



**INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS
UNIFORM EVALUATION SERVICES**

**EVALUATION CRITERIA FOR
TEMPORARY CEILING CONSTRUCTION BARRIERS**

EC 043-2020

(Adopted October 2020, Revised April 2021)

- 1.1 Purpose:** The intent of this criteria is to establish requirements for membranes used as temporary ceiling construction barriers recognized in an evaluation report independently reviewed and issued by an evaluation service agency under the International Building Code® (IBC), the International Residential Code® (IRC), and the International Fire Code® (IFC). Basis of recognition is IBC Section 104.11, IRC Section R104.11, and IFC Section 104.9
- 1.2 Scope:** This evaluation criteria applies to horizontally suspended membranes used as temporary ceiling construction barriers in the interior of a structure from the supporting structure. The membrane is supported in sheets, with seams between membrane sheets, designed and manufactured to release in the event of a fire or sprinkler operation. Individual sheets are suspended from the supporting structure so that in the event of seam release (fire or sprinkler operation) the sheets do not interfere with egress and sprinkler performance. This criteria provides guidelines to evaluate the performance, strength, egress, and fire safety of interior temporary ceiling construction barriers.
- 1.2.1 Limitations:**
1. Ceiling construction barriers shall be for temporary permitting purposes only and shall be for use in structures for a period of less than 180 days as defined by Section 3103.1 of the IBC.
 2. Use of temporary ceiling construction barriers as part as a fire-resistance-rated assembly is outside the scope of this criteria.
 3. The products evaluated in this criteria shall be for interior use only.
 4. The products evaluated in this criteria have not been evaluated to carry imposed loads and is not intended for structural use.
- 1.3 Definitions:** For terms not defined in this section, applicable codes, or referenced standards shall have the ordinary accepted definition for the context for which they are intended.
- 1.3.1 Barrier Type:** Each Barrier material having a single formulation or chemical make-up and composition with identical raw material quantities including reinforcement.
- 1.3.2 Barrier System:** System that includes identical barrier seams, barrier seam material, membrane supporting methods, and installation.
- 1.3.3 Ceiling Construction Barrier:** A sheet type membrane used to mitigate dust and debris, when used to physically separate an area below the barrier from a work-zone located above the barrier.
- 1.3.4 Evaluation Service Agency:** Organization evaluating building products or finished construction for conformance to applicable codes and standards and publishing report or listing documents summarizing conclusions. The agency shall be accredited for the applicable product scope in accordance with ISO/IEC Standard 17065. The agency's accreditation shall be issued by an accreditation body conforming to ISO/IEC 17011 and that is a signatory of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) or another approved agency.

2.0 REFERENCED STANDARDS

Standards shall be applied consistent with the specific edition of the code(s) for which the Evaluation Report is prepared unless otherwise approved by the Evaluation Service Agency.

2.1 ASTM International

- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

2.2 International Code Council

- International Residential Code®, (IRC), 2018, 2015, 2012
- International Building Code®, (IBC), 2018, 2015, 2012
- International Fire Code®, (IFC), 2018, 2015, 2012

2.3 International Organization for Standardization

- ISO/IEC 17011:2017, Conformity Assessment, General Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies
- ISO/IEC 17020:2012 Conformity Assessment, Requirements for the Operation of Various Types of Bodies Performing Inspection
- ISO/IEC 17025:2017, General requirements for the Competence of Testing and Calibration Laboratories, International Organization for Standardization
- ISO/IEC 17065:2012, Conformity assessment – Requirements for Bodies Certifying Products, Processes and Services, International Organization for Standardization

2.4 FM Approval Standard

- FM 4651, Approval Standard of Plastic Suspended Ceiling Panels, February 1978

2.5 National Fire Protection Agency

- NFPA 701, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

2.6 UL LLC

- UL 723, Test for Surface Burning Characteristics of Building Materials – with Revisions through August 2013
- UL 723S-06, Outline of Investigation for Drop-out Ceilings Installed Below Automatic Sprinklers

3.0 BASIC INFORMATION

3.1 Description: The following information and data shall be submitted for review and evaluation for recognition of membranes used as temporary ceiling construction barriers in an evaluation report:

3.1.1 Product Description: The membranes are composed with and without woven reinforcement to make up the temporary barriers.

3.1.2 Installation Instructions: Installations details including limitations of product installations.

3.1.3 Packaging and Identification: Packaging labels for the barriers shall include the manufacturer or a registered trademark, model or name of the product, size and applicable certification body logo and evaluation report number.

3.2 Test Reports: The test reports shall be in accordance with the specified procedures and standards. In addition to the reporting content specified in the applicable standard, the reports shall include:

3.2.1 A description of the test procedures, test results, observations, tested assemblies, load measurements, and photographs of specimens and typical failures.

3.2.2 A description of the test specimens.

- 3.3 Testing Laboratories:** Laboratories shall be accredited as complying with ISO/IEC Standard 17025 for the testing conducted and reported. The laboratory's accreditation shall be issued by an accreditation body conforming to ISO/IEC 17011 and that is a signatory of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). Testing at a non-accredited laboratory may be permitted by the Evaluation Service Agency, provided the testing is conducted under the supervision of an accredited laboratory and the supervising laboratory issues the test report.
- 3.4 Testing Reports:** Test reports shall be submitted to the evaluation service agency for approval. Test reports shall include all of the applicable information required in the applicable test standard. Test reports shall document the location, the time and date of the test, the characteristics of the tested specimen, the laboratory facilities, the test configuration, the applied loading and deformation under load, and the occurrence of any damage sustained by the specimen, together with the loading and deformation at which such damage occurred. The resulting test failure mode shall also be specified in the test report.
- 3.5 Product Sampling:** The test specimens shall be sampled or verified by an accredited inspection agency or testing laboratory. The sampled product shall be representative of the production ongoing after the sampling has taken place. The product specifications shall be within the tolerance limits reported in the quality documentation and the relevant standards.

4.0 TESTING AND PERFORMANCE REQUIREMENTS

General: The intent of testing is to verify and demonstrate the performance characteristics of the temporary barrier as they relate to the applicable conformance requirements in Section 3103.1.1 of the IBC and the intent of provisions of the applicable code as defined in Section 104.11 of the IBC, Section R104.11 of the IRC and Section 104.9 of the IFC.

- 4.1 Transverse Load Test:** Transverse Load tests of the barrier system shall be in accordance with ASTM E330 Procedure A.
- 4.1.1 Configuration:** Specimens shall be configured to induce a pressure applied directly to the barrier material. Assemblies to be tested shall be of maximum span of the end use and include any fastening and support system used to install or attach to supporting structure. At least three assemblies of each system shall be tested in the positive and negative load directions. Both negative and positive load direction tests are not required if the product is symmetrical. The tested assemblies shall be sized to address the maximum length of both field construction seams and seams used in the manufacturing process and the maximum width and length of overall barrier panels to be recognized in the code report. Loading shall be in at least six increments with a 10 second load duration and shall be tested to failure. Load deflection readings are not required for serviceability based on temporary use. Permeable barriers may use plastic film to distribute applied loads to barriers. Configurations to be approved by evaluation body prior to testing.
- 4.1.2 Capacity determined from testing:** Temporary ceiling construction barriers shall perform to a minimum peak load of 15 psf. The ultimate load achieved shall be published in the evaluation report. The minimum pressure of 5 psf, in accordance with ASCE 7 Table 4.3.1, for membrane roof structures shall be published in the evaluation plan. Minimum peak load of 15 psf includes a safety factor of three.
- 4.2 Surface Burning and Smoke Development:** The barrier shall be tested in accordance with ASTM E84 or UL 723 on the thickest barrier for each type of barrier to be included in the scope of the evaluation report. Thinner barriers of the same type are qualified by testing the thicker barrier. Type of barrier is defined as one formulation with identical material and material quantities. Barriers shall have a flame spread index of 25 or less and a smoke-developed index of 450 or less and be classified as a Class A interior finish in accordance with Section 803.1.2 of the IBC or IFC.

- 4.3 Flame Propagation of Textiles and Films:** Thickest barriers of same type shall be tested in accordance with Test Method 1 of NFPA 701.
- 4.3.1** A minimum of ten specimens shall be tested and comply with the performance criteria as specified in Section 10.1 of NFPA 701.
- 4.4 Suspended Ceiling with melt-out or drop-out with sprinkler operations:** Each type of barrier to be recognized in the evaluation report shall be tested in accordance with Section 3.2, melt-out or drop-out before sprinkler operation and Section 3.3, melt-out or drop-out when sprinklers are operating, of FM 4651. For the purpose of testing a membrane type barrier, the word “tiles” and/or “panels” found within FM 4651 shall be substituted for membrane material. Factory installed seams in barriers shall be positioned to inhibit the extinguishing of the ignition source for the melt-out or drop-out behavior when sprinklers are operating, where possible, and still be installed in accordance with the standard. If the factory installed seams allows water to pass through during testing, which extinguish the ignition source, the test report shall state the outcome.
- 4.4.1 Melt-Out or Drop-Out Behavior Before Sprinkler Operation:** Satisfactory performance if membrane directly above the fire melts out or drops from its seam supports within one minute and 45 seconds and if no spreading flame is observed on the membrane.
- 4.4.2 Melt-Out or Drop-Out Behavior When Sprinklers Are Operating:** Satisfactory performance if membrane sheets drop free of seams within one minute and 45 seconds after ignition of the exposure and if no spreading flame is observed on the membrane.
- 4.5 Drop-Out Ceilings installed under automatic sprinklers:** Each type of barrier to be recognized in the evaluation report shall be tested in accordance with Section 3.3 and comply with the acceptance criteria in Section 3.4 of UL 723S-06 for both the minimum and maximum distances beneath the sprinkler for which recognition is sought.
- 4.6 Stability of interior finish materials:** Each type of barrier and installation method to be recognized in the evaluation report shall be tested to demonstrate the temporary ceiling barrier will not become detached where subject to room temperatures of 200°F (93° C) for not less than 30 minutes in accordance with Section 803.14 of the 2018 IBC, Section 803.12 of the 2015 IBC and Section 803.10 of the 2012 IBC. Details of the test procedure shall be provided prior to commencement to the evaluation service agency for review.

5.0 QUALITY CONTROL

- 5.1** Quality documentation complying with the UES Minimum Requirements for Listee's Quality Assurance System (UES-010) shall be submitted. A complete description shall be provided of the quality management system used in the factory to manufacture the temporary barrier membranes.
- 5.2** Inspections of manufacturing facilities are required for this product, by agencies accredited for the required tasks in accordance with ISO/IEC 17020 or ISO/IEC 17065.

6.0 EVALUATION REPORT RECOGNITION

Evaluation reports shall include the following information:

- 6.1** The manufacturer's name, product name and the basic information set forth in Section 3.1 of this criteria for all barrier systems.
- 6.2** Classifications and appropriate results from testing in Section 4.0 of this criteria.
- 6.3** The following statement: Ceiling construction barrier systems are for temporary purposes only and shall be for use in structures for a period of less than 180 days unless otherwise approved by the building official.
- 6.4** Light and ventilation code requirements are outside the scope of this criteria.