

SECTION 10 71 13

EXTERIOR SUN CONTROL DEVICES

This section is based on the products of Intertec, a Div. of Doralco, which is located at:

5919 W. 118th Street
Alsip, IL 60803
Phone: 888-443-6725
Fax: 708-388-9392
Web Site: www.doralco.com

Intertec manufactures the following:

Vertical Sunshades: Vertical exterior sun shades are growing more popular in building design due to their aesthetic quality and sun control functionality. Exterior sunshade designs allow varying amounts of light to penetrate into the building.

- Vertical or horizontal blades.
- Contemporary design style.
- Can be attached to curtain wall or facade.

Airfoil Sunshades: Airfoil screen wall sun shades are a stylish way to control the sunlight in your building. We can create a sunshade that matches the unique look and feel of your design by using any of our numerous airfoil styles.

- 4 inch (102 mm) to 24 inch (610 mm) airfoil range.
- Can be designed to utilize perforated material.

Egg Crate Sunshades: Egg crate grille sun shades marry the best parts of both sunshades and architectural grilles. They are an economical way of creating a shading/sun control device that can be mounted to virtually any structure.

- Strong enough to support service walkway.
- Available with straight or tilted blades.
- Breezeway shade canopies.

Perforated Sunshades: Perforated sun shades allow your exterior sun shade to have a unique look that is customized to the style of your project. Hole spacing, shape, and size can all be tailored to create a one of a kind style.

- Can be formed into shapes.
- Can be utilized as light shelves.

Radiused Sunshades: Aluminum radiused sun shades can be used to make any exterior sun shade project unique and welcoming. Radiusing each sunshade instead of mitering joints creates a seamless look. Radiused sunshades are only available with the airfoils in the vertical position.

- Can be radiused to match the contour of the building.
 - Provides a continuous look for fascia.
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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Division 01 - General Requirements, and other applicable specification sections in the Project Manual apply to the work specified in this Section.

1.2 SUMMARY

- A. **Scope:** Provide design and engineering, labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, erection, and installation for exterior sun control devices as required for the complete performance of the work, and as shown on the Drawings and as herein specified.
- B. **Section Includes:** The work specified in this Section includes, but shall not be limited to, horizontal, fixed, extruded aluminum exterior sun control assemblies.

1.3 REFERENCES

- A. General: The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.

Delete standards below which are not referenced in Parts 1, 2, or 3 of this specification section.

- B. American Architectural Manufacturers Association (AAMA):
1. AAMA 611, "Voluntary Specifications for Anodized Architectural Aluminum (Revised)."
 2. AAMA 2605, "Voluntary Specification, Performance Requirements, and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels."
- C. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE):
1. ASHRAE/IESNA 90.1, "Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings" (co-sponsored by IESNA).
- D. American Welding Society (AWS):
1. AWS D1.2, "Structural Welding Code - Aluminum" (copyrighted by AWS, ANSI approved).
- E. ASTM (ASTM):
1. ASTM B 26/B 26M, "Standard Specification for Aluminum-Alloy Sand Castings."
 2. ASTM B 209/B 209M, "Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate."
 3. ASTM B 221/B 221M, "Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes."
 4. ASTM D 1187, "Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal."
- F. National Association of Architectural Metal Manufacturers (NAAMM):
1. NAAMM MFM, "Metal Finishes Manual."
- G. SSPC: The Society for Protective Coatings (SSPC):
1. SSPC Paint 12, "Paint Specification No. 12 Cold-Applied Asphalt Mastic (Extra Thick Film)."
- H. South Coast Air Quality Management District (SCAQMD):
1. SCAQMD Rule #1168, "Adhesive and Sealant Applications," including most recent amendments.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide exterior sun control assemblies capable of withstanding the effects of loads and stresses from dead loads, live loads, snow loads, wind loads, and normal thermal movement without evidencing permanent deformation of assembly or components including blades, frames, and supports; noise or metal fatigue caused by blade rattle or flutter; or permanent damage to fasteners and anchors.
1. Dead Load: As required by applicable building code.
 2. Live Load: As required by applicable building code.
 3. Snow Load: As required by applicable building code.
 4. Wind Load: As required by applicable building code.
 5. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures in engineering, fabricating, and installing exterior metal fabrications to prevent buckling, opening of joints, overstressing of components and connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

- a. Temperature Change (Range): 120 °F or 67 °C ambient, 180 °F or 100 °C material surfaces.

1.5 SUBMITTALS

- A. General: See Section 01 33 00 - Submittal Procedures.
- B. Product Data: Submit product data showing material proposed. Submit sufficient information to determine compliance with the Drawings and Specifications. Product data shall include, but shall not be limited to, manufacturer's technical and descriptive data on exterior sun control components and assemblies.
- C. Shop Drawings: Submit shop drawings for each product and accessory required. Include information not fully detailed in manufacturer's standard product data, including, but not limited to, plans; elevations; and sections and details showing profiles, angles, and spacing of blades, frames and supports. Show unit dimensions related to supporting and adjoining structures and construction. Indicate anchorage details and locations.
 1. Submit shop drawings which have been signed and sealed by a professional engineer licensed to practice in the State in which the Project is located.
- D. Samples:
 1. Submit samples for initial color selection. Submit samples of each specified finish. Submit samples in form of manufacturer's color charts showing full range of colors and finishes available. Where finishes involve normal color variations, include samples showing the full, range of variations expected.

Delete above if colors preselected and specified or scheduled. Retain below with or without above.

2. Submit samples for verification purposes. Submit 2 inch (51 mm) by 3 inch (76 mm) minimum size sample of selected color coating. Additional samples may be required to show design, fabrication techniques, and workmanship.
- E. Quality Control Submittals:
 1. Design Data: For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by the professional engineer who was responsible for their preparation. Only the loading on the structure at the connections will be reviewed.
 2. Qualification Data: Submit qualification data for firms and persons specified in Quality Assurance Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names of architects and owners, and other information specified.

Retain below for project requiring LEED certification.

- F. LEED Submittals: Submittals that are required to comply with requirements for LEED certification include, but shall not be limited to, the following:
 1. Recycled Content Materials: Provide product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.

Above applies to Credit MR 4. Below applies to Credit MR 5.1 and MR 5.2.

2. Regional Materials: Provide product data for regional materials indicating location and distance from the Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Distance shall be within 500 miles (805 Km) of the Project Site. Include

statement indicating cost for each regional material and, if applicable, the fraction by weight that is considered regional.

3. Low-Emitting Materials: Submit certification by the manufacturer confirming that products (i.e., adhesives, sealants, paints, coatings, etc.) meet or exceed the volatile organic compound (VOC) limits set by specific agencies or other requirements as outlined in the LEED Green Building Rating System. VOC limits shall be clearly stated in the submittal.

Above applies to Credit EQ 4.2. Below applies to Credit EQ 8.1.

4. Daylighting 75 Percent of Spaces: Submit certification by the manufacturer confirming that products provide the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Below applies to Credit EA 1.

5. Optimize Energy Performance: Submit certification by the manufacturer confirming that products contribute to increasing levels of energy performance above the baseline in the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

- G. Maintenance Data: Submit maintenance data for exterior sun control devices to include in operation and maintenance manuals specified in Division 01 - General Requirements.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of exterior sun control devices of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of 10 years.
2. Installer Qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing exterior sun control devices similar in type and scope to that required for this Project.
3. Engineer Qualifications: The engineer shall be a professional engineer legally authorized to practice in the jurisdiction where the Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of products similar to this Project in material, design, and extent, and that have a record of successful in-service performance.
4. Welder Qualifications: Qualify welding processes and welding operators in accordance with AWS standard qualification procedures. Operators shall carry proof of qualification on their persons.

- B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

- C. Welding Standards: Comply with applicable provisions of AWS D1.2.

- D. Pre-Installation Conference: Conduct pre-installation conference in accordance with Section 01 31 19 - Project Meetings. Prior to commencing the installation, meet at the Project site to review the material selections, installation procedures, and coordination with other trades. Pre-installation conference shall include, but shall not be limited to, the Contractor, the Installer, and any trade that requires coordination with the work. Date and time of the pre-installation conference shall be acceptable to the Owner and the Architect.

- E. Coordination: Coordinate installation of exterior sun control devices with provision of exterior wall system, window framing system, curtain wall system, etc., to ensure proper structural support is provided, attachment of exterior sun control devices is compatible with substrate, and weathertightness of exterior envelope is maintained.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any.
- B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to fabrication of the work and preparation of shop drawings, to ensure proper fitting of the work. Show recorded measurements on final shop drawings. Notify the Owner and the Architect, in writing, of any dimensions found which are not within specified dimensions and tolerances in the Contract Documents, prior to proceeding with the fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the work.
 - 1. Established Dimensions: Where field measurements can not be made without delaying the work, guarantee dimensions and proceed with fabricating of exterior sun control assemblies without field measurements. Coordinate construction to ensure that exterior sun control assemblies correspond to established dimensions.

1.9 WARRANTY

- A. General: See Section 01 77 00 - Closeout Procedures.
- B. Special Warranty: The Contractor shall warrant the work of this Section to be in accordance with the Contract Documents and free from faults and defects in materials and workmanship for a period of five years. This special warranty shall extend the one year period of limitations contained in the General Conditions. The special warranty shall be countersigned by the manufacturer and the Installer.
- C. Special PVDF Finish Warranty: Submit a written warranty, signed by manufacturer, covering failure of the factory-applied exterior finish within the specified warranty period and agreeing to repair finish or replace work that shows evidence of finish deterioration. Deterioration of finish includes, but shall not be limited to, color fade, chalking, cracking, peeling, and loss of film integrity.

Ten year warranty for PVDF finish below is standard from the manufacturer, 20 year warranty is available at an extra charge.

- 1. Warranty Period: Warranty period shall be 10 years from date of Substantial Completion.

- D. Additional Owner Rights: The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Products specified are those as manufactured by Intertec, a Div. of Doralco; 5919 W. 118th Street, Alsip, IL 60803; Phone: 888-443-6725; Fax: 708-388-9392; Web Site: www.doralco.com. Items specified are to establish a standard of quality for design, function, materials, and appearance. Equivalent products by other manufacturers are acceptable. The Architect will be the sole judge of the basis of what is equivalent.
- B. Substitutions: If the Contractor desires to make substitutions of materials, comply with requirements specified in Section 01 60 00 - Product Requirements.

2.2 MATERIALS

Retain below for project requiring LEED certification.

- A. LEED Requirements:
 - 1. Recycled Content Materials: Provide building materials with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of [10 percent] [20 percent] of the cost of materials used for the Project. See LEED Green Building Rating System.

Above applies to Credit MR 4. Select applicable percentages (10 percent applies to Credit MR 4.1, 20 percent applies to Credit MR 4.1 and MR 4.2). Below applies to Credit MR 5.1 and MR 5.2. Retain first indicated option below for Credit MR 5.1, retain both options for Credit MR5.2.

- 2. Regional Materials: Provide a minimum of [10 percent (based on cost)] [and an additional 10 percent beyond Credit MR 5.1 (total of 20 percent, based on cost)], of building materials that are regionally extracted, processed, and manufactured.
- 3. Low-Emitting Materials: Use adhesives, sealants, paints, coatings, etc., that comply with the specified limits for VOC content when calculated according to SCAQMD Rule #1168. See LEED Green Building Rating System for VOC content limits.

Above applies to Credit EQ 4.2. Below applies to Credit EQ 8.1.

- 4. Daylighting 75 Percent of Spaces: Design the building to maximize interior daylighting. Predict daylight factors via manual calculations or model daylighting strategies with a physical or computer model to assess footcandle (lx) levels and daylight factors achieved. Select one of the three compliance path options described below and in the LEED Green Building Rating System:
 - a. Option 1 – Calculation.
 - b. Option 2 – Simulation.
 - c. Option 3 – Measurement.

Below applies to Credit EA 1.

- 5. Optimize Energy Performance:
 - a. Design the building envelope and systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost effective energy efficiency measures. Quantify energy performance as compared to a baseline building. Select one of the four compliance path options described below and in the LEED Green Building Rating System:
 - 1) Option 1 - Whole Building Energy Simulation.
 - 2) Option 2 - Prescriptive Compliance Path: ASHRAE Advanced Energy Design Guide for Small Office Buildings.

- 3) Option 3 - Prescriptive Compliance Path: Advanced Buildings Core Performance Guide.
 - 4) Option 4 - Prescriptive Compliance Path: Advanced Buildings Benchmark Basic Criteria and Prescriptive Measures.
- b. If a local code has demonstrated quantitative and textual equivalence following, at a minimum, the U.S. Department of Energy standard process for commercial energy code determination, then the results of that analysis may be used to correlate local code performance with ASHRAE/IESNA 90.1.

B. Aluminum:

1. Aluminum Extrusions: ASTM B 221/B 221M, Alloy 6063-TB or T2.
2. Aluminum Sheet: ASTM B 209/B 209M, Alloy 3003 or Alloy 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
3. Aluminum Castings: ASTM B 26/B 26M, Alloy 319.

C. Fasteners: Same basic metal and alloy as fastened metal or 300 Series stainless steel unless otherwise indicated. Do not use metals that are incompatible with joined materials.

1. Use types and sizes to suit unit installation conditions.
2. Use Phillips flat-head screws for exposed fasteners, unless otherwise indicated.

D. Anchors and Inserts: Type, size, and material required for loading and installation indicated. Use non-ferrous metal or hot dip galvanized anchors and inserts for exterior installations and elsewhere as needed for corrosion resistance. Use toothed steel or expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187 and SSPC Paint 12. Use to separate dissimilar, corrosive metals, or metal from concrete.

2.3 HORIZONTAL, FIXED, EXTRUDED ALUMINUM EXTERIOR SUN CONTROLS

A. General: Provide horizontal, fixed, extruded aluminum exterior sun control assemblies complying with the following:

1. Infill: Airfoil.
2. Outrigger: As detailed.
3. Fascia: None.

B. Basis of Design: "Model #WS17," as manufactured by Intertec, a Div. of Doralco.

2.4 FABRICATION

A. Assemble exterior sun control assemblies in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitation. Clearly mark units for reassembly and coordinated installation.

B. Exterior sun control assemblies shall be assembled in accordance with manufacturer recommendations.

C. Maintain equal blade spacing, including, but not limited to, separation between blades and frames to produce a uniform appearance.

D. Include supports, anchorage, and accessories required for complete assembly.

2.5 FINISHES

A. Comply with NAAMM MFM for architectural metal products for recommendations for applying and designating finishes. Finish exterior sun control devices after assembly if welded.

1. Aluminum Finishes: Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.

Select finish below (clear anodized, color anodized, or two-coat polyvinylidene fluoride).

- a. Class I Clear Anodized Finish: AA-M12-C22-A41 (Mechanical Finish: as fabricated, non-specular; Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural, clear film thicker than 0.7 mil [0.018 mm]) complying with AAMA 611.
- b. Class I Color Anodized Finish: AA-M21-C22-A42/A44 (Mechanical Finish: as fabricated, non-specular; Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural, film thicker than 0.7 mil [0.018 mm] with integral color or electrolytically deposited color) complying with AAMA 611. Provide color to match the Architect's sample, or, if no sample, as selected by the Architect from within full range of industry colors and color density range.
- c. High Performance Organic Coating: AA-C12-C42-R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: chemical conversion coating, acid chromate-fluoride-phosphate pretreatment; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
 - 1) Standard Two-Coat Polyvinylidene Fluoride (PVDF) Finish Coating: Manufacturer's standard thermocured system, complying with AAMA 2605, composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight, as produced by Arkema, Inc. ("Kynar 500") or by Solvay Solexis, Inc. ("Hylar 5000"). Provide minimum 1.2 mil (0.030 mm) total dry film thickness. Provide color to match the Architect's sample, or, if no sample, as selected by the Architect from manufacturer's standard choices for color and gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
 1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the Project Site.

3.3 INSTALLATION

- A. Install exterior sun control devices in accordance with reviewed product data, final shop drawings, and engineering calculations.
- B. Locate and place exterior sun control assemblies level, plumb, and at indicated alignment with adjacent work.
- C. Use concealed anchorage.
- D. Form closely fitted joints with exposed connections accurately located and secured.

- E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be finished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- F. Protect galvanized and non-ferrous metal surfaces from corrosion or galvanic action by applying a heavy coating or bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.

3.4 CLEANING

- A. Periodically clean exposed surfaces of exterior sun control devices that are not protected by temporary covering to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.
- B. Before final inspection, clean exposed surfaces with water and a mild soap not harmful to finishes.
- C. Clean-up and touch-up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

3.5 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to the Installer, that shall ensure that the exterior sun control devices shall be without damage at time of Substantial Completion.
 - 1. Use temporary protective coverings where needed and approved by the manufacturer. Remove protective covering at the time of Substantial Completion.

END OF SECTION