IWUIC

2021 GROUP A PUBLIC COMMENT AGENDA

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2021 Public Comment Agenda

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WUIC1-21

Proposed Change as Submitted

Proponents: Tony Crimi, representing North American Insulation Manufacturers Association (NAIMA), representing representing North American Insulation Manufacturers Association (NAIMA)

2021 International Wildland-Urban Interface Code

Revise as follows:

IGNITION-RESISTANT BUILDING MATERIAL. A type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from wildland-urban interface conflagrations under worst-case weather and fuel conditions with wildfire exposure ~~of burning embers and small flames,~~ as prescribed in Section 503.

Reason: The current definition is misleading and conflicting within itself. It talks about materials being ignition resistant under worst-case fuel conditions, but then limits that to exposure to burning embers and small flames. It further limits that to the conditions specified in Section 503. If not previously, recent experience has certainly shown that there are worst case wildland fire exposure conditions than exposure to burning embers and small flames. There is a large body of work being done in the US and Internationally to better define more appropriate fire exposure conditions than those previously considered necessary. As written, this definition is incorrect.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal revises the defined term but does not add additional requirements.

WUIC1-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were based on not wanting to add requirements into the definition and opposition to the removal of the language of burning embers and small flames. (Vote: 14-0)

WUIC1-21

Individual Consideration Agenda

Public Comment 1:

IWUIC: SECTION 202

Proponents: Tony Crimi, representing representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca) requests As Modified by Public Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

IGNITION-RESISTANT BUILDING MATERIAL . A type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from ~~wildland-urban interface conflagrations under worst-case weather and fuel conditions with~~ wildfire exposure of burning embers and small flames, as prescribed in Chapter 5 ~~Section 503~~.

Commenter's Reason: This proposal does not add requirements into the definition. It deletes some language. The current definition is misleading and conflicting within itself. It talks about materials being ignition resistant under worst-case fuel conditions, but then limits that to exposure to burning embers and small flames. There is a large body of work being done in the US and Internationally to better define more appropriate fire exposure conditions than those previously considered necessary. As written, this definition is incorrect in referring to "worst case".
During the CAH, several participants agreed there was a need for a change to the definition, but suggested that the statement about "burning embers and small flames" needed to be retained, and it was the portion about "wildland-urban interface conflagrations under worst-case weather

and fuel conditions" that should be removed.

Following the CAH, several commenters collaborated on the revised definition, which is submitted here.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a change in the definition only.

Public Comment# 2369

Public Comment 2:

IWUIC: SECTION 202

Proponents: Jeffrey Greenwald, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com) requests As Modified by Public Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

IGNITION-RESISTANT BUILDING MATERIAL . A type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from ~~wildland-urban interface conflagrations under worst-case weather and fuel conditions with~~ wildfire exposure of burning embers and small flames ~~as prescribed in Section 503~~.

Commenter's Reason: The present definition is flawed for two reasons: (1) it contains prescriptive requirements by sending the user to section 503 and (2) it states that ignition resistant materials will resist “worst case” conditions, which is untrue. Moreover, it is clear that the concept that “ignition resistant building materials” as described in section 503 will not resist worst case conditions. Therefore the proposed public comment deletes language that causes the flaws and leaves a more logical definition.
The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, EPS Industry Alliance, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, and Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal revises the defined term but does not add additional requirements.

Public Comment# 2482

WUIC2-21

Proposed Change as Submitted

Proponents: Michael Cudahy, representing Self (mikec@cmservices.com)

2021 International Wildland-Urban Interface Code

Add new text as follows:

404.11 Water Supply Protection.
Service lines shall be protected from backsiphonage by a dual check valve installed in a valve box as close as practicable to the water main.

Reason: In large scale wildland-urban interface fires multiple buildings in one area are often destroyed, compromising the integrity of the water distribution systems. Large scale failure of plumbing systems causes systemic water pressure drops and hampers fire fighting efforts. The pressure drop also allows for back draft of toxic combustion gasses and runoff into the service and main lines, contaminating the water system, potentially for a significant period of recovery, even for buildings not directly impacted.
The installation of a simple check valve or other suitable back flow device on the service line would limit the systemic pressure drop and associated backsiphonage of combustion gasses and contaminated water into the potable water network, easing fire fighting efforts and recovery. There are inexpensive NSF-61 listed check valves which can be buried or otherwise protected that can serve this important function.

Cost Impact: The code change proposal will increase the cost of construction
The proposal would require the addition of a check valve or other device and a valve box on the building water service line, which would increase the cost of construction. NSF-61 listed check valves for example, would cost in the range of $30 to $200, depending on size and material, plus installation. An extra valve box would add between $20 and $200, plus installation.

WUIC2-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were based on the requirements that are already in the IPC, the cost impact in colder climates, no provisions for maintenance, issues with constructability and potential conflicts with various water purveyors and public works agencies. (Vote: 14-0)

WUIC2-21

Individual Consideration Agenda

Public Comment 1:

IWUIC: 404.11

Proponents: Michael Cudahy, representing PPFA (mikec@cmservices.com) requests As Modified by Public Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

404.11 Water Supply Protection . Service lines from utility water systems shall be protected from backsiphonage by ~~a dual check valve installed in a valve box as close as practicable to the water main.~~ an approved method.

Commenter's Reason: In large scale wildland-urban interface fires, multiple buildings in one area are often destroyed, compromising the integrity of the water distribution network. Large scale failure of plumbing systems causes systemic water pressure drops. The pressure drop allows for backdraft of toxic combustion gasses and runoff into the service and main lines, contaminating the water system, potentially for a significant period of recovery, even for buildings not directly impacted, which is a resiliency issue even for unaffected structures.

As noted during testimony, no single approach, location or device, is suitable for all climates, construction types and jurisdictions, so it seems proper

to allow the AHJ make the determination what should be done in terms of water supply protection. If the utility protects the water supply, that would be the approved method. The requirement would not apply to well water, only utility provided.

Bibliography: none

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The change will increase the cost of construction depending on the local jurisdictions approved method of back flow prevention. This could range from zero additional cost to a few thousand depending on what is required in the area, with the likely amount being a few hundred dollars, since the committee noted the issues were very climate related and jurisdictional.

Public Comment# 2813

WUIC3-21

Proposed Change as Submitted

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Wildland-Urban Interface Code

503.1 General. Buildings and structures hereafter constructed, modified or relocated into or within *wildland-urban interface areas* shall meet the construction requirements in accordance with Table 503.1. Class 1, Class 2 or Class 3, ignition-resistant construction shall be in accordance with Sections 504, 505 and 506, respectively. Materials required to be ignition-resistant materials shall comply with the requirements of Section 503.2.

Revise as follows:

TABLE 503.1 IGNITION-RESISTANT CONSTRUCTION[a]

DEFENSIBLE SPACE[c]	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply[b]		Water Supply[b]		Water Supply[b]	
	Conforming[d]	Nonconforming[e]	Conforming[d]	Nonconforming[e]	Conforming[d]	Nonconforming[e]
Nonconforming	IR 2	IR 1	IR 1	IR 1 Rated ~~N.C.~~	IR 1 Rated ~~N.C.~~	Not Permitted
Conforming	IR 3	IR 2	IR 2	IR 1	IR 1	IR 1 N.C.
1.5 × Conforming	Not Required	IR 3	IR 3	IR 2	IR 2	IR 1

a. Access shall be in accordance with Section 403.

b. Subdivisions shall have a conforming water supply in accordance with Section 402.1.

IR 1 = Ignition-resistant construction in accordance with Section 504.

IR 2 = Ignition-resistant construction in accordance with Section 505.

IR 3 = Ignition-resistant construction in accordance with Section 506.

Rated When exterior walls have a fire-resistance rating of not less than 1 hour, the exterior surfaces of such walls shall be noncombustible.

N.C. = ~~Exterior walls shall have a fire-resistance rating of not less than 1 hour and the exterior surfaces of such walls shall be noncombustible. Usage of log wall construction is allowed.~~

c. Conformance based on Section 603.

d. Conformance based on Section 404.

e. A nonconforming water supply is any water system or source that does not comply with Section 404, including situations where there is no water supply for structure protection or fire suppression.

Reason: Table 503.1 has been in the IWUIC code since its first edition, in 2003, when no ignition resistant materials were allowed as alternatives to 1 hour fire resistance rated construction. In subsequent editions, including the 2021 edition, ignition resistant materials are allowed as alternates to a 1 hour fire resistant rated assembly. However, this table has not been updated and is no longer consistent. The table states that some IR1 areas must have fire resistant rated construction but section 503.2 describes all the types of ignition resistant materials that are allowed for IR1, IR2 and IR3 construction, and they include log wall construction (mentioned in the table for some instances) but also fire retardant-treated wood, and various other ignition resistant materials. Thus, assuming that all building elements (or even all walls) must comply with a fire resistance rating is incorrect and singling out "log wall" in the table is also incorrect.
Therefore, it is recommended that the note regarding "N.C." be revised to refer to "Rated" (or any other appropriate term) and to explain that, in some instances (the more severe environments), having a 1 hour fire resistance rated construction is not sufficient to prevent flame spread (upwards) along a wall, which is why having a covering that is noncombustible is important in WUI areas.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This clarifies an error in the code.

WUIC3-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were based on the proposal not addressing the problem and creating more confusion, going beyond an editorial change and the importance in maintaining the current level of technical requirements in fire safety. (Vote: 10-3)

WUIC3-21

Individual Consideration Agenda

Public Comment 1:

IWUIC: 503.1, TABLE 503.1

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com) requests As Modified by Public Comment

Replace as follows:

2021 International Wildland-Urban Interface Code

503.1 General . Buildings and structures hereafter constructed, modified or relocated into or within *wildland-urban interface areas* shall meet the construction requirements in accordance with Table 503.1. Class 1, Class 2 or Class 3, ignition-resistant construction shall be in accordance with Sections 504, 505 and 506, respectively. Materials required to be ignition-resistant materials shall comply with the requirements of Section 503.2.

TABLE 503.1 IGNITION-RESISTANT CONSTRUCTION[a]

DEFENSIBLE SPACE[c]	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply[b]		Water Supply[b]		Water Supply[b]	
	Conforming[d]	Nonconforming[e]	Conforming[d]	Nonconforming[e]	Conforming[d]	Nonconforming[e]
Nonconforming	IR 2	IR 1	IR 1	IR 1 [f] ~~N.C.~~	IR 1 [f] ~~N.C.~~	Not Permitted
Conforming	IR 3	IR 2	IR 2	IR 1	IR 1	IR 1 [f] ~~N.C.~~
1.5 × Conforming	Not Required	IR 3	IR 3	IR 2	IR 2	IR 1

a. Access shall be in accordance with Section 403.

b. Subdivisions shall have a conforming water supply in accordance with Section 402.1.

IR 1 = Ignition-resistant construction in accordance with Section 504.

IR 2 = Ignition-resistant construction in accordance with Section 505.

IR 3 = Ignition-resistant construction in accordance with Section 506.

~~N.C. = Exterior walls shall have a fire-resistance rating of not less than 1 hour and the exterior surfaces of such walls shall be noncombustible. Usage of log wall construction is allowed.~~

c. Conformance based on Section 603.

d. Conformance based on Section 404.

e. A nonconforming water supply is any water system or source that does not comply with Section 404, including situations where there is no water supply for structure protection or fire suppression.

f Ignition-resistant construction shall comply with Section 504, except that the exterior walls shall have a fire-resistance rating of not less than 1 hour and the exterior surfaces of such walls shall comply with the requirements for ignition resistant materials in accordance with Section 503.2. Usage of log wall construction is allowed.

Commenter's Reason: The public comment corrects the errors in the original proposal and does so in a way that makes the most sense. It was clear from the comments by both the committee and staff that there is no clarity as to whether the table intends to require wall materials to comply with **both IR1 and NC** (which basically simply means comply with NC, since none of the other options in IR1 will have a fire resistance rating of 1 hour) or with **either IR1 and NC** (which basically makes NC superfluous because 1 hour fire resistance rating is already one of the options in IR1). That needs to be corrected.

In Sections 504, 505 and 506 it is clear that exterior walls can be built with a fire resistance rating of at least 1 hour. In none of the sections is there a statement that the 1 hour fire resistance rating is the only permitted option (there are several others) and it does not state that the exterior surfaces must be noncombustible (which is really unnecessary since it is just one type of assembly that meets the requirements). Moreover, the use of residential construction that has an exterior noncombustible section is not likely to be realistic.

In view of the fact that the most logical interpretation probably is that both IR1 and NC are required and they are not consistent with each other, this public comment eliminates the inconsistency and just requires that the exterior walls must be constructed with 1 hour fire resistance rating but not necessarily with an exterior that is noncombustible (as that is not very likely to be used) but an exterior that is an ignition resistant material in accordance with Section 503.2. That way there continues to be a progression in fire safety in the table, from left to right, without including an unrealistic requirement.

This public comment also specifically still allows log wall construction, just as it is in the code now.

This public comment also adds, explicitly, that ignition-resistant construction consistent with the type of fire hazard (as represented by IR1), including roofing materials, still need to comply with all of section 504, to avoid losing the requirements for materials other than walls.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction The code contains an unclear requirement and the public comment clarifies it, and makes it consistent with other sections.

Public Comment# 2302

WUIC6-21

Proposed Change as Submitted

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Wildland-Urban Interface Code

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 extended ASTM E84 (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 (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:

   1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 and shall not show 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 $10^1/_2$ 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 D2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.

      1.3.2. ASTM D7032 for wood-plastic composite materials.

      1.3.3. ASTM D6662 for plastic lumber materials.

   1.4. Identification. Materials shall bear identification showing the fire test results.

   1.5. The use of paints, coating, stains, or other surface treatments is not an approved method of protection as required in this section.

   Exception: Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.

2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. 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.
4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that 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.

Reason: In response to the wildfire season of 2020, in wildfire-impacted communities, efforts are being made by manufacturers seeking approval for painted, coated, stains, or other surface-treated wood that require continuous maintenance in lieu of ignition-resistant building materials. This proposed addition will clarify that paints, coating, stains, and other types of products with vulnerable surface coatings are not approved for use as ignition-resistant building materials in the wildland-urban interface (WUI).
This language already exists in the International Building Code in Section 2303.2.2 for fire-retardant-treated wood (FRTW), which is one of the categories of ignition-resistant building materials in IWUIC (503.2#3). It is also in the 2021 IRC, Section R802.1.5.2. This language is also included in the Second Revision for the upcoming NFPA 1140 Standard for Wildland Fire Protection for FRTW. It is also in Chapters 7A and 23 of the California Building Code concerning FRTW.

Finally, note that the required testing referenced in 503.2#1 would require ignition-resistant building materials to undergo the same testing as FRTW.

Adding this proposed language to 503.2 adds clarity and conformity to codes affecting WUI communities and ensures that any ignition-resistant material will perform as well as FRTW.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This language has been in the IBC for two cycles and IRC for one, making it consistent throughout the codes.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were that the proposal would prohibit coatings altogether and it doesn't make a differentiation between factory coated versus coated in the field and if it was only intended to be a coating on wood then that should have been more clearly defined. (Vote: 13-0)

WUIC6-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com); James Gogolski, representing Hoover Treated Wood Products, Inc. (jgogolski@frtw.com) requests As Submitted

Commenter's Reason: Clear limitations on the use of these materials are urgently needed as these surface coated materials require continuous maintenance to perform as ignition-resistant building materials. For this reason, they are inappropriate for use in the WUI as there is no guarantee of long term performance without periodic inspection and recoating as necessary. This constitutes an excessive burden on AHJ's.
Due in part to extensive wildfire losses, California Building Code's Chapter 7A in Section 703A.5.3 has adopted the same language and restrictions proposed in this PC.

The maintenance issue was noted in FCAC's reason statement for WUIC10-21:

- "No evidence exists that coatings are sufficiently durable to be permitted for outdoor use,"
- NIST investigated (see bibliography) coatings and found that they "on their own" would provide protection for not "more than a few weeks" to an estimated "few months" when combined with a top-coating, and
- "[a] durability of a few months is not sufficient to ensure adequate protection, since it is unlikely that homeowners will recoat outdoor products."

Bibliography: The study cited by FCAC: "Effect of Fire-Retardant Coatings and Weathering on the Flammability of Wood-Based Materials in WUI Communities," by Laura Dubrulle, Mauro Zammarano, Douglas Fox, Rick Davis, Kathryn Butler, Erik Johnsson and Alexander Maranghides. It was presented at the 2019 BCC Research Conference on May 19-22, 2019, in San Antonio, TX and later published as NIST TN 2094 in 2020 (https://doi.org/10.6028/NIST.TN.2094).

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This language has been in the IBC for two cycles and IRC for one, making it consistent throughout the codes.

Public Comment# 2893

WUIC9-21

Proposed Change as Submitted

Proponents: Marcelo Hirschler, GBH International, representing self (mmh@gbhint.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of therequirements in Sections 503.2.1 through 503.2.4. ~~following:~~

~~1. Material shall be tested on all sides with the extended ASTM E84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:~~

~~1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 and shall not show evidence of progressive combustion followir~~

~~1.2. Flame front. Material shall exhibit a flame front that does not progress more than 10 1/2 feet (3200 mm) beyond the centerline of the burner a~~

~~1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. M 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 D2898, for fire-retar~~

~~1.3.2. ASTM D7032 for wood-plastic composite materials.~~

~~1.3.3. ASTM D6662 for plastic lumber materials.~~

~~1.4 Identification. Materials shall bear identification showing the fire test results.~~

~~**Exception:** Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.~~

~~2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.~~

~~3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the Intern~~

~~4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the re~~

Add new text as follows:

503.2.1 Noncombustible material.
Material that comply with the requirements for noncombustible materials in Section 202.

503.2.2 Fire-retardant-treated wood.
Fire-retardant-treated wood identified for exterior useand meet the requirements of Section 2303.2 of the International Building Code shall be considered to comply with Section 503.2.

503.2.2.1 Weathering.
Fire retardant treated wood shall demonstrate compliance with the requirements of Section 503.2.2 after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing" in ASTM D2898.

503.2.3 Fire-retardant-treated wood roof coverings.
Roof assemblies containing fire-retardant-treated wood shingles and shakes that 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*.

503.2.4 Alternate ignition resistant material.
Material shall exhibit a flame spread index of 25 or less when tested on the front and back faces in accordance with the ASTM E84 or UL 723 test. Additionally, the ASTM E84 or UL 723 test shall be continued for a 20-minute period and the flame front shall not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burners at any time during the test on either the front or back faces. Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm).

Exceptions:

1. Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.
2. Materials complying with the requirements of ASTM E2768 on the front and back faces shall not be required to be tested in accordance

with ASTM E84 or UL 723, but shall be required to demonstrate its performance after weathering.

503.2.4.1 Performance requirements for weathering.
The material shall also maintain its performance under conditions of use by meeting performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) in accordance with Sections 503.2.4.2 through 503.2.4.4.

503.2.4.2 Alternate ignition resistant materials.
Alternate ignition resistant materials shall demonstrate compliance with the requirements of Section 503.2.4 after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing" in ASTM D2898.

503.2.4.3 Wood-plastic composite materials.
Wood-plastic composite materials shall demonstrate compliance with the requirements of Section 503.2.4 after weathering in accordance with ASTM D7032.

503.2.4.4 Plastic lumber materials.
Plastic lumber materials shall demonstrate compliance with the requirements of Section 503.2.4 after weathering in accordance with ASTM D6662.

Reason: This code change does 4 things, without changing any of the requirements:
1. It introduces into the IWUIC the same changes to eliminate the duplicate testing requirements for fire retardant treated wood (and, by extension, ignition resistant materials) already contained in the IBC and IRC.

2. This moves what used to be Items 2, 3, & 4 to be new sections 503.2.1, 503.2.2, and 503.2.3. These three provisions are easy to grasp but are somewhat obscured in the current text by the complexity of Item 1.

3. This adds to the item on fire retardant treated wood the same weathering requirements, under a new subsection, 503.2.4, that are presently hidden under item 1.

4. This reorganizes current Item 1 (proposed to be revised to a new section 503.2.4) to make the language (hopefully) clearer, without changing the requirements. The weathering requirements for the alternate ignition resistant materials are shown as new subsections.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is just an editorial rewrite to improve clarity in a complex section.

WUIC9-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were opposition to the alteration of the current requirements and the preference for the formatting to be a list instead of a paragraph. (Vote: 13-1)

WUIC9-21

Individual Consideration Agenda

Public Comment 1:

IWUIC: 503.2, 503.2.1, 503.2.2, 503.2.2.1, 503.2.3, 503.2.4, 503.2.4.1 (New), 503.2.4.2 (New), 503.2.4.2, 503.2.4.1, 503.2.4.3.1 (New), 503.2.4.3, 503.2.4.4

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com); Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com) requests As Modified by Public Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

503.2 Ignition-resistant building material . Ignition-resistant building materials shall comply with any one of the requirements in Sections 503.2.1

through 503.2.4.

503.2.1 Noncombustible material . Material shall ~~that~~ comply with the requirements for noncombustible materials in Section 202.

503.2.2 Fire-retardant-treated wood . Fire-retardant-treated wood shall be identified for exterior use and shall meet the requirements of Section 2303.2 of the International Building Code. ~~shall be considered to comply with Section 503.2503.2.~~

~~**503.2.2.1 Weathering.**~~
~~Fire retardant treated wood shall demonstrate compliance with the requirements of Section 503.2.2 after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing" in ASTM D2898.~~

503.2.3 Fire-retardant-treated wood roof coverings . Roof assemblies containing fire-retardant-treated wood shingles and shakes shall ~~that~~ comply with the requirements of Section 1505.6 of the International Building Code and shall be classified as Class A roof assemblies as required in Section 1505.2 of the *International Building Code*.

503.2.4 ~~Alternate ignition resistant~~ Ignition resistant building material . Material shall ~~exhibit a flame spread index of 25 or less when~~ be tested on the front and back faces in accordance with the extended ASTM E84 or UL 723 test , for a total test period of 30 minutes, or with the ASTM E2768 test. The materials shall bear identification showing the fire test results. ~~Additionally, the ASTM E84 or UL 723 test shall be continued for a 20-minute period and the flame front shall not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burners at any time during the test on either the front or back faces.~~ Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm).
The materials, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, shall comply with Sections 503.2.4.1 through 503.2.4.3.

~~Exceptions~~ Exception:

1. ~~1.~~ Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.
2. ~~2. Materials complying with the requirements of ASTM E2768 on the front and back faces shall not be required to be tested in accordance with ASTM E84 or UL 723, but shall be required to demonstrate its performance after weathering.~~

503.2.4.1 Flame spread .
The material shall exhibit a flame spread index not exceeding 25.

503.2.4.2 Flame front . The material shall exhibit a flame front that does not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burner at any time during the test.

~~**503.2.4.2 Alternate ignition resistant materials.**~~
~~Alternate ignition resistant materials shall demonstrate compliance with the requirements of Section 503.2.4 after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing" in ASTM D2898.~~

~~**503.2.4.1**~~ **503.2.4.3 ~~Performance requirements for weathering.~~ Weathering .** ~~The material shall also~~ Ignition resistant building materials shall maintain their ~~its~~ performance in accordance with this section under conditions of use. ~~by meeting~~ The 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 conditions of use. ~~in accordance with Sections 503.2.4.2 through 503.2.4.4.~~

503.2.4.3.1 Evaluation requirements for weathering .
Fire-retardant-treated wood, wood-plastic composite materials, and plastic lumber materials shall be evaluated after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898.

~~**503.2.4.3**~~ **503.2.4.3.2 Wood-plastic composite materials .** Wood-plastic composite materials shall be evaluated ~~demonstrate compliance with the requirements of Section 503.2.4~~ after weathering in accordance with ASTM D7032.

~~**503.2.4.4**~~ **503.2.4.3.3 Plastic lumber materials .** Plastic lumber materials shall be evaluated ~~demonstrate compliance with the requirements of Section 503.2.4~~ after weathering in accordance with ASTM D6662.

Commenter's Reason: This public comment does not change the requirements in any way but places the sections in a logical order and with a separate section for each type of ignition resistant material. Note that there are 4 types of ignition resistant materials: noncombustible materials, fire-retardant-treated wood, fire-retardant-treated roof coverings and other ignition resistant building materials (including those wood-plastic composite and plastic lumber materials that meet the appropriate requirements). This public comment places them in that order. It also includes the two requirements that have to be met with the fire test (in accordance with the extended ASTM E84 or with ASTM E2768), the requirement for the rip or gap with the structural panels, and the weathering requirements. This also includes the original requirement for labeling with the fire test results and the exception.
A mod had been proposed on the original but the changes were felt to be too substantial.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This change is purely editorial and just reorganizes for clarity. No requirements are changed.

Public Comment# 2766

WUIC10-21

Proposed Change as Submitted

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

Add new text as follows:

503.3 Coated Wood Panels.
Coated wood panels used as ignition resistant materials shall be listed and labeled in accordance with the requirements of Section 503.2, where tested on the front and back faces.

Reason: No evidence exists that coatings are sufficiently durable to be permitted for outdoor use. At present the code is silent on whether fire-retardant coatings can, or not, be used outdoors, except for a prohibition to use them on decks (primarily because of the potential for erosion damage from frequent walking).
A relatively recent study by NIST investigated whether fire retardant coatings applied to wood products were able to continue being effective after being exposed to weather. The study was entitled “Effect of Fire-Retardant Coatings and Weathering on the Flammability of Wood-Based Materials in WUI Communities” and was authored by Laura Dubrulle, Mauro Zammarano, Douglas Fox, Rick Davis, Kathryn Butler, Erik Johnsson and Alexander Maranghides. It was presented at the 2019 BCC Research Conference on May 19-22, 2019, in San Antonio, TX and later published as NIST TN 2094 in 2020 (https://doi.org/10.6028/NIST.TN.2094). It studied 10 fire-retardant coatings (6 film-forming and 4 penetrating stains) and 5 top-coatings (although not necessarily those recommended by the coatings manufacturers specifically for use with their products). The fire properties were assessed by using the cone calorimeter (ASTM E1354, in the horizontal orientation and at 50 kW/m2 initial heat flux) and the wood used was red cedar (with the intent of simulating fences, for example). Weathering was done by exposure to “simulated rainwater” and by UV exposure. The conclusion was that none of the fire-retardant coatings investigated would provide adequate protection, on their own, for more than “a few weeks”. When used together with top-coatings, the protective effect was estimated to last “a few months”.

A durability of a few months is not sufficient to ensure adequate protection, since it is unlikely that homeowners will recoat outdoor products (including any wall materials, eaves, or soffits or even fences).The IBC recognizes fire-retardant treated wood in Chapter 23 and it has a clarifying statement in 2303.2.2 that states: “The use of paints, coating, stains or other surface treatments is not an approved method of protection as required in this section.” That clarification is fully appropriate since a coated wood product is not a product that complies with the requirements of a fire retardant treated wood product, which are clear in section 2303 and which require the product to be “impregnated” with chemical. Clearly, coatings do not impregnate the wood.This means that coated wood panels (i.e. panels with coatings that improve fire performance) are not recognized in the IBC code, other than in existing buildings. It is fully appropriate not to allow the application on site of a paint or coating intended to improved fire performance because such an application in a new building would not ensure a consistent application of a safe product.This proposal would incorporate into the IWUIC coated wood panels but only if they have been factory-produced and have been listed and labeled as having complied with the same fire safety requirements as fire retardant treated wood, including having been tested with the ripped or cut longitudinal gap. This proposal does not introduce any new standards not already in the IWUIC.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Factory produced wood panels will be more expensive than field applied coatings.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reason for the approval was that it provides code approval for factory manufactured coded wood panels. (Vote: 8-7)

Individual Consideration Agenda

Public Comment 1:

Proponents: Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com); James Gogolski, representing Hoover Treated Wood Products, Inc. (jgogolski@frtw.com) requests Disapprove

Commenter's Reason: This proposal should be disapproved.
Coated wood panels are not defined anywhere in the code. The code official has absolutely no guidance on what method should or should not be permitted or what substrates might be inappropriate to coat.

Also, these proposed regulations do not apply to any products currently on the market.

Finally, the FCAC's own reason statement explains exactly why these materials should not be allowed to be used in the IWUIC:

- "No evidence exists that coatings are sufficiently durable to be permitted for outdoor use,"
- NIST investigated (see bibliography) coatings and found that they "on their own" would provide protection for not "more than a few weeks" to an estimated "few months" when combined with a top-coating, and
- "[a] durability of a few months is not sufficient to ensure adequate protection, since it is unlikely that homeowners will recoat outdoor products," where "a few months" means an estimated maximum of seven.

For all of these reasons, this code proposal should be disapproved.

Bibliography: Study cited by FCAC: "Effect of Fire-Retardant Coatings and Weathering on the Flammability of Wood-Based Materials in WUI Communities," by Laura Dubrulle, Mauro Zammarano, Douglas Fox, Rick Davis, Kathryn Butler, Erik Johnsson and Alexander Maranghides. It was presented at the 2019 BCC Research Conference on May 19-22, 2019, in San Antonio, TX and later published as NIST TN 2094 in 2020 (https://doi.org/10.6028/NIST.TN.2094).

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 2894

WUIC11-21

Proposed Change as Submitted

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (estafford@ibhs.org); Milad Shabanian, Insurance Institute for Business and Home Safety, representing Insurance Institute for Business and Home Safety (mshabanian@ibhs.org)

2021 International Wildland-Urban Interface Code

Revise as follows:

504.5 Exterior walls. Exterior surfaces of exterior walls shall be noncombustible for a minimum of 6 inches vertically from horizontal surfaces such as ground or attached decking. Exterior walls of buildings or structures shall be constructed with one of the following methods:

1. Materials *approved* for not less than 1-hour *fire-resistance-rated construction* on the exterior side.
2. *Approved noncombustible* materials.
3. Heavy timber or *log wall construction*.
4. Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the International Building Code.
5. Ignition-resistant materials complying with Section 503.2 on the exterior side.

Such material shall extend from the top of the foundation to the underside of the roof sheathing.

Reason: Buildings located in Wildland Urban Interface (WUI) areas can be ignited through three main mechanisms: Wind-blown embers, radiant heat, and direct flame contact [1]. A previous study shows that embers (firebrands) are the most common cause of building ignitions during a wildfire [2]. The ember distribution around a building strongly depends on wind flow, which changes drastically around vertical objects as the wind's kinetic energy is converted to high-pressure points. IBHS lab studies and field investigations identified that one of the most vulnerable locations is at the base of the exterior walls [3]. Where embers accumulate, they are typically in direct contact or close proximity to the exterior walls. Embers are hot, and transfer heat to the surfaces they are in contact with. There is a high potential that embers will ignite combustible surfaces that they are in direct or close contact with. This issue is more critical for construction located in the Class 1 Ignition-Resistant (IR1) category. In this class, exterior walls are particularly vulnerable to exposure from flames or prolonged exposure to radiant heat, such as from burning vegetation, a neighboring home or outbuilding, and embers. Protecting exterior walls with a 6-inch noncombustible material from horizontal surfaces will minimize the chance of ignition of any part of the exterior wall assembly from embers, thereby minimizing the chance of fire spread to the potentially weaker components of the wall. A required 6-in vertical noncombustible zone at the base of the wall is important because embers accumulate in that area (see picture) due to wind flow around the building (eddies created by blockage flow) and crevices [90-degree corner] tend to trap the embers. The 6 inches of noncombustible material on exterior walls is also required in NFPA 1144 [4]. In the photographs below, the top photograph illustrates the ember distribution around a building tested at the IBHS research center [5] and performance of the exterior walls with and without 6-inch vertical separation. In the bottom photograph, note that ignition did not occur on the wall section where there was a 6-inch vertical separation between the ground and the start of the combustible siding material.

Accumulation of embers at the base of the exterior wall.

Ignition of wall section where combustible siding material extended to the ground.

Bibliography: [1] Caton, S. E., Hakes, R. S., Gorham, D. J., Zhou, A., & Gollner, M. J. (2017). Review of pathways for building fire spread in the wildland urban interface part I: exposure conditions. Fire technology, 53(2), 429-473.
[2] Mell WE, Manzello SL, Maranghides A et al (2010) The wildland–urban interface fire problem—current approaches and research needs. Int J Wildland Fire 19:238. doi:10.1071/WF07131

[3] Quarles S, Leschak P, Cowger R et al (2012) Lessons learned from Waldo Canyon: fire adapted communities mitigation assessment team findings. Insurance Institute of Business & Home Safety, Richburg https://fireadapted.org/wp-content/uploads/2018/06/waldo-canyon-report.pdf

[4] National Fire Protection Association (2018) NFPA 1144 Standard for reducing structure ignition hazards from wildland fire.

[5] Quarles S (2017) Vulnerability of Vents to Wind-Blown Embers. Insurance Institute of Business & Home Safety, Richburg. https://ibhs.org/wp-content/uploads/wpmembers/files/Vulnerability-of-Vents-to-Wind-Blown-Embers_IBHS.pdf

Cost Impact: The code change proposal will increase the cost of construction
Construction costs may increase for certain materials and construction types but the impact will be minimal.

WUIC11-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was that the way that it's written it could be confusing in that it is not clear if the requirement applies to both above and below the attached decking. Additionally it was noted that the proponent specifically stated that it

worked at 2 inches but they decided to go with 6 inches which would exceed as stated as a minimum code requirement. (Vote: 12-2)

WUIC11-21

Individual Consideration Agenda

Public Comment 1:

IWUIC: 504.5, 504.5.1 (New)

Proponents: Milad Shabanian, representing Insurance Institute for Business and Home Safety (mshabanian@ibhs.org); T. Eric Stafford, representing Insurance Institute for Business and Home Safety (testafford@charter.net) requests As Modified by Public Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

504.5 Exterior walls . ~~Exterior surfaces of exterior walls shall be noncombustible for a minimum of 6 inches vertically from horizontal surfaces such as ground or attached decking.~~ Exterior walls of buildings or structures shall be constructed with one of the following methods:

1. Materials *approved* for not less than 1-hour *fire-resistance-rated construction* on the exterior side.
2. *Approved noncombustible* materials.
3. Heavy timber or *log wall construction*.
4. Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the International Building Code.
5. Ignition-resistant materials complying with Section 503.2 on the exterior side.

Such material shall extend from the top of the foundation to the underside of the roof sheathing.

504.5.1 Flashing .
A minimum of 6 inches of metal flashing or noncombustible material applied vertically on the exterior of the wall shall be installed at the ground, decking, and roof intersections.

Commenter's Reason: This public comment addresses some of the comments provided by the committee on the original proposal and improves upon the language for clarity. Some on the committee indicated the language was confusing and didn't clearly specify the required location of noncombustible siding. Additionally, there was also some confusion regarding the location of the noncombustible siding at deck-to-wall intersections. The new language proposed in this public comment clearly specifies where the noncombustible material is required to be installed and is worded similarly to a comparable section in Chapter 7A of the California Building Code.
Tests performed at the IBHS Research Center show the importance of preventing ignition of the siding due to wind-blown embers. Figures 1 and 2 depict a full-scale experiment on exterior walls and an attached deck assembly exposed to wind-blown embers. According to these studies, wind-flow will trap the embers and combustible debris at the base of the exterior walls and at the base of other horizontal surfaces such as attached decks [1,2]. The figures clearly show the ember accumulation at these locations. Protecting the exterior walls at these locations with noncombustible materials will improve the fire-performance of these walls and break the fuel load path toward the main structural elements.

Figure 1. Ember accumulation at the intersection of exterior walls and ground [2].

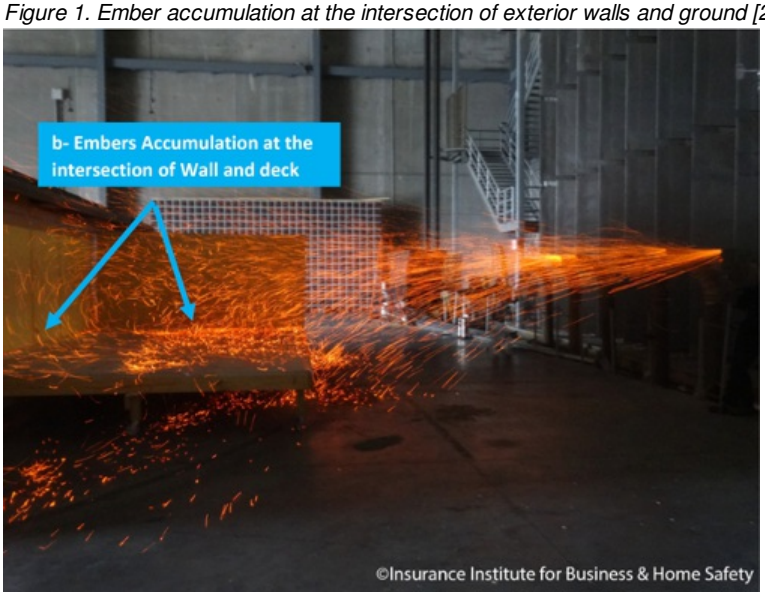

Figure 2. Ember accumulation at the intersection of exterior walls and a deck assembly [2].

To determine the necessary noncombustible vertical clearance to protect these walls from igniting, IBHS conducted two additional experiments on exposed exterior walls. In the first experiment, three different wall configurations were exposed to wind-blown embers without combustible debris located at the base of the wall. These assemblies included the following:

- No separation between the base and combustible siding,
- 2 inches of noncombustible material between the base and combustible siding, and
- 6 inches of noncombustible material between the base and combustible siding.

As shown in Figure 3, the wall assembly with no separation was ignited by embers even in the absence of combustible debris at the base of the wall. The assemblies with 2 and 6 inches of noncombustible material between the base of the wall and combustible siding did not ignite by the embers.

Figure 3. Accumulation of embers at the base of the exterior walls.

In the second experiment, an exterior wall assembly with combustible debris approximately 1 inch in thickness at the base was exposed to a small fire. During this test, the heat distribution along the walls was recorded by 18 thermocouples and an infrared camera. Thermocouples were placed at 2, 4, and 6 inches vertically from the ground level to record the heat distribution along the wall. Figures 4 and 5 depict the exterior wall assembly during the fire test and identifies the thermocouple arrangement.

Figure 4. Exterior wall exposed to a small fire with 6-in noncombustible vertical clearance.

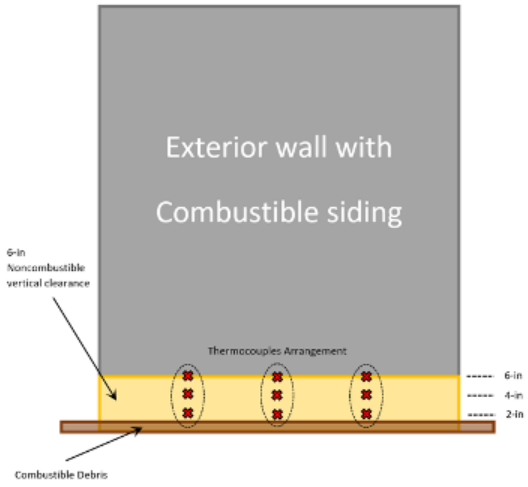

Figure 5. Exterior wall and thermocouples arrangement.

The heat distribution recorded along the wall confirms that even small fires can easily ignite combustible siding at 2 and 4 inches from the ground level. The photograph in Figure 6 was taken with an infrared camera and shows heat distribution at the base of the wall at 2 inches from the ground level. The measured temperature at this level was 276 °C which is high enough to ignite the plywood siding panel.

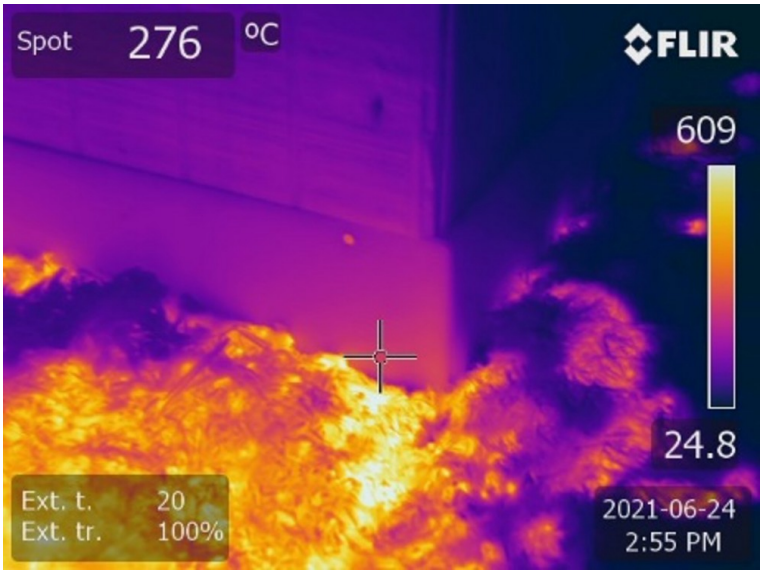

Figure 6. Heat distribution at 2 inches above ground level with the base of the exterior wall exposed to the small fire.

The photograph in Figure 7 shows heat distribution at the base of the wall at 6 inches from the ground level. The measured temperature at 6 inches from the ground level was significantly lower than 2- and 4-inch heights. It's important to note that the combustible siding, which was separated from the ground by 6 inches of noncombustible material, did not ignite during the test.

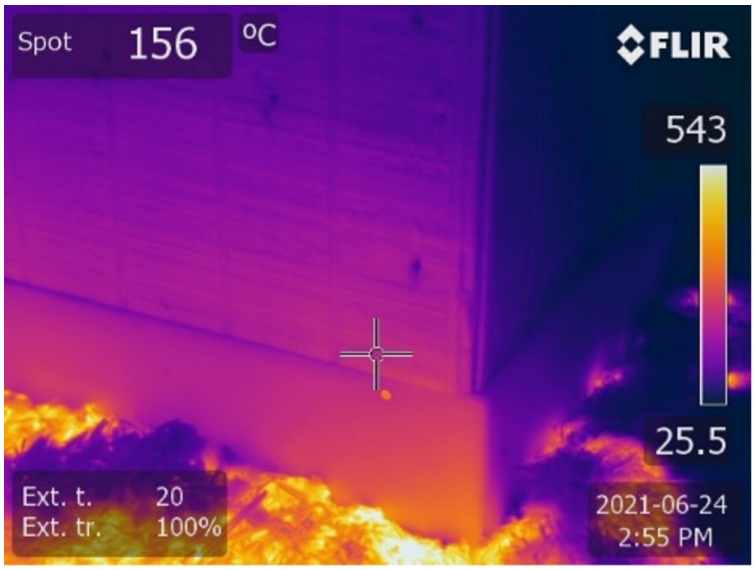

Figure 7. Heat distribution at 6 inches above ground level with the base of the exterior wall exposed to the small fire.

Figure 8 reveals the average heat distribution at the base and in different heights of 2-, 4-, and 6-in. Based on the recorded heat distribution along the wall and the likelihood of having trapped combustible debris at these locations, the tests clearly demonstrate that having a minimum of 6 inches of noncombustible material between horizontal surfaces and exterior combustible siding will significantly reduce the potential for ignition of combustible siding. This code change would make the IWUIC consistent with NFPA 1144 which also requires a minimum of 6 inches of noncombustible material between base of horizontal surfaces and combustible siding.

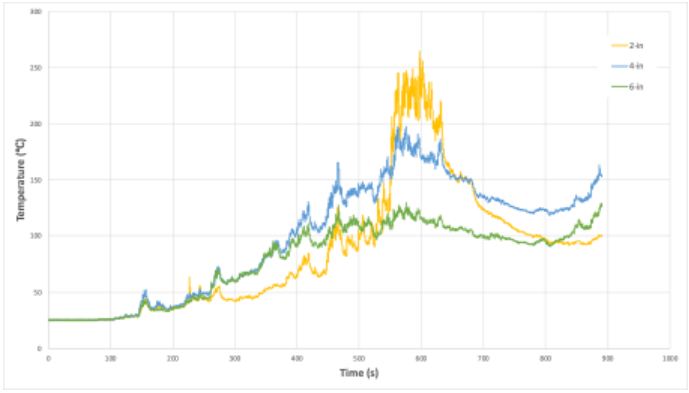

Figure 8. Average heat distribution at the base of the exterior wall.

Bibliography: [1] Quarles S (2017) Vulnerability of Vents to Wind-Blown Embers. Insurance Institute of Business & Home Safety, Richburg

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
This code change proposal may increase the cost of construction slightly as it will likely increase the cost of construction with some additional flashing necessary to comply with this section.

Public Comment# 2701

WUIC13-21

Proposed Change as Submitted

Proponents: William Koffel, representing Fire Safe North America (wkoffel@koffel.com)

2021 International Wildland-Urban Interface Code

Revise as follows:

504.5 Exterior walls. ~~Exterior walls~~
Exterior wall coverings or *exterior wall assemblies* of buildings or structures shall ~~be constructed with one of the following methods:~~ comply with Sections 504.5.1 and 504.5.2.

1. ~~Materials *approved* for not less than 1-hour *fire-resistance-rated construction* on the exterior side.~~
2. ~~*Approved noncombustible* materials.~~
3. ~~Heavy timber or *log wall construction.*~~
4. ~~Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the International Building Code.~~
5. ~~Ignition-resistant materials complying with Section 503.2 on the exterior side.~~

Such materials shall extend from the top of the foundation to the underside of the roof sheathing.

Add new text as follows:

504.5.1 Flame propagation of exterior wall coverings or exterior wall assemblies.
Exterior wall coverings or *exterior wall assemblies* shall be constructed of *noncombustible materials* or *ignition-resistance materials*.

Exceptions:

1. Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.
2. *Approved wall coverings* or *exterior wall assemblies* that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance shown in Section 504.5.3.
3. Combustible components conforming to Section 1402.5 of the *International Building Code*.

504.5.2 Flame impingent of exterior wall coverings or exterior wall assemblies.
Exterior walls shall have a *fire resistance rating* of not less than 1-hour when tested in accordance with ASTM E119 or UL 263 from the exterior side.

Exceptions: Any of the following shall be deemed to meet the assembly performance criteria and the intent of this section:

1. Heavy timber or log wall construction.
2. Wall assemblies that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance in Section 504.5.4.

504.5.3 Conditions of acceptance for flame propagation.
Testing in accordance with ASTM E2707 in Section 504.5.1 shall not exhibit flame propagation to the top of the test specimen during the full duration of the test when tested with a modified flame exposure of 100kW.

504.5.4 Conditions of acceptance for flame impingement.
Testing in accordance with ASTM E2707 in Section 504.5.2 shall comply with all of the following:

1. Not exhibit evidence of glowing combustion on the interior surface of the assembly during the full duration of the test.
2. Have no evidence of flame penetration through the wall assembly during the full duration of the test.

Add new standard(s) as follows:

ASTM International

ASTM

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

ASTM E2707-15 Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure

Reason: This proposal reorganizes section 504.5 and adds a new performance option to address the potential for flame propagation on an exterior wall. There is a need to evaluate two separate and distinct aspects of fire safety pertaining to exterior walls. This proposal separates the requirements for flame impingement into an exterior wall from the flame spread across an exterior wall. The proposed language maintains the provisions that address fire migrating to the interior of an *exterior wall*, while adding language that addresses the tendency for flames to spread across the exterior of an *exterior wall*.The reorganization separates the requirements for protection against flame impingement from flame propagation. Flame propagation is addressed currently addressed by ASTM E136 (noncombustibility) and by extended ASTM E84 provisions. It then creates a separate section to address flame impingement by referencing ASTM E119 and ASTM E2707 as currently exists. ASTM E2707 Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure was adapted from the California State Fire Marshal Standard 12-7A Materials and Construction Methods for Exterior Wildfire Exposure that is referenced in the Chapter 7A [SFM] Materials and Construction Methods for Exterior Wildfire Exposure within the California Building Code.

With respect to the five methods current accepted, they are all incorporated into the reorganization. The first method is in the charging language to Section 504.5.2. The second method is included in the charging language to Section 504.5.1. The third method (heavy timber) is moved to an Exception in Section 504.5.2. The fourth method (fire retardant treated wood) is moved to an Exception in Section 504.5.1. The fifth method is moved to the charging language in Section 504.5.1.

The additional option being proposed is to utilize a modified ASTM E2707 test to address flame propagation. Testing has been conducted both in a 2011 Research program conducted at UL, as well as in 2019 and 2020 as part of work being done through ASTM Committee E05. The ASTM activity has been dormant since early 2020 due to the current restrictions. Multiple assemblies have been successfully tested to date, including some with wood and vinyl siding. The UL research report is available at https://ulfirefightersafety.org/research-projects/residential-attic-fire-mitigation-tactics-and-exterior-fire-spread-hazards.html.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
All of the compliance methods currently permitted by the Code are retained with an additional method added. As such, there is no impact on the cost of construction.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2707-15:Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

WUIC13-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reason for disapproval was based on opposition to the changing the condition of acceptance for flame propagation to a modified flame exposure of 100kW. (Vote: 13-1)

WUIC13-21

Individual Consideration Agenda

Public Comment 1:

IWUIC: 504.5, 504.5.1, 504.5.2, 504.5.3, 504.5.4,

Proponents: William Koffel, representing Fire Safe North America (wkoffel@koffel.com) requests As Modified by Public Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

504.5 Exterior walls . *Exterior wall coverings* or *exterior wall assemblies* of buildings or structures shall comply with Sections 504.5.1 and 504.5.2. Such materials shall extend from the top of the foundation to the underside of the roof sheathing.

504.5.1 Flame propagation of exterior wall coverings or exterior wall assemblies . *Exterior wall coverings* or *exterior wall assemblies* shall be constructed of *noncombustible materials* or *ignition-resistance materials*.

Exceptions:

1. Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.
2. *Approved wall coverings* or *exterior wall assemblies* that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance shown in Section 504.5.3.
3. Combustible components conforming to Section 1402.5 of the *International Building Code*.

504.5.2 Flame impingent of exterior wall coverings or exterior wall assemblies . Exterior walls shall have a *fire resistance rating* of not less than 1-hour when tested in accordance with ASTM E119 or UL 263 from the exterior side.

Exceptions: Any of the following shall be deemed to meet the assembly performance criteria and the intent of this section:

1. Heavy timber or log wall construction.
2. Wall assemblies that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance in Section 504.5.4.

504.5.3 Conditions of acceptance for flame propagation. Testing in accordance with ASTM E2707 in Section 504.5.1 shall not exhibit flame propagation to the top of the test specimen during the full duration of the test when tested with a modified flame exposure of ~~100kW~~ 150 kW .

504.5.4 Conditions of acceptance for flame impingement . Testing in accordance with ASTM E2707 in Section 504.5.2 shall comply with all of the following:

1. Not exhibit evidence of glowing combustion on the interior surface of the assembly during the full duration of the test.
2. Have no evidence of flame penetration through the wall assembly during the full duration of the test.

,

ASTM E2707-15	Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure

Commenter's Reason: The Public Comment responds to the Committee Reason for Disapproval which was "changing the acceptance for flame propagation to a modified flame exposure of 100kW."

Research undertaken by the UL Firefighter Safety Research Institute used modified E2707 apparatus with exposures ranging from 25kW to 300kW while exploring the effect of burning mulch adjacent to a structure. After considering the Committee's reason for Disapproval, it would reasonable to use the 150kW exposure as required in ASTM E2707 and based upon UL's research. Further justifying the 150kW exposure, authors representing the USDA, University of Florida and NIST found that the range of exposures for burning mulch ranged from 50kW to 300kW. A value of 150kW is an appropriate middle-ground exposure for the assessment of these assemblies. The original selection of 100 kW exposure represented an alternative exposure, for which additional test data is also available. However, it was clear from the discussions during the hearing that the 150 kW exposure is preferred.

Bibliography: Zipperer, W. (2007, April 9). Mulch flammability. Proceedings of Emerging Issues Along Urban-Rural Interfaces II: Linking Land-Use Science and Society: 192-195
Kerber, S.(2014). https://ulfirefightersafety.org/research-projects/residential-attic-firemitigation-tactics-and-exterior-fire-spread-hazards.HTML

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
All of the compliance methods currently permitted by the Code are retained with an additional method added. It is understood that some materials may be impacted by the proposed requirements but other alternative compliance methods remain.

Public Comment# 2848

WUIC15-21

Proposed Change as Submitted

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Wildland-Urban Interface Code

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 m^2) 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.~~ Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical wall, shall be in accordance with Section 504.10.1 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

Add new text as follows:

504.10.1 Requirements.
Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

Revise as follows:

~~**504.10.1**~~ **504.10.2 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

505.10 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 m^2) 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.~~ Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical wall, shall be in accordance with Section 505.10.1 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

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~~**505.10.1**~~ **505.10.2 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

Add new text as follows:

506.5 Vents.
Where provided, 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 1/8 inch (3.2 mm), or shall be designed and approved to prevent flame or ember penetration into the structure.

Add new standard(s) as follows:

ASTM

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

ASTM E2886/E2886M-20	Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement

Reason:

Photo shows IBHS research on vent intrusion from embers.

The main thrust of this proposal is to make the vent screens smaller for homes constructed in wildland hazard zones. The current code limits the screen size to no larger than ¼". This was put in to the code as a starting point, and was not based on any testing. Testing using an ember generator was undertaken, and it was shown that 1/4' vents did not prevent fire ignition. screening at 1/8' or 1/16" was effective at preventing ember intrusion.[1]In 2013, IBHS conducted a study on the vulnerability of vents to wind-blown embers. It demonstrated that 1/4 inch openings are not sufficiently small to prevent the penetration of flames via the vents. Therefore it is important to modify the section to get better protection. Even the use of 1/8 inch openings only minimizes the size and number of embers and does not eliminate them entirely; making it very important to reduce what's stored in the attic and crawl space. The same information has been gathered as a result of the wildfires in California.

A link to a key IBHS publication follows:https://ibhs.org/wp-content/uploads/wpmembers/files/Vulnerability-of-Vents-to-Wind-Blown-Embers_IBHS.pdf

NFPA's Standard for Reducing Structure Ignition Hazards from Wildland Fire [NFPA 1144-2018] has, since at least 2008, set minimum requirements for screen size for attic vents at 1/8" maximum diameter openings, see Sec. 5.3.3 (1) based on the same testing mentioned above. (Note that NFPA 1144 will become part of NFPA 1140 in the next edition.)

ASTM E2886 was included for applications in the high hazard and moderate hazard zones, but not in the lowest hazard zones, where a simpler prescriptive approach is used instead of a performance approach. Thus, the proposal recommends the performance approach for the more severe IR1 and IR2 areas (i.e. ignition resistant construction classes 1 and 2), which have the same requirements in the present code (albeit insufficient ones). It recommends a simpler, and probably cheaper, prescriptive approach (1/8 inch openings in vents) for IR3 (ignition resistant construction class 3), which has no requirements now, but should have them.

As seen in the fires in Santa Rosa, and Paradise (in California), structure ignition from embers can involve structures not in a high hazard zone. In these zones, the use of vents tested to the ASTM standard would help prevent structure ignition in both of the zones. Because ASTM E2886 includes the information to be assessed but does not include performance criteria for failure, the provisions found in 504.10.1 and 505.10.1 provide

the information needed to address the performance of vents under the test.

In recognition of that, the California Wildland chapter (Chapter 7A of the California Building Code) has adopted a performance standard approach instead of a prescriptive approach. It uses ASTM E2886, a consensus standard developed by ASTM E5 (committee on fire standards) to assess the performance of vents to protect against ember penetration. It is important to point out that (like most ASTM E5 standards), ASTM E2886 does not have pass/fail criteria but it notes the information needed to be reported and this was adopted as pass/fail criteria by the California code. Note also that this proposal recommends that the vents be listed for the application and that multiple manufacturers already list such systems, for California.

The ASTM standard proposed was issued by ASTM committee E05 on Fire Standards and complies with ICC CP 28. It is fully written in mandatory language and was issued by a consensus standards organization.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at:

https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac

Bibliography: 1 National Fire Protection Association. "NFPA 1144 Standard for reducing structure ignition hazards from wildland fire." 2018.

Cost Impact: The code change proposal will increase the cost of construction
Requiring listed vents will increase the cost of construction. Requiring vent screens with smaller openings will also increase the cost of construction.

Staff Analysis: A review of the standard proposed for inclusion in the code, E2886/E2886M-20, Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

WUIC15-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee stated that the reasons for approval were that the vents need to be listed in both the high and extreme zones and based on the actual experience with wildland fires where homes probably more than likely could have been saved had there been better ember intrusion resistance on these vents. (Vote: 7-6)

WUIC15-21

Individual Consideration Agenda

Public Comment 1:

IWUIC: 504.10, 504.10.1, 504.10.2 (New), 504.10.2, 505.10, 505.10.1, 505.10.2 (New), 505.10.2, 506.5

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com); Michael O'Brian, representing FCAC (fcac@iccsafe.org); Mike Nugent, representing ICC Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

504.10 Vents . Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical surface~~wall~~, shall be in accordance with Section 504.10.1 or Section 504.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings. ~~vertical~~

504.10.1 Performance Requirements . Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

504.10.2 Prescriptive requirements . Where provided, attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical or horizontal surfaces and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm), or shall be designed and approved to prevent flame or ember penetration into the structure.

~~**504.10.2**~~ **504.10.3 Vent locations .** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

505.10 Vents . Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical surface ~~wall~~, shall be in accordance with Section 505.10.1 or Section 505.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings. ~~vertical~~

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1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

505.10.2 Prescriptive requirements .
Where provided, attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical or horizontal surfaces and vents through roofs shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm), or shall be designed and approved to prevent flame or ember penetration into the structure.

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506.5 Vents . Where provided, 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 1/8 inch (3.2 mm), or shall be designed and approved to prevent flame or ember penetration into the structure.

Commenter's Reason: The technical committee approved both WUIC14 and WUIC15 as submitted. This public comment combines the two proposals by providing an alternative: a prescriptive requirement (for 1/8 inch) or a performance requirement (based on the standard).
California currently uses listed vents and those have been successful. Some of them use 1/8" vent screening, but there are other designs that utilize a baffle system. Any of these style vents will make buildings safer, and do not cost substantially more. In fact, California has a listing of "Low cost retrofits" that can be found at www.readyforwildfire.org, and vents such as those required by this code change are on that list.

And while 1/16" vents will also accomplish similar goals, there is a concern about maintenance of the smaller vent screen size since it will clog easier.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
Though this proposal overall will likely increase the cost of construction the PC does not. The option being added is already recognized by the approval of WUIC14-21.

Public Comment# 2408

Public Comment 2:

IWUIC: 504.10, 504.10.1, 504.10.2 (New), 504.10.2, 505.10, 505.10.1, 505.10.2 (New), 505.10.2, 506.5

Proponents: Aaron Phillips, representing Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org) requests As Modified by Public

Comment

Modify as follows:

2021 International Wildland-Urban Interface Code

504.10 Vents . Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, ~~under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters,~~ underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, ~~either in a horizontal or vertical wall,~~ shall be in accordance with Section 504.10.1 or Section 504.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

504.10.1 Requirements . Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

504.10.2 Prescriptive Alternative . Ventilation openings shall not exceed 144 square inches (0.0929 m^2) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm) or shall be designed and approved to prevent flame or ember penetration into the structure.

504.10.3 ~~504.10.2~~ Vent locations . Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

505.10 Vents . Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, ~~under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters,~~ underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, ~~either in a horizontal or vertical wall,~~ shall be in accordance with Section 505.10.1 or Section 505.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

505.10.1 Requirements . Ventilation openings shall be fully covered with listed vents tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

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506.5 Vents . Where provided, 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 1/8 inch (3.2 mm), or shall be designed and approved to prevent flame or ember penetration into the structure.

Commenter's Reason: Both proposals WUIC15 and WUIC14 address the same issue (ember intrusion through ventilation openings into the interior of a structure), and both were approved as submitted during the Committee Action Hearings. WUIC14 addresses ember intrusion via a simple prescriptive approach that establishes a maximum corrosion-resistant mesh opening size of 1/8" for Classes 1, 2, and 3 Ignition Resistant Construction. In contrast, WUIC15 relies on ASTM E2886 to qualify ventilation opening covers for Classes 1 and 2 Ignition Resistant Construction and introduces the same prescriptive requirement as is used in WUIC14 for Class 3 IR Construction.
This public comment attempts to merge the two proposals by permitting compliance via either the test method evaluation of WUIC15 or the prescriptive approach of WUIC14.

In addition to merging two proposals that were both recommended as submitted during the Committee Action Hearings, this public comment is needed because test method E2886, which is referenced as the sole compliance option in WUIC15 for Classes 1 and 2 IR construction, explicitly excludes testing of roof top vents by stating in the standard's scope, "Roof ridge and off-ridge (field) vents are excluded from this standard." Therefore, having a prescriptive compliance option is essential, and the one offered by WUIC14 is supported by research completed by the Insurance Institute for Business and Home Safety that is cited in the original proposal Reason statement.

This public comment also corrects an issue with the scoping sections of WUIC15. Specifically, Sections 504.10 and 505.10 include ventilation opening locations that are expressly excluded in existing “Vent location” code Sections 504.10.1 and 505.10.1 (renumbered as 504.10.2 and 505.10.2 in the original proposal and as 504.10.3 and 505.10.3 in this public comment). These ventilation opening locations are removed from the scoping sections to create consistency with existing provisions.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
The original proposal is expected to increase the cost of construction by requiring vents to be listed or have mesh with smaller openings. Through introduction of a prescriptive alternative, this public comment may make the expected increase in cost of construction slightly less than the original proposal in situations where the prescriptive alternative can be followed.

Public Comment# 2358

Public Comment 3:

Proponents: Gary Ehrlich, representing NAHB (gehrlich@nahb.org) requests Disapprove

Commenter's Reason: This public comment urges disapproval of WUIC15. The proposal would unreasonably increase cost by requiring builders constructing dwellings and multifamily buildings in 2 of the 3 wildfire zones use tested and listed fire-resistant vent products for every exterior vent on a building, regardless of location on the building or exposure to embers, rather than continuing to use commonly-available, generic materials, but with a tighter mesh spacing.
Requiring tested and listed products for all vents on a dwelling or multifamily building is not consistent with the IBHS research cited in the reason statement for the proposal. The IBHS research focused on attic vents (i.e. gable end vents, ridge vents, off-ridge vents and eave vents) and did not look at crawlspace vents or other foundation vents. Foundation vents may have less exposure as they are closer to the ground, may be smaller in size than gable, eave or ridge vents or other roof vents, and may be sheltered by porches, patios, eaves and other projecting elements. No other evidence was provided to the committee to suggest a tested and listed product is required for such vents, or even that a tighter mesh spacing is called for.

The only vents for which the IBHS research clearly demonstrated a tested and listed fire-resistant vent were required gable end vents, due to their larger area and, by virtue of their vertical orientation high on a gable end wall, greater exposure to ember streams. The IBHS research showed vents in the bottom of an enclosed soffit were less vulnerable to ember intrusion and only need a tighter 1/8" mesh spacing to provide a high level of protection. In addition, the research indicated standard off-ridge turbine vents and ridge vents with external baffles (like those used in high-wind regions) provided good protection without requiring such vents be a tested and listed product. The IBHS report did recommend 1/8” steel mesh be installed over the gaps in the roof sheathing.

NAHB is also concerned about the cost impact changing to a tested and listed product. In particular, a quick comparison of costs using vents available at big-box stores and information from one manufacturer of ember-resistant vents suggests the cost of tested soffit vents is 10 times that of standard vents (approximately $2 for a standard 4” x 16” product versus $20+ for a 4” x 14” ember-resistant product). For a typical dwelling with continuous soffit vents that could easily be a $1,500-$2,000 increase.

Product availability of tested and listed vents in all areas of the country where the IWUIC has or may be adopted is also a concern. The website of one manufacturer of ember-resistant vents suggested their product was a special order even in California, and only a handful of dealers outside of California, all but one of those in Oregon and Washington, offered the product (again on special order). NAHB’s members have long experience with building codes requiring specialized products (e.g. AFCI’s and hail-resistant shingles) long before they are readily available across the country and needing to have such products specially-ordered and shipped at a significant premium.

Finally, it is noted WUIC15 was a controversial proposal that passed by a single vote (7-6). This contrasts with proposal WUIC14 which referenced the same IBHS research but simply increased the mesh spacing to 1/8” and did not require a tested and listed product. WUIC14 was unanimously approved 13-0, with the IFC Committee specifically noting the proposal addressed the concerns about protecting vents against intrusion by embers while still allowing the use of traditional products. NAHB testified in support of WUIC14.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code.

Public Comment# 2713

WUIC18-21

Proposed Change as Submitted

Proponents: T. Eric Stafford, representing Insurance Institute for Business and Home Safety (estafford@ibhs.org); Milad Shabanian, representing Insurance Institute for Business and Home Safety (mshabanian@ibhs.org)

2021 International Wildland-Urban Interface Code

Add new text as follows:

603.2.3.1 Combustible mulch.
The required defensible space shall be kept free of combustible materials used for mulch such as small pieces of bark or pine needles.

Reason: This proposal is primarily a clarification. The code clearly contemplates that ground cover materials in the required defensible space must not be capable of transmitting fire to any structure. Additionally, the 2018 IWUIC Commentary more explicitly clarifies that combustible mulch should not be used in the required defensible space [1]. The following is an excerpt from the commentary to Section 603.2.3 from the 2018 IWUIC Commentary:
"A common practice in many areas is to rake the pine needles, or pine straw, together and use them as a type of mulch. This is often placed around the trunk of a tree or along the exterior wall of the building. This practice is not in concert with creating a defensible space. Pine needles will carry fire to the structure. Many structures have been ignited simply from a cigarette discarded into this pine straw. The pine straw smolders and ignites, then ignites the structure itself. In a wildland fire situation, an ember can land in the pine straw and smolder even after the fire has passed, later igniting and consuming the structure. See Commentary Figure 603.2.3."

Based on post-fire investigations, combustible mulch such as bark and rubber are not recommended near structures in wildland-urban interface areas. Burning mulch can ignite adjacent building materials and can result in fire spread to the structure. The photographs below relate to investigations of buildings in Paradise, CA after the devastating 2018 Camp Fire. These pictures show damage to windows due to the direct contact with flames produced by burning combustible mulch. In both cases, the fire did not spread vertically as the cladding system was noncombustible. However, the direct flame contact caused failures of the glazing. Tests performed at the IBHS research center confirmed that flammable debris on the ground near the building ignited and caused a rapid upward flame to spread on the side of the house [2]. There are also other studies investigated the flammability of different types of mulches. In these experimental studies, most of the dried fuel beds were observed to achieve glowing or flaming ignition [3-6]. According to the conducted studies, shredded rubber, pine needles, and shredded western red cedar demonstrated the most hazardous fire behavior [6].

Failure of the outer layer of a double-glazed window

Complete failure of the glazing

Bibliography: [1] International Code Council (ICC) (2018) International Wildland Urban Interface Code (IWUIC) and Commentary.
[2] Quarles, S., Leschak, P., Cowger, R., Worley, K., Brown, R., Iskowitz, C., 2012. Lessons Learned from Waldo Canyon: Fire Adapted Communities Mitigation Assessment Team Findings. https://fireadapted.org/wp-content/uploads/2018/06/waldo-canyon-report.pdf

[3] Manzello, S.L., Cleary, T.G., Shields, J.R., Yang, J.C., 2006a. On the ignition of fuel beds by firebrands. Fire Mater. 30, 77–87. doi:10.1002/fam.901. https://onlinelibrary.wiley.com/doi/abs/10.1002/fam.901

[4] Manzello, S.L., Cleary, T.G., Shields, J.R., Yang, J.C., 2006b. Ignition of mulch and grasses by firebrands in wildland–urban interface fires. Int. J. Wildl. Fire 15, 427. doi:10.1071/WF06031 http://www.mariloureiro.net/ciencia/firebrand/f06031.pdf

[5] Steward, L.G., Sydnor, T.D., Bishop, B., 2003. The ease of ignition of 13 Landscape Mulches. Journal of Arboriculture 29(6) 317-321. http://ucanr.edu/sites/UrbanHort/files/117293.pdf [Last Accessed Jan. 05, 2021]

[6] Quarles, S. and Smith, E., 2004, The combustibility of landscape mulches. University of Nevada Cooperative Extension. https://ucanr.edu/sites/MarinMG/files/321642.pdf [Last Accessed Jan. 05, 2021]

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a clarification.

WUIC18-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee stated that the reasons for disapproval were that the 100 feet distance is extreme even in a high fire zone and that the requirement is unenforceable. (Vote: 14-0)

WUIC18-21

Individual Consideration Agenda

Public Comment 1:

IWUIC: 603.2.3.1

Proponents: Milad Shabanian, representing Insurance Institute for Business and Home Safety (mshabanian@ibhs.org); T. Eric Stafford, representing Insurance Institute for Business and Home Safety (testafford@charter.net) requests As Modified by Public Comment

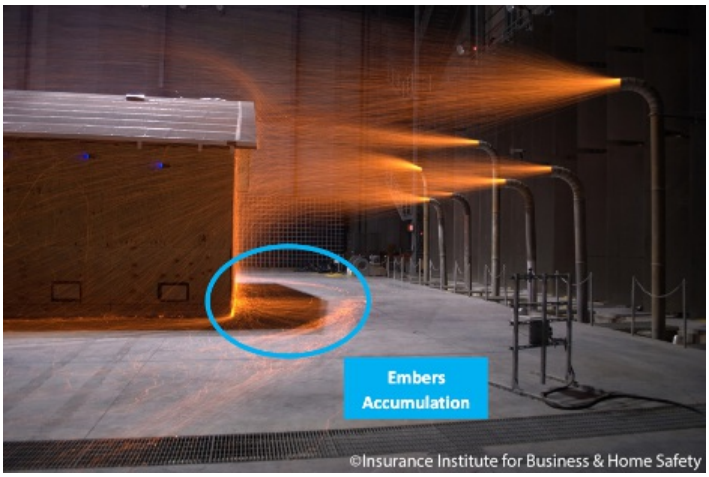
Modify as follows:

2021 International Wildland-Urban Interface Code

603.2.3.1 Combustible mulch . ~~The required defensible space shall be kept free of~~ Combustible materials used for mulch, such as small pieces of bark or pine needles, shall be prohibited within 5 feet horizontally of exterior walls and decks.

Commenter's Reason:
This public comment addresses the committee's concerns with the original proposal. Some on the committee indicated that prohibiting combustible mulch in the required defensible space was extreme, as the required defensible space is a minimum of 100 feet for extreme hazards.

Accumulation of embers has been identified as a big threat for igniting the fuel they land on in literature such as combustible mulch. Burning mulch can ignite adjacent building materials and can result in fire spread to the structure. IBHS research identified two main accumulation locations around a structure: (1) 5-ft from the building, and (2) at the base of the wall [1]. These locations are shown below:



Therefore, in order to address the committee comments and based on IBHS studies, this distance has been reduced to 5-ft from the building.

Bibliography: [1] Hedayati, F., Stansell, C., Gorham, D., Quarles, S. (2018), Near-Building Noncombustible Zone, Insurance Institute for Business and Home Safety (IBHS)

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal will not increase the cost. It will clarify the intent of the code.

Public Comment# 2725