

SECTION 10 52 00  
FIRE PROTECTIVE SMOKE CURTAINS

**PART 1 – GENERAL**

1.01 SUMMARY

A. Section Includes:

1. Division 5 Section "Metal Fabrications" for supplementary metal members supporting smoke curtain systems to structure.
2. Division 26 Sections for electrical wiring and connections and for smoke curtain machines.
3. Division 28 Section "Fire Alarm" for connections of smoke and fire curtain machines to fire alarm, UL 864 label required.

B. Products Furnished Under This Section:

1. This Section includes UL Certified Fire Protective Smoke Curtains – Model Number: U.S. Smoke & Fire - SD60 with Egress

C. Related Requirements:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 REQUIRED TEST REPORTS & MINIMUM PERFORMANCE STANDARDS - Underwriter Laboratory Label Requirement for Fire Protective Automatic Smoke Curtains

A. Required Testing Reports, Label Requirements, and Minimum Performance Standards:

1. UL 10B- Fire test of Door Assemblies Time Temperature Curve Report- 1 hour.
2. UL 10C- Positive pressure for fire door assemblies Time Temperature Curve Report- 1 hour.

3. UL 10D- UL Labeled, Listed, Classified, Certified and Marked Fire Protective Curtains -1 hour.
4. UL 864- UL Labeled, Listed, Classified, Certified and Marked Control units and accessories for Fire Alarms Systems.
5. UL Oversize Certificate Labeled, Listed, Classified, Certified and Marked
6. UL Follow up Service Report Required
7. Tested in Accordance to” standard not acceptable for Fire Protective Curtains. Intertek label not acceptable for substitution.
8. ICC Evaluation Service report ESR-3322 Legend Report showing compliance with:
  - a. ICC-ES AC77, including:
    - 1) Approved opening force
    - 2) Cyclic force
    - 3) Expansion characteristics
9. ASTM E84-Test report with a calculated smoke developed (CSD) of 2 and a smoke developed index (SDI) of 0 and a calculated Flame spread (CFS) of 0.
- 10.ASTM 136 Test Report
- 11.NFPA 701 Test Report
- 12.Impact test report required by Independent testing Laboratory
- 13.The system shall operate under the power of gravity at all times to prove correct gravity fail-safe capability. Battery back up required.
- 14.The system manufacturer shall be certified to ISO 9001 1994 for the design, manufacture, installation and commissioning of Automatic Fire Protective Smoke Barriers and Partitions

### 1.03 SUBMITTALS

#### A. Product Data:

1. For each type of product indicated.

B. Shop Drawings:

1. Show fabrication and installation details for automatic smoke curtains. Include plans, sections, details, attachments to other work, and the following:
  - a. Operating clearances.
  - b. Requirements for supporting automatic smoke curtains, track, and equipment. Verify capacity of each track and rigging component to support loads.
  - c. Locations of equipment components, switches, motors and controls. Differentiate between manufacturer-installed and field-installed wiring.

B. Samples:

1. For each type of fabric from dye lot to be used for the Work, with specified treatments applied, and showing complete pattern and texture repeat, if any. Mark top and face of fabric. Prepare Samples of not less than 36 inches (900 mm) square.

C. Underwriters Laboratory Label:

1. For each type of product provide UL label affixed to Assembly. Intertek label prohibited for Fire Protective Curtain.

D. Qualification Data:

1. For Installer. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

- E. U.S. Green Building Council (USGBC)- LEED- Pre-Recycled content. Assembled in the United States by factory-trained employees.

## 1.04 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. For automatic curtains to include in maintenance manuals.

B. Warranty Documentation:

1. Special warranties specified in this Section.

## 1.05 QUALITY ASSURANCE

B. Overall Standards:

1. Manufacturer shall maintain a quality control program for follow up service in accordance with ICC-ES Acceptance Criteria 77.

C. Qualifications:

1. Installers:

- a. A firm or individual in the United States with no less than five years on-site installation experience in the United States, experienced in installing curtains similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- b. Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

## 1.06 FIELD CONDITIONS

A. Existing Conditions:

1. Verify rough and clear openings and the dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings.

## 1.07 WARRANTY

A. Manufacturer Warranty:

1. Warranty one year on motors, Motor Control Circuits (MCC) and Group Control Panels (GCP) from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 FIRE PROTECTIVE SMOKE CURTAINS**

#### **A. Manufacturers:**

1. U.S. Smoke & Fire, 888-917-8777 Ext. 102  
[www.us smoke and fire curtain.com](http://www.us smoke and fire curtain.com), [www.us smoke and fire.com](http://www.us smoke and fire.com)
2. Fabrilok, Smoke & Fire Prevention Systems, 434.374.8537
3. Total Door, 800.852.6660

#### **B. Description:**

1. Provide U.S. Smoke & Fire <sup>TM</sup> - SD60, as manufactured by U.S. Smoke and Fire.
2. There are no substitutions of materials specified allowed during the bidding process. If, for any reason a deviation from materials specified by the designers is desired or warranted, a cover letter and a request for deviation. Transmittal form must be submitted to construction manager (CM). If the proposed deviation is rejected by the CM or the Designers, it is this subcontractor's responsibility to obtain the original items and maintain the original construction schedule. The Designer has the right to require the originally specified material or item and his decision on the matter is final.

#### **C. Performance/Design Criteria:**

1. The curtain head box shall be manufactured from 1.2mm galvanized steel. The enclosure shall be rated at the same temperature as the curtain fabric.
2. Removable cover plates shall be incorporated to allow access to the

curtain rollers.

3. Standard head box sizes shall be 150mm x 150mm for single rollers (maximum width 5.5m) and 250mm x 150mm for multiple rollers (over 5.5m wide). Larger head boxes may be required where the curtain drop is in excess of 3m.
4. A weighted bottom bar shall be provided to prevent deflection and ensure correct operation under gravity.
5. The roller shall be constructed from an octagonal tube, which will incorporate a 24v d.c. Motor and gearbox and a sealed heavy-duty ball bearing assembly.
6. A motor control circuit housed in a steel enclosure shall be mounted onto the motor end of the head box.
7. Provide each motorized curtain with back Electromagnetic force controlled speed of descent of no less than 6 inches per second and no more than 24 inches per second.
8. The fabric curtain shall be manufactured from X32K woven. The woven glass fiber fabric shall have a nominal weight of no less than 540g/ square meter and shall be UL certified for one hour.

#### D.Operation

1. The Fire Protective Automatic Smoke Curtain shall deploy upon a signal from the fire alarm system in an emergency situation.
2. The system must be proven to “fail safe” to the operational position on total loss of primary and auxiliary power. The system must contain a housed battery system at the Group Control Panels.
3. Under normal operating conditions the curtains would be held in the retracted position via the motors operating at low voltage. The manufacture must be able to confirm that the motor windings are suitable for this type of operation.
4. Upon activation of the fire alarm the control panel will remove the

supply voltage and the curtain shall descend under the power of gravity in a controlled manner. A dynamic braking system housed in the motor control circuit shall control the speed of the descent of the curtain. The descent shall be electronically synchronized on overlapping curtains with a bottom bar.

5. To retract the curtain the control panel shall supply 24v to the motor control circuits and motors will drive the curtains to the upper position. As the bottom bar or stopping bar hits the curtain head box a current limiting circuit will step back the voltage and current and hold the bottom bar in the retracted position.
6. Limit switches are not to be used to control the upper position of the curtain.
7. Group Control Panel must have a delayed descent system. Should the main power fail to the group control panel, the supply is automatically switched to the integral standby battery. The curtain will remain fully operational until the battery low voltage cut off facility reads a voltage of 21v; the curtains will then safely descend under the power of gravity to the operational position.
8. Group Control Panel: Provide Group Control Panel (GCP) capable of controlling up to 6 no. 24v motor assemblies. During normal operation, the GCP will provide a 24v AC supply to the curtain motor holding them in the retracted position. Should smoke be detected, the fire alarm contact in the GCP will be opened by the fire alarm control system, the GCP will remove the 24v supply to the curtain motors and the curtains will descend under the power of gravity in a controlled manner.
9. Open on fire- configured to be gravity fail safe
10. Test Facility- key switch required
11. All push to exit buttons must contain internal battery back up power supply for fail-safe operation for ICC ES requirements.

12.All curtains must have two-stage descent option for secondary means of manual egress for ICC ES requirements.

## **PART 3 - EXECUTION**

### **3.01 INSTALLERS**

#### **A. Installers:**

1. CYSA-U.S. Smoke & Fire 888.917.8777 Ext 102
2. B.T. Mancini 408.942.7900
3. Door Control Services 512.930.1541

### **3.02 EXAMINATION**

#### **A. Verification of Conditions:**

1. Examine areas and conditions, with Installer present, for compliance with requirements for supporting members, blocking, installation tolerances, clearances, and other conditions affecting performance of automatic smoke-curtain work. Proceed with installation only after unsatisfactory conditions have been corrected.
2. Examine inserts, clips, blocking, or other supports required to be installed by others to support boxes. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.03 INSTALLATION**

A. Install system according to manufacturer's written instructions.

#### **B. Interface with Other Work:**

1. Optional Building Management System Relay for remote Monitoring may be installed in the group control panel to provide BMS contacts for mains failure and curtain zone deployment.

### **3.04 FIELD QUALITY CONTROL**



#### A. Field Tests and Inspections

1. Fire alarm testing, the smoke curtain is required to deploy upon a signal from the fire alarm in an emergency situation. The test to verify deployment shall be conducted in the presence of the authority having jurisdiction per NFPA guidelines.
2. When a smoke curtain is required to deploy in an emergency situation, it is probable that the main supply to the control panel may have already failed and that the cables linking the curtains to the control panel might have become damaged. Under these circumstances with no power available the curtain will have to deploy by gravity.
3. A total power failure should be simulated during each test to ensure gravity fail -safe deployment. A test in which a curtain is powered down under normal test conditions from either main power or the battery supply only proves that the curtain can be deployed when powered. This does not confirm an ability to be gravity fail safe.

### 3.05 CLOSEOUT ACTIVITIES

#### A. Demonstration:

1. Engage a factory-authorized service representative to test system.

#### B. Training:

1. Engage a factory-authorized service representative to train Owner's Personnel to rig, adjust, operate, and maintain automatic smoke curtains.

### 3.06 MAINTENANCE

- A. Engage a factory authorized service representative to test, adjust and maintain system once per annum required per NFPA 3 & NFPA 80.

END OF SECTION 10 52 00