SECTION 08 34 00

FIRE PROTECTIVE SMOKE CURTAINS

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\*\* NOTE TO SPECIFIER \*\* Door Systems; Fire protective smoke curtains.
This section is based on the products of Door Systems, which is located at:
1150 S. Las Brisas
Placentia, CA 92870
Toll Free Tel: 866-534-3667
Tel: 714-258-7100
Fax: 714-258-7171
Email: [request info (contact@doorsysinc.com)](https://arcat.com/rfi?action=email&company=Door%252BSystems&message=RE%253A%2520Spec%2520Question%2520(08348dsi)%253A%2520&coid=50183&spec=08348dsi&rep=&fax=714-258-7171)
Web: <https://www.doorsysinc.com>
 [ [Click Here](https://arcat.com/company/door-systems-50183) ] for additional information.
Door Systems provides innovative solutions for your smoke and fire containment needs as well as assisting in the concept, design, and layout of all future projects.
Whether you are an architect seeking consultation on a new construction project or a building owner/engineer looking to bring your existing facility up to code while reducing maintenance costs, the Door Systems staff is here to assist.
Door Systems products include DSI UL 10D Fire Protective Smoke Curtains, DSI UL 10B Hose Stream Rated Smoke and Fire Curtains, and Syntegra Integrated Fire Door Systems.
DSI-UL 10D FIRE PROTECTIVE SMOKE CURTAINS
The gravity fail-safe DSI UL 10D Smoke and Fire Protective Curtains have market leading features and the highest technical specifications available yet offer cost-effective and flexible solutions to fire and smoke control. Typically found in Elevators, Lobbies, Corridors, and Atriums.
DSI curtain systems are designed to be discreet, robust, and simple to operate and maintain, so a solution can be found for the most challenging architectural demands. Every smoke curtain and fire curtain from Door Systems, is rigorously tested and complies with all relevant UL standards allowing their incorporation into design throughout the United States.
DSI-UL 10B HOSE STREAM RATED SMOKE AND FIRE CURTAINS
The DSI-HS10B Hose Stream Rated Smoke and Fire Curtain incorporates the cutting-edge technology of our UL 10D curtain products but with the advantage of being code compliant in any fire wall rated up to 3 hours.
With a UL 10B 3-hour fire rating, the DSI-HS10B Fire Curtain can be used in fire walls and fire barrier walls as a replacement solution to traditional Coiling Steel Fire doors.
The assembly is comprised of a proprietary multi layered fire rated fiberglass/stainless steel fabric wound around a roller which is encased in a compact head box that is typically installed above the ceiling with side guides that are buried in the wall, making the system virtually invisible until activated.
THE SYNTeGRA INTEGRATED DOOR SYSTEM
The locally manufactured Syntegra Integrated Door System is created to include all working hardware and the door into a single integrated package. Syntegra completely integrates the steel door, hardware, and frame into a single working unit - no bolt-on or add-ons.
Precision-engineered, factory-assembled systems eliminate the need to order, coordinate, and site-assemble individual components. Code compliant, cost effective, unparalleled durability and superior aesthetics make the
Syntegra Integrated Door System the product of choice for architects and building owners.
By utilizing Door Systems products for your next new or renovation project, you will be acquiring the best, complete, single source solution for your smoke and fire protection requirements.
I invite you to review the full array of products and services we have to offer and look forward to assisting you with any questions you might have regarding your future needs.
Sincerely,
Jeff Bonnema, President

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. One-hour fire-rated Elevator Smoke Containment Systems. (DSI-600)
		2. One-hour fire-rated Smoke and Fire Curtains. (DSI-C1HR)
		3. Three-hour fire-rated Smoke and Fire Curtains. (DSI-C3HR)
		4. One or Three-hour rated Manual Smoke and Fire Curtains (DSI-M10D)
		5. Four-hour fire-rated Accordion Fire Curtains. (DSI-A4HR)
		6. Smoke-Draft Curtains. (DSI-D1HR)
		7. Three-hour fire rated Horizontal Fire Curtains (DSI-H3HR)
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 08 31 13 - Access Doors and Frames.
		2. Section 09 28 13 - Cementitious Backing Boards.
		3. Section 09 90 00 - Painting and Coating.
		4. Section 14 21 00 - Electric Traction Elevators.
		5. Section 14 24 00 - Hydraulic Elevators.
		6. Division 16 Sections - Detection and Alarm: Provision of smoke detectors.
		7. Division 16 Sections - 120 VAC and control circuit power including conduit, boxes, conductors, wiring devices, and emergency power.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
		2. ICC Evaluation Service Report ESR Acceptance Criteria for Smoke-Containment Systems Used With Fire-Resistive Elevator Hoist way Doors and Frames - AC-77.
		3. NFPA 70 - National Electrical Code.
		4. NFPA 105 - Recommended Practice for the Installation of Smoke-Control Door Assemblies.
		5. UL 10D - Standard for Fire Test for Protective Curtains.
		6. UL 864 - Standard for Classified Control Units for Fire Protective Signaling Systems.
		7. UL 1784 - Standard for Air Leakage Tests for Door Assemblies.
		8. Other UL Standards and Label Requirements:
			1. Impact test required, performed by independent testing laboratory.
			2. Gravity fail-safe design. No battery back-up will be required for deployment.
			3. UL follow up service report required.
		9. ISO 9001 1994 certified for the design, manufacturing, installation, and commissioning of Automatic Smoke Barriers and Partitions.
		10. OSHPD Anchorage Pre-Approved.
		11. California Department of Forestry and Fire Protection and Office of the State Fire Marshal.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data: Manufacturer's catalog cuts on each product to be used.
		3. Shop Drawings: Show fabrication and installation details for automatic smoke curtains. Include plans, sections details, attachments to other work and the following:
			1. Operating clearances.
			2. Requirements for supporting automatic smoke curtains, track, equipment.
			3. Locations of equipment components, switches, motors and controls. Differentiate between manufacturer-installed and field installed wiring.
		4. Quality Assurance/Control Submittals:
			1. Certifications: Copy of specified items.
			2. Manufacturer's installation instructions and testing procedures.
			3. Proof of Manufacturer qualifications.
			4. Proof of Installer qualifications.
		5. Closeout Submittals:
			1. Submit under provisions of Section 01 77 00 - Closeout Procedures.
			2. Operation and Maintenance Manual.
			3. Manufacturer's Warranties.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Minimum of five years' experience manufacturing smoke containment systems of the type specified.
			1. Manufacturer shall maintain a quality control program in accordance with ICC-ES Acceptance Criteria 77.
		2. Installer Qualifications: Factory trained by manufacturer.
		3. Certifications:

\*\* NOTE TO SPECIFIER \*\* Delete certifications that are not required by the text of the edited section.

* + - 1. Manufacturer's ICC Evaluation Service report ESR.
			2. Product must bear a UL label. "Tested in accordance to" standard not acceptable for fire rated smoke curtains. Intertek label not acceptable.
			3. Impact test report by independent laboratory.
			4. California Department of Forestry and Fire Protection and Office of the State Fire Marshal Listing.
			5. UL 1784 Labeled, listed, classified, certified and marked Smoke and Draft assembly with no more than an air leakage of 3 CFM.
			6. UL 864 Labeled, listed, classified, certified and marked control units and accessories for Fire Alarm Systems.
			7. UL Oversized certificate labeled, listed, classified, certified and marked.
			8. UL-10D One- or Three-Hour Fire Protective Curtain Listing Label.
			9. OSHPD Anchorage Pre-Approval.
	1. PRE-INSTALLATION MEETING
		1. Schedule and convene prior to commencement of field operations. Attendees or Representatives: Owner, Architect, General Contractor, smoke containment system sub-contractor, painting sub-contractor, and electrical sub-contractor.
		2. Review substrate conditions, requirements of related work, installation instructions, storage and handling procedures, and protection measures.
		3. Keep minutes of meeting including responsibilities of various parties and deviations from specifications and installation instructions.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Follow manufacturer's instructions.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	4. WARRANTY
		1. Provide manufacturer's standard one-year limited warranty.
		2. Maintenance and Testing:
			1. Perform minimum annual maintenance and testing on each smoke containment system as required by the manufacturer's warranty, code agency evaluation reports, and as required by local authority having jurisdiction.
			2. Provide test documentation.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Door Systems, which is located at:
		1150 S. Las Brisas
		Placentia, CA 92870
		Toll Free Tel: 866-534-3667
		Tel: 714-258-7100
		Fax: 714-258-7171
		Email: [request info (contact@doorsysinc.com)](https://arcat.com/rfi?action=email&company=Door%252BSystems&message=RE%253A%2520Spec%2520Question%2520(08348dsi)%253A%2520&coid=50183&spec=08348dsi&rep=&fax=714-258-7171);Web: <https://www.doorsysinc.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. PERFORMANCE REQUIREMENTS
		1. Air Leakage: Not to exceed 3 cfm (0.001416 cu m per sec) per sf of door opening.

\*\* NOTE TO SPECIFIER \*\* The first paragraph below applies to Model DSI 600. The second paragraph below applies to DSI-C1HR and DSI-C3HR. Delete paragraph not required.

* + 1. Fire Rating - UL-10D: The enclosure shall be rated at the same rating as the curtain fabric.
		2. Fire Rating - UL-10D: One and three hour fire rated and labeled.
		3. Electromagnetic Force Controlled Speed of Descent: From 6 to 24 inches (152 to 610 mm) per second for each motorized curtain.
		4. System must be proven to "fail safe" to operational position on total loss of primary and auxiliary power. System must contain a housed battery system at the Group Control Panels.
	1. SMOKE AND FIRE CURTAINS

\*\* NOTE TO SPECIFIER \*\* Delete smoke curtain options not required.

* + 1. One-Hour Fire-Rated Elevator Smoke Curtains: Model DSI-600 by Door Systems.
			1. Standard Head Box Sizes:

\*\* NOTE TO SPECIFIER \*\* Larger head boxes may be required if curtain drop exceeds ft 10 inches (2,997 mm). Contact the manufacturer for more information.

* + - * 1. Single Rollers: 7-1/2 x 7-1/2 inch (190.5 x 190.5 mm).

Maximum Width: 16 ft (4877 mm).

* + - * 1. Multiple Rollers: 12-1/2 x 7-1/2 inch (317.5 x 190.5 mm).

Width: Over 16 ft (4877 mm).

* + - 1. Weighted Bottom Bar: Prevents deflection. Ensures correct operation under gravity.
			2. Weight of Bottom: To be 1.5 lbs per per linear foot (2.26 kg per m) for curtain to meet secondary means of egress for compliance with ICC ES requirements.
			3. Side Guide Rails (DxW): 2 x 4 inch (51 x 102 mm), primed steel finish.
			4. Fabric Grab Strap: Mounted on the inside of curtain for easy lifting egress.
			5. Curtain Fabric: VG455 woven glass fiber cloth.
				1. Nominal Weight: No less than 0.093 lbs per sq ft (455 grams per sq m).
				2. 10D UL Listed Fire Rating: One hour.
				3. UL 1784 Air Leakage: Not to exceed 3 cfm (0.001416 cu m per sec) per sf of door opening.
			6. Push to Exit Buttons: Must contain internal battery back-up power supply for fail safe operation for ICC ES requirements.
		1. One-Hour Fire-Rated Automatic Smoke Curtains: Model DSI-C1HR by Door Systems.
			1. Standard Head Box Sizes:

\*\* NOTE TO SPECIFIER \*\* Larger head boxes may be required if curtain drop exceeds 9 ft 10 inches (2,997 mm). Contact the manufacturer for more information.

* + - * 1. Single Rollers: 7-1/2 x 7-1/2 inch (190.5 x 190.5 mm).

Maximum Width: 16 ft (4877).

* + - * 1. Multiple Rollers: 12-1/2 x 7-1/2 inch (317.5 x 190.5 mm).

Width: Over 16 ft (4877 mm).

* + - 1. Weighted Bottom Bar: Prevents deflection. Ensures correct operation under gravity.
			2. Side Guide Rails (DxW): 2 x 4 inch (51 x 102 mm), primed steel finish.
			3. Curtain Fabric: VG455 woven glass fiber cloth.
				1. Nominal Weight: No less than 0.093 lbs per sq ft (455 grams per sq m).
				2. 10D UL Listed Fire Rating: One hour.
				3. UL 1784 Air Leakage: Not to exceed 3 cfm (0.001416 cu m per sec) per sf of door opening.

\*\* NOTE TO SPECIFIER \*\* Fabric egress slot is optional. Delete if not required.

* + - 1. Fabric Egress Slot: In fabric curtain. Outlined by stenciling.
		1. Three-Hour Fire-Rated Automatic Smoke Curtains: Model DSI-C3HR by Door Systems.
			1. Standard Head Box Sizes:

\*\* NOTE TO SPECIFIER \*\* Larger head boxes may be required if curtain drop exceeds 9 ft 10 inches (2,997 mm). Contact the manufacturer for more information.

* + - * 1. Single Rollers: 7-1/2 x 7-1/2 inch (190.5 x 190.5 mm).

Maximum Width: 16 ft (4877)

* + - * 1. Multiple Rollers: 12-1/2 x 7-1/2 inch (317.5 x 190.5 mm).

Width: Over 16 ft (4877 mm).

* + - 1. Weighted Bottom Bar: Prevents deflection. Ensures correct operation under gravity.
			2. Side Guide Rails (DxW): 2 x 4 inch (51 x 102 mm), primed steel finish.
			3. Curtain Fabric: VWG690 woven glass cloth.
				1. Nominal Weight: No less than 0.141 lbs per sq ft (690 grams per sq m).
				2. 10D UL Listed Fire Rating: Three hours.
				3. UL 1784 Air Leakage: Not to exceed 3 cfm (0.001416 cu m per sec) per sf of door opening.

\*\* NOTE TO SPECIFIER \*\* Fabric egress slot is optional. Delete if not required.

* + - 1. Fabric Egress Slot: In fabric curtain. Outlined by stenciling.
		1. Fire-Rated Manual Smoke Curtains: Manual Hose Stream Smoke and Fire Curtain.

\*\* NOTE TO SPECIFIER \*\* Delete model option not required.

* + - 1. Model DSI-M1HR10D: One hour rating.
			2. Model DSI-M3HR10D: Three hour rating.
			3. Standard Head Box Sizes:

\*\* NOTE TO SPECIFIER \*\* Larger head boxes may be required if curtain drop exceeds 9 ft 10 inches (2,997 mm). Contact the manufacturer for more information.

* + - * 1. Single Rollers: 7 x 7 inch (178 x 178 mm).

Maximum Width: 16 ft (4877).

* + - 1. Weighted Bottom Bar: Prevents deflection. Ensures correct operation under gravity.
			2. Side Guide Rails (DxW): 2 x 2 inch (51 x 51 mm), primed steel finish.
			3. Curtain Fabric: VWG690 woven glass cloth.
				1. Nominal Weight: No less than 0.141 lbs. per sq ft (690 grams per sq m).
				2. 10D UL Listed Fire Rating: One or Three hours.
				3. UL 1784 Air Leakage: Not to exceed 3 cfm (0.001416 cu m per sec) per sf of door opening.
			4. System Deployment: Upon activation of a replaceable fusible link with a temperature rise and melting point of 165 degrees F (74 degrees C) in an emergency situation.
			5. System must be "fail safe" to the operational position.
			6. Normal Operating Conditions: Curtain is held in the retracted position via fusible link.
			7. Fabric Fire Curtain Retraction: Manually rewind the curtains to the upper position.
			8. Should the Fusible Link Break or Melt: Curtain safely gravity descends to the closed position.
		1. Four-Hour Fire-Rated Accordion Fire Curtains: Model DSI-A4HR by Door Systems.
			1. Curtain Head Box: The curtain head box shall be manufactured from 18 gage (1.2 mm) galvanized steel. The enclosure shall be rated at the same temperature as the curtain fabric.
				1. Removable Cover Plates: Allow access to curtain rollers.

\*\* NOTE TO SPECIFIER \*\* Larger head boxes may be required if curtain drop exceeds 9 ft 10 inches (2,997 mm). Contact the manufacturer for more information.

* + - 1. Standard Head Box Sizes: No more than 12 inches (305 mm) tall.
			2. Weighted Bottom Tray: Prevents deflection. Ensures correct operation under gravity.
			3. Curtain Fabric: VWG690 woven glass cloth.
				1. Nominal Weight: No less than 0.141 lbs per sq ft (690 g per sq m).
				2. 10D UL Listed Fire Rating: One or Three hours.
		1. Automatic Smoke and Draft Curtains: Model DSI-D1HR by Door Systems.
			1. Standard Head Box Sizes:

\*\* NOTE TO SPECIFIER \*\* Larger head boxes may be required if curtain drop exceeds 9 ft 10 inches (2,997 mm). Contact the manufacturer for more information.

* + - * 1. Single Rollers: 7-1/2 x 7-1/2 inch (190.5 x 190.5 mm).

Maximum Width: 16 ft (4877 mm)

* + - * 1. Multiple Rollers: 12-1/2 x 7-1/2 inch (317.5 x 190.5 mm).

Width: Over 16 ft (4877 mm).

* + - 1. Curtain Fabric: VG455 woven glass fiber cloth.
				1. Nominal Weight: No less than 0.093 lbs per sq ft (455 g per sq m).
				2. 10D UL Listed Fire Rating: One hour.
		1. Three-Hour Fire-Rated Horizontal Fire Curtains: Model DSI-H3HR by Door Systems.
			1. Curtain Head Box: The curtain head box shall be manufactured from 18 gage (1.2 mm) galvanized steel. The enclosure shall be rated at the same temperature as the curtain fabric.
				1. Removable Cover Plates: Allow access to curtain rollers.

\*\* NOTE TO SPECIFIER \*\* Maximum width of 22 feet (6706 mm). Maximum length may vary. Contact the manufacturer for more information.

* + - 1. Standard Head Box Sizes: No more than 20 inches (508 mm) tall.
			2. Weighted Bottom Bar: Prevents deflection. Ensures correct operation under gravity.
			3. Curtain Fabric: VWG690 woven glass cloth.
				1. Nominal Weight: No less than 0.141 lbs per sq ft (690 g per sq m).
				2. 10D UL Listed Fire Rating: Three hours.
	1. COMPONENTS
		1. Curtain Head Box Enclosure: 18 gage (1.2 mm) galvanized steel. Rated at same temperature as curtain fabric.
		2. Removable Cover Plates: Incorporated to allow access to curtain rollers.
		3. Weighted Bottom Bar: Prevents deflection. Ensures correct operation under gravity.
		4. Roller: Constructed from octagonal tube. Incorporates a 24 VDC motor, gearbox, and a sealed heavy duty ball bearing assembly.
		5. Motor Control Circuit: Housed in steel enclosure mounted on motor end of head box.
		6. Motorized Curtain Electromagnetic Force Controlled Speed of Descent:
			1. Minimum: 6 inches (152 mm) per second.
			2. Maximum: 24 inches (610 mm) per second.
		7. Housed Battery System: Must be incorporated in the Group Control Panels for operation during total power loss conditions.
		8. Label each smoke containment system with the following information:
			1. Manufacturer's name.
			2. Maximum leakage rating at specified pressure and temperature conditions.
			3. Label of quality control agency.
	2. OPERATION
		1. Smoke and Fire Curtain Deployment: Upon signal from fire alarm system in emergency situation.
		2. Total Loss of Primary and Auxiliary Power: System must be proven to "fail safe" to the operational position.
		3. Normal Operating Conditions: Curtains held in retracted position via motors operating at low voltage. Manufacture must confirm motor windings are suitable for this type of operation.
		4. Upon Activation of Fire Alarm: Control panel removes supply voltage and the curtain descends under power of gravity in a controlled manner.
			1. Descent Speed Control: Dynamic braking system housed in motor control circuit. Descent is electronically synchronized on overlapping curtains with a bottom bar.
		5. Curtain Retraction: Control panel supplies 24 V to motor control circuits. Motors drive curtains to the upper position. When the bottom or stopping bar contacts the curtain head box, a current limiting circuit steps back the voltage and current, holding curtain in the retracted position.
		6. Limit switches must not be used to control the upper position of the curtain.

\*\* NOTE TO SPECIFIER \*\* Braking system is optional. Delete if not required.

* + 1. Braking System: Two stage descent during gravity deployment. If main power to group control panel fails, power is automatically switched to the integral standby battery.
			1. Curtain remains in retracted position for 1 hour (fully retracted loaded system).
			2. Curtain remains fully operational until battery low voltage cut off facility reads a voltage of 21 V. Curtains then safely descend under gravity power to operational position.
		2. Group Control Panel: Provide Group Control Panel (GCP) capable of controlling up to 5 no. 24v motor assemblies.
			1. During Normal Operation: GCP provides 24 VAC supply to the curtain motor holding curtains in the retracted position.
			2. Upon Smoke Detection: The GCP fire alarm contact is opened by the fire alarm control system. The GCP removes the 24 V supply to curtain motors and curtains descend under the power of gravity in a controlled manner.
		3. Open on Fire: Configured to be gravity fail safe.
		4. Test Facility: Key switch required.
		5. Push to Exit Buttons: Must contain internal battery back-up power supply for fail safe operation for ICC ES requirements.
		6. Weight of Bottom: 1.5 pounds per foot (2.23 kg per meter) of curtain for secondary means of egress for compliance with ICC ES requirements.
1. EXECUTION
	1. EXAMINATION
		1. Verify related work performed under other sections is complete and in accordance with Shop Drawings.
		2. Verify wall surfaces and elevator door frames are acceptable for installation of smoke containment system components.
	2. INSTALLATION
		1. Install smoke containment system components in accordance with manufacturer's installation instructions.
	3. FIELD QUALITY CONTROL
		1. Field Test: Follow manufacturer's cycle test procedures.
			1. Notify Owner's Representative, local Fire Marshal, alarm subcontractor a minimum one week in advance of scheduled testing.
			2. Complete maintenance service record.
	4. DEMONSTRATION
		1. Demonstrate required testing and maintenance procedures to Owner's Representative.
		2. Maintenance and Testing:
			1. Perform minimum annual maintenance and testing on each smoke and fire curtain system as required by the manufacturer's warranty, code agency evaluation reports, and as required by local authority having jurisdiction.
			2. Retain permanent record of tests.
		3. Qualified Door Systems, Inc Inspector assesses units after exposure to a fire event.
	5. MAINTENANCE
		1. Engage a Door Systems authorized service representative to test, adjust and maintain the system once per annum as required per NFPA 101 and NFPA 80.

END OF SECTION