



**3-Part Guide Specification**

GENERAL NOTES TO SPECIFIER:

THIS SPECIFICATION SYSTEM HAS BEEN PREPARED TO ASSIST DESIGN PROFESSIONALS IN THE PREPARATION OF PROJECT OR OFFICE MASTER SPECIFICATIONS. IT FOLLOWS GUIDELINES ESTABLISHED BY THE CONSTRUCTION SPECIFICATIONS INSTITUTE, AND THEREFORE MAYBE USED WITH MOST MASTER SPECIFICATION SYSTEMS WITH MINOR EDITING.

EDIT CAREFULLY TO SUIT PROJECT REQUIREMENTS. MODIFY AS NECESSARY AND DELETE ITEMS THAT ARE NOT APPLICABLE. VERIFY THAT REFERENCED SECTION NUMBERS AND TITLES ARE CORRECT (NUMBERS AND TITLES REFERENCED ARE BASED ON *MASTERFORMAT 2004 EDITION*.)

THIS SECTION ASSUMES THE PROJECT MANUAL WILL CONTAIN COMPLETE DIVISION 1 DOCUMENTS INCLUDING 01 25 13 – PRODUCT SUBSTITUTION PROCEDURES, 01 33 00 – SUBMITTAL PROCEDURES, 01 62 00 – PRODUCT OPTIONS, 01 66 00 PRODUCT STORAGE AND HANDLING REQUIREMENTS, 01 74 00 – CLEANING AND WASTE MANAGEMENT, 01 77 00 – CLOSEOUT PROCEDURES, AND 01 78 00 – CLOSEOUT SUBMITTALS. CLOSE COORDINATION WITH DIVISION 1 SECTIONS IS REQUIRED. IF THE PROJECT MANUAL DOES NOT CONTAIN THESE SECTIONS, ADDITIONAL INFORMATION SHOULD BE INCLUDED UNDER THE APPROPRIATE ARTICLES.

THIS IS AN OPEN PROPRIETARY SPECIFICATION ALLOWING USERS THE OPTION OF APPROVING OTHER MANUFACTURERES THAT COMPLY WITH THE CRITERIA SPECIFIED HEREIN.

NOTES TO THE SPECIFIER ARE CONTAINED IN BOXES AND SHOULD BE DELETED FROM FINAL COPY.

OPTIONAL ITEMS REQUIRING SELECTION BY THE SPECIFIER ARE ENCLOSED WITHIN BRACKETS, E.G. [35] [40] [45]. MAKE APPROPRIATE SELECTIONS AND DELETE OTHERS.

ITEMS REQUIRING ADDITIONAL INFORMATION IS UNDERLINED BLANK SPACES, E.G.

OPTIONAL PARAGRAPHS REQUIRING SELECTION OF ONE OF THE OPTIONS ARE SEPARATED BY “OR” WITHIN A BOX. E.G.

OR

**BOLD FACE** TYPE IDENTIFIES OPTIONAL PARAGRAPHS AND FEATURES THAT MAY BE INCLUDED OR DELETED DEPENDING UPON PROJECT REQUIREMENTS. CONVERT THE BOLD FACE TYPE TO REGULAR TYPE WHEN INCLUDING THESE PARAGRAPHS OR FEATURES.

REVISE FOOTER TO SUIT PROJECT / OFFICE REQUIREMENTS.

ELECTRONIC VERSIONS OF THIS SPECIFICATION UTILIZE AUTOMATIC PARAGRAPH NUMBERING.

WHEN EDITING IS COMPLETE, DELETE ALL TEXT ON THIS PAGE, THEN REMOVE THE SECTION BREAK AT THE TOP OF THE NEXT PAGE TO REMOVE THIS PAGE FROM THE DOCUMENT.

**SECTION 08 54 13**  
Fiberglass Windows

**Fiberglass Double Hung Windows**

PART 1 – GENERAL

**1.01 SUMMARY**

- A. Section included: Fiberglass Reinforced Polymer (FRP) windows of the following type:
1. Double Hung tilt windows

**1.02 RELATED SECTIONS**

**Specifier Notes:** Insert appropriate section numbers and title below for Window Flashing and Installation Sealant.

- A. Section 07 27 00 - Air Barriers: Water-resistant barrier.
- B. Section 07 92 00 - Joint Sealants: Sealants and caulking.
- C. Section 08 81 00 – Glass and Glazing

**1.03 REFERENCES**

**Specifier Notes:** List standards referenced in this section, complete with designations and titles. This article does not require compliance with standards, but is merely a listing of those used.

- A. American Architectural Manufacturers Association (AAMA):
  1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
  2. AAMA 613 - Voluntary Performance Requirements and Test Procedures for Organic Coatings on Plastic Profiles.
  3. AAMA 623 07 – Voluntary Specification, Performance Requirements and Test Procedures for Organic Coatings on Fiber Reinforced Thermoset Profiles
  4. AAMA 624 07 – Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Fiber Reinforced Thermoset Profiles
  5. AAMA 625 07 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Fiber Reinforced Thermoset Profiles
- B. American Architectural Manufacturers Association, Window and Door Manufacturers Association, and Canadian Standards Association (AAMA/WDMA/CSA)
  1. ANSI/AAMA/NWDA 101/I.S.2 -97 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
  2. AAMA/WDMA/CSA 101/I.S.2/A440-05 – Standard/Specification for windows, doors, and unit skylights
  3. AAMA/WDMA/CSA 101/I.S.2/A440-08 – NAFS North American Fenestration Standard/Specification for windows, doors, and skylights
- C. American Society for Testing and Materials (ASTM):

1. ASTM C 1036 - Flat Glass.
2. ASTM C 1048 - Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
3. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
4. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.

## 1.04 PERFORMANCE REQUIREMENTS

**Specifier Notes:** Performance ratings for Alpen High Performance Products vary by product and size. Current performance information may be found at [www.AlpenHPP.com](http://www.AlpenHPP.com). Consult your local Alpen High Performance Products representative for more information.

### A. Air, Water and Structural Performance

1. Windows shall meet Rating specifications in accordance with ANSI/AAMA/NWDA 101/I.S.2-97, AAMA/WDMA/CSA 101/I.S.2/A440-05, and AAMA/WDMA/CSA 101/I.S.2/A440-08
2. Window Air Leakage, ASTM E 283: Window air leakage when tested at 1.57 psf (25 mph) shall be 0.16 cfm/ft<sup>2</sup> of frame.
3. Window Water Penetration, ASTM E 547: No water penetration through window when tested under static pressure of 7.52 psf after 4 cycles of 5 minutes each, with water being applied at a rate of 8 gallons per hour per square foot.
4. Forced entry resistance not to exceed limits defined by the standard AAMA/WDMA/CSA 101/I.S.2/A440-05.
5. Field testing to verify compliance shall be performed on units of comparable size to gateway test sizes for designated Performance Classes as listed in Table 1 of Section 4.3 of AAMA/WDMA/CSA 101/I.S.2/A440-05

### B. Thermal Performance

1. Windows shall meet whole-unit U-Value and SHGC Performance determined in accordance with NFRC 100.

## 1.05 SUBMITTALS

### A. Reference Section 01 33 00 – Submittal Procedures; submit following items:

1. Product Data: Submit manufacturer's product data, including installation instructions.

**Specifier Notes:** Delete the following sentence if shop drawings are not required.

2. Shop Drawings: Include window schedule, window elevations, section details, and multiple window assembly details. Submit shop drawings as required; include location floor plans or exterior wall elevations showing all window openings, typical unit elevations, and to scale

detail sections of every typical composite member. Indicate the type of anchors, hardware, operators and other components not included in manufacturer's standard data. Include glazing details and standards for factory glazed units.

3. Samples:
    - a. Color samples: Minimum 1 x 3 inch (25 mm x 76 mm) samples of Fiberglass with coating or Metal with coating
    - b. Glass, showing specified color.
  4. Quality Assurance / Control Submittals:
    - a. Qualifications: Proof of manufacturers qualifications.
    - b. U-Factor and structural rating charts required for AAMA and NFRC labeling requirements.
    - c. Installation Instructions – ref. AAMA Installation Masters
- B. Closeout Submittals: Reference Section 01 78 00 – Closeout Submittals: submit following items:
1. Maintenance instructions.
  2. Special Warranties.

## 1.06 QUALITY ASSURANCE

- A. Overall Standards: Comply with ANSI/AAMA 101.I.S.2, except as otherwise noted herein.
- B. Qualifications:
1. Manufacturer Qualifications:
    - a. Member American Architectural Manufacturers Association (AAMA) and the National Fenestration Rating Council (NFRC)
    - b. IGCC Certified for fabrication of insulated glazing units with suspended film.
    - c. Minimum 5 years experience fabricating insulated glazing units using suspended film.
  2. Product Qualifications:

Certifications for insulated glass windows:

AAMA: Windows shall be Gold Label certified with label attached to frame per AAMA requirements.

NFRC: Windows shall be NFRC certified with temporary U-factor label applied to glass and an NFRC tab added to permanent AAMA frame label.
  3. Provide test reports from an AAMA accredited laboratory certifying the performance as specified in section 1.04 of this specification. Valid test reports shall be no more than four years old.

**Specifier Notes:** INSERT LOCAL REGULATORY REQUIREMENTS BELOW.

- C. Regulatory Requirement: [Egress]

## 1.07 DELIVERY, STORAGE, AND HANDLING

Reference Section 01 66 00 – Product Storage and Handling Requirements.

- A. Delivery:
1. Deliver materials to site undamaged in manufacturer's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.

B. Storage:

1. Protect the windows and accessories from the elements, construction activities, and other hazards until the project is complete.
  - (a) Store materials in an upright position and in accordance with manufacturer's instructions.
  - (b) Store materials off ground and under cover.
  - (c) Protect materials from weather, direct sunlight, and construction activities.

C. Handling: Protect materials and finish during handling and installation to prevent damage.

1. Handle all fiberglass window units with glass cups instead of by the frames whenever possible and if unit is over 100 lbs.
2. Protect materials and finish during handling and installation to prevent damage.

1.08 WARRANTY

**Specifier Notes:** Select "Residential Warranty" below for owner occupied Single Family Residence – or – Owner Occupied Condominium Projects.

Select "Commercial Warranty" for Non-owner Occupied Condominiums, Commercial, and Multi-Family Projects. Go to [www.AlpenHPP.com](http://www.AlpenHPP.com). Site Map for more information.

Residential Warranty:

1. Full Lifetime guarantee to original owner.
2. Guarantee windows against defect in materials and workmanship.

Or

Commercial Warranty:

1. 10 year guarantee.
2. Guarantee windows against defects in materials and workmanship.

PART 2 – PRODUCTS

2.01 MANUFACTURER

A. Alpen High Performance Products  
6268 Monarch Park Place  
Longmont, CO 80503

Tel: (303) 834-3600  
Fax: (303) 834-3541  
Website: [www.ThinkAlpen.com](http://www.ThinkAlpen.com)

**Specifier Notes:** Insert name, address and phone numbers of manufacturer's representative below.

B. Manufacturer's Representative:

	Tel: _____
	Fax: _____
	email: _____

C. Window Series:

525 Series Fiberglass Windows  
725 Series Fiberglass Windows

D. Substitutions: Reference Section 01 25 13 – Product Substitution Procedures.

## 2.02 MATERIALS

- A. Frame and Sash: Pultruded Fiberglass Reinforced Polymer, with color coating.
- B. Hardware: Hardware having component parts which are exposed shall be of brass, aluminum, stainless steel or other non corrosive material(s) compatible with fiberglass and of sufficient strength to perform the functions for which they are used. Cadmium or zinc-plated steel, where used, shall be in accordance with ASTM A 165 or B 633. Nickel chrome-plated steel, where used, shall be in accordance with ASTM B 456. Operable double-hung windows shall have at least one (1) zinc die-cast sweep-type lock (two (2) on units over 27" wide) and an integral keeper for positive locking. Sash Lifts match hardware color and quantity on top and bottom sash.
- C. Weather-strip: Weather-strip conforming to AAMA 701 or 702. Weather-strip shall meet the requirements of the specifications as detailed in the appropriate test report. All weather-strip shall be installed in specially-extruded ports and secured to prevent movement, shrinkage, or loss when removing sash either for cleaning or repair. Adhered weather-strip shall not be allowed. Sash of double hung windows shall be weather-stripped using woven pile with Mylar center fin, double on sash stiles and single on sash rails. Lower rail shall seal to frame sill with dual vinyl compression bulb.
- D. Balances for sash that operate shall be heavy duty Ultra-lift or similar conforming to AAMA 902 and of appropriate capacity to hold each sash stationary and permit it to operate freely; nylon balance shoes which lock in the tilted position to prevent sash travel. Balances shall be factory applied, easily accessible and shall be field replaceable.
- E. Screens: Full screens supplied separately or delivered applied to windows as requested.

**Specifier Notes:** Verify that Window Flashing Material and Installation Sealant is specified in appropriate sections.

## 2.03 ASSEMBLY

- A. Fabricate frames and sash with mitered and mechanically joined corners. Mitered seams shall be sealed thoroughly to prevent air or water penetration
- B. Provide metal or composite reinforcement in sash or frame for attaching operating or locking mechanisms
- C. Factory glazed, with exterior snap on PVC or Fiberglass glazing stops. Insulating glass units shall be reglazable without dismantling sash framing.
- D. The windows shall be assembled in a secure and professional manner to perform as herein specified and to assure neat and weather tight construction. Construction shall be neatly joined and secured by means of two screws into reinforced shear blocks. All sash corners shall be neatly joined and secured by means of two screws anchored into integral screw port at all horizontal member locations. Meeting rails of both sashes shall mechanically interlock in a

closed position. All main framing joints shall be sealed with sealants meeting the requirement of AAMA 803 or 809.

## 2.04 INSECT SCREENS

- A. Provide tight-fitting screen for operating sash with hardware to allow easy removal.
  - 1. Screen Cloth: Charcoal colored fiberglass mesh
  - 2. Frame:  
Rollformed or extruded aluminum. (Exterior placement)  
with Pull tabs

## 2.05 GLASS AND GLAZING

- A. Overall IG thickness: nominally [7/8"] [13/16"] (525 Series and 725 Series)  
Insulated Glass Units: ASTM E774, Class A.,

**Specifier Notes:** Overall thickness and makeup is unique to each series. Refer to [www.AlpenHpp.com](http://www.AlpenHpp.com) for more information. Standard High Solar Heat Gain (HSHG) and Low Solar Heat Gain (LSHG) packages are available for each series. 525 Series 5H and 5L or 725 Series 7H and 7L. Custom glass package will need to be reviewed and approved on a case by case basis.

- B. Construction: Individual components shall comply with criteria specified in following paragraphs. Units shall be hermetically sealed and shall comply with ASTM E 2190, Class CBA.
- C. Components:
  - 1. Exterior layer to be [clear] [low-e coated] float glass of nominal [1/8" (3mm)] [3/16" (5mm)] thickness; per ASTM C 1036: Type 1, Class 1, Quality q3; conforming to ASTM C 1376
  - 2. Exterior glass to be [Kind annealed ] [Kind HS per ASTM C 1048] [Kind FT per ASTM C 1048, complying with CPSC 16CFR-1201; ANSI Z 97.1]
  - 3. Suspended polymer film : [Single] Suspended Film
  - 4. Interior layer to be [clear] [low-e coated] float glass of nominal [1/8" (3mm)] [3/16" (5mm)] thickness; per ASTM C 1036: Type 1, Class 1, Quality q3
  - 5. Interior glass to be [Kind annealed ] [Kind HS per ASTM C 1048] [Kind FT per ASTM C 1048, complying with CPSC 16CFR-1201; ANSI Z 97.1]
  - 6. Gas Fill: Each cavity between glass and SCF shall be filled with an inert gas / air mixture containing a minimum of 90% [Krypton] gas; units shall be equipped with gas-retention device for shipping.
  - 7. Spacers: shall maintain a nominal dimension of [5/16" (7.9mm)] [3/8" (9.5mm)] between glass and suspended film.

**Specifier Notes:** Warmedge spacers are not available on some units including certain oversize units, radius and gabled units.

- 8. Edge Sealants:
  - a. Primary: Polyisobutylene (PIB) sealant complying with ASTM E 774 for glass-to-spacer seals

- b. Secondary: Polyurethane sealant for perimeter moisture barrier
- c. Seal durability: conformance to ASTM E 774; visible ALI certification for CBA rating level. Perimeter seals shall maintain a hermetically-sealed, dehydrated condition for the duration of the product warranty.

**Specifier Notes:** High-altitude Insulated Glass Units available.

**2.06 DIVIDED LITE GRIDS**

**Specifier notes:** Verify that desired grid patterns, if any, are shown on the drawing. Certain grid patterns may not be available - CONSULT ALPEN HIGH PERFORMANCE PRODUCTS REPRESENTATIVE FOR UNUSUAL DESIGN APPLICATIONS.

- A. Grid descriptions
  - 1. Simulated Divided Lite (SDL) - exterior/interior mounted, finished to match interior or exterior finish. [7/8" Bar]

**2.07 FINISH (Exterior / Interior)**

- A. Frame and Sash colors: [White] [Bronze] [Almond] [Sandstone] [Slate]
  - Split – one color inside; different color outside
  - Custom – custom color requests require Pantone number and matching swatch.
- B. Interior Wood Veneer [Oak Veneer]
- C. Color match screen frame to window frame and sash color

**2.08 SOURCE QUALITY CONTROL**

- A. Windows inspected in accordance with manufacturers Quality Control Program.

**2.09 WINDOW TYPES**

**Specifier Notes:** SELECT FOLLOWING WINDOW TYPES BASED ON PROJECT REQUIREMENTS. DELETE WINDOW TYPES NOT USED.

Double Hung Window [525 Series] [725 Series]

- A. Factory assembled and glazed double-hung windows
- B. Frame:
  - 1. Multi-chambered, foam insulated, pultruded fiberglass
  - 2. Interior Exposed Surfaces: [Factory applied coating - color] [Oak Veneer]
  - 3. Base Frame Depth: 3-1/4 inch (83 mm)
  - 4. Overall Frame Depth (interior plane to exterior plane of screen channel): 4" (102mm)
- C. Sash:
  - 1. Chambered, foam insulated, pultruded fiberglass
  - 2. Interior Exposed Surfaces: [Factory applied coating - color] [Oak Veneer]
  - 3. Minimum 1 3/8 inch (34.9 mm) deep, chambered, pultruded fiberglass profile.
  - 4. Both sash tilt-inward, via activation of tilt-latch for easy cleaning.
  - 5. Positive, coupling interlock at meeting rail.
- D. Sightlines: edge of frame to tip of glazing tower or glass line 3 5/8 inch (91mm)
- E. Weather-strip:
  - 1. Single continuous weather-strip on sill up-stand, with finned wool pile.
  - 2. One fin wool pile type weather-strip around sash perimeter's exterior face



3. Foam with fabric skin around sash perimeter's edge.
- F. Hardware:
  1. Cam style lock, zinc die cast base with painted finish [White] [Beige] [Coppertone] [Chestnut] [Black] **Optional:** [ORB] [Pewter] [Brushed Nickel] [Antique Brass]
  2. Keeper, zinc die cast with painted finish
  3. Spring loaded tilt latch with beveled throw bolt.
  4. Lift handles, zinc die cast base with painted finish
  5. Constant force balances utilizing stainless steel spring coil.
  6. All exposed fasteners- stainless steel
- G. Simulated-Divided-Lite (SDL) Grids 7/8" (Optional)
  1. Interior (room side) grids: Solid [Oak]
  2. Exterior Grids: Extruded Aluminum
- H. Performance Class Structural
  1. Commercial CW-PG50 for up to 47"x66" or CW-PG30 for >47"x66" to 55"x91"

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Examine openings in which windows will be installed.
  1. Field verify that the existing window openings are within tolerance, plumb, level, clean, and provide a solid anchoring surface and substrate. Also confirm that the openings and are in accordance with approved shop drawings.
  2. Verify that framing complies with method of installation
  3. Verify that fasteners in framed walls are fully driven and will not interfere with window installation
- B. Coordinate with responsible entity to correct unsatisfactory conditions. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.
- C. Commencement of work by installer is acceptable of substrate conditions.

### 3.02 INSTALLATION

**Specifier Notes:** INSTALLATION INSTRUCTIONS (AAMA 2400) ARE ADEQUATE FOR NORMAL INSTALLATION CONDITIONS IN FRAMED CONSTRUCTION. MASONRY WALL AND UNUSUAL CONDITIONS MAY REQUIRE ADDITIONAL INFORMATION. Install per AAMA Installation Masters recommendations. All flashings should be applied in weatherboard fashion.

- A. Install windows in framed walls in accordance with AAMA 2400, and manufacturer's instruction
- B. Install windows in accordance with manufacturer's instructions.
- C. Install windows to be weather-tight and freely operating.
- D. Maintain alignment with adjacent work.
- E. Secure assembly to framed openings, plumb and square, without distortion.

**Specifier Notes:** The following paragraph applies to windows installed using installation fins only. If the windows are not being installed with installation fins, delete this paragraph.

- F. Integrate window system installation with exterior water-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with window manufacturer's instructions.
- G. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using insulating-foam sealant.
- H. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly. (Continuous at the head and jambs. Discontinuous at the sill.)
- I. Leave windows closed and locked.
- J. Do not remove temporary labels
- K. Install insect screens on operable windows

**Specifier Notes:** Field testing is optional. Delete Field Quality Control if field testing is not required. If Field Quality Control is deleted, delete AAMA 502 from Article 1.3 References in this section.

### 3.03 FIELD QUALITY CONTROL

- A. Optional Field Testing: Field-test windows in accordance with AAMA 502, Test Method
- B. Conduct air and water infiltration testing with the window manufacturer, contractor, and owner present.
- C. An AAMA accredited lab will be hired by the owner to perform the required testing.
- D. Field tested units shall be of comparable size to gateway sizes listed in AAMA/WDMA/CSA 101/I.S.2/A440-05

### 3.04 CLEANING

- A. Reference Section 01 74 00 – Cleaning and Waste Management
- B. Clean window frames and glass in accordance with Division 1 requirements.
- C. Remove temporary labels and retain for Closeout Submittals.
- D. Clean soiled surfaces and glass using a mild detergent and warm water solution with soft, clean cloths.

### 3.05 PROTECTION

- A. Protect installed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

### 3.06 DISPOSAL OF DEBRIS

- A. Remove all garbage off site and legally dispose of existing windows and debris generated from the installation of the new windows.

**END OF SECTION**

# Alpen High Performance Products



This specification was prepared by Alpen High Performance Products. Comments or suggestions for improvement should be addressed to:

Alpen High Performance Products  
6268 Monarch Park Place  
Longmont, CO 80503  
(303) 834-3600/800-882-4466  
Fax: (303) 834-3541