

IBC - Fire Safety



2016 GROUP B PUBLIC COMMENT AGENDA

OCTOBER 19 - OCTOBER 25, 2016
KANSAS CITY CONVENTION CENTER
KANSAS CITY, MO

First Printing

Publication Date: September 2016

Copyright © 2016

by

International Code Council, Inc.

ALL RIGHTS RESERVED. This 2016 Public Comment Agenda is a copyrighted work owned by the International Code Council, Inc. Without advance written permission from the copyright owner, no part of this book may be reproduced, distributed, or transmitted in any form or by any means, including, without limitations, electronic, optical or mechanical means (by way of example and not limitation, photocopying, or recording by or in an information storage retrieval system). For information on permission to copy material exceeding fair use, please contact: Publications, 4051 West Flossmoor Road, Country Club Hills IL, 60478-5795 (Phone 888-ICC-SAFE).

Trademarks: "International Code Council," the "International Code Council" logo are trademarks of the International Code Council, Inc.

PRINTED IN THE U.S.A.

FS3-16

IBC: 1405.14.1.1 (New), 1405.14.1.2 (New), 1405.14.2 (New), 202 (New),
[BS] 1405.14, [BS] 1405.14.1.

Proposed Change as Submitted

Proponent : Matthew Dobson, representing Vinyl Siding Institute

2015 International Building Code

Add new definition as follows:

SECTION 202- DEFINITIONS

~~**Nailable Substrate.** A product or material such as framing, sheathing or furring, composed of wood or wood-based materials, or other materials and fasteners providing equivalent fastener withdrawal resistance.~~

Revise as follows:

~~**[BS] 1405.14 Vinyl siding.** Vinyl siding conforming to the requirements of this section and Insulated Vinyl Siding complying with ASTM D 3679 sections 1404.9 or 1404.13 shall be permitted on exterior walls of buildings located in areas where V_{asd} as the design wind pressure determined in accordance with Section 1609.3.1 1609.6.3 does not exceed 100 miles per hour (45 m/s) and the *building height* is less than or equal to 40 feet (12 192 mm) in Exposure C 30 psf. Where construction is located in areas where V_{asd} as determined in accordance with Section 1609.3.1 the design wind pressure exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm) 30 psf, tests or calculations indicating compliance with Chapter 16 shall be submitted. Vinyl siding Siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.~~

~~**[BS] 1405.14.1 Application.** The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform to the *water-resistive barrier* requirements in Section 1403. Siding and accessories shall be installed in accordance with *approved* manufacturer's instructions. Unless otherwise specified in the *approved* manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313-inch (7.9 mm) head diameter and $\frac{1}{8}$ -inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate the studs~~

or nailing strip at least $\frac{3}{4}$ inch (19 mm). For cold-formed steel light-frame construction, corrosion-resistant fasteners shall be used. Screw fasteners shall penetrate the cold-formed steel framing at least three exposed threads. Other fasteners shall be installed in accordance with the approved construction documents and manufacturer's instructions. Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically, the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.

Add new text as follows:

1405.14.1.1 Fasteners and fastener penetration. Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories shall be corrosion resistant and have a minimum 0.313-inch (7.9 mm) head diameter and 1/8-inch (3.18 mm) shank diameter. The total penetration into nailable substrate shall be not less than 1 1/4 inches (32 mm).

1405.14.1.2 Fastener spacing. Unless specified otherwise by the manufacturer's instructions, fasteners shall be installed in the center of the slots of the nail hem. The maximum spacing between fasteners shall be 16 inches (406 mm) for horizontal siding and 12 inches (305mm) for vertical siding.

1405.14.2 Application with cold-formed steel. For cold-formed steel light-frame construction, corrosion-resistant fasteners shall be used. Screw fasteners shall penetrate the cold-formed steel framing at least three exposed threads. Other fasteners shall be installed in accordance with the approved construction documents and manufacturer's instructions.

Reason: This change is part editorial and part substantive.

The editorial change breaks apart a large paragraph on installation which is tangled. It breaks down the installation provisions performance minimums, fastener size and penetration, fastener spacing, and places the steel framing application by itself.

It changes how to measure siding wind performance from height and exposure to design wind pressure which is in line with how the products are tested and uses the straight performance measure from section 1609.6.3 of the IBC and the IRC.

Additionally, it brings in the horizontal and vertical fastener spacing provisions which were adopted into the IRC.

In addition Insulated Vinyl Siding is added to this section as its installation and testing is the same as that for vinyl siding.

Finally, the nailable substrate approach for fastener hold is added to this section. Nailable substrate offers a performance method to determine if a material is suitable to hold fasteners with the application of cladding. This approach was accepted as part of the International Residential Code and is an accepted way to determine fastener performance with cladding.

Cost Impact: Will not increase the cost of construction

This change clarifies installation and will not have an impact on cost.

**FS3-16 : [BS]
1405.14-
DOBSON5351**

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that the proposed definition for "nailable substrate" is confusing and including "or other materials" means that it may be too broad. Also it is unclear whether the fastener penetration requirement of "1-1/4 inches into nailable substrate" achieves equivalency with required penetration into framing. There was also concern with limiting wind pressures to the alternate all heights method of Section 1609.6.3 rather than a more general reference for wind pressure determination.

Individual Consideration Agenda

Public Comment 1:

Proponent : Matthew Dobson, Vinyl Siding Institute, representing Vinyl Siding Institute (mdobson@vinylsiding.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Building Code

[BS] 1405.14 Vinyl siding. Vinyl siding and Insulated Vinyl Siding complying with sections section 1404.9 or 1404.13 shall be permitted on exterior walls where the design wind pressure determined in accordance with ~~1609.6.3~~ 1609.1.1 does not exceed 30 psf. Where the design wind pressure exceeds 30 psf, tests or calculations indicating compliance with Chapter 16 shall be submitted. Siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

[BS] 1405.14.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform to the *water-resistive barrier* requirements in Section 1403.

1405.14.1.1 Fasteners and fastener penetration for wood

construction. Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories in wood construction shall be corrosion resistant and have a minimum 0.313-inch (7.9 mm) head diameter and 1 /8-inch (3.18 mm) shank diameter. The total penetration into nailable substrate shall be not less than 1 1/4 ~~inches~~ inches (32 mm).

~~1405.14.2~~ **1405.14.1.2 Application with Fasteners and fastener penetration for cold-formed steel light frame construction.** *No change to text.*

~~1405.14.1.2~~ **1405.14.1.3 Fastener spacing.** *No change to text.*

Commenter's Reason: This change is part a change in terminology and

part clean up/editorial.

The concept of nailable substrate clearly recognizes typical wood nailing substrates but also allows for innovation based on performance. This definition has been in the International Residential Code and this will create consistency between the two codes.

We also have changed the design wind pressure to the correct section. Changing section 1609.3.1 to 1609.1.1.

Finally, we have cleaned up the section to clearly separate the differences between wood construction and cold formed steel light framed construction.

This addresses the committees concerns.

FS3-16

FS5-16

IBC: [BS] 1405.18.

Proposed Change as Submitted

Proponent : Matthew Dobson, representing Vinyl Siding Institute
(mdobson@vinylsiding.org)

2015 International Building Code

Revise as follows:

[BS] 1405.18 Polypropylene siding. Polypropylene siding conforming to the requirements of this section and complying with Section 1404.12 shall be limited to exterior walls of Type ~~VB~~ V construction located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Polypropylene siding shall be installed in accordance with the manufacturer's instructions. Polypropylene siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

Reason: During the adopting of this provision during the 2009 cycle the provision to allow polypropylene siding on only Type VB construction was made without clear substantiation during the final action hearings. Because there are performance measures in place for the use of claddings with Type V construction, we believe polypropylene siding should be allowed in all types of Type V construction.

Polypropylene siding has been tested and passed a number of fire performance measures including the NFPA 268 test that is required for combustible cladding used in non-combustible construction as well as the California Urban Interface test CA SFM 12-7a-1. Sample test results have been included with this change. These test provide evidence that the product and should be allowed with Type VA construction as their presence will have no impact on the fire rating of the assembly.

Cost Impact: Will not increase the cost of construction
This change simply expands where the product category can be used and offers options.

**FS5-16 : [BS]
1405.18-
DOBSON5338**

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee's action taken on FS6-16 addressed this issue.

Assembly Action: **None**

Individual Consideration Agenda

Proponent : Matthew Dobson, representing Vinyl Siding Institute (mdobson@vinylsiding.org) requests Approve as Submitted.

Commenter's Reason: This change is only necessary if FS6 is not successful.

The use of polypropylene siding has been shown to be safe and should be allowed in all types of construction if it can perform to the requirements of section 1406 of the building code. Section 1406 regulates and places performance requirements on the use of combustible on non-combustible construction.

Keep in mind the the code already has fire performance measures in place whether it be fire resistive construction or other requirements. The code does a very good job by providing performance criteria vs. creating prescriptive restrictions.

This change simply allows the expanded use of polypropylene siding on all Type V construction instead of just Type VB. Basically larger buildings. This change was originally adopted without any specific justification.

Proponent : Marcelo Hirschler, representing GBH International (gbhint@aol.com) requests Disapprove.

Commenter's Reason: Going from Type VB to Type V allows construction with greater heights, more stories above grade plane and larger allowable areas.

No information was provided (other than a statement that polypropylene siding has been tested and passes a small scale ignition test (NFPA 268). Note that the NFPA 268 test does not have pass/fail criteria but just indicates that ignition or sustained flaming must be reported. Note also that passing that: (1) test is not an indication of adequate fire performance and (2) the fact that some polypropylene siding passes that test is not an indication that polypropylene siding must pass the test. Polypropylene siding must comply with ASTM D7254 (per 1404.12) and that requires testing to ASTM E84 only.

Polypropylene siding is a product with very poor fire performance, something that has been demonstrated time after time. For example, the heat release rate of the polypropylene material typically used for polypropylene siding is about twice as high as that of typical wood siding and over twice as high as that of vinyl siding. The heat released by a material used in the outside of a building is an indication of the radiated heat to a nearby building.

Siding tests using ASTM E1354 fire test:

Wood (cedar) siding: peak heat release rate 309 kW/m^2 - effective heat of combustion: 13 MJ/kg

Polypropylene siding 1: peak heat release rate 546 kW/m^2 - effective heat of combustion: 25 MJ/kg

Polypropylene siding 2: peak heat release rate 878 kW/m^2 - effective heat of combustion: 32 MJ/kg

Material tests using ASTM E1354 fire test:

Vinyl (PVC): peak heat release rate 190 kW/m^2 - effective heat of combustion: 9 MJ/kg

For that reason, the use of this material has been limited to Type VB construction since it was first allowed into the IBC. When polypropylene siding burns it releases much more heat than any other siding material permitted by the code.

Please disapprove this proposal.

FS5-16

FS6-16

IBC: [BS] 1405.18.

Proposed Change as Submitted

Proponent : John Kozal, Universal Forest Products, representing Universal Forest Products (jkozal@ufpi.com)

2015 International Building Code

Revise as follows:

[BS] 1405.18 Polypropylene siding. Polypropylene siding conforming to the requirements of this section and complying with Section 1404.12 shall be limited to exterior walls of ~~Type VB construction~~ located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Polypropylene siding shall be installed in accordance with the manufacturer's instructions. Polypropylene siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

Reason: Restricting Polypropylene Siding to Type VB construction is not appropriate when 2015 IBC Section 1406.2.1 allows combustible materials to be used as wall coverings for any type of construction if they pass NFPA 268 and meet fire separation distances as noted in Table 1406.2.1.1.2.

Bibliography: Our Company hired an independent third party testing firm by the name of SwRI to conduct an NFPA 268 test on our Polypropylene Siding that has a unique proprietary recipe. The siding passed the test requirement of NOT exhibiting any sustained flaming while being subjected to an incident heat energy of 12.5 kW/m². Please note that this test wall was only 2.75 feet away from the heat source.

Cost Impact: Will not increase the cost of construction

It would allow the building owner to have another exterior wall covering option to choose from that meets existing Code test requirements.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee believes that wind loading is not sensitive to the type of construction. It is not a limitation that is structural-based.

Assembly Action: **None**

Individual Consideration Agenda

Proponent : Matthew Dobson, Vinyl Siding Institute, representing Vinyl Siding Institute (mdobson@vinylsiding.org) requests **Approve as Submitted.**

Commenter's Reason: The committee recognized in this change, as the Structural Committee for the development of the IBC, that section 1405 is about the "HOW" of installation of wall coverings based on structural conditions. They determined it is NOT about the limitation of "WHERE" or "Type" of buildings combustible wall coverings can and can't be installed, it is about "HOW" wall coverings are to be installed.

So the removal of any construction "Type" limitation on polypropylene siding was determined to be appropriate. The committee stated in their reason that the "Type" of construction noted in the current section is not structurally based and therefore is inappropriate.

As a further demonstration of the how the code has effectively regulated combustible wall coverings, and has done so since at least the inception of the I-codes in 2000, the code user must reference section 1406, which regulates "Combustible Materials on the Exterior Side of Exterior Walls". Section 1406 (not 1405) is the appropriate place to regulate the fire safety aspects of cladding including polypropylene siding, which is what is under question.

As a combustible cladding it is required to meet certain test requirements when used in higher density settings and when used with other "Types" of construction other than Type V (combustible construction).

We must rely on the performance measures of the code to regulate product use. It is inappropriate to simply limit a product's use without applying some type of performance measure established by the code for all combustible claddings.

The performance measure in this case is NFPA 268, as noted in section 1406. NFPA notes this about NFPA 268 - *"This standard offers a testing method to measure and describe the ignitability characteristics of exterior wall assemblies and their potential of contributing to fire growth under controlled laboratory conditions. It is intended to be used for code and other regulatory purposes, specification and design purposes, and research and development activities."...**What does NFPA 268 address?** "This fire test response standard details a method to determine the propensity of ignition of exterior wall assemblies from exposure to 12.5 kW/m² radiant heat in the presence of a pilot ignition source. From instrumentation and documentation to safety precautions and calibration, this document provides comprehensive testing guidance."*

Polypropylene siding is held to this standard, when applicable, just like all other combustible claddings and materials used on the outside of buildings. Performance not prescription.

As a further step, we tested a range of polypropylene sidings on the market today based on thickness and weight. The two tests were sidings at both ends of the described range.

Below are links to the test report and videos for both tests. **In both cases the polypropylene siding PASSED the NFPA 268 test, which is required by the code.**

<https://www.vinylsiding.org/wp-content/uploads/2016/08/1607-VSI-PP-SWRI-NFPA-268-Final-Report.pdf> (<https://www.vinylsiding.org/wp-content/uploads/2016/08/1607-VSI-PP-SWRI-NFPA-268-Final-Report.pdf>)

<https://www.youtube.com/watch?v=v0tAhee0-4I>

(<https://www.youtube.com/watch?v=v0tAhee0-4I>)

<https://www.youtube.com/watch?v=-DHokOpEBkg>

(<https://www.youtube.com/watch?v=-DHokOpEBkg>)

Approving this change allows the code to regulate products based on established performance, instead of unfounded prescription.

Although the committee's point was that the "Type" of construction in section 1405 is inappropriate, it is important that any descriptions about the fire characteristics of polypropylene siding as unsafe are simply untrue based on the performance based tests required in section 1406, NFPA 268.

We urge the assembly to uphold the action of the committee, approve as submitted.

Proponent : John Kozal, Universal Forest Products, Inc, representing Universal Forest Products, Inc. (jkozal@ufpi.com) requests Approve as Submitted.

Commenter's Reason: Currently, the 2015 IBC Code arbitrarily restricts Polypropylene Siding to Type VB Construction which is not appropriate when 2015 IBC Section 1406.2.1 **allows** combustible siding to be used as wall coverings for **any type of construction** as long as the siding **passes NFPA 268** and meets the fire separation distances as noted in Table 1406.2.1.1.2.

1) Accredited Third Party Test Lab

In order to comply with the **performance** requirements of the 2015 IBC Code, our Company hired an independent third party test lab known as SwRI to conduct the Code required NFPA 268 test and our combustible Polypropylene Siding **passed** the test.

2) Accredited Third Party Listing Company

Our Company then took a major step forward by hiring an accredited, third party listing report writer known as NTA, Inc (an ICC member) to review the SwRI test data and the 2015 IBC Code to ensure we met the **performance** intent of the Code. In fact, NTA's team of engineers and technicians evaluated the SwRI test report and the 2015 IBC Code and **approved** our Polypropylene exterior wall siding to be **applied to all**

types of construction as noted under Section 3.2 of the listing report because our Polypropylene exterior wall siding met the allowable **performance** requirements of the 2015 IBC Code.

3) Summary:

We ask the Assembly to uphold the action of the Committee and **approve the change as submitted** because the 2015 IBC Code does have an effective set of **performance** requirements for exterior wall coverings in place which was duly followed and fully documented in the above scenario.

Proponent : Marcelo Hirschler, representing GBH International (gbhint@aol.com) requests Disapprove.

Commenter's Reason: Going from Type VB to any Type allows construction with greater heights, more stories above grade plane and larger allowable areas as well as allowing in buildings of Types I through IV construction. No information was provided (other than a statement that polypropylene siding has been tested and passes a small scale ignition test (NFPA 268). Note that the NFPA 268 test does not have pass/fail criteria but just indicates that ignition or sustained flaming must be reported. Note also that passing that: (1) test is not an indication of adequate fire performance and (2) the fact that some polypropylene siding passes that test is not an indication that polypropylene siding must pass the test. Polypropylene siding must comply with ASTM D7254 (per 1404.12) and that requires testing to ASTM E84 only. Polypropylene siding is a product with very poor fire performance, something that has been demonstrated time after time. For example, the heat release rate of the polypropylene material typically used for polypropylene siding is about twice as high as that of typical wood siding and over twice as high as that of vinyl siding. The heat released by a material used in the outside of a building is an indication of the radiated heat to a nearby building.

Siding tests using ASTM E1354 fire test:

Wood (cedar) siding: peak heat release rate 309 kW/m² - effective heat of combustion: 13 MJ/kg

Polypropylene siding 1: peak heat release rate 546 kW/m² - effective heat of combustion: 25 MJ/kg

Polypropylene siding 2: peak heat release rate 878 kW/m² - effective heat of combustion: 32 MJ/kg

Material tests using ASTM E1354 fire test:

Vinyl (PVC): peak heat release rate 190 kW/m² - effective heat of combustion: 9 MJ/kg

For that reason, the use of this material has been limited to Type VB construction since it was first allowed into the IBC. When polypropylene siding burns it releases much more heat than any other siding material permitted by the code.

The rationale for allowing the increase in application provided by FS6 was that it complies with a small scale ignition test (NFPA 268) and that it is covered in chapter 6 of the IBC.

However, in fact polypropylene siding is not one of the materials contained in Table 1405.2 of weather coverings (and thus there is no safe minimum thickness provided in the code) and it is not one of the combustible materials permitted in Types I and II construction by section 603. Section 603 specifically states that the allowable materials include "Combustible exterior wall coverings, balconies and similar projections and bay or oriel windows in accordance with Chapter 14".

Therefore, without the approval of this code change polypropylene siding is not one of those materials, in spite of the statement made at the committee hearings that the use is allowed by chapter 6. Moreover no suitable fire hazard information was provided to justify expanding the application of this material, with high flammability.

Please disapprove the proposal.

FS6-16