

SECTION 08 51 13.00 20

ALUMINUM WINDOWS
06/07

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ALUMINUM ASSOCIATION (AA)

AA 45 (2003) Designation System for Aluminum Finishes

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 101 (2002) Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors

AAMA 1503 (1998) Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections

AAMA 2603 (2002) Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels

AAMA 611 (1998) Voluntary Specification for Anodized Architectural Aluminum; includes 604.2, 606.1, 607.1 and 608.1 (which are no longer available as separate documents)

AAMA 902 (1999) Voluntary Specification for Sash Balances

GREEN SEAL (GS)

GS-36 (2000) Commercial Adhesives

NATIONAL FENESTRATION RATING COUNCIL (NFRC)

NFRC 100 (1997; R 2004) Determining Fenestration Product U-factors

NFRC 200 (1997; R 2004) Determining Fenestration Product Solar Heat Gain Coefficient and

Visible Transmittance at Normal Incidence

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

SCAQMD Rule #1168 (1989; R 2005) Adhesive and Sealant Applications

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

Energy Star (1992; R 2006) Energy Star Energy Efficiency Labeling System

1.2 CERTIFICATION

Each prime window unit shall bear the AAMA Label warranting that the product complies with AAMA 101. Certified test reports attesting that the prime window units meet the requirements of AAMA 101, including test size, will be acceptable in lieu of product labeling.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Windows; G
Hardware; G
Fasteners; G

Screens

Weatherstripping; G

Accessories; G

SD-04 Samples

Finish Sample

SD-10 Operation and Maintenance Data

Windows, Data Package 1

Submit in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

1.4 QUALITY ASSURANCE

1.4.1 Sample Requirements

1.4.1.1 Finish Sample Requirements

Submit color chart of standard factory color coatings

1.5 DELIVERY AND STORAGE

Deliver windows to project site in an undamaged condition. Use care in handling and hoisting windows during transportation and at the jobsite. Store windows and components out of contact with the ground, under a weathertight covering, so as to prevent bending, warping, or otherwise damaging the windows. Damaged windows shall be repaired to an "as new" condition as approved. If windows can not be repaired, provide a new unit.

1.6 PROTECTION

Protect finished surfaces during shipping and handling using the manufacturer's standard method, except that no coatings or lacquers shall be applied to surfaces to which calking and glazing compounds must adhere.

PART 2 PRODUCTS

2.1 WINDOWS

Prime windows shall comply with **AAMA 101** and the requirements specified herein. In addition to compliance with **AAMA 101**, window framing members for each individual lite of glass shall not deflect to the extent that deflection perpendicular to the glass lite exceeds L/175 of the glass edge length when subjected to uniform loads at specified design pressures. **Structural calculations for deflection** shall be provided to substantiate compliance with deflection requirements. Provide windows of types, performance classes, performance grades, combinations, and sizes indicated or specified. Design windows to accommodate hardware, glass, weatherstripping, screens, and accessories to be furnished. Each window shall be a complete factory assembled unit with or without glass installed.

Dimensions shown are minimum. Provide windows with insulating glass and thermal break necessary to achieve a minimum Condensation Resistance Factor (CRF) of **35** when tested in accordance with **AAMA 1503**. Glazed systems (including frames and glass) shall be **Energy Star** labeled products as appropriate to climate zone and as applicable to window type, with a whole-window Solar Heat Gain Coefficient (SHGC) maximum of **0.40** determined according to **NFRC 200** procedures. Glazed systems shall have a U-factor maximum of **0.75 Btu per square foot x hr x degree F** in accordance with **NFRC 100**.

Exterior frames, mullions, and window hardware shall be designed to resist equivalent static design loads of **1 pound per square inch** applied to the surface of the glazing. Frame and mullion deformations shall not exceed 1/60 of the unsupported member lengths. A window that complies with the **AAMA 101** Optional Performance Grade 60 is acceptable in lieu of tests or calculations showing compliance with load requirement specified above. The Contractor may use other products, but must demonstrate by calculations or

tests that the window complies with the loading requirement. Equivalent static design loads for connections of window to the surrounding walls or hardware and associated connections, and glazing stop connections shall be 10.8 pounds per square inch for glazing panels with a vision area less than or equal to 10.8 square feet and 4.4 pounds per square inch for glazing panels with a vision area greater than 10.8 square feet but less than or equal to 32 square feet. Alternatively, use frames that provide an equivalent level of performance.

2.1.1 Double Hung Windows (DH)

Type DH-C,HC,AW- 60 (Optional Performance Grade). Sash balances shall be tested and rated to conform with AAMA 902.

2.1.2 Fixed Windows (F)

Type F-C,HC,AW- 60 (Optional Performance Grade).

2.1.3 Glass and Glazing

Materials are specified in Section 08 81 00 GLAZING.

2.1.4 Calking and Sealing

Are specified in Section 07 92 00 JOINT SEALANTS.

2.1.5 Weatherstripping

AAMA 101.

2.2 FABRICATION

Fabrication of window units shall comply with AAMA 101.

2.2.1 Provisions for Glazing

Design windows and rabbets suitable for glass thickness shown or specified.

Exterior glazing shall have a minimum frame bite of 3/8 inch for structurally glazed window systems and 1 inch for window systems that are not structurally glazed. Design sash for inside double glazing and for securing glass with metal beads, or glazing compound.

2.2.2 Weatherstripping

Provide for ventilating sections of all windows to ensure a weather-tight seal meeting the infiltration requirements specified in AAMA 101. Provide easily replaceable factory-applied weatherstripping. Use molded vinyl, molded or molded-expanded neoprene or molded or expanded Ethylene Propylene Diene Terpolymer (EPDM) compression-type weatherstripping for compression contact surfaces. Use treated woven pile or wool, or polypropylene or nylon pile bonded to nylon fabric and metal or plastic backing strip weatherstripping for sliding surfaces. Do not use neoprene or polyvinylchloride weatherstripping where they will be exposed to direct sunlight.

2.2.3 Fasteners

Fabricated from 100 percent re-melted steel. Use fasteners as standard with the window manufacturer for windows, trim, and accessories. Self-tapping sheet-metal screws are not acceptable for material more than 1/16 inch thick.

2.2.4 Adhesives

Comply with applicable regulations regarding toxic and hazardous materials, GS-36, SCAQMD Rule #1168, and as specified in Section 09720 JOINT SEALANTS.

2.2.5 Drips and Weep Holes

Provide continuous drips over heads of top ventilators. Where fixed windows adjoin ventilators, drips shall be continuous across tops of fixed windows. Provide drips and weep holes as required to return water to the outside.

2.2.6 Combination Windows

Windows used in combination shall be the same class and grade and shall be factory assembled. Where factory assembly of individual windows into larger units is limited by transportation considerations, prefabricate, match mark, transport, and field assemble.

2.2.7 Mullions and Transom Bars

Exterior frames, mullions, and window hardware shall be designed to resist equivalent static design loads of 1 pound per square inch applied to the surface of the glazing. Frame and mullion deformations shall not exceed 1/60 of the unsupported member lengths. A window that complies with the AAMA 101 Optional Performance Grade 60 is acceptable in lieu of tests or calculations showing compliance with load requirement specified above. The Contractor may use other products, but must demonstrate by calculations or tests that the window complies with the loading requirement. Equivalent static design loads for connections of window to the surrounding walls or hardware and associated connections, and glazing stop connections shall be 10.8 pounds per square inch for glazing panels with a vision area less than or equal to 10.8 square feet and 4.4 pounds per square inch for glazing panels with a vision area greater than 10.8 square feet but less than or equal to 32 square feet. Alternatively, use frames that provide an equivalent level of performance. Provide mullions with a thermal break. Secure mullions and transom bars to adjoining construction and window units in such a manner as to permit expansion and contraction and to form a weathertight joint. Where window cleaner anchors are required, reinforce mullions and anchor to adjoining construction so as to provide safe and adequate support. Provide mullion covers on the interior and exterior to completely close exposed joints and recesses between window units and to present a neat appearance. Provide special covers over structural support at mullions as indicated.

2.2.8 Accessories

Provide windows complete with necessary hardware, fastenings, clips, fins, anchors, glazing beads, and other appurtenances necessary for complete installation and proper operation.

2.2.8.1 Hardware

AAMA 101. The item, type, and functional characteristics shall be the manufacturer's standard for the particular window type. Provide hardware of suitable design and of sufficient strength to perform the function for which it is used. Equip all operating ventilators with a lock or latching device which can be secured from the inside.

2.2.8.2 Fasteners

Provide concealed anchors of the type recommended by the window manufacturer for the specific type of construction. Anchors and fasteners shall be compatible with the window and the adjoining construction. Provide a minimum of three anchors for each jamb located approximately **6 inches** from each end and at midpoint.

2.2.9 Finishes

Exposed aluminum surfaces shall be factory finished with an anodic coating or organic coating. Color shall be as indicated. All windows shall have the same finish.

2.2.9.1 Anodic Coating

Clean exposed aluminum surfaces and provide an anodized finish conforming to **AA 45** and **AAMA 611**. Finish shall be:

- a. Architectural Class I (**0.7 mil** or thicker), designation **AA-M10-C22-A42**, integral color **or A44**, electrolytically deposited color anodized.

2.2.9.2 Organic Coating

Clean and prime exposed aluminum surfaces. Provide a baked enamel finish in accordance with **AAMA 2603** with total dry film thickness not less than **0.8 mil**.

2.2.10 Screens

AAMA 101. Provide one insect screen for each operable exterior sash or ventilator. Design screens to be rewirable, easily removable from inside the building, and to permit easy access to operating hardware.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Method of Installation

Install in accordance with the window manufacturer's printed instructions and details. Build in windows as the work progresses or install without forcing into prepared window openings. Set windows at proper elevation, location, and reveal; plumb, square, level, and in alignment; and brace, strut, and stay properly to prevent distortion and misalignment. Protect ventilators and operating parts against accumulation of dirt and building materials by keeping ventilators tightly closed and locked to frame. Bed screws or bolts in sill members, joints at mullions, contacts of windows with sills, built-in fins, and subframes in mastic sealant of a type recommended by the window manufacturer. Install and caulk windows in a manner that will prevent entrance of water and wind. Fasten insect screens securely in place.

3.1.2 Dissimilar Materials

Where aluminum surfaces are in contact with, or fastened to masonry, concrete, wood, or dissimilar metals, except stainless steel or zinc, the aluminum surface shall be protected from dissimilar materials as recommended in the Appendix to [AAMA 101](#). Surfaces in contact with sealants after installation shall not be coated with any type of protective material.

3.1.3 Anchors and Fastenings

Make provision for securing units to each other, to masonry, and to other adjoining construction. Windows installed in masonry walls shall have head and jamb members designed to recess into masonry wall not less than $7/16$ inch.

3.1.4 Adjustments After Installation

After installation of windows and completion of glazing and field painting, adjust all ventilators and hardware to operate smoothly and to provide weathertight sealing when ventilators are closed and locked. Lubricate hardware and operating parts as necessary. Adjust double hung windows to operate with maximum applied force of 25 pounds in either direction, not including breakaway friction force. Verify that products are properly installed, connected, and adjusted.

3.2 CLEANING

Clean interior and exterior surfaces of window units of mortar, plaster, paint spattering spots, and other foreign matter to present a neat appearance, to prevent fouling of weathering surfaces and weather-stripping, and to prevent interference with the operation of hardware. Replace all stained, discolored, or abraded windows that cannot be restored to their original condition with new windows.

3.3 WASTE MANAGEMENT

Separate corrugated cardboard and protective materials in accordance with the Waste Management Plan and place in designated areas for reuse or recycling. Place materials defined as hazardous or toxic waste in designated containers. Close and seal tightly all partly used sealant containers and store protected in well ventilated fire-safe area at moderate temperature. Place used sealant tubes and containers in areas designated for hazardous materials.

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