

# **AUTOMATIC FIRE PROTECTIVE CURTAIN**

## **10 - Specialties**

SECTION 10 520 – Fire Protection Specialties

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

A. This Section includes automatic smoke & fire curtains-

- FC240 Fire Curtain
- FC 60 Fire Curtain
- SD 60 Smoke Curtain

B. Related Sections include the following:

- Division 5 Section "Metal Fabrications" for supplementary metal members supporting Smoke curtain systems to structure.
- Division 16 Sections for electrical wiring and connections and for smoke curtain machines. Division 16 Section "Fire Alarm" for connections of smoke curtain machines to fire alarm.

#### **1.3 STANDARDS & LISTING**

The system shall be Underwriters Laboratories Listed with the requirements of the following standards:

- A. EN12101-1 – Specification for smoke barriers.
- B. ANSI/UL 10B- "Fire Tests of Door Assemblies," Ninth Edition, April 1997, tenth Edition, April 2008, Time and Temperature Curves.
- C. ANSI/UL 555 "Fire Dampers" Sixth Edition, June 1999, Seventh Edition with revisions through and including February 2009.
- D. Standards, ANSI/UL 10C "Positive Pressure Fire Tests of Door Assemblies", First Edition, February 1998, Second Edition, January 2009.
- E. UL 10D Listed – Fire Protective Curtains
- F. UL 10D Oversize Certificate- Each curtain roller barrel shall have a UL listed oversize certificate for up to a 12 meter drop and 6 meters in width
- G. NFPA 92B- Standard for Smoke Management Systems in Mall, Atria and Large Spaces
- H. UL 864, Ninth Edition, Listed Control units and accessories for Fire Alarm Systems
- I. NFPA 72- Life Safety Code
- J. NFPA 70-National Electric code
- K. Air Leakage Test of Door Assemblies, UL 1784 (3<sup>rd</sup> Edition, Revised 2009)- S Label for smoke and draft assemblies optional with side guides

- L. The system shall operate under the power of gravity at all times to prove correct gravity fail-safe deployment.
- M. NFPA 105- "Installation of Smoke Door Assemblies and other opening protectives", NFPA 105 (Revision Date 8/17/2006, 2007 Edition).
- N. The system manufacturer shall be certified to ISO 9001 1994 for the design, manufacture, installation and commissioning of Automatic Smoke Barriers.

#### **1.4 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for automatic smoke curtains. Include plans, sections, details, attachments to other work, and the following:
  - Operating clearances.
  - Requirements for supporting automatic smoke curtains, track, and equipment. Verify capacity of each track and rigging component to support loads.
  - Locations of equipment components, switches, motors and controls. Differentiate between manufacturer-installed and field-installed wiring.
- C. Samples for Verification: 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 size indicated below.
  - Size: Not less than 36 inches (900 mm) square.
- D. Product Certificates: For each type of product, signed by product manufacturer.
- E. Qualification Data: For Installer. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Maintenance Data: For automatic curtains to include in maintenance manuals.
- G. Warranties: Special warranties specified in this Section.

#### **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: A firm or individual experienced in installing automatic smoke 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. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

#### **1.6 PROJECT CONDITIONS**

- A. Field Measurements: Verify smoke-curtain openings and the dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings.

## 1.7 WARRANTY

- A. Warranty Period: One year for all electronic parts and motors from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 AUTOMATIC SMOKE CURTAINS

- A. Construction:
  - The curtain head box shall be manufactured from 18 gauge galvanized steel. The enclosure shall be rated at the same temperature as the curtain fabric.
  - Removable cover plates shall be incorporated to allow access to the curtain rollers.
  - 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.
  - A suitably weighted bottom bar shall be provided to prevent deflection and ensure correct operation under gravity. A polycarbonate extrusion or steel t-bar shall be supplied as standard and shall be located in the profile formed in the bottom of the box.
  - The roller shall be constructed from an octagonal tube, in some circumstances and in accordance with testing a round tube, which will incorporate a 24v d.c. motor and gearbox and a sealed heavy duty ball bearing assembly.
  - A motor control circuit housed in a steel enclosure shall be mounted onto the motor end of the head box.
  - Provide each motorized curtain with back EMF controlled speed of descent of no less than 6 inches per second and no more than 24 inches per second.
  - The fabric curtain shall be manufactured from X32K woven glass fiber cloth incorporating a 'Panama' weave for increased stability. The fabric shall have a nominal weight of 540g/square meter and shall be tested to withstand temperatures of up to 1000C for a period of at least 60 minutes.
  - No limit switches for curtain ascent or descent required. Assembly must land on a horizontal assembly for UL listing for per UL 1784.
  - Products: Subject to compliance with requirements, provide the following:
    - SD60,FC60 & FC240 – Automatic Smoke Curtains as manufactured by BLE Smoke and Fire Curtains Ltd., Sheffield, England. U.S. Distributor
    - Colors: As selected by Architect from manufacturer's full range.
    - Manufacturers BLE Smoke & Fire Curtains. Sheffield. England. 0044 114 251 4703

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. 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.
- B. 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.

### **3.2 INSTALLATION, GENERAL**

- A. Install automatic smoke-curtain system according to fabricator's written instructions.

### **3.3 OPERATION**

- A. The smoke curtain shall deploy upon a signal from the fire alarm system in an emergency situation.
- B. The system must be proven to fail safe to the operational position on total loss of primary and auxiliary power.
- C. 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.
- D. 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.
- E. 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.
- F. Limit switches are not to be used to control the upper position of the curtain.
- G. An optional braking system must be available at the manufacture stage to allow a two stage descent during gravity deployment. Should the main power fail to the group control panel, the supply is automatically switched to the integral standby battery. The curtain remains in the retracted position for 1 hour (fully retracted) loaded system). 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.
- H. Group- Control Panel: Provide Group Control panel (GCP) capable of controlling up to 6 no. BLE24v 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 GCO 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.

- I. Open on fire- configured to be gravity fail safe
- J. Test Facility- key switch Indication- Green led= Mains Healthy; Yellow LED= Battery Fault; Red LED= Fuse Blown; Green LED= Fire alarm Status Normal

### **3.4 MONITORING**

- A. Monitoring relays shall be installed in the group control panel to provide BMS contacts for mains failure and curtain zone deployment.
- B. Monitoring relays shall be installed in the motor control circuits to provide BMS contacts for individual curtain deployment.

### **3.5 ACCEPTANCE TESTING**

- A. 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.
- B. 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.
- C. 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 smoke curtain can be deployed when powered. This does not confirm an ability to be gravity fail safe.

### **3.6 DEMONSTRATION**

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

### **3.7 ANNUAL TESTING & MAINTENANCE**

- A. Engage a factory authorized service representative to test, adjust and maintain system per NFPA 2009 and International Fire Code 2009.

END OF SECTION 10 520