

WUIC2-13

503.2, Chapter 7

Proposed Change as Submitted

Proponent: Joseph Holland (jholland@frtw.com) and Dave Bueche (dbueche@frtw.com), representing Hoover Treated Wood Products, Inc. dbueche@frtw.com

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on all sides with the ~~E~~extended ASTM E 84 (UL 723) testing or ASTM E2768, except panel products shall be permitted to test only the front and back faces. Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch. Materials that, when tested in accordance with the test procedures set forth in ASTM E 84 or UL 723, for a test period of 30 minutes, or ASTM E2768, comply with the following:
 - 1.1 through 1.4 (No change to current text)
 - 2 through 4 (No change to current text)

Add new standard to Chapter 7 as follows:

ASTM
E2768-11 Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 Minute Tunnel Test)

Reason: The code is not specific as to the testing of materials with a surface treatment. There are painted and laminated products in the marketplace that are painted or laminated on only one side and are only tested on that side. This is inappropriate for many of the applications where "ignition-resistant material" is permitted; e.g., decks, lapped siding, exposed fascia and other installations with a gap between the material.

The recommendations of the approved agencies for panel products require a 1/8 inch gap between sheets. Because panel products with a surface treatment will be cut in the field and are mandated a 1/8 inch gap it is important that non factory edges be tested to evaluate the effect of their performance in a fire.

ASTM developed a standard for testing materials for 30 minutes in the E84 or UL723 tunnel. Use of the standard is appropriate for "ignition-resistant material" used in the Wildland/Urban Interface. The standard uses E84 as the basis with the extended time period of 30 minutes

Cost Impact: As all products should be testing in this manner the will be no cost impact.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2768-11, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2013.

503.2-WUIC-BUECHE-HOLLAND

Committee Action Hearing Results

For staff analysis of the content of ASTM E2768-11 relative to CP#28, Section 3.6, please visit:
<http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/Proposed-B/ProposedStandards.pdf>

Committee Action:

Approved as Submitted

Committee Reason: The committee approved the code change based on the proponent's reason statement.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Marcelo M Hirschler, GBH International, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on all sides with the extended ASTM E 84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test only the front and back faces. Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch. Materials that, when tested in accordance with the test procedures set forth in ASTM E 84 or UL 723, for a test period of 30 minutes, or ASTM E2768, comply with the following:

1.1 through 1.4 (*No change to current text*)

Exception: Materials comprised of a combustible core and a noncombustible exterior covering shall not be required to be tested with a ripped or cut longitudinal gap.

2. through 4. (*No change to current text*)

Add new standard to Chapter 7 as follows:

ASTM

E2768-11 Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 Minute Tunnel Test)

Commenter's Reason: The reason for the exception is that the rip or cut gap is intended to deal purely with materials that have a coating on a single side only instead of being treated for fire performance throughout the core of the material. It does not make sense to treat materials with a noncombustible outer layer, such as MCM materials (metal composite materials) or IMP panels (insulated metal panels) the same way as panels with combustible outer layers because such materials should not be damaged for testing. Such materials are manufactured in such a way as to protect the combustible cores and any damage to the face would render the material unusable and would require replacement in an actual application.

The intent of the use of the rip or cut gap is to avoid that a material passes the extended ASTM E84 (or ASTM E2768) test simply with an outer coating on a single side.

Public Comment 2:

Andrew Williams, PE, Metal Construction Association; William E. Koffel, PE, FSFPE, representing Alucobond and 3A Composites, request Approval as Modified by this Public Comment.

Modify the proposal as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on all sides with the extended ASTM E 84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test only the front and back faces. Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch. Materials that, when tested in accordance with the test procedures set forth in ASTM E 84 or UL 723, for a test period of 30 minutes, or ASTM E2768, comply with the following:

1.1 through 1.4 (*No change to current text*)

Exception: Materials comprised of a combustible core and a noncombustible exterior covering, comprised of either aluminum at a minimum 0.019" thickness or corrosion resistant steel at a minimum 0.0149" thickness, shall not be required to be tested with a ripped or cut longitudinal gap.

2. through 4. (*No change to current text*)

Add new standard to Chapter 7 as follows:

ASTM

E2768-11 Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 Minute Tunnel Test)

Commenter's Reason: The reason for the exception is that the rip or cut gap is intended to deal purely with materials that have a coating on a single side only instead of being treated for fire performance throughout the core of the material. It does not make sense to treat materials with a noncombustible outer layer, such as MCM materials (metal composite materials) or IMP panels (insulated metal panels) the same way as panels with combustible outer layers because such materials should not be damaged for testing. Such materials are manufactured in such a way as to protect the combustible cores and any damage to the face would render the material unusable and would require replacement in an actual application.

The specific noncombustible outer layers specified originate in Table 1405.2 of the IBC and correspond to minimum acceptable thicknesses of some specific weather coverings. An alternate more generic amendment is also being proposed.

The intent of the use of the rip or cut gap is to avoid that a material passes the extended ASTM E84 (or ASTM E2768) test simply with an outer coating on a single side and this proposed change does not modify that.

WUIC2-13

Final Action: AS AM AMPC_____ D

WUIC3-13

503.2, Chapter 7

Proposed Change as Submitted

Proponent: John Woestman, Kellen Company, representing Composite Lumber Manufacturers Association (CLMA) (jwoestman@kellencompany.com)

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

- ~~1. Extended ASTM E 84 testing. Materials that, when tested in accordance with the test procedures set forth in ASTM E 84 or UL 723, for a test period of 30 minutes, comply with the following:~~
 - ~~1.1. Flame spread. Material shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the extended 30-minute test.~~
 - ~~1.2. Flame front. Material shall exhibit a flame front that does not progress more than 101/2 feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.~~
 - ~~1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:~~
 - ~~1.3.1. Method A "Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D 2898, for fire-retardant treated wood, wood-plastic composite and plastic lumber materials.~~
 - ~~1.3.2. ASTM D 7032 for wood-plastic composite materials.~~
 - ~~1.3.3. ASTM D 6662 for plastic lumber materials.~~
 - ~~1.4. Identification. All materials shall bear identification showing the fire test results.~~
- ~~21. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.~~
- ~~32. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*.~~
- ~~43. Fire-retardant-treated wood roof coverings. Roof assemblies containing fire-retardant-treated wood shingles and shakes which comply with the requirements of Section 1505.6 of the *International Building Code* and classified as Class A roof assemblies as required in Section 1505.2 of the *International Building Code*.~~
4. Exterior deck materials. Exterior deck materials complying with ASTM D7032 and the requirements of 4.1, or 4.2, or 4.3.
 - 4.1 Exterior deck materials complying with all of the following:
 - 4.1.1 Tested in accordance with ASTM E2632 and meeting the following acceptance criteria: peak heat release rate not greater than 25 kW/ft²; and absence of sustained flaming or glowing combustion of any kind at the conclusion of the 40 minute observation period; and absence of structural failure of any deck board; and absence of falling particles that are still burning when reaching the burner or floor.
 - 4.1.2 Tested in accordance with ASTM E2726 / E2726M using the Class A brand and meeting the acceptance criteria of X1.6.1 or X1.6.2 of ASTM E2726 / E2726M.
 - 4.1.3 Tested in accordance with ASTM E84 and meeting the Class A flame spread index with the test extended by 20 minutes.
 - 4.2. Exterior deck materials complying with both of the following:

- 4.2.1 Tested in accordance with ASTM E2632 with a peak heat release rate not greater than 25 kW/ft².
- 4.2.2 Tested in accordance with ASTM E84 and meeting the Class B flame spread index.
- 4.3. Exterior deck materials installed where the exterior wall covering to which the deck is attached and within 10 feet of the deck is of noncombustible or ignition resistant material and the exterior deck materials complying with both of the following:
 - 4.3.1 Tested in accordance with ASTM E2632 with a peak heat release rate not greater than 25 kW/ft².
 - 4.3.2 Tested in accordance with ASTM E84 and meeting the Class C flame spread index.

Add new standards to Chapter 7 as follows:

ASTM

E2632-13 Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials

E2726 / E2726M-12a Standard Test Method for Evaluating the Fire-Test-Response of Deck Structures to Burning Brands

Reason: This proposal introduces, in new Item 4 of Section 503.2, compliance alternatives for decking materials that are consistent with current California Building Code requirements for wildfire exposure (i.e. wildland urban interface areas), and deletes the existing text of Item 1, which would be redundant with the new text.

This proposal revises the IWUIC performance requirements for decking materials to incorporate two ASTM standards specifically developed for evaluating the fire performance characteristics of exterior decking materials. These two standards have been developed from current test requirements in the California building code. ASTM work product WK12052, which will become ASTM E2632-13, is currently at the society review status of approval. ASTM E2632 is commonly described as the under-deck fire test for exterior decks. ASTM E2726 / E2726M received final approval last year, and is commonly described as the burning brand test for exterior deck walking surfaces.

ASTM E2632 was developed from California's 2010 Building Code fire test 12-7A-4 Part A, and ASTM E2726 was developed from 12-7A-4 Part B.

The criteria of 4.1 is intended to be equivalent to the compliance "path" of the 2010 California Building code for wildfire exposure in 709A.3, Item 1. This criteria of 4.1 is similar to, but more stringent than, the criteria for "testing of alternative decking materials" of the San Diego County Consolidated Fire Code in Section 26.3.6.2.1, which is for the Wildland / Urban Interface Area. (Note: Criteria 4.1 would be consistent with San Diego County requirements if 4.1.2 is revised to a Class B brand, and 4.1.3 is deleted.)

The criteria of 4.2 is consistent with the 2010 California Building Code for wildfire exposure in the Exception to 709A.3. The criteria of 4.3 is consistent with the 2010 California Building Code for wildfire exposure in 709A.3, Item 4.

Cost Impact: None

Analysis: A review of the standards proposed for inclusion in the code, ASTM E2632-13 and ASTM E2726/E2726M-12a, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2013.

503.2-WUIC-WOESTMAN

Committee Action Hearing Results

For staff analysis of the content of ASTM E2632-13 and ASTM E2726/E2726M-12a relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/Proposed-B/ProposedStandards.pdf>

Committee Action:

Disapproved

Committee Reason: The committee's disapproval was based on its concern that the proposal would inappropriately lower the standards for testing of exterior deck materials.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Woestman, Kellen Company, representing Composite Lumber Manufacturers Association (CLMA), requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

504.7 Appendages and projections. *Unenclosed accessory structures* attached to buildings with habitable spaces and projections, such as decks, shall be a minimum of 1-hour fire resistance-rated construction, heavy timber construction or constructed of one of the following:

1. *Approved noncombustible* materials;
2. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*; or
3. Ignition-resistant building materials in accordance with Section 503.2.
4. Deck boards, stair treads, guards, and handrails complying with 4.1 and 4.2, or comply with 4.3:
 - 4.1. Material weathered in accordance with ASTM D7032 and tested in accordance with ASTM E1354. The weathering shall not decrease the time to ignition by more than 15%, and shall not increase the effective heat of combustion by more than 15%, and shall not increase the peak heat release rate by more than 15%.
 - 4.2. Material tested in accordance with ASTM E2632 / E2632M with a peak heat release rate no greater than 25 kW/ft² (269 kW/m²).
 - 4.3. Material tested in accordance with ASTM E2632 / E2632M after weathering as defined by ASTM D7032 with a peak heat release rate no greater than 25 kW/ft² (269 kW/m²).

505.7 Appendages and projections. *Unenclosed accessory structures* attached to buildings with habitable spaces and projections, such as decks, shall be a minimum of 1-hour fire resistance-rated construction, heavy timber construction or constructed of one of the following:

1. *Approved noncombustible* materials;
2. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*; or
3. Ignition-resistant building materials in accordance with Section 503.2.
4. Deck boards, stair treads, guards, and handrails complying with 4.1 and 4.2, or complying with 4.3:
 - 4.1. Material weathered in accordance with ASTM D7032 and tested in accordance with ASTM E1354. The weathering shall not decrease the time to ignition by more than 15%, and shall not increase the effective heat of combustion by more than 15%, and shall not increase the peak heat release rate by more than 15%.
 - 4.2. Material tested in accordance with ASTM E2632 / E2632M with a peak heat release rate no greater than 25 kW/ft² (269 kW/m²).
 - 4.3. Material tested in accordance with ASTM E2632 / E2632M after weathering as defined by ASTM D7032 with a peak heat release rate no greater than 25 kW/ft² (269 kW/m²).

Add new standards to Chapter 7 as follows:

ASTM

ASTM E1354-13 Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

ASTM E2632 / E2632M-13e1 Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials

Commenter's Reason: This public comment is addressing testimony, comments, and questions received during the Committee Action Hearings (CAH) in Dallas in April, 2013.

This public comment does not modify the requirements for ignition-resistant building materials in Section 503.2. Also, this public comment moves proposed requirements to Section 504.7 (and Section 505.7) as suggested by opposition testimony at the CAH.

This public comment explicitly requires fire testing to evaluate the effects of weathering, as requested by testimony at the CAH, in criteria 4.1 and 4.3.

Additionally, the requirements of criteria 4.2 and 4.3 rely on a fire test specifically designed to test and evaluate the performance of deck components when constructed as a deck assembly in simulated WUI fire exposure (in contrast with the ASTM E84 test of Section 503.2 for ignition-resistant building materials). The test configuration and test requirements of ASTM E2632 of criteria 4.2 and 4.3 were developed specifically for deck materials in WUI applications.

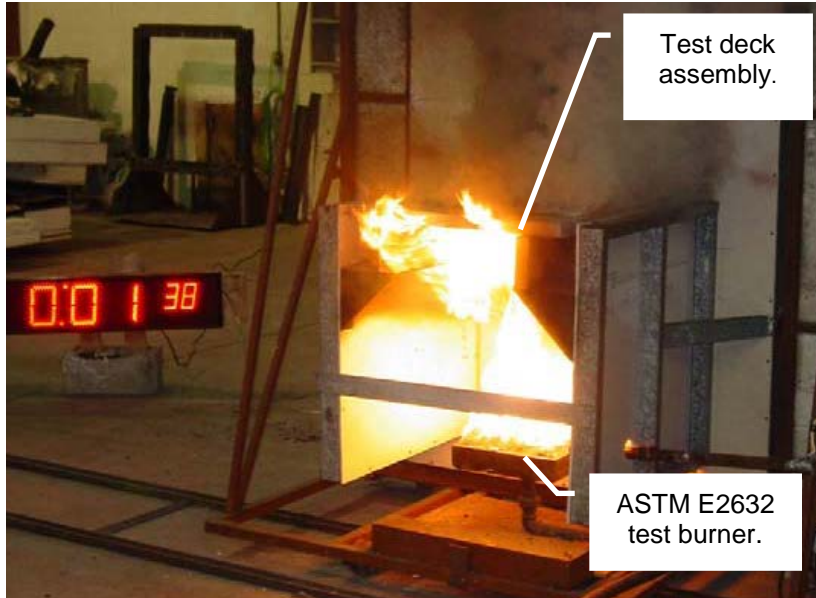
This public comment, as in the original proposal, is limited to deck boards, stair treads, guards, and handrails, and is focused on products tested to ASTM D7032. The requirements in this proposal complement existing IBC and IRC requirements, but are more rigorous than the current IBC and IRC requirements for deck boards, stair treads, guards, and handrails made of plastic composites, which are required by the IBC and the IRC to comply with ASTM D7032.

The ASTM E2632 test procedure requires constructing a small deck structure (joists and deck boards) consistent with the manufacturer's installation instructions, and this small deck structure is placed over a burner, which when ignited is designed to simulate a WUI fire occurring under the deck. The test deck structure is subject to the flame and heat from the burner for 3 minutes, and the performance of the deck structure is evaluated for the next 40 minutes.

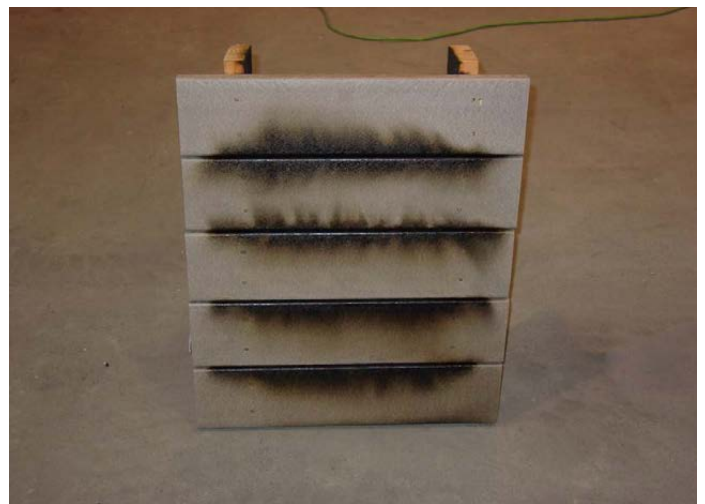
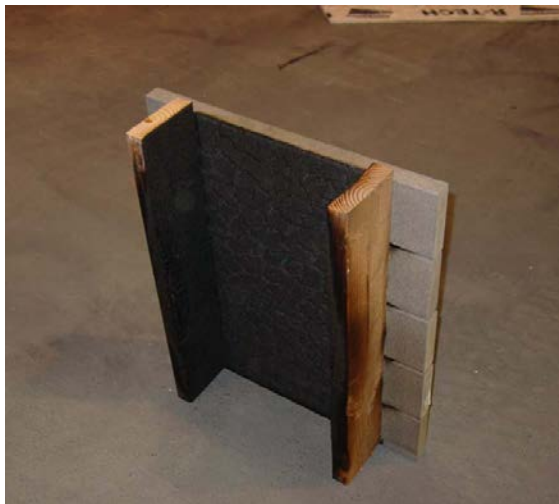
Below are pictures of the ASTM E2632 / E2632M test. Notice the configuration of this small test deck and the wall to which the deck is adjacent, simulating an actual installation of a deck attached to the structure.

Photo 1. ASTM E2632 under-deck test in progress.

The test deck assembly is subjected to the flame and heat of the burner for 3 minutes (80 kW), simulating a WUIC fire causing combustibles beneath a deck to burn.



After the 3-minutes of flame and heat from the burner, the test deck assembly is observed for 40 minutes and fire performance data is collected during this time period. This test deck assembly was stood on end after the fire test to illustrate the effects of a simulated WUI fire under the deck.



Photos courtesy Western Fire Center, Inc.

Photo 4. Test deck assembly ASTM E2632 fire test failure.

During the ASTM E2632 fire test 40-minute observation period, this test deck assembly had a peak heat release rate in excess of 25 kW/ft². This decking material would not meet the criteria for use in a WUI area as it exceeded the proposed maximum peak heat release rate.



Photo courtesy Fiberon,.

Analysis: ASTM D7032 is currently referenced in the IWUIC. ASTM E1354 is currently referenced in the IBC. ASTM E2632/ E2632M was submitted with the original proposal. For staff analysis of the content of ASTM E2632/ E2632M-13 relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/Proposed-B/ProposedStandards.pdf>

WUIC3-13

Final Action: AS AM AMPC____ D

WUIC4-13

504.2, Chapter 7

Proposed Change as Submitted

Proponent: Marcelo M. Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

504.2 Roof covering. Roofs shall have a roof assembly that complies with a Class A rating when tested in accordance with ASTM E 108 or UL 790 roof assembly. For roof coverings where the profile allows a space between the roof covering and roof decking, the space at the eave ends shall be firestopped to preclude entry of flames or embers, or have one layer of 72-pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 installed over the combustible decking.

Add new standard to Chapter 7 as follows:

ASTM

E108-11 Standard Test Methods for Fire Tests of Roof Coverings

UL

UL 790-2004 Standard Test Methods for Fire Tests of Roof Coverings with revisions through October 2008

Reason: This is basically simple clarification, to clarify the test method for the Class A rating. It adds the same ASTM and UL standards contained in the IBC for the application.

Cost Impact: None

Analysis: The standards proposed for inclusion in the code, ASTM E108-07a and UL 790-2004, are currently referenced in the IBC. Updates in year editions will be accomplished by an administrative standards update code change to be heard by the ADM Code Development Committee.

504.2-WUIC-HIRSCHLER

Committee Action Hearing Results

For staff analysis of the content of ASTM E108.11 and UL 790-2004 relative to CP#28, Section 3.6, please visit:
<http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/Proposed-B/ProposedStandards.pdf>

Committee Action:

Approved as Submitted

Committee Reason: The approval was based on the committee's judgment that the proposal provides a needed clarification of exactly what standards are to be used in determining Class A roof assemblies. The committee also agreed with testimony that indicated that the IBC uses the same standards but goes a step further by including a list of acceptable materials for code user guidance. The committee suggested that a public comment could be submitted to duplicate such a list in this section rather than relying on a search in the IBC or IRC, especially since neither code is referenced in this section.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Marcelo M Hirschler, GBH International; Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards, request Approval as Modified by this Public Comment.

Modify the proposal as follows:

504.2 Roof covering. Roofs shall have a roof assembly that complies with a Class A rating when tested in accordance with ASTM E 108 or UL 790. For roof coverings where the profile allows a space between the roof covering and roof decking, the space at the eave ends shall be firestopped to preclude entry of flames or embers, or have one layer of 72-pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 installed over the combustible decking.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry or an exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile or slate installed on noncombustible decks or ferrous, copper or metal sheets installed without a roof deck on noncombustible framing.
3. Class A roof assemblies include minimum 16 oz/sq. ft. (0.0416 kg/m²) copper sheets installed over combustible decks.

Add new standards to Chapter 7 as follows:

ASTM

E108-11 Standard Test Methods for Fire Tests of Roof Coverings

UL

UL 790-2004 Standard Test Methods for Fire Tests of Roof Coverings with revisions through October 2008

Commenter's Reason:

Hirschler: The exceptions shown are copied from the IBC and would comply with the committee's suggestion that they be added for consistency.

IBC reads as follows:

1505.2 Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be *listed* and identified as Class A by an *approved* testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry or an exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile or slate installed on noncombustible decks or ferrous, copper or metal sheets installed without a roof deck on noncombustible framing.
3. Class A roof assemblies include minimum 16 oz/sq. ft. (0.0416 kg/m²) copper sheets installed over combustible decks.

Thompson: Code change WUIC4-13 placed requirements in the Wildland Urban Interface Code (WUIFC) to specify the testing requirements for Class A roof assemblies consistent with the International Building Code (IBC). During the 1st public hearing it was pointed out to the Code Development Committee that the proposal did not include the provisions for roof assemblies and covering that are exempt from the testing requirements in the exceptions to Section 1505.2. The Code Development Committee approved the original proposal and encouraged a public comment be submitted to make this section of the WUIFC consistent with the IBC for Class A roof assemblies. This proposal accomplishes that goal by adding those roof assemblies and coverings permitted by the IBC as acceptable systems to meet the Class A requirements.

WUIC4-13

Final Action: AS AM AMPC____ D

WUIC5-13

504.10

Proposed Change as Submitted

Proponent: John D. Nicholas, Perceptive Solutions LLC (john@perceptivesolutionsllc.com)

Revise as follows:

504.10 Vents. Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m²) each. Such vents shall be ~~covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/4 inch (6.4 mm), or shall be designed~~ protected with materials or devices that prevent the passage of flame, hot gases, and embers sufficient to ignite cotton waste when tested using the Cotton Pad Test of ASTM E119 and approved to prevent flame, hot gases ~~or~~ and ember penetration into the structure.

Reason: This proposed code change introduces similar language used by the International Building Code®, the Residential Code®, and the International Mechanical Code® that states "...protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste..."

This change also provides clarity to the means to be used to determine whether a material or device meets the requirements of to prevent flame, hot gases, and ember penetration into the structure. Section 7.5 of ASTM E119 provides a specific means to employ a cotton pad test.

This proposed language addresses construction that employs a material or device to protect a vent or ventilation opening, which can be tested as a vertical or horizontal test assembly that is an interior or exterior part of the structure. As with any fire scenario, the fire exposure subjected to vented construction can vary. However, the means to determine compliance with the intent to provide protection to the structure should be a constant.

This proposed language provides a means to address variables typically seen in construction. Many times vents are located in storage rooms and other areas where combustibles are stacked. Exterior vents are often in contact with landscaping (vegetation or forestation or both). In some cases, these combustibles are just inches from the vent. When these combustibles are subject to flash over conditions a fire may instantaneously occur with immediate flame impingement upon the vent or ventilation opening. Other times the Wildland fire generates a significant amount of hot gases and embers. Both of which can cause a fire within the structure if not prevented from entering it. The use of a cotton pad test provides a means to determine whether the material or device is meeting the prevention requirements.

Cost Impact: This change will not affect the cost of construction.

Analysis: ASTM E119 is currently referenced in the IWUIC. Updates in year edition will be accomplished by an administrative standards update code change to be heard by the ADM Code Development Committee.

504.10-WUIC-NICHOLAS

Committee Action Hearing Results

For staff analysis of the content of ASTM E119-08a relative to CP#28, Section 3.6, please visit:
<http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/Proposed-B/ProposedStandards.pdf>

Committee Action:

Disapproved

Committee Reason: The committee's disapproval was based on its concern that the proposal would remove the proven protection of openings provided by the current ¼-inch mesh. The proposal was also considered excessive because it would, in effect, be creating a required protection similar to a penetration protection device where there is no fire resistance rated assembly at risk.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

John D. Nicholas, Perceptive Solutions LLC, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

504.10 Vents. Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m²) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/4 inch (6.4 mm), or shall be designed and *approved* to prevent flame or ember penetration into the structure. Flame penetration shall be determined using a standardized cotton pad test intended to detect flame and ensure the integrity of the vent, which is designed and *approved* for preventing flame penetration into the structure.

Commenter's Reason: This change provides a standardized test that has been used for over 50 years (also referred internationally as an integrity test, flame test or ignition test). This simple test is used to detect flame and is referenced in many American National standards (ANSI), ASTM International standards, NFPA standards, and UL standards. This is a very simple cost-effective method to provide an enforcement provision for the 504.10 requirement and increase life safety.

The modifications submitted to this proposal are also intended to address the Committee's opinion related to 1/4-inch mesh as a proven method that prevents flame penetration into the structure. Erroneous re-butttal testimony misled also the Committee by calling the cotton pad test a fire resistance test used for building materials and penetration protection devices. The cotton pad test (described below) is no more of a fire resistance test than is the hose stream (water) test cited in ASTM E119. This clarification and modification submitted clearly resolves both of these Committee comments.

One of the many test methods citing the standardized cotton pad, which tests the vent's integrity to prevent flame penetration, is described in ASTM E2912.

1. ASTM E2912 provides an Integrity Test to assess whether a venting device prevents flame penetration. This test method defines integrity as "the ability of a test assembly, when exposed to fire from one side, to prevent the passage of flame or hot gases through it or the occurrence of flames on its unexposed side."
2. ASTM E2912 is not a fire resistance test: there is no fire resistance rating created or furnace time-temperature curve used. Rather, this test method is a fire performance test based on flame impingement used to assess a "venting device used as part of vented construction intended to resist the transfer of hot gas, radiation, and flame."
3. This test method is used to assess flame penetration through a "...building element or construction feature (such as a floor, wall, roof, ceiling, joint, door or wall cavity, crawl space, air gap, etc.) that includes an opening(s) used for venting..."that is referred to as "vented construction".
4. ASTM E2912 provides fire performance information about both interior and exterior vents that "are subject to a sudden direct flame impingement".
5. ASTM E2912 was under development for over four years and received a 100% affirmative vote (no editorial changes were even required) of ASTM Committee E05 on Fire, which is extremely rare for a new ASTM Committee E05 fire standard. This test method is also an American National Standard.

The following is an excerpt from the ASTM E2912 example cited above that describes the cotton pad test used to determine a venting device's integrity:

"11. Integrity Test

- 11.1 Record any flames on the unexposed side of the test specimen including the flame's location and duration.
- 11.2 Record flaming and ignition of cotton pad by hot gases or radiation, or both, throughout the test's duration. Record the time when ignition of the cotton pad occurs.
 - 11.2.1 Use the materials and devices described in Annex A1 Cotton Pad Test Materials and Equipment.
 - 11.2.2 Follow the Ignition Test Procedure in Annex A2.
 - 11.2.3 When no ignition (defined in A2.4) of the cotton pad occurs during the 30-s application, make screening tests that involve short duration application of the cotton pad over and around such areas. Charring of the pad provides only an indication of imminent failure. Employ an unused cotton pad to confirm an integrity failure.
- 11.3 When possible, photograph the test specimen when any flames occur on its unexposed side or when the cotton pad ignites, or both. Otherwise, refer to the video recording for this information.

ANNEX (Mandatory Information)

A1. COTTON PAD TEST MATERIALS AND EQUIPMENT

A1.1 Where required by the conditions of acceptance in other sections of this standard to determine that the test specimen has not allowed the passage of gases or radiation hot enough to ignite a cotton pad, the cotton pad test shall be conducted in accordance with A2 during the fire-resistance test whenever a crack, hole, opened joint, or other similar void or defect through which hot gases are capable of passing is observed in the unexposed surface of the test specimen.

A1.2 The cotton pad test shall be conducted using a cotton pad as described in A1.3 and A1.4 in a wire frame provided with a handle as described in A1.5.

A1.3 The cotton pad shall comply with the physical characteristics described in A1.3.1 through A1.3.3.

A1.3.1 The cotton pad shall be nominally 4 by 4 in. (100 by 100 mm) by 0.75 in. (19 mm) thick.

A1.3.2 The cotton pad shall consist of new, undyed, soft cotton fibers, without any admixture of artificial fibers.

A1.3.3 The cotton pad shall weigh 0.12 ± 0.02 oz (3.5 ± 0.5 g).

A1.4 The cotton pad shall be conditioned prior to the test by drying in an oven at $212 \pm 9^\circ\text{F}$ ($100 \pm 5^\circ\text{C}$) for a period of not less than 30 min. Immediately upon removal from the drying oven, the cotton pad shall be stored in a desiccator for a period of not less than 24 h prior to the fire-resistance test.

A1.5 The frame used to hold the cotton pad for the purpose of the cotton waste test shall be constructed using No. 16 AWG (0.05 in.) (1.3 mm) steel wire which has been fastened to a handle that has a length that reaches all points on the unexposed surface of the test specimen. See Fig. A1.

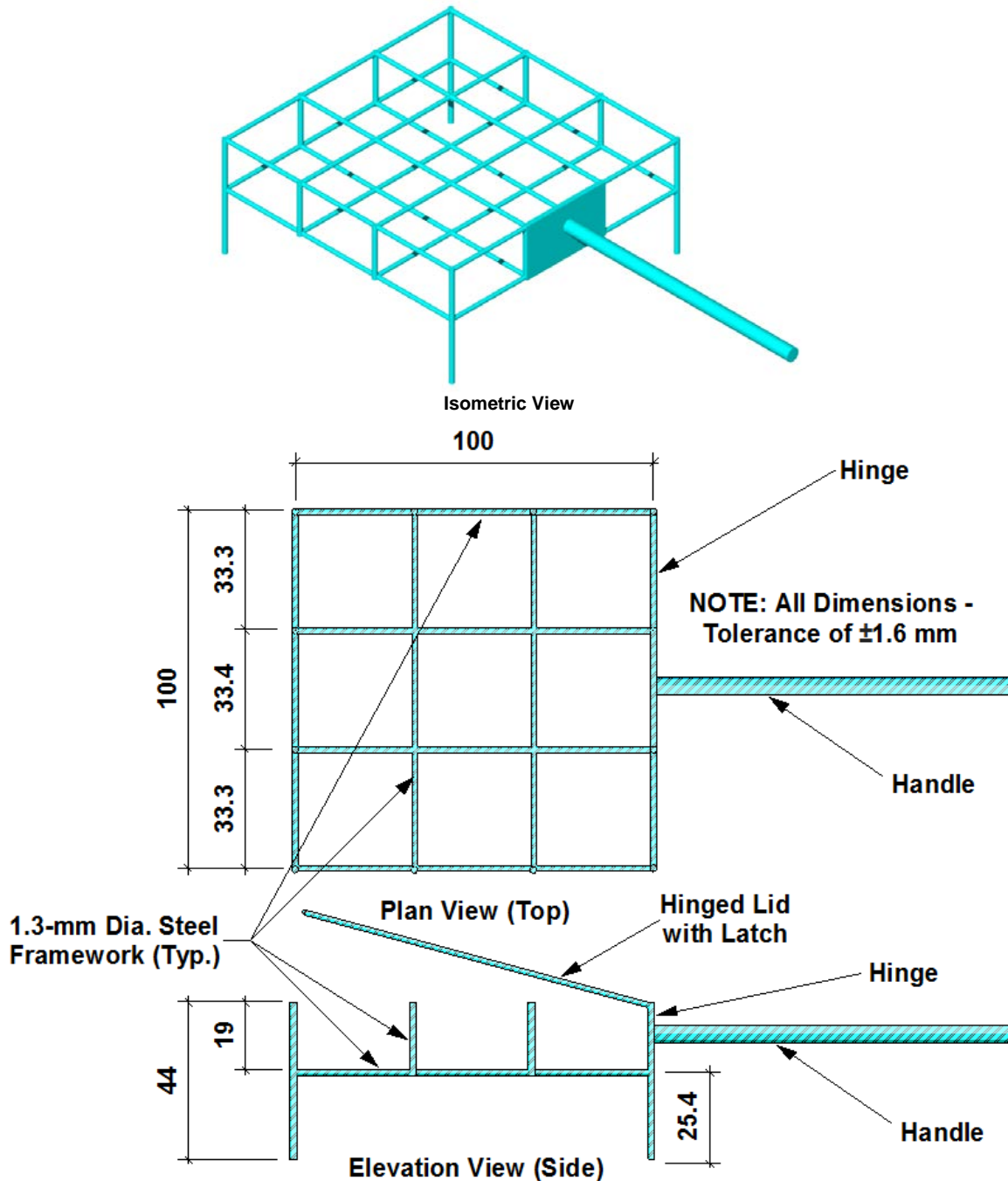


Fig. A1 Typical Cotton Pad Holder

A2. IGNITION TEST PROCEDURE

- A2.1** Conduct the cotton pad test using an unused cotton pad.
- A2.2** Position the cotton pad directly over the observed crack, hole, opened joint, or other similar void or defect in the unexposed surface of the test specimen, approximately 1 ± 1/8 in. (25 ± 3 mm) from the surface, for a period of 30 ± 1 s or until ignition of the cotton pad, whichever occurs first.
- A2.3** All test locations previously tested in accordance with A2.2 shall be retested as close as practical to the end of the desired fire-resistance period. An unused cotton pad shall be positioned over each previously tested location on the unexposed surface of the test specimen.
- A2.4** Ignition of the cotton pad shall be defined as glowing, flaming or smoldering of the cotton pad. Charring of the cotton pad shall not be an indication of ignition.
- A2.5** If ignition of the cotton pad occurs, record the time at which ignition occurs, and report the description of the crack, hole, opened joint, or other similar void or defect and the location where it occurs.

Public Comment 2:

Eivind Elnan, Ax Innovasjon AS, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

504.10 Vents. Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m²) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 4/4 1/8 inch (6.4 3.2 mm), or shall be designed and approved to prevent flame or ember penetration into the structure.

Commenter’s Reason: This change is proposed as continuity between wildfire codes to improve life safety and reduce property damage. The change from “1/4 inch (6.4 mm)” to “1/8-inch (3.2mm)” is based on the 2010 California Building Code (CBC), Title 24, Part 2 (First Printing), Includes Errata Supplement through July 1, 2012 under Chapter 7A - Materials and Construction Methods for Exterior Wildfire Exposure. This change is presented even though there are other more restrictive requirements for wildfire protection cited based on wildfire experience worldwide and ember penetration testing, such as in Australia that allows a maximum of 2mm openings or NIST documents that suggest approximately 1mm openings are far greater ember penetration protection than the “¼-inch mesh”.

CBC SECTION 706A VENTS states, “706A.1 General. Where provided, ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation shall be in accordance with Section 1203 and Sections 706A.1 through 706A.3 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

706A.2 Requirements. Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials or other devices that meet the following requirements:

1. The dimensions of the openings therein shall be a minimum of 1/16-inch (1.6 mm) and shall not exceed 1/8-inch (3.2mm).
2. The materials used shall be noncombustible.

Exception: Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible wire mesh, may be of combustible materials.

3. The materials used shall be corrosion resistant.”

WUIC5-13

Final Action:	AS	AM	AMPC_____	D
---------------	----	----	-----------	---
