

(Specifier Note: The purpose of this guide specification is to assist the Specifier in correctly specifying FEMA compliant impact and wind resistant aluminum window assemblies and their installation as windows and storefront components of storm shelters that comply with ICC 500-2020 and ICC500-2014. These assemblies also meet UL-752 Level 3 Bullet Resistance criteria.

The Specifier needs to edit this guide specification to fit the needs of each specific project. References have been made within the text of the specification to MasterFormat section numbers and titles. The Specifier needs to coordinate these numbers and titles with sections included for the specific project.

Throughout the guide specification, there are Specifier Notes to assist in the editing of the file. Brackets have been used to indicate when a selection is required. Contact an Insulgard representative for further assistance with appropriate product selections)

SECTION 08 56 53.13 – WIND AND IMPACT SECURITY WINDOWS Insulgard STORMDEFEND TTH600

Tornado and Hurricane Storm Shelter Window System

For use in FEMA P 361-[21] [15] / ICC 500-[20] [14] 20 Storm Shelters

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Impact, Wind and Bullet Resistant Aluminum Security Windows.

1.2 ACTION SUBMITTALS

- A. Refer to Section **[01 33 00 Submittal Procedures] [Insert section number and title]**.
- B. Product Data: For each type of framing and glazing including manufacturer recommended installation instructions.
- C. Shop Drawings: Include plans, elevations, sections, details, attachment to other work **[and glazing details for field-glazed units]**.
- D. Samples: For each exposed finish.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Certificates: Indicating compliance with
 - 1. ICC 500 – **[2020] [2014]** and FEMA P-361-**[2021] [2015]** requirements
 - 2. UL 752 Level 3
- B. Qualification Data: For Installer and Testing Agency.
- C. Warranty: Sample of finish warranty

(Specifier Note: Substantial changes have been made and incorporated into the 2014 and more recent versions of ICC 500, including the requirement for the testing and labeling of units by a third-party agency.)

- D. Special Inspection Report: As indicated in **[Section 01 45 33 - Code-Required Special Inspections and Procedures]** **[Insert section number and title]**.

1.4 CLOSEOUT SUBMITTALS

- A. Refer to Section **[01 78 00 Closeout Submittals]** **[Insert section number and title]**.
- B. Maintenance data.

1.5 QUALITY ASSURANCE

(Specifier Note: Depending upon the scope of the work it may be appropriate to require the installation of a mock-up at the project site, which can either be part of the work or separate. Indicate the size of mock-up to be constructed.)

- A. Mock-up: Install framing assembly at project site. Obtain Architect's approval prior to proceeding with installation of remaining windows. Accepted mock-up **[may]** **[may not]** remain as portion of final work.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section **[01 60 00 Product Requirements]** **[Insert section number and title]**.

1.7 WARRANTY

(Specifier Note: The 5-year finish warranty applies to the Class I anodic finishes and the 10 year applies to the 70% PVDF coating finish.)

- A. Finish Warranty: Manufacturer's warranty against deterioration of factory finishes for the period of **[5]** **[10]** years from the date of Substantial Completion.
- B. Glass Warranty: Manufacturer's warranty against defects in material and workmanship resulting in edge separation or delamination for a period of 5 years from the date of Substantial Completion.

PART 2 - PRODUCTS

(Specifier Note: Product information is proprietary to Insulgard Security Products. If additional products are required for competitive procurement, contact Insulgard, Inc. for assistance in listing competitive products that may be available.)

2.1 FRAMING

- A. Basis of Design: Insulgard STORMDEFEND TTH600 Tornado and Hurricane Storm Shelter Window System by Insulgard Security Products; Phone 800.624.6315; website www.insulgard.com
1. Subject to compliance with requirements, manufacturers of products of equivalent design may be acceptable if approved in accordance with **[Section 01 25 00 Substitution Procedures] [Insert section number and title]**.
- B. Description
1. Factory fabricated framing constructed from either 6005-T5 or 6105-T5 extruded aluminum with integral weep design to allow water to vent to the exterior along horizontal members. Thermal separation of frame using polyamide strip.
 2. Dimensions:
 - a. Head, Jamb, and Sill Members: 2-1/2 inches by 6 inches.
 - b. Mullion and Intermediate Horizontal Members: 3-1/4 inch face
 3. Unit to be permanently marked with certification label of the certified testing agency acceptable to the authorities having jurisdiction. Label to include:
 - a. Design Pressure
 - b. Tested Pressure
 - c. Missile Criteria
 - d. ICC-500 (2020) Certification Listing

2.2 GLAZING

- A. Glazing Material: Insulating Glass Clad Polycarbonate

(Specifier Note: TOR-GARD Products conform to FEMA P-361-21/15 requirements.)

1. Wind, Impact and Level 3 Ballistic Resistant Glazing: TOR-GARD 30 IG

2.3 PERFORMANCE CRITERIA

- A. Indicated areas of this project have been designed for occupancy as a storm shelter. The Work identified in this Section is a component of that security occupancy as follows:

1. Type of Shelter: **[Tornado] [Hurricane] [Both Tornado and Hurricane]**

(Specifier Note: SELECT shelter design wind speeds based on ICC 500-2020 or 2014 Figure 304.2(1) for Tornadoes and Figure 304.2(2) for Hurricanes.)

- B. Shelter Design Wind Speeds: **[As indicated on Drawings]**

1. Tornado **[130] [160] [200] [250]** MPH
2. Hurricane **[160] [170] [180] [190] [200] [210] [220]** MPH

- C. Debris Hazard

(Specifier Note: Caution should be used in only requiring comparable products to be FEMA P-361 compliant. Some products may only meet requirements of the lower wind speeds and may not be appropriate for the specific project location.)

1. FEMA P-361-**[21] [15]** Compliant: Pass missile-impact tests according to FEMA P 361-21 / ICC 500-**[2020] [2014]** in accordance with:
 - a. ASTM E1886 - Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Missiles and Exposed To Cyclic Pressure Differentials
 - b. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

(Specifier Note: For a tornado shelter to be FEMA P-361 compliant - the assembly must resist the impact of a 15 pound 2 by 4 at the wind speed indicated in ICC 500 Table 305.1.1 based on the Shelter Design Wind Speed. Insulgard TTH600 glazed with TOR-GARD products will meet the tornado resistance requirements for the most stringent conditions at 100 MPH.)

2. Tornado: Resists impact of a 15 pound 2 by 4 at **[80] [84] [90] [100]** MPH for vertical surfaces and **[53] [56] [60] [67]** MPH for horizontal surfaces.

(Specifier Note: For a hurricane shelter to be FEMA P-361 compliant - the assembly must resist the impact of a 9 pound 2 by 4 at 0.50 times the shelter design wind speed. Insulgard TTH600 glazed with TOR-GARD products will meet the hurricane resistance requirements for the most stringent conditions of a 9 pound 2 by 4 at 113 MPH.)

3. Hurricane: Resists impact of a 9 pound 2 by 4 at **[Design Wind Speed multiplied by 0.5]**

D. Pressure Testing

1. FEMA P-361 Compliant: Pass static pressure tests and cyclic tests according to FEMA P-361-**[2021] [2015]** /ICC 500-**[2020] [2014]** in accordance with:

(Specifier Note: ASTM E330 is used for both tornado and hurricane shelters)

- a. ASTM E330 - Standard Test Method For Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

(Specifier Note: ASTM E1886 is used for hurricane shelters, DELETE if application is ONLY a tornado shelter.)

- b. ASTM E1886 - Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Missiles and Exposed To Cyclic Pressure Differentials

E. Ballistic Resistant: Level 3 in accordance with UL 752 – Standard for Bullet-Resisting Equipment.

F. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. NFRC Model Size: 47-1/4 by 59 inches
2. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.37 as determined according to NFRC 100.
3. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.45 as determined according to NFRC 200.

4. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 60 as determined according to NFRC 500.

2.4 FABRICATION

- A. Tolerances: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members

2.5 FRAMING FINISH

- A. Factory-applied finish:

(Specifier Note: SELECT the project specific finish from the following. Baked Enamel may also be available but may require minimum quantities.)

1. **[Clear Anodic Finish]**: Architectural Class I, clear coating AA-M10C22A41 Mechanical Finish Chemical Finish: etched, medium matte; 0.70 mils minimum complying with AAMA 611 "Voluntary Specification for Anodized Architectural Aluminum"
2. **[Color Anodic Finish]**: Architectural Class I, color coating AA-M10C22A42/A44 Mechanical Finish Chemical Finish: etched, medium matte; 0.70 mils minimum complying with AAMA 611 "Voluntary Specification for Anodized Architectural Aluminum".
 - a. Color: Dark Bronze.
3. **[PVDF-Based Coating]**: Fluoropolymer finish containing minimum 70 percent PVDF resins, in accordance with AAMA 2605 "Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Aluminum Extrusions and Panels"
 - a. Coats: **[two] [three] [four]** coat system,
 - b. Color: **[Insert color] [custom] [to be selected from manufacturer's full color range]**.

2.6 ACCESSORIES

- A. Anchors: Fully concealed in accordance with performance requirements
- B. Glazing Gaskets: Manufacturer supplied EPDM gasket utilized as component of the tested assembly.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify field dimensions of opening prior to fabrication of windows.
- B. Coordinate structural requirements to ensure proper attachment and support.

3.2 INSTALLATION

- A. Install windows in accordance with manufacturer's recommendations and approved shop drawings.
- B. Provide required support and securely fasten and set windows plumb, square, and level without twist or bow.
- C. Apply sealant in accordance with window and sealant manufacturer's recommendations as indicated in installation instructions. Wipe off excess, and leave exposed sealant surfaces clean and smooth

3.3 CLEANING

(Specifier Note: The glazing utilized in this system contains polycarbonate, an impact resistant plastic that could be affected by some chemicals commonly used in the glass industry. Extreme caution should be used especially as related to cleaning products, sealants, setting blocks, gaskets and tape. Use of incompatible products may void the warranty.)

- A. Clean in strict accordance with manufacturer's recommended cleaning procedures using recommend cleaning agents.

3.4 PROTECTION

- A. Protect windows from damage during construction operations. If damage occurs, remove and replace as required to provide windows in their original, undamaged condition.
 - 1. In addition to breakage, damage includes but is not limited to crazing, cracking, fissures and delamination.

END OF SECTION