

**GUIDE SPECIFICATIONS - SECTION 085210**  
**ALUMINUM WINDOWS**  
**Manko Window Systems Inc. 7041 SERIES**  
**(Single Hung)**

**SECTION 085210 ALUMINUM WINDOWS (Single Hung)**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
1. All exterior windows furnished and installed as shown on drawings, specified in this section and designated in AAMA 101/I.S.2..
  2. All labor, materials, tools, equipment and services needed to furnish and install Architectural Performance Class Windows.
  3. Components furnished with installed windows.
  4. Installation accessories furnished and installed.
  5. Single Source Requirement
    - a. All products listed in Section 08400; 08500; 08800; and 08900 shall be by the same manufacturer.

**1.02 SYSTEM PERFORMANCE REQUIREMENTS**

- A. Design Wind Loads
1. The design wind pressure for the project will be: **(Specify)**
    - a. \_\_\_ psf positive and negative; \_\_\_ psf negative at corner zones
    - b. Per wind pressure diagram
    - c. Per local building codes
  2. All structural components, including meeting rails, mullions and anchors shall be designed accordingly, complying with deflection and stress requirements of Paragraph 1.02 B.

*[Determination of design load(s) is the sole responsibility of the building's Engineer of Record, considering code interpretation issues and/or prescriptive requirements not included in contract documents. Manko Window Systems, Inc. strongly recommends that design loads (in psf or Pa) specific to all relevant areas of the building be provided by the specifier.]*

- B. Air, Water and Structural Performance Requirements
1. When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA 101 and 101/I.S.2 for Architectural (AW) Performance Class windows, Performance Grade 50 (AW50).
  2. Air Test Performance Requirements
    - a. Air infiltration maximum 0.3 cfm per square foot at 6.24 psf pressure differential when tested in accordance with ASTM E283.
  3. Water Test Performance Requirements
    - a. No uncontrolled water leakage at 10.00 psf static pressure differential, with water application rate of 5 gallons/hr/sq ft when tested in accordance with ASTM E331.
  4. Structural Test Performance Requirements
    - a. Uniform Load Deflection Test
      - i. No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 50 psf (design test pressure) when tested in accordance with ASTM E330.
      - ii. Structural reinforcing that is not standard on units being furnished is not allowed.
    - b. Uniform Load Structural Test
      - i. Unit to be tested at 1.5 x design test pressure (75 psf), both positive and negative, acting normal to plane of wall in accordance with ASTM E330.
      - ii. No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.

C. Life Cycle Testing:

1. When tested in accordance with AAMA 910-93, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of testing. Air infiltration and dust resistance tests shall meet the minimum performance requirements specified

- C. Life Cycle Testing:
1. When tested in accordance with AAMA 910-93, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of testing. Air infiltration and water resistance tests shall meet the primary performance requirements specified.
- D. Thermal Transmittance (U-Value):
1. Whole window U-Value based on NFRC 100 test sizes and calculated by using NFRC approved versions of Windows and Therm software. Thermal transmittance (U-Value) shall not exceed 0.45 BTU/hr/sf/degF for Single Hung windows when calculated using a COG glass U-value of .24 BTU/hr/sf/degF. Glazing must be supported by Manko Window Systems, Inc. using EdgeTech "TriSeal Superspacer" to meet these requirements.
- E. Solar Heat Gain (SHGC):
1. Whole window SHGC Value based on NFRC 200 test sizes and calculated by using NFRC approved versions of Windows and Therm software. SHGC shall not exceed 0.21 for single hung windows when calculated using a Center of Glass (COG) SHGC of .26.
- F. Condensation Resistance (CR)
1. Condensation resistance (CR) based on NFRC 500 test sizes and calculated by using NFRC approved Windows and Therm software, shall not be less than 38 for Single Hung windows when calculated using a COG glass U-value of .24 BTU/hr/sf/degF.

*[DISCLAIMER: Condensation on interior surfaces of installed windows is affected by many variables, including component thermal performance, thermal mass of surrounding materials, interior trim coverage and air flow conditions, weather, and mechanical system design. Since many of these variables are outside of Manko Window Systems, Inc., we can make no representations or warranties against the formation of condensation, except on pre-defined configurations under controlled and steady-state laboratory conditions, as specified above.]*

### **1.03 SUBMITTALS**

- A. General Requirements
1. Provide all submittals in a timely manner to meet the required construction completion schedule.
- B. Shop Drawings
1. Shop drawings must be prepared wholly by the window manufacturer, or a qualified engineering services firm under the direction of the manufacturer. Shop drawings for pre-engineered configurations may be prepared by installers authorized per 1.04 QUALITY ASSURANCE.
  2. Provide design details along with bid proposals to define system aesthetic and functional characteristics.
  3. Provide three photocopied sets of shop drawings, including half size details of all necessary conditions.
- C. Samples
1. Components: Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components as requested by Architect.
  2. Finish: Submit color samples for Architect's approval as requested.
- D. Test Reports and Calculations
1. Submit certified independent laboratory test reports verifying compliance with all test requirements of 1.02 SYSTEM PERFORMANCE REQUIREMENTS as requested by Architect.

### **1.04 QUALITY ASSURANCE**

- A. Qualifications
1. Upon request, the window manufacturer will provide written confirmation that the installer is authorized to install window products to be used on this project.

### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Packing, Shipping, Handling and Unloading
1. Materials will be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.

### **1.06 WARRANTY**

- A. Aluminum Window Warranty
1. Products: Submit a written warranty, executed by the window manufacturer, for a period of 2 years (10 years for insulated glass seal failure) from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which results in premature failure of the windows, finish, factory-glazed glass, or parts, outside of normal wear.
    - a. In the event that windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
    - b. Warranty for all components must be direct from the manufacturer (non-pass through) and non-prorated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.

- b. Warranty for all components must be derived from the manufacturer (non-pass through) and non-prorated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.
2. Installation: Submit a written warranty, executed by the window installer, for a period of 2 years from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
  - a. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Acceptable Manufacturer
  1. Drawings and specifications are based on:
    - a. Manko Window Systems, Inc. 7041 Series Tilt Sash Single Hung Windows.
    - i. Base bid will be Manko Window Systems, Inc.
- B. Substitutions
  1. Other manufacturers' products that meet or exceed specified design requirements may be considered. Submit the following information with request for substitutions at least ten (10) working days prior to bid date.
    - a. Test reports specified in 1.02 SYSTEM PERFORMANCE REQUIREMENTS
    - b. Full proposal details and samples specified in 1.03 SUBMITTALS
    - c. Copy of manufacturer's warranty specified in 1.06 WARRANTY
    - d. Other information as requested for evaluation
  2. Substitute products not pre-approved by the Architect via addenda will not be considered.

### **2.02 MATERIALS**

- A. Aluminum Members
  1. Extruded aluminum prime billet 6063-T5 or 6063-T6 alloy for primary components; 6063-T5, 6063-T6, or 6061-T6 for structural components; all meeting the requirements of ASTM B221.
  2. Aluminum sheet alloy 5005 H 32 (for anodic finish), meeting the requirements of ASTM B209 or alloy 3003 H 14 (for painted or unfinished sheet).

### **2.03 MANUFACTURED UNITS**

- A. Materials
  1. Principal window frame members will be a minimum 0.062" in thickness except at frame sills, which will be 0.078" minimum thickness.
  2. Extruded or formed trim components will be a minimum 0.062" in thickness.
- B. Fabrication
  1. Frame depth 4" minimum.
  2. Sill must allow for drainage to the exterior and function under both negative and positive pressure.
  3. Frame-to-sash interface shall be designated for sweep seals, to prevent loss of weather-strip contact under positive pressure.
  4. Sash must be tubular, tilt to the interior for cleaning, and be removable to the interior for maintenance.
  5. Frames are designed for self-mulling (stacking).
  6. Screen frame must not protrude from exterior of window frame.
- C. Glazing
  1. Stop glazed with interior removable stop and gasket.
  2. Standard cavity for 1" infill.
  3. Glass or panel set in structural silicone and heal bead.

### **2.04 COMPONENTS**

- A. All steel components including attachment fasteners to be 300 series stainless steel except as noted.
- B. Extruded aluminum components 6063-T5 or 6063-T6.
- C. Locking handles, cases and strikes to be die cast or stainless steel.
- D. Thermoplastic or thermoplastic resin housings and other components to be injection molded unless extruded.

- C. Locking handles, cases and strikes to be die cast or stainless steel.
- D. Thermoplastic or thermo-set plastic caps, housings and other components to be injection-molded nylon, extruded PVC, or other suitable compound.
- E. Hardware:
1. Balances
    - a. Balances must provide a positive lifting force through the full range of sash travel. Sash travel must be limited on oversize units.
    - b. When properly adjusted, balances must hold the sash stationary at any open position.

(Specify from one of the following)

      - i. Spiral balance
      - ii. Ultra-Lift™ balance (Recommended for improved manual assist ratio)
  2. Locks
    - a. White Bronze cam action sweep latches; one per meeting rail.
    - b. Provide stainless steel or white bronze strikes (Specify)

(Specify from one of the following)

      - i. Occupant-operated sweep latches.
      - ii. Custodial-operated (Allen) sweep latches.
      - iii. Automatic spring-loaded head and/or sill locks shall secure sash in closed position.
  3. Lift Handles
    - a. Provide integral continuous lift handles on sash.
  4. Limit Stops (Optional)
    - a. Provide jamb-mounted limit stops.
- F. Sealants
1. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
  2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.
- G. Glass
1. Provide in accordance with Section 08800.
  2. Sealed insulated glass shall meet ASTM E774 Class A.
- H. Glazing
1. Provide in general accordance with Section 08800.
  2. Glazing method shall be in general accordance with the FGMA Glazing Manual for specified glass type, or as approved by the glass fabricator.
- I. Glazing Materials
1. Setting Blocks/Edge Blocking: Provide in sizes and locations recommended by FGMA Glazing Manual.
  2. Back-bedding tapes, expanded cellular glazing tapes, toe beads, heel beads and cap beads shall meet the requirements of applicable specifications cited in AAMA 800.
  3. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
  4. Structural silicone sealant where used shall meet the requirements of ASTM C 1184.
  5. Spacer tape in continuous contact with structural silicone shall be tested for compatibility and approved by the sealant manufacturer for the intended application. Gaskets in continuous contact with structural silicone shall be extruded silicone or compatible material.
- J. Steel Components
1. Provide steel reinforcements as necessary to meet the system performance requirements of 1.02.
  2. Concealed steel anchors and reinforcing shall be factory painted after fabrication with rust-inhibitive primer complying with Federal Specification TT-P-645.
- K. Thermal Break Construction:
1. Frame and sash members must include a thermal break applied in the manufacturer's facility, using concealed low conductance poured-in-place polyurethane in a pre-treated cavity.
  2. After proper curing, the aluminum bridge section must be removed to provide a 1/4" separation between exterior and interior metal surfaces.
- L. Weather Stripping:
1. Dual durometer PVC, neoprene, EPDM or other suitable material as tested and approved by the window manufacturer.
  2. Bulb type at exterior vent members.
  3. Securely stake and join at corners. Provide drainage to exterior as necessary.
  4. Weather-stripping shall provide an effective pressure-equalization seal at the interior face of the sash ventilator.

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3. Securely stake and join at corners. Provide drainage to exterior as necessary.
4. Weather-stripping shall provide an effective pressure-equalization seal at the interior face of the sash ventilator.

M. Muntins: (Optional)

1. Provide muntin grids as shown on architectural drawings.
2. Finish to match window frames.

N. Panning: (Optional)

1. Provide extruded aluminum panning to receive replacement windows as shown on architectural drawings.
2. Finish to match window frames.

O. Receptors/Sill Starter: (Optional)

1. Provide extruded aluminum receptors to receive windows, as shown on architectural drawings.
2. Finish to match window frames.

P. Insect Screens: (Optional)

1. Tubular extruded aluminum frames shall meet the requirements of ANSI/SMA 1004. Finish to match window frames.
2. Aluminum cloth shall comply with GSA-FS-RR-W-365 and USDC-CS-138 with 18 X 16 mesh. Cloth color shall be (Select one) charcoal grey or brite aluminum.

**2.05 FABRICATION**

A. General:

1. Finish, fabricate and shop assemble frame and sash members into complete windows under the responsibility of one manufacturer.
2. No bolts, screws or fastenings to bridge thermal barrier or impair independent frame movement.
3. Fabricate to allow for thermal movement of materials when subjected to a temperature differential from -30 degrees F to +180 degrees F.

B. Frames:

1. Cope and mechanically fasten each corner, then seal weather tight.

C. Operating Sash Ventilator

1. Cope and mechanically fasten each corner, then seal weather tight.

D. Glass Drainage: (field glazed units only)

1. Provision shall be made to insure that water will not accumulate and remain in contact with the perimeter area of sealed insulated glass.

E. Tolerances

1. Reference to tolerances for wall thickness and other cross-sectional dimensions of entrance members are nominal and in compliance with the Aluminum Standards and Data.

**2.06 FINISHES**

A. Finish of Aluminum Components

1. Finish of all exposed areas of aluminum windows and components shall be done in accordance with the appropriate AAMA Voluntary Guide Specification shown (select from below).

Designation	Description	Standard	Color
AAM12C21A31	Clear - Class II	AAMA 611	Clear
AAM12C21A41	Clear - Class I	AAMA 611	Clear
AAM12C21A44	Electrolytically Deposited – Class I	AAMA 611	Champagne, Light Bronze, Medium Bronze, Dark Bronze, Black
	Organic Paint	AAMA 2603	As selected by Architect from manufacturer's standard colors - Suitable for INTERIOR Finishes

Organic Paint

AAMA 2605

As selected by Architect from  
manufacturer's standard colors -  
suitable for INTERIOR or  
EXTERIOR finishes

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Site Verification of Conditions
1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, calculations and contract documents.
  2. Do not install windows until unsatisfactory conditions are corrected.

#### **3.02 INSTALLATION**

- A. Erection of Aluminum Windows
1. Install windows with skilled tradesman in exact accordance with approved shop drawings, installation instructions, specifications, and AAMA 101/I.S.2.
  2. Windows must be installed **plumb, square and level** for proper weathering and operation. Jambes must not be "sprung", bowed or warped during installation.
  3. Aluminum that is not organically coated shall be insulated from direct contact with steel, masonry, concrete or other dissimilar metals by bituminous paint, zinc chromate primer, nonconductive shims or other suitable insulating material.

*[DISCLAIMER: Manko Window Systems, Inc. takes no responsibility for product selection or application, including, but not limited to, compliance with building codes, safety codes, laws, merchantability or fitness for a particular purpose, and further disclaims all liability for the use, in whole or in part, of these guide specifications in preparation of project specifications and/or other documents. Guide specifications are subject to change at any time, without notice, and at Manko Window Systems, Inc. sole discretion.]*

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