

ACCEPTANCE CRITERIA FOR SMOKE-CONTAINMENT SYSTEMS USED WITH FIRE-RESISTANCE-RATED ELEVATOR HOISTWAY DOORS AND FRAMES

AC77

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Evaluation reports issued by ICC Evaluation Service, LLC (ICC-ES), are based upon performance features of the International family of codes. (Some reports may also reference older code families such as the BOCA National Codes, the Standard Codes, and the Uniform Codes.) Section 104.11 of the *International Building Code*® reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

This acceptance criteria has been issued to provide interested parties with guidelines for demonstrating compliance with performance features of the codes referenced in the criteria. The criteria was developed through a transparent process involving public hearings of the ICC-ES Evaluation Committee, and/or on-line postings where public comment was solicited.

New acceptance criteria will only have an “approved” date, which is the date the document was approved by the Evaluation Committee. When existing acceptance criteria are revised, the Evaluation Committee will decide whether the revised document should carry only an “approved” date, or an “approved” date combined with a “compliance” date. The compliance date is the date by which relevant evaluation reports must comply with the requirements of the criteria. See the ICC-ES web site for more information on compliance dates.

If this criteria is a revised edition, a solid vertical line (|) in the margin within the criteria indicates a technical change from the previous edition. A deletion indicator (→) is provided in the margin where wording has been deleted if the deletion involved a technical change.

ICC-ES may consider alternate criteria for report approval, provided the report applicant submits data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. ICC-ES retains the right to refuse to issue or renew any evaluation report, if the applicable product, material, or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause injury or unreasonable damage.

NOTE: The Preface for ICC-ES acceptance criteria was revised in July 2011 to reflect changes in policy.

Acceptance criteria are developed for use solely by ICC-ES for purpose of issuing ICC-ES evaluation reports.

ACCEPTANCE CRITERIA FOR SMOKE-CONTAINMENT SYSTEMS USED WITH FIRE-RESISTANCE-RATED ELEVATOR HOISTWAY DOORS AND FRAMES (AC77)

1.0 INTRODUCTION

1.1 Purpose: The purpose of this criteria is to establish the basis for recognition in ICC Evaluation Service, LLC (ICC-ES), evaluation reports of smoke-containment systems as tight-fitting, smoke and draft control assemblies under Section 716.5.3 of the 2012 *International Building Code*[®] (IBC), Section 715.4.3 of the 2009 IBC, and Section 715.4.3 of the 2006 IBC, when maintained, inspected and tested in accordance with Sections 107 and 703 of the 2012, 2009 and 2006 *International Fire Code*[®] (IFC). The reason for this criteria is the absence of referenced standards within the IBC and IFC upon which to determine code compliance, therefore this subject is an alternative material to what is prescribed in the codes. Bases of recognition are IBC Section 104.11 and IFC Section 104.9.

1.2 Scope: The systems are used with fire-resistance-rated elevator hoistway doors and frames or as smoke curtain systems installed remotely from the hoistway door at the intersection of the elevator lobby and corridor. Use of either type of system would permit deletion of the separated elevator lobby required under Section 713.14.1 of the 2012 *International Building Code*[®] (IBC), Section 708.14.1 of the 2009 IBC and Section 707.14.1 of the 2006 IBC

Systems tested in accordance with UL 10C (see exception to Section 3.9) are recognized for use as alternatives to a 20-minute fire door assembly complying with the requirements of Sections 716.5.3 and 716.5.3.1 of the 2012 IBC and Sections 715.4.3 and 715.4.3.1 of the 2009 and 2006 IBC.

1.3 Reference Standards: Where standards are referenced in this criteria, these standards shall be applied consistently with the code (IBC or IFC) upon which compliance is based. Standard editions applicable to the IBC are summarized in Table 1. Standards applicable to the IFC are summarized in Table 2.

1.3.1 2012, 2009 and 2006 *International Building Code*[®] (IBC), International Code Council.

1.3.2 2012, 2009, and 2006 *International Fire Code*[®] (IFC), International Code Council.

1.3.3 ANSI A 117.1, American National Standards Institute.

1.3.4 ASTM D 412, Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension, ASTM International.

1.3.5 ASTM D 1434, Determining Gas Permeability Characteristics of Plastic Film and Sheeting, ASTM International.

1.3.6 ASTM D 1876, Peel Resistance of Adhesives (T-Peel Test), ASTM International.

1.3.7 ASTM E 84, Surface Burning Characteristics of Building Materials, ASTM International.

1.3.8 UL 10B, Fire Tests of Door Assemblies, Underwriters Laboratories Inc.

1.3.9 UL 10C, Standard for Positive Pressure Fire Tests of Door Assemblies, Underwriters Laboratories Inc.

1.3.10 UL 1784, Air Leakage Tests of Door assemblies, Underwriters Laboratories Inc.

1.3.11 UL 228, Door Closers With and Without Integral Smoke Detectors, Underwriters Laboratories Inc.

1.3.12 UL 268, Smoke Detectors for Fire Alarm Signaling Systems, Underwriters Laboratories Inc.

1.3.13 UL 864, Standards for Control Units and Accessories for Fire Alarm Signaling Systems, Underwriters Laboratories Inc.

1.3.14 NFPA 70, National Electrical Code, National Fire Protection Association.

1.3.15 NFPA 80, Fire Doors and Other Opening Protectives, National Fire Protection Association.

1.3.16 NFPA 105, Installation of Smoke-Control Door Assemblies, National Fire Protection Association.

1.3.17 NFPA 258, Determining Smoke Generation of Solid Materials, National Fire Protection Association.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 General information on the manufacturing process.

2.1.2 Dimensioned drawings and details noting size, component material types and materials, configuration and installation instructions.

2.1.3 Method of field adjustment.

2.1.4 Inspection and maintenance schedule.

2.1.5 Maximum temperature exposure necessitating replacement.

2.1.6 Installation instructions and details. The instructions shall address the need to field test the system for proper operation after installation.

2.2 Product Identification: Each smoke-containment system shall be identified as follows:

2.2.1 The manufacturer's or private labeler's name.

2.2.2 Reference to installation instructions.

2.2.3 Maximum leakage rating at the specified pressure and temperature conditions (cfm/square foot of door opening).

Exception: Where information specified in Section 2.2.3 is in installation instructions attached to, or packaged with, the product, the above information need not be on the smoke-containment system.

ACCEPTANCE CRITERIA FOR SMOKE-CONTAINMENT SYSTEMS USED WITH FIRE-RESISTANCE-RATED ELEVATOR HOISTWAY DOORS AND FRAMES (AC77)

2.2.4 Type of door assembly for which smoke-containment system is intended.

Exception: If each product includes the information specified in Section 2.2.4 with installation instructions that are attached to, or packaged with, the product, the information need not be on the smoke-containment system.

2.2.5 If a product is manufactured at several locations, each piece shall be distinctively marked to identify origin.

2.2.6 Label of the approved inspection agency.

2.2.7 The ICC-ES evaluation report number.

2.3 Testing Laboratories, Test Reports and Product Sampling:

2.3.1 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85), and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3.2 Test Reports: Test reports shall comply with AC85.

2.3.3 Product Sampling: Sampling of the smoke-containment system components for tests under this criteria shall comply with Section 3.1 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 Materials: The smoke-containment system shall comply with the requirements of either Section 3.1.1, 3.1.2, 3.1.3 or 3.1.4:

3.1.1 The smoke-containment film shall be a minimum 1-mil-thick [0.001 inch (0.025 mm)] transparent polyamide meeting the following requirements:

3.1.1.1 The film shall be reinforced with 100 denier nomex yarn spaced $\frac{1}{4}$ inch (6.4 mm) each way. The reinforcing fill yarn shall be attached to the film and overlap the unadhered reinforcing warp yarn. The bond between the yarn and the film shall be at least 2 pounds per inch (0.35 N/mm) when tested according to ASTM D 1876.

3.1.1.2 The film shall be connected along its length to a $2\frac{1}{2}$ -inch-wide-by-0.125-inch-thick (63.5 mm by 3.2 mm) PM14 multi-pole flexible magnet of energized ferrite in a nitrile rubber binder exerting minimum 1.4 MGOe of force. The multipoles shall be oriented along the length, perpendicular to the magnet width.

3.1.1.3 The film and magnets shall be connected with a 0.5-inch-wide-by-0.125-inch-thick (12.7 mm by 3.2 mm) continuous joint of low-modulus silicone.

3.1.1.4 The smoke-containment film shall have a flame-spread index of 25 or less and a smoke-developed rating of 50 or less when tested in accordance with ASTM E 84.

3.1.1.5 The film shall maintain its physical properties after exposure to accelerated aging and certain chemicals. The test methods shall be approved by ICC-ES before the tests are conducted.

3.1.1.6 The smoke-containment system shall be tested and comply with the requirements set forth in Sections 3.2, 3.3, 3.4.1 and 3.5 through 3.8.

3.1.2 The smoke-containment curtain shall be a minimum 2.5-mil-thick [0.0025 inch (0.64 mm)] silica cloth curtain coated with urethane-based resin on one side and complying with the following requirements:

3.1.2.1 The curtain shall be comprised of silica fabric panels stitched together horizontally with twisted stainless steel threads. The stitched seams shall be able to withstand a minimum pressure of 3.1 pounds per square foot (150 Pa).

3.1.2.2 The curtain shall have a flame-spread index of 25 or less and a smoke-developed rating of 50 or less when tested in accordance with ASTM E 84.

3.1.2.3 The curtain shall be attached to a horizontal steel winding shaft at the top and set in a frame assembly consisting of a horizontal steel bottom bar assembly and vertical steel guide rails that capture the edge of the curtain. Steel mounting plates attached at the tops of the guide rails support the winding shaft and provide a structure for the attachment of a sheet metal hood. A woven glass-fiber cloth smoke seal is provided on both sides of the head. Secondary components of the assembly include steel locking bolts at the edge of the curtain to retain it in the guides, steel bracket anchors and steel guide rail anchors.

3.1.2.4 The smoke-containment system shall be tested and comply with the requirements set forth in Sections 3.2, 3.4.2 and 3.6 through 3.9.

3.1.3 The smoke curtain system shall consist of a smoke-containment film that is a minimum 3-mil-thick [0.003 inch (0.076 mm)] PTFE-coated glass-fiber or para-aramid meeting the following requirements:

3.1.3.1 The film shall consist of separate PTFE-coated glass-fiber or para-aramid sheets, joined horizontally by heat sealing.

3.1.3.2 The smoke-containment film shall be connected to the drive system utilizing vertical edge containment loops on either side of the curtain. The loops slide over vertical guide rods contained within the side rails. A narrow vertical slot in each side rail prevents the screen/guide rod assembly from disengaging the side rail.

3.1.3.3 The side rails attach from floor to ceiling on both sides of the opening to be protected. The top portion of the rails also attach to the units housing for the purpose of aligning drive components.

3.1.3.4 The curtain is mechanically operated up and down by an electric drive motor that turns a bearing supported axle running the length of the housing, and pulleys engaging toothed drive belts and contained within the side rails adjacent to the screen guide rods. The toothed drive belt and pulleys at the end of the axle actuate loops in the drive belt. When the belt is activated, the bottom bar of the smoke curtain lowers from the housing as a screen roller tube feeds out the smoke curtain.

ACCEPTANCE CRITERIA FOR SMOKE-CONTAINMENT SYSTEMS USED WITH FIRE-RESISTANCE-RATED ELEVATOR HOISTWAY DOORS AND FRAMES (AC77)

3.1.3.5 An egress switch that complies with ANSI A 117.1 for operation of a powered door shall be located on both sides of the smoke curtain.

3.1.3.6 The smoke-containment film shall have a flame-spread index of 25 or less and a smoke-developed rating of 50 or less when tested in accordance with ASTM E 84.

3.1.3.7 The smoke-containment system shall be tested and comply with the requirements set forth in Sections 3.2, 3.4.1 and 3.5 through 3.8.

3.1.4 The smoke containment curtain shall be a minimum 2.5-mil-thick [0.0025 inch (0.65 mm)] silica cloth, coated on one side with acrylic resin and complying with the following requirements:

3.1.4.1 The curtain shall be comprised of silica cloth panels stitched together vertically with twisted stainless steel threads. The acrylic resin coating shall have a minimum coverage of 2.36 ounces per square foot (80 g/m²). The stitched seams shall be able to withstand a minimum pressure of 3.1 pounds per square foot (150 Pa).

3.1.4.2 The curtain material shall be connected along its length to a 3¹/₂-inch-wide-by-0.124-inch-thick (83 mm by 3.2 mm) multi-pole magnet of energized ferrite in an nitrile rubber binder exerting a minimum 1.4 MGOe force. The multipoles shall be oriented along the length perpendicular to the magnet width.

3.1.4.3 The curtain material shall completely cover the magnets and shall be joined by stitching (2X) along the full length of the magnet.

3.1.4.4 Between the magnet and the curtain material a 4³/₄-inch-wide-by-⁵/₆₄-inch-thick heat expansion material consisting of intumescent graphite encapsulated in a butyl rubber sheet shall be enclosed along the full length of the magnet. The edges of the magnet shall be protected by ³/₄-inch-wide-by-⁹/₆₄-inch-thick (20 mm x 2 mm) of the same material. The heat expansion material shall have the capability of expanding a minimum of 10 times the original material thickness.

3.1.4.5 At variable positions along the magnet length bi-metallic shape memory alloy strips consisting of Nickel – titanium and measuring 2³/₄-inch-wide-by-³/₁₆-inch-high-by-¹/₆₄-inch-thick (70mm by 5mm by 0.5mm) shall be riveted horizontally on the elevator side of the curtain. The bi-metallic strips shall activate at a maximum temperature of 212°F (100°C). When heated, the bi-metallic strips shall expand differentially into a concave shape and grasp specially shaped auxiliary rails after which the intumescent material expands to protect the magnet and bimetallic strips.

3.1.4.6 The curtain shall have a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84.

3.1.4.7 The smoke containment system shall be tested and comply with the requirements set forth in Sections 3.2, 3.4.1 (excluding Sections 3.4.1.6.1.3 through 3.4.1.6.1.6) and 3.6 through 3.9.

3.2 Air Leakage: The rate of air leakage through the smoke-containment system shall be determined at 0.1

inch (25 Pa), 0.2 inch (50 Pa) and 0.3 inch (75 Pa) water pressure differential when tested to the performance requirements of UL 1784. Tests include cycling and air leakage at ambient and elevated [400°F (204°C)] temperatures.

Conditions of Acceptance: The air leakage rating at both ambient and elevated [400°F (204°C)] temperatures shall not exceed 3.0 cfm (14.16 × 10⁻⁴) per square foot of opening at 0.1 inch water pressure (25 Pa) difference.

3.3 Expansion Characteristics: The total expansion of the smoke-containment system shall be determined at 0.3 inch water pressure (75 Pa) differential at both ambient and elevated [400°F (204°C)] temperatures.

Conditions of Acceptance: The smoke-containment system cannot expand more than 6 inches (152 mm) at this pressure difference at ambient or elevated [400°F (204°C)] temperatures.

3.4 Cycling: The smoke-containment system shall be cycled according to one of the following methods.

3.4.1 Standard Test Method for Cyclic Movement of Rolling Magnetic Gasket Systems:

3.4.1.1 Purpose: To determine the cyclic movement of the rolling magnetic gasket system.

3.4.1.1.1 This test method is applicable to rolling magnetic gasket systems used to prevent the infiltration of air and smoke through an entrance or exit way.

3.4.1.2 Apparatus:

3.4.1.2.1 Any arrangement of equipment capable of performing the test procedure within the allowable tolerances is permitted.

3.4.1.2.2 Mounting Frames: No. 14 gage ferrous metal frames shall have a 2-inch-wide (51 mm) profile. Frame shall be blind attached to the wall.

3.4.1.3 Test Specimens: Three full size samples shall be used. The temperatures within the laboratory shall be 73.4°F ± 3.6°F (23°C ± 2°C).

3.4.1.4 Mounting: The system is mounted above test frame according to the manufacturer's written installation instructions. The resulting installation shall be plumb and square.

3.4.1.5 Procedure: Emergency alarm contacts are first energized, allowing the curtain to drop, completely covering the opening. The rewind contacts are next energized, allowing the curtain to roll into container, completely unseating the gasket material.

The door is closed. The curtain is visually inspected after each set of 50 full cycles. The container and frame are visually inspected after each set of 100 full cycles.

3.4.1.6 Visual Inspection:

3.4.1.6.1 Immediately following each set of 50 full cycles, the curtain is visually inspected for the following signs of fatigue:

3.4.1.6.1.1 Visual metal fatigue.

3.4.1.6.1.2 Cracks or creases in film.

ACCEPTANCE CRITERIA FOR SMOKE-CONTAINMENT SYSTEMS USED WITH FIRE-RESISTANCE-RATED ELEVATOR HOISTWAY DOORS AND FRAMES (AC77)

3.4.1.6.1.3 Loss of reinforcing yarn adhesion.

3.4.1.6.1.4 Loss of sealant joint adhesion.

3.4.1.6.1.5 Stretching of sealant joint.

3.4.1.6.1.6 Loss of laminating adhesive.

3.4.1.6.1.7 Misalignment of curtain reel at threshold.

3.4.1.6.1.8 Misaligned rolling relative to the test frame.

3.4.1.6.2 Immediately following each set of 100 full cycles, the curtain is visually inspected for the following signs of fatigue:

3.4.1.6.2.1 Visual metal fatigue.

3.4.1.6.2.2 Warpage of door.

3.4.1.6.2.3 Visual damage to hinge, latch or door stay.

3.4.1.6.3 Immediately following each set of 100 full cycles, the test frame is visually inspected for visual wear.

3.4.1.7 **Conditions of Acceptance:** The smoke-containment system shall demonstrate no fatigue after completing 100 cycles. The system shall continue to function without impairment.

3.4.2 Standard Test Method for Cyclic Movement of Coiling Curtain Systems:

3.4.2.1 **Purpose:** To determine the cyclic movement of the coiling curtain system.

3.4.2.1.1 This test method is applicable to coiling curtain systems described in Section 3.1.2 used to prevent the infiltration of air and smoke through an entrance or exit.

3.4.2.2 Apparatus:

3.4.2.2.1 Any arrangement of equipment capable of performing the test procedure within the allowable tolerances is permitted.

3.4.2.2.2 **Guide Rails:** Minimum No. 16 gage steel plate, of the manufacturer's standard profile and size. Frame shall be attached to the wall in accordance with the manufacturer's standard installation instructions.

3.4.2.3 **Test Specimens:** Three full-size samples shall be used. The temperature within the laboratory shall be 73.4°F ± 3.6°F (23°C ± 2°C).

3.4.2.4 **Mounting:** The system is mounted above the test frame according to the manufacturer's written installation instructions. The resulting installation shall be plumb and square.

3.4.2.5 **Procedure:** Emergency alarm contacts are first energized, allowing the curtain to drop, completely covering the opening. The alarm contacts are de-energized and the release mechanism is reset and the curtain is rolled back into the initial open position.

The door is closed. The curtain is visually inspected after each set of 50 full cycles. The container and frame are visually inspected after each set of 100 full cycles.

3.4.2.6 Visual Inspection:

3.4.2.6.1 Immediately following each set of 50 full cycles, the curtain is visually inspected for the following signs of fatigue:

3.4.2.6.1.1 Cracks or creases in the fabric.

3.4.2.6.1.2 Curtain edge retention in the vertical guiderails.

3.4.2.6.1.3 Misalignment of the bottom bar at threshold.

3.4.2.6.1.4 Misaligned rolling relative to the test frame.

3.4.2.6.2 Immediately following each set of 100 full cycles, the curtain is visually inspected for the following signs of fatigue:

3.4.2.6.2.1 Cracks or creases in the fabric.

3.4.2.6.2.2 Warpage of curtain or frame.

3.4.2.6.2.3 Visual damage to entire assembly.

3.4.2.6.3 Immediately following each set of 100 full cycles, the test frame is visually inspected for visual wear.

3.4.2.7 **Conditions of Acceptance:** The smoke-containment system shall demonstrate no fatigue after completing 100 cycles. The system shall continue to function without impairment.

3.4.3 Standard Test Method for Cyclic Movement of Smoke Curtain Systems:

3.4.3.1 **Purpose:** To determine the cyclic movement of the smoke-containment system.

3.4.3.1.1 This test method is applicable to smoke-containment systems described in Section 3.1.3 used to prevent the infiltration of air and smoke through an entrance or exit.

3.4.3.2 Apparatus:

3.4.3.2.1 Any arrangement of equipment capable of performing the test procedure within the allowable tolerances is permitted.

3.4.3.2.2 **Mounting Frames:** For systems described in Section 3.1.1, the frame shall consist of No. 14 gage ferrous metal frames having a 2-inch-wide (51 mm) profile. The frame shall be blind-attached to the wall. For the systems described in Sections 3.1.2 and 3.1.3, the system shall be mounted in accordance with the system manufacturer's instructions.

3.4.3.3 **Test Specimens:** Three full-size samples shall be used. The temperature within the laboratory shall be 73.4°F ± 3.6°F (23°C ± 2°C).

3.4.3.4 **Mounting:** The system is mounted above the test frame according to the manufacturer's written installation instructions. The resulting installation shall be plumb and square.

3.4.3.5 **Procedure:** Emergency alarm contacts are first energized, allowing the curtain to drop, completely covering the opening. The rewind contacts are next

ACCEPTANCE CRITERIA FOR SMOKE-CONTAINMENT SYSTEMS USED WITH FIRE-RESISTANCE-RATED ELEVATOR HOISTWAY DOORS AND FRAMES (AC77)

energized, allowing the curtain to roll into container, completely unseating the gasket material.

The curtain is visually inspected, with the curtain in the closed position, after each set of 50 full cycles. The container and frame are visually inspected after each set of 100 full cycles.

3.4.3.6 Visual Inspection:

3.4.3.6.1 Immediately following each set of 50 full cycles, the curtain is visually inspected for the following signs of fatigue:

3.4.3.6.1.1 Visual metal fatigue.

3.4.3.6.1.2 Cracks or creases in film.

3.4.3.6.1.3 Loss of fabric adhesion.

3.4.3.6.1.4 Misalignment of curtain reel at threshold.

3.4.3.6.1.5 Misaligned rolling relative to the test frame.

3.4.3.6.2 Immediately following each set of 100 full cycles, the curtain is visually inspected for the following signs of fatigue:

3.4.3.6.2.1 Visual metal fatigue.

3.4.3.6.2.2 Warpage of door.

3.4.3.6.2.3 Visual damage to operable components.

3.4.3.6.3 Immediately following each set of 100 full cycles, the test frame is visually inspected for visual wear.

3.4.3.7 Conditions of Acceptance: The smoke-containment system shall demonstrate no fatigue after completing 100 cycles. The system shall continue to function without impairment.

3.5 Motor: The motor shall be evaluated and listed as required by NFPA 70, the National Electrical Code.

3.6 Release Mechanisms: Components of release mechanisms shall be recognized by an independent testing agency accredited by the International Accreditation Service, Inc. (IAS). Releasing devices shall be tested and listed in accordance with UL 864.

3.7 Smoke Detector: The smoke detector to which the smoke-containment system is connected shall be tested and listed according to UL 228 or UL 268.

3.8 Opening Force: The maximum force to disengage the gasketing system described in Section 3.1.1 is 15 lbf (67 N), and shall be verified by using a spring scale applied perpendicular to the plane of the film at the boundary. The maximum force to lift the curtain described in Section 3.1.2 is 15 lbf (67 N), and shall be verified by using a spring scale applied perpendicular to lower horizontal edge of the curtain assembly.

3.9 Fire Test: The smoke-containment system shall have a minimum 20-minute rating without hose stream when tested in accordance with UL 10B and Section 716.5.2 of the 2012 IBC or Section 715.4.2 of the 2009 and 2006 IBC.

Exception: When recognition of the system is for use as an alternative to a 20-minute fire door assembly complying with the requirements of Section 716.5.3 of the 2012 IBC or Section 715.4.3 of the 2009 and 2006 IBC, the smoke-containment system shall have a minimum 20-minute rating without hose stream when tested in accordance with UL 10C.

4.0 QUALITY CONTROL

4.1 The products shall be manufactured under an approved quality control program with inspections by an inspection agency accredited by the International Accreditation Service, Inc. (IAS) or otherwise acceptable to ICC-ES.

4.2 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

5.0 EVALUATION REPORT RECOGNITION

5.1 The evaluation report shall include, at a minimum, the IBC and the IFC within the evaluation scope.

5.2 The evaluation report shall specify that installation must comply with the report, the report holder's published installation instructions, and the applicable code.

5.3 The evaluation report shall specify that installation must be by installers authorized by the report holder.

5.4 The evaluation report shall specify that the smoke-containment system must be cycle-tested by the building owner of record or the owner's representative on a semiannual basis. A permanent record of the cycle tests must be retained by the building owner of record or the owner's representative.

5.5 The evaluation report shall specify that smoke-containment systems may be used in smoke control systems when designed by registered professionals in accordance with the applicable requirements of Section 909 of the IBC and IFC.

5.6 The evaluation report shall specify that the smoke-containment systems are manufactured under a quality control program with inspections by an inspection agency accredited by the International Accreditation Service, Inc. (IAS), or otherwise acceptable to ICC-ES.

5.7 As applicable, the evaluation report shall include the following conditions of use:

- a. Under the 2009 IBC and IFC and the 2012 IBC and IFC, openings protected with smoke-containment systems must be maintained in accordance with Sections 107 and 703.1.2 of the IFC and Chapter 5 of NFPA 105. Annual inspection must be in accordance with Section 5.2 of NFPA 105.
- b. Under the 2009 IBC and IFC and the 2012 IBC and IFC, openings protected with fire-resistance-rated smoke-containment systems must be maintained in accordance with Sections 107, 703.1.2 and 703.1.3 of the IFC, Chapter 5 of

**ACCEPTANCE CRITERIA FOR SMOKE-CONTAINMENT SYSTEMS USED WITH
FIRE-RESISTANCE-RATED ELEVATOR HOISTWAY DOORS AND FRAMES (AC77)**

NFPA 80 and Chapter 5 of NFPA 105.
Annual inspection must be in accordance

with Section 5.2 of NFPA 80 and Section
5.2 of NFPA 105. ■

TABLE 1—CROSS REFERENCE OF STANDARD EDITIONS IN THE IBC

STANDARD	2006 INTERNATIONAL BUILDING CODE®	2009 INTERNATIONAL BUILDING CODE®	2012 INTERNATIONAL BUILDING CODE®
ASTM D 412	1988	1988	1988
ASTM D 1434	1988	1988	1988
ASTM D 1876	1983	1983	1983
ASTM E 84	2004	2007	2009
NFPA 70	2005	2008	2011
NFPA 80	1999	2007	2010
NFPA 105	2003	2007	2010
NFPA 228	1986	1986	1986
NFPA 258	1987	1987	1987
UL 10B	1997 with revisions through October 2001	1997 with revisions through October 2001	2008 with revisions through April 2009
UL 10C	1998 with revisions through November 2001	1998 with revisions through November 2001	2009
UL 228	1986	1986	1986
UL 268	1996 with revisions through January 1999	2006	2006
UL 864	2003 with revisions through October 2003	2003 with revisions through March 2006	2003 with revisions through February 2010
UL 1784	1995	2001 with revisions through December 2009	2001 with revisions through July 2009

TABLE 2—CROSS REFERENCE OF STANDARD EDITIONS IN THE IFC

STANDARD	2006 INTERNATIONAL FIRE CODE®	2009 INTERNATIONAL FIRE CODE®	2012 INTERNATIONAL FIRE CODE®
ASTM E 84	2004	2007	2009
NFPA 70	N/A	2008	2011
NFPA 80	1999	2007	2010
NFPA 105	N/A	2007	2010
UL 10B	N/A	N/A	N/A
UL 10C	N/A	N/A	2009
UL 268	1996 with revisions through October 2003	2006	2009
UL 864	2003 with revisions through October 2003	2003 with revisions through March 2006	2003 with revisions through February 2010