

**SECTION 12 24 00**  
**WINDOW SHADES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This section includes cloth shades and blackout shades. Provide window shades complete, including brackets, fittings and hardware.

**1.2 QUALITY ASSURANCE:**

- A. Manufacturer's Qualification: Submit evidence that the manufacture has a minimum of three (3) years' experience in providing item of type specified, and that the blinds have performed satisfactorily on similar installations. Submit qualifications.
- B. Submit qualifications for installers who are trained and approved by manufacturer for installation of units provided.
- C. Electrical Requirements:
  - 1. NFPA 70 Article 100.
  - 2. Listed and labeled in accordance with UL 325.
  - 3. Marked for intended use, and tested as a system.
  - 4. Individual testing of components is not acceptable in lieu of system testing.

**1.4 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
  - 1. Shade cloth, each type, 610 mm (24 inch) square, including cord and ring, showing color, finish and texture.
- C. Manufacturer's literature and data; showing details of construction and hardware for:
  - 1. Cloth and window shades
- D. Shop Drawings: Provide fabrication and installation details for cloth shades, including shade cloth materials, their orientation to rollers, and their seam and batten locations.
  - 1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.
- E. Fire Testing: Submit report of flame spread and smoke developed during product material tests by independent testing laboratory.
- F. Manufacturer's warranty.

### **1.5 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21, "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their window shades in between 5 to 25 years from date of installation and final acceptance by the Government. Submit manufacturer's warranty.

### **1.6 APPLICABLE PUBLICATIONS:**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced to in the text by the basic designation only.
- B. Federal Specifications (Fed. Spec.):
  - AA-V-00200B.....Venetian Blinds, Shade, Roller, Window, Roller, Slat, Cord, and Accessories
- C. ASTM International (ASTM):
  - A240/A240M-14.....Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
  - B221-14.....Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
  - B221M-13.....Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes (Metric)
  - G21-13.....Determining Resistance of Synthetic Polymeric Materials to Fungi
- D. National Electric Manufacturer's Association (NEMA):
  - ICS 6-93(R2006).....Industrial Control and Systems Closures
- E. National Fire Protection Association (NFPA):
  - 70-14.....National Electrical Code (NEC)
  - 701-15.....Fire Tests for Flame Propagation of Textiles and Films
- F. Underwriters Laboratories Inc. (UL):
  - 325-06(R2013).....Door, Drapery, Gate, Louver, and Window operators and Systems

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS:**

- A. Light-Filtering Shade Cloth: Woven fabric.
  - 1. Type: Sheerweave Infinity 2

2. Weave: Basketweave.
3. Thickness: 0.031 in.
4. Weight: 464.17 grams per square meter (13.69 ounces per square yard).
5. Orientation on Shadeband: Up the bolt.
6. Openness Factor: 1 percent.
7. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Submit report for testing of shade cloth materials identical to products provided. NFPA 701-2004 TM#1 (small scale), NFPA 101 (Class A Rating), CAN/ULC-S 109-03 (large and small scale) ASTM E84 (class 1), CAN/CGSB2-4 162-M80.
8. Drive-End Location: Matching existing control side.
9. Shade Cloth Anti-Microbial Characteristics: 'No Growth' per ASTM G21 results for fungi ATCC9642, ATCC9677, and ATCC9645, ASTM E2180, ASTM G21.

B. Light-Blocking Shade Cloth: Coated fabric.

1. Type: Sheerweave 7000
2. Weave: Basketweave Coated
3. Thickness: 0.26 in.
4. Weight: 454.67 grams per square meter (13.41 ounces per square yard).
5. Orientation on Shadeband: Up the Bolt
6. Openness Factor: 0
7. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Submit report for testing of shade cloth materials identical to products provided California U.S. Title 19 (small scale), NFPA 701-2004 Tm#1 (small scale), BS 5867 2008 Part 2 Type B Performance, CAN/ULC-S109-03 (large and small scale) and CAN/CGSB2-4, 162-M80
8. Drive-End Location: Match existing control side
9. Shade Cloth Anti-Microbial Characteristics: "No Growth" per ASTM G21 results for fungi ATCC9642, ATCC9677, and ATCC9645, AATCC 174-1998 Part II and III.
10. Cordless Shades: Provide roller containing spring operating mechanism sized to accommodate shade side indicated in construction documents. Provide with positive locking mechanism that can stop

shade movement at each half-turn of roller and with manufacturer's standard pull: N/A

11. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated on construction documents, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operating without malfunction. Include wiring for motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
  - a. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency and marked for intended location and application.
  - b. Electric Motor: Manufacturer's standard tubular, enclosed in roller: Yes.
    - 1) Electrical Characteristics: Single phase. 120V, 60 Hz.
  - c. Remote Control: Electric control with NEMA ICS6, Type 1 enclosure for recessed or flush mounting. Provide the following for control activation of shades:
    - 1) Wall mounted controls: keypads with hand held remote (option) that are able to electronically set and reconfigure shade open and close limits, shade preset positions, system groups and system subgroups at the control without rewiring and without access to the Electronic Drive Unit.
    - 2) Sun Sensor Controls: Programmable system activated by LEDs detecting daylight intensity and responding by automatically adjusting shades: N/A
    - 3) Radio Controls: Digital system consisting of code-compatible universal coaxial receiver, (1) switch per room for operating up to 5 motors.
    - 4) Infrared Controls: System consisting of concealed receiver complete with external eye and connecting modular cable, and two (2) portable, multi-channel transmitters with separate buttons to open and close up to 12 individual shades or groups of shades, to open and close all shades simultaneously, and top stop: N/A

- 5) Time Controls: N/A
- 6) Provide switches that are adjustable and interlocked with motor controls and set to automatically stop the shade at fully raised and fully lowered position. Provide low voltage switching. Yes the controls are wireless and they communicate with the shade via radio frequency.
- 7) Operating Function: Stop and hold shade at open, closed and user selected stopping position.

## **2.2 MATERIALS:**

- A. Stainless Steel: ASTM A240/A240M.
- B. Extruded Aluminum: ASTM B221M (B221).
- C. Cords for Cloth roller shades No. 4 braided nylon or No. 4-1/2 braided cotton having not less than 80 kg (175 pounds) breaking strength.
- D. Room Darkening, PVC Free Shade Cloth with Opaque Acrylic Backing: Not less than 0.19 mm (0.008 inches) thick blackout material and weighing 580 grams per square meter (17.1 ounces per square yard), plus or minus 5 percent comprised of fiberglass, acrylic, polyester finish materials.
  1. Color: Selected from manufacturer's standard colors.
  2. Fire-Test-Response Characteristics: Passes NFPA 701 small and large scale vertical burn. Submit report for testing of shade cloth materials identical to products provide.
- A. Cordless Shades: Provide roller containing spring operating mechanism sized to accommodate shade size. Provide with positive locking mechanism that can stop shade movement at each half-turn of rollers and with manufacturer's standard pull.
  1. Pole: Manufacturer's standard type in length required to make operation convenient from floor level and with hook for engaging pull.

## **2.3 FASTENINGS:**

- A. Zinc-coated or cadmium plated steel or stainless steel fastenings of length and type recommended by manufacturer. Except as otherwise specified, provide fastenings for installation with various structural materials as follows:

Type of Fastening	Structural Material
Wood screw	Wood
Tap screw	Metal
Case-hardened, self-tapping screw in pre-drilled hole	Solid masonry, concrete
Screw or bolt in expansion shields	Solid masonry, concrete
Toggle bolts	Hollow blocks, gypsum wallboard, plaster

B. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated on construction documents, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operating without malfunction. Include wiring for motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.

1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency and marked for intended location and application.

2. Electric Motor: Manufacturer's standard tubular, enclosed in roller.

a. Electrical Characteristics: Single phase, //24// //110// //110// //V, 60 Hz.

3. Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for surface mounting. Provide the following for control activation of shade:

a. Wall mounted controls: with hand held remote that are able to electronically set and reconfigure shade open and close limits, shade preset positions, system groups and system subgroups at the control without rewiring and without access to the Electronic Drive unit.

## 2.4 FABRICATION:

A. Measure openings before fabrication. Do not scale construction documents.

B. Fabricate cloth shades to fit measurements of finished openings obtained at site.

- C. Fabricate Blackout shades with metal bead housing, deep side guides, still light lock members, continuous metal jamb and head anchor sections, operating bars, and complete with roller assembly, one (1) piece Blackout shade cloth, and two (2) metal disappearing type horizontal braces for each shade.
- D. Cloth Shades: Rolling type, constructed of shade cloth mounted on rollers. Provide shade cloth with plain sides, and with hem at bottom to accommodate weight bar.
  - 1. Provide separate shades for each individual sash within opening. Provide shade length that exceeds height of window by 305 mm (12 inches) measured from head to sill, in addition to material required to make-up hem:
    - a. Provide rollers with spindles, nylon bearings, tempered steel springs, and other related accessories required for positive action.
    - b. Provide rollers of diameter and wall thicknesses required to accommodate operating mechanisms, weights, and widths of shadebands indicated without deflection.
    - c. Provide rollers with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
    - d. Secure shade cloth to rollers to prevent wrinkling or folding, and on line parallel to axis of rollers so that shade hangs plumb.
    - e. Secure shade cloth with zinc-coated steel or stainless steel machine screws spaced not over 228 mm (9 inches) on centers.
    - f. Do not attach shade cloth to rollers with tacks.
    - g. Provide hem bar of extruded aluminum for entire width of shade band. Heat seal hem bar on all sides to prevent removal.
    - h. Provide eyelets with clear openings large enough to accommodate cords, without cutting into cloth when set.
    - i. Provide cords of sufficient length to permit shades to be drawn to bottom of opening with ends looped and held with cord rings. Attach cords to hems through metal eyelets in center of slats in bottom hems.
- E. Shop fabricate light traps consisting of head box to house shade roller, and steel channels U-shape in cross section to serve as guides for shade along sides, and to receive bottom edge of shade along sill.

1. Fabricate light trap of sheet steel having a minimum thickness of 0.38mm (0.015 inches). Provide legs of the U-shaped channels not less than 45mm (1-3/4 inches) long and separated by minimum distance that will permit free operation of the shade.
  2. Round or bead edges of light trap coming into contact with shade cloth.
  3. Provide hinged or removable exposed face of head box for access to shade roller.
  4. Fabricate entire assembly to prevent light from entering the room when the shade is drawn.
  5. Finish interior or concealed surfaces of light trap with coat of flat black enamel.
  6. Finish exposed portions of light trap with pyroxylin lacquer, or baked on enamel finish in color to match adjoining wood or metal work.
- F. Fabricate rollers of aluminum or stainless steel of sufficient diameter and thickness to support the shade, and provided with spindles, bearings and coil springs.
- G. Provide rollers with groove and metal spline with steel, or stainless steel machine screws spaced not over 228mm (9 inches) on centers, for attaching the shade cloth.
- H. For shades not finished with a selvage, bind or hem vertical edges.
1. Sewn Edges: Double or triple stitched, using a heavy-duty thread. Make needle holes lightproof by applying a suitable filler.
  2. Sealed Edges: Continuously hot seal without curling or raveling.
- I. Stiffen shade by transverse steel bars or size and weight sufficient to hold shade in channel guides.
1. Space bars approximately 457 mm (18 inches) on centers and conceal in pockets in the shade.
  2. Fit bottom edge of shade with steel operating bar designed to engage sill channel of light trap.
  3. Paint bars with flat black enamel.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION:**

- A. Measure openings before fabrication. Do not scale construction documents.



- B. Cloth Shades: Mount window shades on end of face brackets, set on metal gussets, or casing of windows as required. Provide extension face brackets where necessary at mullions. In existing buildings, provide brackets similar to those on existing windows.
  - 1. Locate rollers in level position as high as practicable at heads of windows.
  - 2. Install shades to prevent infiltration of light over rollers.
  - 3. Where extension brackets are necessary for alignment of shades, provide metal lugs, and rigidly anchor lugs and brackets.
  - 4. Place brackets and rollers so that shades do not interfere with window and screen hardware.
  - 5. Electrical Connections: Connect motor-operated shade cloth roller shades to building electrical system.
  - 6. Shade installation methods not specifically described, are subject to approval of Contracting Officer Representative (COR).
- C. Install Blackout shades level at a height that will permit proper operation of the shades, and prevent outside light from infiltrating into the room.
- D. Fit light traps to adjacent construction, with rigid and light-tight connections.
- E. Locate so shade is no closer than 51mm (2 inches) to interior face of glass.
- F. Allow clearance for hardware at operable window.
- G. Electrical Connections: Connect motor-operated Blackout shades to building electrical system.

### **3.2 ADJUSTING:**

- A. Adjust and shades to operate smoothly, easily, safely and free from binding or malfunction throughout entire operational range.

### **3.3 CLEANING AND PROTECTION:**

- A. Clean shade surfaces after installation, according to manufacturer's written instructions.
- B. Paint and patch after installing the shades if needed.
- B. Provide final protection and maintain conditions that ensure that shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged shades that cannot be repaired, in a manner approved by COR before time of Substantial Completion.

**3.4 DEMONSTRATION:**

- A. Furnish services of factory-authorized service representative to train maintenance personnel to adjust, operate, and maintain motorized shade operation systems.