

# Windows & Deal Trays

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Harden high security aluminum and steel windows and deal trays are certified to withstand 5 or 15 minutes of simulated mob attack and rifle-level ballistic threats. Our welded structural steel window systems offer narrow sight lines and flexibility in design, and our proprietary aluminum systems utilize high strength aluminum alloy components for strength and thermally-broken frames for industry leading U-values and resistance to condensation.

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# HARDEN ARCHITECTURAL SECURITY Windows & Deal Trays



#### Aluminum – DOS FE/BR & Blast

DOS certified to withstand 5 or 15 minutes of simulated "mob" attack. 15 Minute models are also certified for rifle-level ballistic rounds. Both models are available as non-operable systems with optional deal tray and engineered blast load rating up to 40 psi / 300 psi-ms and beyond.



### Aluminum – UL752/NIJ3 BR & Blast

Tested to withstand rifle-level ballistic threats for UL 752 levels 5 and 8, NIJ III and 7.62 x 39 rounds. Available as non-operable systems with optional deal tray and engineered blast load ratings up to 40 psi / 300 psi-ms and beyond.



#### Steel – UL752/NIJ3 BR & Blast

Tested to withstand rifle-level ballistic threats for UL 752 levels 5 and 8, NIJ III and 7.62 x 39 rounds. Available as non-operable systems with optional deal tray and engineered blast load ratings up to 40 psi / 300 psi-ms and beyond. .....pg.6

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# Industries

- Government
- Military
- Oil & Gas
- Critical Infrastructure
- Commercial















# Applications

Harden's FE/BR and Ballistic-Resistant Windows safeguard prominent and mission critical buildings, guard houses, control rooms, cashier areas, executive offices and anywhere the highest levels of protection, aesthetics and sustainability are important considerations. Engineered blast resistance may be added for more comprehensive security.

Aluminum Windows are ideal for facilities where the aesthetics of aluminum and the thermal properties of thermally-broken systems are critical. FE/BR versions satisfy specific forced-entry, ballistic and blast resistance requirements of the U.S. Department of State, while Ballistic-Resistant models are designed for use by other agencies and commercial entities where rifle-level bullet and high blast resistance is paramount.

Steel Windows are particularly suited for applications requiring narrow sight lines or unique shapes, and have the versatility to handle virtually any ballistic or blast requirement. Ballistic-Resistant versions couple the ability to withstand high blast loads with bullet resistance, and are used in government, commercial, industrial and residential applications.

# ALUMINUM WINDOW-DOS FE/BR & BLAST

Tested to Department of State Standard SD-STD-01.01 Rev. G (Amended), Harden Aluminum FE/BR Windows offer an ideal solution where the call for high ballistic and forced-entry resistance competes with targets for design excellence. The WAFV-05 and WAFV-15R all-aluminum, fixed window designs are tested and certified to withstand simulated "mob" attack for 5 minutes and 15 minutes respectively. The WAFV-15R is also resistant to 5.56 M193 & M855 and 7.62 M80 ballistic rounds. Both models can be engineered to resist blast loads up to 40 psi / 300 psi-ms and beyond.

Fabricated as a complete system, typical construction includes a heavy-duty thermally broken aluminum frame, laminated/insulated glazing, glazing stops, ballistic protection bars, interior/exterior trim and a plate or tube-type sub-frame. An optional FE/BR deal tray or deal drawer can be added for high-security document transfer needs. Their wide and deep construction provides ample room for the passage of 100+ sheet documents.

All windows are factory glazed and can be installed as a single unit or ganged together to form a unitized "window wall. Numerous glazing options are available along with interior and exterior trims, which come in a wide range of finish types and snap on to the frame to provide installation flexibility.

The WAFV-05 and WAFV-15R windows offer architects and end users:

- Anti-Terrorism Level Security where conformance to U.S. Department of State forced-entry / ballistic resistant threat levels and high blast protection is required
- **Energy Efficiency** where window thermal performance is important to overall building design considerations
- **Condensation Resistance** thermal break vastly improves the frame's ability to resist interior sweating and freezing



- Architectural Appeal provides the look of a commercial aluminum window system and complements modern architectural design
- **Design Flexibility** where architectural or security concerns require the use of large windows, ganged window systems or unique shapes
- **Durability** high strength aluminum alloy provides maximum durability and low maintenance

In addition to engineering the full window and subframe system, Harden has the unique ability to customize styles and finishes to provide architects and engineers with a wide range of flexibility in creating or preserving the aesthetics of new and existing structures.



- Full window system, factory glazed, with shipping bolts to retain stops and glazing to frame
- Aluminum, thermally broken frame with mitered and welded corners
- Laminated, insulated glazing to meet applicable threats
- Removable glazing stops
- Ballistic stop bars to protect construction shim gap (on ballistic-rated units)

 Pre-drilled and tapped sub-frame in one of three styles 1) embed plate with studs for newly poured concrete walls 2) tubing with chemical or mechanical anchors for existing masonry walls 3) tubing for welding to steel walls

#### **Standard Finish – Frame and Glazing Stops**

• Clear anodizing, 215-R1

#### Standard Finish – Optional Interior/Exterior Trim

• Manufacturer's standard finish coat. Contact Harden for color chart tracking in character style

Model Comparison Guide						
Harden Model Series	WAFV 05	/AFV 15R				
Frame Construction	Aluminum, thermally broken frame	Aluminum, thermally broken frame				
Frame Depth (without trim)	6.0" (152 mm)	6.0" (152 mm)				
Frame Profile Width	3.25" (83 mm)	3.25" (83 mm)				
Maximum Certified Size	Contact Harden for details					
Mounting Technique	M12 or larger bolts, maximum 12" (300 mm) on center	M12 or larger bolts, maximum 12" (300 mm) on center				
Ballistic Resistance	N/A	5.56 M193, 5.56 M855, 7.62 M80 Per DOS SD-STD-01.01 Rev G (Amended)				
Forced Entry Resistance	5 minutes Per DOS SD-STD-01.01 Rev G (Amended)	15 minutes Per DOS SD-STD-01.01 Rev G (Amended)				
DOS Code	1141	1123				
Blast Resistance	Engineered per customer requirements	Engineered per customer requirements				
Air Leakage ASTM E283	1.6 psf: <0.10 cfm/ft (77 Pa: <0.16 L/sec-m)					
Water Penetration ASTM E331/E547	20 psf (958 Pa): pass					
Dynamic Water Penetration AAMA 501.1	15 psf (718 Pa): pass					
Jniform Load Deflection ASTM E330	+91 psf / -115 psf : <0.07" (4357 Pa / -5506 Pa: < 1.8 mm)					
Unform Load Structural ASTM E330	+136 psf / -173 psf: <0.03" (6512 Pa / -8283 Pa: < 0.8 mm)					
Thermal Cycling AAMA 501.5	6.2 psf air: 0.06 cfm/sqft (296 Pa air: 0.3 L/sec-sqm) 15 psf (718 Pa) water: pass					
Thermal U-factor, SHGC, CR, VLT	Analyzed per NFRC 100, 200, 500; results will vary with glazing type.					
Additional Notes		UL 752 level 5 ballistic resistance available on certain versions				

# ALUMINUM WINDOW-DOS FE/BR & BLAST

# **Optional Features**

- Window System:
  - o Transaction tray (certified as 15 minute FE/ BR) with interior lid and stainless steel interior/exterior trim
  - o Transaction drawer (certified as 15 minute FE/BR) with interior lid and stainless steel interior/exterior trim
  - o Snap-on interior window trim
  - o Snap-on exterior window trim
  - o Blast-rated glazing and anchorage systems (user-defined blast loads)
- Glazing:
  - o Low-e hardcoats
  - o Films for RF / IR attenuation
  - o Tints & frits
  - o High-definition printing

## **Optional Finishes - Frame and Glazing Stops**

- Color anodizing
- Painted finish, AAMA 2604 (Contact Harden for color chart and minimum quantities)
- Painted finish, AAMA 2605 (Contact Harden for color chart and minimum quantities)

## **Optional Finishes - Interior/Exterior Trim**

- Clear anodizing, 204-R1 or 215-R1
- Color anodizing
- Painted finish, AAMA 2604 (Contact Harden for color chart)
- Painted finish, AAMA 2605 (Contact Harden for color chart)
- Stainless steel cladding





# **Technical Data**

### **Applicable Standards, Testing & Certifications**

- Department of State, SD-STD-01.01 Rev. G (Amended): Certification Standard – Forced Entry and Ballistic Resistance of Structural Systems
- ASTM E283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- AAMA 501.1: Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure
- AAMA 501.5: Test Method for Thermal Cycling of Exterior Walls
- NFRC 100: Procedure for Determining Fenestration Product U-factors
- NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
- NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values

### Installation Considerations

- Windows are fully glazed at the factory, and require only minimal preparation prior to installation
- Sub-frames can be shipped in advance of factory glazed window assembly
- Three different methods of installation into the structure, depending on the stage and type of wall construction:

- o Pre-drilled and tapped plate-type embeds cast into concrete
- o Pre-drilled and tapped steel tube-type subframes bolted into the wall
- o Pre-drilled and tapped steel tube-type subframes welded to the wall structure



#### Maintenance

Regular inspection of window, trim and flashing is recommended.

### **Availability & Cost**

Window systems are typically manufactured to order and subject to production lead times at the time of purchase.

### Warranty

Harden warrants that its Architectural Security products shall remain free of defects in material and workmanship under normal use for a period determined by the individual project specification.

# ALUMINUM WINDOWS – UL752 / NIJ III BR & BLAST WINDOWS

# **Design Overview**

Harden Aluminum Ballistic Resistant Windows offer an ideal solution where the call for high ballistics resistance competes with targets for design excellence. The WAFV-N-B series are tested to meet multiple firearm threat levels including UL 752 (Levels 5 & 8), NIJ III and 7.62 x 39 rounds. The WAFV-N-EX is engineered to resist blast loads up to 40 psi / 300 psi-ms and beyond. Custom designs are available to meet combined blast and ballistic threats.

Fabricated as a complete system, typical construction includes a heavy-duty thermally broken aluminum frame, laminated/insulated glazing, glazing stops, ballistic protection bars, interior/exterior trim and a plate or tube-type sub-frame. An optional FE/BR deal tray or deal drawer can be added for high-security document transfer needs. Their wide and deep construction provides ample room for the passage of 100+ sheet documents.

All windows are factory glazed and can be installed as a single unit or ganged together to form a unitized "window wall." Numerous glazing options are available along with snap-on interior and exterior trims, which improve installation flexibility and come in a wide range of finish types.

The WAFV-N-B series and EX model windows offer architects and end users:

- Anti-Terrorism Level Security where the threat of rifle-level ballistic and high level blast attacks exist
- **Energy Efficiency** where window thermal performance is important to overall building design considerations
- **Condensation Resistance** thermal break vastly improves the frame's ability to resist interior sweating and freezing



- Architectural Appeal provides the look of a commercial aluminum window system and complements modern architectural design
- **Design Flexibility** where architectural or security concerns require the use of large windows, ganged window systems or unique shapes
- **Durability** high strength aluminum alloy provides maximum durability and low maintenance

In addition to engineering the full window and subframe system, Harden has the unique ability to customize styles and finishes to provide architects and engineers with a wide range of flexibility in creating or preserving the aesthetics of new and existing structures.



# **Standard Features**

- Full window system, factory glazed, with shipping bolts to retain stops and glazing to frame
- Pre-drilled and tapped sub-frame in one of three styles 1) embed plate with studs for newly poured concrete walls 2) tubing with chemical or mechanical anchors for existing masonry walls 3) tubing for welding to steel walls
- Aluminum, thermally broken frame with mitered and welded corners
- · Laminated glazing to meet applicable threats

- Removable glazing stops
- Ballistic stop bars to protect construction shim gap (on ballistic-rated units)

## **Standard Finish – Frame and Glazing Stops**

• Clear anodizing, 215-R1

## Standard Finish – Optional Interior/Exterior Trim

• Manufacturer's standard finish coat (Contact Harden for color chart)

Model Comparison Guide							
Harden Model Series	WAFV-N-BU5	WAFV-N-BU8	WAFV-N-BN3	WAFV-N-B39	WAFV-N-EX		
Frame Construction	Aluminum, thermally broken frame	Aluminum, thermally broken frame	Aluminum, thermally broken frame	Aluminum, thermally broken frame	Aluminum, thermally broken frame		
Frame Depth (without trim)	6.0" (152 mm)	6.0" (152 mm)	6.0" (152 mm)	6.0" (152 mm)	6.0" (152 mm)		
Frame Profile Width	3.25" (83 mm)	3.25" (83 mm)	3.25" (83 mm)	3.25" (83 mm)	3.25" (83 mm)		
Mounting Technique	M12 or larger bolts, maximum 12" on center	M12 or larger bolts, maximum 12" on center	M12 or larger bolts, maximum 12" on center	M12 or larger bolts, maximum 12" on center	Determined by blast analysis		
Ballistic Resistance	UL 752 level 5 (7.62 M80)	UL 752 level 8 (7.62 M80, multiple shot)	NIJ III (7.62 M80, multiple shot)	7.62 X 39	See Note 2		
Blast Resistance	See Note 1	See Note 1	See Note 1	See Note 1	Engineered per customer requirements. 20-50 psi is typical; higher levels possible.		
Air Leakage ASTM E283	1.6 psf: <0.10 cfm/ft (77 Pa: <0.16 L/sec-m)						
Water Penetration ASTM E331/E547	20 psf (958 Pa): pass						
Dynamic Water Penetration AAMA 501.1	15 psf (718 Pa): pass						
Uniform Load Deflection ASTM E330	+91 psf / -115 psf: <0.07" (4357 Pa / -5506 Pa: < 1.8 mm)						
Unform Load Structural ASTM E330	+136 psf / -173 psf: <0.03" (6512 Pa / -8283 Pa: < 0.8 mm)						
Thermal Cycling AAMA 501.5	6.2 psf air: 0.06 cfm/sqft (296 Pa air: 0.3 L/sec-sqm) 15 psf (718 Pa) water: pass						
Thermal U-factor, SHGC, CR, VLT	Can be analyzed per NFRC 100, 200, 500; results will vary with glazing type.						

Note 1: Ballistic-rated models will have some inherent blast resistance, but level is highly dependent on size and mounting technique. Non-linear analysis, shock tube testing or arena testing is recommended if blast resistance is required.

Note 2: Blast-only models will have some inherent ballistic resistance, but laminates designed for blast resistance will need to be tested to specific ballistic threats if ballistic resistance is required.

# ALUMINUM WINDOWS – UL752 / NIJ III BR & BLAST WINDOWS

# **Optional Features**

- Window System:
  - o Transaction tray (certified as 15 minute FE/ BR) with interior lid and stainless steel interior/exterior trim
  - o Transaction drawer (certified as 15 minute FE/BR) with interior lid and stainless steel interior/exterior trim
  - o Snap-on interior window trim
  - o Snap-on exterior window trim
  - o Blast-rated glazing and anchorage systems (user-defined blast loads)
- Glazing:
  - o Low-e hardcoats
  - o Films for RF / IR attenuation
  - o Tints & frits
  - o High-definition printing

## **Optional Finishes - Frame and Glazing Stops**

- Color anodizing
- Painted finish, AAMA 2604 (Contact Harden for color chart and minimum quantities)
- Painted finish, AAMA 2605 (Contact Harden for color chart and minimum quantities)

## **Optional Finishes - Interior/Exterior Trim**



- Clear anodizing, 204-R1 or 215-R1
- Color anodizing
- Painted finish, AAMA 2604 (Contact Harden for color chart)
- Painted finish, AAMA 2605 (Contact Harden for color chart)
- Stainless steel cladding



# **Technical Data**

### **Applicable Standards, Testing & Certifications**

- UL 752: Standard for Bullet-Resisting Equipment
- NIJ 01.08.01: Ballistic-Resistant Protective Materials
- ASTM E283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- AAMA 501.1: Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure
- AAMA 501.5: Test Method for Thermal Cycling of Exterior Walls
- NFRC 100: Procedure for Determining Fenestration Product U-factors
- NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
- NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values

## Installation Considerations

- Windows are fully glazed at the factory, and require only minimal preparation prior to installation
- Sub-frames can be shipped in advance of factory glazed window assembly
- Three different methods of installation into the structure, depending on the stage and type of wall construction:

- o Pre-drilled and tapped plate-type embeds cast into concrete
- o Pre-drilled and tapped steel tube-type subframes bolted into the wall
- o Pre-drilled and tapped steel tube-type subframes welded to the wall structure



### Maintenance

Regular inspection of window, trim and flashing is recommended.

## **Availability & Cost**

Window systems are typically manufactured to order and subject to production lead times at the time of purchase.

### Warranty

Harden warrants that its Architectural Security products shall remain free of defects in material and workmanship under normal use for a period determined by the individual project specification.

# STEEL WINDOWS – UL 752 / NIJ III BR & BLAST

# **Design Overview**

Harden Steel Ballistic Resistant Windows offer an ideal solution where the call for high ballistics resistance is combined with requirements for minimalistic or uniquely shaped frames. The WSFV-N-B series are tested to meet multiple firearm threat levels including UL 752 (Levels 5 & 8), NIJ III and 7.62 x 39 rounds. The WSFV-N-EX is engineered to resist blast loads up to 40 psi / 300 psi-ms and beyond. Custom designs are available to meet combined blast and ballistic threats.

Fabricated as a complete system, typical construction includes a heavy-duty structural steel frame, laminated/insulated glazing, glazing stops, ballistic protection bars, interior/exterior trim and a plate or tube-type sub-frame. An optional FE/BR deal tray or deal drawer can be added for high-security document transfer needs. Their wide and deep construction provides ample room for the passage of 100+ sheet documents.

All windows are factory glazed and can be installed as a single unit or ganged together to form a unitized "window wall." Numerous glazing options are available along with interior and exterior trims, which improve installation flexibility and come in a wide range of finish types.



The WSFV-N-B series and WSFV-N-EX offer architects and end users:

- Anti-Terrorism Level Security where the threat of rifle-level ballistic and high level blast attacks exist
- **Minimal Sight Lines** where a limited view of the window's framing system is an important component of the overall building design
- Architectural Design the ability to form numerous shapes and configurations facilitates integration with other architectural elements
- **Design Flexibility** where architectural or security objectives require the use of large or ganged window systems
- **Durability** galvanized, structural steel provides maximum durability and low maintenance



# **Standard Features**

- Full window system, factory glazed, with shipping bolts to retain stops and glazing to frame
- Pre-drilled and tapped sub-frame in one of three styles 1) embed plate with studs for newly poured concrete walls 2) tubing with chemical or mechanical anchors for existing masonry walls 3) tubing for welding to steel walls
- Structural steel frame with welded corners
- Laminated glazing to meet the applicable threat

- Removable glazing stops
- Ballistic stop bars to protect construction shim gap (on ballistic-rated units)

### **Standard Finish – Frame and Glazing Stops**

• Hot-dip galvanized per ASTM A123

### Standard Finish – Optional Interior/Exterior Trim

• Manufacturer's standard finish coat (Contact Harden for color chart)

Model Comparison Guide							
Harden Model Series	WSFV-N-BU5	WSFV-N-BU8	WSFV-N-BN3	WSFV-N-B39	WSFV-N-EX		
Frame Construction	Welded steel	Welded steel	Welded steel	Welded steel	Welded steel		
Frame Depth (without trim)	6.0" (152 mm)	6.0" (152 mm)	6.0" (152 mm)	6.0" (152 mm)	6.0" (152 mm)		
Frame Profile Width	2.0" (51 mm)	2.0" (51 mm)	2.0" (51 mm)	2.0" (51 mm)	2.0" (51 mm)		
Mounting Technique	M12 or larger bolts, maximum 12" on center	M12 or larger bolts, maximum 12" on center	M12 or larger bolts, maximum 12" on center	M12 or larger bolts, maximum 12" on center	Determined by blast analysis		
Ballistic Resistance	UL 752 level 5 (7.62 M80)	UL 752 level 8 (7.62 M80, multiple shot)	NIJ III (7.62 M80, multiple shot)	7.62 X 39	See Note 2		
Blast Resistance	See Note 1	See Note 1	See Note 1	See Note 1	Engineered per customer requirements. 20-50 psi is typical; higher levels possible.		
Air Leakage ASTM E283	1.6 psf: <0.01 cfm/ft (77 Pa: <0.02 L/s-m)						
Water Penetration ASTM E331/E547	20 psf (958 Pa): pass						
Dynamic Water Penetration AAMA 501.1	10 psf (429 Pa): pass						
Uniform Load Deflection ASTM E330	+91 psf / -115 psf: <0.01" (4357 Pa/-5506 Pa: <0.25 mm)						
Uniform Load Structural ASTM E330	+136 psf / -173 psf: <0.01" (6512 Pa/-8283 Pa: <0.25 mm)						
Thermal Cycling AAMA 501.5	1.6 psf air: 0.01 cfm/sqft (77 Pa: <0.02 L/s-m) 6.2 psf air: 0.04 cfm/sqft (296 Pa air: 0.2 L/sec-sqm) 15 psf (718 Pa) water: pass						
Thermal U-factor, SHGC, CR, VLT	Can be analyzed per NFRC 100, 200, 500; results will vary with glazing type.						

Note 1: Ballistic-rated models will have some inherent blast resistance, but level is highly dependent on size and mounting technique. Non-linear analysis, shock tube testing or arena testing is recommended if blast resistance is required.

# STEEL WINDOWS – UL 752 / NIJ III BR & BLAST

# **Optional Features**

- Window System:
  - o Transaction tray with interior lid and stainless steel interior/exterior trim
  - o Transaction drawer (certified as 15 minute FE/BR) with interior lid and stainless steel interior/exterior trim
  - o Snap-on interior window trim
  - o Exterior window trim
  - o Blast-rated glazing and anchorage systems (user-defined blast loads)
- Glazing:
  - o Low-e hardcoats
  - o Films for RF / IR attenuation
  - o Tints & frits
  - o High-definition printing

## **Options Finishes - Frame and Glazing Stops**

- Epoxy primed
- Epoxy primed and manufacturer's standard powder coat (Contact Harden for color chart)

### **Optional Finishes - Interior/Exterior Trim**

- Clear anodizing, 204-R1 or 215-R1
- Color anodizing
- Painted finish, AAMA 2604 (Contact Harden for color chart)
- Painted finish, AAMA 2605 (Contact Harden for color chart)
- Stainless steel cladding





# **Technical Data**

### **Applicable Standards, Testing & Certifications**

- UL 752: Standard for Bullet-Resisting Equipment
- NIJ 01.08.01: Ballistic-Resistant Protective Materials
- ASTM E283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- AAMA 501.1: Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure
- AAMA 501.5: Test Method for Thermal Cycling of Exterior Walls
- NFRC 100: Procedure for Determining Fenestration Product U-factors
- NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
- NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values

### Installation Considerations

- Windows are fully glazed at the factory, and require only minimal preparation prior to installation
- Sub-frames can be shipped in advance of factory glazed window assembly
- Three different methods of installation into the structure, depending on the stage and type of wall construction:
  - o Pre-drilled and tapped plate-type embeds cast into concrete
  - o Pre-drilled and tapped steel tube-type subframes bolted into the wall
  - o Pre-drilled and tapped steel tube-type subframes welded to the wall structure

### Maintenance

Regular inspection of window, trim and flashing is recommended.

### **Availability & Cost**

Window systems are typically manufactured to order and subject to production lead times at the time of purchase.

### Warranty

Harden warrants that its Architectural Security products shall remain free of defects in material and workmanship under normal use for a period determined by the individual project specification.



# Harden offers a complete line of Architectural Security Products

- Windows & Deal Trays
- Doors
- Louvers
- Roof/Escape Hatches



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