

ALUMINUM ARCHITECTURAL WINDOWS

General

In general, follow the guidelines below when specifying aluminum architectural windows and related items. Unless otherwise indicated, these guidelines are not intended to restrict or replace professional judgment.

University Approved Manufacturers

Preferred manufacturers are listed in a separate document, "Architectural Preferred Manufacturers List." Obtain current copy from the Project Coordinator.

Design Requirements

Aluminum Windows:

General - A master specification for aluminum architectural windows is available from the University of Michigan Facilities Planning and Design department for your information. The master specification is based on AIA Masterspec Section "Aluminum Architectural Windows" and AAMA GS-001 "Voluntary Guide Specifications for Aluminum Architectural Windows".

Monumental Windows - In most cases, select "monumental" windows, which for the purpose of this guideline, means minimum 1/8-inch wall thickness for frame and ventilator extrusions. However, non-monumental grade (AAMA commercial or heavy commercial grades) windows may be considered appropriate when units will have relatively small ventilators; are not likely to be subjected to vandalism or other abuse; and where cost is a predominant factor.

The decision to use non-monumental windows, should be made in consultation with the University Architect or University Project Coordinator.

Standards - The A/E is encouraged to write window specifications based on AAMA GS-001 (for monumental units). However, A/E's may reference AAMA 101, in which case, the University's minimum standard for monumental aluminum windows is a modified version of the "Heavy Commercial" classification.

Comply with BOCA code, AAMA specifications, and project requirements to determine the performance class of the window. The minimum acceptable performance class for University work is 40 (HC-40).

Tests - Require submittal of test reports of an independent laboratory indicating compliance with requirements. The University does not require field testing of windows.

Design - Generally, aesthetic considerations are the prerogative of the architect. Consult with the University Architect or Facilities Planning and Design through the University Project Coordinator, concerning visual effects which do not correspond general design features stated in this guideline.

Construction - Include the following requirements:

- Specify thermally improved (thermal-break) construction in all cases, without exception. The University accepts both poured and degridged thermal breaks and "insulbar" thermal breaks manufacturer Ensinger Corp. Specify "Insulbar" system where different finishes or colors and desired interior and exterior sides of window frames.
- Wall Thickness: Comply with the following:
 - Monumental Windows: Specify a minimum wall thickness for extrusions of 0.125-inches. If you are preparing specifications based on AAMA 101, this requirement must be stated clearly as a modification of HC class specifications.
 - Heavy Commercial or Commercial Grade Windows: Specifications may be based on AAMA 101 without modification.
- Frame Depth: In general, the University prefers not more than 2-1/2 inch frame depths for appearance. Wherever possible, size ventilators to avoid larger frame depths as required below. Comply with the following:
 - Inswing Ventilators: Where ventilator size exceeds 15 square feet, require frame depth of not less than a 3-1/8 inch frame depth.
 - Outswing Ventilators: Where ventilator size exceeds 12 square feet, require frame depth of not less than a 3-1/8 inch frame depth.

Glazing - Specify units for inside glazing wherever practicable. Require glass surfaces to be within 3/16" of the frame exterior surface and that adjacent glass, spandrel or filler panels be located in the same plane, with a tolerance of 1/8".

Finish - Comply with the following:

- Match existing adjacent units to the greatest extent possible, whenever doing patch or in-fill type work.
- For most new and replacement work, specify a polyvinylidene fluoride coating based on either Kynar 500 or Hylar 5000, and marketed under a variety of trade names such as Duranar and Nubelar.
- Color: In general, non-metallic dark bronze; but there is no mandatory color requirement. Consult with University Project Coordinator.

- Specify two-coat application technique; or three-coat for applicable colors/metallics.
- Siliconized polyester and similar coatings are not acceptable.
- Where window finish is a dark bronze color, specify oxidized bronze finish on handles; otherwise specify chrome finish.
- When an anodized finish is judged appropriate, specify NAAM Class 1 finish, natural or color anodized, as suited to project.

Accessories - Comply with the following:

- Specify ventilator units with full weatherstripping.
- Specify continuous trim anchor clips where trim length exceeds 36-inches.
- Determine requirements for type of latching and locking hardware with University Project Coordinator.
- Except for Housing projects and for food preparation areas, insect screens are generally not required for University projects.

Warranty - No special warranty is required for window frames.

Glass and Glazing

General - Energy considerations have caused the University to mandate the use of 1-inch thick, low-e coated, argon gas filled insulating glass in all vision glass panels. Where spandrel glass is used, specify units with insulation board adhered to inside surface. Where metal filler panels are used, specify 1-inch thick aluminum sandwich panels with rigid insulation core.

Insulating Glass - Specify insulating glass in all vision glass applications as follows:

- Standards: Require insulating glass units to have Insulating Glass Manufacturer's Certification Council marking and IGCC rating of not less than CBA.
- Tint/Coatings: Most often, University projects have included non-reflective, bronze tint outer panes paired with clear, low-e coated inner panes. Coordinate use of other tints, reflective coatings and other possible combinations with the University Architect or Facilities Planning and Design through the University Project Coordinator.
- Performance: Select units with maximum winter U-value of 0.30 through the use of low-e coatings and argon gas filled airspaces. "Warm-edge technology" spacers are neither required nor prohibited. Note that bronze anodized color is not available with the "warm-edge" spacers.
- Low-e Coating: Comply with the following:

- Apply low-e coating to the third surface of insulating glass units.
- The University generally prefers glass coatings produced by vacuum deposition ("softcoat") methods. However, recent improvements in pyrolytic coatings ("hardcoat") has made them increasingly comparable to the softcoats, in terms of thermal performance and lack of multi-color reflections. Consequently, glass of either type is acceptable, provided it meets the indicated U-value requirement, and has an unobjectionable level of reflections. Currently, the University accepts LOF "Energy Balance" glass in this category.
- Require insulating glass products to be sealed with dual seal method.
- Where bronze tint glass specified, include bronze anodized spacers unless "warm-edge" spacers are specified. Consider other color coated spacers where appropriate and available.

Glazing - Specify pre-glazing wherever possible.

Special Warranty for Insulating Glass Units - Require special project warranty on insulating glass of 10 years.

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