SECTION 08 43 13
ALUMINUM FRAMED WINDOW WALL SYSTEMS
OS-2, Top Notch, BG, BT SERIES

This guide specification has been prepared by U.S. Aluminum in printed and electronic form as an aid to the specification writer in preparing written construction documents for glazed aluminum window wall systems.

This section includes factory pre-finished aluminum fixed horizontal ribbon window wall systems designed for dealer fabrication, field assembly and glazing.

Sections 01 40 00 are intended for use along with this section; coordinate requirements accordingly.

Sealants are referenced in Section 07 92 00, Joint Sealants.

Glass and glazing are referenced in Section 08 81 00, Glass and Glazing.

Where a storefront, slope glazed system, or curtain wall system integrates with a window wall system, carefully coordinate all sections to function together, or alternately include extracts from sections 08 41 13, 08 42 13, and 08 71 00 in this section as appropriate.

Edit entire master to suit project requirements. Modify or add items as necessary. Delete items that are not applicable. Words and sentences within brackets [_____] reflect a choice to be made regarding inclusion or exclusion of a particular items or statement. This section may include proprietary and performance descriptive type specifications. Edit to avoid conflicting requirements.

Editor notes are included within the text of this section to assist the specification writer in knowledgeable decision-making.

This guide specification is written using imperial measurements with metric conversions in parentheses. These may be switched or one may be deleted to suit project requirements. The conversion to metric is "soft" in the fact that rounding was utilized to the nearest millimeter.
PART 1 - GENERAL

1.1 SUMMARY
A. Related Documents: Conditions of the Contract, Division 1 - General Requirements, and Drawings apply to Work of this Section.

B. Section Includes:
1. Aluminum window wall system, complete with reinforcing, shims, anchors and attachment devices.
2. Accessories necessary to complete Work.

C. Products Furnished But Not Installed Under this Section: Inserts and anchoring devices that are to be built into structure.

D. Related Sections:
1. Section 08 41 33 - Aluminum Framed Entrances and Storefronts.
2. Section 08 41 26 - All Glass Entrances.
3. Section 08 42 33 - Revolving Entrance Doors.
5. Section 08 43 13 - Aluminum Framed Window Wall System.
6. Section 08 71 00 - Door Hardware.
7. Section 08 81 00 - Glass and Glazing.
8. Section 08 44 33 - Slope Glazed System.
9. Section 08 90 00 - Horizontal Louver Blinds.

1.2 REFERENCES
A. Aluminum Association (AA):
1. DAF-45 Designation System for Aluminum Finishes.
B. American Architectural Manufacturers Association (AAMA):
2. 501.2 Field check of Metal Curtain Walls for Water Leakage.
5. 611 Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
7. 701.2 Specifications for Pile Weather stripping.
8. Manual #10 Care and Handling of Architectural Aluminum From Shop to Site.

C. American Society for Testing and Materials (ASTM):
1. A36 Structural Steel.
2. B209 Aluminum and Aluminum-Alloy Sheet and Plate.
5. C509 Cellular Elastomeric Pre-formed Gasket and Sealing Material.
6. C864 Dense Elastomeric Compression Seal Gaskets, Setting Blocks and Spacers.
8. E283 Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.

D. Federal Specifications (FS):
1. TT-P-645A Primer, Paint, Zinc Chromate, Alkyd Type.

E. Flat Glass Marketing Association (FGMA):

Use this article carefully; restrict statements to identify system performance requirements or function criteria only. Delete paragraphs not appropriate to project.

Performance specifying permits system manufacturers the latitude to adjust or redesign proprietary systems to achieve specified requirements. Rely on this article as the "anchor" for window wall system specifying and minimize the material and component statements so not to conflict with performance criteria.

Edit system requirements carefully and include only applicable performance criteria. Make sure there is no conflict with proprietary information listed in part 2.

1.3 SYSTEM REQUIREMENTS
A. General Standard: In addition to requirements shown or specified, comply with applicable provisions of Aluminum Curtain Wall Design Guide Manual for design,
materials, fabrication and installation of component parts.

B. Design Requirements:
1. Metal stick framed systems with interior and exterior exposed metal framing.
2. System manufacturer shall provide window wall systems, including necessary modifications to meet specified requirements and maintaining visual design concepts.
3. Perimeter conditions shall allow for installation tolerances, expansion and contraction of adjacent materials, and sealant manufacturer's recommended joint design.
4. Drawings are diagrammatic and do not purport to identify nor solve problems of thermal or structural movement, glazing, anchorage or moisture disposal.
5. Requirements shown by details are intended to establish basic dimension of unit, sight lines and profiles of members.
6. Do not assume glass, sealants and interior finishes contribute to framing member strength, stiffness or lateral stability.
7. Assemblies shall be free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.
8. Attachment considerations are to take into account site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
9. Anchors, fasteners and braces shall be structurally stressed not more than 50% of allowable stress when maximum loads are applied.
10. Allow for expansion and contraction without detriment to appearance or performance.
11. Provide continuous interior gutter system at sill that drains any infiltrated water to the exterior through baffled weep holes.
12. Provide concealed fastening.
13. Metal faces are required to be visually flat under all lighting conditions, subject to acceptance of Architect.
14. Provide uniform color and profile appearance at components exposed to view.

<table>
<thead>
<tr>
<th>Retain item below when structural silicone glazing is utilized.</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. [Stresses placed on structural silicone sealants shall be kept within sealant manufacturer's recommended maximum.]</td>
</tr>
<tr>
<td>16. Not Permitted: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coordinate performance requirements with section 01411.</th>
</tr>
</thead>
<tbody>
<tr>
<td>In C1 below, 6.24psf (300 Pa) is equal to a 50 mph (80 km/h) wind. All United States Aluminum window wall systems meet air infiltration requirement of 0.06 cfm/sq. ft (0.0003 m3/sm2). Edit C2 below for the specific system specified (ranges from 7.0 to 12.0psf) (335 Pa to 575 Pa). Refer to United States Aluminum technical product literature.</td>
</tr>
</tbody>
</table>

C. Performance Requirements:

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1. **Air infiltration:** Air leakage shall not exceed 0.06 cfm per square foot (0.0003 m/3/sm²) of surface area when tested in accordance with ASTM E 283 at differential static pressure of 6.24 psf (300 Pa).

2. **Water infiltration:** No uncontrolled water penetration when tested in accordance with ASTM E 331 at test pressure of [7.0] [8.0] [9.0] [10.0] [12.0] psf ([335] [377] [431] [479] [575] Pa).

### D. **Structural Requirements:**

1. **Wind loading:**
   a. **Basic zones:** Resist wind pressure of [___] psf (___ Pa) psf positive and [___] psf (___ Pa) psf negative.
   b. **Corner zones:** Resist wind pressure of [___] psf (___ Pa) psf positive and [___] psf (___ Pa) negative for areas extending [___] feet (___) feet from corners.
   c. **Parapet zones:** Resist wind pressure [____] psf (___ Pa) positive and [____] psf (___ Pa) negative.

2. **Deflection under uniform loading:** When tested in accordance with ASTM E 330 at design pressure, maximum deflection of exterior member shall not exceed 1/175 of span or [_________].

3. **Deflection of members parallel to the plane of the wall,** when carrying its full dead load, shall not exceed an amount that will reduce glass bite by less than 75 percent of the design dimension and shall not reduce edge clearance between itself and the panel, glass or other fixed member immediately below to less than 1/8 inch (3.2 mm).

4. **Do not regard points of contraflexure as lateral braces or as end points of un-braced length; un-braced length is actual distance between effective lateral braces as defined above.**

5. **Where framing member reaction is resisted by continuous element, maximum assumed effective length of the resisting element is 4 times bearing length, but not more than 12 inches (305 mm).**

### E. **Thermal Requirements:** Framing systems shall accommodate expansion and contraction movement due to surface temperature differential of 180 degree Fahrenheit (82 degree Celsius) without causing buckling, stress on glass, failure of joint seals, excessive stress on structural elements, reduction of performance or other detrimental effects.

### F. [Laboratory Testing: Refer to Section 01400 for requirements.]

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**Coordinate wind loads with applicable building code, or appropriate wind loads may be determined by using ANSI A58.1-1982, "Minimum Design Loads for Buildings and Other Structures".**

An allowable deflection less than 1/175 of clear span is industry standard. Smaller deflections will often require use of heavier cross sections or internal reinforcements.

*Edit following paragraph accordingly. Coordinate provisions with Section 01400.*

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Include submittal requirements below that are consistent with scope of project and extent of work of this section. Only request submittals that are absolutely necessary.
1.4 SUBMITTALS

A. General: Submit in accordance with Section 01300.

B. Product Data:
   1. Submit manufacturer's descriptive literature for each manufactured product.
   2. Include information for factory finishes, accessories and other required components.

Retain item below when manufacturer's standard colors are specified for pigmented finishes; coordinate with finish article.

3. [Include color charts for finish indicating manufacturer's standard colors available for selection.]

C. Shop Drawings:
   1. Submit shop drawings indicating elevations, detailed design, dimensions, member profiles, joint locations, arrangement of units and member connections.
   2. Show following items:
      a. Details of special shapes.
      b. Reinforcing.
      c. Anchorage system.
      d. Interfacing with building construction.
      e. Provisions for expansion and contraction.
      f. [Thermal breaks.]
   3. Indicate typical glazing details, [locations of various types and thickness of glass], [emergency breakout locations,] and internal sealant requirements as recommended by sealant manufacturer.
   4. Clearly indicate locations of exposed fasteners and joints for Architect's acceptance.
   5. Clearly show where and how manufacturer's system deviates from Contract Drawings and these Specifications.

D. Mock-up Drawings: Submit drawings for mock-ups; refer to Section 01400 for mock-up requirements.

Retain data within brackets in first subparagraph when pigmented finish is specified; coordinate with article 2.07.

E. Samples:
   Sizes as standard with manufacturer.
   1. Where normal texture or color variations are expected, include additional samples illustrating range of variation.
   2. [Submit 12 inch (305 mm) long samples of structural glazing gaskets.]

Following paragraph permits option to submit results of pre-tested existing fixed window designs. Retain when applicable.

F. [Test Reports: Submit certified copies of previous test reports by independent laboratory substantiating performance of system. Include other supportive data as necessary.]

G. Certificates:
1. Submit manufacturer's certification stating that installed system is in compliance with specified requirements.

H. Qualification Data:
1. Submit installer qualifications verifying years of experience.
2. Include list of projects having similar scope of work identified by name, location, date, reference name and phone number.

<table>
<thead>
<tr>
<th>Retain data within brackets in paragraph below for structural silicone glazed system.</th>
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</thead>
<tbody>
<tr>
<td>I. Manufacturer's Instructions: Submit manufacturer's printed installation instructions. Include detailed instructions describing each step of re-glazing procedures.</td>
</tr>
<tr>
<td>J. Warranty: Submit specified warranties.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Include quality assurance requirements consistent with size and scope of project and extent of work of this section. Edit following article accordingly.</th>
</tr>
</thead>
</table>

1.5 QUALITY ASSURANCE
A. Single Source Responsibility:
1. To ensure quality of appearance and performance, obtain materials for each system from either a single manufacturer or from manufacturer approved by each system manufacturer.
B. Installer Qualifications: Certified in writing by Contractor as qualified for installation of specified systems.
C. Perform Work in accordance with manufacturer's written instructions.
D. Conform to requirements of ANSI A117.1 and local amendments.

<table>
<thead>
<tr>
<th>Depending on scope of work, mock-ups may not be required; retain and edit following article accordingly. Ensure section 01400 includes details for each mock-up required.</th>
</tr>
</thead>
</table>

1.6 MOCK-UPS
A. Visual Mock-up: Provide mock-up to demonstrate visual features and workmanship; refer to Section 01400 for requirements.
B. Test Mock-up: Provide mock-up for laboratory testing; refer to Sections 01400 for requirements. Architect shall have approved sample mock prior to construction of test mock-up.

1.7 DELIVERY, STORAGE AND HANDLING
A. Comply with requirements of Section 01600.
B. Protect finished surfaces to prevent damage.
C. Do not use adhesive papers or sprayed coatings that become firmly bonded when exposed to sun.
D. Do not leave coating residue on surfaces.

1.8 PROJECT CONDITIONS
A. Ensure ambient and surface temperatures and joint conditions are suitable for installation of materials.
1.9 WARRANTY
A. Provide warranties in accordance with Section 01700.
B. Provide written manufacturer's warranty, executed by company official, warranting against defects in materials and products for 2 years from ship date. Warrant door corner construction for the life of the project.
C. [Provide written installer's warranty, warranting work to be watertight, free from defective materials, defective workmanship, glass breakage due to defective design, and agreeing to replace components that fail within [2] ____ years from ship date.
   1. Warranty shall cover following:
      a. Complete watertight and airtight system installation within specified tolerances.
      b. Completed installation will remain free from rattles, wind whistles and noise due to thermal movement and wind pressure.
      c. System is structurally sound and free from distortion.
      d. Glass and glazing gaskets will not break or "pop" from frames due to design, wind load pressure, expansion or contraction movement or structural loading.
      e. Glazing sealants and gaskets will remain free from abnormal deterioration or dislocation due to sunlight, weather or oxidation.

**Delete paragraph below if high performance DURANAR finish is not used.**

D. Provide written warranty stating organic coating finish will be free from fading more than 10%, chalking, yellowing, peeling, cracking, pitting, corroding or non-uniformity of color, or gloss deterioration beyond manufacturer's descriptive standards for 2 years from ship date and agreeing to promptly correct defects.

**Delete paragraph below if thermal barrier framing system is not used. This 2 year warranty is offered by U.S. Aluminum, exclusively.**

E. Provide a written thermal integrity warranty for 2 years from ship date against thermal barrier system failure resulting from the following:
   1. Longitudinal and transverse thermal barrier shrinkage.
   2. Thermal barrier cracking.
   3. Structural failure of the thermal barrier material.
   4. Loss of adhesion or loss of prescribed edge pressure on glazing material resulting in excessive air and water infiltration.

PART 2 – PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS
A. Subject to compliance with requirements indicated, provide products by one of the following:
   
   1. U.S. Aluminium
      2450 E. Vernon Ave Los Angeles, California 90058-1802
B. Substitutions: Submit under provisions of Section 01 60 00, a minimum of 10 days prior to bid date.

Edit the following paragraphs for appropriate system in each category and delete remaining. Refer to U.S. Aluminum technical literature for additional information.

When specifying manufacturer's standard product or manufacturer's standard product with modifications, describe using manufacturer's name and model numbers.

C. Acceptable Systems:
U.S. Aluminum Window Wall Systems:

**OS-2 Offset Glazed Window Wall Systems**
These Systems offer a shallow face reveal and “stacking” type installation into continuous head and sill channels.

<table>
<thead>
<tr>
<th>SERIES</th>
<th>FACE WIDTH</th>
<th>HEAD/SILL DEPTH</th>
<th>GLAZING INFILL</th>
<th>GLAZING METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS175</td>
<td>2&quot; (50.8)</td>
<td>2&quot; (50.8)</td>
<td>1/4&quot; (6) or 3/8&quot; (10)</td>
<td>Exterior</td>
</tr>
<tr>
<td>OS450</td>
<td>2&quot; (50.8)</td>
<td>4-3/4&quot; (120.7)</td>
<td>1/4&quot; (6) or 3/8&quot; (10)</td>
<td>Exterior/Interior</td>
</tr>
<tr>
<td>OS451</td>
<td>2&quot; (50.8)</td>
<td>6-1/4&quot; (158.8)</td>
<td>1/4&quot; (6) or 3/8&quot; (10)</td>
<td>Exterior/Interior</td>
</tr>
</tbody>
</table>

**Top Notch Systems**
Feature continuous head and sill for superior water control in ribbon window and punched openings. Frame assembly is simplified by the use of screw spline joinery and one piece mullions with glazing option for two-sided structural silicone support, captured glazing or a combination of these two configurations.

<table>
<thead>
<tr>
<th>SERIES</th>
<th>WIDTH</th>
<th>HEAD/SILL DEPTH</th>
<th>GLAZING INFILL</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN451/TT451</td>
<td>2-1/4&quot; (57.2)</td>
<td>4-1/2&quot; (114.3)</td>
<td>1&quot; (25)</td>
<td>Horizontal Interior Glazed Window Walls for Low to Mid-Rise Buildings.</td>
</tr>
<tr>
<td>TN601/TT601</td>
<td>2-1/4&quot; (57.2)</td>
<td>6&quot; (152.4)</td>
<td>1&quot; (25)</td>
<td></td>
</tr>
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</table>

**TT Window Wall Systems**
Series TT451 and TT601 are high performance thermally broken Window Wall Systems.
**BG Window Wall Systems**

Designed for a “stacking” type installation and allow for three types of configuration; two-sided structural silicone support, captured glazing or a combination of these two configurations. Two-tone colors can be achieved by specifying different finishes for exterior face covers and interior mullions.

<table>
<thead>
<tr>
<th>SERIES</th>
<th>FACE WIDTH</th>
<th>DEPTH</th>
<th>GLAZING INFILLS</th>
<th>GLAZING METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BG450</td>
<td>2-1/4&quot; (57.2)</td>
<td>4-1/2&quot; (114.3)</td>
<td>1/4&quot; (6)</td>
<td>Exterior/Interior</td>
</tr>
<tr>
<td>BG520</td>
<td>2-1/4&quot; (57.2)</td>
<td>5-1/4&quot; (133.4)</td>
<td>1/4&quot; (6)</td>
<td>Exterior/Interior</td>
</tr>
<tr>
<td>BG525</td>
<td>2-1/4&quot; (57.2)</td>
<td>5-1/4&quot; (133.4)</td>
<td>1&quot; (25)</td>
<td>Exterior/Interior</td>
</tr>
<tr>
<td>BG600</td>
<td>2-1/4&quot; (57.2)</td>
<td>6&quot; (152.4)</td>
<td>1&quot; (25)</td>
<td>Exterior/Interior</td>
</tr>
</tbody>
</table>

**BT Window Wall Systems**

Series BT525 and BT600 are high performance thermally broken Window Wall Systems

<table>
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<tr>
<th>SERIES</th>
<th>FACE WIDTH</th>
<th>DEPTH</th>
<th>GLAZING INFILLS</th>
<th>GLAZING METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT525</td>
<td>2-1/4&quot; (57.2)</td>
<td>5-1/4&quot; (133.4)</td>
<td>1&quot; (25)</td>
<td>Exterior/Interior</td>
</tr>
<tr>
<td>BT600</td>
<td>2-1/4&quot; (57.2)</td>
<td>6&quot; (152.4)</td>
<td>1&quot; (25)</td>
<td>Exterior/Interior</td>
</tr>
</tbody>
</table>

2.2  **FRAMING MATERIALS AND ACCESSORIES**

A. Aluminum:
   1. ASTM B221, alloy 6063-T5 for extrusions; ASTM B209, alloy 5005-H34 for sheets; or other alloys and temper recommended by manufacturer appropriate for specified finish.

B. [Internal Reinforcing:
   1. ASTM A36 for carbon steel; or ASTM B308 for structural aluminum.
   2. Shapes and sizes to suit installation.
   3. Shop coat steel components after fabrication with alkyd type zinc chromate primer complying with FS TT-P-645.]

C. Inserts and Anchorage Devices:
   1. Manufacturer's standard formed or fabricated assemblies, steel or aluminum, of shapes, plates, bars or tubes.
   2. Shop coat steel assemblies after fabrication with alkyd type zinc chromate primer complying with FS TT-P-645.

D. Fasteners:
   1. Aluminum, non-magnetic stainless steel or other materials warranted by...
manufacturer to be non-corrosive and compatible with components being fastened.

2. No use of exposed fasteners, except where unavoidable for application of hardware.

3. For exposed locations, provide countersunk Phillips head screws with finish matching items fastened.

4. For concealed locations, provide manufacturer's standard fasteners.

5. Provide nut or washers of design having means to prevent disengagement; deforming of fastener threads is unacceptable.

E. Expansion Anchor Devices: Lead-shield or toothed-steel, drilled-in, expansion bolt anchors.

F. Shims: Non-staining, non-ferrous, type as recommended by system manufacturer.

G. Protective Coatings: Cold applied asphalt mastic complying with SSPC-Paint 12, compounded for 30 mil (0.77 mm) thickness for each coat; or alkyd type zinc chromate primer complying with FS TT-P-645.

H. Glazing Gaskets: Must be “Top Loaded E.P.D.M.”
   1. Compression type design, replaceable, molded or extruded neoprene, or ethylene propylene diene monomer (EPDM).
   2. Comply with ASTM C509 or C864.
   3. Profile and hardness as necessary to maintain uniform pressure for watertight seal.
   4. Provide in manufacturer's standard black color.

I. Internal Sealants: Types recommended by sealant manufacturer to remain permanently elastic, tacky, non-drying, non-migrating and weather tight.

J. "Anti-Walk" Edge Blocking: "W" shaped EPDM blocks for use in keeping glazing material stationary under vibration or seismic loading.

K. Baffles (at weep holes): Type as recommended by system manufacturer and shown in published installation instructions.

2.3 GLASS AND GLAZING ACCESSORIES

A. Refer to Section 08810.

2.4 SYSTEM FABRICATION

A. Take accurate field measurements to verify required dimensions prior to fabrication.

B. Location of exposed joints are subject to Architect's acceptance.

C. Fabricate components in accordance with approved shop drawings. Remove burrs and smooth edges. Shop fabricate to greatest extent practicable to minimize field cutting, splicing and assembly. Disassemble only to extent necessary for shipping and handling limitations.

D. Steel Components:
   1. Clean surfaces after fabrication and immediately prior to application of primer in accord with SSPC-SP2 or SSPC-SP3 at manufacturer's option.
   2. Apply specified shop coat primer in accord with manufacturer's instructions to provide 2.0mil (0.050 mm) minimum dry film thickness.

E. Fabricate components true to detail and free from defects impairing appearance, strength or durability. [Fabricate custom extrusions indicated and as necessary for complete installation.]
F. Fabricate components to allow for accurate and rigid fit of joints and corners. Match components carefully ensuring continuity of line and design. Ensure joints and connections will be flush and weather-tight. Ensure slip joints make full, tight contact and are weather-tight.

G. Reinforce components as required at anchorage and support points, at joints, and at attachment points for interfacing work.

H. Provide structural reinforcing within framing members where required to maintain rigidity and accommodate design loads.

I. Provide holes or slots, deflector plates, internal flashings, and sealants to accommodate internal weepage draining water to the exterior.

J. Provide tight fitting, injection molded, plastic water deflectors at all intermediate horizontals.

K. Allow for adequate clearance around perimeter of system to enable proper installation and for thermal movement within system.

L. Separate dissimilar metals with protective coating or pre-formed separators to prevent contact and corrosion.

M. [Fabricate window stool, jamb and head extensions with gypsum board receivers and mating tabs to fit window extrusions with tight fit hairline joints.]

2.5 FINISH

A. Organic Coating (high performance DURANAR Coating):
   1. Comply with requirements of AAMA 605.2-92.
   2. Surfaces cleaned and given conversion coating pre-treatment prior to application of 0.3 mil dry film thickness of epoxy or acrylic primer following recommendations of finish coat manufacturer.

   3. Finish coat of [70 percent] minimum fluoropolymer resin fused to primed surfaces at temperature recommended by manufacturer, 1.0 mil (0.25 mm) minimum dry film thickness.
   5. Provide in 2, 3, or 4 coat system as required for color selected.
   6. [Custom colors as selected by Architect.]

      ***** OR *****

   7. [Manufacturer's standard colors as selected by Architect.]

      ***** OR *****

B. [Clear Anodized:
   1. Conforming to AA-M12C22A31 and AAMA 611.]

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2. Architectural Class II, etched, medium matte, clear anodic coating, 0.4 mil (0.010 mm) minimum thickness.]

**** OR ****

<table>
<thead>
<tr>
<th>Note: AA class 44 is a type I coating and is 0.7 mil (0.018 mm) thick. AA Class 34 is a type II coating and is 0.4 mil (0.010 mm) thick. United States Aluminum offers, at no additional cost, a two-year warranty on either of the finishes below.</th>
</tr>
</thead>
</table>
| C. [Color Anodized:  
1. Conforming to AA-M12C22A [34] [44] and AAMA 611.  
2. Architectural Class [II] [I], etched, medium matte, [black] [dark bronze] [medium bronze] [light bronze] colored anodic coating, [0.4] [0.7] mil ([0.010] [0.018] mm) minimum thickness.] |

PART 3 - EXECUTION

3.1 EXAMINATION  
A. Examine conditions and proceed with Work in accordance with Section 01400.  
B. Verify dimensions, tolerances and method of attachment with other Work.

3.2 INSTALLATION  
A. Install window wall system in accordance with manufacturer's instructions and applicable provisions of AAMA Aluminum Curtain Wall Design Guide Manual.  
B. Align assemblies plumb and level, free of warp or twist, aligning with adjacent Work.  
C. Tolerances:  
1. Limit variations from plumb and level:  
   a. 1/8 inch in 10 feet (3 mm in 3 M) vertically and horizontally.  
   b. 1/8 inch in 40 feet (3 mm in 6 M) horizontally.  
2. Limit offsets in theoretical end-to-end and edge-to-edge alignment:  
   a. 1/16 inch (2 mm) where surfaces are flush or less than 1/2 inch (13 mm) out of flush and separated by not more than 2 inches (51 mm).  
   b. 1/8 inch (3 mm) for surfaces separated by more than 2 inches (51 mm).  
3. Step in face: 1/16” (2 mm) maximum.  
4. Jog in alignment: 1/16 inch (2 mm) maximum.  
5. Location: 1/4” (6 mm) maximum deviation of any member at any location.  
6. Tolerances are not accumulative.  
D. Provide attachments and shims to permanently fasten system to building structure.  
E. Anchor securely in place, allowing for required movement, including expansion and contraction.  
F. Separate dissimilar materials at contract points, including metal in contact with masonry or concrete surfaces, with protective coating or pre-formed separators to prevent contact and electrolytic action.  
G. Seal perimeter members as shown on manufacturer’s installation instructions as required for unique job conditions. Set other members with internal sealants and baffles as called for in manufacturer’s installation instructions. Use sealants as recommended by sealant manufacturer.

Retain following paragraph when window walls are installed adjacent to stone.
H. [Provide adequate support for all the aluminum frames, glass dead loads and for the end reactions to specified wind loads.]

I. Glazing:
   1. Install glazing gaskets and sealants in accordance with manufacturer's instructions without exception, including surface preparations. Refer to Section 08810 for additional requirements. Utilize "anti-walk" edge blocking on all vertical edges of glazing.

**Delete article below if not applicable.**

3.3 **FIELD QUALITY CONTROL**

**Edit paragraph below to include required field tests; air and water infiltration tests usually not required. Coordinate provisions with referenced section.**

A. Field Tests: Independent testing laboratory will perform [air infiltration.] [water infiltration] [and] hose test; refer to Section 01400 for requirements.

3.4 **CLEANING**

A. Clean surfaces in compliance with manufacturer's recommendations; remove excess mastic, mastic smears and other foreign materials.

B. Clean metal surfaces exercising care to avoid damage.

**END OF SECTION**