

**SECTION 12 24 21  
LIGHTPROOF SHADES**

SPEC WRITER NOTE: Delete between // // if not applicable to project. Also delete any other item or paragraph not applicable in the section, and re-number the paragraphs.

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This section includes lightproof shades. Provide lightproof shades complete including brackets, light traps, fittings, and hardware.

**1.2 RELATED WORK:**

- A. Section 12 24 00, WINDOW SHADES.
- B. Shade Cloth and Color of Light Track Trim Finish: Section 09 06 00, SCHEDULE FOR FINISHES.

**1.3 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 shades have performed satisfactorily on similar installations. Submit manufacturer qualifications.
- B. Submit qualifications for installers who are trained and approved by manufacturer for installation of units provided.

**1.4 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data: Showing details of construction and hardware for Lightproof Shades.
- C. Samples:
  - 1. Shade cloth, each type, 600 mm (24 inch) square, including cord and ring, showing color, finish and texture.
- D. Shop Drawings: Provide fabrication and installation details for lightproof shades.
- E. Fire Testing: Submit report of flame spread and smoke development 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 lightproof shades for a minimum of five (5) // // 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 in the text by the basic designation only.

B. ASTM International (ASTM):  
G21-13.....Determining Resistance of Synthetic Polymeric  
Materials to Fungi

C. National Fire Protection Association (NFPA):  
701-15.....Fire Tests for Flame Propagation of Textiles  
and Films

SPEC WRITER NOTE: Update material requirements to space with applicable requirements (types, grades, classes, and other related items) specified in the referenced Applicable Publications.

**PART 2 - PRODUCTS**

**2.1 MATERIALS:**

A. Room Darkening, PVC Free Shade Cloth with Opaque Acrylic Backing: Not less than 0.19 mm (.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 or as indicated in Section 09 06 00, SCHEDULE FOR FINISHES.

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.

//2. Shade Cloth Anti-Microbial Characteristics: 'No Growth' in accordance with ASTM G21 results for fungi ATCC9642, ATCC9644, and ATCC9645. //

//B. Cords for Shades: // No. 4 braided nylon, or No. 4 1/2 braided cotton // // #10 stainless steel chain // having not less than 80 Kg (175 pounds) breaking strength. //

//C. 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 roller 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.

D. Fastenings: Zinc-coated or cadmium plated steel or stainless steel fastenings of proper length and type. Except as otherwise specified, fastenings for use with various structural materials are to be as follows:

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

//E. 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 operation 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 // // 220 // V, 60 Hz.
3. Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for // surface // // recessed or flush // mounting. Provide the following for control activation of shades:
  - //a. Wall mounted controls: // key pads // // switches // // // // 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. //
- //b. Sun Sensor Controls: Programmable system activated by LEDs detecting daylight intensity and responding by automatically adjusting shades. //
- //c. Radio Controls: Digital system consisting of code-compatible universal coaxial receiver, // one (1) per shade and // two (2) // // // // portable multiple-channel transmitters for operating up to // 2 // // 4 // // // shades individually, each with a single button to open and close shades. //
- //d. Infrared Controls: System consisting of concealed receiver complete with external eye and connecting modular cable, and // two (2) // // // // portable, multiple-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 to stop. //
- //e. Timer Controls: Clock timer, // 24-hour // // 7 day // programmable. //
- //f. // Provide switches that are adjustable and interlocked with motor controls and set to automatically stop the shade at fully raised and fully lowered positions. // // Provide low voltage switching. // //
- //g. Operating Function: // Stop and hold shade at any position // // Stop and hold shade at open, midpoint, and closed positions // // Stop and hold shade at 3 predetermined positions including open, closed, and user-programmed position // // Stop and hold shade at 5 pre-determined positions including open, closed, and 3 user-programmed positions //. //
- h. Provide the following options: // Group switching with integrated switch control; single face plate for multiple switch cut-outs. // // Capable of interface with // audiovisual // // multi-room // control system // // Capable of accepting input from building automation control system // // Override switch // // Backup gear and crank operator for manual operation during power failures with detachable handle, // 1.8 m (6 feet) long // // length required to make operation convenient from floor

level // // Power failure memory for the life of the systems  
which protects presets //.

SPEC WRITER NOTE: Internal shades between  
window panes are required at Mental  
Health and Behavioral Care Units.

**//2.2 SHADES ENCLOSED IN WINDOWS // FOR MENTAL HEALTH AND BEHAVIORAL CARE  
UNITS //:**

- A. Provide internal shades between windows panes where indicated on construction documents.
- B. Operating cords or ropes are not acceptable.
- C. Provide hardware flush with walls.
- D. Provide tamper proof hardware. //

**2.3 FABRICATION:**

- A. Measure openings before fabrication. Do not scale construction documents.
- B. Fabricate lightproof shades with metal head housing, deep side guides, sill light lock members, continuous metal jamb and head anchor section, operating bars, and complete with roller assembly, one (1) piece lightproof shade cloth, and two (2) metal disappearing type horizontal braces for each shade.
- C. 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 0.38 mm (0.015 inches). Provide legs of the U-shaped channels not less than 45 mm (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 //. // As indicated in Section 09 06 00, SCHEDULE FOR FINISHES. //

- D. Fabricate rollers of aluminum or stainless steel of sufficient diameter and thickness to support the shade, and provided with spindles, bearings and coil springs.
- E. Provide rollers with groove and metal spline with steel, or stainless steel machine screws spaced not over 228 mm (9 inches) on centers, for attaching the shade cloth.
- F. 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.
- G. Stiffen shade by transverse steel bars of 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.
- //H. Cords: Fit operating bar with pull cord. //

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION:**

- A. Install lightproof shades level at a height that will permit proper operation of the shades, and prevent outside light from infiltrating into the room.
- B. Fit light traps to adjacent construction, with rigid and light-tight connections.
- C. Locate so shade is no closer than 51 mm (2 inches) to interior face of glass.
- D. Allow clearance for hardware at operable windows.
- //E. Electrical Connections: Connect motor-operated lightproof shades to building electrical system. //
- F. Do not install shades until after room painting and finishing operations are complete.

#### **3.2 ADJUSTING:**

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

**3.3 CLEANING AND PROTECTION:**

- A. Clean lightproof surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, that ensure that lightproof shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged lightproof shades that cannot be repaired, in a manner approved by Contracting Officer Representative (COR) before time of Substantial Completion.

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