

SECTION 12 26 00 (Interior Daylighting Devices)

PART 1 - GENERAL

1.1 SUMMARY

This section includes manual and motorized lightshelves with integral roller shades and associated operating systems and controls.

1.2 SECTION INCLUDES:

1. Interior daylighting and shading systems.
2. Manually controlled interior sunscreen and room darkening roller shades and lightshelves as applicable.
3. Electronically operated interior sunscreen and room darkening roller shades and lightshelves as applicable.
4. Shade accessories.

Related Sections :

1. Section [092100 – Plaster and Gypsum Board Assemblies:] Gypsum board substrate for window shade systems.

1.3 REFERENCES

1. American National Standards Institute (www.ansi.org and www.ieee.org)
2. National Electrical Manufacturers Association (www.nema.org)
3. ASTM International (ASTM) (www.astm.org): D4674-89 - Standard Test Method for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Fluorescent Lighting and Window-Filtered Daylight.
G21-96 (2002) - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
G22-76 (1996) - Standard Practice for Determining Resistance of Plastics to Bacteria.
4. National Fire Protection Association (NFPA) 701 (2004) – Standard Methods of Fire Tests for Flame Propagation.
Electrical components: NFPA Article 100 listed and labeled by UL or other testing agency acceptable to authority having jurisdiction.
Where applicable, system components shall be FCC compliant.
5. Shade Cloth Anti-microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi.

1.4 SYSTEM DESCRIPTION

1. Interior daylighting and shading system including operable fabric lightshelves and integral roller shades:
2. Controls: Wall mounted, handheld remote.

1.5 SUBMITTALS

1. Submittals for Review:
 - a. Shop Drawings; include:
 - i. Shade schedule indicating room number, opening sizes, quantities and key to details.
 - ii. Head, jamb and sill details, and mounting dimension requirements for each product and mounting condition.
 - iii. Wiring diagrams (if applicable) based on switching and operational requirements.
 - b. Samples:
 - i. Fabric samples showing; each specified color/manufacturer's full range of available colors.
 - ii. Samples showing available color and finish selections for controls.
 - c. Product Data; include:
 - i. Descriptive literature and details for each product type including materials, finishes, construction, and dimensions of individual components, profiles, and mounting requirements.
 - ii. Maintenance data for roller shades including cleaning precaution, materials and methods and instructions for operating hardware and controls.
 - d. Quality Control Submittals:
 - i. Test Reports: Indicating compliance with specified fabric properties. Include the following paragraph for certification of bacterial and mildew resistance.
Certification: Morton International Laboratory Report for PVC coated fabrics and bacterial and mildew resistance.

1.6 QUALITY ASSURANCE

1. Manufacturer Qualifications:
 - a. Qualified to supply specified products and to honor claims against product presented in accordance with warranty.
 - b. Assign responsibility for design, engineering, installation, and performance of window shade system to single manufacturer and their qualified dealers and installers
 - c. Furnish shading system and electrical control equipment for complete installation.
2. Installer Qualifications:
 - a. Qualified to install and commission specified products by prior factory training, experience, demonstrated performance, and

acceptance of any requirement of the manufacturer, subsidiary of the manufacturer, or licensed agent.

3. Mockups:
 - a. Provide mockup of window shade complete with selected shade fabric including sample of seam when applicable.

1.7 DELIVERY, STORAGE, AND HANDLING

1. Store products in manufacturer's unopened packaging until ready for installation.
2. Do not deliver shades until concrete, masonry, plaster, painting, and other wet work is complete and dry.
3. Deliver shades to project in protective packaging, labeled to identify each shade for each opening.
4. Include installation, programming, and maintenance instructions.

1.8 PROJECT CONDITIONS

1. Maintain environmental conditions in installation areas within manufacturer's recommended limits:
Ambient operating temperature: 32 to 104 degrees F.
Humidity: 0 to 90 percent, non-condensing
2. Do not install products under environmental conditions outside manufacturer's absolute limits.
3. Do not install shade system until building is operating at ambient temperature and humidity ranges that are consistent with those intended for buildings ultimate use.

1.9 COORDINATION

1. Fabricate shades after obtaining field dimensions for each opening.
2. Coordinate construction of surrounding conditions to allow for timely field dimension verification.

1.10 WARRANTY

1. Provide manufacturer's 1 year parts and labor and 10 years limited parts warranty for shade cloth and lifetime warranty on components.
2. Provide manufacturer's 1 year warranty providing for repair or replacement of defective equipment.

1.11 MAINTENANCE

1. Make ordering of new equipment for expansions, replacements, and spare parts available to qualified dealer or installer.
2. Make replacement parts available for minimum of ten years after date of manufacture.

3. Provide on-site service support within 24 hours anywhere in continental United States and within 72 hours worldwide except where special visas are required.
4. Offer renewable service contract on yearly basis to include parts, factory labor, and annual training visits. Make service contracts available up to ten years after date of system startup completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

1. Manufacturer to meet all qualifications noted in 1.6 above and are registered as a US owned and operated business.
2. All proposed substitutions (clearly delineated as such) must be submitted in writing for approval by the design professional a minimum of 10 working days prior to the bid date and must be made available to all bidders. Proposed substitutes must be accompanied by a review of the specification noting compliance on a line-by-line basis.
3. By using pre-approved substitutions, the contractor accepts responsibility and associated costs for all required modifications. The contractor shall provide complete engineered shop drawings (including power wiring if appropriate) with deviations for the original design highlighted in an alternate color to the engineer for review and approval prior to rough-in.

2.2 DAYLIGHTING SHADES

1. Single Lightshelf Pole Operated:
 - a. Single lightshelf element, sunshade fabric on aluminum outriggers and fabric tension bars mounted to universal one-piece roller shade bracket. All visible components to be either powder coated or brushed finish.
 - b. Single lightshelf to have open position (parallel to ceiling) and closed position (parallel to window) for maximum daylight management with alternate angles available. (Intermediate positions of 15 and 35 degrees may be selected by the specifier).
 - c. Removable stops allow for lowering of lightshelf for deep cleaning purposes.
 - d. Lightshelf operated by hand using pole provided.
 - e. Single integral roller shade to match lightshelf fabric (standard) or as selected by the specifier.
2. Single Lightshelf with Worm Drive:
 - a. A single lightshelf with worm drive to have infinite positioning flexibility between 0 and 90 degrees to cater for low winter sun angles and other daylighting needs.

- b. Single integral roller shade to match lightshelf fabric (standard) or as selected by the specifier.
 - c. Removable 3" deep aluminum fascia powder coated to match lightshelf frame – remove to lower lightshelf to cleaning position.
 - d. Worm drive operated by folding crank handle.
3. Multiple Lightshelf with Worm Drive:
- a. Multiple parallel lightshelf elements as above, sunshade fabric on aluminum frame mounted to a series of parallel mounting brackets.
 - b. Lower lightshelf connected to a worm drive.
 - c. Upper lightshelf elements to be coupled with adjustable wire connectors to operate in harmony throughout movement cycle.
 - d. Single integral roller shade to match lightshelf fabric (standard) or as selected by the specifier.
4. Dual Shade Single Lightshelf:
- a. Single lightshelf element as above, but with blackout fabric on aluminum outriggers and fabric tension bars mounted to universal one-piece roller shade bracket. All visible components to be either powder coated or brushed finish.
 - b. Dual integral roller shades, one room darkening to match black out fabric used in the lightshelf and one in solar shade fabric selected by the specifier.
(Specifier note; the lightshelf may be operated by pole or worm drive)
5. Motorized Daylighting Shade:
- a. Single or multiple parallel lightshelves driven by an internal electronic tube motor with a maximum speed of 5 rpm and a minimum 10 Nm torque output.
 - b. Single or dual integral roller shades to match lightshelf fabric (standard) or as selected by the specifier.

Specifier note; model identification protocol example: SW1600 where the first letter(s) indicate the number of shelves and operating method and the numbers represent the depth of the lightshelf, in this case 16 inches.

2.3 COMPONENTS

1. Mounting Brackets:
- a. One piece mounting brackets engineered to carry both lightshelf and roller shade assemblies.
 - b. Brackets to provide symmetrical light gaps of 0.5 inch on each side of shade.

- c. Roller shade leveling adjustment allowing leveling adjustment while roller shades are mounted to brackets.
 - d. Allow side-to-side adjustment up to 0.375 inch on each side while shade is mounted to bracket.
 - e. Projection adjustment up to 0.24inch.
 - f. Provide universal mounting brackets for wall, mullion and jamb mounting.
 - g. One piece mounting brackets providing level, projection, and shade centering adjustments from mounting bracket.
 - h. For dual shade application both roller shades will be mounted on single bracket and designed to operate independently for either room darkening or solar shading.
2. Roller Shade Tube:
- a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection.
 - b. Fabric connected to tube using double-sided adhesive strip with minimum of one turn of fabric on roller before working section of fabric starts.
3. Drive Systems
- a. Operating Clutch (Roller Shade Only):
 - i. Dynamic internal spring arrangement enables the application of a balanced force on both sides of the roller shade simultaneously allowing for even distribution of forces. Available in 3 sizes to handle shade weights up to 15lbs.
 - ii. Each roller shade in the dual shade to have independent clutch.
 - iii. Clutch driven by manual bead chain attached to jamb with integral child safety device.
 - b. Worm Drive:
 - i. Self-braking worm drive assembly attached to mounting bracket on designated drive side of shade including ½" square output shaft. Input shaft to include bell housing to facilitate attachment of folding crank. This system allows for lightshelf to be positioned at any angle between 0 and 90 degrees.
 - c. Electronic Drive:
 - i. Silent, precision controlled tube motor housed inside roller tube and/or lightshelf drive tube controlling shade movement.
 - ii. A/C and D/C options available;
 - 1. 28, 35 and 45mm Quiet DCRF – low voltage tubular motor w/Lithium-ion rechargeable battery (preferred system).
 - 2. 35 and 45mm ACRF direct wire tubular motor.

- iii. Solar panel for rechargeable batteries if selected.
 - iv. Operate independently without the use of external group controllers.
 - d. Systems with multiple units electronically synchronized to start, stop and move in unison if desired.
 - e. May be integrated with BMS (by others)
- 4. Fabric:
 - a. Shall be flame resistant in accordance with NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
 - b. Standard fabric selection: PVC coated solar screen fabric with up to 5% transparency factor. Optional selections include PVC free and High performance metal coated fabrics.
 - c. For shades requiring total light blockage when complete room darkening or privacy is required for single or dual shade select: SierraSol Mesa or Tempe blackout fabric.
 - d. Custom printing: Shade fabric may be custom printed – consult manufacturer.
- 5. Hem Bar:
 - a. Internal hem bar heat sealed on all sides containing continuous aluminum hem bar
 - b. Extruded aluminum external hem bar with integral end caps color as selected.

2.4 ACCESSORIES

- 1. Crank Operator:
 - a. Folding crank in white or grey powder coat with wall mounted retaining clip and length to suit height of lightshelf. Snap-in universal connector to fit bell housing on worm drive to allow for removability of crank.
 - b. Non-removable folding crank in white powder coat with wall mounted retaining clip and length to suit height of lightshelf.
- 2. Fascia:
 - a. Continuous extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strip or exposed fasteners. (Not available on S Series)
 - b. Fascia shall fully conceal shade roller and fabric on the tube.
- 3. Wall Mounted Controls:
 - a. Low voltage keypads with faceplates attached without visible means of attachments and with backlit buttons.
 - b. Product: Four button for dual motors in roller shade and lightshelf. Six button for dual mount or two group applications. Multi-group keypad for control of multiple groups of shades.
- 4. Handheld Remotes:
 - a. Hand-Held transmitter to suit operating system.

2.4 FABRICATION

1. Fabricate lightshelf fabric to remain taut across the full width of the lightshelf frame. Front and rear edges to feature welded pockets for fabric tension bars.
2. Fabricate roller shade cloth to hang flat without buckling or distortion. Fabricate with trimmed edges, heat sealed if necessary, to hang straight without curving or raveling. Fabricate unguided shade cloth to hang true and straight without shifting sideways more than 1/8" in either direction in an 8 feet shade height.

2.5 SOURCE QUALITY CONTROL

1. Perform full-function testing on completed assemblies prior to shipment.

PART 3 – EXECUTION

1. INSTALLATION

- a. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- b. Install shades to provide smooth operation.

2. ADJUSTING

- a. Adjust level, projection, and shade centering from mounting brackets.
- b. Adjust fabric on tube if visibly telescoping.

3. DEMONSTRATION

- a. Demonstrate proper operation and maintenance of window shade system to Owner.

4. SCHEDULE

- a. Shade Type 1:
Description: Interior lightshelf with integral solar control shade.
Color: White or alternate color selected by the architect.
- b. Shade Type 2:
Description: Interior lightshelf with integral room darkening shade with blackout fabric.
Color: Black.

END OF SECTION