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August 1, 2019

TO: **PARTIES INTERESTED IN PORTABLE INFLATABLE PAINT SPRAY BOOTHES**

SUBJECT: Proposed Acceptance Criteria for Portable Inflatable Paint Spray Booths, Subject AC512-0819-R1 (ST/KR)

Dear Colleague:

We are seeking your comments on the enclosed proposal for a new acceptance criteria, which is being posted for 30 days of public comment on the ICC-ES web site. Public comments will be considered in preparing a revised draft of the criteria, which we hope to present at a future Evaluation Committee hearing.

The subject of this new acceptance criteria is portable inflatable paint spray booths that may be installed inside or outside of another code-complying structure and which may be installed for a period exceeding the 180-day limit for temporary structures and uses.

These structures meet the definition in the 2018 *International Fire Code*® (IFC) Section 202 for both “Air-Supported Structure (Single skin)” and “Membrane Structure”. The design, construction and occupancy of these structures is regulated by IFC Chapter 31 and 2018 *International Building Code*® (IBC) Section 3102.

The requirements for paint spray booths are governed by the IFC and specifically Section 2404 as well as the referenced standard NFPA 33; however, these provisions do not address the subject of this proposed acceptance criteria. The portable inflatable paint spray booths, covered under the proposed acceptance criteria, are different from ‘traditional’ permanently installed spray booths regulated under the IFC in a number of ways, with the key differences being as follows:

1. They are constructed using a membrane that meets the fire propagation performance criteria of Test Method 1 or Test Method 2, when tested in accordance with NFPA 701 and as prescribed in IFC Section 3104.2 and IBC Section 3102.3. IBC Section 3102.3.1 recognizes the membrane material as noncombustible when the membrane qualifies under NFPA 701 as an alternative to testing for noncombustibilty in accordance with IBC Section 703.5 (i.e. ASTM E136) and also allows the structure to be classified as Type IIB construction.

However, the IFC Section 2404.3.3.1 does not contain similar provisions for the determination that a material is noncombustible similar to IFC Section 3104.2 and, as noted in the IFC Commentary, assumes that the determination of noncombustibilty is based on the requirements of IBC Section 703.5 (i.e. ASTM E136), which the membrane cannot pass.

2. They do not have an automatic fire extinguishing system installed in the booth as prescribed in IFC Section 2404.4.

Currently, the primary standard referenced for the design and installation of spray booths in IFC Section 2404.3.3 is NFPA 33 – 2016. Chapter 18 of NFPA 33 has provisions for the installation and use of membrane enclosures for spraying applications, but these requirements are limited to single use, temporary enclosures and do not address requirements for portable enclosures that may be used multiple times during their installation and which may be installed for a time period exceeding 180 days. The NFPA 33 Technical Committee is currently reviewing proposed revisions to Chapter 18 to add a new section that is specific to portable reusable enclosures. This proposed new section addresses these portable inflatable enclosures, and provisions in this proposed acceptance criteria are based, in part, upon those proposed revisions.

NFPA 33 has some provisions for temporary membrane spraying enclosures, however, it must be noted that IFC Section 2404 does not incorporate those provisions of NFPA 33 nor does IFC Section 2404 include a reference to those provisions of NFPA 33. In summary, it appears that the requirements of IFC Section 2404 address permanently installed spray booths constructed of noncombustible materials and which are protected by an automatic fire-extinguishing system. It does not appear to consider or provide requirements for the design and construction of portable inflatable paint spray booths.

Based upon a review of the various code requirements noted above that apply to air-supported membrane structures and the prescriptive requirements in Section 2404, there are several code requirements that these types of enclosures do not appear to be able to meet. The following are the primary issues we are seeking public input and comment on:

1. IFC Section 2404.3.3.1 requires the construction of spray booths to be of noncombustible materials. IBC Section 703.5 requires determination of noncombustibilty based on testing in accordance with ASTM E136. The vinyl material used in the construction of the portable inflatable paint spray booths is unable to successfully pass testing in accordance with ASTM E136 and therefore does not meet the requirements for a noncombustible material. As noted above, IFC Section 3104.2, IBC Section 3102.3 and Section 18.3 of NFPA 33 have provisions for recognition of a membrane tested in accordance with NFPA 701 and meets the fire propagation performance criteria of Test Method 1 or Test

Method 2, as noncombustible in lieu of being tested in accordance with ASTM E136.

However, those same provisions are not provided for in IFC Section 2404.3.3.1, and as noted in the IFC Commentary, there appears to be that assumption that the determination of noncombustibilty for spray booth materials is based on the requirements of IBC Section 703.5 (i.e. ASTM E136), which the membrane cannot pass.

Additionally, the requirements of the IFC and IBC for air-supported, membrane structures appear to be based upon the structure being either on or attached to the exterior of another building or stand-alone since these sections do not contain requirements for this type of structure when installed inside another building, whereas the requirements of IFC Section 2404 appear to be based upon the premise that a spray booth is going to be installed inside a building.

It also must be noted that Section 18.2.3 of NFPA 33 states that membrane materials tested in accordance with NFPA 701 and used as temporary membrane spraying enclosures shall not reused for any other spray application operations. In the case of the portable inflatable paint spray booths, they will be used for multiple spray operations during the period of time they are installed.

Based upon the differences between the prescriptive material requirements for determination of noncombustibility in IFC Section 2404.3.3.1 and the allowances in IFC Section 3104.2, IBC Section 3102.3.1 and NFPA 33 for qualifying a combustible material as noncombustible based upon testing in accordance with NFPA 701, we are seeking input on whether the use of a membrane that complies with the Test 1 or Test 2 requirements of NFPA 701 is applicable to the construction of spray booths instead of a noncombustible material as prescribed in the IFC Section 2404.3.3.1 based upon ASTM E136.

2. IFC Section 2404.4 requires that "*Spray booths and spray rooms shall be protected by an approved automatic fire-extinguishing system complying with Chapter 9.*" The portable inflatable paint spray booths do not have the structural capability for an automatic fire-extinguishing system to be installed inside the enclosure. IFC Section 2404 does not provide exceptions to this requirement; however, Section 18.3 of NFPA 33 allows for the use of the membrane materials for the enclosures, as noted in comment 1 above, provided that (a) As required by NFPA 33 Sections 18.4.3.1.1 and 18.4.3.1.2, they are limited to installation in buildings equipped with an automatic fire-extinguishing system that is designed for an extra hazard (Group 2) occupancies as defined in NFPA 13; (b) As required by NFPA 33 Section 18.4.3.2.1, the membrane material must be listed for installation beneath sprinklers and installed to meet the requirements of Section 8.15.15 of NFPA 13; and (c) As required by NFPA 33 Section 18.4.3.14, the building is provided with a Class III standpipe system in accordance with NFPA 14.

Based upon the differences between the prescriptive fire protection requirements of the IFC and the allowances in NFPA 33, we are seeking input regarding the use of these enclosures based on the NPFA 33 provisions as an alternative to the automatic fire-extinguishing system requirements of IFC Section 2404.4.

3. NFPA 33, Section 18.4.3.2.1 requires that the membrane installed in a horizontal plane (i.e. ceiling of the enclosure) be listed for installation below sprinklers and meet the requirements of NFPA 13 for drop out ceiling materials. Neither the IFC, NFPA 13 nor NFPA 33 specify a test method for determining that a material complies with this performance requirement. IBC Section 2606.7 contains requirements for light-transmitting plastics used in light diffusing (ceiling) applications with a requirement that the light-transmitting plastic diffusers must demonstrate they will fall from their mountings at a temperature of at least 200º F (111º C) below the material ignition temperature, as well as stay in place at an ambient room temperature of 175º F (79º C) for at least 5 minutes; however, the IBC does not specify any test method(s) for determining compliance with these requirements.

   We are seeking input on what test methods currently exist and/or are used to establish that a ceiling material complies with either the requirements of NFPA 33/NFPA 13 and/or IBC Section 2606.7 for drop out ceiling materials or that are being used to list or certify a material as complying with this requirement.

4. The applicant has indicated that the enclosures may be installed for a time period exceeding the 180-day limit specified in IBC Section 108.1, IFC Section 3103.1 or NFPA 33 Section 18.2 for temporary structures and uses. The removal of the 180-day time limit currently specified in NFPA 33 Section 18.2 is one of the revisions being proposed to Chapter 18 of NFPA 33. The result of not applying the 180-day time limit for the installation and use is that this could result in the enclosures be installed on a permanent basis and, as noted in IFC Section 3103.1, would then require compliance with the requirements of the IBC.

   We are seeking input on the whether or not the temporary structures requirements of the IFC and IBC should be applied to these enclosures as outlined in the proposed acceptance criteria.

5. NFPA 701 requires that the membrane used for temporary spraying operations must be smooth and anti-static; however, NFPA 701 does not provide any reference standards or other guidance on how these characteristics are to be established.

   We are seeking input on what test methods are currently used to establish that a membrane complies with the requirements of NFPA 33 as being smooth and anti-static or that are being used to list or certify a material as complying.

If it is of interest, please review the draft criteria and send us your comments at the earliest opportunity.

To submit your comments, please use the form on the web site and attach any letters or other materials. If you would like an explanation of the "alternate criteria process," under which we are soliciting comments, this too is available on the ICC-ES web site.

Please do not try to communicate directly with any Evaluation Committee member about a criteria under consideration, as committee members cannot accept such communications.

Thank you for your interest and your contributions. If you have any questions, please contact me at (800) 423-6587, extension 4313, or Ken Roberts, PE, at extension 5694. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

Steven R. Thorsell, AIA, CSI
Director – Environmental Programs

SRT/raf

Encl.

cc: Evaluation Committee

PROPOSED ACCEPTANCE CRITERIA FOR PORTABLE INFLATABLE PAINT SPRAY BOOTHS

AC512

Proposed August 2019

PREFACE

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.**

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PROPOSED ACCEPTANCE CRITERIA FOR PORTABLE INFLATABLE PAINT SPRAY BOOTHS (AC512)

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for portable inflatable paint spray booths to be recognized in an ICC Evaluation Service, LLC (ICC-ES), evaluation report under the 2018 *International Building Code*® (IBC) and the 2018 *International Fire Code*® (IFC). Bases of recognition is IBC Section 104.11 and IFC Section R104.11. The booths are intended for spraying of work items exceeding the aggregate surface area of 9 square feet (0.84 m^2) allowed for limited spray spaces provisions of IFC Section 2404.9 and are not applicable to these booths.

1.2 Scope: The scope of this acceptance criteria applies to portable inflatable paint spray booths intended for use as an alternative to the prescriptive requirements of Section 2404 of the 2018 *International Fire Code*® (IFC) for permanently installed spray booths. The structures are also considered as air-supported structures (single skin) under the membrane structures requirements of Chapter 31 of the IFC and classified as Type IIB construction in accordance with the provisions of IBC Section 3102.3. The portable inflatable paint spray booth is intended to be installed either inside or outside of an existing code-complying structure. They are intended to be used for a period of time greater than the 180-day temporary structures and use provisions set forth in IFC Section 3103.1 and/or IBC Section 108.1 and would also be subject to the requirements of IFC Section 3104. They are intended for application of either flammable and non-flammable finishes.

1.3 Codes and Referenced Standards:

1.3.1 2018 and 2015 *International Fire Code*® (IFC).

1.3.2 2018 and 2015 *International Building Code*® (IBC).

1.3.3 NFPA 10 – 2018, Standard for Portable Fire Extinguishers.

1.3.4 NFPA 13 – 2016, Standard for the Installation of Sprinkler Systems.

1.3.5 NFPA 14 – 2016, Standard for the Installation of Standpipe and Hose Systems.

1.3.6 NFPA 33 – 2016, Standard for Spray Application Using Flammable or Combustible Materials.

1.3.7 UL 900 – 2004, Air Filter Units – with revisions through April 2015.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information concerning the enclosure construction, including material components and specifications, thickness, size and the manufacturing process.

2.1.2 Installation Instructions: Complete dated installation instructions shall be submitted. The installation instructions shall contain details for connections to the structure within which it is to be installed and methods for maintaining the enclosure during the life of its installation.

2.1.3 Packaging and Identification: A description of the method of packaging and field identification of the portable inflatable paint spray booths. Identification provisions shall include the evaluation report number.

2.2 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 Test Reports: Test reports shall comply with AC85.

2.4 Product Sampling: Sampling of the portable inflatable paint spray booths components for tests under this criteria shall comply with Section 3.2 of AC85.

2.5 Qualification Test Plan: A qualification test plan shall be submitted to and approved by ICC-ES staff prior to any testing being conducted.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 The membrane used in the construction of the portable inflatable paint spray booth must comply with the following requirements:

3.1.1 Be tested in accordance with NFPA 701. Where the membrane consists of multiple layers, the finished membrane is to be tested.

Conditions of Acceptance: Must comply with the requirements for classification as a Type 2 material.

3.1.2 Be smooth and anti-static.

3.1.3 The membrane used for the ceiling of the must be listed for installation below sprinklers and be classified for use as a drop out ceiling material meeting the requirements of NFPA 13.

Conditions of Acceptance: The membrane must demonstrate it will collapse or melt at a temperature of at least 200º F (111º C) below the material ignition

temperature, as well as stay in place at an ambient room temperature of 175º F (79º C) for at least 5 minutes.

3.1.4 Air intake and exhaust filters must be tested in accordance with UL 900.

Conditions of Acceptance: Air filters shall meet the requirements for Class I or II and be listed as such.

3.2 Detailed drawings of the portable inflatable paint spray booth showing the following:

3.2.1 The means of egress doors from the booth is a minimum of 30 inches (762 mm) in width by 80 inches (2032 mm) in height.

3.2.2 The interior surfaces of the booth are constructed to permit the free passage of exhaust air from all parts of the interior.

3.2.3 Fans for the exhaust duct system are located outside of the booth.

3.2.4 The booth has an independent exhaust duct system discharging to the exterior of the building in which the enclosure is installed.

3.2.5 Location of supports and holders for filters and that they are constructed of noncombustible material.

3.2.6 Overspray collection filters are readily removable and able to be accessed for cleaning or replacement.

3.3 Installation instructions must be submitted that details for the following:

3.3.1 The means for washing and cleaning the booth and cleaning and replacement of filters.

3.3.2 The means for installation of an independent exhaust duct system discharging air from the interior of the booth to the outside of the structure in which it is installed. The instructions shall require that the exhaust duct system is installed in a manner so that air exhausted from spraying operations is not recirculated into the ventilation system of the building in which the booth is installed. This does not apply when the booth installed outside of a building.

3.4 Documentation that the electric fans and belts comply with IFC Section 2407.7.7.

3.5 Documentation that the ventilation system for the booth is designed so that the flammable contaminants are diluted in noncontaminated air to maintain concentrations in the exhaust airflow below 25 percent of the contaminant's lower flammable limit (LFL). In addition, the documentation that the booth is provided with mechanical ventilation so that the average air velocity through openings is in accordance with IFC Sections 2404.7.3.1 and 2404.7.3.2.

4.0 QUALITY CONTROL

4.1 The products shall be manufactured under an approved quality control program with inspections by ICC-ES or by a properly accredited inspection agency that has a contractual relationship with ICC-ES.

4.2 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted. A qualifying inspection shall be conducted at each manufacturing facility when required by the ICC-ES Acceptance Criteria for Inspections and Inspection Agencies (AC304).

4.3 Regular, ongoing inspections are not required under this acceptance criteria but the manufacturing facilities may be subject to annual inspections in accordance with Section 9.0 of the ICC-ES Rules of Procedure for Evaluation Reports.

5.0 EVALUATION REPORT RECOGNITION

5.1 The evaluation report shall contain the following conditions that apply to the installation of the portable inflatable paint spray booth:

5.1.1 The portable inflatable paint spray booth must be installed in accordance with Chapter 18 of NFPA 33, with the exception that the 180 day time limit of Section 18.2 is waived.

5.1.2 Fire extinguishers must be provided in accordance with IFC Section 2404.4.1.

5.1.3 Control of sources of ignition must be in accordance with IFC Section 2404.6.

5.1.4 Drying operations using any heat source or process capable of producing sparks are not permitted.

5.1.5 The termination point for exhaust ducts discharging to the atmosphere must comply with the distance requirements set forth in IFC Section 2404.7.6.

5.1.6 The booth must be secured to the building structure by the D-rings provided in accordance with the booth manufacturers published installation instructions.

5.1.7 The booth must not be used for any type of automated spraying operation.

5.1.8 The booth is limited to installation in buildings equipped with an automatic fire-extinguishing system designed for extra hazard (Group 2) occupancies as defined in NFPA 13 and that are provided with a Class III standpipe system in accordance with NFPA 14.

5.1.9 The booth must be installed to maintain the clear spaces requirements of IFC Section 2404.3.3.5.

5.1.10 Illumination must comply with the requirements of IFC Section 2404.6.2.

5.1.11 Interlocks for spray application finishes shall be in accordance with IFC Sections 2404.8.1 through 2404.8.2.

5.1.12 The booth must not be installed in Use Groups A, E, I or R, unless the requirements of IFC Section 2404.2 are met.

5.1.13 The size of booth must not exceed the limits set forth in IFC Section 2404.3.3.6. ■