AGENDA

NFPA Technical Committee on Fire Tests
F2021 Second Draft Meeting and F2022 First Draft Meeting
Monday, March 1, 2021 -12:00 pm – 4:00 pm ET
Tuesday March 2, 2021 -12:00 pm – 4:00 pm ET
Friday, March 5, 2021 -12:00 pm – 4:00 pm ET
Monday, March 8, 2021 -12:00 pm – 4:00 pm ET

1. **Call to order.** Call meeting to order by Chair B. Badders at 12:00 pm ET on Monday March 1st.

2. **Introductions.** For a current committee roster, **see page 3.**

3. **Meeting minutes.** Approval of F2021 First Draft meeting minutes. **see page 7.**

4. **The process. –** Staff PowerPoint presentation by T. Vecchiarelli.

5. **NFPA Second Draft preparation.** For Public Comments (PCs), **see page 10.**
   a. NFPA 268 (1 PCs)
   b. NFPA 269 (1 PCs)
   c. NFPA 275 (4 PCs)
   d. NFPA 285 (10 PCs)
   e. NFPA 287 (1 PCs)
   f. NFPA 252 (0 PCs)
   g. NFPA 257 (0 PCs)
   h. NFPA 288 (0 PCs)

6. **NFPA First Draft preparation.** For Public Inputs (PIs), **see page 68.**
   a. NFPA 259 (5 PIs)
   b. NFPA 270 (4 PIs)
   c. NFPA 289 (2 PIs)
   d. NFPA 261 (6 PIs)
   e. NFPA 274 (5 PIs)
   f. NFPA 290 (3 PIs)
   g. NFPA 260 (28 PIs)
   h. NFPA 276 (2 PIs)
   i. NFPA 701 (24 PIs)
   j. NFPA 262 (12 PIs)
   k. NFPA 265 (5 PIs)
   l. NFPA 286 (7 PIs)
   m. NFPA 705 (0 PIs)

7. **Task group reports.**
   a. NFPA 285 Engineering Judgement Task Group Report. J. Beitel
   b. NFPA 260 Task Group Report. R.Gann
   c. Bathroom Partitions Task Group Report. K. Carpenter

8. **Other business.**

9. **Future meetings.** The next meeting will be the F2022 Second Draft meeting held between January and June of 2022.

10. **Adjournment.**

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MINUTES
NFPA Technical Committee on Fire Tests
F2021 First Draft Meeting

Wednesday May 20, 2020 11:00AM-3:00PM ET
And Friday May 22, 2020 11:00AM-3:00PM ET

1. The meeting was called to order by Chair B. Badders at 11:00 AM ET on Wednesday May 20th.

2. Self -introductions were made by committee members and guests. The following technical committee members were in attendance.

TECHNICAL COMMITTEE MEMBERS PRESENT

NAME	COMPANY
Barry L. Badders, Jr., Chair	Intertek Testing Services
Farid Alfawakhiri, Principal	American Iron and Steel Institute
Benjamin H. Caldwell, Principal	Bjarke Ingels Group (BIG)
Karen C. Carpenter, Principal	Southwest Research Institute
William E. Fitch, Principal	Phyrefish.com
Richard G. Gann, Principal	
Marcelo M. Hirschler, Principal	GBH International
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Michael E. Luna, Principal	ICC NTA, LLC.
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John Martell, Principal	Professional Fire Fighters of Maine, IAFF
Rodney A. McPhee, Principal	Canadian Wood Council
Arthur J. Parker, Principal	JENSEN HUGHES
Michael L. Savage, Sr., Principal	Marion County Building Safety
Michael Schmeida, Principal	Gypsum Association
Dwayne E. Sloan, Principal	UL LLC
Kuma Sumathipala, Principal	American Wood Council
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Timothy Earl, Alternate to M. Hirschler	GBH International
Stephen Paul Fuss, Alternate to D. Sheppard	US Bureau of Alcohol, Tobacco, Firearms & Explosives/Fire Research Laboratory
Elizabether C. Keller, Alternate to S. Dillon	Engineering Systems, Inc.
Andrew Lock, Alt. to R. Khanna, Nonvoting Member	US Consumer Product Safety Commission
Daniel Martin, Alternate to A. Parker	JENSEN HUGHES
Matthew T. Vinci, Alternate to J. Martell	International Association of Fire Fighters

Luke C. Woods, Alternate to D. Sloan	UL LLC

TECHNICAL COMMITTEE PRINCIPAL MEMBERS NOT PRESENT
(NOT LISTED WHERE ALTERNATE ATTENDED)

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Gordon H. Damant, Principal	Inter-City Testing & Consulting Corp. of California
Rick D. Davis, Principal	National Institute of Standards & Technology (NIST)
Richard L. Day, Principal	Michigan State Fire Marshal's Office
Paul Hough, Principal	Armstrong World Industries, Inc.
Kathleen Newman, Principal	Firetect
Stanislav I. Stoliarov, Principal	University of Maryland

GUESTS PRESENT

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Scott Ayers	CPSC
Eric Banks	
Michael Bowe	ALPOLIC
Kelly Carey	NFPA
Bill Egan	Bill Egan Group
Jeff Greenwald	
Ethan Grove	
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Larry Wainright	Qualtim
Andy Williams	MCA
John Woestman	Kellen Company
Mauro Zammarano	NIST
Thomas Zaremba	Roetzel and Andress

3. The F2018 Second Draft March 20-22, 2018 meeting minutes were approved as submitted.

4. Tracy Vecchiarelli, NFPA Staff Liaison presented a PowerPoint overview of the First Draft meeting procedures and development process.

5. F2021 Task group reports.

a. **16' Parallel Panel Test Task Group Report .** D. Zeng and R. Davis. The task group reported on their draft document and motioned to send the document to Standards Council for issuance.

After a discussion by the TC, the motion failed and a motion to cease work on the project was made and passed. The TC chair disbanded the task group.

b. **NFPA 285 Engineering Judgement Task Group Report.** J. Beitel. The task group reported on their draft material. A motion was made and passed to create a First Revision adding the draft material to a new Annex B in NFPA 285. The task group will continue revising the document for the Second Draft.

6. **NFPA F2021 FIZ-AAA First Draft preparation.** All public inputs on NFPA 285, 252, 257, 268, 269, 275, 287, and 288 were reviewed; first revisions/committee inputs were developed.

7. **F2022 Task group reports.**
   a. **NFPA 260 Task Group Report.** R.Gann. The task group gave a report of their draft revisions to NFPA 260 which will be submitted as public inputs and discussed during the next revision cycle of NFPA 260.

8. **Other standards update.**
   a. **ASTM WK59635**. The TC briefly discussed the work item being developed by ASTM.
   b. Harmonization list. The TC discussed the harmonization list and potential documents that could be merged/put into longer cycles or withdrawn.

9. **Other business.**
   a. Bathroom Partitions Task Group. A task group was appointed to prepare a public input for NFPA 286 on mounting methods for bathroom partitions. Task Group members include K. Carpenter (chair), M. Hirschler, W. Koffel, B. Caldwell, A. Parker, P. Hough, W. Fitch.

10. **Future meetings.** The next meeting will be a combination Second Draft (F21) and First Draft (F22) meeting. The meeting date range is between Jan 21 – May 21. Note that this meeting will include all 22 of our fire test documents. Suggested locations included Nashville, New Orleans or Baltimore.

11. **Adjournment.** Meeting adjourned at 3:00 PM on Friday May 22.

Public Comment No. 1-NFPA 268-2020 [Section No. B.3.7]

B.3.7 Use of Lower Incident Radiant Heat Fluxes in Building Code.

The *International Building Code (IBC)* permits the use of any material as an exterior wall covering if it has been exposed to a reduced level of incident radiant heat flux in accordance with the NFPA 268 test method without exhibiting sustained flaming. The minimum fire separation distance required by the *IBC* for the exterior wall covering is shown in Table B.3.7. It is based on the assumption that the lower incident heat flux used for the test is the maximum tolerable level of incident radiant heat flux that does not cause sustained flaming of the exterior wall covering. Reduced incident heat fluxes can be obtained by calibrating the radiant panel at lower heat fluxes or by increasing the distance between the radiant panel and the test specimen, the most commonly used procedure.

Table B.3.7 Reduced Incident Heat Fluxes Acceptable for Various Fire Separation Distances

Fire Separation Distance (ft)	Incident Heat Flux (kW/m^2)
5	12.5
6	11.8
7	11
8	10.3
9	9.6
10	8.9
11	8.3
12	7.7
13	7.2
14	6.7
15	6.3
16	5.9
17	5.5
18	5.2
19	4.9
20	4.6
21	4.4
22	4.1
23	3.9
24	3.7
25	3.5

Additional Proposed Changes

File Name	Description	Approved
Table_268_heat_fluxes_Nov_20.docx	Revised table with metric values	✓

Statement of Problem and Substantiation for Public Comment

The attached file contains a revised table that includes the distances in meters in parentheses after each

value in feet, as requested by the committee.

Related Item

• pi10

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Copyright Assignment

I, Marcelo Hirschler, hereby irrevocably grant and assign to the National Fire Protection Association (NFPA) all and full rights in copyright in this Public Comment (including both the Proposed Change and the Statement of Problem and Substantiation). I understand and intend that I acquire no rights, including rights as a joint author, in any publication of the NFPA in which this Public Comment in this or another similar or derivative form is used. I hereby warrant that I am the author of this Public Comment and that I have full power and authority to enter into this copyright assignment.

☑ By checking this box I affirm that I am Marcelo Hirschler, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature

B.3.7 Use of Lower Incident Radiant Heat Fluxes in Building Code

The International Building Code (IBC) permits the use of any material as an exterior wall covering material if it has been exposed to a reduced level of incident radiant heat flux in accordance with the NFPA 268 test method without exhibiting sustained flaming. The minimum fire separation distance required by the IBC for the exterior wall covering is shown in Table B.3.7 and it is based on the assumption that the lower incident heat flux used for the test is the maximum tolerable level of incident radiant heat flux that does not cause sustained flaming of the exterior wall covering. Reduced incident heat fluxes can be obtained by calibrating the radiant panel at lower heat fluxes or by increasing the distance between the radiant panel and the test specimen and the most common procedure used is the latter.

Table B.3.7 Reduced Incident Heat Fluxes Acceptable for Various Fire Separation Distances

Fire Separation Distance (feet)	Incident Heat Flux (kW/m^2)
5 (1.52 m)	12.5
6 (1.83 m)	11.8
7 (2.13 m)	11.0
8 (2,44 m)	10.3
9 (2.74 m)	9.6
10 (3.05 m)	8.9
11 (3.35 m)	8.3
12 (3,66 m)	7.7
13 (3.96 m)	7.2
14 (4.27 m)	6.7
15 (4.57 m)	6.3
16 (4.88 m)	5.9
17 (5.18 m)	5.5
18 (5.49 m)	5.2
19 (5.79 m)	4.9
20 (6.10 m)	4.6
21 (6.40 m)	4.4
22 (6.71 m)	4.1
23 (7.01 m)	3.9
24 (7.32 m)	3.7
25 (7.62 m)	3.5

Public Comment No. 1-NFPA 269-2020 [Section No. D.1.2.1]

D.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E800, *Standard Guide for Measurement of Gases Present or Generated During Fires*, ~~2014~~ 2020 .

ASTM E1678, *Standard Test Method for Measuring Smoke Toxicity for Use in Fire Hazard Analysis*, ~~2015~~ 2020 .

Statement of Problem and Substantiation for Public Comment

date updates

Related Item

• fr2

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Public Comment No. 4-NFPA 275-2020 [Section No. 2.3.1]

2.3.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2019~~ 2020 .

Statement of Problem and Substantiation for Public Comment

date update

Related Item

• fr2

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Public Comment No. 1-NFPA 275-2020 [Section No. 5.1 [Excluding any Sub-Sections]]

The thermal barrier and foam plastic insulation or MCM shall be tested in accordance with NFPA 286; the room test in ANSI FM 4880, *American National Standard for Evaluating the Fire Performance of Insulated Building Panel Assemblies and Interior Finish Materials*; or UL 1715, *Fire Test of Interior Finish Material*.

Statement of Problem and Substantiation for Public Comment

The technical committee decided that only the room test in FM 4880 shall be an acceptable option and not the three other tests in FM 4880. This public comment does that by identifying that test as the only one of the 4 FM 4880 tests acceptable.

The annex note to this section makes clear the committee's intent, since it explains that the 25 ft and 50 ft high corner tests are no longer viable options and the 16 ft parallel panel test has not been shown to be appropriate as a thermal barrier test. That annex note reads:
A.5.1 The 2009, 2013, and 2017 editions of NFPA 275 included UL 1040, Fire Test of Insulated Wall Construction, and the 25 ft (7.6 m) and the 50 ft (15.2 m) high corner tests of ANSI FM 4880, American National Standard for Evaluating the Fire Performance of Insulated Building Panel Assemblies and Interior Finish Materials. NFPA technical committee members have been made aware that those tests have not been conducted for many years. However, approvals of any materials or products associated with these fire tests contained in any earlier editions of NFPA 275 are considered valid and should remain so. The 16 ft (4.9 m) parallel panel test contained in the newer edition of FM 4880 has not yet been evaluated for use as an integrity fire test for thermal barriers.

Related Item

- fr4

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Public Comment No. 2-NFPA 275-2020 [Section No. A.5.1]

A.5.1

The 2009, 2013, and 2017 editions of NFPA 275 included UL 1040, *Fire Test of Insulated Wall Construction*, and the 25 ft (7.6 m) and the 50 ft (15.2 m) high corner tests of ANSI FM 4880, *American National Standard for Evaluating the Fire Performance of Insulated Building Panel Assemblies and Interior Finish Materials.* NFPA technical committee members have been made aware that those tests have not been conducted for many years. However, approvals of any materials or products associated with these fire tests contained in any earlier editions of NFPA 275 are considered valid and should remain so. The 16 ft (4.9 m) parallel panel test contained in the newer edition of FM 4880 has not yet been evaluated for use as an integrity fire test for thermal barriers. The room fire test in ANSI FM 4880 is the only test from that standard being retained as an option.

Statement of Problem and Substantiation for Public Comment

Additional clarification, associated with PC1.

Related Item

• fr1

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Public Comment No. 3-NFPA 275-2020 [Section No. B.1.2.1]

B.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2019~~ 2020 .

Statement of Problem and Substantiation for Public Comment

date update

Related Item

• fr5

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Public Comment No. 3-NFPA 285-2020 [Section No. 1.1.1]

1.1.1*

This standard provides a test method for determining the fire propagation characteristics of exterior wall assemblies that are constructed using combustible materials or that incorporate combustible components.

This revision has eliminated the allowance to test only the combustible panel component of a n exterior glass curtain wall assembly (vs having to test the entire curtain wall assembly that contains a combustible panel component). I do not believe that was the intention. This opening statement should read... " **This standard provides a test method for determining the fire propagation characteristics of exterior wall assemblies as well as the panels used as components of exterior curtain wall assemblies that are constructed using combustible materials or that incorporate combustible components.**

Statement of Problem and Substantiation for Public Comment

Restore original intent of NFPA 285 Standard.

Related Item

• FR-1

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Public Comment No. 4-NFPA 285-2020 [Section No. 1.2]

1.2 Purpose.

The purpose of this standard is to provide a standardized fire test procedure for evaluating the suitability of exterior wall assemblies that are constructed using combustible materials or that incorporate combustible components for installation on buildings.

This revision has eliminated the allowance to test _ only the combustible panel component of a n exterior glass curtain wall assembly (vs having to test the entire curtain wall assembly that contains a combustible panel component). I do not believe that was the intention. This opening statement should read... **"The purpose of this standard is to provide a standardized fire test procedure for evaluating the suitability of exterior wall assemblies as well as the panels used as components of exterior curtain wall assemblies that are constructed using combustible materials or that incorporate combustible components for installation on buildings."**

Statement of Problem and Substantiation for Public Comment

Restore original intent of NFPA 285 Standard.

Related Item

• FR-7

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Public Comment No. 8-NFPA 285-2020 [Section No. 2.2]

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 259, *Standard Test Method for Potential Heat of Building Materials,* 2018 edition.

NFPA 703 “Standard for Fire-Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials”, 2021 edition

Statement of Problem and Substantiation for Public Comment

Standard proposed to be referenced in the new proposed chapter 12 in PC6.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 6-NFPA 285-2020 [Chapter 11]	
Public Comment No. 5-NFPA 285-2020 [Chapter B]	
Public Comment No. 7-NFPA 285-2020 [Section No. 2.3.1]	

Related Item

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Submitter Information Verification

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Public Comment No. 7-NFPA 285-2020 [Section No. 2.3.1]

2.3.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM C1177 “Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing” 2017

ASTM C1178 “Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel” 2018

ASTM C1396/C1396M, *Specification for Gypsum Board*, 2017.

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, 2020.

ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*, 2019a.

ASTM E1354 “Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter” 2017

ASTM E2307 “Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-scale, Multi-story Test Apparatus” 2020

ASTM E2404 “Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Polymeric (Including Vinyl) and Wood Wall or Ceiling Coverings, Facings and Veneers, to Assess Surface Burning Characteristics” 2017

ASTM E2652, *Standard Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*, 2018.

ASTM E2965, *Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter*, 2017.

Statement of Problem and Substantiation for Public Comment

The proposed new standards are being proposed to be referenced in the proposed chapter 12, in PC6.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 6-NFPA 285-2020 [Chapter 11]	
Public Comment No. 8-NFPA 285-2020 [Section No. 2.2]	
Public Comment No. 5-NFPA 285-2020 [Chapter B]	

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Public Comment No. 9-NFPA 285-2020 [Section No. 3.3]

3.3 General Definitions.

3.3.

~~1~~

1 AHJ – Authority having jurisdiction

3.3.2 Air cavity – Void space between two layers of materials, intentionally included within the wall assembly for movement of air or water.

3.3.3 Base wall – A load-bearing or non-load-bearing exterior wall that is used as an enclosing wall for a building. The base wall provides a base for the attachment of other wall system components.

3.3.4 Combustible Insulation.

Combustible material used as insulation.

3.3.2 5 Combustible (Material).

A material that, in the form in which it is used and under the conditions anticipated, will ignite and burn; a material that does not meet the definition of noncombustible or limited-combustible. [**5000,** 2021]

3.3. 6 Exterior insulation – A material or system installed on the exterior side of the base wall to provide thermal insulation.

3.3.7 * Exterior Wallcovering.

A material or assembly of materials applied on the exterior side of exterior walls for the purpose of providing a weather-resisting barrier or insulation or for aesthetics.

3.3.4 8 Limited-Combustible (Material).

See Section 4.2.

3.3.5 9 Noncombustible Material.

See Section 4.1.

3.3.6 10 Test Specimen.

The exterior wall assembly to be tested in accordance with this fire test method.

Statement of Problem and Substantiation for Public Comment

The proposed new definitions refer to terms used in the proposed new chapter 12, PC6.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 6-NFPA 285-2020 [Chapter 11]	
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Public Comment No. 1-NFPA 285-2020 [Section No. 5.7.2.1.3]

5.7.2.1.3

The horizontal joint or seam shall not be required where one of the following criteria is met:

(1) Where the exterior veneer is exterior insulation finish systems (EIFS)

(2) Where the exterior veneer is ¾ in. (19 mm) thick or greater standard stucco veneer

(3) Where ~~the actual design~~ the design of the wall assembly to be ~~used in the field will not have any~~ constructed does not incorporate horizontal joints

Statement of Problem and Substantiation for Public Comment

Revised proposed revisions based on discussion during the First Draft meeting.

The proposed editorial revisions are intended to clarify the intent of this sentence. The “in the field” idiom may not
communicate clearly and concisely the intent of this sentence.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 2-NFPA 285-2020 [Section No. 5.7.2.2.3]	

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Committee: FIZ-AAA

Public Comment No. 2-NFPA 285-2020 [Section No. 5.7.2.2.3]

5.7.2.2.3

The vertical joint or seam shall not be required where one of the following criteria is met:

(1) Where the exterior veneer is exterior insulation finish systems (EIFS)

(2) Where the exterior veneer is ¾ in. (19 mm) thick or greater standard stucco veneer

(3) Where the ~~actual~~ design of the wall assembly to be ~~used in the field will not have any~~ constructed does not incorporate vertical joints

(4)* Where the ~~actual~~ design of the wall assembly to be ~~used in the field will not have any~~ constructed does not incorporate continuous vertical joints

Statement of Problem and Substantiation for Public Comment

Revised proposed revisions based on discussion during the First Draft meeting.

The proposed editorial revisions are intended to clarify the intent of this sentence. The “in the field” idiom may not
communicate clearly and concisely the intent of this sentence.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1-NFPA 285-2020 [Section No. 5.7.2.1.3]	

Related Item

• Public Input No. 10-NFPA 285-2020

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Public Comment No. 6-NFPA 285-2020 [Chapter 11]

Chapter 11 Report

11.1* Fire Test Report.

A fire test report shall be prepared to document the fire test.

11.1.1

The fire test report shall contain all of the following:

(1) * Description of the test specimen wall assembly, including the following:

(2) Drawings showing the structural design in plan and elevation, principal cross-section and other sections as needed for clarity, projections and joint locations and details

(3) Drawings and description of the construction used in the test around the window opening header, jambs, and sills, including the type and thickness of the closure material around the perimeter of the opening; the fastening detail, including the type, size, and spacing of fasteners around the perimeter of the window opening; and the type, thickness, and density of any insulation or blocking used internal to the window opening closure

(4) Details of the attachment of the wall assembly to the test apparatus

(5) Location of thermocouples

(6) The date and results (i.e., temperature and heat flux) of the most recent calibration

(7) Ambient conditions at the start of the fire test

(8) Temperatures of all thermocouples during the fire test

(9) Burner gas flow data obtained during the fire test, including type of gas used and total gas flow of both burners for the duration of the fire test

(10) Comparison of burner gas flow data obtained during the fire test to the burner gas flow data obtained during the latest calibration test

(11) Position of the vertical centerline of the window burner with respect to the exterior face of the wall assembly for the fire test and the latest calibration test

(12) Visual observations made during the fire test

(13) Photographs of the following:

(14) Wall assembly — prior to fire test, exterior face

(15) Wall assembly — fire test in progress, exterior face

(16) Wall assembly — post-fire test, exterior face

(17) Wall assembly — post-fire test, interior face, both stories

(18) Wall cavity insulation in wall assembly — post-fire test

(19) Damage sketch(es) of the wall assembly

(20) Extent of residual burning that continues during the 10-minute period immediately after the gas flow to the gas burners has been shut off

(21) Visual observations of smoke accumulation inside the second-story test room during the fire test

(22) Performance of the wall assembly with respect to each of the applicable conditions of acceptance *(see Chapter 10)*

Chapter 12 – Extension of Data Using Engineering Analysis

12.1 Scope of Engineering Analysis.

12.1.1* This chapter shall cover the extension of NFPA 285 test results obtained from NFPA 285 tests to wall assemblies that contain changes in materials, components, or configurations of materials that differ from a tested wall assembly.

A.12.1.1 The definitive response to the question as to whether a combination of desired materials and construction for a particular wall assembly of interest meets the requirements of NFPA 285 is obtained by conducting an NFPA 285 test containing all materials and construction in a manner fully representative of the system of interest.

12.1.2 The procedure in this chapter is optional and shall not be used unless an exterior wall assembly, using alternative design, materials, or method of construction, is presented for AHJ approval or for certification without conducting a test.

12.1.3 The procedure in this chapter shall be based on principles involving the extension of existing test data.

12.1.4 The extension of test data or results in this chapter shall be based on the fire performance of wall assemblies that meet the acceptance criteria of the NFPA 285 fire test.

12.1.5 In NFPA 285, the tested wall assemblies are subjected to specific laboratory fire test exposure conditions.

12.1.5.1 Substitution of an alternative design, materials, or method of construction has the ability to change the measured fire-test-response characteristics of the wall assembly.

12.1.5.2 Therefore, the extension of data and results of an engineering analysis based on this chapter shall be valid only for the fire test exposure conditions described in NFPA 285.

12.2 Purpose of Engineering Analysis .

12.2.1 The purpose of this chapter shall be to create a set of information and instructions for qualified engineers or other qualified design professionals to follow when performing a design for an engineering analysis of results associated with testing of NFPA 285 wall assemblies.

12.2.2 The engineering analysis in this chapter shall not be intended to provide numerical results but simply to assess whether the wall assembly with a change in the materials or construction will either “Meet the requirements of NFPA 285” or “Not meet the requirements of NFPA 285”.

12.2.3* The use of the methodology in this chapter shall be considered suitable to develop engineering analyses or judgments with the potential for them to be used to obtain AHJ approvals for alternative design, materials, or method of construction to those in NFPA 285 tested wall assemblies.

A.12.2.3 The engineering analyses or judgments obtained from the methodology in this chapter, when acceptable to the AHJ, or to a certification agency, may serve as the basis to request approval of an alternative design, material, or method of construction proposed for use instead of a previously exterior wall assembly tested to NFPA 285.

12.2.4 The development of engineering analyses or judgments based on the methodology in this chapter shall require background knowledge and understanding of the NFPA 285 test procedure and conditions of acceptance, including an understanding of the fire test performance of pertinent tested assemblies or materials in the NFPA 285 test.

12.2.5 The underlying concept in the methodology presented in this chapter is that an alternate wall assembly shall be an acceptable equivalent only if test data or engineering analysis has demonstrated that the fire performance of the tested system is expected to be similar or worse that of the proposed alternate.

12.3 Limitations

12.3.1 The engineering analysis for the extension of NFPA 285 fire test results to untested exterior wall assemblies shall be valid only for such changes to a tested exterior wall assembly as fall within normal and reasonable limits of standard construction practices.

12.3.2 Engineering analyses or judgments shall be valid only if the in alternative design, materials, or method of construction, are the only changes between the untested exterior wall assembly and the exterior wall assembly for which a test report has been obtained.

12.3.3* The engineering analysis or judgment shall take into account the fact that multiple changes are likely to have a different cumulative effect than the separate effects of individual changes.

A.12.3.3 The methodology in this chapter is, therefore, not intended to be used consider multiple simultaneous changes but simply one change at a time.

12.3.4 In view of the fact that it is not possible to conduct engineering analyses that account for every possible alternative design, materials, or method of construction, the methodology in this chapter provides a standardized procedure for predicting the results of NFPA 285 tests, but, when in doubt about a specific change, an actual NFPA 285 test shall be conducted on the

exterior wall assembly to be assessed.

12.4 Principles.

12.4.1 This chapter provides a methodology to extend test results associated with the evaluation of wall assemblies for compliance with NFPA 285 *"Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components"* to similar wall assemblies that have not been tested .

12.4.2 This chapter shall address the specific fire test result based on NFPA 285 testing, for complete exterior wall assemblies, composed of a set of materials and components, typically including but not limited to: a base wall, in-cavity insulation, a water resistive barrier (WRB), exterior insulation (optional), an air cavity, a mounting system, and exterior veneer or cladding.

12.4.3 The engineering analysis in this chapter shall not be applied to assess whether one or more individual components or materials is capable of meeting the requirements of NFPA 285.

12.4.4 The engineering analysis provided in this chapter shall not apply to wall assemblies containing materials for which fire test data required in this chapter are not available.

12.4.5 The engineering analysis provided in this chapter shall not apply to the substitution of one proprietary material for another proprietary material.

12.4.6 The engineering analysis in this chapter shall not be considered to be applicable to address every potential modification of tested constructions.

12.4.7 Whenever the engineering analysis in this chapter is not suitable to assess the fire test results applicable to a particular exterior wall assembly construction, either acceptable alternate engineering evaluations or actual fire tests shall be performed to assess the fire test results associated with the wall assembly under consideration.

12.4.8 This chapter shall be used for engineering analyses of systems, which shall potentially include, but are not limited to, the following (interior to exterior) types of components:

- Base wall
    - Base wall with steel studs and gypsum
    - Base wall alternatives, with concrete or masonry units
    - Base wall with cavity insulation
- Base wall framing
- Stud cavity insulation
- Stud cavity floor line fire stops
- Air cavity
- Exterior Sheathing
- Other base walls
- Water resistive barrier (WRB) over exterior sheathing
- Exterior Insulation
- Exterior weather resistive barrier (WRB) over insulation
- Drainage mats
- Exterior cladding or veneer attachment system
- Exterior cladding or veneer
- Window perimeter – headers, jams, sills (treatment and flashings)

12.4.9 The engineering analysis contained in this chapter shall be based on an actual fire test report associated with a test conducted in accordance with NFPA 285.

12.4.9.1 The principles described in this chapter shall require a direct reference to a fire test report on an exterior wall assembly tested to NFPA 285 .

12.4.9.2 In order to apply some of the principles contained in this chapter, additional fire test information and/or data for one or more materials or components is likely to be required.

12.4.9.3 The fire test information potentially required in 12.4.9.2 shall be provided by means of actual fire test data or by means of data found in referenced sources.

12.4.10 The same conditions of acceptance as specified in NFPA 285 and used to establish a passing test result in the original NFPA 285 tested assembly forming the basis of the engineering analysis shall be used as the basis of the extension when evaluating the effects of the modification or substitution of components in a wall assembly.

12.4.11 Whenever replacing one or more components of an exterior wall assembly that has been successfully tested in accordance with NFPA 285 with alternate components, the engineering analysis shall involve both an analysis of the individual fire test data associated with the replacement component(s) and also an analysis of the effect of the component or components on the fire test performance of the entire alternate exterior wall assembly, since it has been demonstrated that the replacement of any single component has the potential to affect both the fire-test-response of other component(s) and that of the entire wall system.

12.4.12 Each of the statements about an acceptable equivalent exterior wall system shall be based on a single modification from the system tested, unless explicitly stated otherwise.

12.4.13 The consecutive application of the methodology contained in this chapter to achieving acceptable equivalent systems associated with multiple changes, even one after another, shall not be considered a suitable application of the methodology.

12.5 Analysis Methodology

12.5.1 Base wall, with steel studs and gypsum, interior wallboard considerations

12.5.1.1 Whenever the base wall interior sheathing used in the NFPA 285 test conducted was ⅝- inch thick, Type X gypsum wallboard, the use of ⅝- inch thick, Type C gypsum wallboard shall be an acceptable equivalent.

12.5.1.2 Testing experience has shown that the use of ½-inch regular gypsum wallboard has the potential to result in failures of Thermocouple Nos. 18 and 19 (stud cavity lateral thermocouples); therefore, the use of ½-inch regular gypsum board shall not be permitted as the replacement interior sheathing without conducting a successful NFPA 285 test.

12.5.2 Base wall, with steel studs and gypsum, Steel Stud Considerations.

12.5.2.1* Whenever 3-⅝ inch deep, 20 (0.033 inch) through 25 ()0.019 inch) gauge steel studs, spaced 24-inch on center, were used in the NFPA 285 test conducted, the use of thicker studs, deeper stud depths and 16-inch spacing shall be permitted, based on the fact that the assembly tested represented a more severe fire test.

A.12.5.2.1 Field applications typically use 16- or 24-inch spacing. Experience with NFPA 285 and with ASTM E119 testing has shown that thicker studs, deeper stud depth and 16-inch spacing represent a less severe fire test scenario .

12.5.2.2 Whenever spacing 16-inch on center was used in the NFPA 285 test conducted, the use of 24-inch spacing shall not be permitted as an acceptable alternate, since wider spacing is not as stable and the wall is potentially more flexible and prone to warping.

12.5.2.3 Whenever no lateral bracing was used in the NFPA 285 test conducted, the use of exterior wall assemblies with lateral bracing shall be permitted.

12.5.3 Base Wall Alternatives: Concrete or masonry

12.5.3.1 Whenever the base wall used in the NFPA 285 test conducted was based on non-load-bearing steel or on wood framing, the use of concrete or of concrete masonry unit (CMU) as an alternative shall be an acceptable equivalent.

12.5.4 Base Wall Alternatives: Wood studs

12.5.4.1 Whenever the base wall used in the NFPA 285 test conducted was based on wood studs, an acceptable alternative construction shall comply with the following:

(1) The wood studs shall be fire-retardant-treated wood (FRTW) and shall be placed at their maximum spacing.

(2) At each floor line of the test wall, three layers of nominally 2-inch thick wood plates shall be used.

(3) The header, sill and jambs shall consist of nominally 2 x 4-inch thick wood.

(4) The cavities shall be empty or contain a noncombustible insulation either faced or unfaced.

(5) Interior wallboard – 5/8-inch thick, Type X gypsum wallboard

12.5.4.2 Whenever the base wall used in the NFPA 285 test conducted was based on an FRTW wood stud wall, the use of a steel stud wall shall not be permitted. due to potential warping and bending of the steel studs.

12.5.4.3 Whenever the base wall used in the NFPA 285 test conducted was based on a steel stud wall, the use of an FRTW stud wall shall be permitted as an alternate, as long as the FRTW wood stud wall assembly is constructed as described in Section 12.5.4.1.

12.5.4.4 Whenever the base wall used in the NFPA 285 test conducted was based on a steel stud wall, the addition of FRTW wood sheathing on the outer face of the studs shall be permitted only if the wood sheathing is covered on its exterior face by one layer of ⅝-inch Type X gypsum sheathing and the interior face of the wall is covered by ⅝-inch Type X gypsum wallboard.

12.6 Base Wall: Cavity Insulation, no foam plastic

12.6.1 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested without insulation in the cavity, the use of combustible insulation in the cavity shall not be an acceptable alternative.

12.6.1.1 Acceptable alternatives shall be as shown in Sections 12.6.1.2 through 12.6.1.4, while Section 12.6.1.5 shows an alternative that is not acceptable.

12.6.1.2 Empty cavity without insulation,

12.6.1.3* Cavity with nominally noncombustible insulation such as fiberglass or mineral wool (both of which shall be permitted to be faced or unfaced), or

A.12.6.1.3 The terms mineral wool and mineral fiber are used interchangeably in this chapter.

12.6.1.4 Cavity with a 6-mil thick water/air barrier (such as 6-mil polyethylene) attached to one of the stud faces.

12.6.1.5 Cavity with cellulosic insulation shall not be an acceptable alternative to an empty cavity.

12.6.2 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with fiberglass (faced or unfaced) insulation in the cavity, the use of an empty cavity shall be an acceptable alternative.

12.6.3 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with fiberglass (faced or unfaced) insulation in the cavity, the use of a thin water/air barrier such as polyethylene, at a maximum thickness of 8-mil, attached to one of the stud faces shall be an acceptable alternative.

12.6.4 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with mineral wool (faced or unfaced) insulation in the cavity, the use of an empty cavity shall be an acceptable alternative.

12.6.5 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with mineral wool (faced or unfaced) insulation in the cavity, the use of a thin water/air barrier such as polyethylene, at a maximum thickness of 8-mil, attached to one of the stud faces shall be an acceptable alternative.

12.6.6 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with cellulosic insulation in the cavity, the use of an empty cavity shall be an acceptable alternative.

12.6.7 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with cellulosic insulation in the cavity, the use of alternate cellulosic insulation that is not of the same type as the one in the base wall system (such as wet applied

or dry applied) shall not be an acceptable alternative.

12.6.8 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with a nominally noncombustible insulation such as mineral wool or fiberglass (faced or unfaced) in the cavity, the use of cellulosic insulation in the cavity shall not be an acceptable alternative.

12.7 Base Wall: Cavity Insulation, foam plastic insulation

12.7.1* The rules for spray polyurethane foam insulation (SPF) in Sections 12.7.2 through 12.7.8 shall apply only when the SPF is encapsulated from all sides within a framed stud wall (with horizontal floor line firestops at each floor, full-depth lateral studs without holes, and in-plane gypsum wallboard or sheathing on both sides).

A.12.7.1 Test results using wall assemblies with SPF, with and without air cavities, and with studs of various thicknesses and depths, have shown that burning of the SPF will be contained by means of the floor line firestops and stud framing when the foam clad on both sides with ⅝-inch thick, Type X gypsum wallboard or sheathing.

12.7.2* The specific rules for closed cell SPF are shown in sections 12.7.4 and 12.7.5 and the specific rules for open cell SPF are shown in Sections 12.7.6 through 12.7.8.

A.12.7.2 The rules for closed cell SP are different from those for open cell SPF because of the potential intumescing nature of closed cell SPF.

12.7.3 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with any type of spray polyurethane foam (SPF) insulation in the cavity, the use of alternate SPF insulation that was not produced by the same manufacturer, under the same brand, as the one in the base wall system shall not be an acceptable alternative.

12.7.4 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with open cell SPF insulation in the cavity, with full depth, cavity fill, the use of alternate SPF insulation with partial depth cavity fill, at any stud depth (with or without air cavity) that was produced by the same manufacturer as the one in the base wall system shall be an acceptable alternative.

12.7.5 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with open cell SPF insulation in the cavity, the use of alternate SPF insulation that was produced by the same manufacturer as the one in the base wall system shall be an acceptable alternative if the peak heat release rate and the total heat released from the alternative insulation, when tested to ASTM E1354 at an incident heat flux of 50 kW/m^2, in the horizontal orientation is lower than that of the insulation used in the base wall.

12.7.6 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with closed cell SPF insulation in the cavity with partial stud depth cavity fill, the use of a system with full depth cavity fill shall not be an acceptable alternative.

12.7.7 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with closed cell SPF insulation in the cavity with partial stud depth cavity fill, with an air cavity, the use of a system with partial fill with an air cavity of the same or lesser depth shall be an acceptable alternative.

12.7.8 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with closed cell SPF insulation in the cavity with full stud depth cavity fill, the use of a system with partial fill shall be an acceptable alternative.

12.7.9 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with any type of SPF insulation in the cavity, it shall be an acceptable alternative to apply other materials to the exterior face based on the Base Wall Test in Section 12.7.14.

12.7.10* Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with expanded polystyrene insulation (EPS) or with extruded polystyrene insulation (XPS) in the cavity, the use of a system with the corresponding insulation at a lower density or with a lower thickness shall be an acceptable alternative.

A.12.7.10 EPS, XPS and polyisocyanurate foam plastic insulation are not typically used as insulation in stud cavities but their use could be allowed based on specific wall assemblies

tested to NFPA 285 that use these materials insulation in the stud cavity.

12.7.11* Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with polyisocyanurate foam in the cavity, the use of a system with the corresponding insulation of the same brand with a lower thickness and using the same facer shall be an acceptable alternative.

A.12.7.11 See A.12.7.10.

12.7.12 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with polyisocyanurate foam in the cavity, the use of a system with polyisocyanurate foam produced by the same manufacturer under the same brand and using the same facer shall be an acceptable alternative if the original insulation exhibited a Class B rating when tested to ASTM E84 and the replacement insulation exhibits a Class A rating .

12.7.13 Whenever the base wall used in the NFPA 285 test conducted was based on an assembly that was tested with phenolic foam in the cavity, the use of a system with phenolic foam produced by the same manufacturer under the same brand and using the same facer shall be an acceptable alternative if the original insulation exhibited a Class B rating when tested to ASTM E84 and the replacement insulation exhibits a Class A rating .

12.7.14 Base wall test for cavity insulation or WRB

12.7.14.1 A base wall test shall be conducted on an exterior wall assembly that includes ⅝-inch thick, Type X gypsum interior wallboard and exterior sheathing on steel studs (3-⅝ inch deep, 20 gauge, 0.033 inch) and shall be fire-stopped within the stud cavity at the floor line with mineral wool (at a minimum density of 4 pounds per cubic feet and a minimum thickness of 4 inches, and contains the desired additional cavity insulation or WRB.

12.7.14.2* The base wall in this test shall be considered to have achieved a passing result if it complies with the following criteria:

- No flaming on the exterior face of the wall,
- The gypsum sheathing shall not allow combustible or flammable gases to penetrate to the exterior side of the assembly,
- The gypsum sheathing shall not evidence cracks, after the test, and
- There shall be only minor flaming around the window perimeter.

A.12.7.14.2 It is considered that the approval criteria of the base wall test described in this section are more stringent than those of a standard NFPA 285 test.

12.7.14.3 The addition of a cladding that has passed the base wall test in accordance with the criteria in 12.7.14.2 to an NFPA 285 compliant exterior wall assembly shall be acceptable.

12.7.14.4 The addition of a cladding containing SPF, EPS, XPS or polyisocyanurate foam insulation that has been tested or approved to be used in an NFPA 285 compliant assembly to a base wall that has passed the test in accordance with the criteria in 12.7.13.2 shall be acceptable.

12.8 Floor line firestops

12.8.1 All exterior wall systems to be tested to NFPA 285 which have stud base walls shall require floor line firestops within the stud cavity, both when the stud cavity is empty and when any insulation is used in the stud cavity.

12.8.2 Whenever the firestopping material is mineral wool it shall have a minimum density of 4 pounds per cubic foot (either friction fit, with at least 25% compression, or Z clipped in place, with steel clips) and it shall fill the full depth of the stud cavity and be a minimum of 4 inches high.

12.8.3 The use of a joint fire barrier system tested to ASTM E2307 and approved for use with the specific wall design in question shall be an acceptable replacement for the mineral wool system in the exterior wall assembly tested, if fire modeling demonstrates that the ASTM E2307 joint fire barrier system is capable of stopping the fire, even within the stud cavity of the base wall.

12.8.4 The use of a joint barrier system based in accordance with Section 12.8.3 shall be an acceptable alternative to be installed next to mineral wool (of the approved thickness and

density) or next to gypsum wallboard (approved for the ASTM E2307 system), or next to metallic spandrel plates (approved for the ASTM E2307 system), but it shall not be an acceptable alternative to be installed next to combustible insulation.

12.8.5 If intumescent firestopping materials have been used in the wall assembly tested to NFPA 285, they shall also be used in the wall assembly being considered and it shall be acceptable only if the location of the intumescent firestopping between the tested assembly and the actual assembly has been successfully evaluated so that the tested configuration will provide the assumed protection for the actual wall assembly.

12.8.5

12.9 Exterior Sheathing

12.9.1 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with exterior sheathing consisting of ½-inch regular gypsum sheathing or of ⅝-inch thick Type X gypsum sheathing (both of which shall conform to ASTM C1396) the use of the same type of material at a greater thickness shall be an acceptable alternative.

12.9.2 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with exterior sheathing consisting of ⅝-inch thick Type X glass matt sheathing conforming either to ASTM C1177 or to ASTM C1178 the use of the same type of material at a greater thickness shall be an acceptable alternative.

12.9.3* Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested without an exterior sheathing, the addition of any type of gypsum sheathing or of glass matt sheathing shall be an acceptable alternative.

A.12.9.3 When no exterior sheathing is used in an exterior wall assembly, that means that an insulation layer will actually become the exterior sheathing. In some case, approvals have been given to exterior wall assemblies that include no exterior gypsum or glass mat sheathing, based on successful NFPA 285 wall assembly tests. However, when there is no exterior sheathing present, the potential exists for combustible exterior insulation to burn from both sides, or for ignition of combustible cavity insulation. It is recommended to carefully consider the fire hazard implications of wall assemblies containing no exterior sheathing.

12.10 Water resistive barriers over exterior sheathing

12.10.1 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with a water resistive barrier (WRB) over the exterior sheathing the use of a WRB of improved fire performance, as tested in accordance with Section 12.10.2, shall be an acceptable alternative.

12.10.2 The comparison between the WRB used in the test and the proposed alternative shall be done by testing both materials in accordance with both ASTM E1354 and ASTM E84 as described in Sections 12.10.2.1 through 12.10.2.3.

12.10.2.1 ASTM E1354 (cone calorimeter) testing shall be conducted in triplicate at an incident radiant heat flux of 50 kW/m^2 in the horizontal orientation, with the test material applied to the "paintable" paper face of one layer of ⅝-inch thick, Type X interior gypsum wallboard.

12.10.2.2 ASTM E84 (Steiner tunnel) testing shall be conducted with test specimen preparation and mounting in accordance with ASTM E 2404.

12.10.2.3* The candidate WRB shall be an acceptable alternative to the WRB used in the tested assembly if it exhibits equal or better results in terms of peak heat release rate, total heat released and effective heat of combustion (when testing to ASTM E1354) and also exhibits a flame spread index of no more than 25 when tested in accordance with ASTM E84.

A12.10.2.3 ASTM E1354 testing yields the following individual data and comparisons between the fire performance of the materials should probably also be considered:

- Ignition time (s)
- Flame duration (s)
- Peak Heat Release (kW/m^2)

- Average Heat Release for 60 seconds interval (kW/m^2)
- Average Heat Release for 180 seconds interval (kW/m^2)
- Average Heat Release for 300 seconds interval (kW/m^2)
- Total Heat Release (MJ/m^2)
- Effective Heat of Combustion (MJ/kg)

If one or more of the above parameters represents significantly lower fire performance for the proposed WRB, then a determination should be made whether the proposed WRB is a suitable replacement .

12.11 Exterior Insulation

12.11.1 Insulation incorporated into an exterior wall system used in an NFPA 285 test shall be installed in accordance with manufacturer's instructions.

12.11.2 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with nominally noncombustible insulation such as mineral wool or fiberglass, the use of the same type of insulation at either a greater thickness or a greater density shall be an acceptable alternative.

A.12.11.2 A minimum thickness of insulation of 2 inches is typical and would improve the fire performance of the WRB.

12.11.3 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with nominally noncombustible insulation such as mineral wool or fiberglass, the use of the same type of insulation at either a lower thickness or a lower density shall not be an acceptable alternative.

12.11.4* Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with nominally noncombustible insulation such as mineral wool or fiberglass, the use of any type of combustible insulation shall not be an acceptable alternative

A.12.11.4 Typical combustible insulations used are spray polyurethane foam (SPF, open cell or closed cell), expanded polystyrene (EPS), extruded polystyrene (XPS) and polyisocyanurate.

12.11.5 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested without nominally noncombustible insulation, the use of a system with any added insulation shall not be an acceptable alternative, except as permitted by Section 12.11.6.

12.11.6 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested without nominally noncombustible insulation, the use of a system with added insulation that complies with the requirements of ASTM E136 shall be an acceptable alternative.

A.12.11.5 Insulation typically designated as nominally noncombustible insulation, such as mineral wool or fiberglass, often contains combustible components. Therefore, some nominally noncombustible insulation materials may not fully comply with the requirements of a noncombustible material.

12.11.7* Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with a combustible insulation, the use of the same type (including the same brand) of insulation at a lower thickness or lower density shall be an acceptable alternative.

A.12.11.7 The use of combustible insulation at a greater thickness or density will increase the fuel load, which is a key difference between such a material and noncombustible insulation. Whenever assemblies are tested with combustible insulation it is always recommended that initial tests be conducted at the maximum thickness proposed for use, because that will allow any other thickness to be substituted. Insulation should be installed in accordance with manufacturers' installation instructions.

12.11.8 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with a combustible insulation, the use of an exterior wall assembly

with a combustible insulation from another brand or another manufacturer shall not be an acceptable alternative.

12.11.9 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with a combustible insulation, the use of an exterior wall assembly with a combustible insulation from another brand by the same manufacturer shall be an acceptable alternative if the alternate insulation is shown to be a rebrand of that in the originally tested assembly.

12.11.10 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with a combustible insulation, the use of an exterior wall assembly with an alternate combustible insulation of the same composition but of a different thickness or density shall be an acceptable alternative if the alternate insulation exhibits a potential heat value no greater than that of the insulation used in the originally tested assembly, when tested in accordance with NFPA 259.

12.11.11 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with exterior insulation and a WRB on the base wall, the use of an exterior wall assembly without exterior insulation shall not be an acceptable alternative, except when any one of the following applies:

(1) The elimination of the exterior insulation shall be an acceptable alternative when a combustible exterior insulation has been tested without a WRB over the base wall.

(2) The elimination of the exterior insulation shall be an acceptable alternative when a WRB is used that is allowed to be used over the exterior foam insulation on the tested wall with the specific claddings allowed for that combination and air cavity.

(3) The elimination of the exterior insulation shall be an acceptable alternative when the WRB used was included in the wall assembly which passed the NFPA 285 test with the exterior cladding to be used in the proposed wall.

12.11.12 Acceptable alternate designs associated with exterior insulation in conjunction with window headers is presented in section 12.20.

12.12 WRB over exterior insulation

12.12.1 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with a WRB over the exterior insulation, the use of an alternate WRB shall be an acceptable alternative if the candidate WRB complies with the requirements in Sections 12.10 .2.

12.12.1 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that was tested with a WRB over the exterior insulation, the use of an alternate WRB shall not be an acceptable alternative based on the requirements in Sections 12.10.2 unless the underlying material behind the WRB is the same as that used in the exterior wall assembly successfully tested to NFPA 285.

12.13 FRTW over exterior insulation

12.13.1 The addition of FRTW sheathing above the exterior insulation for an exterior wall system tested successfully to NFPA 285 shall not be an acceptable alternative without a test of the new wall system.

12.13.2 The addition of FRTW furring strips over the exterior insulation for an exterior wall system tested successfully to NFPA 285 shall not be an acceptable alternative without a test of the new wall system, because of the concern about stability of the system during the test.

12.14 Air cavity

12.14.1* Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that contained an air cavity between the interior face of the cladding, or of any veneer, and the next underlying material, the use of an alternate exterior wall assembly with an air cavity that is not less than ½ inch smaller than that in the tested system (i.e. not exceed a difference of + 0 and - ½ inch) shall be an acceptable alternative.

A.12.14.1 Exterior wall assemblies with rain-screen claddings or anchored masonry veneer facades typically incorporate air cavities. Such an air cavity, in this case, is the distance between the interior face of the cladding, or of any veneer, to the next underlying material, such as the base wall, the WRB, or an insulation layer. Distances to framing materials are not

considered for the measurement of this air cavity, since the most critical issue is the air cavity size.

12.14.2 Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that contained an air cavity between the interior face of the cladding, or of any veneer, and the next underlying material, the use of an alternate exterior wall assembly with an air cavity that is smaller in size from that in the tested system shall be an acceptable alternative.

12.15 Drainage mats

12.15.1* Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that did not contain a drainage mat between the back face of the veneer and the front face of the next underlying material , the use of an alternate exterior wall assembly with a noncombustible drainage mat added to the tested system shall only be an acceptable alternative if the size of the air cavity, between the back of the cladding and the face of the drainage mat, is not exceeded.

A.12.15.1 The use of drainage mats is becoming more common in some types of wall constructions. Typically, these mats are installed between the back face of the veneer and the front face of the underlying material.

12.15.2* Whenever the exterior wall system used in the NFPA 285 test conducted was based on an assembly that did not contain a drainage mat, the use of an alternate exterior wall assembly with the addition of a combustible drainage mat to the tested exterior wall assembly shall not be an acceptable alternative.

A.12.15.2 Typically drainage mats may or may not fill the depth of the gap into which it is installed. In order to add combustible drainage mats to an exterior wall system it would be essential to test the revised assembly with the specific exterior insulation and cladding as a system.

12.15.3 The use of ASTM E1354 (cone calorimeter) test data shall not be acceptable to permit the addition of a combustible drainage mat to a tested system as an alternative, since the ASTM E1354 test method is unable to assess the potential influence of factors such as density and thickness, or attachment details.

12.16 Exterior cladding or veneers

12.16.1 Whenever the exterior wall system used in the NFPA 285 test conducted was covered by a brick cladding or by a cladding based on an MCM system or an ACM system, the replacement of the cladding by an alternate noncombustible cladding shall be considered an acceptable alternative.

12.16.2 Whenever the exterior wall system used in the NFPA 285 test conducted contained a firestop within the airspace between the cladding and the insulation or the base wall, a wall assembly that contains the same firestop in a different location shall not be considered an acceptable alternative.

12.16.3 Whenever an exterior wall system containing a combustible cladding is evaluated, it shall be an acceptable alternative only if it is compared to another combustible cladding that has been evaluated successfully to NFPA 285 and that has been demonstrated to be a worst-case construction in comparison with the proposed replacement system.

A.12.16.3 It is important to include comparative predictive performance of alternate cladding materials in the engineering analysis.

12.16.4 A fiber cement board used as a veneer that has met the requirements of ASTM E136 shall be considered a noncombustible veneer and the replacement by an alternate noncombustible veneer shall be an acceptable alternative.

12.16.5 A fiber cement board product that contains combustible components and does not meet the requirements of ASTM E136 shall be considered a combustible veneer.

12.16.6 Whenever the exterior wall system used in the NFPA 285 test was conducted with a metal cladding, the replacement by metal cladding of the same composiiton but with a thicker metal layer shall be considered an acceptable alternative.

12.17 Brick façades

12.17.1 Whenever the exterior wall system used in the NFPA 285 test conducted was covered by a brick façade, the replacement of the façade by an alternate masonry façade of the same thickness and with no open joints shall be considered an acceptable alternative .

12.18 Fiber reinforced plastic (FRP) veneers

12.18.1 Whenever the exterior wall system used in the NFPA 285 test conducted was covered by an FRP veneer, the replacement of the system by any alternate system shall not be considered an acceptable alternative, due to the variability in formulations and configurations of FRP materials used as exterior veneers.

12.19 Joints

12.19.1 The NFPA 285 test specifies joint locations in Section 5.7 (starting in the 2019 edition).

12.19.2* Whenever the exterior wall system used in the NFPA 285 test conducted used the joint locations contained in Section 5.7 of the 2019 edition of NFPA 285, the replacement by an alternate system using all of the same components but with any other joint locations shall be considered an acceptable alternative .

A.12.19.2 The joint locations prescribed in Section 5.7 of NFPA 285 are considered to be a worst-case scenario and, therefore, an exterior wall system testing with alternate joint locations is expected to be acceptable.

12.19.3 Whenever the exterior wall system used in the NFPA 285 test conducted used joint locations that differ from those contained in Section 5.7 of the 2019 edition of NFPA 285, the replacement by an alternate system shall not be considered an acceptable alternative .

12.20 Window perimeter – Headers, jambs, sill treatments and flashings

12.20.1* Exterior wall assemblies tested to NFPA 285 shall incorporate window perimeters to simulate actual construction, one example of which is a generic window header design contained in Section 5.7.3.

A.12.20.1 When a specific window header design is used in a successful NFPA 285 test, other variations of window perimeters would typically also be able to be used. Some of these variations include the use of steel or wood at various thicknesses. For tests of wall assemblies with exterior insulation, it has been shown that the fire performance of different window perimeter treatment designs may not be heavily influenced by the type of foam plastic insulation used. When testing foam plastic insulation materials they are typically tested at thicknesses associated with those in actual construction. If the insulation is EPS or XPS window designs typically incorporate mineral wool or wood. S teel stud cavity combustible insulation tests typically use C-Channel steel stud framing as the window perimeter, often with mineral wool separating the stud cavity insulation from the perimeter steel.

12.20.2 The replacement of a window design without window perimeter treatments that has been used in a successful NFPA 285 test of an exterior wall assembly by one that contains window perimeter treatments shall be an acceptable alternative.

12.20.3 The replacement of a window design with steel window perimeters that has been used in a successful NFPA 285 test of an exterior wall assembly by one that contains steel or stainless-steel window perimeter of the same or greater thickness shall be an acceptable alternative.

12.20.4 The replacement of a window design with aluminum window perimeters or plate sheets that has been used in a successful NFPA 285 test of an exterior wall assembly by one that contains window perimeters of other materials with a higher melting point than aluminum of the same or greater thickness shall be an acceptable alternative.

12.20.5 The replacement of a window design with steel window perimeters that has been used in a successful NFPA 285 test of an exterior wall assembly by one that contains steel or stainless-steel window perimeter of the same or greater thickness shall be an acceptable alternative.

12.20.6 The replacement of a window design that contains FRTW wood meeting the requirements of NFPA 703 that has been used in a successful NFPA 285 test of an exterior wall assembly by one that contains FRTW wood meeting the requirements of NFPA 703 of the same or greater thickness shall be an acceptable alternative.

12.20.6 The replacement of a window design with mineral wool that has been used in a

successful NFPA 285 test of an exterior wall assembly by one that contains mineral wool of the same or greater thickness shall be an acceptable alternative.

12.20.7* Since combustible tapes and flashings at the window opening are not considered to be a cause for a failure of NFPA 285 tests, due to their limited area of application around the window opening, the use of any flashing material shall be an acceptable alternative.

A.12.20.7 Typically, these materials only extend approximately 12- to 18-inches from the edges of the window opening.

12.20.8* If an exterior wall assembly is only insulated with mineral wool in the stud cavity and the wall does not contain an exterior combustible WRB, or if the wall assembly is insulated on the exterior side of the base wall with unfaced mineral wool at least 2 inches thick and of a density of not less than 4 pounds per cubic feet over a combustible WRB, any design of window perimeter shall be an acceptable alternative for noncombustible claddings.

A12.20.8 If a wall assembly contains a combustible WRB on the base wall and no exterior insulation, the window perimeter design should be based on designs for combustible exterior insulation where combustible WRB's are allowed over the insulation.

12.21 MCM systems

12.21.1* MCM systems shall consist of cladding panels with a metal facing on each side of a solid plastic core material, that exhibit a minimum exterior skin thickness of 0.019 in (0.5 mm), a minimum interior skin thickness of 0.010 in (0.25 mm), and a maximum panel thickness of 1⁄4 in. (6.3 mm) and shall include aluminum clad systems (ACM).

A.12.21.1 While there are some MCM systems with unequal thickness of metal on each side, the vast majority are of equal thickness. Therefore, in order to test the worst case system would require testing a system with a 0.019 in (0.5 mm) exterior skin and a 0.010 in (0.25 mm) interior skin.

12.21.2 Whenever the exterior wall system used in the NFPA 285 test conducted contained an MCM system, the use of an MCM system with a lower skin thickness (whether exterior or interior) from that in the tested MCM system shall not constitute an acceptable alternative.

12.21.3* Whenever the exterior wall system used in the NFPA 285 test conducted contained an MCM system, any changes in the core material (such as the formulation, thickness, or density) from that in the tested MCM system shall not constitute an acceptable alternative.

A.12.21.3 It is difficult to predict the impact of core formulation not only on the fire performance, but also on different aspects of the performance of the MCM system. One important consideration is the adhesion between the core and the metal skin under a variety of conditions, including fire.

12.21.4 Whenever the exterior wall system used in the NFPA 285 test conducted contained an MCM system, any changes in the skin material (such as the type of metal, the alloy, or the thickness) from that in the tested MCM system shall not constitute an acceptable alternative unless the replacement skin provides both fire and mechanical performance at least as satisfactory as the tested skin.

12.21.4.1 If the tested system used an aluminum skin, the use of a metal skin with a higher melting point, such as titanium, copper, or stainless steel, shall be an acceptable alternative.

12.21.4.2 If the tested system used an aluminum skin, the use of a metal skin with a lower melting point, such as zinc, shall not be an acceptable alternative.

12.21.5* Whenever the exterior wall system used in the NFPA 285 test conducted contained an MCM system with a panel to framing anchor extrusion mechanical fastening method in the tested MCM system (rivets or screws), changes to non-mechanical fastening (adhesive attachment) shall not constitute an acceptable alternative.

A.12.21.5 If the exterior skin of the cladding material is mechanically fastened, the worst-case scenario is a panel mechanically fastened to framing anchor extrusions, either continuous or clip, where the joint is open (without a sealant or cover plate/trim piece to restrict airflow through the perimeter of the panel to the free air cavity). If the exterior skin of the cladding material is not mechanically fastened to the framing anchor extrusion system, the worst-case scenario is a panel fit into framing extrusions using an adhesive to connect the components, where the joint is open (without a sealant or cover plate/trim piece to restrict airflow through the

perimeter of the panel to the free air cavity). The typical joint width is nominally ½ in.

12.21.6 Whenever the exterior wall system used in the NFPA 285 test conducted contained an MCM system with open joints, the replacement of the MCM system by alternate claddings with better fire performance, such as uninsulated metal panels (with aluminum or copper facings), or claddings composed of noncombustible materials, such as noncombustible fiber cement, porcelain, mortared thin brick, or other masonry, shall constitute an acceptable alternative.

12.21.7 Whenever the exterior wall system used in the NFPA 285 test conducted contained an MCM system as a cladding, the replacement of the MCM system by a non-MCM combustible cladding shall not constitute an acceptable alternative.

Statement of Problem and Substantiation for Public Comment

This proposes a replacement of the proposed annex B by a mandatory chapter which incorporates the information presented in the Annex B proposed during the first revision (FR15) in a format that can be actually referenced in codes.

In this proposed new chapter (which is a chapter that can optionally be used but is not a requirement and is not needed to conduct tests to NFPA 285) each acceptable alternative and each unacceptable alternative is specifically described in detail, in mandatory language, so that an experienced professional can apply the rules. The various sections explain, in each case, what alternatives are acceptable to still obtain a satisfactory NFPA 285 test without retesting and which alternatives are not acceptable and will require a new actual test.

Note that this public comment simply proposes a new chapter 12 (including some new annex material for that chapter) but does not propose any revision to chapter 11.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 5-NFPA 285-2020 [Chapter B]	
Public Comment No. 7-NFPA 285-2020 [Section No. 2.3.1]	
Public Comment No. 8-NFPA 285-2020 [Section No. 2.2]	
Public Comment No. 9-NFPA 285-2020 [Section No. 3.3]	

Related Item

• FR15

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Committee: FIZ-AAA

Public Comment No. 5-NFPA 285-2020 [Chapter B]

Annex B ~~Guide for Extensions of Results from Assemblies that Meet NFPA 285 Test Requirements~~ **Information for NFPA 285 Testing of Specific Cladding Systems**

This annex

~~is~~

is not a part of the requirements of this NFPA document but is included for informational purposes only.

~~**B.1** – Administration.~~

~~**B.1.1** – Scope.~~

~~**B.1.1.1** –~~

~~This annex covers the extension of NFPA 285 test results obtained from NFPA 285 tests to wall assemblies that contain changes in materials, components, or configurations of materials that differ from a tested wall assembly.~~

~~**B.1.1.2** –~~

~~This annex is based on principles involving the extension of test data using simple considerations.~~

~~**B.1.1.3** –~~

~~The extension of test data/results in this annex is primarily based on the fire performance of wall assemblies that meet the acceptance criteria of Chapter 10 .~~

~~**B.1.2** – Purpose.~~

~~**B.1.2.1** –~~

~~The purpose of this annex is to create guidelines for qualified engineers or design professionals to follow when performing a design for or an engineering judgement on NFPA 285 wall assemblies.~~

~~**B.1.2.2** –~~

~~Statements in this annex only indicate whether the wall assembly with a change in the materials or construction will either meet the requirements of NFPA 285 or not meet the requirements of NFPA 285.~~

~~**B.1.3** – Application.~~

~~**B.1.3.1** –~~

~~This annex is only applicable for evaluating wall assemblies for compliance with NFPA 285.~~

~~**B.1.3.2** –~~

~~This annex does not cover the substitution of one proprietary material for another proprietary material or materials for which fire test data are not presently available.~~

~~**B.1.3.3** –~~

~~An exterior wall assembly that is addressed via this annex is considered to be a system. All the systems' materials and components, such as the base wall, in-cavity insulation, the water-resistive barrier (WRB), exterior insulation, air gap, mounting system, and the exterior veneer or cladding, are considered as parts of the system. These items together achieve a specific NFPA 285 test result.~~

B.1.3.4 –

This annex does not purport to be comprehensive in its treatment of nonproprietary modifications of tested constructions. Engineering evaluations or tests are recommended for assessing modifications not specifically covered in this annex.

B.1.3.5 –

An actual NFPA 285 test with appropriate materials or construction can be used to provide deviations from the guidelines provided in this annex.

B.1.3.6 –

This annex covers the following types of analyses:

(1) Base wall, including the following:

(2) Base wall with steel studs and gypsum (see Section B.5)

(3) Base wall alternatives (e.g., concrete and masonry units)

(4) Base wall with cavity insulation

(5) Floor line fire stops

(6) Exterior sheathing

(7) WRB over exterior sheathing

(8) Air gap

(9) Exterior insulation

(10) Exterior WRB over insulation

(11) Drainage mats

(12) Exterior cladding

(13) Attachment system

(14) Window perimeter, including headers, jams, and sills (treatment and flashings)

B.1.3.7 –

To apply some of the principles described in this annex, reference to the test report of the NFPA 285 tested wall assembly is necessary.

B.1.3.8 –

To apply some of the principles described in this annex, additional fire test information or data might be required. This data must be provided via referenced sources or fire test data.

B.1.3.9 –

In NFPA 285, the tested wall assemblies are subjected to specific laboratory fire test exposure conditions. Substitution of different test conditions or changes in the construction materials can change the measured fire-test-response characteristics of the wall assembly. Therefore, the extension of data and results are valid only for the fire test exposure conditions described in NFPA 285.

B.1.3.10 –

The use of this annex might lead to the development of engineering analyses or judgments which, in turn, could be used to obtain approvals for the substitution of materials in NFPA 285 tested wall assemblies.

B.1.3.11 –

Users of this annex, when developing engineering analyses or judgments, must have knowledge and understanding of NFPA 285 to include performance of pertinent tested assemblies, materials, and NFPA 285 conditions of acceptance.

B.1.3.12 –

These analyses/judgments, where acceptable to the AHJ, can be used as the basis for approval where an alternative design, material, or method of construction is proposed for use in a previously NFPA 285 tested wall assembly.

B.2 – General.

B.2.1 –

The same conditions of acceptance as specified in NFPA 285 and followed in the establishment of a passing result of the original NFPA 285 tested assembly should be used as the basis of the extension when evaluating the effects of the modification or substitution of components in a wall assembly.

B.2.2 –

Where replacing a component (or components) in a wall assembly that has been successfully tested per NFPA 285 with baseline component(s), the alternate component(s) must be analyzed individually and, more importantly, as a system. Changing one component can affect the overall fire response of another component and of the entire wall system.

B.3 – Limitations.

B.3.1 –

The extension of the NFPA 285 test results is valid only for changes to the tested specimen that fall within normal and reasonable limits of standard construction practices.

B.3.2 –

Analyses or judgments are valid only if the identified changes are the only changes in the construction or properties of the components.

B.3.3 –

Multiple changes can have a different cumulative effect than that of individual changes applied separately.

B.3.4 –

It is not possible to analyze every configuration or every potential change to a tested configuration. This document provides the best information to date and when in doubt about a change, an NFPA 285 test should be conducted.

B.4 – Wall Design.

B.4.1 –

An exterior wall can have many components, including, but not limited to, the following (interior to exterior):

(1) Base wall interior—gypsum wallboard (or another thermal barrier)

(2) Base wall framing—studs (depth, gauge, materials, and so on)

(3) Stud cavity insulation—combustible and noncombustible, thickness, vapor barriers, and so on

(4) Stud cavity floor line firestop—mineral wool (friction fit or Z clip)

(5) Air gap in stud cavity

(6) Exterior sheathing—gypsum-based sheathing, no sheathing, and other sheathing material

(7) Other base walls—concrete, concrete masonry unit (CMU), other (materials, thickness, and so on)

(8) WRB over exterior sheathing—none, mechanically fastened sheet, fluid applied, self-adhered

(9) Exterior insulation—expanded polystyrene foam plastic insulation (EPS), extruded polystyrene foam plastic insulation (XPS), polyisocyanurate foam plastic insulation (Polyiso), spray polyurethane foam plastic insulation (SPF), mineral wool insulation, and so on

(10) WRB over insulation—none, mechanically fastened sheet, fluid applied, self-adhered

(11) Exterior cladding or veneer attachment system, air gaps, if required, and joints, joint types, joint location, and configuration

(12) Exterior cladding/veneer—materials, thickness

B.5 – Analysis: Base Wall—Steel studs/Gypsum.

B.5.1 – Interior Wallboard Considerations.

B.5.1.1 –

Most NFPA 285 tests use **5/8** in. thick, Type X gypsum wallboard as the only option. However, **5/8** in. thick, Type C gypsum wallboard can be used as an equivalent.

B.5.1.2 –

Testing experience has shown that using **1/2** in. regular gypsum wallboard can cause failures of thermocouple nos. 18 and 19. Therefore, use of **1/2** in. regular gypsum board should not be permitted as the interior sheathing unless this material was used in a successful NFPA 285 test.

B.5.2 – Steel Stud Considerations.

Most NFPA 285 tests have employed 3 **5/8** in. deep (92 mm), 20 or 25 GA. steel studs spaced 24 in. (0.6 m) on center. Field applications typically use 16 in. (0.4 m) or 24 in. (0.6 m) spacing. Wider spacing is not as stable since the wall is potentially more flexible and prone to warping. As with ASTM E 119, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*), testing, thicker studs, deeper stud depth, and 16 in. (0.4 m) spacing is allowed based on testing worst case. Testing with lateral bracing requires lateral bracing to be used. Testing without lateral bracing can allow lateral bracing as an option. Fire-retardant-wood (FRTW) framing should also be tested.

B.6 – Analysis: Base Wall Alternatives—Concrete and CMU.

Testing with non-load-bearing steel or wood stud base walls allows use of concrete or CMU walls as alternatives.

B.7 – Analysis: Base Wall Alternatives—Wood Studs.

B.7.1 –

Where a wood stud wall assembly is to be tested, the following construction should apply:

(1) The wood studs should be FRTW and placed at their maximum spacing.

(2) At each floor line of the test wall, three layers of nominal 2 in. (50 mm) thick wood plates should be used.

(3) The header, sill, and jambs should consist of nominal 2 × 4 in. thick wood.

(4) The cavities should be empty or contain a noncombustible insulation either faced or unfaced.

(5) For interior wallboard, 5/8 in. thick, Type X gypsum wallboard should be used.

B.7.2 –

If an FRTW wood stud wall is tested, the results cannot be applied to a steel stud wall due to potential warping and bending of the steel studs.

B.7.3 –

An FRTW wood stud wall can be allowed based on a steel stud wall test. The FRTW wood stud wall assembly must comply with Section B.7 .

B.7.4 –

FRTW wood sheathing on the outer face of the studs is only allowed without a test when the wood sheathing is covered on its exterior face by one layer of 5/8 in. Type X gypsum sheathing and the interior face of the wall is covered by 5/8 in. Type X gypsum wallboard.

B.8 – Analysis: Base Wall—Cavity Insulation.

B.8.1 –

If the base wall assembly is tested without any insulation, then the cavity can remain empty or contain an insulation such as fiberglass or mineral wool. These insulations can be faced or unfaced. Additionally, a 6-mil thick water/air barrier, such as 6-mil polyethylene, can be used when attached to one of the stud faces.

B.8.2 –

If the base wall assembly is tested with fiberglass (faced or unfaced) insulation, then the cavity can remain empty or contain a fiberglass insulation. This insulation can be faced or unfaced. Additionally, a thin water/air barrier, such as 6-mil polyethylene, can be used when attached to one of the stud faces.

B.8.3 –

If the base wall assembly is tested with mineral wool (faced or unfaced) insulation, then the cavity must contain the mineral wool insulation. This insulation can be faced or unfaced. Additionally, a thin water/air barrier, such as 6-mil polyethylene, can be used when attached to one of the stud faces.

B.8.4 –

Testing with cellulose insulation in the base wall assembly allows use of cellulose insulation of the same material and method of application as tested (e.g., wet applied, dry applied, and so on). However, testing with no insulation does not allow one to add cellulose as optional insulation.

B.8.5 – SPF Insulation.

B.8.5.1 –

The following only applies where the SPF is encapsulated from all sides within a framed stud wall (i.e., horizontal floor line firestops at each floor, lateral studs, in-plane gypsum board on both sides). It has been shown that testing with and without air gaps and studs of various thicknesses and depths, burning of the SPF is trapped via the floor line firestops and stud framing when clad on both sides with **5/8** in. thick, Type X gypsum wallboard or sheathing. Different rules apply for open cell vs closed cell SPF.

B.8.5.1.1 – Open Cell SPF.

B.8.5.1.1.1 –

Testing with full stud cavity depth of an open cell SPF allows any stud depth of open cell SPF with an air gap (if used) between the SPF and the gypsum wallboard.

B.8.5.1.1.2 –

It is permissible to determine a worst-case SPF formulation via ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter,* testing and test the worst case in the NFPA 285 test wall assembly to facilitate extension to other SPFs within that manufacturer's brand.

B.8.5.1.1.3 –

It is not permissible to allow SPF of one manufacturer to be used in an NFPA 285 test based on data from another manufacturer.

B.8.5.1.1.4 –

It is permissible to allow a specific SPF successfully tested per the base wall test described in Section B.21 to be used as a base wall assembly with other materials applied to its exterior face.

B.8.5.1.2 – Closed Cell SPF.

Because of the potential intumescing nature of closed cell SPF, the following rules apply:

(1) A test with partial stud depth cavity fill does not permit a full cavity fill when using closed cell SPF.

(2) Testing partial stud depth cavity fill (with air gap) only allows partial fill with the same or lesser air gap for any stud depth.

(3) Testing with full stud depth fill allows full stud depth cavity fill or less.

(4) It is not permissible to allow a manufacturer's SPF to be substituted based on data from another manufacturer's product.

(5) It is permissible to allow a specific SPF successfully tested per the base wall test described in Section B.21 to be used as a base wall assembly with other materials applied to its exterior face.

B.8.6 –

EPS, XPS, and Polyisocyanurate foam plastic insulations are not typically used in stud cavities but can be allowed based on NFPA 285 test assemblies that use these materials as insulation in the stud cavity.

B.8.6.1 –

Testing the maximum thickness and density (for EPS or XPS) allows lesser density and thickness. Testing the maximum thickness of polyisocyanurate allows thinner polyisocyanurate.

B.8.6.2 –

Polyiso brands/products can not be interchanged unless each brand/product has been tested per NFPA 285 to be used in the stud cavity. A Class A Polyiso per ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials* , can be used in lieu of a Class B Polyiso only when the same facer is used on the Class A Polyiso as used on the Class B Polyiso that was tested per NFPA 285.

B.9 – Analysis: Floor Line Firestops.

B.9.1 –

In actual construction, all NFPA 285–compliant stud-base walls require floor line firestops within the stud cavity. Where the stud cavity is empty or where any insulation is used in the stud cavities, firestopping material is required. The firestopping materials typically used are minimum 4 pcf mineral wool (friction fit or Z-clipped in place) and the mineral wool should be the full depth of the stud cavity and a minimum of 4 in. (100 mm) high.

B.9.2 –

Where the mineral wool is friction fit, at least 25 percent compression is required. Where it is Z-clipped in place, the Z-clips should be steel. In some constructions, ASTM E2307, *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-scale, Multi-story Test Apparatus,* approved perimeter joint fire barrier systems can replace the mineral wool system as long as the ASTM E2307 joint is approved for use with the specific wall design in question. It is important that the fire path be analyzed so that the fire is stopped by the ASTM E2307 system, including within the stud cavity of the base wall. A wall with an ASTM E2307 firestop system cannot be installed up against combustible insulation, but can be installed next to mineral wool (of the approved thickness and density), gypsum wallboard (where approved for the ASTM E2307 system), or metallic spandrel plates (where approved by the ASTM E2307 system).

B.9.3 –

If intumescent firestopping materials are used in the NFPA 285 tested wall assembly, they must also be used in the actual construction. The location of the intumescent firestopping between the tested assembly and the actual assembly must be evaluated so that the tested configuration provides the assumed protection for the actual wall assembly.

B.10 – Analysis: Exterior Sheathing.

B.10.1 –

NFPA 285 tests usually incorporate **1**⁄**2** in. regular gypsum sheathing, or **5**⁄**8** in. thick Type X gypsum sheathing conforming to ASTM C1396/C1396M, *Specification for Gypsum Board* , or **5**⁄**8** in. thick Type X glass matt sheathing conforming to either ASTM C1177, *Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing,* or ASTM C1178, *Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.* Testing with one of these materials qualifies the other materials of the same or greater thickness.

B.10.2 –

Some approvals allow “None” based on successful NFPA 285 wall assembly tests where the wall assembly had no sheathing. However, allowing no exterior sheathing might allow combustible exterior insulation to burn from both sides, or might allow ignition of combustible cavity insulations.

B.10.3 –

For wall assembly designs that allow no exterior sheathing, the specific configuration of the wall assembly that passed NFPA 285 should be followed carefully.

B.10.4 –

Where an exterior insulation is tested with no exterior gypsum sheathing (i.e., the insulation is the exterior sheathing), the use of exterior gypsum sheathing is optional.

B.10.5 –

Where no exterior gypsum sheathing is tested, any gypsum-based sheathing can be used.

B.11 – Analysis: WRB Over Exterior Sheathing.

B.11.1 –

Some successful NFPA 285 tested wall assemblies have incorporated a WRB product over the exterior sheathing. Testing with a specific WRB allows WRBs with lower or lesser fire characteristics to be used in place of the specific tested WRB.

B.11.2 –

The determination of the fire characteristics of WRBs can be made using the cone calorimeter in ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter* .

B.11.3 –

B.11.3.1 –

The cone calorimeter shall be conducted as follows:

(1) Testing should be done in triplicate for each material.

(2) Testing should be conducted at a radiant heat exposure of 50 kW/m^2 .

(3) Test material should be applied to the "paintable" paper face of one layer of **5** /**8** in. thick, Type X interior gypsum wallboard (not sheathing).

(4) The test should be conducted per ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter* and all standard data collected and reported.

B.11.3.2 –

When comparing test data between two or more WRBs, the following data, should be used:

(1) Ignition time(s)

(2) Flame duration(s)

(3) Peak heat release (kW/m^2)

(4) Average heat release for 60-second intervals (kW/m^2)

(5) Average heat release for 180-second intervals (kW/m^2)

(6) Average heat release for 300-second intervals (kW/m^2)

(7) Total heat release (MJ/m^2)

(8) Effective heat of combustion (MJ/kg)

When comparing the values, the parameters in B.11.3.2 (3) through B.11.3.2 (8) are the most important. If the values of the proposed WRB are better than (i.e., lower), or very similar to the tested WRB, then the substitution can be allowed.

If one or more parameter is significantly higher for the proposed WRB, then a determination must be made if the proposed WRB can be used. Any such determination should be provided in writing.

B.12 – Analysis: Exterior Insulation.

B.12.1 –

Some NFPA 285 tests incorporate exterior insulation. Various types are used, such as mineral fiber (mineral wool), SPF, Polyiso, EPS, and XPS.

B.12.2 –

Where mineral fiber or mineral wool insulation is used as exterior insulation, a minimum 1 in. (25.4 mm) thickness should be tested. Increasing the thickness or density, or both, of the insulation is allowed.

B.12.3 –

Where testing the SPF, the Polyiso, the XPS or the EPS, the maximum thickness proposed for use should be installed in the wall assembly and tested. The testing of the maximum thickness allows lesser thicknesses of the same insulation material. Reducing the thickness of a combustible insulation (of the same brand, type, and density) is allowed since the wall has less fuel load than the tested system.

B.12.4 –

The exterior insulation should be installed per the manufacturer's installation instructions.

B.12.5 –

See Section B.20 for guidance regarding the use of exterior insulation in conjunction with window headers as the header design can vary based on the exterior insulation material. The NFPA 285 test conditions and construction details must be used as the minimum basis of the design for the actual construction.

B.12.6 –

It is not permissible to eliminate the use for exterior insulation, based on testing with insulation and a WRB on the base wall, except when the following applies:

(1) Where a combustible exterior insulation has been tested without a WRB over the base wall, it is permissible to allow elimination of the exterior insulation.

(2) Where eliminating exterior insulation, it is permissible to use WRB's that are allowed to be used over the exterior foam insulation on the tested wall with the specific claddings allowed for that combination and air gap.

(3) Where the WRB was included in the wall assembly that passed the NFPA 285 test with the exterior cladding to be used in the proposed wall.

An NFPA 285 test on one brand or type of insulation cannot be used to qualify another brand or type of insulation.

Where using the same foam plastic insulation in the actual construction as was tested (i.e., brand, type, facing, and so on), the thickness and density can be varied based on a calculation using the BTU/ft ^{2} value of the insulation used in the successful NFPA 285 test.

B.13 – Analysis: WRB Over Exterior Insulation.

B.13.1 –

Some successful NFPA 285 wall assembly tests have incorporated a WRB product over the exterior insulation that is behind the exterior cladding. Testing with a WRB allows WRBs with lower or lesser fire propagation characteristics to be used in place of the tested WRB. See Section B.11 .

B.13.2 –

It is not permitted to substitute a WRB for NFPA 285 tested WRB based on cone calorimeter testing if the underlying material directly behind the WRB in the cone test is not the same as that used in the successful NFPA 285 wall assembly test.

B.14 – Analysis: FRTW Plywood Over Exterior Insulation.

B.14.1 –

The application of FRTW plywood over the exterior insulation must be verified by an NFPA 285 test.

B.14.2 –

The type, thickness, and attachment details of the plywood must be the same as that tested. Additionally, the remainder of the proposed wall assembly (i.e., the WRB and veneer), must be the same as that used in the successful NFPA 285 test.

B.15 – Analysis: Air Gap.

B.15.1 –

NFPA 285 testing of wall assemblies with rain-screen claddings or anchored masonry veneer facades incorporate air gaps. The air gap in this case is the distance from the interior face of the cladding, or the interior face of the masonry veneer, to the next underlying material such as the base wall or WRB or insulation. Distance to framing materials/systems are not included in this measurement.

B.15.2 –

For anchored masonry veneer such as brick facades, the tested air gap is typically 2 in. For metal composite material/aluminum composite material (MCM/ACM), the air gap is typically between 1 $^{1}/_{2}$ and 2 $^{1}/_{2}$ in. (38 mm and 63.5 mm). Other cladding, such as high-pressure laminates (HPL) might have other required air gaps. It is important that the air gap allowed on the actual construction not be greater than 1 in. (25.4 mm) from what was tested for the cladding being evaluated.

A test on a light cladding with a specific air gap can allow the same air gap, (+ $^{1}/_{2}$ in. [12.7 mm]), or less with other light claddings, or heavy masonry, as long as the tested cladding is worst case.

A test on a heavy masonry cladding with a specific air gap can allow the same air gap ($^{1}/_{2}$ in. [12.7 mm]), or less with other masonry claddings as long as the tested cladding is worst case.

B.16 – Analysis: Drainage Mats.

B.16.1 –

The use of drainage mats is becoming more common in some types of wall constructions. Typically, these are installed between the back face of the veneer and the front face of the underlying material.

B.16.2 –

The drainage mat might or might not fill the depth of the gap into which it is installed.

B.16.3 –

Noncombustible drainage mats can be used in the actual construction over exterior insulation without NFPA 285 testing where the air gap tested is not exceeded.

B.16.4 –

Combustible drainage mats can be used over exterior insulation only if tested with the specific exterior insulation and cladding as a system.

B.16.5 –

Combustible drainage mats installed in a wall assembly can only be used if it is to be used in the same location and between the same materials that were used on the tested system.

B.16.6 –

Use of cone calorimeter test data might not provide adequate information for evaluating potential substitution of drainage mat materials. This is due to potential influences of density, thickness, attachment details, and so on.

B.17 – Analysis: Exterior Cladding/Veneer.

B.17.1 –

To date, most approvals for insulation or WRBs have been historically based on tests with brick or MCM/ACM claddings. These two claddings have been considered as acceptable baseline claddings from which most other noncombustible claddings can be approved. Other noncombustible claddings can be evaluated against brick or ACM as potential improvements to the tested design, are considered equivalent, or are deemed to not affect NFPA 285 test results.

B.17.2 –

For NFPA 285 wall assembly fire tests where a worst-case cladding choice for combustible underlying components is desired, the choice cladding to be used must be demonstrated to be the worst case for those under consideration. The method should also include comparative predicted performance of alternate cladding materials.

B.17.3 –

Where an NFPA 285 test used a firestop within the airspace between the cladding and insulation or base wall, this firestop is required for all actual construction using this cladding/insulation/base wall combination. However, a major concern is where the firestop was located in the test sample and how this location relates to the actual construction.

B.18 – Analysis: Specific Testing Information for Various Claddings.

B.18.1 – MCM/ACM/ZCM Panel.

B.18.1.1 –

The MCM is a broad category of panels that consist of a metal facing on each side of a solid plastic core material. The primary MCM in use today is the aluminum-faced panel (ACM).

B.18.1.2 –

Changes in the core material (e.g., formulation, thickness, density, and so on) of a tested MCM within a brand must be analyzed on a case-by-case basis. It is difficult to predict core/skin adhesion under fire conditions.

B.18.1.3 –

Changes to the metal skin (e.g., type, alloy, thickness, and so on) of a tested ACM/MCM (with the same core as the tested core) is allowed only if the alternate skin provides same-as or better fire performance to the tested skin. For example, testing with aluminum skin allows, based on higher melting points, titanium skin, copper skin or stainless steel skin, but not zinc.

B.18.1.4 –

If the exterior facer of the cladding material is not mechanically fastened to resist delamination during testing, the system must be tested.

B.18.1.5 –

If the exterior skin of the cladding material is mechanically fastened to resist delamination during testing, the worst-case scenario is a routed return panel mechanically fastened to anchor extrusions, either continuous or clip, where the joint is open (i.e., no sealant to restrict airflow through the perimeter of the panel to the free air cavity). The width of the joint is typically **1**⁄**2** in.; however, reasonable variation in that joint width would not seem to impact the airflow to the free air cavity.

B.18.1.6 –

Typical system depths provide a free-air cavity 1 **1**⁄**2** in. to 2 in. (38 mm to 50 mm) behind the panel (back face of the panel to insulation or sheathing). Thus, as a guideline, the free-air cavity depth should be 2 in. (50 mm) ± **1**⁄**2** in. (12.7 mm) and 2 in. (50 mm) + **1**⁄**2** in. (12.7 mm) to any smaller free-air cavity.

B.18.1.7 –

The free-air gap in the actual construction should not exceed 1/2 in. greater than the tested free-air gap.

B.18.1.8 –

Successful NFPA 285 testing with an ACM typically allows claddings that are less flammable than ACM/MCM (with open joints) such as uninsulated metal panels (e.g., aluminum or copper), noncombustible fiber cement, porcelain, mortared thin brick, other masonry, and materials of similar noncombustibility.

NFPA 285 testing with MCMs does not allow other combustible claddings.

B.18.2 – Composite Panels (non-MCM).

B.18.2.1 –

Composite panels typically consist of an aluminum facer but have cores that are adhesively applied to the facers. The cores are typically aluminum honeycomb or corrugated metals, with stone or other composite material veneer.

B.18.2.2 –

Composite panels must be tested per NFPA 285. Even though the exterior facer is non-combustible and has a Class A flame-spread rating per ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials* . Previous unsuccessful NFPA 285 testing has demonstrated potential problems with adhesives or other materials used in construction of composite panels.

B.18.3 – Brick Façade.

Testing with brick allows other masonry with specific thickness and no open joints.

Calculations of the interior surface temperature of the cladding can make use of thermal diffusivity techniques to determine the equivalent thickness. The values of the properties used in the calculation must have been determined at the expected temperatures. Additionally, the references for the values of the various parameters must be reported. An exception to this rule is where the exterior cladding and the exterior insulation systems (and any materials in between) are noncombustible.

B.18.4 – High-Pressure Laminates (HPL).

B.18.4.1 –

Testing the thickest HPL panel is not always worst case. It is advisable to test the thinnest and thickest panels.

B.18.4.2 –

Mineral wool or mineral fiber exterior insulation is typically used in successful NFPA 285 tests.

B.18.4.3 –

Testing without mineral wool exterior insulation and with a WRB allows mineral wool to be added as an option.

B.18.4.4 –

Where a 2 in. or greater thickness of mineral wool or mineral fiber is installed directly over the WRB, any type of WRB can be used.

B.18.4.5 –

Testing with exposed fasteners does not qualify concealed fasteners.

B.18.4.6 –

Testing with concealed fasteners does not qualify exposed fasteners.

B.18.5 – Exterior Insulation and Finish System (EIFS).

B.18.5.1 –

Each EIFS lamina system (i.e., combination of base coat, mesh, and finish coat) must be tested separately.

B.18.5.2 –

An EIFS system must be tested and built with materials from the same manufacturer. EIFS components from different manufacturers cannot be mixed.

B.18.5.3 –

Each EIFS drainage system must be tested separately.

B.18.5.4 –

A test on the maximum EPS or XPS thickness can allow thinner EPS or XPS of the same density or lower density.

B.18.5.5 –

Insulation board edges at system terminations must be back or edge wrapped unless tested otherwise in the NFPA 285 test. If back-wrapping is used in the test, then in actual construction back-wrapping should be used at the following:

(1) Top and bottom of each wall

(2) Other horizontal wall terminations

(3) Door and window penetrations

(4) Expansion and control joints

B.18.6 – Insulated Metal Panels (IMPs).

B.18.6.1 –

The fire performance of IMPs can be affected by both the panel's construction and the configuration/installation of the panels.

B.18.6.2 –

Typically, NFPA 285 tests of IMPs involve steel facings on both sides of the panel. Other metal facings can be used with melting points less than steel based on NFPA 285 testing of those panels.

B.18.6.3 –

In actual construction, the thickness of the facers on each side of the IMP must be the same or greater than that used in a successful NFPA 285 test.

B.18.6.4 –

Typically, flat profiles have greater potential for flame-spread than complex profiles.

B.18.6.5 –

NFPA 285 testing of thicker panels allows the use of thinner panels.

B.18.6.6 –

To qualify both horizontal and vertical IMPs, the IMP must be tested in both the vertical and the horizontal configurations.

B.18.6.7 –

Where an IMP is successfully NFPA 285 tested without a base wall and installed directly to the test apparatus, the IMP can be allowed for use over a steel stud frame wall.

B.18.6.8 –

Where the IMP is covered with a combustible veneer, combination must be tested per NFPA 285.

B.18.6.9 –

Testing of IMP with concealed fasteners allows the use of exposed fasteners.

B.18.7 – Fiber Cement Board.

B.18.7.1 –

Fiber cement board that has met the requirements of ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C* , should be considered noncombustible.

B.18.7.2 –

Many fiber cement board products contain combustible resins. Thus, if the cement board does not meet the requirements of ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C* , the cement board should be considered to be a combustible veneer.

B.18.7.3 –

Joint locations were introduced in the 2019 edition. If different joint locations that fall outside the scope of NFPA 285 are used, then the actual construction wall assemblies must use the joint locations of the tested locations.

B.18.7.4 –

If the joint locations specified in the 2019 edition of NFPA 285 are used on the tested wall assembly, then any joint location is qualified for the actual wall assembly.

B.18.8 – Fiber Reinforced Plastic (FRP).

B.18.8.1 –

Due to the various formulations and configurations in which FRP can be used as exterior veneer, each actual project wall construction requires an NFPA 285 test.

B.19 – Analysis: Attachment System.

B.19.1 –

Most NFPA 285 wall assembly tests incorporate generic cladding attachment systems. Most approvals or listings do not list attachment systems because it is not practical to include every possible cladding attachment that would qualify. There are simply too many to list.

B.19.2 –

For tests with anchored brick veneer, common brick ties are used. Since heavy masonry claddings are durable under fire conditions, their attachment system (such as brick ties) typically does not get exposed to direct flames during the test. It should be noted that some brick attachments use zinc barrel ties and melt in the area of flame exposure thus loosening the brick attachment.

B.19.3 –

For MCM/ACM or HPL systems, there is no common attachment system. See Section B.21 for typical ACM joint types and attachments. Most ACM or HPL manufacturers do not manufacture attachment systems, but they do sell their product to ACM or HPL fabricators who manufacture attachment systems.

B.19.4 –

Given a tested design, alternate attachment systems might be allowed if the alternate system has similar melting temperatures, mass, and orientation and does not create an air gap larger than the tested system.

B.19.5 –

For HPL, two attachment types are typical—exposed fastener and concealed fastener. The two are not interchangeable. Alternate attachment systems for each type might be allowed if the alternate system has similar melting temperatures, mass, and orientation and does not create an air gap larger than the tested system.

B.19.6 –

For other light claddings (e.g., metal panels, fiber cement board, and so on), similar guidance can apply.

B.19.7 –

Some manufacturers have developed attachment systems that use composite materials, typically rigid fiberglass. These systems should be tested per NFPA 285 to assure in initial compliance. Where the composite materials are protected by mineral wool or mineral fiber, they can usually be substituted for metal framing systems.

B.20 – Analysis: Window Perimeter—Headers/Jamb/Sill Treatment and Flashings.

B.20.1 –

Most NFPA 285 tests incorporate window perimeters to simulate actual construction.

B.20.2 –

A generic window header design was introduced in the 2019 edition and if used in a successful NFPA 285 test, other variations of window perimeters can be used. Some of these variations include use of steel or wood at various thicknesses.

B.20.3 –

If an NFPA 285 test is successful and did not use any window perimeter treatments, then any type of window perimeters can be used.

B.20.4 –

For tests of wall assemblies with exterior insulation, the type of foam plastic insulation can be either insensitive or sensitive to window perimeter treatment design.

B.20.4.1 –

Most NFPA 285 tests with Polyiso insulation products have been performed using specific thicknesses of aluminum or sheet steel perimeters. The tested material and thickness are the minimum allowed in the actual construction.

B.20.4.2 –

Most NFPA 285 tests with SPF insulation products have been performed using specific thickness of sheet steel perimeters. The tested material and thickness are the minimum allowed in the actual construction.

B.20.4.3 –

Most NFPA 285 tests with EPS or XPS insulation products have been performed with very specific window perimeters (typically incorporating mineral wool insulation or wood—FRT and non-FRT). The tested configuration, material, and its thickness are the minimum allowed in the actual construction.

B.20.4.4 –

For steel stud cavity combustible insulation tests, most tests use the C-channel steel stud framing as the window perimeter. In some cases, mineral wool is used to separate the stud cavity insulation from the perimeter steel. The tested material and thickness are the minimum allowed in the actual construction.

B.20.5 –

A successful NFPA 285 test with aluminum window perimeter plate/sheet can allow other materials with higher melting points to be used since the aluminum melts in this area.

B.20.6 –

A successful NFPA 285 test with steel window perimeters allows use of steel or stainless steel of the same thickness or greater.

B.20.7 –

A test with FRTW lumber meeting the requirements of NFPA 703 allows use of any FRTW lumber of same thickness or greater.

B.20.8 –

A test with mineral wool allows use of mineral wool of the same thickness/density or greater.

B.20.9 –

Combustible tapes and flashings at the window opening are not a cause for a failure in testing due to the limited area of application around the window opening. Typically, these materials only extend approximately 12 to 18 in. (0.30 m to 0.45 m) from the edges of the window opening. Thus, any flashing material can be used as long as it is limited in its application.

B.20.10 –

Where a wall is only insulated with mineral wool in the stud cavity and the wall is without an exterior combustible WRB, or where a wall is insulated on the exterior side of the base wall with unfaced 2 in. (50 mm) (min. 4 pcf) mineral wool over a combustible WRB, the window perimeter is not critical for noncombustible claddings.

B.20.11 –

Where a wall contains a combustible WRB on the base wall and no exterior insulation, the window perimeter design should be based on designs for combustible exterior insulation where combustible WRB's are allowed over the insulation.

B.21 – Base Wall Tests with SPF Cavity Insulation.

B.21.1 –

Base wall tests with SPF cavity insulation typically use **5**/**8** in. thick, Type X gypsum interior wallboard and exterior sheathing on steel studs (typically 3 **5**/**8** in. [92 mm] deep, 20 ga) and are firestopped within the stud cavity at the floor line with mineral wool (min. 4 pcf, min. 4 in. [100 mm] thick).

B.21.2 –

Where a base wall test incorporates a combustible cavity insulation such as SPF in the stud cavity, the test criteria is more stringent than the normal criteria specified in NFPA 285. In this test, no flaming on the exterior face of the wall is allowed. Thus, the gypsum sheathing must not significantly crack nor allow combustible gasses or flames to the exterior side of the assembly.

B.21.3 –

If the base wall test with SPF cavity insulation results in minor flaming around the window perimeter and no appearance of flames on the exterior face, then the following are permissible:

(1) It is permissible to add on top of the tested base wall any cladding (combustible or noncombustible) that has been tested or approved to be used in an NFPA 285–compliant assembly.

(2) It is permissible to add on top of the tested base wall any cladding (combustible or noncombustible) paired with approved polyisocyanurate, EPS, XPS, or SPF insulation and specifically allowed WRBs that have been tested or approved to be used in an NFPA 285–compliant assembly.

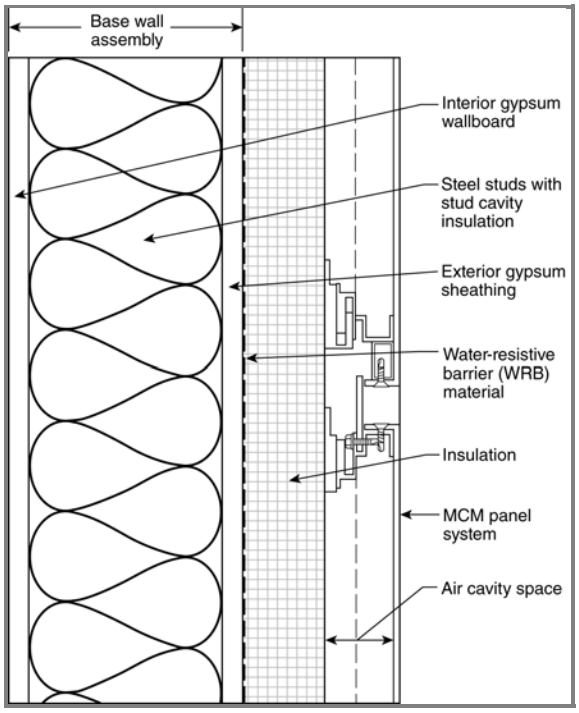
(3) It is permissible to pair with approved polyisocyanurate, EPS, XPS, or SPF.

B.22 – ACM Cladding Information.

B.22.1 – Product Thickness.

For NFPA 285 analysis, products with the highest fuel content typically are considered worst case. It is assumed that the 4 mm and 6 mm products both use the same inner/outer aluminum skins. The 6 mm panels use a thicker core material to achieve the 6 mm panel thickness. Based on this, the 6 mm product would represent the worst-case fire scenario. Figure B.22.1 shows an example of an ACM Assembly.

Figure B.22.1 Example of an ACM Assembly.



B.22.2 – Joint Design.

Most ACM systems are offered with various joint designs. Some designs allow air to freely flow in and out of the cladding system (i.e., rainscreen) at panel joint locations. The three basic types are as follows:

(1) *Open Joint Rainscreen.* Open joint rainscreen is worst case from a fire test point of view since these systems allow air to freely flow.

(2) *Wet Seal System.* A wet seal system uses backer rods and caulk to seal panel joints. Typically, these use silicone caulk, which does not readily spread flame.

(3) *Dry Seal System.* The dry seal system is the most complicated but is commonly used in NFPA 285 fire tests. The dry seal system is a semi-open joint design that has been used by many ACM manufacturers to meet the requirements of NFPA 285. Testing based on this system has historically allowed use of any ACM that has passed NFPA 285 testing in many third-party approvals.

~~**B.22.3** – Additional Comments on Joint Types—Caulk/Backer Rod.~~

~~The wet seal system utilizes caulk and backer rod within joints. For this joint type, it is possible that the flame spread of the caulk/backer rod alone can cause a visual flame spread failure. See 10.2.1.2 (2).~~

~~The possible failure due to the caulk/backer rod system is not a problem of the ACM/MCM but of the caulk/backer rod materials that can be solved by mandating products with FR chemistry. The problem is that the flame spread (under NFPA 285 conditions) of the caulk/backer rod can only be determined with an NFPA 285 test.~~

~~If the caulk/backer rod issue is of concern, it is recommended to test the open joint system, but include the caulk/backer rod in vertical joints to evaluate the flame spread of the joint/backer rod assembly. This limits the brand/model of caulk/backer rods used to what was tested, and to products with similar or better flame spread or flammability.~~

~~In the specific case of noncombustible backer rod sealed with weather-resistant caulking, an ASTM E84, *Standard Method of Test for Surface Burning Characteristics of Building Materials* , test of two strips of caulking on GRC board and centered on each burner, if Class A, qualifies that caulk for use in sealing joints between panels.~~

(Additional language is in the attached file)

Additional Proposed Changes

File Name	Description	Approved
NFPA_285_Annex_B_MMH_submitted.docx	New Annex B proposed by Marcelo Hirschler	

Statement of Problem and Substantiation for Public Comment

This is information associated with some specific systems, associated with the new proposed chapter 12, in PC6.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 6-NFPA 285-2020 [Chapter 11]	
Public Comment No. 7-NFPA 285-2020 [Section No. 2.3.1]	
Public Comment No. 8-NFPA 285-2020 [Section No. 2.2]	

Related Item

• fr15

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Committee: FIZ-AAA

Annex B Information for NFPA 285 Testing of Specific Cladding Systems

B1. MCM and other panel claddings

B.1.1 Some claddings that do not fit the definition of MCM panels, consist of metallic or nonmetallic facers with cores that are adhesively applied to the facers. The cores are often honeycomb or corrugated materials that allow airflow (or the flow of combustion products) within the space between the metal facers. The replacement of a tested MCM panel by these types of panels should not be an acceptable alternative and should require individual testing in accordance with NFPA 285. The reason is that, even though the exterior facer may be noncombustible and may exhibit a Class A flame spread index when tested to ASTM E84, examples exist of unsuccessful tests to NFPA 285 and to other full-scale tests worldwide that have demonstrated potential problems with adhesives or with other materials used in the construction of these types of panels.

B1.2 Typically, for an analysis of acceptable replacements for NFPA 285 tests, those products with the highest fuel load are considered a worst-case scenario. Thus, for ACM panels, it can be assumed that typical panels labeled to be 4 mm or 6 mm panels will use the same thickness of both inner and outer aluminum skins and that a 6 mm panel will use a thicker core material than a 4 mm panel, but some examples exist of panels with different thicknesses of metal skins. Based on this analysis, a 6 mm panel should represent a worst-case fire scenario compared to a 4 mm panel.

B.1.3 Typically, many ACM systems are being provided with various joint designs. Some of those designs allow air to flow freely in and out of the cladding system or rainscreen at panel joint locations. The three most common types are described in Sections B1.12.1 through B1.12.3.

B1.3.1 The open joint rainscreen is the attachment likely to result in the poorest fire performance since these systems allow air to flow freely. Figure B1 describes an example of such a system.

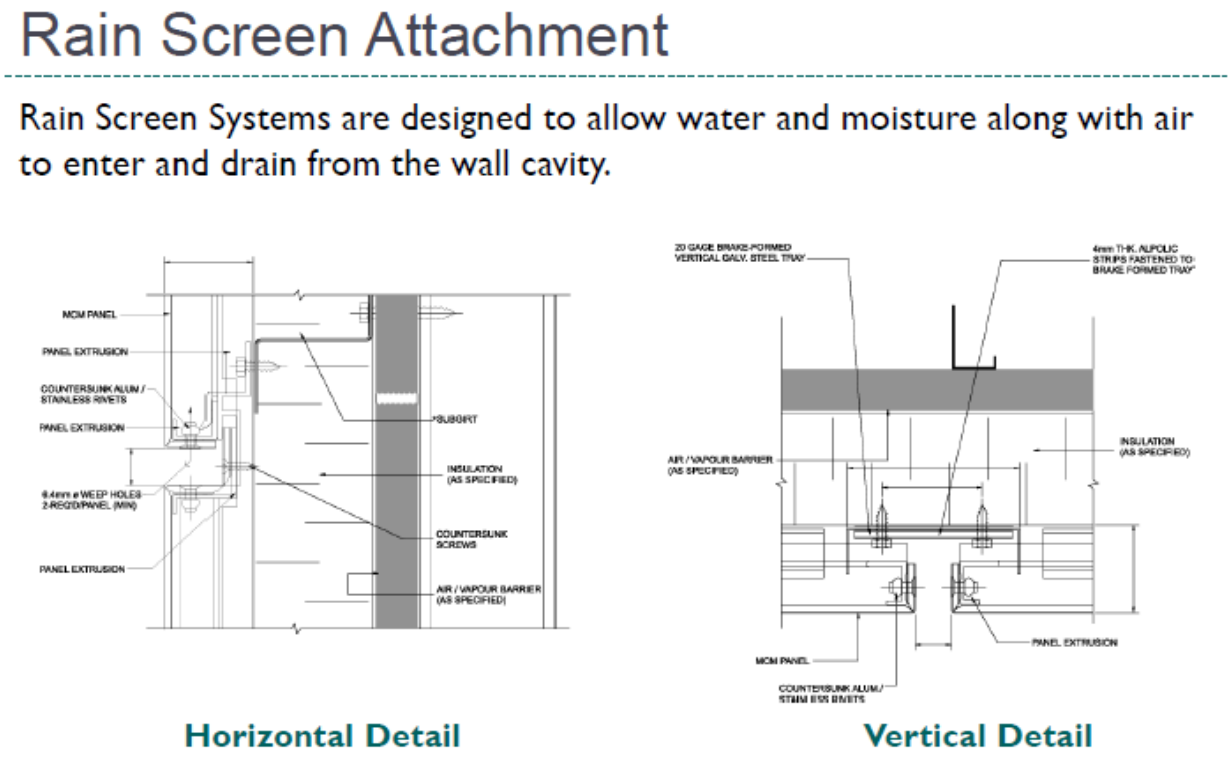

Figure B1 – Rainscreen attachment for ACM panels

B1.3.2 The wet seal attachment, exemplified in Figure B2, uses backer rods and sealants to seal panel joints. Typically, the use of silicone-based sealants would decrease the probability of flame spread. For this joint type, examples have been found where the flame spread of the sealant/backer rod alone can cause a visual flame spread failure in accordance with Clause 10.2.1.2 (2). Experience suggests that this potential failure is due to the backer sealant or rod materials and not of the panel itself. This failure can probably be overcome by requiring backer sealant or rod materials with better fire performance. Experience suggests that it is difficult to predict whether there will be a failure in an NFPA 285 test due to these materials without conducting an actual NFPA 285 test. If experience indicates that the backer rods or sealants are an issue of concern, it is recommended to test using an open joint system, but it might be helpful to include the backer sealants and rods in the vertical joints, so as to evaluate the flame spread of the joint/backer rod assembly. This approach is likely to limit the choice of materials to what was tested, or to materials with similar or better fire performance. In the specific case of a noncombustible backer rod sealed with weather resistant sealants, experience suggests that the use of a material that exhibits a Class A rating on an ASTM E84 test conducted on two strips of sealant, applied to a GRC board and centered on each burner, should indicate that the sealant tested is suitable for use in sealing joints between panels.

B1.3.3 The dry seal attachment system, exemplified in Figure B3, is the most complex attachment method but it is the one most commonly used in successful NFPA 285 fire tests. The dry seal attachment system is a semi-open joint design. Testing based on this attachment system has historically allowed the use of any MCM that has passed an NFPA 285 test in many third-party approvals

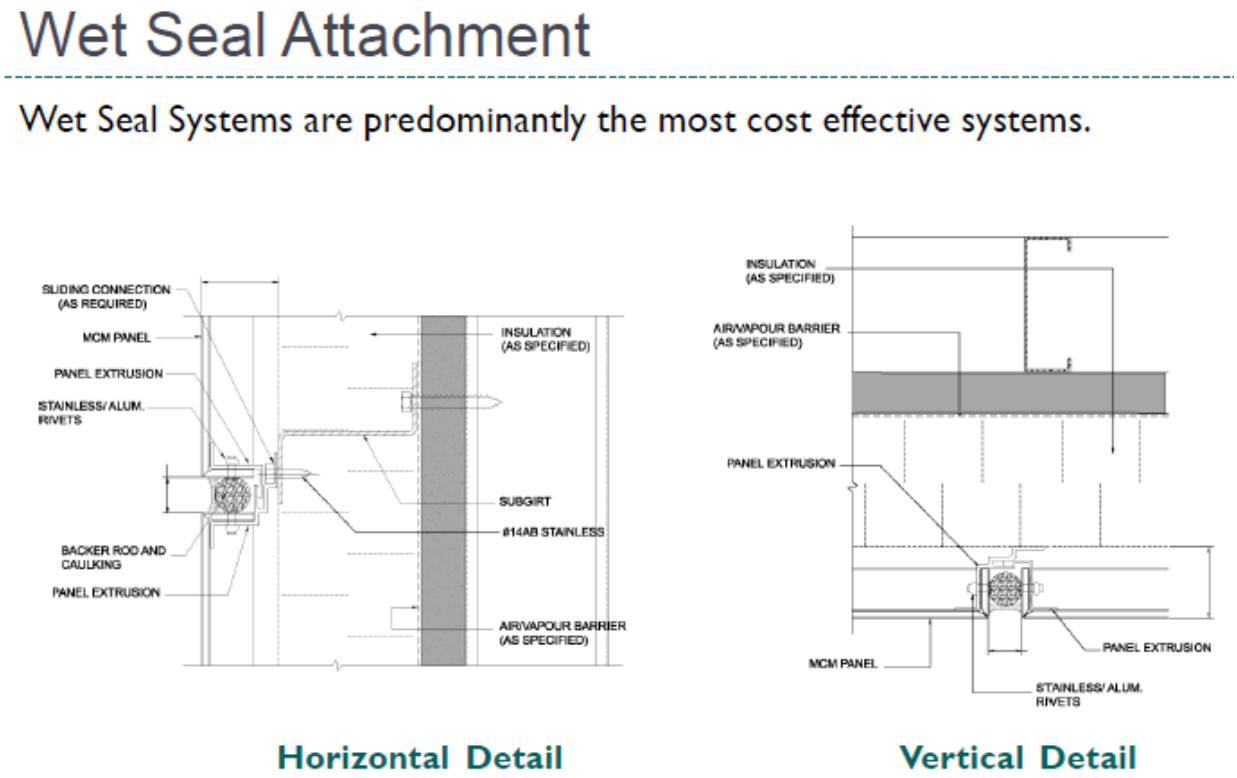

Figure B2 Wet seal attachment system for ACM panels

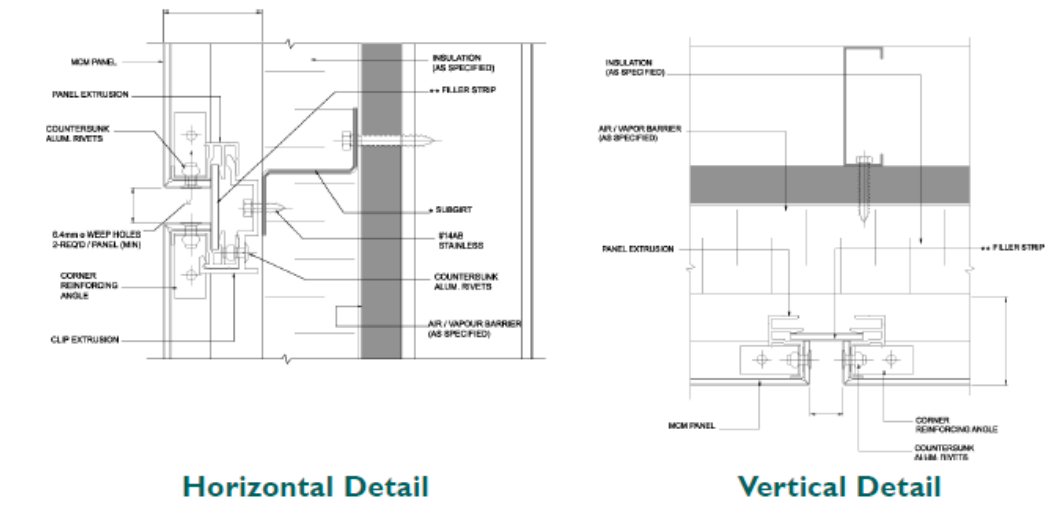

Figure B3 Dry seal attachment system for ACM panels

B2. Insulated Metal Panels (IMP)

B.2.1 Insulated metal panels are lightweight laminated exterior wall and roof panels with two layers of corrosion-resistant coated thin sheet metal (typically steel or aluminum) wrapped around a rigid foam core to form a stiff composite. The fire performance of IMPs can be affected by both the construction of the panel and the configuration or installation of the panels. IMPs are different from metal composite materials (MCMs) and from aluminum composite materials (ACMs), themselves a subset of MCMs. MCMs are described as metal skins bonded to both faces of a solid plastic core (meaning that the core is not a foam plastic, in contrast to IMPs with a foam core). MCM Systems are covered by Section B1.

B.2.2 Typically, most NFPA 285 tests conducted on IMPs have involved ones with corrosion-resistant steel facings on both sides of the panel. When other metal facings are used (such as aluminum) they typically have lower melting points less than steel facings. Therefore, typically, it is acceptable to substitute an aluminum facing by a steel facing, but not vice versa.

B.2.3 In order for an acceptable substitution, the uncoated thickness of the metal facers on each side of the IMP should be the same or greater than that used in the successful NFPA 285 test.

B.2.4 In order for an acceptable substitution, the IMP should have identical profile facers and a total thickness equal or lower than that of the tested panel, because that would involve a lower fuel load.

B.2.5 Typically, IMPS with flat profiles have greater potential for flame spread than do those with complex profiles, such as ribbed profiles.

B.2.6 In order to qualify IMPs for both horizontal and vertical applications, the exterior wall system containing the IMP should be tested in both the vertical and the horizontal configurations. An issue not being addressed here is that if horizontal systems with gaskets.

B.2.7 When an IMP panel has been successfully tested to NFPA 285 in a system without a base wall and installed directly onto the test apparatus, that IMP should be allowed to be used over a steel stud frame wall.

B,2,8 When the IMP is intended to be covered with a combustible veneer, the new combined system, consisting of the combustible veneer and the IMP, should be tested in accordance with NFPA 285.

B.2.9 When a system containing an IMP with concealed fasteners has been tested, a system containing an IMP with additional fasteners, exposed, should be allowed as an alternative. In other words, the addition of exposed fasteners for supplemental strength should be acceptable.

B.2.10 When a system containing an IMP has been tested, a system that is identical but includes wider panels should be allowed as an alternative.
B.2.11 If an IMP system consists of metallic layers surrounding a noncombustible core, it is still likely to require testing to NFPA 285 because of the potential impact of a combustible adhesive.

B.3. High pressure laminates (HPL)

B.3.1 Testing the thickest HPL panel should not always be considered a worst-case scenario, and, thus, it is advisable to test both the thinnest and the thickest panels.

B.3.2 The use of mineral wool or mineral fiber exterior insulation is common with HPL laminates and ithas been typically used in successful NFPA 285 tests. The use of any other type of insulation is not an acceptable alternative to mineral fiber insulation and requires retesting,

B.3.3 When a successful test with an HPL system has been conducted without mineral wool exterior insulation and with a WRB, the substitution for a system with added mineral wool should be an acceptable alternative.

B.3.4 As with other panel systems, when a successful test with an HPL system has been conducted with 2 inches or more of mineral wool or mineral fiber exterior insulation installed directly over a WRB, the substitution for a system with any type of WRB should be an acceptable alternative.

B.3.5 The replacement of an HPL system tested with exposed fasteners by one with concealed fasteners should not be an acceptable alternative. Neither should it be acceptable to replace a system with concealed fasteners by one with exposed fasteners.

B.4 Exterior insulation and finish systems EIFS

B.4.1 EIFS systems are a combination of a base coat, a mesh and a finish coat. Each individual component of the EIFS system should be considered separately. It is recommended that EIFS systems be tested and built with materials from the same manufacturer, instead of combining EIFS components from different manufacturers. Similarly, each EIFS drainage system should be assessed separately.

B.4.2 When a successful test with an EIFS system has been conducted at the maximum thickness of the EPS or of the XPS insulation, the substitution for a system with an EPS or an XPS (as applicable) of lower thickness should be an acceptable alternative, as long as the replacement material has the same or lower density. This is a case of lowering the fuel load.
B.4.3 When testing EIFS systems, all joints and edges should be back-wrapped unless the system is being tested without this installation technique. If back-wrapping is used in the test, then in actual construction back-wrapping should be used at the following locations:

- Top and bottom of each wall.

- Re-entrant (corner walls) and other horizontal wall terminations.
- Door and window penetrations.
- Expansion and control joints.

B.4.4 If an EIFS system consists of a noncombustible layer surrounding a noncombustible core, it is still likely to require testing to NFPA 285 because of the potential impact of a combustible adhesive.

B5. Attachment systems

B.5.1 Most NFPA 285 wall assembly tests incorporate generic cladding attachment systems. Most approvals or listings do not list details of attachment systems because it is typically not practical to include every possible cladding attachment which would qualify, as there are too many options to list.

B5.2 For tests with anchored brick veneer, common brick ties are typically used. Since heavy masonry claddings are durable under fire conditions, their attachment system (such as brick ties) typically does not get exposed to direct flames during the test. It should be noted that some brick attachments use zinc barrel ties and will melt in the area of flame exposure thus loosening the brick attachment.

B.5.3 For MCM/ACM systems, there is no common attachment system. See the section on MCMs and ACMs for some typical ACM joint types and attachments. Typically, ACM or HPL manufacturers do not manufacture attachment systems, but they do provide products to ACM or HPL fabricators who manufacture attachment systems. Given a tested design, alternate attachment systems may be acceptable alternatives if the alternate system has similar melting temperatures, mass, orientation and does not create an air cavity larger than that in the tested system.

B.5.4 For HPL systems, two types of attachments are typical. These are exposed fastener and concealed fastener attachments, but the two are not interchangeable. Alternate attachment systems for each type may be acceptable alternatives if the alternate system has similar melting temperatures, mass, orientation and does not create an air cavity larger than that in the tested system.

B.5.5 Some manufacturers have developed attachment systems that use composite materials, typically rigid fiberglass. The replacement by such systems should require a new NFPA 285 test to ensure initial compliance. When the attachment systems based on composite materials are protected with mineral wool or mineral fiber, they can usually be substituted for ones based on metal framing systems.

B.5.6 Similar type of guidance would apply to some other lightweight claddings, such as IMPs or fiber cement board.

Public Comment No. 3-NFPA 287-2020 [New Chapter after A]

TITLE OF NEW CONTENT

Type your content here ...

Additional Proposed Changes

File Name	Description	Approved
Comment_287.docx		

Statement of Problem and Substantiation for Public Comment

This public comment addresses the need for the specifications of paint coating for test specimens.

Related Item

• First Revision No. 9-NFPA 287-2020

Submitter Information Verification

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Submittal Date: Thu Nov 05 16:09:27 EST 2020
Committee: FIZ-AAA

A.6.3.1 A paint coating is applied to specimens to ensure surface absorption of the imposed radiant heat flux, i.e., >0.95. and the paint coating should have high thermal stability, and no self-ignition until 550 C.

Public Input No. 4-NFPA 259-2021 [Global Input]

Remove “ANSI/” and “Standard for” from all UL standard Titles.

Statement of Problem and Substantiation for Public Input

Many years ago, UL preferred the ANSI/UL reference because there was a transition of traditional UL standards towards an ANSI standards development process.
Now, years later, a large majority of UL Standards are ANSI approved and follow the ANSI development and maintenance process. However, sometimes readers are confused because they don’t understand the standards are actually UL standards, not developed by ANSI. There are many other references to standards promulgated by other standards development organizations where they are considered ANSI approved but do not include ANSI in the reference.

The terms “Standard for” or “Subject” are redundant and unnecessary. All references to UL are standards.

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Public Input No. 1-NFPA 259-2020 [Section No. 2.3.1]

2.3.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D5865/D5865M , *Standard Test Method for Gross Calorific Value of Coal and Coke,* ~~2013~~ 2019 .

Statement of Problem and Substantiation for Public Input

update

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Submittal Date: Thu Dec 24 14:45:09 EST 2020
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Public Input No. 3-NFPA 259-2020 [Section No. B.1.1]

B.1.1

A number of NFPA codes and standards, including NFPA *101*, *NFPA 5000*, NFPA 13, NFPA 90A, and NFPA 220, potentially used for regulations, use the potential heat of materials, assessed via NFPA 259, as part of the determination as to whether a material is a limited combustible material.

B.1.1.1

~~A limited~~ NFPA 5000 describes a limited combustible material ~~is a material that is not a noncombustible material but that~~ as a material where one of the following is met:

(1) The conditions of B1.1.2 and B.1.1.3, and the conditions of either B.1.1.4 or B.1.1.5 are met, or

(2) The conditions of B.1.1.6 are met.

B.1.1.2 The material does not comply with the requirements for a noncombustible material in accordance with ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C.*

B.1.1.3 The material, in the form in which it is used, exhibits a potential heat value ~~of no more than~~ not exceeding 3500 Btu/lb (8141 kJ/kg) ~~and complies with either B.1.1.2 or B.1.1.3~~ . when tested in accordance with NFPA 259.

B.1.1.

~~2~~

~~The~~ 4 The material has a structural base of ~~a~~ noncombustible material with a surfacing not exceeding a thickness ~~of~~ of 1// 8 ~~in~~ in . (3.2 mm) where the surfacing exhibits a flame spread index not greater than 50 when tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials* , or ~~ANSI/~~ UL 723, ~~Standard for~~ *Test for Surface Burning Characteristics of Building Materials* .

B.1.1.

~~3~~

~~The material is composed~~ 5 The material is composed of materials that ~~,~~ in the form and thickness used ~~,~~ neither exhibit a flame spread index greater than 25 nor exhibit evidence of continued progressive combustion when tested in accordance with ASTM ~~E84, *Standard Test Method for Surface Burning Characteristics of Building Materials* , or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials* ,~~ E84 or UL 723 and are of such composition that all surfaces that would be exposed by cutting through the material on any plane would neither exhibit a flame spread index greater than 25 nor exhibit evidence of continued progressive combustion when tested in accordance with ASTM E84 or ~~ANSI/~~ UL 723

B .1.1.6 Materials are considered limited-combustible materials where tested in accordance with ASTM E2965, *Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter* , at an incident heat flux of 75 kW/m 2 for a 20-minute exposure, and both the following conditions are met: (a) t he peak heat release rate does not exceed 150 kW/m 2 for longer than 10 seconds, and (b) the total heat released does not exceed 8 MJ/m 2 .

Statement of Problem and Substantiation for Public Input

The requirements in NFPA 5000 have been revised to include ASTM E2965 as an alternate optional test for assessing limited combustibility.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 259-2020 [Section No. D.1.2.1]	

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Public Input No. 2-NFPA 259-2020 [Section No. D.1.2.1]

D.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials,* ~~2016~~ 2020 .

ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C, 2019.*

ASTM E906/E906M, *Standard Method of Test for Heat and Visible Smoke Release Rates for Materials and Products Using a Thermopile Method,* 2017.

ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter (Cone Calorimeter),* ~~2016a~~ 2017 .

ASTM E1474, *Standard Test Method for Determining the Heat Release Rate of Upholstered Furniture and Mattress Components or Composites Using a Bench Scale Oxygen Consumption Calorimeter*, ~~2014~~ 2020a .

ASTM E1537, *Standard Test Method for Fire Testing of Upholstered Seating Furniture*, ~~2015~~ 2016 .

ASTM E1590, *Standard Test Method for Fire Testing of Mattresses*, 2017.

ASTM E1822, *Standard Test Method for Fire Testing of Stacked Chairs*, ~~2013~~ 2017 .

ASTM E2965, *Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter*, ~~2016a~~ 2017 .

Gross, D., and M. G. Natrella, “Interlaboratory Comparison of the Potential Heat Test Method,” in ASTM STP 464, *Fire Test Performance*, 1970, pp. 127–152.

Loftus, J. J., D. Gross, and A. F. Robertson. “Potential Heat, a Method for Measuring the Heat Release of Materials in Building Fires,” *ASTM Proceedings*, Vol. 61, 1961, pp. 1336–1348.

Parker, W. J., and M. E. Long. “Development of a Heat Release Rate Calorimeter at NBS,” in ASTM STP 502, *Ignition, Heat Release and Noncombustibility of Materials,* 1972, pp. 135–151.

Robertson, A. F. “Test Method Categorization and Fire Hazard Standards,” *ASTM Standardization News*, Nov. 1975, pp. 18–20.

Statement of Problem and Substantiation for Public Input

date updates

Also ASTM E136 is recommended to be added into annex B by another PI.

Related Public Inputs for This Document

Related Input	Relationship
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Public Input No. 5-NFPA 259-2021 [Section No. D.1.2.5]

D.1.2.5 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

~~ANSI/~~ UL 723, ~~*Standard for*~~ *Test for Surface Burning Characteristics of Building Materials*, ~~2013~~ 2018 .

Statement of Problem and Substantiation for Public Input

UL Standard edition update.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4-NFPA 259-2021 [Global Input]	

Submitter Information Verification

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Submittal Date: Mon Jan 04 12:39:52 EST 2021
Committee: FIZ-AAA

Public Input No. 1-NFPA 270-2020 [Section No. 2.3.1]

2.3.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E176, *Standard Terminology of Fire Standards*, ~~2015ae1~~ 2018ae1 .

Statement of Problem and Substantiation for Public Input

date update

Submitter Information Verification

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Submittal Date: Wed Dec 23 14:55:41 EST 2020
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Public Input No. 3-NFPA 270-2020 [Section No. 6.6]

6.6 Specimen ~~Preparation.~~ Preparation

6.6.1

–

General— The specimen shall be representative of the

~~material, product, or assembly~~

materials or composite and shall be prepared in accordance with

~~the procedures described in~~

recommended application procedures.

6.6.

~~2 and~~

1.1 Flat sections of the same thickness and composition shall be tested rather than curved, molded, or specialty parts.

6.6.

~~4.~~

1.2 Substrate or core materials for the test specimens shall be the same as those for the intended application.

6.6.1.

~~1~~ –

~~The specimens shall be cut, sawn, molded, or stamped from identical sample areas of the material, product, or assembly.~~

~~**6.6.1.2** –~~

~~Records shall be kept of specimens' thicknesses and, if required, their masses.~~

~~**6.6.2** –~~

~~If flat sections of the same thickness and composition are tested in place of curved, molded, or specialty parts, this difference shall be stated in the test report.~~

~~**6.6.3** –~~

~~Any substrate or core materials for the specimens shall be the same as those used in practice.~~

~~**6.6.4** –~~

~~When coatings, including paints and adhesives, are tested with the substrate or core as used in practice, specimens shall be prepared following 6.6.1 , and in such cases the method of application of the coating, number of coats, and type of substrate shall be included in the test report.~~

3 If a material or assembly has the potential to be exposed to a fire on either side, both sides shall be tested.

6.6.1.4 If an adhesive is intended for field application of a finish material or substrate, the prescribed type of adhesive and the spreading rate recommended for field application of the assembly of test specimen shall be used and the details reported.

6.6.2 Paints, adhesives, or similar finish materials shall be applied to the smooth face of $\frac{1}{4}$-in. (6.4-mm) thick uncoated fiber cement board, nominally 90 ± 10 lb/ft^3 (1440 ± 160 kg/m^3) in density, complying with ASTM C1288 or ASTM C1186, Grade II, using recommended application techniques and coverage rates.

6.6.3 Finish materials, including sheet laminates, tiles, fabrics, and others secured to a substrate material with an adhesive, shall be evaluated by performing supplementary tests on a split exposed surface.

6.6.4 Composite materials not attached to a substrate, which have the potential to be subject to delamination, cracking, peeling, or other separations affecting their smoke generation, shall be evaluated by performing supplementary tests on an interior layer or surface.

6.6.5 When supplementary tests, as required by Section 6.6.3 or Section 6.6.4, are conducted, the manner of performing such supplementary tests, and the test results, shall be included in the report, together with the test results from the original tests.

6.6.6 Finish materials without a substrate or core shall be tested using the procedures in Sections 6.6.6.1 and 6.6.6.2.

6.6.6.1 Rigid or semirigid finish materials, such as sheet materials or veneers, shall not require supplementary tests, regardless of thickness.

6.6.6.2* Veneers that are not rigid or semi-rid materials, intended for application to combustible substrates, shall be applied to the smooth face of $\frac{1}{4}$-in. (6.4-mm) nominal tempered hardboard, complying with ANSI/AHA A135.4 “Basic Hardboard”, using recommended application techniques and coverage rates, unless a specified assembly system has been provided.

A.6.6.6.2 Tempered hardboard sheets conforming to ANSI/AHA A135.4 are marked with a 0.5 in. (12.7 mm) wide single red stripe placed on the thickness side approximately 3 in. (76 mm) from each corner. Service tempered hardboard sheets are marked with two red stripes.

6.6.6.2.1 Supplementary tests shall also be conducted on the hardboard alone, and the results reported as supplemental to the measured values for the composite specimens.

6.6.6.2.2 The results of the tests conducted with the backed veneers and of those conducted with the hardboard alone shall be included in the test report.

6.6.7 Fabrics and thin films that tend to shrink, to bunch, to blister, or to pull out from under the specimen holder during the test, shall be tested with the test specimens, and the aluminum foil wrapper, stapled to an inorganic insulation millboard backing, using five standard size wire staples, approximately $\frac{1}{2}$ by $\frac{1}{4}$ by 0.02 in. (12.7 by 6.3 by 0.5 mm), positioned horizontally at the center, and at the center of the four quadrants.

6.6.8 Electrical or optical fiber wires or cables

6.6.8.1 Electrical or optical fiber wires or cables up to 1 in. (25.4 mm) in diameter shall be tested by cutting the cables to 3 + 0, –0.03 in. (76.2 + 0 – 0.8 mm) lengths.

6.6.8.2 Lengths of wires or cables prepared in 6.6.7.1 shall be placed side-by-side in the specimen

holder until no additional lengths can be added.

6.6.8.3 A sheet of 1/2-in. (12.7-mm) thick inorganic insulation millboard shall be wrapped with aluminum foil and placed behind the wires or cables as a backing board before inserting the specimen holder spring and retaining rod.

Statement of Problem and Substantiation for Public Input

This change makes NFPA 270 consistent with ASTM E1995, which is an equivalent test method.
It is important to point out that testing paints or adhesives should be done on a noncombustible substrate, since it has been demonstrated that the smoke generated by a combustible substrate (such as hardboard) may overwhelm the smoke generated by the paint or adhesive.
When veneers and finishes intended for application on a combustible substrate are tested they should be tested on a standard hardboard and the values obtained with the hardboard alone should be reported also.
When materials that are multilayered (such as composites or thin flexible veneers), which have the potential to delaminate and expose interior surfaces with higher smoke, they need to be tested with an interior surface exposed and the results of both tests reported.
Specimen preparation methods are being added for wires and cables and for fabrics and films.

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Committee: FIZ-AAA

Public Input No. 4-NFPA 270-2020 [Section No. 11.2]

11.2 Test Results.

The following test results shall be included in the test report:

(1) Table of numerical results containing the following information for each valid specimen tested:

(2) Specific optical density at 1.5 minutes

(3) Specific optical density at 4.0 minutes

(4) Specific optical density at 10.0 minutes

(5) Specific optical density at end of test (if test duration is different from 10.0 minutes)

(6) Maximum specific optical density

(7) Time to ignition

(8) Time to maximum optical density

(9) Duration of the test

(10) If calculated, the neutral density correction, C_f

(11) The clear beam correction factor, D_c

(12) The mass loss, D_m

(13) Graphical results for each valid specimen tested

(14) Graph of specific optical density against time

(15) All available information required in Section 6.7 (regarding specimen preparation and coatings used, if applicable) and in Section 9.6 (observations regarding burning characteristics of the specimens and any events of special interest during the tests)

(16) Details of any invalid tests, including reasons for them being invalid as described in 1.3.3.1 and 9.9.3

(17) Details of any supplementary tests conducted, including information on the supplementary test itself and on the test results.

Statement of Problem and Substantiation for Public Input

This PI simply adds one additional requirement: to report the results of supplementary tests (the other apparent changes are introduced by Terra).

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Submittal Date:	Wed Dec 30 15:15:29 EST 2020
Committee:	FIZ-AAA

Public Input No. 2-NFPA 270-2020 [Section No. E.1.2.1]

E.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D2843, *Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics*, ~~2016~~ 2019 .

ASTM D4100, *Test Method for Gravimetric Determination of Smoke Particulates from Combustion of Plastic Materials*, 1982 (reapproved 1989 with editorial change, withdrawn 1997).

ASTM D5424, *Standard Test Method For Smoke Obscuration of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration,* ~~2014~~ 2018 .

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2016~~ 2020 .

ASTM E603, *Standard Guide for Room Fire Experiments*, ~~2013~~ 2017 .

ASTM E662, *Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials*, ~~2015~~ 2020 .

ASTM E906/E906M, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using a Thermopile Method*, 2017.

ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*, ~~2016a~~ 2017 .

ASTM E1474, *Standard Test Method for Determining the Heat Release Rate of Upholstered Furniture and Mattress Components or Composites Using a Bench Scale Oxygen Consumption Calorimeter*, ~~2014~~ 2020a .

ASTM E1537, *Standard Test Method for Fire Testing of Upholstered Furniture*, 2016.

ASTM E1590, *Standard Test Method for Fire Testing of Mattresses*, 2017.

ASTM E1995, *Standard Test Method for Measurement of Smoke Obscuration Using a Conical Radiant Source in a Single Closed Chamber, With the Test Specimen Oriented Horizontally*, ~~2016~~ 2020 .

Statement of Problem and Substantiation for Public Input

date updates

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Committee: FIZ-AAA

Public Input No. 1-NFPA 289-2021 [Global Input]

Remove “Standard for” and “Subject” from all UL standard Titles

Statement of Problem and Substantiation for Public Input

The terms “Standard for” or “Subject” are redundant and unnecessary. All references to UL are standards.

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Public Input No. 2-NFPA 289-2021 [Section No. C.1.2.4]

C.1.2.4 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 1975, ~~*Standard for*~~ *Fire Tests for Foamed Plastics Used for Decorative Purposes,* 2006.

UL ~~Subject~~ 2358, *Outline of Investigation for Fire Tests of Pre-Lit Artificial Seasonal Use Trees and Other Seasonal Decorative Items*, 2013.

Statement of Problem and Substantiation for Public Input

The term “Standard for” are redundant and unnecessary. All references to UL are standards. The term “Subject” is an old term referred to Outlines of Investigation, it is redundant to use both terms.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1-NFPA 289-2021 [Global Input]	

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Public Input No. 2-NFPA 261-2020 [Section No. 4.2]

4.2* Ignition Source.

The ignition source shall be the current supply of SRM 1196 series cigarettes without filter tips, made from natural tobacco, 83 mm ± 2 mm long with a tobacco packing density of 0.270 g/cm^3 ± 0.020 g/cm^3 and a total ~~weight of~~ mass of 1.1 g ± 0.1 g.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at test methods for cigarette ignition resistance and concluded that the cigarette needs to be revised because the SRM 1196 cigarette no longer is available but NIST has procured a series of cigarettes (SRM 1196 series) that have equivalent characteristics.
This has been changed by a TIA.
The word weight is also being proposed to be replaced by the word mass.

Submitter Information Verification

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Public Input No. 6-NFPA 261-2020 [Section No. 4.2]

4.2* Ignition Source.

The ignition source for the test shall consist of the current supply of ~~be~~ SRM 1196 series cigarettes without filter tips, made from natural tobacco,

~~83 mm~~

83 mm ±

~~2 mm~~

2 mm long , with a tobacco packing density of 0.

~~270 g~~

270 g /cm 3 ± 0.

~~020 g~~

020 g /cm 3 , and a total weight of 1.

~~1 g~~

1 g ± 0.

~~1 g.~~

1 g.

A.4.2 Standard Reference Material (SRM) 1196 series cigarettes are ~~is~~ obtained from the National Institute of Standards and Technology (NIST). In previous editions of this test method, the ignition source was a commercially available cigarette identified by certain characteristics that corresponded to an unfiltered Pall Mall cigarette. Based on regulations for reduced ignition propensity cigarettes, these particular cigarettes are no longer available in the United States. That cigarette has been replaced by the manufacturer with a banded cigarette that meets the regulations for reduced ignition propensity. Banded cigarettes very frequently go out when placed on a test substrate. Since the test requires that a test cigarette burn its full length, the new version of the old test cigarette is not usable.

NIST had samples of the old cigarettes and was able to characterize their ignition propensity. They commissioned cigarettes to be manufactured to those specifications. Then they verified that the new cigarettes met the physical and performance requirements of the previously used cigarettes. These cigarettes were made available by ~~are now available from~~ NIST as SRM 1196, one of over 1300 ~~2000~~ standard reference materials that they produce for various uses. When the original SRM 1196 cigarettes ceased to be available, NIST procured SRM 1196a cigarettes and is planning to continue providing cigarettes to be designated as SRM 1196 series cigarettes in the future.

Additional Proposed Changes

File Name	Description	Approved
TIA_261_18_1.pdf	NFPA TIA 18-1 (Log No. 1533)	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 18-1 (Log No. 1533) issued by the Standards Council on December 3, 2020 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the document.
Substantiation: The TIA item shown above addresses the cigarette to be used as ignition source, since SRM 1196 is no longer available from NIST (or anyone else) and it has been replaced by SRM 1196a by NIST. NIST is planning to issue, as needed, future versions of the SRM 1196 cigarette, and they are planned to be designated SRM1196b, SRM 1196c, and so forth. Tests in accordance with this standard cannot be conducted without a reference to an available appropriate cigarette as the ignition source.
In the annex, the changes present the rationale for the changes in the body of the standard and update some of the information presently contained in the standard.
Emergency Nature: The proposed TIA intends to accomplish a recognition of an advance in the art of safeguarding property or life where an alternative method is not in current use or is unavailable to the public. The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification of the action.
The codes (both the NFPA 101 Life Safety Code and the International Fire Code) reference NFPA 261 for assessing the ignition propensity of mocked-up composites of upholstered furniture when exposed to smoldering cigarettes. The 2018 edition of NFPA 261 cannot be used to conduct the testing because of the lack of availability of SRM 1196 cigarettes. The source of SRM 1196 has issued a replacement and it is urgent that the revised standard be available for the next edition of the codes, since the closing date for proposals to the International Fire Code is January 2021 and public inputs to NFPA 101 are also due in 2021, all of which will precede the next edition of NFPA 261.

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Submittal Date: Tue Dec 22 16:07:37 EST 2020
Committee: FIZ-AAA

Tentative Interim Amendment

NFPA® 261

Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes

2018 Edition

Reference: 4.2 and A.4.2
TIA 18-1
(SC 20-12-20 / TIA Log #1533)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards,* the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 261, *Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes,* 2018 edition. The TIA was processed by the Technical Committee on Fire Tests and was issued by the Standards Council on December 3, 2020 with an effective date of December 23, 2020.

1. Revise 4.2 and associated Annex A.4.2 to read as follows:

4.2* Ignition Source. The ignition source for the test shall consist of the current supply of ~~be~~ SRM 1196 series cigarettes without filter tips, made from natural tobacco, 83 mm ± 2 mm long, with a tobacco packing density of 0.270 g/cm^3 ± 0.020 g/cm^3, and a total weight of 1.1 g ± 0.1 g.

A.4.2 Standard Reference Material (SRM) 1196 series cigarettes are ~~is~~ obtained from the National Institute of Standards and Technology (NIST).

In previous editions of this test method, the ignition source was a commercially available cigarette identified by certain characteristics that corresponded to an unfiltered Pall Mall cigarette. Based on regulations for reduced ignition propensity cigarettes, these particular cigarettes are no longer available in the United States. That cigarette has been replaced by the manufacturer with a banded cigarette that meets the regulations for reduced ignition propensity. Banded cigarettes very frequently go out when placed on a test substrate. Since the test requires that a test cigarette burn its full length, the new version of the old test cigarette is not usable.

NIST had samples of the old cigarettes and was able to characterize their ignition propensity. They commissioned cigarettes to be manufactured to those specifications. Then they verified that the new cigarettes met the physical and performance requirements of the previously used cigarettes. These cigarettes were made available by ~~are now available from~~ NIST as SRM 1196, one of over 1300 ~~2000~~ standard reference materials that they produce for various uses. When the

original SRM 1196 cigarettes ceased to be available, NIST procured SRM 1196a cigarettes and is planning to continue providing cigarettes to be designated as SRM 1196 series cigarettes in the future.

Issue Date: December 3, 2020

Effective Date: December 23, 2020

Public Input No. 1-NFPA 261-2020 [Sections 7.7, 7.8, 7.9, 7.10]

Sections 7.7, 7.8, 7.9, 7.10

7.7 Test duration

7.7.1 The test shall be conducted for a total period of 45 minutes, unless ignition, as described in 7.7.2, has occurred.

7.7.2 For this test method, pronounced continuous and self-sustaining combustion of the test system or the generation of a flame or of smoke shall be evidence of ignition.

7.8 Test Acceptance.

7.8.1 A test at any location shall be considered complete if any of the following occurs:

(1) Three cigarettes in a given location have burned their full lengths without ~~sustained~~ ignition.

(2) Three cigarettes in a given location have self-extinguished before burning their full lengths.

(3) Three cigarettes in a given ~~location sustained ignition~~ location ignition.

(4) The maximum char distance has exceeded 5.1 cm (2 in.).

(5) Forty five minutes have elapsed from the placement of the last lit cigarette on the test assembly.

7.8.2 If the test has been completed without an ignition having occurred, the tested assembly shall be classified as a Class I system .

7.8 .3 If the test has had to be terminated for any reason, in accordance with 7.8.1, before forty five minutes have elapsed, the tested assembly shall be classified as a Class II system.

7.9 Ignition.

7.8 9 .1

If ~~obvious~~ ignition occurs, the test shall be stopped and the burning material extinguished.

7.8 9 .2

The test room shall be ventilated, and an ignition shall be recorded for the cigarette test location.

7.9 10 Char Length Measurement.

7.9 10 .1

If the cigarette burns to completion at a test location, the maximum char length in any direction of any material shall be measured from the point nearest to the original location of the cigarette.

7.9 10 .2 Cigarette Ignition Results.

7.9 10 .2.1

The char length measurement for each cigarette shall be recorded, except when the cigarette has extinguished without burning to completion or where obvious combustion occurs.

7.9 10 .2.2

If the char from one cigarette runs into the char from another, the results of the test shall be invalid and the test shall be repeated, burning one cigarette at a time.

7.9 10 .2.3

All mock-ups shall be disassembled after testing is complete.

7.~~9~~ 10 .2.3.1

If when disassembling the apparatus, it is determined that smoldering is still in progress, the test shall be invalid and shall be repeated.

7.~~10~~ 11 Testing Environment.

The test shall be carried out in a draft-protected area. The maximum airflow across the sample face shall be less than 15.2 m/min.

Statement of Problem and Substantiation for Public Input

This public input addresses the duration of the test and when the test is to be terminated early. It also describes what is to be considered ignition and eliminates the unnecessary description of "obvious" ignition or "sustained" ignition and simply addresses ignition.
A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at test methods for cigarette ignition resistance and concluded that a test duration of 45 minutes is appropriate and that tests should be terminated if any criterion for classification has been reached. If the test assembly continues smoldering at the end of test that is, in fact, equivalent to continued burning and should be reported as an ignition. Note that the test method already states that any char length measurement exceeding 2 inches shall be reported as “> 2 in.”, and continuing the test after that is unnecessary. Other public inputs will be submitted also.

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Public Input No. 5-NFPA 261-2020 [Chapter 9]

Chapter 9 Reporting

9.1

~~– Reporting.~~

The following shall be reported:

9.1.1 The edition of this test method that was used (including an explanation if the latest edition was not used).

9.1.

~~1 –~~

~~The~~

2 A description of the system being tested, including the source.

9.1.3 The test laboratory.

9.1.4 The date the test was conducted.

9.1.5 The temperature and relative humidity in the test laboratory.

9.1.6 The classification of the system tested.

9.1.7 If the system was classified as a Class II system, the criterion used for that classification.

9.1.8

The maximum char distance measured to the nearest 5 mm from the center of the original location of the test cigarette shall be recorded for each cigarette location.

9.1.~~2~~ 9

When ~~obvious ignition~~ ignition has occurs, an ignition shall be recorded for ~~the test~~ that test location.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at test methods for cigarette ignition resistance. This is one of the resulting PIs. The reporting information needs to be more complete.

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Submittal Date: Wed Dec 16 20:05:49 EST 2020

Committee: FIZ-AAA

Public Input No. 4-NFPA 261-2020 [Section No. A.1.1.1]

A.1.1.1

This test method was originally similar to that described in ASTM E1352, *Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies*. When the use of reduced ignition propensity cigarettes became required in the United States, this test method (NFPA 261) changed its ignition source and started using a cigarette developed by NIST (SRM 1196). The cigarette ignition potency of SRM 1196 cigarettes [as assessed by NIST (Gann and Hnetkovsky 2009) using a method close to that in ASTM E2187, *Standard Test Method for Measuring the Ignition Strength of Cigarettes*] is similar to that of the ignition source used when the test method was developed initially and is much higher than that of reduced ignition propensity cigarettes *(see also A.4.2)*. ~~The change in ignition source for ASTM E1352 did not occur until 2016. There~~ There is insufficient information as to the effect of the cigarette covered with fabric on ignition potency. Once the SRM 1196 cigarettes ceased being available, NIST procured equivalent cigarettes that are designated as SRM 1196 series cigarettes.The 2016 edition of ASTM E1352 references the SRM 1196 cigarettes as the ignition source, even though these cigarettes are no longer available.

Statement of Problem and Substantiation for Public Input

This change, from the task group, is consistent with the other changes on the new cigarettes.

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Public Input No. 3-NFPA 261-2020 [Section No. A.4.2]

A.4.2

Standard Reference Material (SRM) 1196 ~~is obtained~~ series cigarettes are obtained from the National Institute of Standards and Technology (NIST).

In previous editions of this test method, the ignition source was a commercially available cigarette identified by certain characteristics that corresponded to an unfiltered Pall Mall cigarette. Based on regulations for reduced ignition propensity cigarettes, these particular cigarettes are no longer available in the United States. That cigarette has been replaced by the manufacturer with a banded cigarette that meets the regulations for reduced ignition propensity. Banded cigarettes frequently go out when placed on a test substrate. Since the test requires that a test cigarette burn its full length, the new version of the old test cigarette is not usable.

NIST had samples of the old cigarettes and was able to characterize their ignition propensity. They commissioned cigarettes to be manufactured to those specifications. Then they verified that the new cigarettes met the physical and performance requirements of the previously used cigarettes. These cigarettes ~~are now available from NIST~~ were made available by NIST as SRM 1196, one of over ~~2000 standard~~ 1300 standard reference materials that they produce for various uses. When the original SRM 1196 cigarettes ceased to be available, NIST procured SRM 1196a cigarettes and is planning to continue providing cigarettes to be designated as SRM 1196 series of cigarettes in future. In view of the fact that SRM 1196 is no longer available, the test method was changed to reflect the use of an SRM 1196 series cigarette.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at test methods for cigarette ignition resistance and prepared various public inputs. This particular PI is a companion to the one addressing the cigarette ignition source and the annex material regarding it in section A1.
This was approved by a TIA.
An added sentence is proposed to be included also.

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Public Input No. 4-NFPA 274-2021 [Global Input]

Remove “Standard for” from all UL standard Titles

Statement of Problem and Substantiation for Public Input

The terms “Standard for” or “Subject” are redundant and unnecessary. All references to UL are standards.

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Public Input No. 3-NFPA 274-2020 [Chapter B]

Annex B Commentary

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1 Measurement Section Instrumentation.

B.1.1

The locations for velocity, temperature, gas analysis, and smoke photometer should be chosen to ensure that the products of combustion are well mixed and not stratified at the sampling location. The general rule should be for the duct to run a sufficient length (10 diameters) downstream from the last turn in the duct prior to location of instrumentation in order to provide for a fully developed gas flow. Mixing vanes should be used in the duct if concentration gradients are found to exist.

B.1.2

A laser beam system can be permitted to be used as an alternative system for measuring smoke obscuration.

B.2 Mounting.

B.2.1

Three pipes are used to provide a configuration where radiation and reradiation can occur between burning specimens, the center specimen potentially receiving energy on two sides. The recommended spacing between the installed insulation assemblies of 50 mm ± 13 mm (2 in. ± ½ in.) is a distance believed to produce significant radiation between the pipes and yet allow enough space for easy installation.

B.2.2

Specimens of alternative size could be tested with this method on different diameter pipes if it is not possible to manufacture material in the standard size required. The spacing between the insulation assemblies should remain 50 mm ± 13 mm (2 in. ± ½ in.). Any deviation from the standard should be noted in the report.

B.3 ~~Conditions of Acceptance.~~

~~**B.3.1** –~~

~~The performance of the pipe insulation assembly should be judged on the basis of data obtained during the test.~~

~~**B.3.2** –~~

~~The acceptance should be valid for the pipe insulation assembly tested, including the actual thickness and all accessories used in the assembly.~~

~~**B.3.3** –~~

~~Assemblies should be considered to have acceptable performance if B.3.4 through B.3.7 are all met during the 10-minute test.~~

~~**B.3.4** –~~

~~Peak rate of heat release should be 300 kW or less.~~

~~**B.3.5** –~~

~~Total heat released at 10 minutes (THR $_{600}$), which includes the heat released by the burner, should be 83 MJ or less. This limit corresponds to 50 MJ above the total heat release of the burner for the full 10-minute burn.~~

~~**B.3.6** –~~

~~Total smoke release (TSR_{600}) should be 500 m^2 (5382 ft^2) or less.~~

~~**B.3.7** –~~

~~Flames should not extend 0.3 m (1 ft) or more above the top of the vertical portion of the apparatus at any time during the test.~~

~~**B.3.8** –~~

~~The temperature of any of the three thermocouples specified in 5.1.11 should not exceed 538°C (1000°F) at any time during the test.~~

~~**B.4** –~~ Insulation Materials.

The *Uniform Mechanical Code* (*UMC*) uses this test for regulation of pipe insulation materials in plenums. The ~~conditions of acceptance in the *UMC* are slightly different from those in Section B.3 . The~~ *International Mechanical Code (IMC), NFPA 5000*, and NFPA 90A use ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard Test Method for Surface Burning Characteristics of Building Materials*, for regulation of both pipe insulation and duct insulation.

Statement of Problem and Substantiation for Public Input

Does it make sense to include conditions of acceptance into this test method and then say the code actually doesn't use them? The correct conditions of acceptance should be included or the entire section deleted as this PI recommends.

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Committee: FIZ-AAA

Public Input No. 1-NFPA 274-2020 [Section No. D.1.2.1]

D.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2015b~~ 2020 .

Statement of Problem and Substantiation for Public Input

update

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Public Input No. 2-NFPA 274-2020 [Section No. D.1.2.3]

D.1.2.3 ICC Publications.

International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001.

International Mechanical Code (IMC), ~~2015~~ 2021 .

Statement of Problem and Substantiation for Public Input

update

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
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Submittal Date: Tue Dec 29 16:45:11 EST 2020
Committee: FIZ-AAA

Public Input No. 5-NFPA 274-2021 [Section No. D.1.2.4]

D.1.2.4 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

~~ANSI/~~ UL 723, ~~*Standard Test*~~ *Method for Surface Burning Characteristics of Building Materials*, ~~2008~~ 2018 .

Statement of Problem and Substantiation for Public Input

UL Standard edition update.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4-NFPA 274-2021 [Global Input]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
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Submittal Date: Mon Jan 04 12:50:00 EST 2021
Committee: FIZ-AAA

Public Input No. 2-NFPA 290-2021 [Global Input]

Remove “ANSI/” and “Standard for” from all UL standard Titles.

Statement of Problem and Substantiation for Public Input

Many years ago, UL preferred the ANSI/UL reference because there was a transition of traditional UL standards towards an ANSI standards development process.
Now, years later, a large majority of UL Standards are ANSI approved and follow the ANSI development and maintenance process. However, sometimes readers are confused because they don’t understand the standards are actually UL standards, not developed by ANSI. There are many other references to standards promulgated by other standards development organizations where they are considered ANSI approved but do not include ANSI in the reference.

The terms “Standard for” or “Subject” are redundant and unnecessary. All references to UL are standards.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL LLC
Street Address:
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Submittal Date: Mon Jan 04 12:59:22 EST 2021
Committee:

Public Input No. 3-NFPA 290-2021 [Section No. 2.3.1]

2.3.1 ~~ANSI/~~ UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

~~ANSI/~~ UL 385, ~~*Standard for*~~ *Safety Play Pipes for Water Supply Testing in Fire Protection Service,*~~ 2005, revised 2015~~ 2020 .

Statement of Problem and Substantiation for Public Input

UL Standard edition update.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 290-2021 [Global Input]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL LLC
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Submittal Date: Mon Jan 04 13:00:32 EST 2021
Committee: FIZ-AAA

Public Input No. 1-NFPA 290-2020 [Section No. A.1.1]

A.1.1

Thermal protection insulating systems are allowed for use on LP-Gas containers as a means of "Special Protection" in NFPA 58 and NFPA 59. These standards have required that these materials undergo thermal performance testing as a precondition for acceptance. The intent of this testing procedure is to identify insulation systems that retard or prevent the release of the container's contents in a fire environment of 50 minutes' duration and that will resist a concurrent hose stream of 10 minutes' duration.

~~This test method provides a replacement for the test as described~~ With the issuance of NFPA 290, this test method, with the acceptance criteria of Section 7.5, is now the test for thermal insulation of LP-gas containers required in Annex H of NFPA 58 and ~~referenced in NFPA 59~~ also required by NFPA 59 for the insulation in LP-gas insulated containers .

Statement of Problem and Substantiation for Public Input

clarification

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
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Submittal Date: Tue Dec 29 16:56:23 EST 2020
Committee: FIZ-AAA

Public Input No. 1-NFPA 260-2018 [Global Input]

1. *Revise 5.5.1 to read as follows:*

   5.5.1 Three 203 mm x 127 mm x ~~51~~ 76 mm specimens shall be cut for the horizontal panels, and three 203 mm x 203 mm x ~~51~~ 76 mm specimens shall be cut for the vertical panels.

2. *Revise 6.1.1 to read as follows:*

   6.1.1 For horizontal panels, the 203 mm x 280 mm cover fabric specimen shall be placed on a 203 mm x 127 mm x ~~51~~ 76 mm polyurethane foam substrate, using pins in the ends of the fabric specimen to hold it in place, as shown in Figure 6.1.1.

Additional Proposed Changes

File Name	Description	Approved
Issued_TIA_260-19-1_Final.pdf	NFPA 260 TIA 19-1 Log No. 1386	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment Log No. 1386 issued by the Standard Council on December 7, 2018 and per the NFPA Regs, needs to be reconsidered by the Technical Committee for the next edition of the document.

Substantiation: The dimensions of the filling/padding in these sections (which indicate a 51 mm thickness) are inconsistent with the dimensions of the filling/padding in all other locations in chapter 6. Throughout chapter 6 the dimensions are listed as 76 mm thick. This can be found in the following sections: 6.1.2, 6.2.2, 6.3.1.3, 6.3.1.4, 6.6.1.1 and 6.6.1.4.

It is essential that the new edition of NFPA 260, which is a consent document, does not get published with errors. The technical committee purposefully changed the dimensions of the filling/padding from 51 mm to 76 mm (i.e. from 2 inches to 3 inches), for technical reasons. If the dimensions (thickness of the filling/padding (i.e. typically the foam) is not changed to the correct one in those places (and especially in 5.5.1 which is where the test specimens are prepared) the foam would not be able to be used to conduct the test according to the procedures in Chapter 6.

Emergency Nature. The standard contains an error or an omission that was overlooked during the regular revision process.

Submitter Information Verification

Submitter Full Name: TC on FIZ-AAA
Organization: NFPA
Street Address:
City:
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Submittal Date: Fri Dec 21 13:24:59 EST 2018

Committee:

Tentative Interim Amendment

NFPA® 260

Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture

2019 Edition

Reference: 5.5.1 and 6.1.1
TIA 19-1
(SC 18-12-8 / TIA Log #1386)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 221, *Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture*, 2019 edition. The TIA was processed by the Technical Committee on Fire Tests and was issued by the Standards Council on December 7, 2018, with an effective date of December 27, 2018.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a public input of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. *Revise 5.5.1 to read as follows:*
   5.5.1 Three 203 mm x 127 mm x ~~51~~ 76 mm specimens shall be cut for the horizontal panels, and three 203 mm x 203 mm x ~~51~~ 76 mm specimens shall be cut for the vertical panels.

2. *Revise 6.1.1 to read as follows:*
   6.1.1 For horizontal panels, the 203 mm x 280 mm cover fabric specimen shall be placed on a 203 mm x 127 mm x ~~51~~ 76 mm polyurethane foam substrate, using pins in the ends of the fabric specimen to hold it in place, as shown in Figure 6.1.1.

Issue Date: December 7, 2018

Effective Date: December 27, 2018

Public Input No. 11-NFPA 260-2020 [Global Input]

With the move to 3" specimen thickness, NFPA 260 is an anomaly among furniture component smolder test protocols and, with the implementation of the SOFFA bill, will fade into the myriad of outdated and unused tests.

I suggest that NFPA 260 be altered to become a better version of California Technical Bulletin 117-2013, which with acceptance of the SOFFA bill will become the federal upholstered furniture mandatory standard. The opportunity to incorporate the language of ASTM E 1353-08, which is referenced frequently within TB117-2013, would be a service to test labs everywhere. In addition, there are gray areas with TB117-2013, that could be better clarified in a NFPA edition.

Respectfully submitted,

Bobby Bush

UFAC Technical Director

Hickory Springs Director- Foam Spcification/Compliance

bwbush@hickorysprings.com

Statement of Problem and Substantiation for Public Input

1) better consistency of test procedure between labs.
2) ease of use with one document rather than a back and forth procedure between a California Technical Bulletin and an ASTM standard.

Submitter Information Verification

Submitter Full Name: Bobby Bush
Organization: Hickory Spgs
Affiliation: UFAC and Hickory Springs
Street Address:
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Zip:
Submittal Date: Thu Oct 08 10:39:34 EDT 2020
Committee:

Public Input No. 28-NFPA 260-2021 [Global Input]

WIth the passage of the SOFFA ACT in the United States Congress S.4317 SAFE TO WORK ACT Omnibus- AKA: The COVID-19 Regulatory Relief and Work from Home Safety Act, NFPA 260 shall be removed in it's entirety as TB-117-2013 will be adopted as the national standard by CPSC.

The NFPA Standards Council shall review and consider the elimination of NFPA 260.

TB117-2013 contains smolder tests for fabric, filling, decking and barriers if used, similar to the current voluntary industry standard UFAC/ NFPA 260.

Statement of Problem and Substantiation for Public Input

The adoption by the CPSC of TB 117-2013 will replace NFPA 260. Additional documentation will be provided once formally implemented by the CPSC.

Submitter Information Verification

Submitter Full Name: Matthew Vinci
Organization: IAFF
Street Address:
City:
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Zip:
Submittal Date: Wed Jan 06 12:53:13 EST 2021
Committee:

Public Input No. 3-NFPA 260-2020 [Global Input]

Proposed Modification of the Mini-mock-up Apparatus in NFPA 260

The current test apparatus in NFPA 260 should be modified to allow access to air from below and behind the upholstery surfaces for better prediction of sustained smoldering in real furniture.

Additional Proposed Changes

File Name	Description	Approved
260_-13_Held_Comment.pdf	NFPA_260_PC13	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. of F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.1.

Submitter Information Verification

Submitter Full Name: Tc On Fiz-Aaa
Organization: NFPA
Street Address:
City:
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Zip:
Submittal Date: Tue Feb 18 09:50:25 EST 2020
Committee:

Public Comment No. 13-NFPA 260-2016 [Global Input]

Proposed Modification of the Mini-mock-up Apparatus in NFPA 260

The current test apparatus in NFPA 260 should be modified to allow access to air from below and behind the upholstery surfaces for better prediction of sustained smoldering in real furniture.

Additional Proposed Changes

File Name	Description	Approved
MiniMockup-Final.pdf		

Statement of Problem and Substantiation for Public Comment

The current test apparatus in NFPA 260 should be modified to allow access to air from below and behind the upholstery surfaces for better prediction of sustained smoldering in real furniture (see attached file)

Related Item

First Revision No. 8-NFPA 260-2016 [Section No. 4.11]

Submitter Information Verification

Submitter Full Name: mauro zammarano
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Nov 17 13:51:26 EST 2016
Committee:

Committee Statement

Committee Action: Rejected but held

Resolution: This comment was held for the next edition of the standard. The TC agrees that further work needs to be done on this document to bring it up to date and has created a task group to review all of the major changes proposed to this document. The TC specifically mentioned that the submitter is correct, the wooden platform currently used by the test was developed in the 70s and should be updated.

Proposed Modification of the Mini-mock-up Apparatus in NFPA 260
Mauro Zammarano; 11/17/2016

The current test apparatus in NFPA 260 should be modified to allow access to air from below and behind the upholstery surfaces for better prediction of sustained smoldering in real furniture.

Data collected by NIST showed that the use of the current mini-mock-up tester yields results that do not correlate with tests on real-scale because for many material combinations it systematically under-represents smoldering ignitions in real-scale upholstered furniture mock-ups.[1] With certain combinations of upholstery materials, no ignition was observed with the current mini-mock-up tester, but more than 50 % ignitions were observed for real-scale mock-ups. A report by the State of California's Bureau of Home Furnishings showed similar results: about 40 % to 70 % of the upholstery materials that ignited in actual furniture did not ignite with the mini-mockup-up tester.[2] Consumer Product Safety Commission observed a similar trend.[3]

NIST data show that free air access to the back surfaces of the filling/padding is required to better replicate smoldering ignition in real furniture. Smoldering induces convective air flow through the foam-fabric assembly. In turn, such convective air flow promotes smoldering by increasing the entering supply of oxygen to the spreading smoldering front.[4]

NIST modified the mini-mock-up as shown in Figure 1 to substantially increase the mock-up surface area available for air access.[5] A metal wire mesh was used to separate the padding/filling material from the mini-mockup plywood support, the cover fabric was reduced in size to allow freer air flow from the bottom and back of the padding/filling material, and the thickness of the padding/filling material was increased from 50 mm to 76 mm.

The plywood surfaces of the current mini-mock-up tester are not permeable to air and effectively block air flow into the mock-up at locations where they are in contact with the mock-up surfaces. As evident in Figure 1A, a large fraction of the surface area of the mock-up is obstructed by the mock-up holder. Due to the reduced availability of oxygen in the partially blocked configuration, the smoldering rate is suppressed compared to that which would be expected in a more open configuration. This airflow suppression is particularly severe due to the relatively small thickness of the foam used in the test (50 mm). After the full-length burn of the cigarette

[1] M. Zammarano, Factors Affecting Smoldering Propensity in Bench-Scale Test Methods, presentation at ASTM E05, TAMPA, August 2015. Manuscript in preparation
[2] Correlation Study of Small Scale Furniture Mockup-up Smoldering Tests to Full Scale Cigarette Tests, Gordon H. Damant, Bureau of Home Furnishings State of California, May 31, 1987. Available also as Section 1 in: http://www.nist.gov/el/fire_research/upload/TSG_7_Damant.pdf
[3] Upholstered furniture memoranda U.S. Consumer Product Safety Commission, Bethesda, MD (2012). Available at: www.cpsc.gov/PageFiles/129840/ufmemos.pdf
[4] M.Zammarano, S.Matko, R.D. Davis, NIST Technical Note 1799 - Impact of Test and Foam Design on Smoldering, May 2013
[5] M. Zammarano, S. Matko, W.M. Pitts, D.M. Fox, R.D. Davis, Towards a reference polyurethane foam and bench scale test for assessing smoldering in upholstered furniture, Polymer Degradation and Stability, Volume 106, August 2014, 97–107

(35 min from the test start), the value of mass loss measured for the mock-up up with free air flow was about 5 times the value measured for the mockup with the current mini-mockup tester.[1,5] In actual furniture, such airflow suppression is negligible. In fact, an informal survey of residential furniture suggests that the foam is typically sitting on open substrates (*e.g.*, slats, permeable fabrics, etc.) and the foam is typically thicker than 50 mm.

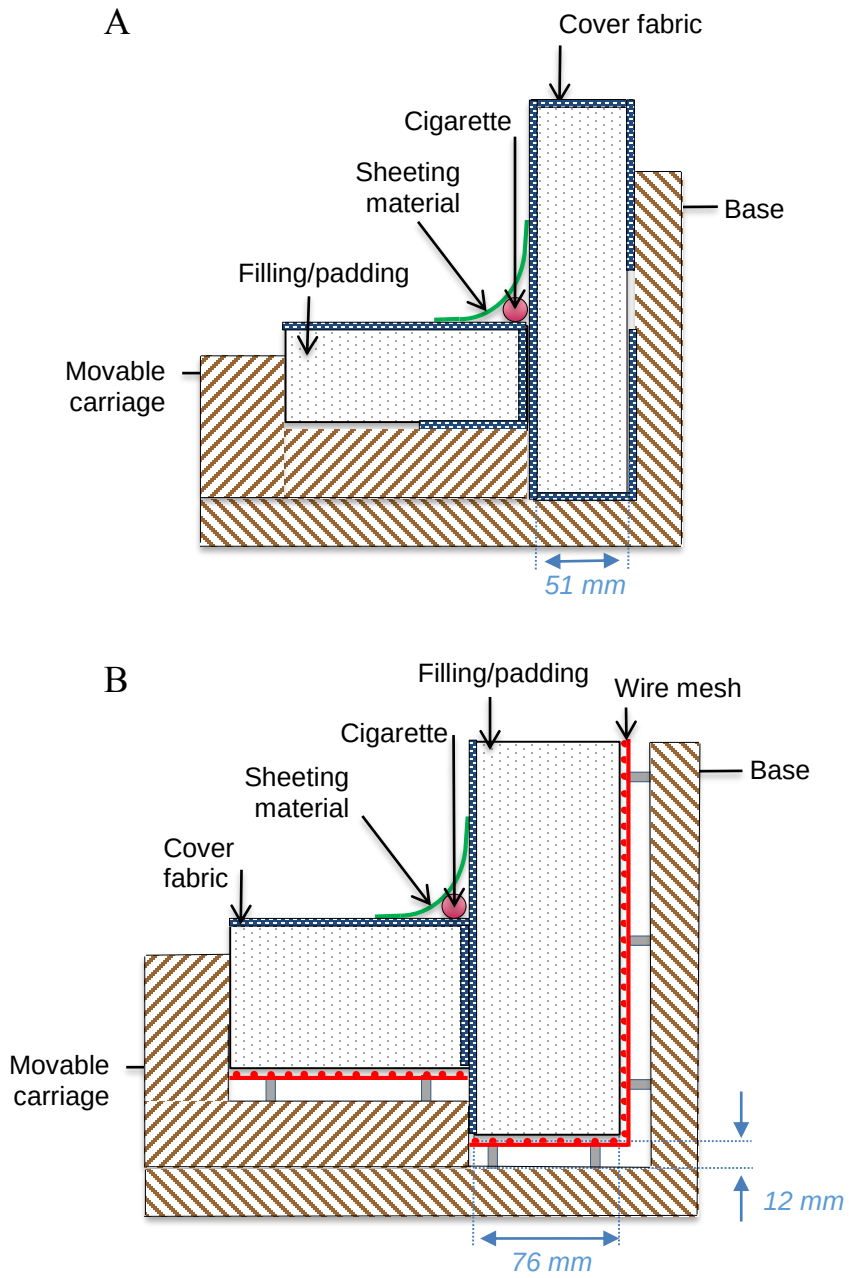

Figure 1 Schematic side view of the Mini-Mock-Up (A) vs NIST modified Mini-Mock-Up (B).

NIST data showed that the modified mini-mock-up provided results for the likelihood of smoldering ignition that were much more consistent with real-scale experiments, even for border-line smoldering upholstery materials that ignited in the real scale test but did not ignite with the current mini-mock-up.[1] Furthermore, dynamic temperatures measured for the smoldering foam and fabric in the modified mini-mock-up closely resembled the temperatures observed in real-scale tests. These temperatures were significantly higher (in the order of 100° C) than the ones measured during tests using the current mini-mockup tester, promoting a faster smoldering rate.

In summary, NIST data indicate that the modified mini-mock-up is more realistic and improves the classification of upholstery materials in terms of likelihood of sustained smoldering in actual furniture.

The following paragraphs need to be modified to account for the introduction of the metal wire mesh and the change in size for cover fabric and padding/filling material:

4.1.2 The base shall consist of two wooden panels, each nominally 203 mm × 203 mm with nominal 19 mm thickness, joined together at one edge. It shall support a vertical wire mesh, nominally 203 mm × 203 mm, on the vertical support panel and a horizontal wire mesh, nominally 203 mm × 76 mm, on the horizontal panel. Each wire mesh shall be located at a distance of 13 mm from the respective panels of the base.

4.1.4 The platform shall be 38 mm above the floor of the base and shall have a 32 mm lip at the front edge. It shall support a nominally 125 mm × 203 mm wire mesh. The wire mesh shall be located 13 mm above the platform.

5.2.1 Three 203 mm × 203 mm specimens shall be cut from the material to be tested for horizontal panels, and three 203 mm × ~~381~~ 203 mm specimens shall be cut for vertical panels.

5.5.1 Three 203 mm × 127 mm × ~~51~~ 76 mm specimens shall be cut for the horizontal panels, and three 203 mm × 203 mm × ~~51~~ 76 mm specimens shall be cut for the vertical panels.

5.7 Barrier Materials Specimen. Three 203 mm × 203 mm specimens shall be cut for horizontal panels from the material to be tested, and three 203 mm × ~~381~~ 203 mm specimens shall be cut for vertical panels.

6.1.1 For horizontal panels, the 203 mm × ~~280~~ 203 mm cover fabric specimen shall be placed on a 203 mm × 127 mm × ~~51~~ 76 mm polyurethane foam substrate, using pins in the ends of the fabric specimen to hold it in place, as shown in Figure 6.1.1.

6.1.2 For vertical panels, the 203 mm × ~~432~~ 203 mm fabric specimen shall be placed on a 203 mm × 203 mm × 76 mm polyurethane foam substrate as shown in Figure 6.1.1.

~~6.1.2.1 The fabric shall overlap the top and bottom of the substrate and be pinned into place on the corners.~~

6.2.1 For horizontal panels, the 203 mm × ~~280~~ 203 mm piece of interior fabric and the 203 mm × ~~280~~ 203 mm standard Type I cover fabric shall be placed with the interior fabric against the polyurethane foam substrate, using pins in the ends of the fabric specimens to hold them in place, as shown in Figure 6.2.1.

Figure 6.2.1 Interior Fabric Test Method.

6.2.2 For vertical panels, 203 mm × ~~432~~ 203 mm standard Type I cover fabric shall be placed on a 203 mm × 203 mm × 76 mm polyurethane foam substrate as shown in Figure 6.2.1.

~~6.2.2.1 The fabric shall overlap the top and bottom of the substrate and shall be pinned into place at the corners.~~

Public Input No. 18-NFPA 260-2020 [Section No. 1.2]

1.2 Purpose.

1.2.1

These test methods are designed to evaluate ignition resistance of upholstered furniture when exposed to smoldering cigarettes under specified conditions.

1.2.2

It is the intent of this standard to provide tests to determine whether covered upholstered furniture components such as cover fabrics, welt cords, decking materials, interior fabrics, and filling/padding materials are relatively resistant to ignition by smoldering cigarettes.

1.2.3*

This standard establishes a classification system for determining the resistance of upholstered furniture components to cigarette ignition.

1.2.4

A material shall be designated to be Class II unless demonstrated to be Class I using these test methods.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable.
This public input clarifies that all materials tested to NFPA 260 are to be classified as Class I or as Class II. Any material that fails any criterion to be a Class I material is automatically a Class II material.

Submitter Information Verification

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Submittal Date: Fri Dec 11 18:17:16 EST 2020
Committee: FIZ-AAA

Public Input No. 24-NFPA 260-2020 [Section No. 1.4.6]

1.4.6

Any material intended to serve as a barrier between a Class II cover ~~fabrics and conventional polyurethane foam~~ fabric or an interior fabric and the padding material in a seat ~~shall~~ or other padded section of an upholstered furniture item shall be subjected to the barrier materials test.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable.
This makes the section more generic.

Submitter Information Verification

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Submittal Date: Thu Dec 17 21:21:33 EST 2020
Committee: FIZ-AAA

Public Input No. 14-NFPA 260-2020 [Section No. 3.3.4.1]

~~**3.3.4.1** * – Obvious Ignition.~~

~~Pronounced, continuous, and self-sustaining combustion of the test system.~~

(also delete the annex note)

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make such a standard more reliable and to improve its repeatbaility.

This PI deletes the definition of "obvious ignition", which contains a requirement and a decision point in the annex note. This is proposed to be added into section 7.2.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 22-NFPA 260-2020 [Section No. A.3.3.4.1]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Affiliation: FIZ NFPA 260 Task Group
Street Address:
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Submittal Date: Thu Dec 10 00:49:47 EST 2020
Committee: FIZ-AAA

Public Input No. 15-NFPA 260-2020 [Section No. 4.3]

4.3* Ignition Source.

The ignition source for the test shall ~~be~~ consist of the current supply of SRM 1196 series cigarettes without filter tips made from natural tobacco, 83 mm ± 2 mm long, with a tobacco packing density of 0.270 g/cm^3 ± 0.020 g/cm^3, and a total ~~weight of~~ mass of 1.1 g ± 0.1 g.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable. This public input addresses the cigarette to be used as ignition source, since SRM 1196 is no longer available and has been replaced by SRM 1196a by NIST. Future versions of the SRM 1196 cigarette are planned to be designated SRM1196b, SRM 1196c and so forth. Other public inputs are planned to be issued also. Revised information is placed in the annex also.
The change in cigarette was approved in a TIA.
In the section, the cigarette is identified by “weight” but should be identified by “mass”.
This was also TIA 1532, which passed in 2020.

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Affiliation: NFPA FIZ 260 Task Group
Street Address:
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Submittal Date: Thu Dec 10 00:52:40 EST 2020
Committee: FIZ-AAA

Public Input No. 25-NFPA 260-2020 [Section No. 4.3]

4.3* Ignition Source.

The ignition source for the test shall consist of the current supply of ~~be~~ SRM 1196 series cigarettes without filter tips , made from natural tobacco,

~~83 mm~~

83 mm ±

~~2 mm~~

2 mm long, with a tobacco packing density of 0.

~~270 g~~

270 g /cm 3 ± 0.

~~020 g~~

020 g /cm 3 , and a total weight of 1.

~~1 g~~

1 g ± 0.

~~1 g.~~

1 g.

A.4.3 Standard Reference Material (SRM) 1196 series cigarettes are ~~is~~ obtained from the National Institute of Standards and Technology (NIST). In previous editions of this test method, the ignition source was a commercially available cigarette identified by certain characteristics that corresponded to an unfiltered Pall Mall cigarette. Based on regulations for reduced ignition propensity cigarettes, these particular cigarettes are no longer available in the United States. That cigarette has been replaced by the manufacturer with a banded cigarette that meets the regulations for reduced ignition propensity. Banded cigarettes very frequently go out when placed on a test substrate. Since the test requires that a test cigarette burn its full length, the new version of the old test cigarette is not usable.

NIST had samples of the old cigarettes and was able to characterize their ignition propensity. They commissioned cigarettes to be manufactured to those specifications. Then they verified that the new cigarettes met the physical and performance requirements of the previously used cigarettes. These cigarettes were made available by ~~are now available from~~ NIST as SRM 1196, one of over 1300 ~~2000~~ standard reference materials that they produce for various uses. When the original SRM 1196 cigarettes ceased to be available, NIST procured SRM 1196a cigarettes and is planning to continue providing cigarettes to be designated as SRM 1196 series cigarettes in the future.

Additional Proposed Changes

File Name	Description	Approved
TIA_260_19_2.pdf	NFPA TIA 15-1 Log 1532	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 19-2 (Log 1532) issued by the Standards Council on December 3, 2020 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.
Substantiation: The TIA item shown above addresses the cigarette to be used as ignition source, since SRM 1196 is no longer available from NIST (or anyone else) and it has been replaced by SRM 1196a by NIST. NIST is planning to issue, as needed, future versions of the SRM 1196 cigarette, and they are planned to be designated SRM1196b, SRM 1196c, and so forth. Tests in accordance with this standard cannot be conducted without a reference to an available appropriate cigarette as the ignition source. In the annex, the changes present the rationale for the changes in the body of the standard and update some of the information presently contained in the standard.
Emergency Nature: The proposed TIA intends to accomplish a recognition of an advance in the art of safeguarding property or life where an alternative method is not in current use or is unavailable to the public. The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification of the action.
The codes (both the NFPA 101 Life Safety Code and the International Fire Code) reference NFPA 260 for assessing the ignition propensity of upholstered furniture components when exposed to smoldering cigarettes. The 2019 edition of NFPA 260 cannot be used to conduct the testing because of the lack of availability of SRM 1196 cigarettes. The source of SRM 1196 has issued a replacement and it is urgent that the revised standard be available for the next edition of the codes, since the closing date for proposals to the International Fire Code is January 2021 and public inputs to NFPA 101 are also due in 2021, all of which will precede the next edition of NFPA 260.

Submitter Information Verification

Submitter Full Name: TC on FIZ-AAA
Organization: NFPA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Dec 22 15:53:43 EST 2020
Committee: FIZ-AAA

Tentative Interim Amendment

NFPA® 260

Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture

2019 Edition

Reference: 4.3 and A.4.3
TIA 19-2
(SC 20-12-19 / TIA Log #1532)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards,* the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 260, *Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture,* 2019 edition. The TIA was processed by the Technical Committee on Fire Tests and was issued by the Standards Council on December 3, 2020 with an effective date of December 23, 2020.

1. Revise 4.3 and associated Annex A.4.3 to read as follows:

4.3* Ignition Source. The ignition source for the test shall consist of the current supply of ~~be~~ SRM 1196 series cigarettes without filter tips, made from natural tobacco, 83 mm ± 2 mm long, with a tobacco packing density of 0.270 g/cm^3 ± 0.020 g/cm^3, and a total weight of 1.1 g ± 0.1 g.

A.4.3 Standard Reference Material (SRM) 1196 series cigarettes are ~~is~~ obtained from the National Institute of Standards and Technology (NIST).

In previous editions of this test method, the ignition source was a commercially available cigarette identified by certain characteristics that corresponded to an unfiltered Pall Mall cigarette. Based on regulations for reduced ignition propensity cigarettes, these particular cigarettes are no longer available in the United States. That cigarette has been replaced by the manufacturer with a banded cigarette that meets the regulations for reduced ignition propensity. Banded cigarettes very frequently go out when placed on a test substrate. Since the test requires that a test cigarette burn its full length, the new version of the old test cigarette is not usable.

NIST had samples of the old cigarettes and was able to characterize their ignition propensity. They commissioned cigarettes to be manufactured to those specifications. Then they verified that the new cigarettes met the physical and performance requirements of the previously used cigarettes. These cigarettes were made available by ~~are now available from~~ NIST as SRM 1196, one of over 1300 ~~2000~~ standard reference materials that they produce for various uses. When the

original SRM 1196 cigarettes ceased to be available, NIST procured SRM 1196a cigarettes and is planning to continue providing cigarettes to be designated as SRM 1196 series cigarettes in the future.

Issue Date: December 3, 2020

Effective Date: December 23, 2020

Public Input No. 2-NFPA 260-2020 [Section No. 5.1.1]

5.1.1

All test upholstery fabrics and test materials, including cigarettes and sheeting material, shall be conditioned at a temperature of 21°C ± 2.8°C and a relative humidity of less than 65 percent for at least 4 hours prior to testing.

5.1.1.1 The mass of each of the filling and padding test materials shall be measured after conditioning and prior to mock-up construction.

5.1.1.2 The initial mass of the test materials determined in 5.1.1.1 shall be reported.

Additional Proposed Changes

File Name	Description	Approved
260_-_4_Held_Comment.pdf	NFPA_260_PC4	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold " in Public Comment No. 4 of the F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.1.

Submitter Information Verification

Submitter Full Name: Tc On Fiz-Aaa
Organization: NFPA
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Submittal Date: Tue Feb 18 09:43:00 EST 2020
Committee: FIZ-AAA

Public Comment No. 4-NFPA 260-2016 [Section No. 5.1.1]

5.1.1

All test upholstery fabrics and test materials, including cigarettes and sheeting material, shall be conditioned at a temperature of 21°C ± 2.8°C and a relative humidity of less than 65 percent for at least 4 hours prior to testing.

5.1.1.1 The mass of each of the filling and padding test materials shall be measured after conditioning and prior to mock-up construction.

5.1.1.2 The initial mass of the test materials determined in 5.1.1.1 shall be reported.

Statement of Problem and Substantiation for Public Comment

This is the first of a series of public comments on the committee input, based on the CPSC proposed input. The public comments provide an optional alternate approach to measurement of char length by allowing a mass loss procedure to be used also.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 5-NFPA 260-2016 [Chapter 6]	
Public Comment No. 6-NFPA 260-2016 [Section No. 7.2]	
Public Comment No. 7-NFPA 260-2016 [Section No. 7.3]	
Public Comment No. 8-NFPA 260-2016 [Section No. 7.4]	
Public Comment No. 9-NFPA 260-2016 [Section No. 7.5]	
Public Comment No. 10-NFPA 260-2016 [Section No. 7.6]	
Public Comment No. 11-NFPA 260-2016 [Section No. 7.7]	

Related Item

First Revision No. 11-NFPA 260-2016 [Chapter 6]

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Submittal Date: Thu Nov 03 00:59:38 EDT 2016
Committee:

Committee Statement

Committee Action: Rejected but held

Resolution: This comment will be held for the next revision cycle. The TC has developed a task group to address both mass loss and char length.

Public Input No. 13-NFPA 260-2020 [Section No. 6.1]

6.1– General.

6.1.1 The test duration shall be 45 minutes from the time the lit cigarette is placed on the test specimen, unless otherwise required by Sections 6.1.2.

6.1.2 If the test is terminated before 45 minutes have elapsed, due to any one of the reasons in Section 6.1.2.1 through 6.1.2.3, the material shall be designated as Class II.

6.1.2.1 The test operator shall terminate a test prior to the 45 minute time limit if the vertical char length has exceeded the limit prescribed in Section 7.3.

6.1.2.2 The test operator shall terminate a test prior to the 45 minute time limit if the test specimen has transitioned to flaming combustion.

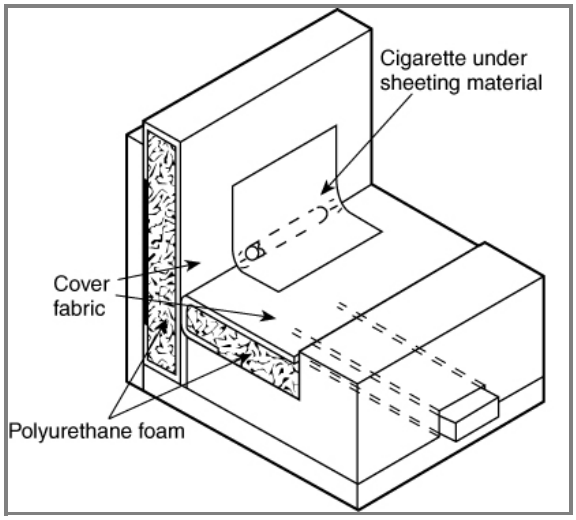
6.1.2.3 The test operator shall terminate a test prior to the 45 minute time limit if obvious ignition of the test specimen (in accordance with Section 7.2) has occurred.

6.2 Cover Fabric Test.

6.1 2 .1

For horizontal panels, the 203 mm × 280 mm cover fabric specimen shall be placed on a 203 mm × 127 mm × 76 mm polyurethane foam substrate, using pins in the ends of the fabric specimen to hold it in place, as shown in Figure 6.1 2 .1.

Figure 6.1 2 .1 Cover Fabric Test Method.



6.1 2 .2

For vertical panels, the 203 mm × 432 mm fabric specimen shall be placed on a 203 mm × 203 mm × 76 mm polyurethane foam substrate as shown in Figure 6.1 2 .1.

6.1 2 .2.1

The fabric shall overlap the top and bottom of the substrate and be pinned into place on the corners.

6.1 2 .2.2

The warp or machine direction of the fabric shall run from front to back on the test assembly.

6.1 2 .3

Each assembled vertical and horizontal panel shall be placed in a mini-mock-up tester as shown in Figure 6.1 2 .1.

6.1 2 .4

The position of the crevice shall be marked on the sides of the vertical substrate.

6.1 2 .5

Three cigarettes shall be lighted, and a lighted cigarette shall be placed on each of the three test assemblies such that the cigarette lies in the crevice and against the vertical panel, with each cigarette end equidistant from its respective side of the assembly.

6.1 2 .6

Each cigarette shall be well lighted and burned not more than 4 mm when placed at a specific test location.

6.1 2 .7*

A piece of sheeting material shall be placed over each cigarette and shall be smoothed over the cigarette to ensure intimate contact.

6.1 2 .7.1

The sheeting shall be pinned to the vertical panel approximately 63 mm above the crevice.

6.1 2 .8

Each cigarette shall be allowed to burn its full length unless an obvious ~~ignition~~ ignition (in accordance with section 7.2) of the polyurethane foam substrate occurs.

6.1 2 .8.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a fresh area of the test assembly and covered with sheeting fabric until one of the following occurs:

(1) Three cigarettes have burned their entire lengths on three individual test specimens.

(2) Three cigarettes have self-extinguished on the sample.

6.1 2 .9

If an obvious ~~ignition~~ ignition (in accordance with section 7.2) occurs on any of the three specimens, the smoldering materials shall be extinguished, and the sample shall be recorded as a Class II cover fabric based on the results of this test.

6.1 2 .10

If no obvious ignition occurs, the char on the vertical panel measured from the original crevice position to the highest part of the destroyed or degraded cover fabric shall be recorded to the nearest 2.5 mm.

6.1 2 .10.1

The original crevice position shall be determined by laying a straightedge or ruler between the two marks required by 6.1.4 on the edges of the vertical panel.

6.1 2 .10.2

The highest point of destroyed or degraded fabric shall be defined as the highest point at which any of the fabric is charred from front to back.

(renumber all sections from 6.1 through 6.6 as 6.2 through 6.7)

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and

Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make such a standard more reliable and to improve its repeatability. This public input adds a total test time of 45 minutes and sends the user to the description of "obvious ignition" proposed for section 7.2. This PI also indicates the reasons why a test is to be terminated prior to 45 minutes.

Submitter Information Verification

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Submittal Date: Thu Dec 10 00:40:09 EST 2020
Committee: FIZ-AAA

Public Input No. 19-NFPA 260-2020 [Section No. 6.1.8.1]

6.1.8.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a ~~fresh area of the~~ new test assembly and covered with sheeting fabric until one of the following occurs:

(1) Three cigarettes have burned their entire lengths on three individual test specimens.

(2) Three cigarettes have self-extinguished on the sample.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable.

There is an inconsistency in how to proceed when the cigarette goes out in the middle of a test. In 6.1.8.1, 6.5.6.1, and 6.6.7.1, it says that "… a fresh cigarette shall be placed on a fresh area of the test assembly." In 6.2.8.1, 6.3.8.1, and 6.4.7.1, it says that "… a fresh cigarette shall be placed on a new test assembly." As a minimum, there should be a section in the Commentary that explains the rationale for the difference. There also needs to be a definition of a "fresh area." The frame width is 203 mm, and the cigarette length is 83 mm. The initial cigarette is centered along the crevice, so the crevice length on either side of the original cigarette is only 60 mm. The decking material tester has some available space for a second test cigarette, but lacks guidance as to where it can/cannot be placed. The Task Group suggests the uniform use of a fresh test assembly. That is the change proposed in this PI.

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Committee: FIZ-AAA

Public Input No. 21-NFPA 260-2020 [Section No. 6.5.6.1]

6.5.6.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a ~~fresh area of the cover fabric~~ new test assembly until one of the following occurs:

(1) Three cigarettes have burned their entire lengths.

(2) Three cigarettes have self-extinguished.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable.

There is an inconsistency in how to proceed when the cigarette goes out in the middle of a test. In 6.1.8.1, 6.5.6.1, and 6.6.7.1, it says that "… a fresh cigarette shall be placed on a fresh area of the test assembly." In 6.2.8.1, 6.3.8.1, and 6.4.7.1, it says that "… a fresh cigarette shall be placed on a new test assembly." As a minimum, there should be a section in the Commentary that explains the rationale for the difference. There also needs to be a definition of a "fresh area." The frame width is 203 mm, and the cigarette length is 83 mm. The initial cigarette is centered along the crevice, so the crevice length on either side of the original cigarette is only 60 mm. The decking material tester has some available space for a second test cigarette, but lacks guidance as to where it can/cannot be placed. The Task Group suggests the uniform use of a fresh test assembly. That is the change proposed in this PI.

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Public Input No. 20-NFPA 260-2020 [Section No. 6.6.7.1]

6.6.7.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a ~~fresh area of the~~ new test assembly and covered with sheeting fabric until one of the following occurs:

(1) Three cigarettes have burned their entire lengths on three individual test specimens.

(2) Three cigarettes have self-extinguished on the sample.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable.

There is an inconsistency in how to proceed when the cigarette goes out in the middle of a test. In 6.1.8.1, 6.5.6.1, and 6.6.7.1, it says that "… a fresh cigarette shall be placed on a fresh area of the test assembly." In 6.2.8.1, 6.3.8.1, and 6.4.7.1, it says that "… a fresh cigarette shall be placed on a new test assembly." As a minimum, there should be a section in the Commentary that explains the rationale for the difference. There also needs to be a definition of a "fresh area." The frame width is 203 mm, and the cigarette length is 83 mm. The initial cigarette is centered along the crevice, so the crevice length on either side of the original cigarette is only 60 mm. The decking material tester has some available space for a second test cigarette, but lacks guidance as to where it can/cannot be placed. The Task Group suggests the uniform use of a fresh test assembly. That is the change proposed in this PI.

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Committee: FIZ-AAA

Public Input No. 4-NFPA 260-2020 [New Section after 6.6.9.2]

6.7 Mass Loss Procedure

6.7.1 As an alternate procedure to the char length procedure described in sections 6.1 through 6.6 above, the propensity for smoldering combustion of the tested material shall be permitted to be assessed by a mass loss procedure as indicated in this section.

6.7.2 If an obvious ignition occurs on any of the three specimens, the smoldering materials shall be extinguished, and the sample shall be recorded as a Class II material based on the results of this test.

6.7.2 If no obvious ignition occurs at the end of 45 minutes, carefully remove the polyurethane foam substrate pieces and clean all carbonaceous char from the panels with a brush.

6.7.3 Unless an extinguishing agent was applied to the polyurethane foam substrate, record the mass of the un-charred portions of the polyurethane foam substrate pieces to the nearest 0.1 grams within 15 minutes of end of test.

6.7.4 Calculate the percent mass loss of the polyurethane foam substrate to the nearest 0.1% by using the initial mass (from 5.1.1.1) and the final mass (from 6.7.3) with the equation below:

Mass Loss = (Initial Mass - Final Mass)/Initial Mass) x100.

Additional Proposed Changes

File Name	Description	Approved
260_-5_Held_Comment.pdf	NFPA_260_PC5	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. 5 of the F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.3.

Submitter Information Verification

Submitter Full Name: Tc On Fiz-Aaa
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Submittal Date: Tue Feb 18 10:00:42 EST 2020
Committee: FIZ-AAA

Public Comment No. 5-NFPA 260-2016 [Chapter 6]

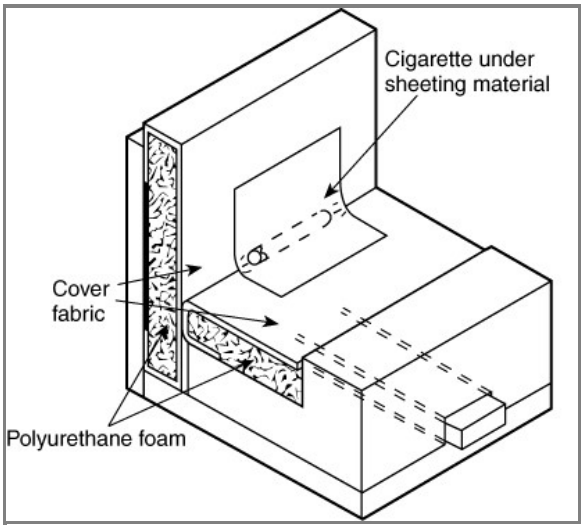
Chapter 6 Test Procedures

6.1 Cover Fabric Test.

6.1.1

For horizontal panels, the 203 mm × 280 mm cover fabric specimen shall be placed on a 203 mm × 127 mm × 51 mm polyurethane foam substrate, using pins in the ends of the fabric specimen to hold it in place, as shown in Figure 6.1.1.

Figure 6.1.1 Cover Fabric Test Method.



6.1.2

For vertical panels, the 203 mm × 432 mm fabric specimen shall be placed on a 203 mm × 203 mm × 76 mm polyurethane foam substrate as shown in Figure 6.1.1.

6.1.2.1

The fabric shall overlap the top and bottom of the substrate and be pinned into place on the corners.

6.1.2.2

The warp or machine direction of the fabric shall run from front to back on the test assembly.

6.1.3

Each assembled vertical and horizontal panel shall be placed in a mini-mock-up tester as shown in Figure 6.1.1.

6.1.4

The position of the crevice shall be marked on the sides of the vertical substrate.

6.1.5

Three cigarettes shall be lighted, and a lighted cigarette shall be placed on each of the three test assemblies such that the cigarette lies in the crevice and against the vertical panel, with each cigarette end equidistant from its respective side of the assembly.

6.1.6

Each cigarette shall be well lighted and burned not more than 4 mm when placed at a specific test location.

6.1.7*

A piece of sheeting material shall be placed over each cigarette and shall be smoothed over the cigarette to ensure intimate contact.

6.1.7.1

The sheeting shall be pinned to the vertical panel approximately 63 mm above the crevice.

6.1.8

Each cigarette shall be allowed to burn its full length unless an obvious ignition of the polyurethane foam substrate occurs.

6.1.8.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a fresh area of the test assembly and covered with sheeting fabric until one of the following occurs:

(1) Three cigarettes have burned their entire lengths on three individual test specimens.

(2) Three cigarettes have self-extinguished on the sample.

6.1.9

If an obvious ignition occurs on any of the three specimens, the smoldering materials shall be extinguished, and the sample shall be recorded as a Class II cover fabric based on the results of this test.

6.1.10

If no obvious ignition occurs, the char on the vertical panel measured from the original crevice position to the highest part of the destroyed or degraded cover fabric shall be recorded to the nearest 2.5 mm.

6.1.10.1

The original crevice position shall be determined by laying a straightedge or ruler between the two marks required by 6.1.4 on the edges of the vertical panel.

6.1.10.2

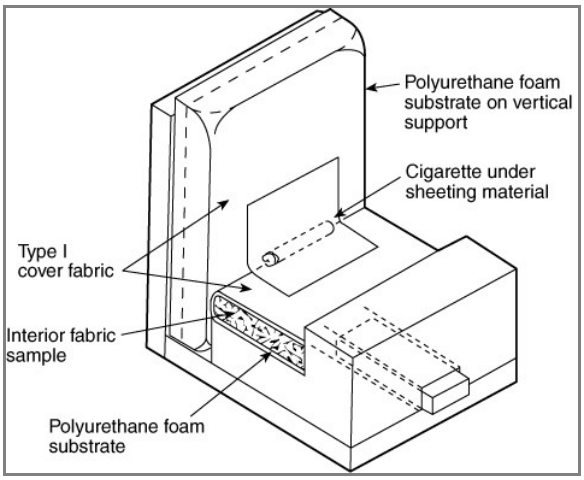
The highest point of destroyed or degraded fabric shall be defined as the highest point at which any of the fabric is charred from front to back.

6.2 Interior Fabric Test.

6.2.1

For horizontal panels, the 203 mm × 280 mm piece of interior fabric and the 203 mm × 280 mm standard Type I cover fabric shall be placed with the interior fabric against the polyurethane foam substrate, using pins in the ends of the fabric specimens to hold them in place, as shown in Figure 6.2.1.

Figure 6.2.1 Interior Fabric Test Method.



6.2.2

For vertical panels, 203 mm × 432 mm standard Type I cover fabric shall be placed on a 203 mm × 203 mm × 76 mm polyurethane foam substrate as shown in Figure 6.2.1.

6.2.2.1

The fabric shall overlap the top and bottom of the substrate and shall be pinned into place at the corners.

6.2.3

Each assembled vertical and horizontal panel shall be placed in a mini-mock-up tester as shown in Figure 6.2.1.

6.2.4

The position of the crevice shall be marked on the sides of the vertical polyurethane foam substrate.

6.2.5

Three cigarettes shall be lighted, and a lighted cigarette shall be placed on each of the three test assemblies such that the cigarette lies in the crevice and against the vertical panel, with each cigarette end equidistant from its respective side of the assembly.

6.2.6

Each cigarette shall be well lighted and burned not more than 4 mm when placed at a specific test location.

6.2.7*

A piece of sheeting material shall be placed over each cigarette and shall be smoothed over the cigarette to ensure intimate contact.

6.2.7.1

The sheeting shall be pinned to the vertical panel approximately 63 mm above the crevice.

6.2.8

Each cigarette shall be allowed to burn its full length unless an obvious ignition of the polyurethane foam substrate occurs.

6.2.8.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a new test assembly and covered with sheeting fabric until one of the following occurs:

(1) Three cigarettes have burned their entire length on three individual test specimens.

(2) Three cigarettes have self-extinguished on the sample.

6.2.9

If an obvious ignition occurs on any of the three specimens, the smoldering materials shall be extinguished, and the sample shall be recorded as a Class II interior fabric based on the results of this test.

6.2.10

If no obvious ignition occurs, the char on the vertical panel measured from the original crevice position to the highest part of the destroyed or degraded interior fabric shall be recorded to the nearest 2.5 mm.

6.2.10.1

The original crevice position shall be determined by laying a straightedge or ruler between the two marks required by 6.2.4 on the vertical panel.

6.2.10.2

The highest point of destroyed or degraded fabric shall be defined as the highest point at which any of the fabric is charred from front to back.

6.3 Welt Cord Test.

6.3.1 Sizes.

6.3.1.1

Three specimens of standard Type II cover fabric shall be cut for each of the following specified sizes:

(1) Horizontal panels measuring 203 mm × 280 mm

(2) Vertical panels measuring 203 mm × 432 mm

(3) Unsewn welts folded to measure 203 mm × 25 mm

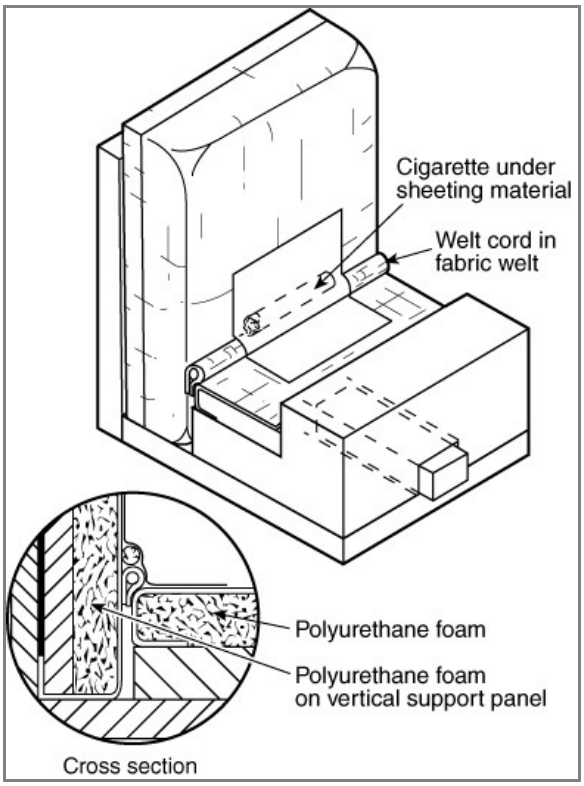
6.3.1.2

The width of the welt shall be adjusted to the size of the welt cord.

6.3.1.3

For horizontal panels, the 203 mm × 280 mm Type II cover fabric shall be placed on a 203 mm × 127 mm × 76 mm polyurethane foam substrate, using pins in the ends of the fabric specimens to hold them in place, as shown in Figure 6.3.1.3.

Figure 6.3.1.3 Welt Cord Test Method.



6.3.1.4

For vertical panels, the 203 mm × 432 mm Type II cover fabric shall be placed on a 203 mm × 203 mm × 76 mm polyurethane foam substrate as shown in Figure 6.3.1.3.

6.3.1.4.1

The fabric shall overlap the top and bottom of the substrate and shall be pinned into place at the corners.

6.3.2

Each assembled vertical and horizontal panel shall be placed in a mini-mock-up tester as shown in Figure 6.3.1.3.

6.3.3

A welt cord specimen shall be placed into the center of a folded strip of standard Type II cover fabric to form an unsewn welt.

6.3.3.1

An unsewn welt shall be placed in each test assembly such that the fabric edges are located between the horizontal and vertical panels and are held tightly in place by the panels as shown in Figure 6.3.1.3.

6.3.4

The position of the top of the welt shall be marked on the sides of the vertical polyurethane foam substrate.

6.3.5

Three cigarettes shall be lighted, and a lighted cigarette shall be placed on each of the three test assemblies such that the cigarette lies on the welt and against the vertical panel, with each cigarette end equidistant from its respective side of the assembly.

6.3.6

Each cigarette shall be well lighted and burned not more than 4 mm when placed at a specific test location.

6.3.7*

A piece of sheeting material shall be placed over each cigarette and shall be smoothed over the cigarette to ensure intimate contact.

6.3.7.1

The sheeting shall be pinned to the vertical panel approximately 63 mm above the crevice.

6.3.8

Each cigarette shall be allowed to burn its full length unless an obvious ignition of the polyurethane foam substrate occurs.

6.3.8.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a new test assembly and covered with sheeting fabric until one of the following occurs:

(1) Three cigarettes have burned their entire lengths on three individual specimens.

(2) Three cigarettes have self-extinguished on the sample.

6.3.9

If an obvious ignition occurs on any of the three specimens, the smoldering materials shall be extinguished, and the sample shall be recorded as a Class II welt cord based on the results of this test.

6.3.10

If no obvious ignition occurs, the char on the vertical panel measured from the top of the original welt position to the highest part of the destroyed or degraded fabric shall be recorded.

6.3.10.1

The top of the original welt position shall be determined by laying a straightedge or ruler between the two marks required by 6.3.4 on the edges of the vertical panel.

6.3.10.2

The highest point of destroyed or degraded fabric shall be defined as the highest point at which any of the fabric is charred from front to back.

6.4 Filling/Padding Component Test.

6.4.1

Three 203 mm × 280 mm specimens shall be cut from standard Type I cover fabric for the horizontal panels, and three 203 mm × 432 mm specimens shall be cut for the vertical panels.

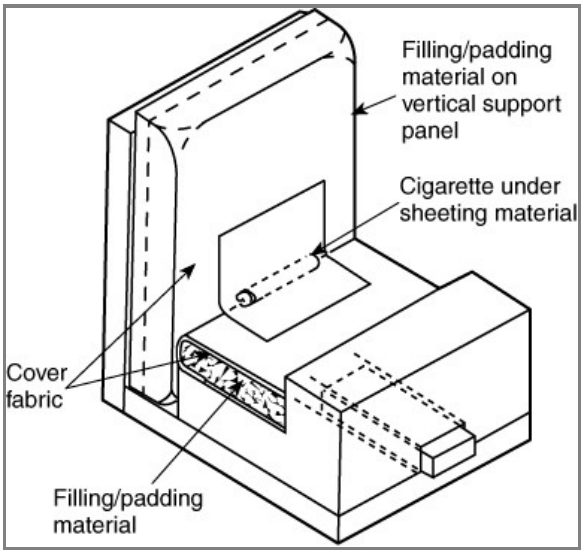
6.4.1.1

Three horizontal panels shall be constructed by wrapping each panel with Type I cover fabric, such that the top surface is completely covered, and the long direction of the fabric continues over the crevice edge and partially covers the bottom surface.

6.4.1.2

The cover fabric shall be pinned into place on the top and bottom as shown in Figure 6.4.1.2.

Figure 6.4.1.2 Filling/Padding Component Test Method.



6.4.1.3

Three vertical panels shall be constructed by covering one surface of a removable vertical support panel with a vertical pad of the test specimen material topped by the Type I cover fabric.

6.4.1.4

The Type I cover fabric shall be pulled around the top and bottom of the removable vertical support panel and stapled to the back side.

6.4.2

Each assembled vertical and horizontal panel shall be placed in a mini-mock-up tester as shown in Figure 6.4.1.2, such that a snug fit is created between the two panels.

6.4.3

The position of the crevice shall be marked on the edges of the cover fabric.

6.4.4

Three cigarettes shall be lighted, and a lighted cigarette shall be placed on each of the three test assemblies such that the cigarette lies in the crevice and against the vertical panel, with each cigarette end equidistant from its respective side of the assembly.

6.4.5

Each cigarette shall be well lighted and burned not more than 4 mm when placed at a specific test location.

6.4.6*

A piece of sheeting material shall be placed over each cigarette and shall be smoothed over the cigarette to ensure intimate contact.

6.4.6.1

The sheeting shall be pinned to the vertical panel approximately 63 mm above the crevice.

6.4.7

Each cigarette shall be allowed to burn its full length unless an obvious ignition of the polyurethane foam substrate occurs.

6.4.7.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a new test assembly and covered with sheeting fabric until one of the following occurs:

(1) Three cigarettes have burned their entire lengths on three individual test specimens.

(2) Three cigarettes have self-extinguished on the sample.

6.4.8

If an obvious ignition occurs on any of the three specimens, the smoldering materials shall be extinguished, and the sample shall be recorded as a Class II filling/padding material based on the results of this test.

6.4.9

If no obvious ignition occurs, the char on the vertical panel measured from the original crevice position to the highest part of the destroyed or degraded fabric shall be recorded.

6.4.9.1

The original crevice position shall be determined by laying a straightedge or ruler between the two marks required by 6.4.3 on the edges of the vertical panel.

6.5 Decking Materials Test.

6.5.1

One 533 mm × 343 mm specimen shall be cut from standard Type II fabric.

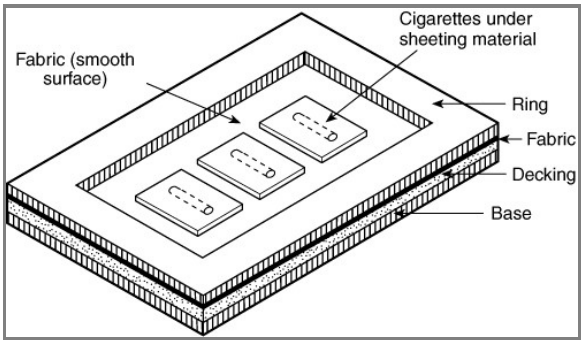
6.5.2

The decking material specimen shall be placed on the plywood base of the decking materials tester and covered with the standard Type II fabric.

6.5.2.1

The plywood retainer ring shall be placed on top of the cover fabric as shown in Figure 6.5.2.1.

Figure 6.5.2.1 Decking Materials Test Method.



6.5.3

Three cigarettes shall be lighted and placed on the surface of the standard Type II fabric so that they are equally spaced from each other and from the edges of the retainer ring.

6.5.4

Each cigarette shall be well lighted and burned not more than 4 mm when placed at a specific test location.

6.5.5

A piece of sheeting material shall be placed over each of the cigarettes and shall be smoothed over the cigarette to ensure intimate contact.

6.5.6

Each cigarette shall be allowed to burn its full length.

6.5.6.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a fresh area of the cover fabric until one of the following occurs:

(1) Three cigarettes have burned their entire lengths.

(2) Three cigarettes have self-extinguished.

6.5.7

If an obvious ignition occurs at any of the cigarette locations, the smoldering material shall be extinguished, and the sample shall be recorded as a Class II decking material based on the results of this test.

6.5.8

If no obvious ignition occurs, the maximum length of char shall be measured from the original cigarette position and recorded to the nearest 2.5 mm.

6.6 Barrier Materials Test.

6.6.1

Three 203 mm × 280 mm specimens shall be cut from standard Type II cover fabric for horizontal panels, and three 203 mm × 432 mm specimens shall be cut for vertical panels.

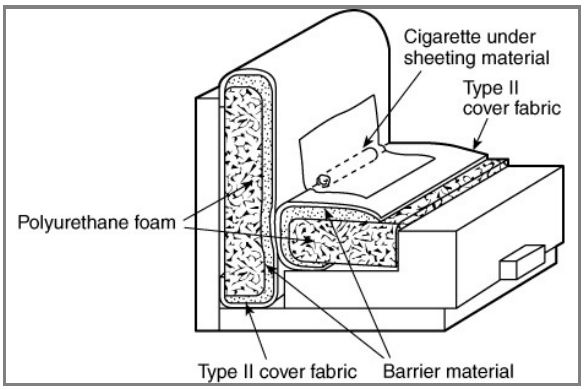
6.6.1.1

For horizontal panels, a barrier specimen shall be placed on a 203 mm × 127 mm × 76 mm polyurethane foam substrate.

6.6.1.2

The barrier shall be folded around and under the polyurethane foam as shown in Figure 6.6.1.2 and fastened in place with pins.

Figure 6.6.1.2 Barrier Materials Test Method.



6.6.1.3

The 203 mm × 203 mm cover fabric shall be placed over each barrier and fastened in place with pins.

6.6.1.4

For vertical panels, a barrier specimen shall be placed on a 203 mm × 203 mm × 76 mm polyurethane foam substrate.

6.6.1.5

The 203 mm × 432 mm cover fabric specimen shall be placed over each vertical panel and fastened in place with pins as shown in Figure 6.6.1.2.

6.6.2

Each assembled horizontal panel and vertical panel shall be arranged in the test assembly such that a firm contact is achieved across the entire crevice formed by the vertical and horizontal panels.

6.6.3

The position of the crevice shall be marked on the sides of the vertical polyurethane foam substrate.

6.6.4

Three cigarettes shall be lighted, and a lighted cigarette shall be placed on each of the three test assemblies such that the cigarette lies in the crevice and against the vertical panel, with each cigarette end equidistant from its respective side of the assembly.

6.6.5

Each cigarette shall be well lighted and burned not more than 4 mm when placed at a specific test location.

6.6.6*

A piece of sheeting material shall be placed over each cigarette and shall be smoothed over the cigarette to ensure intimate contact.

6.6.6.1

The sheeting shall be pinned to the vertical panel approximately 63 mm above the crevice.

6.6.7

Each cigarette shall be allowed to burn its full length unless an obvious ignition of the substrate occurs.

6.6.7.1

If a cigarette extinguishes before burning its entire length, a fresh cigarette shall be placed on a fresh area of the test assembly and covered with sheeting fabric until one of the following occurs:

(1) Three cigarettes have burned their entire lengths on three individual test specimens.

(2) Three cigarettes have self-extinguished on the sample.

6.6.8

If an obvious ignition occurs on any of the three specimens, the smoldering materials shall be extinguished, and the sample shall be recorded as a Class II barrier material based on the results of this test.

6.6.9

If no obvious ignition occurs, the char on the vertical panel measured from the original crevice position to the highest part of the destroyed or degraded fabric shall be recorded to the nearest 2.5 mm.

6.6.9.1

The original crevice position shall be determined by laying a straightedge or ruler between the two marks required by 6.6.3 on the edges of the vertical panel.

6.6.9.2

The highest point of destroyed or degraded fabric shall be defined as the highest point at which any of the fabric is charred from front to back.

6.7 Mass Loss Procedure

6.7.1 As an alternate procedure to the char length procedure described in sections 6.1 through 6.6 above, the propensity for smoldering combustion of the tested material shall be permitted to be assessed by a mass loss procedure as indicated in this section.

6.7.2 If an obvious ignition occurs on any of the three specimens, the smoldering materials shall be extinguished, and the sample shall be recorded as a Class II material based on the results of this test.

6.7.2 If no obvious ignition occurs at the end of 45 minutes, carefully remove the polyurethane foam substrate pieces and clean all carbonaceous char from the panels with a brush.

6.7.3 Unless an extinguishing agent was applied to the polyurethane foam substrate, record the mass of the un-charred portions of the polyurethane foam substrate pieces to the nearest 0.1 grams within 15 minutes of end of test.

6.7.4 Calculate the percent mass loss of the polyurethane foam substrate to the nearest 0.1% by using the initial mass (from 5.1.1.1) and the final mass (from 6.7.3) with the equation below:

Mass Loss = (Initial Mass - Final Mass)/Initial Mass) x100.

Statement of Problem and Substantiation for Public Comment

This is the second public comment to address the issue of an alternate optional mass loss procedure - the first one being public comment # 4.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 4-NFPA 260-2016 [Section No. 5.1.1]	
Public Comment No. 6-NFPA 260-2016 [Section No. 7.2]	
Public Comment No. 7-NFPA 260-2016 [Section No. 7.3]	
Public Comment No. 8-NFPA 260-2016 [Section No. 7.4]	
Public Comment No. 9-NFPA 260-2016 [Section No. 7.5]	
Public Comment No. 10-NFPA 260-2016 [Section No. 7.6]	
Public Comment No. 11-NFPA 260-2016 [Section No. 7.7]	

Related Item

First Revision No. 11-NFPA 260-2016 [Chapter 6]

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Committee:

Committee Statement

Committee Action: Rejected but held

Resolution: This comment has been held for the next revision cycle. The TC has created a task group to review both the mass loss and char length pass/fail criteria.

Public Input No. 12-NFPA 260-2020 [Chapter 7]

Chapter 7 Cigarette Resistance Classifications

7.1 General.

7.1.1

Furniture components shall be classified as Class I or Class II in accordance with Section 7.2 through Section 7.~~7~~ 9 .

7.1.2

An upholstered furniture component shall meet all the requirements of Class I to be considered resistant to cigarette ignition.

7.

~~2 Cover Fabric Classification. 7.2.~~

1

~~– Class I.~~

~~Class I cover fabric shall meet the criteria of 7.2.1.1 and 7.2.1.2 .~~

~~**7.2.1.1** –~~

~~When subjected to the cover fabric test, a specimen shall show no evidence of ignition of any test assembly.~~

~~**7.2.1.2** –~~

~~The vertical char on any of the three specimens shall not exceed 45 mm.~~

~~**7.2.2** – Class II.~~

~~Cover fabrics that do not meet Class I criteria shall be designated as Class II.~~

~~**7.3** – Interior Fabric Classification.~~

~~**7.3.1** – Class I.~~

~~Class I interior fabric shall meet the criteria of 7.3.1.1 and 7.3.1.2 .~~

~~**7.3.1.1** –~~

~~When subjected to the interior fabric test, a specimen shall show no evidence of ignition of any test assembly.~~

~~**7.3.1.2** –~~

~~The vertical char on the cover fabric of any of the three specimens shall not exceed 38 mm.~~

~~**7.3.2** – Class II.~~

~~Interior fabrics that do not meet Class I criteria shall be designated as Class II.~~

~~**7.4** – Welt Cord Classification.~~

~~**7.4.1** – Class I.~~

~~Class I welt cord shall meet the criteria of 7.4.1.1 and 7.4.1.2 .~~

~~**7.4.1.1** –~~

~~When subjected to the welt cord test, a specimen shall show no evidence of ignition of any test assembly.~~

~~**7.4.1.2** –~~

~~When measured from the top of the original welt position, the vertical char on the cover fabric shall not exceed 38 mm for any of three replicated tests.~~

~~**7.4.2** – Class II.~~

~~Welt cord that does not meet Class I criteria shall be designated as Class II.~~

~~**7.5** – Filling/Padding Components Classification.~~

~~**7.5.1** – Class I.~~

~~Class I components shall meet the criteria of 7.5.1.1 and 7.5.1.2 .~~

~~**7.5.1.1** –~~

~~When subjected to the filling/padding component test, a specimen shall show no evidence of ignition of any test assembly.~~

~~**7.5.1.2** –~~

~~When measured from the original crevice position, the vertical char length on the cover fabric shall not exceed 38 mm for any of three replicated tests.~~

~~**7.5.2** – Class II.~~

~~Components that do not meet Class I criteria shall be designated as Class II.~~

~~**7.6** – Decking Materials Classification.~~

~~**7.6.1** – Class I.~~

~~Class I decking materials shall meet the criteria of 7.6.1.1 and 7.6.1.2 .~~

~~**7.6.1.1** –~~

~~When subjected to the decking materials test, a specimen shall show no evidence of ignition at any cigarette location.~~

~~**7.6.1.2** –~~

~~When measured from the original cigarette position, the char length on the cover fabric shall not exceed 38 mm at any of three cigarette locations.~~

~~**7.6.2** – Class II.~~

~~Decking materials that do not meet Class I criteria shall be designated as Class II.~~

~~**7.7** – Barrier Materials Classification.~~

~~**7.7.1** –~~

~~All barrier materials used in cigarette-resistant furniture construction shall be classified as Class I barrier fabric using the test method described in Section 6.6 .~~

~~**7.7.2** – Class I.~~

~~Class I barriers shall meet the criteria of 7.7.2.1 and 7.7.2.2 .~~

~~**7.7.2.1** –~~

~~When subjected to the barrier materials test, a specimen shall show no evidence of ignition of any test assembly.~~

~~**7.7.2.2** –~~

~~When measured from the original crevice position, the vertical char length on the cover fabric shall not exceed 51 mm for any of three replicated tests.~~

~~**7.7.3** – Class II.~~

~~Barriers that do not meet Class I criteria shall be designated as Class II.~~

.3 Any material that does not meet all the requirements of Class I shall be designated as a Class II material.

7.2 For this test method, the existence of pronounced continuous and self-sustaining combustion of the test system or the generation of a flame or of smoke shall be evidence of ignition.
7.3 Vertical char length:

7.3.1 Maximum vertical char length for cover fabrics: < 1.8 in. (45 mm)

7.3.2 Maximum vertical char length for interior fabrics: < 1.5 in. (38 mm)

7.3.3 Maximum vertical char length for welt cords: < 1.5 in. (38 mm)

7.3.4 Maximum vertical char length for fillings or paddings: < 1.5 in. (38 mm)

7.3.5 Maximum vertical char length for decking materials: < 1.5 in. (38 mm)

7.3.6 Maximum vertical char length for barrier materials: < 1.5 in. (38 mm)

7.4 A material shall be classified as a Class II material if the test specimen exhibits a vertical char length that meets or exceeds the prescribed limit, as set forth in sections 7.3.1 through 7.3.6.

7.5 A material shall be classified as a Class II material if the test specimen transitions from smoldering combustion to flaming combustion.

7.6 A material shall be classified as a Class II material if the test specimen exhibits obvious ignition, by virtue of generating a visible flame or smoke (see section 7.2).

7.7 A material shall be classified as a Class II material if, after 45 minutes have elapsed since the lit cigarette has been placed on the test specimen, the char length is still growing, or visible smoke is still emerging.

7.8 If, after 45 minutes have elapsed since the lit cigarette has been placed on the test specimen, and the cigarette has burnt its full length, the material has not exhibited any of the criteria in sections 7.3 through section 7.7, as appropriate, the test operator shall separate the vertical panel from the horizontal carriage.

7.8.1 If any of the interior surfaces are still glowing, visible smoke continues to be emitted for another 10 seconds, or the specimen transitions to flaming combustion, the material shall be designated as a Class II material.

7.8.2 The observation of a cavity in the filling or padding (possibly due to decomposition), or of a discoloration on the surface of the filling or padding, shall not, by itself, be construed as indication of an ignition having occurred.

7.8.3 If the formation of a cavity in the filling or padding or of discoloration of the filling or padding is observed, those observations shall be reported.

7.9 If a material does not exhibit any of the criteria in 7.2 through 7.8.1, the material shall be designated as a Class I material.

7.10 Optionally, the test operator shall determine and report the amount, and percentage, of the mass of the filling or padding that was lost during the test.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to

make such a standard more reliable and to improve its repeatability. This public input addresses the classification of test materials. Other public inputs are planned to be issued also.
This PI proposes rationalization of the classification, continuing to use Classes I and II. For information, NFPA 260 already uses the concept of Classes I and II but ASTM E1353 uses partially Classes A and B and CA TB 117-2013 uses the concept of pass and fail. The public input recommends classifying materials as Class I and Class II, where Class I materials are all those that are not classified as Class II.
2. It creates a single separate subsection for eacg type of material for vertical char length.
3. Research at NIST and at CPSC has shown that continued smoldering, glowing, smoking or transition to flaming can be observed when interior surfaces of the test specimen are exposed to the atmosphere. As this creates an obvious hazard, it is being added as a criterion for classifying a material as Class II.
4. The standard does not presently provide a test duration. A companion PI recommends that observations be conducted after 45 minutes from the time the lit cigarette is placed on the test specimen. If combustion continues in some fashion, the material is to be classified as Class II. This will help to rationalize testing.
5. The definition of “obvious ignition” is proposed to be deleted by another PI and a more objective criterion for obvious ignition is proposed to be added to this classification section. Definitions are not enforceable and the existing definition probably contains a requirement.
6. The information to be reported is rationalized to provide the needed information and to eliminate a vague requirement such as “test conditions” and “number of cigarettes: (required by the test method).
7. A different PI changes the cigarette because the cigarette referenced is no longer available.
8.Vertical char length criterion for different materials is different and that is not being changed.
9. An optional measurement and report of mass loss is being added. This would enable a manufacturer to make the case that after 45 minutes, the extent of an ignition that is no longer sustained was of limited consequence.

The task group recommends that all the requirements for vertical char length be identical, unless a rationale exists for differences and none is known.

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Submittal Date: Wed Dec 09 21:12:23 EST 2020
Committee: FIZ-AAA

Public Input No. 5-NFPA 260-2020 [Section No. 7.2]

7.2 Cover Fabric Classification.

7.2.1 Class I.

Class I cover fabric shall meet the criteria of 7.2.1.1 and 7.2.1.2.

7.2.1.1

When subjected to the cover fabric test, a specimen shall show no evidence of ignition of any test assembly.

7.2.1.2

The vertical char on any of the three specimens shall not exceed 45 mm.

7.2. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7. 2.2 Class II.

Cover fabrics that do not meet Class I criteria shall be designated as Class II.

Additional Proposed Changes

File Name	Description	Approved
260_-6_Held_Comment.pdf	NFPA_260_PC6	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. 6 of the F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.3.

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Committee: FIZ-AAA

Public Comment No. 6-NFPA 260-2016 [Section No. 7.2]

7.2 Cover Fabric Classification.

7.2.1 Class I.

Class I cover fabric shall meet the criteria of 7.2.1.1 and of 7.2.1.2 or of 7 .2.1.3.

7.2.1.1

When subjected to the cover fabric test, a specimen shall show no evidence of ignition of any test assembly.

7.2.1.2

The vertical char on any of the three specimens shall not exceed 45 mm.

7.2. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7. 2.2 Class II.

Cover fabrics that do not meet Class I criteria shall be designated as Class II.

Statement of Problem and Substantiation for Public Comment

This is the third public comment (the others being 4 and 5) addressing the optional mass loss procedure.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 4-NFPA 260-2016 [Section No. 5.1.1]	
Public Comment No. 5-NFPA 260-2016 [Chapter 6]	
Public Comment No. 7-NFPA 260-2016 [Section No. 7.3]	
Public Comment No. 8-NFPA 260-2016 [Section No. 7.4]	
Public Comment No. 9-NFPA 260-2016 [Section No. 7.5]	
Public Comment No. 10-NFPA 260-2016 [Section No. 7.6]	
Public Comment No. 11-NFPA 260-2016 [Section No. 7.7]	

Related Item

First Revision No. 11-NFPA 260-2016 [Chapter 6]

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Committee:

Committee Statement

Committee Action: Rejected but held

Resolution: The TC is holding this comment for the next revision cycle. A Task Group was created to address all of the pass/fail criteria within the document, including mass loss and char length.

Public Input No. 6-NFPA 260-2020 [Section No. 7.3]

7.3 Interior Fabric Classification.

7.3.1 Class I.

Class I interior fabric shall meet the criteria of 7.3.1.1 and 7.3.1.2.

7.3.1.1

When subjected to the interior fabric test, a specimen shall show no evidence of ignition of any test assembly.

7.3.1.2

The vertical char on the cover fabric of any of the three specimens shall not exceed 38 mm.

7.3. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.3. 2 Class II.

Interior fabrics that do not meet Class I criteria shall be designated as Class II.

Additional Proposed Changes

File Name	Description	Approved
260_-7_Held_Comment.pdf	NFPA_260_PC7	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. 7 of the F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.1.

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Committee: FIZ-AAA

Public Comment No. 7-NFPA 260-2016 [Section No. 7.3]

7.3 Interior Fabric Classification.

7.3.1 Class I.

Class I interior fabric shall meet the criteria of 7.3.1.1 and of 7.3.1.2 or of 7 .3.1.3.

7.3.1.1

When subjected to the interior fabric test, a specimen shall show no evidence of ignition of any test assembly.

7.3.1.2

The vertical char on the cover fabric of any of the three specimens shall not exceed 38 mm.

7.3. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.3. 2 Class II.

Interior fabrics that do not meet Class I criteria shall be designated as Class II.

Statement of Problem and Substantiation for Public Comment

The next public comment in the series, following #4, 5 and 6.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 4-NFPA 260-2016 [Section No. 5.1.1]	
Public Comment No. 5-NFPA 260-2016 [Chapter 6]	
Public Comment No. 6-NFPA 260-2016 [Section No. 7.2]	
Public Comment No. 8-NFPA 260-2016 [Section No. 7.4]	
Public Comment No. 9-NFPA 260-2016 [Section No. 7.5]	
Public Comment No. 10-NFPA 260-2016 [Section No. 7.6]	
Public Comment No. 11-NFPA 260-2016 [Section No. 7.7]	
Related Item	
First Revision No. 11-NFPA 260-2016 [Chapter 6]	

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Committee:

Committee Statement

Committee Action: Rejected but held

Resolution: The TC is holding this comment for the next revision cycle. A Task Group was created to address all of the pass/fail criteria within the document, including mass loss and char length.

Public Input No. 7-NFPA 260-2020 [Section No. 7.4]

7.4 Welt Cord Classification.

7.4.1 Class I.

Class I welt cord shall meet the criteria of 7.4.1.1 and 7.4.1.2.

7.4.1.1

When subjected to the welt cord test, a specimen shall show no evidence of ignition of any test assembly.

7.4.1.2

When measured from the top of the original welt position, the vertical char on the cover fabric shall not exceed 38 mm for any of three replicated tests.

7.4.1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.4.2 Class II.

Welt cord that does not meet Class I criteria shall be designated as Class II.

Additional Proposed Changes

File Name	Description	Approved
260_-8_Held_Comment.pdf	NFPA_260_PC8	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. 8 of the F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.1.

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Committee: FIZ-AAA

Public Comment No. 8-NFPA 260-2016 [Section No. 7.4]

7.4 _ Welt Cord Classification.

7.4.1 Class I.

Class I welt cord shall meet the criteria of 7.4.1.1and of _ 7.4.1.2 or of 7 . 4.1.3

7.4.1.1

When subjected to the welt cord test, a specimen shall show no evidence of ignition of any test assembly.

7.4.1.2

When measured from the top of the original welt position, the vertical char on the cover fabric shall not exceed 38 mm for any of three replicated tests.

7.4. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.4. 2 Class II.

Welt cord that does not meet Class I criteria shall be designated as Class II.

Statement of Problem and Substantiation for Public Comment

related to public comments 4 through 7 on mass loss.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 4-NFPA 260-2016 [Section No. 5.1.1]	
Public Comment No. 5-NFPA 260-2016 [Chapter 6]	
Public Comment No. 6-NFPA 260-2016 [Section No. 7.2]	
Public Comment No. 7-NFPA 260-2016 [Section No. 7.3]	
Public Comment No. 9-NFPA 260-2016 [Section No. 7.5]	
Public Comment No. 10-NFPA 260-2016 [Section No. 7.6]	
Public Comment No. 11-NFPA 260-2016 [Section No. 7.7]	

Related Item

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Committee:

Committee Statement

Committee Action: Rejected but held

Resolution: The TC is holding this comment for the next revision cycle. A Task Group was created to address all of the pass/fail criteria within the document, including mass loss and char length.

Public Input No. 8-NFPA 260-2020 [Section No. 7.5]

7.5 Filling/Padding Components Classification.

7.5.1 Class I.

Class I components shall meet the criteria of 7.5.1.1 and 7.5.1.2.

7.5.1.1

When subjected to the filling/padding component test, a specimen shall show no evidence of ignition of any test assembly.

7.5.1.2

When measured from the original crevice position, the vertical char length on the cover fabric shall not exceed 38 mm for any of three replicated tests.

7.5. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.5. 2 Class II.

Components that do not meet Class I criteria shall be designated as Class II.

Additional Proposed Changes

File Name	Description	Approved
260_-9_Held_Comment.pdf	NFPA_260_PC9	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. 9 of the F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.1.

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Committee: FIZ-AAA

Public Comment No. 9-NFPA 260-2016 [Section No. 7.5]

7.5 Filling/Padding Components Classification.

7.5.1 Class I.

Class I components shall meet the criteria of 7.5.1.1and of 7.5.1.2 or of 7 . 5.1.3 .

7.5.1.1

When subjected to the filling/padding component test, a specimen shall show no evidence of ignition of any test assembly.

7.5.1.2

When measured from the original crevice position, the vertical char length on the cover fabric shall not exceed 38 mm for any of three replicated tests.

7.5. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.5. 2 Class II.

Components that do not meet Class I criteria shall be designated as Class II.

Statement of Problem and Substantiation for Public Comment

The next in the series starting with public comment # 4.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 4-NFPA 260-2016 [Section No. 5.1.1]	
Public Comment No. 5-NFPA 260-2016 [Chapter 6]	
Public Comment No. 6-NFPA 260-2016 [Section No. 7.2]	
Public Comment No. 7-NFPA 260-2016 [Section No. 7.3]	
Public Comment No. 8-NFPA 260-2016 [Section No. 7.4]	
Public Comment No. 10-NFPA 260-2016 [Section No. 7.6]	
Public Comment No. 11-NFPA 260-2016 [Section No. 7.7]	

Related Item

First Revision No. 11-NFPA 260-2016 [Chapter 6]

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Submittal Date: Thu Nov 03 01:21:02 EDT 2016
Committee:

Committee Statement

Committee Action: Rejected but held

Resolution:	The TC is holding this comment for the next revision cycle. A Task Group was created to address all of the pass/fail criteria within the document, including mass loss and char length.

Public Input No. 9-NFPA 260-2020 [Section No. 7.6]

7.6 Decking Materials Classification.

7.6.1 Class I.

Class I decking materials shall meet the criteria of 7.6.1.1 and of 7.6.1.2 or of 7 .6.1.3.

7.6.1.1

When subjected to the decking materials test, a specimen shall show no evidence of ignition at any cigarette location.

7.6.1.2

When measured from the original cigarette position, the char length on the cover fabric shall not exceed 38 mm at any of three cigarette locations.

7.6. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.6. 2 Class II.

Decking materials that do not meet Class I criteria shall be designated as Class II.

Additional Proposed Changes

File Name	Description	Approved
260-10_Held_Comment.pdf	NFPA_260_PC10	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. 10 of the F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.1.

Submitter Information Verification

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Submittal Date: Tue Feb 18 10:58:34 EST 2020
Committee: FIZ-AAA

Public Comment No. 10-NFPA 260-2016 [Section No. 7.6]

7.6 Decking Materials Classification.

7.6.1 Class I.

Class I decking materials shall meet the criteria of 7.6.1.1and of 7.6.1.2 or of 7 . 6.1.3 .

7.6.1.1

When subjected to the decking materials test, a specimen shall show no evidence of ignition at any cigarette location.

7.6.1.2

When measured from the original cigarette position, the char length on the cover fabric shall not exceed 38 mm at any of three cigarette locations.

7.6. 1.3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.6. 2 Class II.

Decking materials that do not meet Class I criteria shall be designated as Class II.

Statement of Problem and Substantiation for Public Comment

The next public comment in the mass loss series

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 4-NFPA 260-2016 [Section No. 5.1.1]	
Public Comment No. 5-NFPA 260-2016 [Chapter 6]	
Public Comment No. 6-NFPA 260-2016 [Section No. 7.2]	
Public Comment No. 7-NFPA 260-2016 [Section No. 7.3]	
Public Comment No. 8-NFPA 260-2016 [Section No. 7.4]	
Public Comment No. 9-NFPA 260-2016 [Section No. 7.5]	
Public Comment No. 11-NFPA 260-2016 [Section No. 7.7]	
Related Item	
First Revision No. 11-NFPA 260-2016 [Chapter 6]	

Submitter Information Verification

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Submittal Date: Thu Nov 03 01:23:54 EDT 2016
Committee:

Committee Statement

Committee Action: Rejected but held

Resolution:	The TC is holding this comment for the next revision cycle. A Task Group was created to address all of the pass/fail criteria within the document, including mass loss and char length.

Public Input No. 10-NFPA 260-2020 [Section No. 7.7]

7.7 Barrier Materials Classification.

7.7.1

All barrier materials used in cigarette-resistant furniture construction shall be classified as Class I barrier fabric using the test method described in Section 6.6 or in Section 6 .7.

7.7.2 Class I.

Class I barriers shall meet the criteria of 7.7.2.1 and 7.7.2.2 or of 7 .7.2.3.

7.7.2.1

When subjected to the barrier materials test, a specimen shall show no evidence of ignition of any test assembly.

7.7.2.2

When measured from the original crevice position, the vertical char length on the cover fabric shall not exceed 51 mm for any of three replicated tests.

7.7. 2. 3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.7.3 Class II.

Barriers that do not meet Class I criteria shall be designated as Class II.

Additional Proposed Changes

File Name	Description	Approved
260-11_Held_Comment.pdf	NFPA_260_PC11	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Reject but Hold" in Public Comment No. 11 of the F2017 Second Draft Report for NFPA 260 and per the Regs. at 4.4.8.3.1.

Submitter Information Verification

Submitter Full Name: Tc On Fiz-Aaa
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Submittal Date: Tue Feb 18 11:02:23 EST 2020
Committee: FIZ-AAA

Public Comment No. 11-NFPA 260-2016 [Section No. 7.7]

7.7 Barrier Materials Classification.

7.7.1

All barrier materials used in cigarette-resistant furniture construction shall be classified as Class I barrier fabric using the test method described in Section 6.6or in Section 6 . 7 .

7.7.2 Class I.

Class I barriers shall meet the criteria of 7.7.2.1and of 7.7.2.2 or of 7 . 7.2.3 .

7.7.2.1

When subjected to the barrier materials test, a specimen shall show no evidence of ignition of any test assembly.

7.7.2.2

When measured from the original crevice position, the vertical char length on the cover fabric shall not exceed 51 mm for any of three replicated tests.

7.7. 2. 3 The mass loss of the polyurethane foam substrate shall not exceed 10%.

7.7.3 Class II.

Barriers that do not meet Class I criteria shall be designated as Class II.

Statement of Problem and Substantiation for Public Comment

The last public comment in the series associated with the optional mass loss procedure

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 4-NFPA 260-2016 [Section No. 5.1.1]	
Public Comment No. 5-NFPA 260-2016 [Chapter 6]	
Public Comment No. 6-NFPA 260-2016 [Section No. 7.2]	
Public Comment No. 7-NFPA 260-2016 [Section No. 7.3]	
Public Comment No. 8-NFPA 260-2016 [Section No. 7.4]	
Public Comment No. 9-NFPA 260-2016 [Section No. 7.5]	
Public Comment No. 10-NFPA 260-2016 [Section No. 7.6]	

Related Item

First Revision No. 11-NFPA 260-2016 [Chapter 6]

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Submittal Date: Thu Nov 03 01:30:41 EDT 2016
Committee:

Committee Statement

Committee Action:	Rejected but held
Resolution:	The TC is holding this comment for the next revision cycle. A Task Group was created to address all of the pass/fail criteria within the document, including mass loss and char length.

Public Input No. 23-NFPA 260-2020 [Chapter 8]

Chapter 8 ~~Safety Precautions 8~~ **Report**

8.1 The following shall be reported:

8.1.1 The edition of this test method that was used (including an explanation if the latest edition was not used).

8.1.2 A description of the material being tested, including the source.

8.1.3 The test laboratory.

8.1.4 The date the test was conducted.

8.1.5 The temperature and relative humidity in the test laboratory.

8.1.6 The section (within chapter 6) that was used.

8.1.7 The classification of the material tested.

8.1.8 If the material was classified as a Class II material, the criterion used for that classification.

8.1.9 (Optional) The mass loss (in g) and the percentage of mass lost (in %) filling or padding, if determined.

Chapter 9 Safety Precautions

9 .1* Combustion.

~~8~~ 9 .1.1

Any test shall be discontinued as soon as continuing combustion occurs.

~~8~~ 9 .1.2

The exposed area shall be wet immediately with a water spray from the water bottle, and the charred or burned material shall be removed and immersed in a bucket of water.

~~8~~ 9 .1.3

The test area then shall be ventilated.

~~8~~ 9 .2* Exposure.

~~8~~ 9 .2.1

Test personnel shall avoid exposure to smoke and gases produced during testing as much as possible.

~~8~~ 9 .2.2

A large hood with a low air velocity shall be permitted to be in operation during testing to remove products of combustion.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable.
The test method does not have a report section and this PI adds one.

Submitter Information Verification

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Submittal Date: Fri Dec 11 19:12:17 EST 2020
Committee: FIZ-AAA

Public Input No. 17-NFPA 260-2020 [Section No. A.1.1.1]

A.1.1.1

These test methods were originally similar to those described in ASTM E1353, *Standard Test Methods for Cigarette Ignition Resistance of Components of Upholstered Furniture.*When the use of reduced ignition propensity cigarettes became required in the United States, this test method (NFPA 260) changed its ignition source and started using a cigarette developed by NIST (SRM 1196). The cigarette ignition potency of SRM 1196 cigarettes[as assessed by NIST (Gann and Hnetkovsky 2009) utilizing a method close to that in ASTM E2187, *Standard Test Method for Measuring the Ignition Strength of Cigarettes*] is similar to that of the ignition source used when the test method was developed initially and is much higher than that of reduced ignition propensity cigarettes *(see also A.4.3)*.~~The change in ignition source for ASTM E1353 did not occur until 2016.~~ There is insufficient information as to the effect of the cigarette covered with fabric on ignition potency. Once the SRM 1196 cigarettes ceased being available, NIST procured equivalent cigarettes that are designated as SRM 1196 series cigarettes.The 2016 edition of ASTM E1353 references the SRM 1196 cigarettes as the ignition source, even though these cigarettes are no longer available.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable. This PI addresses the change in cigarette, consistent withe the change in section 4.3.

Submitter Information Verification

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Submittal Date: Thu Dec 10 01:00:56 EST 2020
Committee: FIZ-AAA

Public Input No. 22-NFPA 260-2020 [Section No. A.3.3.4.1]

~~**A.3.3.4.1** – Obvious Ignition. –~~

~~This is a matter of operator judgment based on experience in this type of operation.~~

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable. This PI deletes the annex section, consistent with the deletion of the definition of obvious ignition.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 14-NFPA 260-2020 [Section No. 3.3.4.1]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Committee: FIZ-AAA

Public Input No. 16-NFPA 260-2020 [Section No. A.4.3]

A.4.3

Standard Reference Material SRM 1196 ~~is obtained~~ series cigarettes are obtained from the National Institute of Standards and Technology (NIST).

In previous editions of this test method, the ignition source was a commercially available cigarette identified by certain characteristics that corresponded to an unfiltered Pall Mall cigarette. Based on regulations for reduced ignition propensity cigarettes, these particular cigarettes are no longer available in the United States. That cigarette has been replaced by the manufacturer with a banded cigarette that meets the regulations for reduced ignition propensity. Banded cigarettes very frequently go out when placed on a test substrate. Since the test requires that a test cigarette burn its full length, the new version of the old test cigarette is not usable.

NIST had samples of the old cigarettes and was able to characterize their ignition propensity. They commissioned cigarettes to be manufactured to those specifications. Then they verified that the new cigarettes met the physical and performance requirements of the previously used cigarettes. These cigarettes ~~are now~~ were made available ~~from~~ by NIST as SRM 1196, one of over ~~2000 standard~~ 1300 standard reference materials that they produce for various uses. When the original SRM 1196 cigarettes ceased to be available, NIST procured SRM 1196a cigarettes and is planning to continue providing cigarettes to be designated as SRM 1196 series of cigarettes in future. In view of the fact that SRM 1196 is no longer available, the test method was changed to reflect the use of an SRM 1196 series cigarette.

Statement of Problem and Substantiation for Public Input

A task group composed of Richard Gann (chair), Marcelo Hirschler, Andrew Lock, Bill Perdue and Mauro Zammarano looked at the test method for cigarette ignition resistance of components of upholstered furniture (of which there are 4 similar test methods: ASTM E1353, NFPA 260, CA TB 117-2013 and Upholstered Furniture Action Council, or UFAC) and suggested a variety of changes to make the standard more reliable. This PI addresses the cigarette to be used as ignition source, since SRM 1196 is no longer available and has been replaced by SRM 1196a by NIST. Future versions of the SRM 1196 cigarette are planned to be designated SRM1196b, SRM 1196c and so forth. Other PIs are planned to be issued also.
This was also changed by TIA 1532-2020, but an added sentence is recommended.

Submitter Information Verification

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Submittal Date: Thu Dec 10 00:56:09 EST 2020
Committee: FIZ-AAA

Public Input No. 26-NFPA 260-2021 [New Section after B.1.2]

TITLE OF NEW CONTENT

Type your content here ...

B.1.3 It was not the intent of the UFAC construction criteria to increase the risk from fires. In some cases, additives used to improve the performance in certain fire tests, for ignitablity and/or heat release may have increased the rate of smoke production, increased the irritancy of the smoke, and increased the toxicity of the smoke. This is critical since smoke is typically the first tenability criteria reached in fires. Even in cases in which ignitablity was improved and/or the rate of heat release rate was reduced, the death rate per fire appears to have increased or stayed the same. Manufacturers should be aware of this potential unintended consequence when designing products to comply with this standard.

Statement of Problem and Substantiation for Public Input

Some studies have shown that after regulations that required additives to be added to furniture where enacted that the death rate per fire increased. Some studies have shown that when comparing furniture with additives to furniture without additives that the rate of smoke production, the level of smoke irritancy, and the level of smoke toxicity were increased. This non-mandatory requirement is intended to focus the attention of the manufacturers on the ultimate goal of improving fire safety and not view meeting of the test in this standard as the goal itself.

Submitter Information Verification

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Submittal Date:	Tue Jan 05 16:57:25 EST 2021
Committee:	FIZ-AAA

Public Input No. 27-NFPA 260-2021 [Section No. B.1.2]

B.1.2

The UFAC construction criteria are intended to effect the following changes:

(1) Eliminate ignition-prone welt cords and substitute smolder-resistant welt cords that meet the requirements of the UFAC welt cord test.

(2) Eliminate untreated cotton batting as a substrate in immediate contact with decking fabrics and substitute materials that meet the requirements of the UFAC decking materials test.

(3) Eliminate untreated cotton batting in immediate contact with the covering of the inside vertical walls and substitute materials that meet the requirements of the UFAC filling/padding component test.

(4) Eliminate intimate contact between Class II fabrics and the horizontal seating surfaces of conventional polyurethane foam cushions. Where Class II fabrics are used with conventional polyurethane foam cushions, a barrier meeting the requirements of the UFAC barrier materials test should be used.

(5) The purpose of items 1-4 is to reduce the risk to the public from upholstered furniture fires.

Statement of Problem and Substantiation for Public Input

The listed items in 1-4 are means to an end, not an end in and of itself,

This language clarifies the purpose of the listed items.

It is possible that a piece of furniture in compliance with this standard, could decrease the probability of ignition but make the fire worse, if ignition does occur.

This language clarifies that a result of that nature would be inconsistent with the intent of this standard.

Submitter Information Verification

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Submittal Date:	Tue Jan 05 17:02:29 EST 2021
Committee:	FIZ-AAA

Public Input No. 1-NFPA 276-2020 [Section No. 2.3.1]

2.3.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM C62, *Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale)*, 2017.

ASTM C208, *Standard Specification for Cellulosic Fiber Insulating Board*, 2012 (2017) e2 .

ASTM E136, *Standard Test Method for ~~Behavior~~ Assessing Combustibility of Materials ~~in a~~ Using a Vertical Tube Furnace at 750°C*, ~~2016a~~ 2019a .

Statement of Problem and Substantiation for Public Input

update

Submitter Information Verification

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Submittal Date: Mon Dec 28 17:40:01 EST 2020
Committee: FIZ-AAA

Public Input No. 2-NFPA 276-2020 [Section No. 7.5.2.3]

7.5.2.3

The test specimen–furnace interface shall be sealed with an insulating cement material to prevent heat loss from the test furnace chamber, with physical properties as follows:

(1) Density: ≥22 lb/ft^3 (352 kg/m^3)

(2) Recommended use temperature: ≤2000°F (1093°C)

(3) Noncombustible in accordance with ASTM E136, *Standard Test Method for ~~Behavior~~ Assessing Combustibility of Materials ~~in a~~ Using a Vertical Tube Furnace at 750°C*

Statement of Problem and Substantiation for Public Input

title correction

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1-NFPA 276-2020 [Section No. 2.3.1]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Submittal Date: Tue Dec 29 17:11:33 EST 2020
Committee: FIZ-AAA

Public Input No. 17-NFPA 701-2020 [Global Input]

Revise Title as follows:

Standard Methods of Fire Tests for Flame Propagation of Textiles and Films for Applications Other Than Protective Clothing.

Statement of Problem and Substantiation for Public Input

This standard has been misapplied to protective clothing. Changing the title and scope to expressly exclude protective clothing applications may reduce this misapplication of the standard.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 12-NFPA 701-2020 [Section No. D.2.2]	
Public Input No. 15-NFPA 701-2020 [New Section after 1.1.3.2]	
Public Input No. 16-NFPA 701-2020 [New Section after 1.2.2]	

Submitter Information Verification

Submitter Full Name: Brian Shiels
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Street Address:
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Submittal Date: Mon Dec 21 15:09:40 EST 2020
Committee:

Public Input No. 24-NFPA 701-2021 [Global Input]

Remove “Standard for” from all UL standard Titles

Statement of Problem and Substantiation for Public Input

The terms “Standard for” or “Subject” are redundant and unnecessary. All references to UL are standards.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 25-NFPA 701-2021 [Section No. 2.3.3]	
Public Input No. 26-NFPA 701-2021 [Section No. E.1.2.2]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
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Submittal Date: Mon Jan 04 13:09:41 EST 2021
Committee:

Public Input No. 23-NFPA 701-2020 [Section No. 1.1.1.1]

1.1.1.1

Test Method 1 shall apply to materials with an areal density less than or equal to 700 g/m^2 (21 oz/yd^2), including the following:

(1) Fabrics or other materials used in curtains, draperies, or other window treatments

(2) Single-layer fabrics

(3) Multilayer curtain and drapery assemblies in which the layers are fastened together by sewing or other means

(4) Combustible artificial decorative vegetation with an areal density less than or equal to 700 g/m^2 (21 oz/yd^2)

(5) Where required, fabrics with an areal density less than or equal to 700 g/m^2 (21 oz/yd^2) and used in other construction applications

Statement of Problem and Substantiation for Public Input

This PI adds an application that is covered by both NFPA 101 and the IFC. If the combustible artificial vegetation has a higher areal density it is covered by Test Method 2, and that is being added in an alternate PI.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 22-NFPA 701-2020 [Section No. 1.1.2.1]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
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Submittal Date: Thu Dec 24 14:37:58 EST 2020
Committee: FIZ-AAA

Public Input No. 21-NFPA 701-2020 [Section No. 1.1.1.2]

1.1.1.2

Test Method 1 shall not apply to the following, which shall be tested according to Test Method 2:

(1) Vinyl-coated fabric blackout linings or lined draperies using a vinyl-coated fabric blackout lining

(2) Plastic films

(3) Decorative materials other than fabrics

(4) Other materials where Test Method 2 is required by 1.1.2

(5) Personal clothing

Statement of Problem and Substantiation for Public Input

NFPA 701 needs to clearly indicate the standard is not intended for clothing. To not mention this in the administration section scope could falsely imply a worker may not suffer burns if any textiles meet the testing criteria in the standard. In such a case, the worker does not understand the standard is for other types of textiles and not clothing.

By adding the extra item of "clothing" to the list of what the standard does not cover would rectify any confusion.
Submitter Information Verification

Submitter Information Verification

Submitter Full Name: Janet Washburn
Organization: Bonita Springs Fire Control and Rescue District
Street Address:
City:
State:
Zip:
Submittal Date: Wed Dec 23 14:39:43 EST 2020
Committee: FIZ-AAA

Public Input No. 22-NFPA 701-2020 [Section No. 1.1.2.1]

1.1.2.1

Test Method 2 shall apply to the following:

(1) Decorative materials other than fabrics meeting the requirements of 1.1.1.1

(2) Fabrics, including multilayered fabrics, films, and plastic blinds, with or without reinforcement or backing, with areal densities greater than 700 g/m^2 (21 oz/yd^2)

(3) Vinyl-coated fabric blackout linings and lined draperies using a vinyl-coated fabric blackout lining

(4) Plastic films

(5) Fabrics, with or without reinforcement or backing, used for decorative or other purposes inside a building or as temporary or permanent enclosures for buildings under construction

(6) Fabrics used in the assembly of awnings, ~~tents,~~ tarps, or banners

(7) Fabrics used in the assembly of both temporary and permanent tents, membrane structures ~~, or banners~~ and their appurtenances, which include sidewalls, drops, tarpaulins, and floor coverings

(8) Combustible artificial decorative vegetation with an areal density greater than 700 g/m ^{2} (21 oz/yd ^{2})

Statement of Problem and Substantiation for Public Input

This PI separates in a separate category tents and membrane structures, both temporary and permanent, as characterized in the International Fire Code (IFC).

Section 3104 of the IFC deals with "TEMPORARY AND PERMANENT TENTS AND MEMBRANE STRUCTURES" and states that "the floor coverings, tents, membrane structures and their appurtenances,
which include sidewalls, drops and tarpaulins, are composed of materials meeting the flame propagation performance of Test Method 2 of NFPA 701".

Also, both the IFC and NFPA 101 require combustible artificial decorative vegetation to comply with NFPA 701, test method 1 or 2, as appropriate.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 23-NFPA 701-2020 [Section No. 1.1.1.1]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Committee:	FIZ-AAA

Public Input No. 20-NFPA 701-2020 [Section No. 1.1.2.2]

1.1.2.2

Test Method 2 shall not apply to the following:

(1) Materials covered by Test Method 1 *(See 1.1.1.)*

(2) Wall coverings, ceiling coverings, floor coverings, and other interior finish

(3) Personal clothing

Statement of Problem and Substantiation for Public Input

NFPA 701 needs to clearly indicate the standard is not intended for clothing. To not mention this in the administration section scope could falsely imply a worker may not suffer burns if any textiles meet the testing criteria in the standard. In such a case, the worker does not understand the standard is for other types of textiles and not clothing.

By adding the extra item of "clothing" to the list of what the standard does not cover would rectify any confusion.
Submitter Information Verification

Submitter Information Verification

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Submittal Date: Wed Dec 23 14:36:04 EST 2020
Committee: FIZ-AAA

Public Input No. 15-NFPA 701-2020 [New Section after 1.1.3.2]

1.1.3.3
Test Methods 1 and 2 both shall not apply to protective clothing applications *(See D.2.2).*

Statement of Problem and Substantiation for Public Input

These test methods have been inappropriately applied to protective clothing applications. These test methods are insufficient for protective clothing applications. The proposed language will expressly exclude from the scope their application to protective clothing.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 12-NFPA 701-2020 [Section No. D.2.2]	
Public Input No. 16-NFPA 701-2020 [New Section after 1.2.2]	
Public Input No. 17-NFPA 701-2020 [Global Input]	

Submitter Information Verification

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Zip:
Submittal Date: Mon Dec 21 15:01:46 EST 2020
Committee: FIZ-AAA

Public Input No. 16-NFPA 701-2020 [New Section after 1.2.2]

1.2.3

Test Methods 1 and 2 shall not be deemed to indicate whether the material tested is suitable for protective clothing applications.

Statement of Problem and Substantiation for Public Input

This standard has been inappropriately applied to protective clothing. Expressly stating that it shall not apply to the assessment of protective clothing may reduce this misapplication of the standard.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 12-NFPA 701-2020 [Section No. D.2.2]	
Public Input No. 15-NFPA 701-2020 [New Section after 1.1.3.2]	
Public Input No. 17-NFPA 701-2020 [Global Input]	

Submitter Information Verification

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Committee: FIZ-AAA

Public Input No. 1-NFPA 701-2020 [Section No. 2.3.2]

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D5025, *Standard Specification for Laboratory Burner Used for Small-Scale Burning Tests on Plastic Materials*, ~~2012 e1~~ 2020a .

ASTM D5207, *Standard Practice for Confirmation of 20-mm (50-W) and 125-mm (500-W) Test Flames for Small-Scale Burning Tests on Plastic Materials*, ~~2014~~ 2020 .

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2018~~ 2020 .

Statement of Problem and Substantiation for Public Input

date updates

Submitter Information Verification

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Submittal Date: Wed Jan 01 20:29:27 EST 2020
Committee: FIZ-AAA

Public Input No. 25-NFPA 701-2021 [Section No. 2.3.3]

2.3.3 UL Publications.

Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062–2096.

UL 723, ~~*Standard Test for*~~ *Surface Burning Characteristics of Building Materials,* ~~2008, revised 2017~~ 2018 .

Statement of Problem and Substantiation for Public Input

UL Standard edition update.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 24-NFPA 701-2021 [Global Input]	
Public Input No. 26-NFPA 701-2021 [Section No. E.1.2.2]	

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Public Input No. 3-NFPA 701-2020 [Section No. C.3.3]

C.3.3

During the 1980s, considerable effort was expended to modify the NFPA 701 tests and to arrive at pass/fail criteria for one of the ~~small-scale test that~~ two tests included in the 1977 edition, the one known as the "small scale test", that would agree more closely with the results obtained with the ~~large~~ other one, known as the large -scale test. During this time, a series of tests involving multilayer composites were performed at Southwest Research Institute (SwRI) by Belles and Beitel, and published in 1988, which concluded that meeting the requirements of the "small scale test" was not indicative of adequate fire performance . Following that research, the "small scale test" is, after the 1989 edition, no longer part of NFPA 701.

Statement of Problem and Substantiation for Public Input

clarification

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Submittal Date: Wed Jan 01 20:48:01 EST 2020
Committee: FIZ-AAA

Public Input No. 4-NFPA 701-2020 [Section No. C.3.5]

C.3.5

The Belles and Beitel tests generally demonstrated that draperies consisting of face and lining materials made from the same type of fiber were less likely to propagate flame extensively. Also, draperies consisting of face and lining fabrics made from dissimilar materials were very likely to propagate flame extensively and to be destroyed almost totally in less than 2 minutes. The only exception to these results ~~was~~ involved draperies consisting of face and lining materials made from cotton with ~~nondurable, flame-resistant (FR) treatments~~ nondurable treatments for improved fire performance . In these cases, the fabric tended to resist the flame for 2 to 3 minutes and then to ignite and burn intensely. Because NFPA 701 is intended to evaluate fabrics for relatively short exposures to the flame, such fabrics generally tended to pass NFPA 701 tests.

Statement of Problem and Substantiation for Public Input

editorial clarifications

Submitter Information Verification

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Submittal Date: Wed Jan 01 20:52:31 EST 2020
Committee: FIZ-AAA

Public Input No. 5-NFPA 701-2020 [Section No. C.3.6]

C.3.6

In any event, the Belles and Beitel tests demonstrated a serious weakness in the NFPA 701 small-scale test, because the same combinations of fabrics that propagated the flames extensively in SwRI tests performed well in both the NFPA 701 large- and small-scale tests. This led the fiber and textile industry trade associations to work closely with NFPA, ASTM, and the Center for Fire Research at the National Institute of Standards and Technology (NIST) to implement a program to develop a new test that would evaluate both single-layer fabrics and multilayer composites, such as draperies, for flame ~~resistance~~ propagation performance in a small-scale test that adequately predicts the results obtained at SwRI.

Statement of Problem and Substantiation for Public Input

Editorial change reflecting the title of the standard now. The title used to talk about flame resistance but now addresses flame propagation.

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Submittal Date: Wed Jan 01 20:54:51 EST 2020
Committee: FIZ-AAA

Public Input No. 6-NFPA 701-2020 [Section No. C.3.8]

C.3.8

The second phase of work at NIST resulted in Test Method 1. Subsequent to the work at NIST, there has been some refinement of the test method as well as much verification testing. Test Method 1, as presented here, does not reproduce the SwRI results precisely, because combinations that burned nearly completely (at least 95 percent destruction) in the SwRI tests showed an approximate weight loss of only 80 percent in Test Method 1. Nevertheless, the "good" performers at SwRI showed a weight loss of less than 40 percent in this test, and the "bad" performers at SwRI showed a weight loss of greater than 40 percent. The one exception is vinyl-coated fabric blackout linings, which behave very inconsistently. Consequently, these linings and lined draperies containing such materials should be tested using Test Method 2, former;y known as the large-scale test.

Statement of Problem and Substantiation for Public Input

clarification

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Submittal Date: Wed Jan 01 21:02:58 EST 2020
Committee: FIZ-AAA

Public Input No. 7-NFPA 701-2020 [Section No. C.3.9]

C.3.9

During the development of what is known as Test Method 1 since the 1996 edition , another test method was tried and eventually abandoned because of the cost of the apparatus and potential operator safety problems. This alternative test method was based on an analysis of the differences between the room-scale test and the NFPA 701 test. It was observed in the room-scale tests that flames usually propagated more rapidly on the portion of the specimen that faced the wall. This finding suggested that the radiant energy reflected back to the specimen by the wall was critical. To simulate this situation in a test cabinet such as the one used in the NFPA 701 test, it seemed appropriate to heat the back wall of the cabinet so that it would radiate heat to the back surface of the specimen.

Consequently, a cabinet was equipped with electrical strip heaters mounted on a 1 cm (0.39 in.) aluminum plate that, in turn, was attached to the back of the cabinet. The remainder of the test was identical to ASTM D3659, *Standard Test Method for Flammability of Apparel Fabrics by Semi-Restraint Method*, a test which was withdrawn in 2001. Back surface temperatures in excess of 240°C (460°F) were needed to duplicate the SwRI results. The quoted cost of a test chamber modified for ASTM D3659 ~~was $3000~~ was $3000, at that time . The additional modification for heating the back wall surface was estimated at an additional $3000, for a total cost for the test chamber of approximately $6000. This cost was believed to be such that it would prevent many laboratories from participating in the interlaboratory testing required to validate the test. For this reason, as well as the possibility of operators sustaining burns when placing and removing specimens, this alternative method was abandoned.

Statement of Problem and Substantiation for Public Input

clarification.

I wonder if the dollar figures should be deleted altogether.

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Public Input No. 8-NFPA 701-2020 [Section No. C.3.10]

C.3.10

The present test method (Test method 1) eliminates the need for heating the back surface by placing the specimen very close to the back surface. This placement tends to form a chimney that funnels the heat between the wall and the specimen. This arrangement permits the back wall to be heated, which, in turn, re-radiates some of the heat onto the back surface of the specimen.

Statement of Problem and Substantiation for Public Input

clarification

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Submittal Date: Wed Jan 01 21:08:23 EST 2020
Committee: FIZ-AAA

Public Input No. 9-NFPA 701-2020 [Section No. D.1.1]

D.1.1

Although it is not possible to make combustible textiles and films completely resistant to charring and decomposition when exposed to flame or high temperature, a degree of ~~flame resistance~~ improved fire propagation performance can be achieved. Most natural and synthetic fiber textiles can be treated chemically to ~~increase their flame resistance~~ improve their fire propagation performance . Such treatments might be fugitive and, hence, not durable to laundering, dry cleaning, or water leaching, whereas other treatments are very durable and can withstand many cycles of laundering, dry cleaning, or water leaching. Furthermore, some synthetic fibers are made from polymers that contain flame retardants in their basic structure. Both approaches could be necessary to impart ~~flame resistance~~ improved fire propagation performance to materials in which different types of fibers are blended. It should be noted, however, that combinations of flame ~~-resistant~~ retarded (FR) fibers with relatively small percentages of non-flame~~-resistant fibers~~ retarded fibers can interfere with the ~~flame-resistant~~ improved fire propagation performance effect of the FR fibers.

Statement of Problem and Substantiation for Public Input

editorial changes

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Public Input No. 11-NFPA 701-2020 [Section No. D.2]

D.2 Applications of Improved Flame ~~-Resistant~~ Propagation Fabrics.

D.2.1

Standards for theater scenery, curtains, and furnishings in high-risk or assembly occupancies ~~are commonly~~ as well as for materials for tents are often set by ~~law.Flame-resistant fabrics are~~ codes or regulations .

Fabrics with improved flame propagation performance (which were often previously called "flame-resistant fabrics") which meet one or the other of the tests in NFPA 701 are often used in hotels, hospitals, and similar occupancies in the interest of the preservation of lives and property from fire.

D.2.2

~~Flame-resistant fabrics also are used~~ Compliance with this standard does not make a fabric suitable for work clothing in industries where exposure to heat, open flames, or ~~and~~ flash fire is a possibility.

~~See NFPA 1971, NFPA 1975, NFPA 1977, NFPA 2112, ASTM F1506, or ASTM F1891 for such applications.~~ ~~D.2.3~~ –

D2.3 Fabrics treated ~~for~~ to improve flame ~~and~~ propagation performance and weather resistance are used for tents, tarpaulins, and other outdoor protective covering.

D.2.4

Reinforced plastic films with improved flame ~~-resistant qualities~~ propagation performance are used in membrane structures.

D.2.5

Transparent plastic films often are used as temporary enclosures for greenhouses and for construction work.

Statement of Problem and Substantiation for Public Input

This public input is important as it may affect the safety of workers who may purchase clothing labeled as flame-resistant by virtue of having complied with NFPA 701 and use it, inappropriately as personal protective equipment/work clothing. While this inappropriate use of the standard is clearly unintended, the wording of Section D.2.2 as it stands implies that this standard may be appropriate for the evaluation of work clothing for use as PPE (personal protective equipment), which is certainly not the case. I am aware that third-party testing laboratories have been asked (many times) by manufacturers if they can use this standard for compliance with the requirements of PPE. Unfortunately, there have also been instances where manufacturers use this document as a loophole to label clothing with poor fire performance as “flame-resistant” and use it for inappropriate applications like protection against arc flash and flash fire (in such scenarios, inappropriate melting fabrics would melt and drip onto a worker’s skin potentially causing serious injury).
The public input proposes to revise this section for clarification so that NFPA 701 cannot be misinterpreted; the NFPA 701 test method is not appropriate for protective work clothing worn by workers to protect against hazards like arc flash or flash fire. Note also that the term “flame resistant fabric” is not included in the body of the NFPA 701 test method standard (it was eliminated recently) and Section D.2.2 as worded presently gives the impression that fabrics meeting NFPA 701 are allowed by the standard to be labeled “flame resistant” when the test method does not say so. Other standards and specifications exist and are appropriate for such uses and if work clothing is to be cited, it is reasonable to direct readers to standards appropriate for those hazards. There is precedence for this in existing standards (for example, Section 1.3.2 of NFPA 2112). The presence of the statement in

Section D.2.2 as is, without amendment is misleading and suggests to manufacturers that they can sell clothing with inappropriate fire performance for use as PPE and label it as “flame-resistant” according to this standard. The testing required by NFPA 701 is not stringent enough to determine appropriateness for hazards like flash fire and arc flash; specifications and standards for these hazards already exist and they should be referenced in this document for use.
Changes in other sections eliminate the misleading term flame resistant and make some minor adjustments.

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Committee: FIZ-AAA

Public Input No. 10-NFPA 701-2020 [Section No. D.2.2]

D.2.2

~~Flame-resistant fabrics also are used~~ Compliance with this standard does not make a fabric suitable for work clothing in industries where exposure to heat, open flames, or ~~and~~ flash fire is a possibility. See NFPA 1971, NFPA 1975, NFPA 1977, NFPA 2112, ASTM F1506, or ASTM F1891 for such applications.

(also add NFPA 1971, NFPA 1975, NFPA 1977 and NFPA 2112 into section E1.1 on NFPA Publications and ASTM F1506 (Standard Performance Specification for Flame Resistant and Electric Arc Rated Protective Clothing Worn by Workers Exposed to Flames and Electric Arcs, 2019) and ASTM F1891 (Standard Specification for Arc and Flame Resistant Rainwear, 2019) into section E.1.2.1 on ASTM publications)

Statement of Problem and Substantiation for Public Input

This public input is important as it may affect the safety of workers who may purchase clothing labeled as flame-resistant by virtue of having complied with NFPA 701 and use it, inappropriately as personal protective equipment/work clothing. While this inappropriate use of the standard is clearly unintended, the wording of Section D.2.2 as it stands implies that this standard may be appropriate for the evaluation of work clothing for use as PPE (personal protective equipment), which is certainly not the case. I am aware that third-party testing laboratories have been asked (many times) by manufacturers if they can use this standard for compliance with the requirements of PPE. Unfortunately, there have also been instances where manufacturers use this document as a loophole to label clothing with poor fire performance as “flame-resistant” and use it for inappropriate applications like protection against arc flash and flash fire (in such scenarios, inappropriate melting fabrics would melt and drip onto a worker’s skin potentially causing serious injury).

The public input proposes to revise this section for clarification so that NFPA 701 cannot be misinterpreted; the NFPA 701 test method is not appropriate for protective work clothing worn by workers to protect against hazards like arc flash or flash fire.

Note also that the term “flame resistant fabric” is not included in the body of the NFPA 701 test method standard (it was eliminated recently) and Section D.2.2 as worded presently gives the impression that fabrics meeting NFPA 701 are allowed by the standard to be labeled “flame resistant” when the test method does not say so.

Other standards and specifications exist and are appropriate for such uses and if work clothing is to be cited, it is reasonable to direct readers to standards appropriate for those hazards. There is precedence for this in existing standards (for example, Section 1.3.2 of NFPA 2112).

The presence of the statement in Section D.2.2 as is, without amendment is misleading and suggests to manufacturers that they can sell clothing with inappropriate fire performance for use as PPE and label it as “flame-resistant” according to this standard. The testing required by NFPA 701 is not stringent enough to determine appropriateness for hazards like flash fire and arc flash; specifications and standards for these hazards already exist and they should be referenced in this document for use.

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Submittal Date:	Wed Jan 01 21:14:58 EST 2020
Committee:	FIZ-AAA

Public Input No. 12-NFPA 701-2020 [Section No. D.2.2]

D.2.2

~~Flame-resistant fabrics also are used for~~ Compliance with this Standard does not make a fabric suitable for work clothing in industries where exposure to heat, open flames, ~~and~~ arc flash or flash fire is a possibility. See NFPA 1971, NFPA 1975, NFPA 1977, NFPA 2112, ASTM F1506, *Standard Performance Specification for Flame Resistant and Electric Arc Rated Protective Clothing Worn by Workers Exposed to Flames and Electric Arcs*, or ASTM F1891, *Standard Specification for Arc and Flame Resistant Rainwear* , for such applications.

Statement of Problem and Substantiation for Public Input

The current wording of Section D.2.2 implies that this standard may be appropriate for the evaluation of work clothing for use as PPE (personal protective equipment), which is certainly not the case. As a third-party testing laboratory and consulting company, we have been asked (many times) by manufacturers if they can use this standard for compliance with the requirements of PPE. Unfortunately, we've also seen instances where manufacturers use this document as a loophole to label clothing with poor fire performance as "flame-resistant" and use it for inappropriate applications like protection against arc flash and flash fire (in such scenarios, inappropriate melting fabrics would melt and drip onto a worker's skin potentially causing serious injury). NFPA 701 is not appropriate for protective work clothing worn by workers to protect against hazards like arc flash or flash fire. Other standards and specifications exist and are appropriate for such uses and if work clothing is to be cited, it is reasonable to direct readers to standards appropriate for those hazards. There is precedence for this in existing standards (for example, Section 1.3.2 of NFPA 2112).

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 13-NFPA 701-2020 [Section No. E.1.1]	
Public Input No. 14-NFPA 701-2020 [Section No. E.1.2.1]	
Public Input No. 15-NFPA 701-2020 [New Section after 1.1.3.2]	
Public Input No. 16-NFPA 701-2020 [New Section after 1.2.2]	
Public Input No. 17-NFPA 701-2020 [Global Input]	

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Public Input No. 13-NFPA 701-2020 [Section No. E.1.1]

E.1.1 NFPA Publications.

NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls,* 2019 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth,* 2019 edition.

NFPA 289, *Standard Method of Fire Test for Individual Fuel Packages,* 2018 edition.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* , 2018 edition.

NFPA 1975, *Standard on Emergency Services Work Apparel* , 2019 edition.

NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting* , 2016 edition.

NFPA 2112, *Standard on Flame-Resistant Clothing for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire,* 2018 edition.

Statement of Problem and Substantiation for Public Input

Adding references to documents listed in PI No. 12.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 12-NFPA 701-2020 [Section No. D.2.2]	

Submitter Information Verification

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Public Input No. 14-NFPA 701-2020 [Section No. E.1.2.1]

E.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D3659, *Standard Test Method for Flammability of Apparel Fabrics by Semi-Restraint Method*, 1980 (1993 e1; withdrawn 2001).

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, 2018.

ASTM F1506, *Standard Performance Specification for Flame Resistant and Electric Arc Rated Protective Clothing Worn by Workers Exposed to Flames and Electric Arcs* , 2020a.

ASTM F1891, *Standard Specification for Arc and Flame Resistant Rainwear* , 2019.

Statement of Problem and Substantiation for Public Input

Adding references to documents listed in PI No. 12.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 12-NFPA 701-2020 [Section No. D.2.2]	

Submitter Information Verification

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Public Input No. 2-NFPA 701-2020 [Section No. E.1.2.1]

E.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D3659, *Standard Test Method for Flammability of Apparel Fabrics by Semi-Restraint Method*, 1980 (1993 e1; withdrawn 2001).

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2018~~ 2020 .

Statement of Problem and Substantiation for Public Input

date update

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Submittal Date: Wed Jan 01 20:30:46 EST 2020
Committee: FIZ-AAA

Public Input No. 26-NFPA 701-2021 [Section No. E.1.2.2]

E.1.2.2 UL Publications.

Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 723, ~~*Standard Test for*~~ *Surface Burning Characteristics of Building Materials*, ~~2008, revised 2010~~ 2018 .

Statement of Problem and Substantiation for Public Input

UL Standard edition update.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 24-NFPA 701-2021 [Global Input]	
Public Input No. 25-NFPA 701-2021 [Section No. 2.3.3]	

Submitter Information Verification

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Committee: FIZ-AAA

Public Input No. 10-NFPA 262-2021 [Global Input]

Remove “ANSI/” and “Standard for” from all UL standard Titles.

Statement of Problem and Substantiation for Public Input

Many years ago, UL preferred the ANSI/UL reference because there was a transition of traditional UL standards towards an ANSI standards development process.
Now, years later, a large majority of UL Standards are ANSI approved and follow the ANSI development and maintenance process. However, sometimes readers are confused because they don’t understand the standards are actually UL standards, not developed by ANSI. There are many other references to standards promulgated by other standards development organizations where they are considered ANSI approved but do not include ANSI in the reference.

The terms “Standard for” or “Subject” are redundant and unnecessary. All references to UL are standards.

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Submittal Date: Mon Jan 04 12:44:12 EST 2021
Committee:

Public Input No. 1-NFPA 262-2020 [Section No. 2.3.1]

2.3.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM C1186, *Standard Specification for Flat Fiber-Cement Sheets,* 2008 (2016).

ASTM C1288, *Standard Specification for Fiber-Cement Interior Substrate Sheets,* 2017.

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials,* ~~2018~~ 2020 .

Statement of Problem and Substantiation for Public Input

date update

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Submittal Date: Wed Dec 23 18:36:26 EST 2020
Committee: FIZ-AAA

Public Input No. 11-NFPA 262-2021 [Section No. 2.3.2]

2.3.2 UL Publications.

Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062–2096.

UL 723, ~~*Standard for* Test for Surface Burning Characteristics of Building Materials,~~ ~~2008, revised 2017~~ 2018 .

Statement of Problem and Substantiation for Public Input

UL Standard edition update.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 10-NFPA 262-2021 [Global Input]	
Public Input No. 12-NFPA 262-2021 [Section No. E.1.2.2]	

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Public Input No. 8-NFPA 262-2020 [Section No. 4.2]

4.2– * Fire Test Apparatus.

The fire test apparatus shall consist of the following:

(1) Air-inlet chamber

(2) Air-inlet shutter

(3) Fire test chamber

(4) Gas burner

(5) Removable top cover

(6) Exhaust transition

(7) Exhaust duct

(8) Exhaust duct velocity measurement system

(9) Smoke measurement system

(10) Exhaust duct damper

4.2.1 Air-Inlet Chamber.

4.2.1.1

The fire test chamber air-inlet transition shall consist of an L-shaped galvanized steel unit secured to the air-inlet end of the fire test chamber.

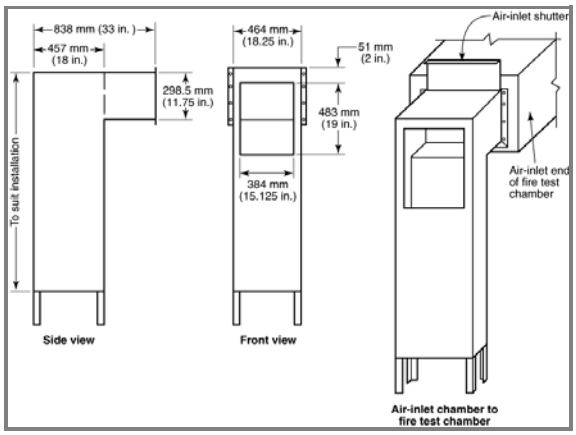
4.2.1.2

The unit shall contain a 298.5 mm ± 6 mm × 464 mm ± 6 mm (11.8 in. ± 0.25 in. × 18.25 in. ± 0.25 in.) rectangular opening to allow air to enter the fire test chamber through the chamber air-inlet shutter.

4.2.1.3

A schematic of the air-inlet chamber shall be as shown in Figure 4.2.1.3.

Figure 4.2.1.3 Schematic of the Air-Inlet Chamber. Tolerances are contained in applicable paragraphs. Otherwise, dimensions are nominal.



4.2.2 Air-Inlet Shutter.

4.2.2.1

A vertically sliding shutter, extending the entire width of the test chamber, shall be provided at the air-inlet end of the fire test chamber.

4.2.2.2

The shutter shall be positioned to provide an air-inlet opening 76 mm ± 2 mm (3 in. ± 0.08 in.) high, measured from the floor level of the test chamber and across the full width of the chamber, as shown in Figure 4.2.1.3. *[See also Figure 4.2.3.1(a).]*

4.2.3 Fire Test Chamber.

4.2.3.1

The fire test chamber shall consist of a horizontal duct of the shapes and sizes shown in Figure 4.2.3.1(a) and Figure 4.2.3.1(b).

Figure 4.2.3.1(a) Details of Fire Test Chamber. Tolerances are contained in applicable paragraphs. Otherwise, dimensions are nominal.

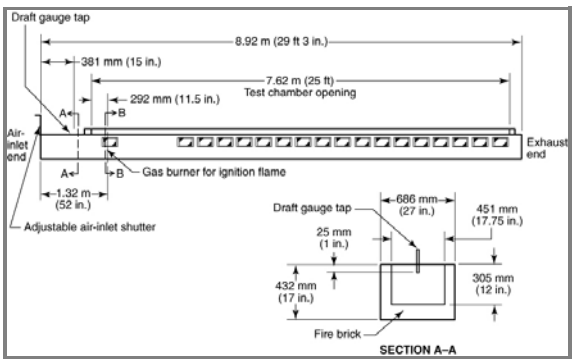
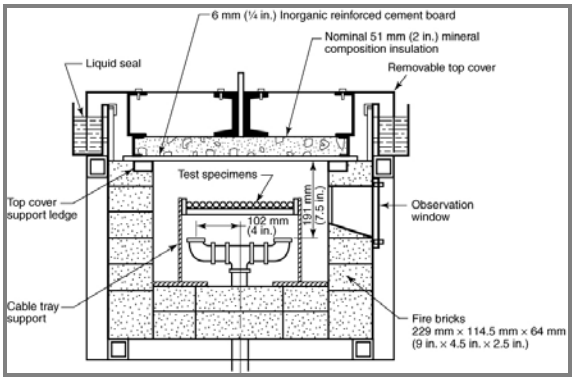


Figure 4.2.3.1(b) Cross-Section of the Fire Test Chamber. Tolerances are contained in applicable paragraphs. Otherwise, dimensions are nominal.



4.2.3.2*

The sides and base of the duct shall be lined with insulating masonry, consisting of refractory firebrick, as illustrated in Figure 4.2.3.1(b).

4.2.3.3*

One side of the fire test chamber shall be provided with a row of two panes of 6 mm (¼ in.) thick high-temperature glass, pressure-tight observation windows, with the inside pane mounted flush with the inner wall. *[See Figure 4.2.3.1(b).]*

4.2.3.4

The exposed window area shall be 70 mm ± 6 mm × 280 mm ± 38 mm (2.75 in. ± 0.25 in. × 11 in. ± 1.5 in.).

4.2.3.5

The windows shall be located so that the gas burner and the length of the specimens being tested, from the point at which the test fire ends, can be observed from outside the fire test chamber.

4.2.3.6*

The top cover support ledges shall be fabricated of a structural material capable of withstanding the abuse of continuous testing.

4.2.3.7

The ledges shall be level with respect to length and width of the chamber and with respect to each other.

4.2.3.8

To provide air turbulence for combustion, turbulence-inducing baffles shall be provided by positioning six 229 mm long × 114.5 mm wide × 64 mm thick (9 in. long × 4.5 in. wide × 2.5 in. thick) refractory firebricks (long dimension vertical and 114.5 mm dimension parallel to the wall) along the side walls of the chamber at distances of 1.98 m ± 152 mm (6.5 ft ± 0.5 ft), 3.96 m ± 152 mm (13 ft ± 0.5 ft), and 5.79 m ± 152 mm (19 ft ± 0.5 ft) on the window side (do not obstruct the windows) and 1.37 m ± 152 mm (4.5 ft ± 0.5 ft), 2.90 m ± 152 mm (9.5 ft ± 0.5 ft), and 4.88 m ± 152 mm (16 ft ± 0.5 ft) on the opposite side, as measured from the centerline of the gas burner to the centerline of the firebricks.

4.2.4 Gas Burners.

4.2.4.1 Positioning.

4.2.4.1.1

One end of the test chamber, designated as the air-inlet end in Figure 4.2.3.1(a), shall be provided with a dual-port gas burner, delivering flames upward, to engulf the test specimens.

4.2.4.1.2

As shown in Figure 4.2.3.1(b), the burner shall be positioned transversely to each side of the centerline of the furnace so that the flame is evenly distributed over the width of the specimens.

4.2.4.1.3

The burner shall be spaced 292 mm ± 6 mm (11.5 in. ± 0.25 in.) from the air-inlet end of the test chamber, and 191 mm ± 6 mm (7.5 in. ± 0.25 in.) below the removable top cover *[see Figure 4.2.3.1(a) and Figure 4.2.3.1(b)]*.

4.2.4.1.4

The burner shall be located 1320 mm ± 51 mm (52 in. ± 2 in.) downstream of the air-inlet shutter, as measured from the burner centerline to the outside surface of the shutter.

4.2.4.2 Burner.

4.2.4.2.1

Gas to the burner shall be provided through a single inlet pipe, distributed to each port burner through a tee-section.

4.2.4.2.2

The outlet shall be a nominal 19 mm (¾ in.) elbow.

4.2.4.2.3

The plane of the ports shall be parallel to the chamber floor, such that the gas is directed upward toward the specimen.

4.2.4.2.4

Each port shall be positioned with its centerline 102 mm ± 6 mm (4 in. ± 0.25 in.) on each side of the centerline of the fire test chamber so that the burner flame is evenly distributed *[see Figure 4.2.3.1(b)]*.

4.2.4.3 Ignition.

4.2.4.3.1

The gas burner shall be ignited remotely, using an electronic ignition system.

4.2.4.3.2

The controls used to maintain a constant flow of methane gas to the burners shall consist of the following:

(1) A pressure regulator

(2) A gas meter calibrated to read in increments of not more than 2.8 L (0.1 ft^3)

(3) A gauge to indicate gas pressure in Pa (or inches of water column)

(4) A quick-acting gas shutoff valve

(5) A gas metering valve

(6) An orifice plate in combination with a manometer to assist in maintaining uniform gas flow conditions

4.2.4.3.3

Alternative control equipment, if shown to be equivalent, shall be permitted.

4.2.5 Removable Top Cover.

4.2.5.1

The removable top cover shall consist of a metal and mineral insulation composite unit whose insulation consists of nominal 51 mm ± 6 mm (2 in. ± 0.25 in.) thick mineral composition material.

4.2.5.1.1

The top unit, shown in Figure 4.2.3.1(b), shall completely cover the fire test chamber.

4.2.5.1.2*

The metal and mineral composite material shall have physical characteristics as follows:

(1) Maximum effective use temperature of not less than 650°C (1200°F)

(2) Bulk density of 335 kg/m^3 ± 20 kg/m^3 (21 lb/ft^3 ± 1.5 lb/ft^3)

(3) Thermal conductivity of

$$0.072 \text{ to } 0.102 \frac{W}{m \cdot K} \text{ at } 150^\circ \text{ to } 370^\circ C$$

$$\left(0.50 \text{ to } 0.71 \frac{Btu \cdot in.}{ft^3 \cdot hr \cdot {}^\circ F} \text{ at } 300^\circ \text{ to } 700^\circ F \right) \quad \text{[4.2.5.1.2a]}$$

(4) $K\rho c$ product of

$$1 \times 10^4 \text{ to } 4 \times 10^4 \frac{W^2 \cdot sec}{m^2 \cdot k^2} \left(1 \text{ to } 4 \frac{Btu^2 \cdot in.}{ft^2 \cdot hr \cdot {}^\circ F^2} \right) \quad \text{[4.2.5.1.2b]}$$

4.2.5.2

The entire top panel unit shall be protected with flat sections of uncoated fiber-reinforced cement board.

4.2.5.2.1

The fiber-cement board shall comply with either ASTM C1186, *Standard Specification for Flat Fiber-Cement Sheets*, Grade II, or ASTM C1288, *Standard Specification for Fiber-Cement Interior Substrate Sheets*, and with the following additional specifications:

(1) The board shall have a nominal thickness of 6 mm (1/4 in.)

(2) The board shall have a density of 1442 kg/m^3 ± 160 kg/m^3) (90 lb/ft^3 ± 10 lb/ft^3).

(3) The board shall be uncoated.

(4) The board shall remain in place throughout the test.

(5) The board shall be suitable for test sample adhesion.

4.2.5.2.2

The board shall be maintained in an unwarped and uncracked condition through continued replacement.

4.2.5.2.3

While in place, the top panel shall rest on a nominal 3 mm (⅛ in.) thick woven fiberglass belting, positioned on the top cover support ledges.

4.2.5.2.4*

The top panel shall be completely sealed against the leakage of air into the fire test chamber during the test.

4.2.6 Exhaust Transition.

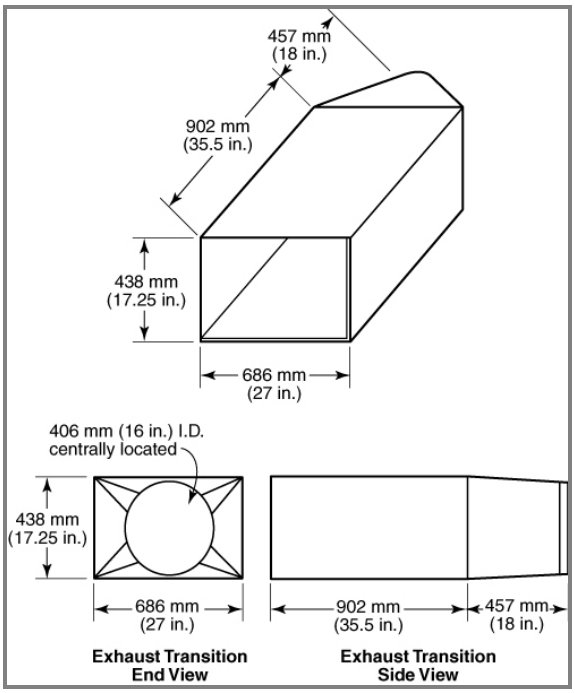
4.2.6.1

The exhaust end of the fire test chamber shall be fitted with a transition piece.

4.2.6.1.1

The exhaust transition shall consist of a stainless steel unit composed of a 902 mm ± 6 mm long × 686 mm ± 6 mm wide × 438 mm ± 6 mm high (35.5 in. ± 0.25 in. long × 27 in. ± 0.25 in. wide × 17 in. ± 0.25 in. high) rectangular section and a 457 mm ± 6 mm (18 in. ± 0.25 in.) long rectangular-to-round transition section connected to the 406 mm ± 3 mm (16 in. ± 0.125 in.) inside diameter (I.D.) exhaust duct, as shown in Figure 4.2.6.1.1.

Figure 4.2.6.1.1 Exhaust Transition. Tolerances are contained in applicable paragraphs. Otherwise, dimensions are nominal.



4.2.6.1.2

The outside of the transition section shall be insulated with a nominal 51 mm (2 in.) ceramic-fiber blanket [nominal density 130 kg/m^3 (8 lb/ft^3)].

4.2.6.2

The unit shall be secured to the exhaust end of the fire test chamber.

4.2.7 Exhaust Duct.

4.2.7.1

The 406 mm ± 3 mm (16 in. ± 0.125 in.) I.D. exhaust duct shall be constructed from stainless steel and shall extend 4.88 m to 5.49 m (16 ft to 18 ft) horizontally from the vent end of the transition to the centerline of the smoke measurement system, to provide for a fully mixed exhaust gas flow.

4.2.7.2

The exhaust duct shall extend a minimum of 8.53 m (28 ft) from the vent end of the exhaust transition section.

4.2.7.3*

The exhaust duct shall be insulated with at least 51 mm (2 in.) of high-temperature mineral composition material from the beginning of the exhaust transition piece up to and including the smoke measurement system.

4.2.8 Exhaust Duct Velocity Measurement.

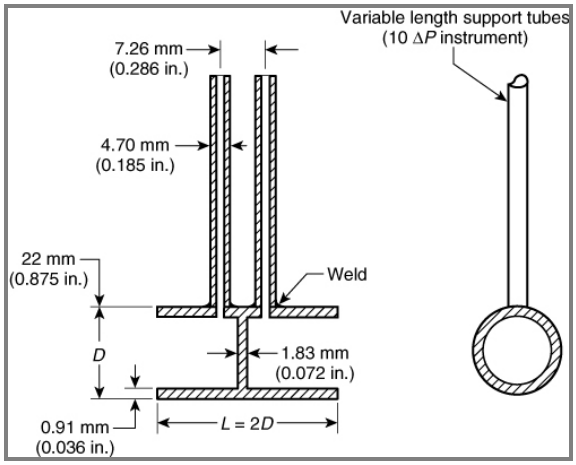
4.2.8.1

The velocity in the exhaust duct shall be determined by measuring the differential pressure in the flow path with a bidirectional probe connected to an electronic pressure gauge or with an equivalent measuring system and a thermocouple.

4.2.8.1.1

The probe, as shown in Figure 4.2.8.1.1, shall consist of a stainless steel cylinder with a cylinder length that is nominally two times the outside diameter of the cylinder, with a minimum length of 25.4 mm (1 in.) and a maximum length of 51 mm (2 in.) with a solid diaphragm in the center.

Figure 4.2.8.1.1 Bidirectional Probe.



4.2.8.1.2

The pressure taps on either side of the diaphragm shall support the probe.

4.2.8.1.3

The axis of the probe shall run along the centerline of the duct.

4.2.8.1.4

The pressure taps specified in 4.2.8.1.2 shall be connected to a pressure transducer that is able to resolve pressure differences of 0.25 Pa (0.001 psi water column).

4.2.8.1.5

The response time to a stepwise change of the duct flow rate shall not exceed 5 seconds to reach 90 percent of the final value.

4.2.8.2

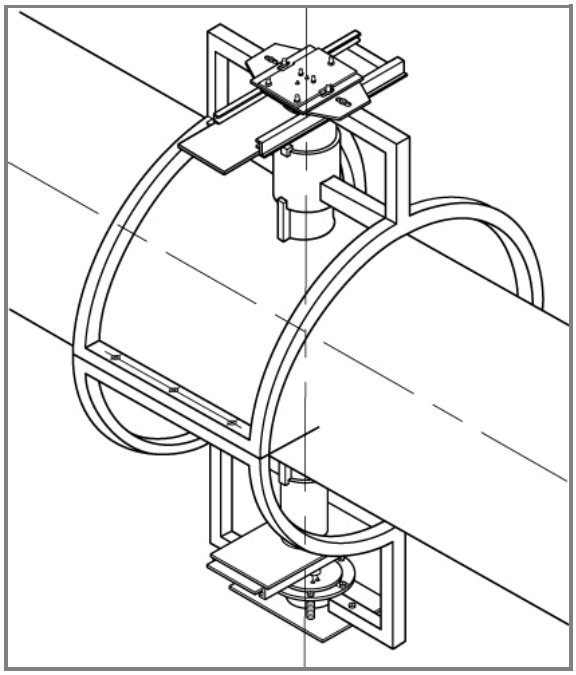
The temperature of the exhaust gas shall be measured within 152 mm (6 in.) from the probe and at the centerline of the duct, with a 28 AWG Type K thermocouple having an Inconel® sheath.

4.2.9 Smoke Measurement System.

4.2.9.1*

A 12 V sealed-beam, clear lens, auto spot lamp shall be mounted on a horizontal section of the exhaust duct as shown in Figure 4.2.9.1.

Figure 4.2.9.1 Smoke Measurement System.



4.2.9.2

The lamp shall be located at a point that is preceded by a straight run of round pipe at least 4.88 m (16 ft) and not greater than 5.49 m (18 ft) from the vent end of the exhaust transition section.

4.2.9.3

The light beam shall be directed upward along the vertical axis of the exhaust duct.

4.2.9.4

A photoelectric cell having an output directly proportional to the amount of light received shall be mounted over the light source, with an overall light-to-cell path distance of 914 mm ± 51 mm (36 in. ± 2 in.).

4.2.9.5

The light source and photoelectric cell shall be located such that they are open to the environment of the test room.

4.2.9.6

The cylindrical light beam shall pass through 76 mm ± 3 mm (3 in. ± ⅛ in.) diameter openings at the top and bottom of the 406 mm (16 in.) I.D. duct, with the resultant light beam centered on the photoelectric cell.

4.2.9.7*

The cell shall be connected to recording devices that indicate the attenuation of incident light due to particulate matter, and due to other effluents, in the passing smoke.

4.2.10 Exhaust Duct Damper.

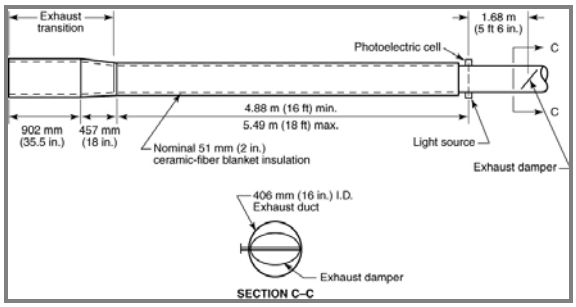
4.2.10.1

A single-blade duct volume control damper for a 406 mm (16 in.) I.D. duct shall be positioned in the exhaust duct 1.68 m ± 0.15 m (5.5 ft ± 0.5 ft) downstream of the smoke measurement system, centerline to centerline.

4.2.10.2

The relative locations of the exhaust transition piece, exhaust duct, smoke measurement system, and exhaust duct damper shall be as shown in Figure 4.2.10.2.

Figure 4.2.10.2 Location of Exhaust Transition, Exhaust Duct, Smoke Measurement System, and Damper. Tolerances are contained in applicable paragraphs. Otherwise, dimensions are nominal.



4.2.10.3

To maintain airflow control throughout each test run, the exhaust duct damper shall be controlled by a closed-loop feedback system with respect to the air-inlet draft gauge static pressure.

4.2.11 Exhaust Blower.

4.2.11.1

The exhaust blower shall have the capacity to develop at least 37 Pa (0.15 in. of water column) at the draft gauge tap, with the specimens in place, with the air shutter positioned to provide an air-inlet opening of 76 mm ± 1.5 mm (3 in. ± 0.06 in.), and with the exhaust duct damper in the wide-open position. *(See 4.2.7.)*

4.2.11.2

The exhaust duct connecting the exhaust duct damper to the exhaust blower shall be 406 mm (16 in.) I.D. and shall be a straight section for a minimum of 1.83 m (6 ft) from the centerline of the exhaust duct damper.

4.2.11.3

Provisions shall be provided for an airtight expansion joint between the exhaust duct damper and the exhaust blower.

Statement of Problem and Substantiation for Public Input

An annex note is proposed.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 9-NFPA 262-2020 [New Section after A.1.3]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
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Submittal Date:	Wed Dec 23 19:43:41 EST 2020
Committee:	FIZ-AAA

Public Input No. 3-NFPA 262-2020 [Section No. A.1.1.1]

A.1.1.1

This standard is referenced in NFPA 90A as a test method that electrical wires and cables and optical fiber cables are required to comply with for use in plenums. The pass/fail requirements are a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less. *NFPA 70* contains informational notes that reference this standard, with the same pass/fail requirements, as the test method used to list cables for use in plenums, in Articles 725 (Class 1, Class 2, and Class 3 Remote-Control, Signaling, and Power-Limited Circuits), 760 (Fire Alarm Systems), 770 (Optical Fiber Cables), and 800 (General Requirements for Communications Systems). Following a reorganization of Chapter 8 of NFPA 70, the 2020 edition of NFPA 70 refers to Article 800 in the other articles. This standard applies to plenum cables in article 805 (Communications Circuits), 820 (Community Antenna Television and Radio Distribution Systems), and 830 (Network-Powered Broadband Communications Systems). In *NFPA 70* a cable complying with the above requirements is said to be “a cable that is low-smoke-producing and fire-resistant” by “having adequate fire-resistant and low-smoke-producing characteristics.” It should be noted that the property of a cable being “fire resistant” as described in *NFPA 70* does not address the same issues of fire resistance that are addressed when testing products or assemblies by use of a temperature–time curve, such as described in ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials.* Procedures for testing fire-resistive cables are described in ANSI/UL 2196, *Standard for Tests of Fire Resistive Cables*, which is a test that does use a time–temperature curve.

Statement of Problem and Substantiation for Public Input

Updates the information, following the reorganization of Chapter 8 of NFPA 70.

Submitter Information Verification

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Public Input No. 9-NFPA 262-2020 [New Section after A.1.3]

A.4.2 The test apparatus used for this standard is a modification of the test apparatus used for ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials , often known as the Steiner tunnel apparatus. A number of equipment modifications have been incorporated in order to provide a test apparatus suitable for assessing flame travel and smoke emission from wires and cables for use in air handling spaces, or plenums.

Statement of Problem and Substantiation for Public Input

Helpful information for the user.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 8-NFPA 262-2020 [Section No. 4.2]	
Public Input No. 2-NFPA 262-2020 [Section No. E.1.2.1]	

Submitter Information Verification

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Public Input No. 5-NFPA 262-2020 [Section No. D.1.1]

D.1.1

The reference cable should be a 4-pair UTP CAT 3 cable ~~(~~ . The original cable used as reference cable is hereinafter identified as "149 reference cable"~~)~~ . ~~It should~~ The reference cable should be composed of four twisted pairs of insulated copper conductors housed in an overall jacket. There should be no ripcords or other components other than the conductors inside the jacket. The cable outside diameter should be 4.7 mm ± 0.4 mm (0.186 in. ± 0.018 in.).

D.1.1.1

The following product information is provided for informational purposes only and has not been independently verified, certified, or endorsed by NFPA or any of its technical committees: The original standard reference cable (149 reference cable) was available from Mohawk Cable (part No. M58631), but might no longer be available.

Statement of Problem and Substantiation for Public Input

the original cable is probably no longer available

Submitter Information Verification

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Public Input No. 4-NFPA 262-2020 [Section No. D.1.2 [Excluding any Sub-Sections]]

The jacket should be a smoke-suppressed, lead-free, flame-retarded PVC, using a standard ammonium octamolybdate (AOM) smoke suppressant and metal hydrate/halogen combination flame retardant package. The material contains a mixed-metals, lead-free stabilization package. The jacket thickness should be 0.4 mm ± 0.04 mm (0.016 in. ± 0.002 in.). The jacket material should be of a natural color, with no color concentrates. The jacket material should have the material specifications in accordance with Table D.1.2.

Table D.1.2 149 Reference Cable Jacket Material Specifications

Properties	Results	Tolerance	Method
Specific gravity	1.42	±0.03	ASTM D792
Durometer D, instantaneous	69	±3	ASTM D2240
Tensile strength, psi (15 mil)	2500	–	ASTM D412
Elongation, % (15 mil)	200	–	ASTM D412
Brittle point, C, (F-50)	-6	–	ASTM D746
Oxygen index, % (125 mil)	52	–	ASTM D2863
Smoke, %	5	–	ASTM D4100
Dielectric constant, 100 MHz @ 23°C	3.3	–	ASTM D150
Dissipation factor, 100 MHz @ 23°C	0.016	–	ASTM D150

Note to Table: The properties of the jacket were determined using the methods in the standards shown in Table D.1.2, but the editions of the standards referenced in Annex E are the most updated ones at the time of revision of this standard and the test methods are not necessarily technically identical.

Statement of Problem and Substantiation for Public Input

Every time NFPA 262 is updated the editions of the referenced standards are updated but the properties were determined with the editions applicable at the time that the measurements were made.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 6-NFPA 262-2020 [Section No. D.1.3]	
Public Input No. 7-NFPA 262-2020 [Section No. D.1.2.1]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Committee: FIZ-AAA

Public Input No. 7-NFPA 262-2020 [Section No. D.1.2.1]

D.1.2.1

The following product information is provided for informational purposes only and has not been independently verified, certified, or endorsed by NFPA or any of its technical committees: A suitable jacket material used for the standard reference cable ~~is~~ was manufactured by AlphaGary, Cat. No. SG III 1012 NAT.

Statement of Problem and Substantiation for Public Input

update

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4-NFPA 262-2020 [Section No. D.1.2 [Excluding any Sub-Sections]]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
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Submittal Date: Wed Dec 23 19:40:44 EST 2020
Committee: FIZ-AAA

Public Input No. 6-NFPA 262-2020 [Section No. D.1.3]

D.1.3

The conductor insulation should be a smoke-suppressed, flame-retarded plasticized PVC, using a standard ammonium octamolybdate (AOM) smoke suppressant and metal hydrate/halogen combination flame retardant package. This material contains a mixed-metals, lead-free stabilization package. The insulation thickness should be 0.178 mm ± 0.02 mm (0.007 in. ± 0.0007). The insulation material should have the material specifications in accordance with Table D.1.3.

Table D.1.3 149 Reference Cable Conductor Insulation Material Specifications

Properties	Results	Tolerance	Method
Specific gravity	1.56	±0.02	ASTM D792
Durometer D, instantaneous	68	±3	ASTM D2240
Durometer D, 15 second	54	±3	ASTM D2240
Tensile strength, psi (15 mil)	2500	–	ASTM D412
Elongation, % (15 mil)	190	–	ASTM D412
Tensile strength, psi (75 mil)	2200	–	ASTM D412
Elongation, % (75 mil)	210	–	ASTM D412
Brittle point, C, (F-50)	-3	–	ASTM D746
Oxygen index, % (125 mil)	49	–	ASTM D2863
Smoke, %	5	–	ASTM D4100
Dielectric constant, 100 MHz @ 23°C	3.3	–	ASTM D150
Dissipation factor, 100 MHz @ 23°C	0.016	–	ASTM D150

Note to Table: The properties of the jacket were determined using the methods in the standards shown in Table D.1.3 , but the editions of the standards referenced in Annex E are the most updated ones at the time of revision of this standard and the test methods are not necessarily technically identical .

D. 1.3.1

The following product information is provided for informational purposes only and has not been independently verified, certified, or endorsed by NFPA or any of its technical committees: A suitable conductor insulation material used for the ~~standard~~ original standard reference cable ~~is~~ was manufactured by AlphaGary, Cat. No. SG III 1698 NAT.

Statement of Problem and Substantiation for Public Input

update

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4-NFPA 262-2020 [Section No. D.1.2 [Excluding any Sub-Sections]]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
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Submittal Date: Wed Dec 23 19:38:15 EST 2020
Committee: FIZ-AAA

Public Input No. 2-NFPA 262-2020 [Section No. E.1.2.1]

E.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D150, *Standard Test Methods for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulation,* ~~2011~~ 2018 .

ASTM D412, *Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers — Tension,* 2016.

ASTM D746, *Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact,* ~~2014~~ 2020 .

ASTM D792, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement,* ~~2013~~ 2020 .

ASTM D2240, *Standard Test Method for Rubber Property — Durometer Hardness,* 2015 e1 .

ASTM D2863, *Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index),* ~~2017~~ 2019 .

ASTM D4100, Standard *Test Method for Gravimetric Determination of Smoke Particulates from Combustion of Plastic Materials,* 1982 1989 e1 (withdrawn 1997).

ASTM E84, Standard T est Method for Surface Burning Characteristics of Building Materials , 2020.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials,* ~~2018~~ 2020 .

Statement of Problem and Substantiation for Public Input

date updates - also add ASTM E84 as recommended in an additional PI.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 9-NFPA 262-2020 [New Section after A.1.3]	

Submitter Information Verification

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Submittal Date: Wed Dec 23 18:37:53 EST 2020
Committee: FIZ-AAA

Public Input No. 12-NFPA 262-2021 [Section No. E.1.2.2]

E.1.2.2 UL Publications.

Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096.

~~ANSI/~~ UL 2196, ~~Standard for Tests~~ T *ests of Fire Resistive Cables*, ~~2001~~ 2017 , revised ~~2012~~ 2018 .

Statement of Problem and Substantiation for Public Input

UL Standard edition update.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 11-NFPA 262-2021 [Section No. 2.3.2]	
Public Input No. 10-NFPA 262-2021 [Global Input]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
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Submittal Date: Mon Jan 04 12:46:30 EST 2021
Committee: FIZ-AAA

Public Input No. 1-NFPA 265-2020 [Section No. 2.3.1]

2.3.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM C1186, *Standard Specification for Flat Fiber-Cement Sheets*, 2008 (2016).

ASTM C1288, *Standard Specification for Fiber-Cement Interior Substrate Sheets*, 2017.

ASTM C1396/C1396M, *Standard Specification for Gypsum Board*, 2017.

ASTM E136, *Standard Test Method for ~~Behavior~~ Assessing Combustibility of Materials ~~in a~~ Using a Vertical Tube Furnace at 750°C*, ~~2016a~~ 2019 .

Statement of Problem and Substantiation for Public Input

update

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Submittal Date: Thu Dec 24 16:04:48 EST 2020
Committee: FIZ-AAA

Public Input No. 4-NFPA 265-2020 [Section No. 5.1.4 [Excluding any Sub-Sections]]

Where the wall coverings are intended to be applied directly to a noncombustible wall surface complying with the requirements of ASTM E136, *Standard Test Method for ~~Behavior~~ Assessing Combustibility of Materials ~~in a~~ Using a Vertical Tube Furnace at 750°C*, the specimens shall consist of the wall covering mounted on fiber-cement board in accordance with 5.1.4.1.

Statement of Problem and Substantiation for Public Input

update title

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1-NFPA 265-2020 [Section No. 2.3.1]	

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Committee: FIZ-AAA

Public Input No. 5-NFPA 265-2020 [Section No. B.1]

B.1

The acceptance criteria in Section B.2, related to test method A of NFPA 265, have been used by several of the model code organizations, such as the International Conference of Building Officials (ICBO), the Building Officials and Code Administrators International (BOCA), and the Southern Building Code Congress International (SBCCI), and are provided as a guide for the user of the test method, as described in Annex C of this standard. Similar criteria have also been in use in the *International Building Code (IBC)* and the *International Fire Code (IFC),* both issued by the International Code Council (ICC), and in NFPA *101* and *NFPA 5000*. ~~However, this test method has now been replaced by NFPA 286 for most applications other than for textile and expanded vinyl wall coverings. This test method is not included in codes or regulations for the assessment of any ceiling coverings because the 150 kW flame does not reach the ceiling.~~ The acceptance criteria in Section B.2 ~~were~~ , related to test method A of NFPA 265, were used in the *International Fire Code* primarily for existing textile and expanded vinyl wall coverings but are no longer used.

The acceptance criteria in Section B.3, related to test method B of NFPA 265 , or equivalent ones, have been used by the same codes and continue to be used ~~; the smoke release criteria apply to all such~~ for textile and expanded vinyl wall coverings in the building codes ~~but only~~ . However, they apply only to new installations ~~in~~ of such wall coverings in the *IFC* and in NFPA *101*. Test method B of NFPA 265 is not included in codes or regulations for the assessment of any ceiling coverings because the 150 kW flame used does not reach the ceiling. However, test method B of NFPA 265 has now been replaced by NFPA 286 for most applications other than for textile and expanded vinyl wall coverings.

Statement of Problem and Substantiation for Public Input

clarification

Submitter Information Verification

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Submittal Date: Mon Dec 28 14:56:11 EST 2020
Committee: FIZ-AAA

Public Input No. 2-NFPA 265-2020 [Section No. D.1.2.1]

D.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E800, *Standard Guide for Measurement of Gases Present or Generated During Fires*, ~~2014~~ 2020 .

ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*, 2017.

Statement of Problem and Substantiation for Public Input

date update

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Public Input No. 3-NFPA 265-2020 [Section No. D.1.2.2]

D.1.2.2 ICC Publications.

International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001.

International Building Code (IBC), ~~2018~~ 2021 .

International Fire Code (IFC), ~~2018~~ 2021 .

Statement of Problem and Substantiation for Public Input

update

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Public Input No. 6-NFPA 286-2021 [Global Input]

Remove “Standard for” and “Subject” from all UL standard Titles

Statement of Problem and Substantiation for Public Input

The terms “Standard for” or “Subject” are redundant and unnecessary. All references to UL are standards.

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Submittal Date: Mon Jan 04 12:51:39 EST 2021
Committee:

Public Input No. 2-NFPA 286-2020 [Section No. 2.3.1]

2.3.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM C1186, *Standard Specification for Flat Fiber-Cement Sheets*, 2008 (2016).

ASTM C1288, *Standard Specification for Fiber-Cement Interior Substrate Sheets,*2017.

ASTM C1396/C1396M, *Standard Specification for Gypsum Board*, 2017.

ASTM E136, *Standard Test Method for ~~Behavior of Materials in a~~ Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*, ~~2016a~~ 2019a .

Statement of Problem and Substantiation for Public Input

update

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 5-NFPA 286-2020 [Section No. 5.8.6 [Excluding any Sub-Sections]]	

Submitter Information Verification

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Submittal Date: Mon Dec 28 14:39:16 EST 2020
Committee: FIZ-AAA

Public Input No. 5-NFPA 286-2020 [Section No. 5.8.6 [Excluding any Sub-Sections]]

If the wall or ceiling coverings are intended to be applied directly to a noncombustible wall or ceiling surface (namely, one composed of a material passing ASTM E136, *Standard Test Method for ~~Behavior~~ Assessing Combustibility of Materials ~~in a~~ Using a Vertical Tube Furnace at 750°C*), the specimens shall consist of the wall or ceiling covering mounted on a fiber-cement board in accordance with 5.8.6.1.

Statement of Problem and Substantiation for Public Input

update title

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 286-2020 [Section No. 2.3.1]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
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Submittal Date: Mon Dec 28 15:51:31 EST 2020
Committee: FIZ-AAA

Public Input No. 1-NFPA 286-2020 [Section No. 9.1.2]

9.1.2

If flashover has occurred before the 15-minute period is complete, the laboratory shall be permitted to terminate the test.

If the test is terminated by the lab, the lab will document the reason for pre mature flashover and note it on the test log.

Statement of Problem and Substantiation for Public Input

Data on pre mature flashover under controlled conditions may present new information to help firefighters understand fire conditions and flashover potential .

Submitter Information Verification

Submitter Full Name: ed jancauskas
Organization: State Fire Marshal
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Submittal Date: Wed Sep 23 10:13:15 EDT 2020
Committee: FIZ-AAA

Public Input No. 3-NFPA 286-2020 [Section No. D.1.2.1]

D.1.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA, 19428-2959.

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2018~~ 2020 .

ASTM E800, *Standard Guide for Measurement of Gases Present or Generated During Fires*, ~~2014~~ 2020 .

ASTM E2573, *Standard Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics*, ~~2017~~ 2019 .

ASTM Institute for Standards Research, “Interlaboratory Test Program: Proposed ASTM Standard Method for Room Fire Test of Wall and Ceiling Materials and Assemblies,” International Fire Standards Project Report, PCN: 33-000012-31, October 1994.

Statement of Problem and Substantiation for Public Input

update

Submitter Information Verification

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Committee: FIZ-AAA

Public Input No. 4-NFPA 286-2020 [Section No. D.1.2.2]

D.1.2.2 ICC Publications.

International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001.

International Building Code (IBC), ~~2015~~ 2021 .

International Fire Code (IFC), ~~2015~~ 2021 .

Statement of Problem and Substantiation for Public Input

update

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Public Input No. 7-NFPA 286-2021 [Section No. D.1.2.4]

D.1.2.4 UL Publications.

Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 723, ~~*Standard for*~~ *Test for Surface Burning Characteristics of Building Materials*, ~~2008, revised 2013~~ 2018 .

Statement of Problem and Substantiation for Public Input

UL Standard edition update.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 6-NFPA 286-2021 [Global Input]	

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