

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. Manufacturers to meet all qualifications noted in 1.6 above and be 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 ROLLER SHADES

1. Mounting:
 - a. Brackets to provide symmetrical light gaps of 0.5 inch on each side of shade.
 - b. Roller shade leveling adjustment allowing leveling adjustment while roller shades are mounted to brackets.
 - c. Allow side-to-side adjustment up to 0.375 inch on each side while shade is mounted to bracket.
 - d. Projection adjustment up to 0.24inch.
 - e. Provide universal mounting brackets for wall, mullion and jamb mounting.
 - f. One piece mounting brackets providing level, projection, and shade centering adjustments from mounting bracket.
 - g. 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. 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. Operating Clutch:
 - a. Dynamic internal spring arrangement enables the application of a balanced force on both sides of the shade simultaneously allowing for even distribution of forces. Available in 3 sizes to handle shade weights up to 15lbs.
 - b. Each roller shade in the dual unit to have independent clutch unless otherwise specified.
 - c. Clutch driven by manual bead chain to operate main shade only attached to jamb with integral child safety device.
4. Electronic Drive:
 - a. Silent, precision controlled tube motor housed inside roller tube controlling shade movement.
 - b. A/C and D/C options available;
 - i. 35mm Quiet ACRF motor
 - ii. 28 or 45mm DC tubular motor w/Lithium-ion rechargeable battery
 - c. Solar panel for rechargeable batteries if specified.
 - d. Operate independently without the use of external group controllers.
 - e. Systems with multiple units electronically synchronized to start, stop and move in unison if desired.
 - f. May be integrated with BMS (by others)
5. 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.
 - c. For shades requiring total light blockage when complete room darkening or privacy is required for single or dual shade select blackout fabric with max. 1% transparency.
 - d. Custom printing: Shade fabric may be custom printed – consult manufacturer.
6. 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.

2.3 LIGHTSHELVES

1. Single:
 - a. Single lightshelf element, sunshade fabric on aluminum outriggers and external fabric tension bars mounted to universal one-piece roller shade bracket. All visible components to be either powder coated or brushed finish.
 - b. Lightshelf to have open position (parallel to ceiling) and closed position (parallel to window) for maximum daylight management and have infinite positioning flexibility between 0 and 90 degrees to cater for low winter sun angles and other daylighting needs.
 - c. Removable fascia allow for lowering of lightshelf for deep cleaning purposes.
2. Multiple:
 - a. Multiple parallel lightshelf elements as above, sunshade fabric on aluminum frame mounted to vertical jamb receptors.
 - b. Lightshelf elements to be coupled with adjustable wire connectors to operate in harmony throughout movement cycle.
3. Dual Shades:
 - a. Single lightshelf element as above, but with blackout fabric on aluminum outriggers and external fabric tension bars mounted to universal one-piece roller shade bracket. All visible components to be either powder coated or brushed finish.
4. Drive Systems:
 - a. Self-braking worm drive assembly attached to mounting bracket on designated drive side of shade including ½" square, 1 ½" long 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.
 - b. Optional 45mm DC tubular motor w/Lithium-ion rechargeable battery adjusted to maximum 5rpm.
 - c. May be integrated with BMS (by others)
5. Fabric:
 - a. Lightshelf fabric selected to match main roller shade or contrasting according to specification.
 - b. For dual shade fabric to match blackout selection in roller shade.

6. Roller shade fabrication:
 - a. Fabricate 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.

2.4 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 or grey 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.
 - 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.

2.5 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