysis by a Texas Professional Engineer
  - Draft Evaluation Report
  - Installation Instructions
  - Quality Assurance
- TDI’s expire on expiration date
- Renewal required
- Recently adopted acceptance of Third-Party Evaluation Reports

TDI – Texas Department Of Insurance

- Test Plans are not required to be submitted prior to testing, but must meet codes and standards
- Application submitted electronically to email address
- Submittal Guidelines online
- Requirements include:
  - Test Reports
  - Certifications
  - Labels
  - Drawings
  - Analysis by a Texas Professional Engineer
  - Draft Evaluation Report
  - Installation Instructions
  - Quality Assurance
- TDI’s expire on expiration date
- Renewal required

TDI – Texas Department Of Insurance

Recently adopted acceptance of Third-Party Evaluation Reports!

- TDI posts website links to third-party evaluation reports from the following sources:
  - Product evaluation reports developed by and listed with product certification agencies that are accredited as complying with ISO/IEC Standard 17025 by the International Accreditation Service (IAS) or by any other accreditation body recognized by the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA).
  - Notice of Acceptance (NOA) reports developed by and listed with the Miami-Dade County Product Control Section.
  - Product Approvals listed with the Florida Department of Business and Professional Regulation (DBPR).

References

- Miami-Dade website
  - Product Approval Forms - https://www.miamidade.gov/building/control-forms.asp
  - Product Control Search - https://www.miamidade.gov/building/pc-search_app.asp
  - TAS Standards - https://codes.iccsafe.org/content/FLTP2023P1
- Florida Product Approval
  - Product Approval Menu - https://www.floridabuilding.org/pr/pr_default.aspx
- Texas Department of Insurance
  - TDI Developed Evaluation Reports - https://www.tdi.texas.gov/wind/prod/index
  - Catastrophe Areas - https://www.tdi.texas.gov/wind/maps/index.html
  - Submittal Requirements - https://www.tdi.texas.gov/wind/submittal_requi.html
- Building Code
  - 2023 Florida Building Code – https://codes.iccsafe.org/content/FLBC2023P1
  - 2015 Texas Building Code - https://codes.iccsafe.org/content/IBC2015P4
  - TDI Adopts 2018 - https://content.govdelivery.com/accounts/TXINSUR/bulletins/29c5368
- Tools
  - ATC Hazards by Location - https://hazards.atcouncil.org/
  - ASCE & Hazard Tool - https://asce7hazardtool.online/

NGA
NATIONAL GLASS ASSOCIATION with GANA

thirsty
THURSDAY
Quench your thirst for knowledge!

Hurricane Standards, Testing and the Product Approval Process

Tanya Dolby, PE
Manager, Engineering Services
Intertek
tanya.dolby@intertek.com

CELEBRATING NGA 75 YEARS
NATIONAL GLASS ASSOCIATION with GANA

Additional NGA Resources

Hurricane Product Substitution GTP

Laminated Glazing Reference Manual

Protective Glazing Manual

NGA's GANA Glazing Manual

Browse glass.org/store for additional tools

SAVE the DATE

GlassBuild America
Oct 31 – Nov 2, 2023 | Atlanta, GA

Glazing Executives Forum
Oct 31, 2023 | Atlanta, GA

NGA Glass Conference: Isle of Palms
Feb 6-8, 2024 | Isle of Palms, SC

BEC Conference
Mar 3-5, 2024 | Omni Nashville Hotel

Glass Processing Automation Days|GPAD
March 5-6, 2024 | Omni Nashville Hotel

glass.org/ondemand-webinars

NGA
NATIONAL GLASS ASSOCIATION with GANA