

FS101-09/10-PART II

1703.5.4 (New)

NOTE: PART I DID NOT RECEIVE A PUBLIC COMMENT AND IS ON THE CONSENT AGENDA. PART I IS REPRODUCED FOR INFORMATIONAL PURPOSES ONLY FOLLOWING ALL OF PART II.

Proposed Change as Submitted

Proponent: William F. O'Keeffe, representing SAFTIFirst

PART II- IBC STRUCTURAL

Add new text as follows:

1703.5.4 Method of labeling. Information required to be permanently identified on the product shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that, once applied, cannot be removed without being destroyed.

Reason: This code change provides for a method of permanently identifying information required by the code on the label. The language for permanent identification is taken from Section 2403.1, which applies to the permanent identification of information on glazing required by Chapter 24. This clarifies that the same method of permanent identification applies to other labeling required in the code, and specifically, Chapter 7.

This change also makes an editorial correction to Section 715.4.7.3 by correcting the reference to 715.4.7.3.1, instead of the incorrect reference to 715.5.9.1.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: OKeeffe-FS5-703.5

Public Hearing Results

PART II- IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: To be consistent with the committee's action on FS101-09/10 Part I.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee (GICC), Committee of the Glass Association of North America (GANA), requests Disapproval.

Commenter's Reason: FS101 Part II should be disapproved. In support of Part II of FS101, the Proponent says that: "[t]he language for permanent identification is taken from Section 2403.1, which applies to the permanent identification of information on glazing required by Chapter 24." What the Proponent did not tell the Committee is that the language found in this proposal is taken from the second paragraph of Section 2403.1 and that paragraph only applies to tempered glass. Further, the Proponent failed to tell the Committee that, even where these same marking techniques (namely acid etching, sand blasting etc.) are found in connection with the designation of safety glazing in Section 2406.3, exceptions from compliance with these marking techniques exist for all types of glazings "other than tempered glass." The reason that these methods of labeling are mandated only for tempered glass is because tempered glass must be manufactured to size and cannot be cut in the field. It is, therefore, easy to apply acid etchings, laser etchings or sand blasted labels to each specially manufactured light of tempered glass. However, it is, simply, impracticable to require these methods of labeling for all other types of glazings that can be cut in the field.

The mandatory inclusion of these labeling techniques for all products is, simply, overbroad and impracticable and Final Action Agenda voters are urged to vote against the standing motion to approve FS101 Part II "As Submitted" in order to vote in favor of a motion to disapprove FS101 Part II.

Final Action: AS AM AMPC___ D

FS101-09/10, PART I- IBC FIRE SAFETY

Revise as follows:

703.5 Fire-resistance-rated glazing. Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 or UL 263 and complying with the requirements of Section 707, shall be permitted. Fire-resistance-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and the identifier “W-XXX,” where the “XXX” is the fire-resistance rating in minutes. Such label or identification shall be issued by an agency and shall be permanently ~~affixed to~~ identified on the glazing.

715. 4.7.3 Labeling. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section ~~715.5.9.1~~ 715.4.7.3.1 that shall be issued by an approved agency and shall be permanently ~~affixed to~~ identified on the glazing.

715. 5.9 Labeling. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section 715.5.9.1 that shall be issued by an approved agency and shall be permanently ~~affixed to~~ identified on the glazing.

Reason: This code change provides for a method of permanently identifying information required by the code on the label. The language for permanent identification is taken from Section 2403.1, which applies to the permanent identification of information on glazing required by Chapter 24. This clarifies that the same method of permanent identification applies to other labeling required in the code, and specifically, Chapter 7.

This change also makes an editorial correction to Section 715.4.7.3 by correcting the reference to 715.4.7.3.1, instead of the incorrect reference to 715.5.9.1.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I- IBC FIRE SAFETY
Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proposed glazing marking is appropriate and consistent with Section 2403.1.

Assembly Action:

None

FS102-09/10

715.5

Proposed Change as Submitted

Proponent: William F. O'Keeffe, representing SAFTIFirst

715.5 Fire-protection-rated glazing. Glazing in fire window assemblies shall be fire-protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.7. Fire-protection-rated glazing in fire window assemblies shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire-protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 705.3, 705.8, 705.8.5 or 705.8.6 shall have a fire protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.4
2. Fire-protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.

715.5.8 Interior fire window assemblies. Fire-protection-rated glazing used in fire window assemblies located in fire partitions and fire barriers shall be limited to use in assemblies with a maximum fire-resistance rating of 1 hour in accordance with this section.

715.5.8.1 Where 3/4-hour fire protection window assemblies permitted. Fire-protection-rated glazing requiring 45-minute opening protection in accordance with Table 715.5 shall be limited to fire partitions designed in accordance with Section 709 and fire barriers utilized in the applications set forth in Sections 707.3.6 and 707.3.8 where the fire-resistance rating does not exceed 1 hour.

715.5.8.2 Area limitations. The total area of fire-protection rated windows assemblies shall not exceed 25 percent of the area of a common wall with any room.

Reason: This code change is a clarification that fire protection-rated window assemblies are subject to area limits. Since there are some window assemblies that are fire resistance rated to ASTM E119, this code change aids the user in clarifying that fire protection rated window assemblies are subject to these limits.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: OKeeffe-FS10-715.5-2

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The term “assemblies” appropriately includes the frame, which makes the requirements more conservative. Further, this is consistent with the committee’s actions on FS107-09/10.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee (GICC), a Committee of the Glass Association of North America (GANA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

715.5.8.2 Area limitations. The total area of the glazing in fire-protection rated window assemblies shall not exceed 25% of the area of a common wall with any room.

(portions of proposal not shown, remain unchanged)

Commenter’s Reason: In recommending approval of this proposal, it is believed that the Committee intended to make references to fire windows uniform throughout Chapter 7 by referring to them as “fire window assemblies” rather than merely as “windows” or “fire windows” since the testing and rating of fire windows includes their assemblies. However, adopting this proposal as submitted will alter how the 25% area limitation established in 715.5.8.2 is calculated. As written, the proposal would add the framing and other opaque assembly materials to the calculation of the 25% limitation. Since no evidence was submitted justifying a need to change the method of calculating the 25% limitation, the modification proposed by this Public Comment would 1- retain the proposed changes needed to make references to “fire window assemblies” uniform, but retain the current method of calculating the 25% area limitation. In that regard, it would include only the total area of the glazing, not the opaque materials used in the fire window assembly.

Final Action Agenda voters are urged to vote against the standing motion to approve FS102 as submitted in order to vote in favor of a motion to adopt the proposal “As Modified” by this Public Comment.

Final Action: AS AM AMPC____ D

FS107-09/10

702, 703.5, 715.2, 715.3, 715.3.1, Table 715.3 (New), 715.4, 715.4.1, 715.4.2, 715.4.3, 715.4.3.1, 715.4.3.2, 715.5.4, 715.4.4, 715.4.4.1, 715.4.5, 715.4.6, 715.4.6.1, 715.4.6.1.1, 715.4.7, 715.4.7.1, 715.5.8.1.1, 715.5.8.1.2, 715.5.8.1.2.1, 715.5.8.1.2.2, 715.4.7.2, 715.4.7.3, 715.5, 715.4.7.3.1, 715.4.7.4, 715.5.8, 715.5.8.1, 715.5.8.2, 715.6.8.3, Table 715.5, 715.5.9, 715.5.9.1, TABLE 715.4,

Proposed Change as Submitted

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC); William F. O’Keeffe, representing SAFTIFirst

1. Add new text:

SECTION 702 DEFINITIONS

Fire-rated glazing. Glazing with either a fire protection rating or a fire resistance rating.

2. Revise as follows:

SECTION 703 FIRE RESISTANCE RATINGS AND FIRE TESTS

703.5 Fire-resistance-rated glazing. Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 or UL 263 and complying with the requirements of Section 707, shall be permitted. Fire-resistance-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and the identifier "W XXX," where the "XXX" is the fire-resistance rating in minutes. Such label or identification shall be marked in accordance with Table 715.3 issued by an approved agency and shall be permanently affixed to the glazing.

SECTION 715 OPENING PROTECTIVES

715.1 General. (No change to current text)

715.2 Fire-resistance-rated glazing. Fire-resistance-rated glazing tested as part of a fire-resistance-rated wall assembly in accordance with ASTM E 119 or UL 263 and labeled in accordance with Section 703.5, shall be permitted in fire doors and fire window assemblies where tested and installed in accordance with their listings and shall not otherwise be required to comply with this section.

3. Add new text as follows:

715.3 Marking Fire-Rated Glazing Assemblies Fire-rated glazing assemblies shall be marked in accordance with Tables 715.3, 715.5, and 715.6.

715.3.1 Fire-rated glazing that exceeds the code requirements. Fire-rated glazing assemblies marked as complying with hose stream requirements (H) shall be permitted in applications that do not require compliance with hose stream requirements. Fire-rated glazing assemblies marked as complying with temperature rise requirements (T) shall be permitted in applications that do not require compliance with temperature rise requirements. Fire-rated glazing assemblies marked with ratings (XXX) that exceed the ratings required by this code shall be permitted.

Table 715.3
Marking Fire-Rated Glazing Assemblies

Fire Test Standard	Marking	Definition of Marking
ASTM E119 or UL 263	W	Meets wall assembly criteria.
NFPA 257 or UL 9	OH	Meets fire window assembly criteria including the hose stream test.
NFPA 252 or UL 10B or UL 10C	D	Meets fire door assembly criteria.
	H	Meets fire door assembly "Hose Stream" test.
	T	Meets to 450° F temperature rise criteria for 30 minutes
	XXX	The time in minutes of the fire resistance or fire protection rating of the glazing assembly

~~715.3~~ **715.4 Alternate methods for determining fire-protection.** (No change to current text)

~~715.4~~ **715.5 Fire door and shutter assemblies.** (No change to current text)

Exceptions:

(Exceptions to remain unchanged)

~~715.4.1~~ **715.5.1 Side hinged or pivoted swinging doors.** (No change to current text)

~~715.4.2~~ **715.5.2 Other types of assemblies.** (No change to current text)

~~715.4.3~~ **715.5.3 Door assemblies in corridors and smoke barriers.** Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in corridor walls or smoke barrier walls having a fire-

resistance rating in accordance with Table ~~715.4~~ 715.5 shall be tested in accordance with NFPA 252, UL 10B or UL 10C without the hose stream test.

Exceptions:

(Exceptions to remain unchanged)

~~715.4.3.1~~ 715.5.3.1 Smoke and draft control. *(No change to current text)*

~~715.4.3.2~~ 715.5.3.2 Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire-protection rating of 20-minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lites and sidelites, shall be tested in accordance with NFPA 257 or UL 9, including hose stream test, in accordance with Section 715.5.

715.5.4 Door assemblies in other fire partitions. Fire door assemblies required to have a minimum fire-protection rating of 20-minutes where located in other fire partitions having a fire resistance rating of 0.5-hour in accordance with Table 715.4 shall be tested in accordance with NFPA 252, UL 10B or UL 10C with the hose stream test.

(Renumber subsequent sections)

~~715.4.4~~ 715.5.5 Doors in exit enclosures and exit passageways. Fire door assemblies in exit enclosures and exit passageways shall have a maximum transmitted temperature ~~end point~~ rise of not more than 450F degrees (250C degrees) above ambient at the end of 30 minutes of standard fire test exposure.

Exception: The maximum transmitted temperature rise is not required ~~limited~~ in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

~~715.4.4.1~~ 715.5.5.1 Glazing in doors. Fire protection rated glazing shall be limited to 100-sq. inches (0.065 m²). Fire protection rated glazing in excess of 100-sq. inches (0.065 m²) shall be permitted in fire door assemblies when unless the glazing has been tested as components of the door assemblies and not as glass lights, and shall have has a maximum transmitted temperature rise of 450F degrees (250C degrees) in accordance with Section ~~715.4.4~~ 715.5.5.

Exception: The maximum temperature rise is not ~~required~~ limited in buildings equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

~~715.4.5~~ 715.5.6 Fire door frames with transom lights and sidelights. Door frames with transom lights, sidelights, or both shall be permitted where a ¾-hour fire protection rating or less is required in accordance with Table 715.4. ~~Where a fire protection rating exceeding ¾ hour is required in accordance with Table 715.4,~~ Fire door frames with transom lights, sidelights, or both, ~~shall be permitted where installed with fire-resistance rated glazing tested as an assembly in accordance with ASTM E119 or UL 263~~ shall be permitted where a fire-protection rating exceeding ¾-hour is required in accordance with Table 715.4.

~~715.4.6~~ 715.5.7 Labeled protective assemblies. *(No change to current text)*

~~715.4.6.1~~ 715.5.7.1 Fire door labeling requirements. Fire doors shall be labeled showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or trademark of the third-party inspection agency, the fire protection rating and, where required for fire doors in exit enclosures and exit passageways by Section ~~715.4.4~~ 715.5.5, the maximum transmitted temperature point. Smoke and draft control doors complying with UL 1784 and shall be labeled as such and shall also comply with Section ~~715.4.6.3~~ 715.5.7.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

~~715.4.6.1.1~~ 715.5.7.1.1 Light kits, louvers and components. Listed light kits and louvers and their required preparations shall be considered as part of the labeled door where such installations are done under the listing program of the third-party agency. Where tested for such use, fire doors and door assemblies shall be permitted to consist of components, including glazing, vision light kits and hardware that are labeled, listed or classified by different third party agencies.

~~715.4.6.2~~ 715.5.7.2 Oversized doors. *(No change to current text)*

~~715.4.6.3~~ 715.5.7.3 Smoke and draft control door labeling requirements. *(No change to current text)*

~~715.4.7~~ 715.5.8 Glazing material. *(No change to current text)*

~~715.4.7.1~~ 715.5.8.1 Size limitations. Fire-protection-rated glazing ~~used in fire doors~~ shall comply with the size limitations of NFPA 80, and as provided in sections 715.5.8.1.1 and 715.8.1.2.

Exceptions:

715.5.8.1.1 Fire-resistance-rated glazing in door assemblies in fire walls and fire barriers rated greater than 1-hour. Fire-resistance-rated glazing tested to ASTM E119 or UL 263 and NFPA 252, UL10B or UL 10C shall be permitted in fire door assemblies located in fire walls and in fire barriers in accordance with Table 715.4 to the maximum size tested and in accordance with their listings.

715.5.8.1.2 Fire-protection-rated glazing in door assemblies in fire walls and fire barriers rated greater than 1-hour. Fire-protection-rated glazing shall be prohibited in fire walls and fire barriers except as provided in 715.5.8.1.2.1 and 715.5.8.1.2.2

715.5.8.1.2.1 Horizontal exits. ~~4. Fire-protection-rated glazing in fire doors located in fire walls shall be prohibited except where serving a fire door in a horizontal exit, a self-closing swinging door shall be permitted to have a vision panel of not more than 100 square inches without a dimension exceeding 10 inches. Fire-protection-rated glazing shall be permitted as vision panels in self-closing swinging fire door assemblies serving as horizontal exits in fire walls where limited to 100 square inches with no dimension exceeding 10 inches.~~

715.5.8.1.2.2 Fire barriers. ~~2. Fire-protection-rated glazing shall not be installed in fire doors shall be permitted in fire doors having a 1-1/2-hour fire protection rating intended for installation in fire barriers, where limited to 100 square inches, unless the glazing is not more than 100 square inches in area.~~

~~715.4.7.2~~ 715.5.8.2 Exit and elevator protectives. *(No change to current text)*

~~715.4.7.3~~ 715.5.8.3 Labeling. *(No change to current text)*

~~715.4.7.3.1~~ 715.5.8.3.1 Identification. *(No change to current text)*

~~715.4.7.4~~ 715.5.8.4 Safety glazing. *(No change to current text)*

(Renumber subsequent sections)

~~715.5.8~~ 715.6.8 Interior fire window assemblies. Fire-protection-rated glazing used in fire window assemblies located in fire partitions and fire barriers shall be limited to use in assemblies with a maximum fire-resistance rating of 1-hour in accordance with this section.

~~715.5.8.1~~ 715.6.8.1 Where ¾-hour fire-protection window assemblies permitted. Fire-protection-rated glazing requiring 45 minute opening protection in accordance with Table ~~715.5~~ 715.6 shall be limited to fire partitions designed in accordance with Section 709 and fire barriers utilized in the applications set forth in Sections 707.3.6 and 707.3.8 where the fire resistance rating does not exceed 1 hour. Fire-resistance-rated glazing assemblies tested in accordance with ASTM E119 or UL 263 shall not be subject to the limitations of this section.

~~715.5.8.2~~ 715.6.8.2 Area limitations. The total area of windows shall not exceed 25 percent of the area of a common wall with any room.

715.6.8.3. Where 1/3- hour fire-protection window assemblies permitted. Fire-protection-rated glazing shall be permitted in window assemblies tested to NFPA 257 or UL 9 in smoke barriers and fire partitions requiring 1/3-hour opening protection in accordance with Table 715.6

**TABLE 715.5-715.6
FIRE WINDOW ASSEMBLY FIRE-PROTECTION RATINGS**

TYPE OF <u>WALL</u> ASSEMBLY	REQUIRED <u>WALL</u> ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE RATED GLAZING MARKING
Interior walls	All	NP ^a	<u>W-xxx^b</u>
Fire walls	>1	NP ^a	<u>W-xxx^b</u>
Fire barriers	1	NP ^a	<u>W-xxx^b</u>
Incidental use areas (707.3.6), Mixed occupancy separations(707.3.8)	1	$\frac{3}{4}$	OH-45 or W-60
Fire partitions	1 0.5	$\frac{3}{4}$ 1/3	OH-45 or W-60 OH-20 or W-30
Smoke barriers	1	$\frac{3}{4}$	OH-45 or W-60
Exterior walls	>1 1 0.5	1-1/2 $\frac{3}{4}$ 1/3	OH-90 or W-XXX ^b OH-45 or W-60 OH-20 or W-30
Party wall	All	NP	Not Applicable

NP – Not Permitted

a. Not permitted except fire resistance rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 715.2

b. xxx = The fire rating duration period in minutes, which shall be equal to the fire resistance rating required for the wall assembly.

715.5.9 715.6.9 Labeling. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required Section 715.5.9.1 Table 715.6 that shall be issued by an approved agency and shall be permanently affixed to the glazing.

715.5.9.1 Identification. For fire protection-rated glazing, the label shall bear the following two-part identifiers: “OH—XXX.” “OH” shall indicate that the glazing has been tested to and meets both the fire protection and the hose-stream requirements of NFPA 257 or UL 9. “XXX” shall indicate the fire protection rating period, in minutes, that was tested.

**TABLE 715.4-715.5
FIRE DOOR AND FIRE SHUTTER PROTECTION RATINGS
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**

TYPE OF ASSEMBLY	REQUIRED <u>WALL</u> ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	<u>DOOR</u> <u>VISION</u> <u>PANEL</u> <u>SIZE</u>	<u>FIRE</u> <u>RATED</u> <u>GLAZING</u> <u>MARKING</u> <u>DOOR</u> <u>VISION</u> <u>PANEL</u> ^a	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					<u>Fire</u> <u>protection</u>	<u>Fire</u> <u>resistance</u>	<u>Fire</u> <u>protection</u>	<u>Fire</u> <u>resistance</u>
Fire walls and fire barriers having a required fire resistance rating greater than 1 hour	4	3	<u>Not</u> <u>Permitted</u>	<u>Not</u> <u>Permitted</u>	<u>Not</u> <u>permitted</u>	<u>4</u>	<u>Not</u> <u>Permitted</u>	<u>W-240</u>
	3	3 ^a	<u>Not</u> <u>Permitted</u>	<u>Not</u> <u>Permitted</u>	<u>Not</u> <u>Permitted</u>	<u>3</u>	<u>Not</u> <u>Permitted</u>	<u>W-180</u>
	2	1-1/2	<u>100 sq. in.^c</u>	<u><=100 sq.in.</u> <u>= D-H-90</u> <u>>100 sq.in.=</u> <u>D-H-W-90</u>	<u>Not</u> <u>Permitted</u>	<u>2</u>	<u>Not</u> <u>Permitted</u>	<u>W-120</u>
				<u><=100 sq.in.</u>				

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL ^e	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
<u>Shaft, exit enclosures and exit passageway walls</u>	1-1/2	1-1/2	100 sq. in. ^c	= D-H- 90	<u>Not Permitted</u>	1-1/2	<u>Not Permitted</u>	<u>W-90</u>
	2	1-1/2	100 sq. in. ^c _g	>100 sq.in.= D-H-W-90 ≤100 sq.in. = D-H-90 ≤100 sq.in.= D-H- T-or D- H-T-W-90	<u>Not Permitted</u>	2	<u>Not Permitted</u>	<u>W-120</u>
Fire barriers having a required fire-resistance rating of 1 hour: Shaft, exit enclosure and exit passageway walls	1	1	100 sq. in. ^c _g	≤100 sq.in. = D-H-60 >100 sq.in.= D-H- T-60 or D-H-T-W-60	<u>Fire protection</u> <u>Not Permitted</u>	<u>Fire resistance</u> 1	<u>Fire protection</u> <u>Not Permitted</u>	<u>Fire resistance</u> <u>W-60</u>
Other fire barriers	1	3/4	<u>Maximum size tested</u>	<u>D-H-NT-45</u>	<u>Fire protection</u> 3/4		<u>D-H-NT-45</u>	
	1	1/3 ^b	<u>Maximum size tested</u>	<u>D- 20</u>	3/4 ^b		<u>D-H-OH-45</u>	
Fire partitions:: Corridor walls	0.5	1/3 ^b	<u>Maximum size tested</u>	<u>D-20</u>	1/3		<u>D-H- OH-20</u>	
Other fire partitions	1	3/4	<u>Maximum size tested</u>	<u>D-H-45</u>	3/4		<u>D-H-45</u>	
	0.5	1/3		<u>D-H--20</u>	1/3		<u>D-H-20</u>	

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL ^a	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Exterior walls	3	1-1/2	100 sq. in. ^c	≤ 100 sq.in. = D-H-90	Not Permitted	<u>3</u>	Not Permitted	W-180
	2	1-1/2	100 sq. in. ^c	≤ 100 sq.in. = D-H-90	Not Permitted	<u>2</u>	Not Permitted	W-120
				> 100 sq.in. = D-H-W-90				
				≤ 100 sq.in. = D-H-90				
				> 100 sq.in.= D-H-W-90				
				D-H- 45				
			Maximum size tested		Fire Protection		D-H-NT-45	
	1	3/4			3/4			
Smoke barriers	1	1/3 ^b	Maximum size tested	D-20	Fire protection		D-H-OH-45	
					3/4			

- a. Two doors, each with a fire protection rating of 1-1/2 hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
- b. For testing requirements, see Section 715.5.3 ~~715.4.3~~.
- c. Fire resistance rated glazing tested to ASTM E119 per section 715.2 shall be permitted, in the maximum size tested.
- d. Except where the building is equipped throughout with an automatic sprinkler and the fire-rated glazing meets the criteria established in Section 715.5.5.1.
- e. Under the column heading "Fire rated glazing marking door vision panel", W refers to the fire-resistance rating of the glazing, not the frame.

Reason:

(Heilstedt) The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Labeling of Fire Rated Glazing". The scope of the activity is noted as:

Identify root causes of problems selecting, specifying, installing, and inspecting fire protective and fire resistive glazing and other assembly components including the frames. Propose identification requirements and other related code changes.

The marking provisions of the IBC applicable to fire rated glazing ("Marking Provisions") were first adopted as a part of Chapter 7 of the IBC in 2004. In the last development cycle, the Fire Safety Committee recommended that the ICC Board consider submitting the marking of fire rated glazing to the Code Technology Committee (CTC) as an area of study since repeat proposals to change the Marking Provisions were being submitted on a regular basis.

The ICC Board referred the Marking Provisions to the CTC as an area of study and a Study Group (SG), Chaired Carl Wren, was formed. The SG consisted of both fire and building code officials; architects; engineers; fire rated window and door manufacturers; primary fire rated glazing manufacturers; and a fire protection engineer. It was recognized by the SG that the existing marking system, as those marks were designated in product listings, was leading to fire protection products in applications not allowed by the IBC. After numerous meetings and a full hearing before the CTC, the SG and the CTC unanimously approved proposing these changes to the IBC's Marking Provisions.

The primary objective of the CTC in proposing these changes is to make the Marking Provisions of Chapter 7 easier to understand and enforce and to minimize the possibility that the system could result in confusion between fire protection rated products in applications where fire-resistance rated products meeting ASTM E 119 are permitted. The proposal includes the following changes:

1- Adds a new Table 715.3, to define and relate the various test standards for fire rated glazing to the designations used to mark fire rated glazing. A new definition of the term "fire rated glazing" would also be included.

2- While the designations "W," "OH," "D," "DT," "DH" and "XXX" used to mark fire rated glazing will remain as they were originally adopted in 2004, the marking of fire rated glazing in fire door assemblies (D) are simplified by deleting the NH designation (not hose stream tested) and the NT designation (not temperature rise tested). It is clarified that those designations correspond to test standards, not end uses. Tables 715.4 and 715.5 show the markings required for acceptance in specified applications.

3- All text provision used to define and relate test standards to marking designations are deleted in favor of including all of the required marking provisions in Tables 715.3, 715.4 and 715.5. This is intended to provide building and fire code officials with easy access to all of the information needed when inspecting fire window and fire door installations, including required marking designations.

4- In connection with removing many of the text provisions referring to the marking of fire rated glazing and the inclusion of all pertinent marking requirements in tables 715.4 and 715.5, a number of columns are added to those Tables. These new columns specify the required designations that the building and fire code officials will need to look for when inspecting fire rated glazing in the various categories of fire resistance rated walls, fire door assemblies and fire window assemblies identified in Tables 715.4 and 715.5.

5- The size limitation provisions starting at 715.4.6.1 are re-written to eliminate the use of "exceptions" and thus clarify them - no substantive changes to these provisions are intended.

6- It was determined that Table 715.4 inadvertently omitted reference to 1 1/2 hour doors in shaft, exit enclosures and exit passageway walls and this proposal adds that reference to the Table.

7- The Marking Provisions have been written to clarify that fire protection rated glazing tested to NFPA 257 and used in transoms and sidelites in certain fire barriers and corridor walls will also have to be tested to NFPA 252 since they are a part of a door assembly. Accordingly, these glazings are marked D-H-OH-XXX.

(O'Keefe) The marking provisions of the IBC applicable to fire rated glazing ("Marking Provisions") were first adopted as a part of Chapter 7 of the IBC in 2004. In the last development cycle, the Fire Safety Committee recommended that the ICC Board consider submitting the marking of fire rated glazing to the Code Technology Committee (CTC) as an area of study since repeat proposals to change the Marking Provisions were being submitted on a regular basis, because of confusion and misuse of products being marked by individual manufacturers under the current system.

The ICC Board referred the Marking Provisions to the CTC as an area of study and a Study Group (SG), Chaired by Carl Wren, was formed. The SG consisted of both fire and building code officials; architects; engineers; fire rated window and door manufacturers; primary fire rated glazing manufacturers; and a fire protection engineer.

It was recognized by the SG that the existing marking system, as those marks were designated in product listings, was leading to the misuse of fire protection products in applications not allowed by the IBC. It was also recognized that "T" marking were being applied by some manufacturers to designate use of fire protection products in temperature rise doors that in fact did not limit temperature rise and should not be so marked. Attached as support are documents submitted to the CTC Labeling Study Group that show the confusion in listings showing end-use marks that are not permitted by the IBC. After numerous meetings and a full hearing before the CTC, the SG and the CTC unanimously approved proposing these changes to the IBC's Marking Provisions.

The primary objective of the CTC in proposing these changes is to make the Marking Provisions of Chapter 7 easier to understand and enforce and to minimize the possibility that the system could result in confusion between fire protection rated products in applications where fire-resistance rated products meeting ASTM E 119 are required. The proposal includes the following changes:

1- Adds a new Table 715.3, to define and relate the various test standards for fire rated glazing to the designations used to mark fire rated glazing. A new definition of the term "fire rated glazing" would also be included.

2- While the designations "W," "OH," "D," "DT," "DH" and "XXX" used to mark fire rated glazing will remain as they were originally adopted in 2004, the marking of fire rated glazing in fire door assemblies (D) are simplified by deleting the NH designation (not hose stream tested) and the NT designation (not temperature rise tested). It is clarified that those designations correspond to compliance with test standards only, not that they are permitted for end uses. Tables 715.4 and 715.5 show the markings required for acceptance in specified applications.

3- All text provision used to define and relate test standards to marking designations are deleted in favor of including all of the required marking provisions in Tables 715.3, 715.4 and 715.5. This is intended to provide building and fire code officials with easy access to all of the information needed when inspecting fire window and fire door installations, including required marking designations.

4- In connection with removing many of the text provisions referring to the marking of fire rated glazing and the inclusion of all pertinent marking requirements in tables 715.4 and 715.5, a number of columns are added to those Tables. These new columns specify the required designations that the building and fire code officials will need to look for when inspecting fire rated glazing in the various categories of fire resistance rated walls, fire door assemblies and fire window assemblies identified in Tables 715.4 and 715.5.

5- The size limitation provisions starting at 715.4.6.1 are re-written to eliminate the use of "exceptions" and thus clarify them - no substantive changes to these provisions are intended.

6- It was determined that Table 715.4 inadvertently omitted reference to 1 1/2 hour doors in shaft, exit enclosures and exit passageway walls and this proposal adds that reference to the Table.

7- The Marking Provisions have been written to clarify that fire protection rated glazing tested to NFPA 257 and used in transoms and sidelites in certain fire barriers and corridor walls will also have to be tested to NFPA 252 since they are a part of a door assembly. Accordingly, these glazings are marked D-H-OH-XXX. It has also been clarified where fire rated glazing products must be tested to and marked as complying with ASTM E119 in sidelight and transom assemblies in openings requiring greater than ¾-hour protection, and for glazing sizes exceeding 100 sq. inches in doors rated 1-hour and greater.

8. Section 715.4.6.1 was revised to clarify labeling of door assembly components, and to recognize that door assemblies are permitted to have components labeled by different test agencies.

Bibliography: Examples of UL Listing Markings submitted to CTC Labeling Study Group.

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

ICCFILENAME: HEILSTEDT-FS3-702

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the reorganization of the glazing provisions and the clarity of the fire rated glazing marking provisions. The revised provisions will give the code official all they need to determine if glazing is being used in the right locations.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Bob Eugene, representing Underwriters Laboratories, Inc., requests Disapproval.

Commenter's Reason: We applaud the CTC for attempting to clarify glazing requirements in Section 715. A copy of how the finished Section 715 would look with the changes was not provided in the monograph or to the code development committee. When we literally cut and pasted the proposal together, a number of correlation errors and misnumbered sections were found. These errors and inconsistencies cannot be easily corrected with a public comment, so we reluctantly feel this proposal should be disapproved. Some, but not all, of the problems we found include the following:

1. Section 715.2 states that fire-resistance rated glazing shall not otherwise be required to comply with this section (Section 715), but the proposal then introduces new requirements for fire-resistance rated glazing in section 715.5.8.1.1, 715.6.8.1, Table 715.3 and Table 715.5. This is a conflict.
2. The glazing marking requirements in table 715.3 are confusing and do not correlate well with glazing marking requirements in section 715.5.8.3.1 (formerly section 715.4.7.3) and in Table 715.6 (formerly 715.5). Manufacturers have already changed their markings to meet the requirements established in the 2006 code. This will require manufacturers to change the markings again. A mixture of the new and old markings in the field will create confusion during inspections.
3. Table 715.3 includes a column with the "Definition of Marking", which seems more like code commentary language and not mandatory code language.
4. Section 101.3 clearly states that the code includes the minimum requirements to be met. It is unnecessary, and bad precedence, to include section 715.3.1 titled "Fire rated glazing that exceeds code requirements". For example, there is no need to indicate that 90-minute rated glazing can be used in a 45-minute application. If it is done here then do we need to repeat this concept throughout the code? This is better suited for code commentary, if there is considered a need to communicate that the minimum code requirements can be exceeded.
5. We found what appeared to be incorrect section references in the following new sections: 715.5.3.2, Table 715.4, 715.4, and 715.5.8.
6. Section 715.5.8.1 is titled "Size limitations" and indicates, "Fire-protection rated glazing shall comply with 715.5.8.1.1 and 715.5.8.1.2. However, the new Section 715.5.8.1.1 covers "fire-resistant" glazing, not "fire-protection" glazing. This is outside the scope of this section.
7. The proposal included a numbering system that included five decimal points (e.g. section 715.5.8.1.2.1) which is confusing and may not comply with ICC guidelines. It would be much clearer to organize the sections in a fashion that avoids this level of complexity. This would have been more evident if a final version of how the revised code would look was provided.
8. Section 715.4.6.1.1 suggests components of the door assembly may be labeled, listed or classified by different third party agencies *where tested for such use*. How is an AHJ to know if these components were tested for such use? It would be more appropriate to state when *listed and labeled for such use* by different third party agencies.
9. This marking scheme appears to set a precedent that may allow glazing that does not meet hose or temperature criteria to be installed in applications where it is required.

Again, we applaud the CTC for their work on this, but more work and additional review is needed before this proposal is ready for adoption in the code.

Final Action: AS AM AMPC_____ D

FS113–09/10 **716.5.3 (IMC 607.5.5)**

Proposed Change as Submitted

Proponent: Dave Frable, US General Services Administration, representing the US General Services Administration

Revise as follows:

716.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *approved* fire and smoke *dampers* installed in accordance with their listing.

Exceptions:

1. *Fire dampers* are not required at penetrations of shafts where:
 - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
 - 1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly; or
 - 1.3. Ducts are used as part of an *approved* smoke control system designed and installed in accordance with Section 909 and where the *fire damper* will interfere with the operation of the smoke control system; or

- 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, *smoke dampers* are not required at penetrations of shafts where:
 - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.187-inch (0.4712 mm) (No. 26 gage);
 - 2.2. The subducts extend at least 22 inches (559 mm) vertically; and
 - 2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. *Smoke dampers are not required at penetrations of shafts in Group B occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 where the air in ducts continues to move and the air handling system is configured to prevent recirculation of return or exhaust air upon fire conditions.*
- 4.3. *Smoke dampers* are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
- 5.4. *Smoke dampers* are not required at penetrations of shafts where ducts are used as part of an *approved* mechanical smoke control system designed in accordance with Section 909 and where the *smoke damper* will interfere with the operation of the smoke control system.
- 6.5. *Fire dampers* and *combination fire/smoke dampers* are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the *International Mechanical Code*.

Reason: The intent of this code change is to acknowledge that Group B occupancies protected by an operational fire sprinkler system where the air in ducts continues to move and the air handling system is configured to prevent recirculation of return or exhaust air upon fire conditions provides an acceptable level of safety for building occupants and therefore does not warrant the need for the installation of smoke dampers at all penetrations of shaft duct/air transfer opening penetrations. This code change proposes to remove the current requirement for smoke dampers in shaft wall penetrations, but leave fire dampers in place. This is because smoke travel through ducted ventilation shafts has not been a contributing factor to fire deaths in sprinklered Group B occupancies in recent history. Note: all high-rise office fires where smoke spread has been cited as a problem have either occurred in unsprinklered buildings, partially sprinklered buildings or buildings subject to terrorist attacks. Fire sprinklers control the burning rate (and thus limit smoke production) and maintain near ambient temperature which limits the buoyancy forces that drive smoke to the shafts where stack effect may cause smoke spread to other floors. It is also widely accepted that operating fire sprinklers will prevent room flashover and full floor fires, and will limit the size of room fires. The reliability of sprinklers should not be called into question as an NFPA report issued in 2005 indicated that automatic fire sprinklers successfully operating in reported structural fires was an exemplary 93%. This same report indicated that two-thirds of the automatic fire sprinkler system failures were because the automatic fire sprinkler systems were shut off, an unlikely scenario where jurisdictions adopt the IBC since the IBC requires the supervision of the automatic fire sprinkler system. Hence, the successful operation of an automatic fire sprinkler system designed and installed in compliance with the IBC requirements could be reasonably estimated at 98% (or better, since NFPA indicated that a number of fire incidents extinguished by sprinklers may not even be reported).

In addition to fire sprinklers, these buildings have a number of additional safeguards in place. For example, the IMC and NFPA 90A both require duct smoke detectors to shut off of air handling equipment to minimize the potential of smoke spread through ventilation ducts. Also, the 2009 edition of the IBC now requires a number of additional safety enhancements such as: two way communication at elevator landings; an increase of 50% in egress capacity for exit stairs in all buildings; increased cohesive/adhesive bond strength for sprayed fire resistive materials; exit stair path markings in all high rise buildings; fire service access elevators for buildings greater than 120 feet; and an additional stair and redundant sprinkler risers for buildings greater than 420 feet, etc.

Given the aforementioned protection coupled with the excellent track record for sprinklered B occupancies, and keeping in mind that the purpose of the IBC is to provide minimum requirements to safeguard occupants of buildings from fire and other hazards attributed to the built environment based on sound technical documentation, we strongly believe that it is unreasonable to require smoke dampers in shaft duct/air transfer opening penetrations as an additional means for slowing or stopping the spread of smoke throughout a building.

Note: Though not relevant to this code change, NFPA 90A does not require smoke dampers in shaft walls regardless of whether the building is sprinklered. Also note that some jurisdictions (e.g., Commonwealth of Virginia) are granting similar modifications to the requirement for smoke dampers in exhaust ducts because it is impractical to comply with the IBC and there is no demonstrated need.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: Ftable-FS1-716.5.3

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that the sprinkler threshold was confusing as written with respect to the area to be sprinklered throughout; the Group B area or the entire building. Further, perhaps this proposal would be better located under current exception #2. Lastly, the language "air.....moves" and "prevent recalculation" is confusing as it seems to contradict.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.
2010 ICC FINAL ACTION AGENDA

Public Comment:

Dave Frable, US General Services Administration, representing the US General Services Administration, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

716.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *approved* fire and smoke *dampers* installed in accordance with their listing.

Exceptions:

1. *Fire dampers* are not required at penetrations of shafts where:
 - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
 - 1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly; or
 - 1.3. Ducts are used as part of an *approved* smoke control system designed and installed in accordance with Section 909 and where the *fire damper* will interfere with the operation of the smoke control system; or
 - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, *smoke dampers* are not required at penetrations of shafts where:
 - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.187-inch (0.4712 mm) (No. 26 gage);
 - 2.2. The subducts extend at least 22 inches (559 mm) vertically; and
 - 2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. *Smoke dampers* are not required at penetrations of shafts in Group B occupancies that are equipped throughout the entire building with an automatic sprinkler system in accordance with Section 903.3.1.1 where the air in ducts continues to move and the air handling system is configured to prevent recirculation of return or exhaust air upon fire conditions, and equipped with an exhaust fan at the upper terminus of the shaft to maintain an upward airflow to the outside that meets one of the following
 - 3.1. The exhaust fan is powered continuously in accordance with the provisions of Section 909.11.
 - 3.2. The exhaust fan is powered upon operation of any fire alarm system initiating device and once operated, the exhaust fan is powered continuously in accordance with the provisions of Section 909.11.
4. *Smoke dampers* are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
5. *Smoke dampers* are not required at penetrations of shafts where ducts are used as part of an *approved* mechanical smoke control system designed in accordance with Section 909 and where the *smoke damper* will interfere with the operation of the smoke control system.
6. *Fire dampers* and *combination fire/smoke dampers* are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the *International Mechanical Code*.

Commenter's Reason: The intent of this code change is to acknowledge that Group B occupancies protected by an operational fire sprinkler system throughout the buildings where also equipped with an exhaust fan in the shaft equipped with two sources of power that is capable of maintaining an upward airflow (either at all times or upon activation of the fire alarm system) provides an acceptable level of safety for building occupants and therefore does not warrant the need for the installation of smoke dampers at all penetrations of shaft duct/air transfer opening penetrations. This code change proposes to remove the current requirement for smoke dampers in shaft wall penetrations, but leave fire dampers in place. This is because smoke travel through ducted ventilation shafts has not been a contributing factor to fire deaths in sprinklered Group B occupancies in recent history. Note: all high-rise office fires where smoke spread has been cited as a problem have either occurred in unsprinklered buildings, partially sprinklered buildings or buildings subject to terrorist attacks. Fire sprinklers control the burning rate (and thus limit smoke production) and maintain near ambient temperature which limits the buoyancy forces that drive smoke to the shafts where stack effect may cause smoke spread to other floors

It is also widely accepted that operating fire sprinklers will prevent room flashover and full floor fires, and will limit the size of room fires. The reliability of sprinklers for office buildings should not be called into question as an NFPA report issued in 2009 indicated that automatic wet-pipe fire sprinklers successfully operating in reported structural fires was an exemplary 96%. This same report indicated that two thirds of the automatic fire sprinkler system failures were because the automatic fire sprinkler systems were shut off, an unlikely scenario where jurisdictions adopt the IBC since the IBC requires the supervision of the automatic fire sprinkler system. Hence, the successful operation of an automatic fire sprinkler system designed and installed in compliance with the IBC requirements could be reasonably estimated at 98% (or better, since NFPA indicated that a number of fire incidents extinguished by sprinklers may not even be reported). The report also indicated that in office buildings with wet-pipe sprinklers that operated were 99% effective.

In addition to fire sprinklers, these buildings have a number of additional safeguards in place. For example, the IMC and NFPA 90A both require duct smoke detectors to shut off of air handling equipment to minimize the potential of smoke spread through ventilation ducts. Also, the 2009 edition of the IBC now requires a number of additional safety enhancements such as: two way communication at elevator landings; an increase of 50% in egress capacity for exit stairs in all buildings; increased cohesive/adhesive bond strength for sprayed fire resistive materials; exit stair path markings in all high rise buildings; fire service access elevators for buildings greater than 120 feet; and an additional stair and redundant sprinkler risers for buildings greater than 420 feet, etc.

This code change addresses the technical issues raised by the Fire Safety Committee. Regarding where best located in the code, this change is being proposed as a new exception 3, instead of being tacked on to existing exception 2, because it is only being offered to B occupancies and it does require a 22 inch subduct that is required by exception 2 given the latter is not common practice for return air handling systems in Group B occupancies.

Given the aforementioned protection coupled with the excellent track record for sprinklered B occupancies, and keeping in mind that the purpose of the IBC is to provide minimum requirements to safeguard occupants of buildings from fire and other hazards attributed to the built environment

based on sound technical documentation, we strongly believe that it is unreasonable to require smoke dampers in shaft duct/air transfer opening penetrations as an additional means for slowing or stopping the spread of smoke throughout a building.

Note: Though not relevant to this code change, NFPA 90A does not require smoke dampers in shaft walls regardless of whether the building is sprinklered. Also note that some jurisdictions (e.g., Commonwealth of Virginia) are granting similar modifications to the requirement for smoke dampers in exhaust ducts because it is impractical to comply with the IBC and there is no demonstrated need.

Final Action: AS AM AMPC D

FS118-09/10-PART I

717.2.1

Proposed Change as Submitted

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Cellulose Insulation Manufacturers Association (CIMA)

PART I – IBC FIRE SAFETY

Revise as follows:

717.2.1 Fireblocking materials. Fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 0.719-inch (18.3 mm) wood structural panels with joints backed by 0.719-inch (18.3 mm) wood structural panels.
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool, mineral fiber or other approved materials installed in such a manner as to be securely retained in place.
8. Spray-applied cellulose insulation installed as tested for the specific application

Reason: This code change simply adds a new Item 8 to the list of fireblocking materials to recognize spray-applied cellulose insulation as a suitable fireblocking material. It qualifies the use of spray-applied cellulose insulation by indicating that it must be installed as tested for the specific application. The Cellulose Insulation Manufacturers Association (CIMA) has conducted a variety of fireblocking fire tests based on the ASTM E119 time-temperature fire curve exposure to demonstrate that spray-applied cellulose insulation will serve as an adequate fireblocking material.

It should be noted that spray-applied cellulose insulation is different than loose-fill cellulose insulation in that it is sprayed in place using a nozzle under pressure with a small quantity of water added to the insulation to activate the adhesive that, when dried, holds the cellulose insulation in place. Thus, it can be exposed in vertical applications, as well as horizontal applications. Furthermore, it will remain in place after it has dried without any need to restrain or otherwise contain or enclose it.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: Thornberry-FS4-717.2.1; RB-1-R302.11.1

Public Hearing Results

PART I- IBC FIRE SAFETY

Committee Action:

Approved as Modified

Modify the proposal as follows:

717.2.1 Fireblocking materials. Fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 0.719-inch (18.3 mm) wood structural panels with joints backed by 0.719-inch (18.3 mm) wood structural panels.
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool, mineral fiber or other approved materials installed in such a manner as to be securely retained in place.
8. ~~Spray-applied~~ cellulose insulation installed as tested for the specific application

Committee Reason: The committee agreed that cellulose insulation used as fireblocking has been substantiated as another valid option and which allows for current construction practices. The modification allows for more types of cellulose insulation to be used as fireblocking material.

Assembly Action:

None

Individual Consideration Agenda

These items are on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Ali M. Fattah, PE, City of San Diego, Development Services Department, representing San Diego Area Chapter of ICC, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

Part I – IBC-Fire Safety

717.2.1 Fireblocking materials. Fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 0.719-inch (18.3 mm) wood structural panels with joints backed by 0.719-inch (18.3 mm) wood structural panels.
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool, mineral fiber or other approved materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation installed as ~~tested~~ listed for the specific application.

Commenter's Reason: Requiring the Code Official to review test reports will place an undue burden. The product listing will place conditions of application such as density, material composition, etc.

Public Comment 2:

Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA), requests Disapproval.

Commenter's Reason: In the IBC, Fireblocking is installed to resist the free passage of flame to other areas of the building through concealed spaces. The ASTM E119 Standard does not contain any specific test configurations for evaluating fireblocking. While the testing submitted by CIMA may be based on exposure to an ASTM E119 time-temperature curve, the details of how the concealed space is protected, and how the fireblocking materials are installed, is not described. More importantly, the proposed code change language itself does not describe the need to conduct any testing in accordance with an ASTM E119 time-temperature curve, nor does it indicate how the fireblocking is to be installed in the assembly, or what, if any, pass/fail criterion are used to decide if the material has performed successfully. Presumably an ASTM E84 test could also be used to conduct an evaluation of "... installed as tested for the specific application", even though it is a completely different fire exposure, and not related to an ASTM E119 test. At a minimum, a specific test standard, or fire exposure condition, needs to be defined within this new requirement.

Consumer Product Safety Commission ("CPSC") regulates cellulose insulation as a recognized fire threat. The regulation is codified as part of the Code of Federal Regulations (16 C.F.R. § 1404). Indeed, the CPSC states the following in its codified regulations:

Based on available fire incident information, engineering analysis of the probable fire scenarios, and laboratory tests, the Consumer Product Safety Commission has determined that fire may occur where cellulose insulation is improperly installed too close to the sides or over the top of recessed electrical light fixtures, or installed too close to the exhaust flues from heat producing devices or apparatus such as furnaces, water heaters, and space heaters. These fires may result in serious injuries or deaths. Presently available information indicates that fires may occur where cellulose insulation is improperly installed even though the cellulose insulation complies with the Commission's amended interim standard for cellulose insulation. (16 C.F.R. § 1404.2)

To warn consumers and installers of this danger, the CPSC requires that manufacturers of cellulose insulation label all containers of cellulose with the following statement, using capital letters, CAUTION POTENTIAL FIRE HAZARD. (16 C.F.R. § 1404.4(a)) The CPSC also imposes additional warning language on the manufacturers of cellulose insulation.

Furthermore, the modification to permit loose-fill cellulose insulation to be used as a fireblocking material is not justifiable. Even the proponent noted in their reason statement that spray-applied cellulose insulation is different than loose-fill cellulose insulation in that it is sprayed in place using a nozzle under pressure with a small quantity of water added to the insulation to activate the adhesive that, when dried, holds the cellulose insulation in place. Thus, it can be exposed in vertical applications, as well as horizontal applications. Furthermore, it will remain in place after it has dried without any need to restrain or otherwise contain or enclose it. There is no such assurance with loose-fill cellulose insulation.

Final Action: AS AM AMPC____ D

FS118-09/10-PART II

IRC R302.11.1

Proposed Change as Submitted

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Cellulose Insulation Manufacturers Association (CIMA)

PART II – IRC BUILDING/ENERGY

Revise as follows:

R302.11.1 Fireblocking materials. Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3 mm) wood structural panels.
4. One thickness of ¾-inch (19.1 mm) particleboard with joints backed by ¾-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-quarter-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place.
8. Spray-applied cellulose insulation installed as tested for the specific application.

Reason: This code change simply adds a new Item 8 to the list of fireblocking materials to recognize spray-applied cellulose insulation as a suitable fireblocking material. It qualifies the use of spray-applied cellulose insulation by indicating that it must be installed as tested for the specific application. The Cellulose Insulation Manufacturers Association (CIMA) has conducted a variety of fireblocking fire tests based on the ASTM E119 time-temperature fire curve exposure to demonstrate that spray-applied cellulose insulation will serve as an adequate fireblocking material.

It should be noted that spray-applied cellulose insulation is different than loose-fill cellulose insulation in that it is sprayed in place using a nozzle under pressure with a small quantity of water added to the insulation to activate the adhesive that, when dried, holds the cellulose insulation in place. Thus, it can be exposed in vertical applications, as well as horizontal applications. Furthermore, it will remain in place after it has dried without any need to restrain or otherwise contain or enclose it.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: Thornberry-FS4-717.2.1; RB-1-R302.11.1

Public Hearing Results

PART II - IRC

Committee Action:

Approved as Modified

Modify proposal as follows:

R302.11.1 Fireblocking materials. Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3 mm) wood structural panels.
4. One thickness of ¾-inch (19.1 mm) particleboard with joints backed by ¾-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-quarter-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place.
8. ~~Spray-applied~~ Cellulose insulation installed as tested for the specific application.

Committee Reason: This change will increase the list of products that can be used for fire blocking and will permit more options. The modification removes the limitation to spray-applied cellulose.

Assembly Action:

None

Individual Consideration Agenda

These items are on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Ali M. Fattah, PE, City of San Diego, Development Services Department, representing San Diego Area Chapter of ICC, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

Part II – IRC Building/Energy

R302.11.1 Fireblocking materials. Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3mm) wood structural panels.
4. One thickness of ¾-inch (19.1 mm) particleboard with joints backed by ¾-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-quarter-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation installed as ~~tested~~ listed for the specific application.

Commenter's Reason: Requiring the Code Official to review test reports will place an undue burden. The product listing will place conditions of application such as density, material composition, etc.

Public Comment 2:

Tony Crimi, A.C. Consulting Solutions Inc, representing North American Insulation Manufacturers Association (NAIMA), requests Disapproval.

Commenter's Reason: In the IBC, Fireblocking is installed to resist the free passage of flame to other areas of the building through concealed spaces. The ASTM E119 Standard does not contain any specific test configurations for evaluating fireblocking. While the testing submitted by CIMA may be based on exposure to an ASTM E119 time-temperature curve, the details of how the concealed space is protected, and how the fireblocking materials are installed, is not described. More importantly, the proposed code change language itself does not describe the need to conduct any testing in accordance with an ASTM E119 time-temperature curve, nor does it indicate how the fireblocking is to be installed in the assembly, or what, if any, pass/fail criterion are used to decide if the material has performed successfully. Presumably an ASTM E84 test could also be used to conduct an evaluation of “.... installed as tested for the specific application”, even though it is a completely different fire exposure, and not related to an ASTM E119 test. At a minimum, a specific test standard, or fire exposure condition, needs to be defined within this new requirement.

Consumer Product Safety Commission (“CPSC”) regulates cellulose insulation as a recognized fire threat. The regulation is codified as part of the Code of Federal Regulations (16 C.F.R. § 1404). Indeed, the CPSC states the following in its codified regulations:

Based on available fire incident information, engineering analysis of the probable fire scenarios, and laboratory tests, the Consumer Product Safety Commission has determined that fire may occur where cellulose insulation is improperly installed too close to the sides or over the top of recessed electrical light fixtures, or installed too close to the exhaust flues from heat producing devices or apparatus such as furnaces, water heaters, and space heaters. These fires may result in serious injuries or deaths. Presently available information indicates that fires may occur where cellulose insulation is improperly installed even though the cellulose insulation complies with the Commission’s amended interim standard for cellulose insulation. (16 C.F.R. § 1404.2)

To warn consumers and installers of this danger, the CPSC requires that manufacturers of cellulose insulation label all containers of cellulose with the following statement, using capital letters, CAUTION POTENTIAL FIRE HAZARD. (16 C.F.R. § 1404.4(a)) The CPSC also imposes additional warning language on the manufacturers of cellulose insulation.

Furthermore, the modification to permit loose-fill cellulose insulation to be used as a fireblocking material is not justifiable. Even the proponent noted in their reason statement that spray-applied cellulose insulation is different than loose-fill cellulose insulation in that it is sprayed in place using a nozzle under pressure with a small quantity of water added to the insulation to activate the adhesive that, when dried, holds the cellulose insulation in place. Thus, it can be exposed in vertical applications, as well as horizontal applications. Furthermore, it will remain in place after it has dried without any need to restrain or otherwise contain or enclose it. There is no such assurance with loose-fill cellulose insulation.

Final Action: AS AM AMPC_____ D

Proposed Change as Submitted

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing North American Insulation Manufacturers Association

Revise as follows:

719.1 General. Insulating materials, including facings such as vapor retarders and *vapor-permeable membranes*, similar coverings and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall be determined in accordance with ASTM E 84 or UL 723. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture or other atmospheric conditions shall not be permitted.

Exceptions:

2. Foam plastic insulation shall comply with Chapter 26 and have a smoke developed index of not more than 450.
(Exceptions not shown, remain unchanged)

Reason: The exception for foamed plastics in Chapter 26 does not adequately cover smoke developed performance of foamed plastics. Current requirements for glass fiber, mineral fiber, cellulose and reflective plastic core insulation all require both flame spread and smoke development requirements either based on ASTM E84 or UL 723 or 803.1.2. Alternative methods are acceptable for use, however, their performance level needs to address the same hazards as the base requirement, plus any additional hazards that might arise as a result of a specific material.

Justification: For all other thermal and sound insulating materials within the IBC, **including non-combustible insulation materials**, the minimum performance level for materials permitted to be used includes at least some requirements for both flame spread (fire growth) and smoke production. These requirements are primarily based on either ASTM E84 testing or alternative methods such as NFPA 286, CAN/ULC-S102.2, or even UL 1715 with the inclusion of the criterion from 803.1.2. However, in the case of foamed plastics, of the four alternative test methods permitted by 2603.9, only NFPA 286 contains any limits on smoke developed for any foamed plastics by virtue of the inclusion of a reference to section 803.1. Room corner tests such as FM 4880, UL 1040, NFPA 286 or UL 1715 do evaluate fire growth and flashover. However, with the exception of the criteria for NFPA 286 in 803.1.2, the pass/fail criteria proposed for the room corner tests in the proposed acceptance criteria do not include quantitative evaluation of smoke density. Criteria for fire and smoke performance of building materials are based as much on issues arising from smoke production from burning materials, and smoke migration within the occupied spaces. It is not reasonable to provide an exception to the basic ASTM E84 flame spread and smoke developed requirements which apply to all other types of insulations, even noncombustible insulations, for foamed plastics based on room corner tests unless the limits on smoke production are applied to all of the room corner tests. There are numerous reported instances of the hazards associated with smoke production from building materials. One is the tragic fire at the Greenwood Health Center in Hartford, CT on Feb 26 2003. The New York Times quoted Chief Charles A. Teale of the Hartford Fire Department as stating that "Most of the 10 residents killed, ranging in ages from 27 to 76, died of smoke inhalation". The same article further goes on to quote officials as saying: "The nursing home itself suffered little damage, though, and the fire was put out in about 15 minutes. Most of the residents were then led back inside, and by midday, 84 of the 148 residents remained at the center".

It is reasonable to allow alternative methods of testing materials to determine their acceptability for use, however, their performance criteria needs to address the same hazards as the base requirement, plus any additional hazards that might arise as a result of a specific material.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: CRIMI-FS8-719.1

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee agreed that Chapter 26, Section 2603 already requires this and therefore this proposal is redundant.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Tony Crimi, A.C. Consulting Solutions Inc., representing North American Insulation Manufacturers Association (NAIMA), requests Approval as Submitted.

Commenter's Reason: The purpose of this public comment is to ensure that the IBC requirements for smoke development ratings for foamed plastic materials are clearly stated and easily enforceable. On its own, the requirements under Special Approvals in 2603.9 do not adequately cover smoke developed performance of foamed plastics. In the published report of the Baltimore Code Action Hearings, the Committee agreed that Chapter 26, Section 2603 already requires this and therefore felt that this proposal was redundant. We agree entirely that it is, or at least should be, required. The proposed change here is merely a clarification designed to simplify the code for users, and prevent inadvertent misinterpretation.

The principal concern is that the language of Section 2603.3 begins with the words "Unless otherwise indicated in this section,...." Since 2603.9 is in the same section as 2603.3, and another of the exceptions (#4) in 719.1 directs the code user to 2603.9 for foamed plastic insulations greater than 4 inches in thickness, there have been instances where compliance with the ASTM E84 and UL 723 smoke development ratings have been overlooked.

Final Action: AS AM AMPC _____ D

FS123-09/10

719.7

Proposed Change as Submitted

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

719.7 Insulation and covering on pipe and tubing. Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450. This shall include insulation coverings on exposed water supply and drainpipes under accessible lavatories and sinks.

Exception: Insulation and covering on pipe and tubing installed in plenums shall comply with the *International Mechanical Code*.

Reason: There have been some statements that insulation coverings required on exposed water supply and drainpipes for ADA compliance are not really insulation products and, therefore, need to comply with the requirements for insulation in the IBC. This code proposal is simply clarification.

The ADA requires that exposed hot water and drainpipes under lavatories and sinks be insulated (sections 4.19.4 and 4.24.6). The ICC/ANSI A117.1/2003 Standard (Accessible and Usable Buildings and Facilities 606.6 Exposed Pipes and Surfaces) states that: "*Water supply and drainpipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks.*" This indicates that we are dealing with an exposed insulation product or material.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: HIRSCHLER-FS2-719.7.doc

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee's disapproval was based on the following reasons: This level of protection is not required by the code; this material and application poses no threat to life-safety and regulating it achieves nothing; this proposal would require a Class A finish on a material that is used in a space where other interior finishes are required to only be Class C; the code already requires this material to meet Section 719.7, so this is redundant text or should be handled as an exception if it were not required; and lastly, the ability to enforce this after the building occupancy is a concern.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment 1:

Marcelo M. Hirschler (GBH International) representing American Fire Safety Council, Approval as Modified by this Public Comment.

Modify the proposal as follows:

719.7 Insulation and covering on pipe and tubing. Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450. This shall include insulation coverings on exposed water supply and drainpipes under accessible lavatories and sinks.

Exception: Insulation and covering on pipe and tubing installed in plenums shall comply with the *International Mechanical Code*.

Commenter's Reason: The technical committee was split on the reasons for disapproving this proposal. With the change to go beyond just accessible lavatories and sinks this addresses one concern expressed. Some of the committee members clearly felt that the added sentence was unnecessary as they stated "the code already requires this material to meet Section 719.7, so this is redundant text or should be handled as an exception if it were not required". However, an explicit statement is important because other committee members felt that this requirement was not needed.

This is not a proprietary product. There are at present at least 4 manufacturers who make these materials and make them so as to meet the requirements of ASTM E 84 of a flame spread index not to exceed 25 and a smoke developed index not to exceed 450. They are: IPS Corporation (500 Distribution Parkway, Collierville, TN, 38017, also known as TrueBro) and their Soft Guard Plus line of products (web site: <http://www.ipscorp.com/truebro/softguard>), Johns Manville (717 17th St, Denver, CO, 80202) and their Zeston 2000 Series PVC Insulated Fitting Covers and Jacketing (web site: http://www.jm.com/insulation/performance_materials/products/ci55_zeston_2000_pvc.pdf), Plumberex Specialty Products (PO Box 1864, Palm Springs, CA, 92263) and their various lines of products (web site: <http://www.plumberex.com/products.htm>), and Proto Corporation (10500 47th Street North, Clearwater, FL, 33762) and their line of Proto Fitting Covers, made of Regular PVC and LoSmoke PVC (web site: http://www.protocorporation.com/specifications_pdfs/proto_submittal_sheet.pdf). Other manufacturers use plenum grade insulation materials (ASTM E 84 25/50) for this application (such as tapes).

It is interesting that the US Access Board, who is required to protect the disabled and enforce ADA, has come on record as stating that they feel this requirement is needed for the protection of the disabled and that this requirement is consistent with the requirements of ICC/ANSI A117.1-2003 because the coverings are insulation. The following e-mail from Marsh Mazz of the US Access Board shows that.

From: Mazz, Marsha [mailto:mazz@Access-Board.gov]

Sent: Tuesday, September 29, 2009 6:55 AM

To: Howard Ahern (Plumberex)

Cc: Kim Paarlberg; Jay A. Woodward, AIA; John Battles ; mgiachetti@iccsafe.org; Jim@PaschalEngineering.com

Subject: RE: Pipe and Drain Coverings

Our General Counsel, Mr. James Raggio, requested that I reply to your inquiry regarding an interpretation of the intent of the Access Board's accessibility guidelines pertaining to exposed pipes and surfaces beneath accessible lavatories and sinks. You asked if the requirement that the pipes be "insulated or otherwise configured to protect against contact" is intended to provide thermal protection as well as protection from sharp surfaces, or only to prevent contact with sharp surfaces.

The Access Board's most recent accessibility guideline is the 2004 Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines. Section 606.5 of these guidelines requires the following: *606.5 Exposed Pipes and Surfaces. Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks.*

Criteria in the 2004 ADA and ABA Accessibility Guidelines is based on previous Access Board accessibility guidelines. The lavatory and sink requirement first appeared in 1989, in Section 1190.31(k) of the Access Board's *Minimum Guidelines and Requirements for Accessible Design (MGRAD)*. At that time, the Access Board's accessibility guidelines referenced the ANSI A117.1-1986 Edition. The ANSI A117.1 included the following requirement: *4.19.4 Exposed Pipes and Surfaces. Hot water and drain pipes under lavatories or sinks shall be insulated or otherwise protected if they abut the clearance areas indicated in Fig. 31. There shall be no sharp or abrasive surfaces under lavatories or sinks.*

In 1991, the Access Board issued the Americans with Disabilities Act Accessibility Guidelines (ADAAG) based on its earlier accessibility guidelines. ADAAG retained the earlier requirement in Sections 4.19 Lavatories and 4.24 Sinks. The requirement specifies that: *Hot water and drain pipes under lavatories [and sinks] shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories.* Despite minor changes in wording, the requirements for lavatories and sinks has remained unchanged in the Access Board's accessibility guidelines since 1989.

After publication of ADAAG in 1991, the Access Board published the *ADAAG Manual - a guide to the Americans with Disabilities Act Accessibility Guidelines*. The substance of the Manual is available on-line at <http://www.access-board.gov/adaag/about/guide.htm>. In the Manual, the Access Board stated the following regarding the exposed pipes and sharp surfaces beneath lavatories: *Exposed Pipes and Surfaces [4.19.4]*

To prevent burns, hot water pipes and drain pipes under lavatories must be insulated or otherwise configured to protect against contact. Exposed sharp or abrasive edges are prohibited. Foam or fiber insulation with protective over-wrap on drain, hot water supply, and sharp edges or commercially available rigid pipe covers will satisfy this requirement. The P-trap may also be installed parallel to the wall so that it is located outside the knee/toe space. If an under-lavatory enclosure is used, the specified knee and toe clearances must be maintained.

This guidance clarifies that the Board's requirement is intended to protect against burns due to contact with hot pipes and drains as well as to reduce the potential for injury due to contact with sharp or abrasive elements. Please note that while the Access Board's current accessibility guidelines include provisions for limiting water temperature to 120°F maximum in bathtubs and showers, the guidelines include no such provisions at lavatories and sinks. The reference to "hot water" was removed in 2004 guidelines because it was thought that there was equal potential for wheelchair users to experience adverse reactions or discomfort resulting from contact with cold water supply lines as with those that are hot.

As background to your inquiry, you provided differing interpretations of a parallel requirement in the ICC/ANSI A117.1-2003 Edition from staff at the International Code Council (attached) and a number of state building officials regarding this matter. The Access Board is authorized to provide technical assistance and guidance on its accessibility guidelines and standards. However, we cannot interpret state or local building codes. Please bear in mind that the Access Board does not establish requirements for fire resistant construction, interior finishes or other building materials intended to reduce the risk of flame spread or smoke development. Generally, these requirements are established in state, local and model building and fire codes which usually reference the ASTM E 84 *Standard Test Method for Surface Burning Characteristics of Building Materials*. The Access Board does not provide guidance regarding these building and fire code requirements.

If you have further questions, please don't hesitate to contact me at the telephone number below or by e-mail.

Regards,
Marsha K. Mazz
Technical Assistance Coordinator
U.S. Access Board
1331 F ST, NW
Washington, DC 20004-1111

(202) 272-0020 (direct)
(202) 272-0082 (TTY)

www.access-board.gov
mazz@access-board.gov

Public Comment 2:

Howard Ahern representing Plumberex Specialty Products Inc, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

719.7 Insulation and covering on pipe and tubing. Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450. This shall include insulation coverings ~~on exposed water supply and drainpipes under accessible lavatories and sinks.~~ required by ANSI A117.1 Section 606.6.

Exception: Insulation and covering on pipe and tubing installed in plenums shall comply with the *International Mechanical Code*.

Commenter's Reason: This language is needed to clarify that any insulation covering material on pipe & tubing shall comply with IBC 719.7 including insulation covering materials used to comply with ANSI A117.1. There has been confusion as to whether insulation material requirements for ANSI A117.1 is categorized as a thermal application. The U.S. Access Board issued a letter stating the requirement is "To prevent burns exposed hot water & drain pipes must be insulated." In addition to preventing burns and thermal shock from hot water pipes, the cold water supply must also be insulated to prevent thermal shock as well as protect from sharp surfaces.

The National Mechanical Insulation Committee (NMIC) and the National Insulation Association (NIA) and the mechanical insulation industry has generally adopted the following category definitions:

Category	Definition
Cryogenic Applications	-50 F & Below
Thermal Applications:	
Refrigeration, chill water and below ambient applications	-49 F to +75 F
Medium to high temperature applications	+76 F to 1,200 F
Refractory Applications	+ 1,200 F & Above

Insulation that is required by the ADA, ADAAG, ANSI A117.1 and the ABA for exposed drain and water pipes to prevent "thermal Shock" have a service temperature which are classified as a Thermal Application and therefore requires Thermal Insulation and coverings on the pipe.

This is not an arbitrary requirement, IBC 719.7 only exception is for plenum use and there is no exception for the thermal insulation coverings material on pipe used to comply with ANSI A117.1. When Thermal Insulation materials are used as an Interior Finish it is regulated by IBC Chapter 8 Interior Finish Section 803.8: (Thermal & Sound Insulation) Section 803.8 shall comply with IBC Section 719.

ASTM has recognized the risks of combustion posed by PVC jacketing. In the published standard **ASTM C 930-05**, which addresses potential health and safety concerns associated with thermal insulation materials and accessories,

ASTM C 930 identifies "thermal burns, impaired vision from smoke, and toxic effects," as possible negative effects from "combustion" of "PVC jacketing." The proposed amendments to Section 719.7 would address these risks, in so far as they are posed by the PVC jacketing used in under sink pipe insulation, by clarifying that the limits on surface burning characteristics of insulation already imposed by Section 719.7 apply to under sink pipe insulation, as well." This standard referenced the

Consumer Product Safety Commission, NFPA, ANSI, ASTM, EPA, North American Insulation Manufacturers Assn. and the National Science Foundation etc.

The following is a response (underlined) to the FS committee's comments:

1. "The Code already requires this material to meet Section 719.7, so this is redundant text". The added language is very much needed to clarify a thermal insulation ANSI A117.1 requirement and to regulate highly combustible materials that produce large volumes of smoke.
2. "This material and application poses no threat to life-safety"- Material that is highly combustible and produces large volumes of smoke is a Life Safety threat especially for people with disabilities. In addition ASTM standard C90 clearly identifies potential threats to life safety from thermal insulation combustion as well as the U.S. Fire Administration report on School fires which reports over 6,000 structural school fires in U.S. schools annually, most of these structural fires are started in the bathrooms.

3. "This level of protection is not required by the code." - 719.7 only exception is for plenum use and there is no exception for this insulation and covering material on pipe under lavatories and sinks. IBC Chapter 8 Interior Finish Section 806.3 Thermal Insulation also refers back to Section 719 for its material.
4. "Would require a Class A finish on a material that is used in a space where other interior finishes are required to only be Class C."- This is thermal insulation material and not Interior Finish "Trim" material, IBC Chapter 8 clearly defines Thermal Insulation and Trim and the different flame spread and smoke maximum allowed indexes of the ASTM E84 test for each.

The main overwhelming concern for the materials in this safety proposal is combustion and smoke. Insulation covering to protect people with disabilities heightens the requirement that the material be properly tested and conforms to required limits already adopted by the IBC. The added language is not redundant and is needed to bring clarification to this particular ANSI A117.1 requirement that is not exempted by 719.7.

Final Action: AS AM AMPC_____ D

FS127-09/10

Table 720.1(3)

Proposed Change as Submitted

Proponent: Sam Francis representing American Forest & Paper Association

Add new text as follows:

TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hr	3 hr	2 hr	1 hr	4 hr	3 hr	2 hr	1 hr
30. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of 1-1/2" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @24" o.c. Fiberglass insulation placed between I-joists supported by the resilient channels.	30-1.1	Minimum 0.019" thick resilient channel 16" o.c. (Channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by 1-1/4" Type S drywall screws. Two Layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	=	=	—	Varies	—	—	—	5/8

Reason: Many code officials have come to rely upon Table 720 as the preferred source of information regarding fire resistance rated assemblies. Because of its importance, we believe that the table should offer the most common generic assemblies. Floor systems utilizing I-joists have increased from less than 10 percent in 1990 to more than 50 percent. With the increased prevalence of I-joist floor/ceiling assemblies, including this assembly in the table will make the IBC more complete and it will be more useful to code officials. It is also expected that the document will be "user friendly", particularly for designers. In an effort to fulfill this expectation, we propose this common assembly for incorporation into Table 720.1(3). It is supported by ASTM E-119 test results as shown on the attached page. The following information and test results are provided with the understanding that their inclusion does not place them within the copyright release requirements of the signature statement.

Cost Impact: This code change proposal will reduce the cost of construction by an unknown amount.

ICCFILENAME: FRANCIS-FS4-TABLE 720.1(3)

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Disapproval was based on lack of supporting data (test report) to verify this assembly. Approved design can contain many details and specifications and the committee could not verify these without a test report that included a description.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Sam Francis, American Wood Council/AF&PA, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hr	3 hr	2 hr	1 hr	4 hr	3 hr	2 hr	1 hr
30. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of 1-1/2" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @24" o.c. Fiberglass insulation placed between I-joists supported by the resilient channels.	30-1.1	Minimum 0.019" thick resilient channel 16" o.c. (Channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by 1-1/4" Type S drywall screws. Two Layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the resilient channel joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same resilient channel joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" 1-1/2" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	5/8

Commenter's Reason: This proposal was submitted to be inserted into Table 720.1(3) as a new item in the table. This design is identical to the assembly shown at AWC's website and was tested using the ASTM E119 test procedure. The REASON STATEMENT in the submittal made reference to the test results. Due to the nature of the electronic submittal and electronic publication of the monograph, the actual test report and data was not transmitted to the committee. Committee members correctly refused to vote in the affirmative on an assembly for which the supporting test data was not provided. In an effort to overcome the problems in distributing the report and data, we are making it available at our website. This satisfies the committee's concern and represents compelling documentation for acceptance of this proposal AS MODIFIED. While making the modifications for FS128, it became apparent that we had made a typing error in entering the information about the construction of the assembly. Namely, the gypsum board long dimension should be perpendicular to the resilient channel, not the joists. So this Public Comment is to ACCEPT the proposal as modified with that correction. The corrected version matches the tested assembly. The information regarding the tested assembly may be found at

<http://www.awc.org/fire/testreport.html> username: guest password: awc

The test report you see when you choose FS127 is labeled on the website as WIJ1.7. This information was the basis for the original submission of this assembly by AWC to have the assembly listed in Table 720.

More assemblies which have been tested and demonstrated to afford a fire resistance rating mean more flexibility for designers and results in lower construction costs.

Final Action: AS AM AMPC_____ D

FS128-09/10

Table 720.1(3)

Proposed Change as Submitted

Proponent: Sam Francis representing American Forest & Paper Association

Revise as follows:

TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hr	3 hr	2 hr	1 hr	4 hr	3 hr	2 hr	1 hr
23. Wood I-joist (minimum joist depth 9-1/4" with a minimum flange depth of 1 5/16" and a minimum flange cross-sectional area of 2-3 2.25 square inches) at 24" o.c. spacing with 4" by 4 inch (nominal) a minimum 1x4 (3/4" x 3.5" actual) wood furring strip spacer ledger strip applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2" mineral wool insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joist and supported by the 4"x4" furring strip spacer 1x4 ledger strip.	23-1.1	1/2" deep single leg resilient channel 16" on center (channels doubled at wallboard end joints), placed perpendicular to the furring strip and joist and attached to each joist by 1-7/8" Type S drywall screws, 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered at least 4' and fastened with 1-1/8 Type S drywall screws spaced 7" on center. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	5/8
27. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of 1 5/16" and a minimum flange cross-sectional area of 1.95 square inches; minimum web thickness of 3/8") @24" o.c.	27-1.1	Minimum 0.019" thick resilient channel 16" o.c. (Channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by 1-5/8 1-1/4" Type S drywall screws. Two Layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1

Reason: Editorial corrections to entries in the table.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: FRANCIS-FS3-TABLE 720.1(3)

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that the requirements were being decreased without justification and therefore the proposal was more than editorial.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Sam Francis, American Wood Council/AF&PA, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hr	3 hr	2 hr	1 hr	4 hr	3 hr	2 hr	1 hr
23. Wood I-joist (minimum joist depth 9-1/4" with a minimum flange depth of 1 5/16" and a minimum flange cross-sectional area of 2.25 square inches) at @24" o.c. spacing with a minimum 1x4 (3/4" x 3.5" actual) wood ledger strip applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2" mineral wool insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joist and supported by the 1x4 ledger strip.	23-1.1	1/2" deep single leg resilient channel 16" on center (channels doubled at wallboard end joints), placed perpendicular to the furring <u>ledger</u> strip and joist and attached to each joist by 1-7/8" Type S drywall screws; 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered at least 4' and fastened with 1-1/8 Type S drywall screws spaced 7" on center. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	5/8
27. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of 1 5/16" and a minimum flange cross-sectional area of 1.95 square inches; minimum web thickness of 3/8") @ 24" o.c.	27-1.1	Minimum 0.019" thick resilient channel 16" o.c. (Channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by 1-1/4" Type S drywall screws. Two Layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the <u>resilient channel</u> I-joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same <u>resilient channel</u> I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" <u>1-1/2"</u> from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1

Commenter's Reason: AWC is seeking to have the committee action overturned in favor of the Modification contained in this Comment. The proposal was submitted to be an editorial "clean-up" of the item in the Table 720.1(3). This design is identical to the assembly shown at AWC's website and was tested using the ASTM E119 test procedure. Another submission this cycle made some of the same editorial comments as was shown in our original submittal. When the item was published in the Electronic Monograph for the hearings in Baltimore, it had the editorial corrections made to our submittal. Those changes made this submittal appear to be substantively changing the item in the table. It does NOT SUBSTANTIVELY CHANGE the item. Instead, it corrects all the errors of the item as it is published in the table. The text, as modified herein makes this item match the assembly intended to be described by this item in Table 720.1(3).

In our original submission, the REASON STATEMENT made reference to the test results. Due to the nature of the electronic submittal and electronic publication of the monograph, the actual test report and data was not transmitted to the committee. Committee members appropriately refused to vote in the affirmative on an assembly for which the supporting test data was not provided. Unlike FS127, this assembly is already in the table and the previous committees have seen the test data so we did not provide it with this submittal. However, in an effort to satisfy all concerns, we are making the test report and data from the original submittal available at our website. This satisfies the committee's concern and represents compelling documentation for acceptance of this proposal AS SUBMITTED. The information may be found at

<http://www.awc.org/fire/testreport.html>

username: guest password: awc

The test reports you see when you choose FS128 are labeled on the website as WIJ1.3 for table item number 23-1.1 and WIJ1.6 for table item number 27-1.1. This information was the basis for the original submission of this assembly by AWC. Due to the electronic format of the ICC monograph, AWC failed to ensure this information was readily available to the committee in a timely manner. It was distributed to the public at the hearing in Baltimore. Because of its work load, the committee did not have time to consider these data.

More assemblies which have been tested and demonstrated to afford a fire resistance rating means flexibility for designers and results in lower construction costs.

Final Action: AS AM AMPC_____ D

FS133-09/10, Part I

708.14, 801.4

Proposed Change as Submitted

Proponent: Joe Holland or Dave Bueche, Hoover Treated Wood Products, representing Hoover Treated Wood Products

PART I – IBC FIRE SAFETY

Add new text as follows:

801.3 Fire retardant paints and coating. Fire retardant paints and coating applied to wood products shall be permitted in accordance with this chapter for interior finish when there is a change of occupancy. Paints and coatings shall comply with NFPA 703 and be maintained in accordance with the International Fire Code.

(Renumber subsequent sections)

Reason: To correlate the IBC with the IFC and IEBC. This proposal incorporates the provisions currently contained in the IFC and IEBC. Both of these documents are concerned with structures after being occupancy. The IBC does govern existing buildings when there is a change of occupancy, Chapter 34. There is concern with this class of product being used in inappropriate applications in new construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standard NFPA 703 is currently referenced in the I-codes.

ICCFILENAME: HOLLAND-BUESHE-FS1-801.1.1.3; S2-2303.3

Public Hearing Results

PART I- IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: the committee felt that this proposal could prohibit the use of a product for new construction that may meet the code for such a use. Further, requirements for change of occupancy belongs in Chapter 34 or the International Existing Building Code for existing buildings.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Joseph Holland and Dave Bueche representing Hoover Treated Wood Products Inc, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

801.3 Fire retardant paints and coating. Fire retardant paints and coating applied to wood products shall be permitted in accordance with this chapter for interior finish when there is a change of occupancy. Paints and coatings shall comply with NFPA 703 and Section 1703 and be maintained in accordance with the International Fire Code.

Commenter's Reason: Committee felt this was a provision for Chapter 34. We disagree. The building code discusses change of occupancy and what is required. Chapter 8 contains the general provisions. Chapter 34 contains the specific provisions. The proposed section is a general provision as it applies to wood products painted to reduce the flame spread.

Final Action: AS AM AMPC_____ D

FS133-09/10, Part II

2303.3

Proposed Change as Submitted

Proponent: Joe Holland or Dave Bueche, Hoover Treated Wood Products, representing Hoover Treated Wood Products

PART II – IBC STRUCTURAL

Add new text as follows:

2303.3 Fire retardant paints and coating. Fire retardant paints and coating applied to wood products shall be permitted in accordance with Chapter 8. Paints and coatings shall comply with NFPA 703 and be maintained in accordance with the International Fire Code.

(Renumber subsequent sections)

Reason: To correlate the IBC with the IFC and IEBC. This proposal incorporates the provisions currently contained in the IFC and IEBC. Both of these documents are concerned with structures after being occupancy. The IBC does govern existing buildings when there is a change of occupancy, Chapter 34. There is concern with this class of product being used in inappropriate applications in new construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standard NFPA 703 is currently referenced in the I-codes.

ICCFILENAME: HOLLAND-BUESHE-FS1-801.1.1.3; S2-2303.3

Public Hearing Results

PART II- IBC STRUCTURAL

Committee Action:

Disapproved

Committee Reason: Based on the committee's action on FS133-09/10 Part I.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Joseph Holland and Dave Bueche representing Hoover Treated Wood Products Inc, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

2303.3 Fire retardant paints and coating. Fire retardant paints and coating applied to wood products shall be permitted in accordance with Section 801.3 Chapter 8. Paints and coatings shall comply with NFPA 703 and be maintained in accordance with the International Fire Code.

Commenter's Reason: Section 801.3 refers one to NFPA 703 and the IFC, they are not needed to be repeated. Part II clarifies that painted products are not FRTW and are allowed only for interior finish where they can be maintained.

Final Action: AS AM AMPC D

FS139-09/10

809 (New)

Proposed Change as Submitted

Proponent: Joe McELvaney, representing self

Add new Section as follows:

Section 809

Children's Playground Structures

809.1 Children's playground structures. Structures intended as children's playgrounds that exceed 10 feet (3048 mm) in height and 150 square feet (14 m²) in area shall comply with Sections 809.1.1 through 809.1.4.

809.1.1 Materials. Children's playground structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Fire-retardant-treated wood complying with Section 2302.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975.
4. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
5. Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) exhibiting a peak rate of heat release not exceeding 400 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation at a thickness of 6 mm.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975. The minimum specimen test size shall be 36 inches by 36 inches (914mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
8. Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
9. The floor covering placed under the children's playground structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

809.1.2 Fire protection. Children's playground structures located within the compartment shall be provided with the same level of approved fire suppression and detection devices required for similar structures in the same compartment.

809.1.3 Separation. Children's playground structures shall have a minimum horizontal separation from other structures of 20 feet (6090 mm).

809.1.4 Area limits. Children's playground structures shall not exceed 300 square feet (28 m²) in area, unless a special investigation has demonstrated adequate fire safety.

Reason: The current 2009 IBC has a section 402.12 for children's playground structures. This section currently only applies to Malls. However children's playground equipment can be found in all types of buildings and not just in malls. This new section will allow the code official to enforce these rules in any building that chooses to have children's playground equipment.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: MCELVANEY-FS1-809 NEW.doc

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that Chapter 4 requirements should perhaps be removed if these requirements were to move to Chapter 8, however the committee was not convinced that Chapter 8 was appropriate as it deals only with interior finishes. Chapter 4 might be more appropriate as it deals with amusement structures. Lastly, the terms structure and compartment need to be defined in this context.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Marcelo M. Hirschler (GBH International), representing American Fire Safety Council; Robert J. Davidson (Davidson Code Concepts, LLC) representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

402.12 Children's playground structures. Structures intended as children's playgrounds that exceed 10 feet (3048 mm) in height and 150 square feet (14 m²) in area shall comply with Sections 402.12.1 through 402.12.4.

402.12.1 Materials. Children's playground structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

- 1- Fire-retardant treated wood.
- 2- Light transmitting plastics complying with Section 2606.
- 3- Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat release rate not greater than 100 kW when tested in accordance with UL 1975.
- 4- Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
- 5- Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
- 6- Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) exhibiting a peak rate of heat release not exceeding 400 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation at a thickness of 6 mm.
- 7- Ball pool balls, used in soft-contained play equipment structures, having a maximum heat release rate not greater than 100 kW when tested in accordance with UL 1975. The minimum specimen test size shall be 36 inches by 36 inches (914 mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
- 8- Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
- 9- The floor covering placed under the children's playground structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

402.12.2 Fire protection. Children's playground structures located within the mall shall be provided with the same level of approved fire suppression and detection devices required for kiosks and similar structures.

402.12.3 Separation. Children's playground structures shall have a minimum horizontal separation from other structures within the mall of 20 feet (6090 mm).

402.12.4 Area limits. Children's playground structures shall not exceed 300 square feet (28 m²) in area, unless a special investigation has demonstrated adequate fire safety.

402.12 Children's play structures. Children's play structures shall comply with Section 424. The minimum horizontal separation between children's play structures, kiosks and similar structures within the mall shall be 20 feet (6096 mm).

Section 809 424
Children's Play Playground Structures

809-1.2 424.1 Children's play playground structures. ~~Structures intended as children's playgrounds~~ Children's play structures installed inside all occupancies covered by this code that exceed 10 feet (3048 mm) in height and 150 square feet (14 m²) in area shall comply with Sections 424.2 through 424.5 ~~809.1.1 through 809.1.4.~~

809-1.1 424.2 Materials. Children's ~~play playground~~ structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Fire-retardant-treated wood complying with Section 2302.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289, using the 20 kW ignition source.
4. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
5. Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) exhibiting a peak rate of heat release not exceeding 400 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation at a thickness of 6 mm.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289, using the 20 kW ignition source. The minimum specimen test size shall be 36 inches by 36 inches (914 mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
8. Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
9. The floor covering placed under the children's ~~play playground~~ structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

809-1.2 424.3 Fire protection. Children's ~~play playground~~ structures ~~located within the compartment~~ shall be provided with the same level of approved fire suppression and detection devices required for other similar structures in the same occupancy compartment.

809-1.3 424.4 Separation. Children's play structures shall have a minimum horizontal separation from building walls, partitions and from elements of the means of egress of 5 feet (1524 mm). Children's ~~play playground~~ structures shall have a minimum horizontal separation from other children's play structures of 20 feet (6090 mm).

809-1.2 424.5 Area limits. Children's playground structures shall not exceed 300 square feet (28 m²) in area, unless a special investigation, acceptable to the code official, has demonstrated adequate fire safety.

Commenter's Reason: The technical committee was concerned that the proposal was placed in the wrong location because Chapter 8 addresses interior finish only, and suggested that it would be better placed in Chapter 4 as a separate section. That is why a new section is being proposed for this language. The intent of this proposal is that it should apply to all such large children's playground structures (to be called play structures), as long as they are placed indoors. As stated by the original submitter, children's play equipment can be found in all types of buildings and not just in malls.

The revised language also makes a few other changes that handle the issue raised by the technical committee of the words "similar structures" and "compartment". In the revised language the words "similar" and "compartment" are eliminated from the new section and it simply discusses "children's play structures".

Since new Section 424 covers children's play structures in all buildings, there is no need to retain the same requirements in their entirety in Section 402.12. Section 402.12 was revised to retain only the 20-foot separation requirements between children's play structures, kiosks and similar structures, which are only applicable in malls.

In areas other than covered malls, the code does not currently include separation distances between kiosks and children's' play structure. However, it was felt appropriate to include both a 20-foot separation between children's play structures (if there is more than one) and a minimum five-foot separation from walls, partitions and elements of the means of egress to ensure that adequate space is provided around the structure for proper sprinkler operation and unimpeded egress.

The new language also makes the change approved by the IFC committee in F58 parts I and II, where it allows the use of NFPA 289 as an alternate for UL 1975. NFPA 289 is more versatile than UL 1975 and is also likely to offer lower variability. The 20 kW gas burner ignition source in NFPA 289 was specifically designed with the intent of being a substitute for UL 1975.

Analysis: NFPA 289 was introduced in Code Change Proposal F58 09/10 Parts I and II and was found to be in compliance with ICC's policy on referenced standards.

Final Action: AS AM AMPC _____ D

FS142-09/10

1403.5 (New)

Proposed Change as Submitted

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing The Extruded Polystyrene Foam Association

Add new text as follows:

1403.5 Vertical and Lateral Flame Propagation. Exterior walls greater than 20 feet (6 096 mm) in height above grade plane that contain combustible exterior wall coverings shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

Exceptions:

1. Exterior walls of Type V construction
2. Exterior walls that contain as the only combustible material, one or more of the following components:
 1. Thermal- and sound-insulating materials that meet the requirements of Section 1406.2.2.
 2. Architectural trim and embellishments.
 3. Combustible exterior wall veneers installed to heights not exceeding 40 ft. above grade plane.

(Renumber subsequent numbers)

Reason: This new section is proposed to address the potential vertical and lateral flame spread that can occur either on or within exterior wall assemblies that contain combustible materials.

Newer construction practices such as the addition of combustible weather resistant barriers allow significant amounts of combustible materials/products (other than foam plastics) to be installed on or in exterior walls. This code change proposal adds the requirement for NFPA 285 testing for exterior walls that contain these types of combustible materials. This requirement is already in place for any exterior walls that contain foam plastic insulation or use MCM exterior veneers.

Testing has shown that when a combustible weather resistive barrier was added to an exterior wall system that had successfully met the criteria for NFPA 285, that the addition of the barrier caused failure to occur in the NFPA 285 test.

Small-scale testing has shown that these types of materials can provide significant amounts of combustible fuel loading to a wall assembly and they are not currently regulated by the Code.

With the advent of newer exterior wall technologies such as "rainscreen" systems, the openings in the exterior veneer will allow flames and or heat to readily impact and ignite the barrier material. Due to the built-in standoffs of these systems, the barrier materials could then exhibit significant vertical or lateral flame propagation.

The Code proposal requires the NFPA 285 testing for exterior walls on Types I, II, III, or IV construction since these types of construction allow either none or limited combustibles in the exterior walls. The 20 ft. height limit provides a safety margin on the height of wall that can use these materials without testing. Also, while the code allows combustible exterior wall covering up to 40 ft., this proposal has as a limit 20 ft. since these materials can provide a hidden or concealed fire situation.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Standard NFPA 285 is currently referenced in the I-codes.

ICCFILENAME: BEITEL-FS1-1403.5.doc

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee was concerned that there was no area limitations imposed on architectural trim or exterior wall veneers.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Jesse J. Beitel, Hughes Associates Inc, representing Extruded Polystyrene Foam Association, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1403.5 Vertical and Lateral Flame Propagation. Exterior walls on buildings of Type I, II, III or IV construction that are greater than 20-40 feet (12 192 mm) in height above grade plane and that contain a combustible water-resistive barrier ~~exterior wall coverings~~ shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

Exceptions:

- 1- ~~Exterior walls of Type V construction~~
- 2- ~~Exterior walls that contain as the only combustible material, one or more of the following components:~~
 - 1- ~~Thermal and sound insulating materials that meet the requirements of Section 1406.2.2.~~
 - 2- ~~Architectural trim and embellishments.~~
- 3- ~~Combustible exterior wall veneers installed to heights not exceeding 40 ft. above grade plane.~~

(Renumber subsequent sections.)

Reason: This new section is proposed to address the potential vertical and lateral flame spread that can occur either on or within exterior wall assemblies that contain combustible materials.

Newer construction practices such as the addition of combustible water-resistant barriers allow significant amounts of combustible materials/products (other than foam plastics) to be installed on or in exterior walls. This code change proposal adds the requirement for NFPA 285 testing for exterior walls that contain these types of combustible materials. This requirement is already in place for any exterior walls that contain foam plastic insulation or use MCM exterior veneers.

Testing has shown that when a combustible water-resistive barrier was added to an exterior wall system that had successfully met the criteria for NFPA 285, that the addition of the barrier caused failure to occur in the NFPA 285 test.

Small-scale testing has shown that these types of materials can provide significant amounts of combustible fuel loading to a wall assembly and they are not currently regulated by the Code.

With the advent of newer exterior wall technologies such as "rainscreen" systems, the openings in the exterior veneer will allow flames and or heat to readily impact and ignite the barrier material. Due to the built-in standoffs of these systems, the barrier materials could then exhibit significant vertical or lateral flame propagation.

The Code proposal requires the NFPA 285 testing for exterior walls on Types I, II, III, or IV construction since these types of construction allow either none or limited combustibles in the exterior walls. The 40 ft. height limit follows the code allowance for combustible exterior wall covering up to 40 ft.

This Comment has revised the original proposal by being more specific with respect to addressing the materials of concern. Floor discussion and potential modifications all addressed exceptions and not the issue that gave rise to this code change. The comment now addresses the concerns raised by the Committee and others.

Final Action: AS AM AMPC____ D

FS143-09/10

1404.12 (New)

Proposed Change as Submitted

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

1. Add a new definition as follows:

SECTION 1402 DEFINITIONS

Polypropylene siding - a shaped material, made principally from polypropylene homopolymer, or copolymer, which in some cases may contain fillers and/or reinforcements, that is used to clad exterior walls of buildings.

2. Add new section as follows

1404.12 Polypropylene siding. Polypropylene siding shall be certified and labeled as conforming to the requirements of 1404.12.1, 1404.12.2 or 1404.12.3 by an approved quality control agency. Polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

1404.12.1 Flame Spread Index. The polypropylene siding material shall comply with the requirements of ASTM D 7254. The certification shall be accompanied by a test report stating that all portions of the test specimen ahead of the flame front remained in position during the test in accordance with ASTM E 84 or UL 723.

1404.12.2 Heat Release. The polypropylene siding material shall comply with the requirements of ASTM D 7254 and a 4 foot by 8 foot (1.22 x 2.44 m) section of the polypropylene siding material shall exhibit a peak rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source at the thickness intended for use.

1404.12.3 Fire Separation Distance. The polypropylene siding shall comply with all the requirements of ASTM D 7254 and the fire separation distance between a building with polypropylene siding and the adjacent building shall be no less than 10 feet (3.05 m).

1405.18 Polypropylene siding. Polypropylene siding conforming to the requirements of this section and complying with 1404.12 shall be permitted on exterior walls of buildings of Type V construction located in areas where the basic 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 secured to the building so as to provide weather protection for the exterior walls of the building.

1405.18.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with 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 0.125-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 0.75 inch (19 mm). 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.

3. Add new standards to Chapter 35 as follows:

ASTM D 7254-07 Standard specification for polypropylene (PP) siding.
NFPA 289-09 Standard Method of Fire Test for Individual Fuel Packages

Reason: Polypropylene siding is being used in construction now although the IBC does not permit it. Therefore, it is important to regulate the use of polypropylene siding in a way that it can be used safely. The new sections are similar to the existing sections on vinyl siding, except for the fire testing. Vinyl siding is known to have adequate fire performance since the siding needs to be made of rigid (unplasticized) PVC in accordance with ASTM D 3679. Polypropylene is known not to have adequate fire performance unless properly fire retarded.

A new standard specification has been issued for polypropylene siding, ASTM D 7254. The specification addresses many of the key requirements for the material. Unfortunately the fire test requirement in ASTM D 7254 is not explicit enough. ASTM D 7254 does not require that, when fire testing is conducted in the ASTM E 84 (Steiner tunnel), the test specimen must remain in place during the test and flaming drips and falling test specimens are not allowed to happen. This requirement is critical for materials that are used exposed so that the flame spread index assesses actual surface flame spread on the material surface. The standards committee responsible for the ASTM E 84 fire test (ASTM E05) decided that this issue should be addressed in the code rather than in the standard itself. Polypropylene that has not been appropriately fire retarded will release abundant amount of heat, much more than other combustible sidings permitted by the code, such as wood siding or vinyl (PVC) siding, and spread fire through flaming drips. Such flaming drips will contribute to ignite mulch and debris found near the building and spread the fire. Table 1 shows such results.

Recent fire tests were also conducted in the Steiner tunnel, ASTM E 84, on a rigid PVC material 0.06 in. thick; it exhibited a flame spread index of 10. Under the same test conditions, a fire retarded polypropylene material 0.15 in. thick exhibited a flame spread index of 50. These are both very adequate values, in view of the fact that both the polypropylene material and the PVC material remained in place during the ASTM E 84 test and did not generate flaming drips.

Table 1: Results of Steiner Tunnel Tests (ASTM E 84)

Material	Flame Spread Index	Maximum Flame Front Advance (ft)	Time to Max. Flame Front Advance (min:s)	Flaming on Floor (Duration) (min:s)
PVC	10	4.6	7:48	None
FR Polypropylene	50	19.5	6:24	4:18

This shows that it is possible to use fire retarded polypropylene materials that give very adequate flame spread values and also very adequate heat release values, without flaming drips. Consequently, polypropylene siding should only be used when it is shown to exhibit the appropriate fire performance.

When polypropylene siding material (which does not have the appropriate fire performance) is tested in ASTM E 84 (Steiner tunnel) the test specimen will often fall ahead of the arrival of the flame giving incorrect results.

Table 2 shows new results of cone calorimeter heat release tests with polypropylene and PVC:

Table 2: Results of Cone Calorimeter (ASTM E 1354) Tests					
Material	Peak Heat Release Rate	Total Heat Released	Time to Ignition	Effective Heat of Combustion	Fire Performance Index
	kW/m ²	MJ/m ²	s	MJ/kg	s m ² /kW
PVC	186.8	16.7	36	9.2	0.19
Non FR Polypropylene	768.3	47.2	23	40.3	0.03

Table 3 shows some earlier results with polypropylene, PVC and wood materials in the cone calorimeter:

Table 3 - Cone Calorimeter Data on Plastics and Douglas Fir

Material	Flux 20 kW/m ²				
	Pk HRR (kW/m ²)	THR (MJ/m ²)	TTI (s)	EHC (MJ/kg)	FPI (s m ² /kW)
PVC Rigid, Custom Inj. Mold.	40	3.0	5159	1.4	1343
PVC Rigid, Extrusion	102	2.9	3591	7.3	31.4
PP Non FR	1170	231.3	218	72.0	0.19
PP FR	236		382	23.6	1.62
PE Non FR	913	161.9	403	41.1	0.44
XLPE FR	88	87.6	750	22.4	8.08
Douglas Fir	237	46.5	254	13.1	1.10
Material	Flux 40 kW/m ²				
	Pk HRR (kW/m ²)	THR (MJ/m ²)	TTI (s)	EHC (MJ/kg)	FPI (s m ² /kW)
PVC Rigid, Custom Inj. Mold.	175	24.3	73	5.1	0.42
PVC Rigid, Extrusion	183	90.8	85	13.3	0.46
PP Non FR	1509	206.9	86	42.1	0.06
PP FR	243		80	23.9	0.33
PE Non FR	1408	221.0	159	46.6	0.06
XLPE FR	192	126.2	105	24.2	0.55
Douglas Fir	221	64.1	34	17.6	0.15
Material	Flux 70 kW/m ²				
	Pk HRR (kW/m ²)	THR (MJ/m ²)	TTI (s)	EHC (MJ/kg)	FPI (s m ² /kW)
PVC Rigid, Custom Inj. Mold.	191	93.0	45	12.7	0.24
PVC Rigid, Extrusion	190	96.5	48	10.8	0.25
PP Non FR	2421	231.1	41	43.1	0.02
PE Non FR	2735	227.5	47	42.6	0.02
XLPE FR	268	129.2	35	24.7	0.13
Douglas Fir	196	50.0	12	13.5	0.06

Table 3 shows that, when tested in the cone calorimeter, ASTM E 1354, under the same conditions, it was found that non fire retarded polypropylene exhibits a peak heat release rate of 1509 kW/m², while a non fire retarded PVC material exhibits a peak heat release rate of 183 kW/m², and a Douglas fir material exhibits a peak heat release rate of 221 kW/m². Such a very high heat release rate is unacceptable for a siding material. Testing in the cone calorimeter, including the testing above, is normally conducted in the horizontal orientation with radiant heat exposing the test specimen from above, thus capturing any flaming drips and assessing their effects.

Table 4 shows that wood materials, when not fire retarded, will usually exhibit flame spread index values that are less than 200 and will correspond to Class B or Class C categories. At the same time rigid PVC (vinyl) materials will generally exhibit flame spread index values less than 25. Neither wood nor PVC materials will cause flaming drips or molten material burning on the ground.

Table 4. Steiner tunnel (ASTM E 84) Data for Wood and Vinyl Materials

Material/Product	Flame Spread Index		Material/Product	Flame Spread Index	
	Low	High		Low	High
Cellulose fiberboard ceiling tile	70	80	Ponderosa pine B	105	170

Cottonwood	115		Poplar	170	185
Cypress	145	150	Red Gum	140	155
Douglas fir	70	100	Red oak flakeboard	70	190
Douglas fir overlay	110	140	Red Oak Flooring	100	100
Douglas fir/cedar plywood	190	230	Red Pine	140	
Eastern White Pine	85		Redwood	65	70
Hemlock/cedar plywood	190		Southern yellow pine	130	195
Lauan hardwood	150	170	Vinyl faced plywood	110	130
Lodgepole Pine	95		Vinyl profile	15	20
Maple flooring	105		Vinyl Siding	10	15
Northern white pine A	190	215	Vinyl vapor barrier	10	15
Northern white pine B	120	180	Walnut	130	140
Pacific silver fir	70		West Coast Hemlock	60	70
Pacific Yellow Cedar	80		Western Red Cedar	70	
Particleboard	135	180	Western spruce	100	
Plywood paneling over gypsum	130	150	Western white pine	75	
Ponderosa pine A	170	230	Yellow birch	105	110

Figure 1 shows char from a PVC siding fire (no foam backing): the material softened, charred and burned but is still substantially intact. Figure 2 shows a vertical PP sheet melting and resulting in flaming drips on the floor.

The reason that heat release rate and floor flaming are important issues is because it has been shown that the heat radiated by siding is a major contributor to the ignition of neighboring houses, as is the spread of fire along the ground, particularly when there are loose combustibles present.

That is the reason that the third option allows polypropylene siding to be used, but with a larger separation distance, when the results of the ASTM E 84/UL 723 (Steiner tunnel) test are based on a test specimen that is not self supporting and falls to the floor of the tunnel during the test. The standard ASTM E 84 states: "1.4 Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by testing materials that remain in place." Therefore valid test results require the test specimen to stay in place ahead of the exposing flame.

Polypropylene siding should not be used in buildings other than Type V construction.

Figure 1 – remains of vinyl siding fire



Figure 2 Polypropylene siding melting and flaming on the floor.
(No figure 2 attached)

NFPA 289 was developed to test individual fuel packages and is similar in concept to UL 1975, already widely used in the code.

Cost Impact The code does not at present allow the use of polypropylene siding. In order to safely use polypropylene siding construction costs would have to increase either by using materials that would meet test requirements for adequate fire safety or by increasing fire separation distances.

Analysis: Code change proposal FS143 and FS144 address new requirements for polypropylene siding. The committee needs to make its intent clear with respect to these provisions. A review of the standard(s) proposed for inclusion in the code, ASTM D 7254-07 and NFPA 289-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: HIRSCHLER-FS6-1404.12.doc

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

Analysis: Review of the proposed new standards indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

Committee Action:

Disapproved

Committee Reason: The committee was concerned that NFPA 289 was not appropriate for polypropylene materials. Further, no fire data to substantiate the fire hazard was provided.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Marcelo M. Hirschler (GBH International), representing American Fire Safety Council, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

Polypropylene siding - a shaped material, made principally from polypropylene homopolymer, or copolymer, which in some cases may contain fillers and/or reinforcements, that is used to clad exterior walls of buildings.

1404.12 Polypropylene Siding. Polypropylene siding shall be certified and labeled as conforming to the requirements of ASTM D 7254 and those of 1404.12.1 or those of 1404.12.2 or 1404.12.3 by an approved quality control agency. Polypropylene siding shall be installed in accordance with the requirements of 1405.18 and in accordance with the manufacturer's installation instructions. Polypropylene siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

1404.12.1 Flame Spread Index. The polypropylene material shall comply with the requirements of ASTM D7254. The certification of the flame spread index shall be accompanied by a test report stating that all portions of the test specimen ahead of the flame front remained in position during the test in accordance with ASTM E 84 or UL 723.

1404.12.2 Heat Release. The polypropylene siding material shall comply with the requirements of ASTM D 7254 and a 4 foot by 8 foot (1.22 x 2.44 m) section of the polypropylene siding material shall exhibit a peak rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source at the thickness intended for use.

1404.12.3 Fire Separation Distance. The polypropylene siding shall comply with all the requirements of ASTM D7254 and The fire separation distance between a building with polypropylene siding and the adjacent building shall be no less than 10 feet (3.05 m).

1405.18 Polypropylene siding. Polypropylene siding conforming to the requirements of this section and complying with 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 installation instructions. Polypropylene siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

1405.18.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with 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 0.125-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 0.75 inch (19 mm). 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.

CHAPTER 35

ASTM D 7254 Standard specification for polypropylene (PP) siding
NFPA 289 Standard Method of Fire Test for Individual Fuel Packages (2009)

Commenter's Reason: The committee had a valid concern regarding the use of NFPA 289 for testing this material and this option has been eliminated. Polypropylene siding material does not normally contain flame retardants or any other additives that will prevent it from forming a pool fire as soon as it is exposed to a flame. Therefore, when polypropylene siding is exposed to the flame in the ASTM E 84 Steiner tunnel test it immediately starts melting and burning occurs in the floor of the tunnel, with no material left in the tunnel ceiling where the test sample should be. This material gets a low flame spread index (ASTM D 7254 requires a flame spread index under 200, just like for wood siding) but it is not a valid result because the material is no longer in the test position when the flame comes by.

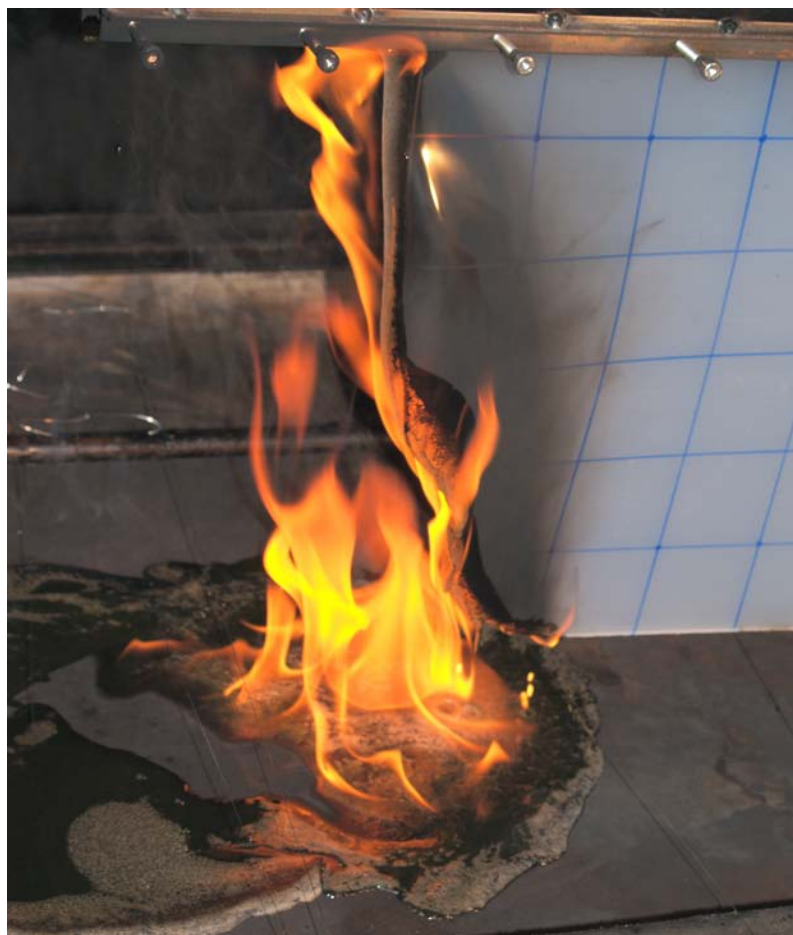
This is a problem because polypropylene that is not properly flame retarded will generate about 4 times as much heat as vinyl (PVC) or as wood or even properly fire retarded polypropylene (see peak heat release rate in the table below) and it ignites much more rapidly. Therefore if polypropylene siding is made with typical polypropylene that has not been treated, the siding is a very dangerous product and polypropylene siding should not be allowed to be used based only on the requirements of ASTM D 7254. This means that proposal FS144 should not be approved.

Table: Results of Cone Calorimeter (ASTM E 1354) Tests (4 inch x 4 inch test sample)

Material	Peak Heat Release Rate	Time to Ignition	Effective Heat of Combustion
	kW/m ²	s	MJ/kg
PVC (vinyl)	190	36	9
Wood	220	34	15
Non FR Polypropylene	770	23	40
FR Polypropylene	200	60	25

It is possible to make properly flame retarded polypropylene and use it for siding because flame retarded polypropylene can easily be compounded so that it does not melt/drip and pass the requirements of a flame spread index of 200 in the ASTM E 84 test. In fact, the original proposal includes an ASTM E 84 test with an FR polypropylene material that gave a flame spread index of 50. Such a material should be permitted for use but not the unsafe material normally offered for sale.

The missing Figure from the proposal (that could also be found with proposal RB148) is found below. It shows what happens when normal non flame retarded polypropylene (the material that is used in siding) burns: it forms a pool fire. The photograph is not polypropylene siding but its component material.



Analysis: Public comments to FS143 and FS144 address new requirements for polypropylene siding. The membership needs to make their preference clear with respect to these provisions.

Final Action: AS AM AMPC_____ D

FS144-09/10, Part I

1402 (New), 1404.8 (New), 1405.13 (New), Chapter 35

Proposed Change as Submitted

Proponent: Matthew Dobson, representing Vinyl Siding Institute

PART I – IBC FIRE SAFETY

1. Add new text as follows:

1402 DEFINITIONS

Polypropylene Siding. A shaped material made principally from polypropylene that is used to clad exterior walls covering.

2. Add new text as follows:

1404.8 Polypropylene Siding. Polypropylene siding shall conform to the requirements of ASTM D7254.

(Renumber subsequent sections)

3. Add new text as follows:

1405.13 Polypropylene Siding. Polypropylene siding conforming to the requirements of this section and complying with ASTM D7254 shall be permitted on exterior walls of buildings located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hours (45m/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 exceed 100 mile 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 secured to the building so as to provide weather protection for the exterior walls of the building.

1405.13.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with the weather-resistive barrier requirements in Section 1403. Siding and accessories shall be installed in accordance with approved manufacturer's instructions.

(Renumber subsequent sections)

4. Add new text to Chapter 35 standards as follows:

ASTM D7254 – 07 Standard Specification for Polypropylene (PP) Siding...1402, 1404.8, 1405.13

Reason: The purpose of this change is to assist code officials with the recognition of polypropylene (PP) siding. This product has reached a level of maturity including the establishment of an acceptance criterion through ES and an ASTM product standard. By providing this recognition in the code, building officials will be able to quickly reference the product and installation provisions.

Currently there is confusion in the market place between vinyl siding and PP siding. In many instances the PP siding is thought to be vinyl siding, this new language will help the code official to understand the requirements of the product established by ES and ASTM and what to enforce relative to its installation.

D7254 – 07 Standard Specification for Polypropylene (PP) Siding

The ASTM standard provides all necessary manufacturing tests and specifications to ensure the product meets the intent of the code from safety and welfare to wind performance. Included with this proposal are copies of the acceptance criteria and the ASTM standard D7254.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposal FS143 and FS144 address new requirements for polypropylene siding. The committee needs to make its intent clear with respect to these provisions. A review of the standard(s) proposed for inclusion in the code, ASTM D7254-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: DOBSON-FS1-1404.8; RB2-202 PART II

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

Analysis: Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

PART I- IBC FIRE SAFETY

Committee Action:

Approved as modified

Modify the proposal as follows:

Polypropylene Siding. A shaped material, made principally from polypropylene homopolymer, or copolymer, which in some cases may contain fillers and/or reinforcements, that is used to clad exterior walls of buildings covering.

1405.13 Polypropylene Siding. Polypropylene siding conforming to the requirements of this section and complying with ASTM D7254 shall be limited to permitted on exterior walls of Type VB construction buildings located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hours (45m/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 exceed 100 mile 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 secured to the building so as to provide weather protection for the exterior walls of the building.

(Portions of the proposal not shown remain unchanged)

Committee Reason: The committee agreed that ASTM D7254 was the appropriate material standard and appropriate installation requirements were provided. The modification created further consistency with the referenced standard and the current ICC ES Acceptance Criteria.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment 1:

Matthew Dobson, Vinyl Siding Institute (VSI), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1405.13 Polypropylene Siding. Polypropylene siding conforming to the requirements of this section and complying with ASTM D7254 shall be limited to exterior walls of Type VB construction, unless it has been tested in accordance with NFPA 268 and complies with section 1406.2 located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hours (45m/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 exceed 100 mile 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 secured to the building so as to provide weather protection for the exterior walls of the building.

(Portion of proposal not shown, remains unchanged.)

Commenter's Reason: The modifications to this proposal, which were accepted by the IBC FS committee, reflected what is currently in the acceptance criteria for polypropylene siding, AC366. In reviewing this issue further and after discussions with ICC-ES staff it was confirmed that the reference to Type VB in AC366 is an error and will be corrected, hopefully by these hearings. It was supposed to reference to Type V and was processed as an editorial fix to Type VB. Additionally we have added the referenced sections of the IBC that have to do with testing protocol necessary should the product be used with other types of construction. This change in language is also from AC366. This modification makes the code consistent with the products current acceptance criteria.

Analysis: Public comments to FS143 and FS144 address new requirements for polypropylene siding. The membership needs to make their preference clear with respect to these provisions.

Public Comment 2:

Sam Francis, American Wood Council/AF&PA, request Disapproval.

Polypropylene is a new combustible product designed for the exterior of buildings. Its fire performance in this intended application is unknown. Additionally, ASTM D7254 purports to provide fire regulation by requiring polypropylene siding to perform to a flame spread rating Class C per ASTM E84 the "Standard Test Method for Surface Burning Characteristics of Building Materials." However, the Scope E84 is limited to materials that do not melt and drip when heated. Polypropylene melts and drips when heated and thus not suitable for classifying in accordance with E84. A more appropriate test for evaluating exterior fire performance is ASTM E2707 "Standard Test Method for Determining Fire Penetration of Exterior Wall

Assemblies Using a Direct Flame Impingement Exposure.” The proponents have not provided any E2707 technical data for polypropylene and other comparable siding for comparison.

Public Comment 3:

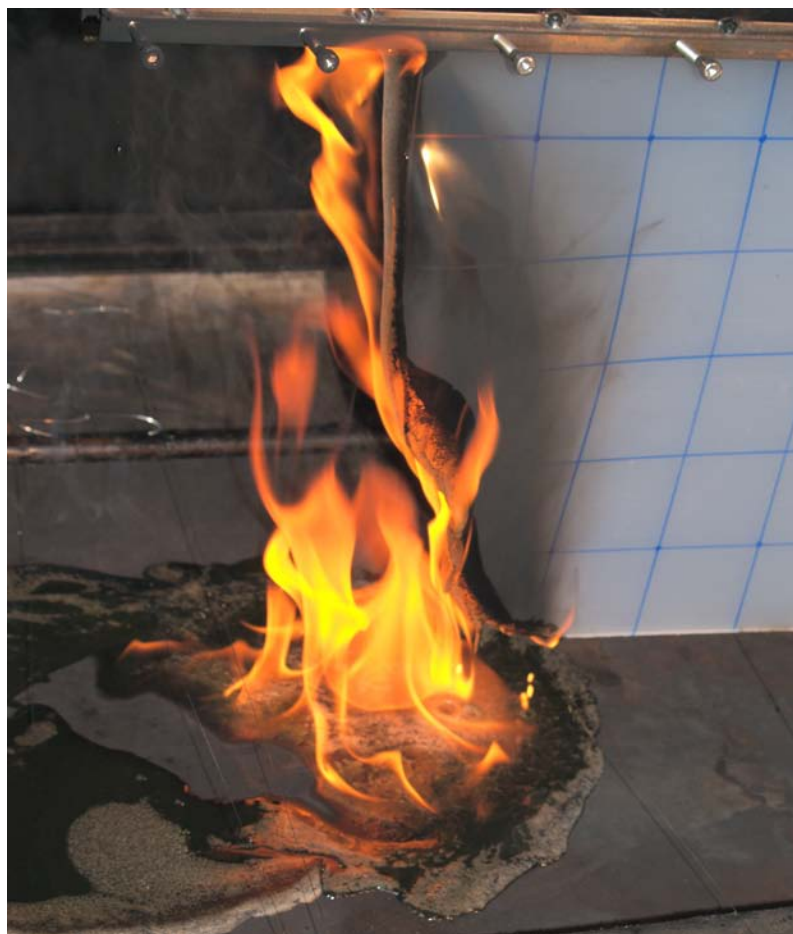
Marcelo M. Hirschler (GBH International), representing American Fire Safety Council, requests Disapproval.

When polypropylene siding is normally sold it is made with material that neither contains flame retardants nor contains any other additives that will prevent it from forming a pool fire as soon as it is exposed to a flame. Therefore, when polypropylene siding is exposed to the flame in the ASTM E 84 Steiner tunnel test it immediately starts melting and burning occurs in the floor of the tunnel, with no material left in the tunnel ceiling where the test sample should be. This material gets a low flame spread index (ASTM D 7254 requires a flame spread index under 200, just like for wood siding) but it is not a valid result because the material is no longer in the test position when the flame comes by. Therefore if polypropylene siding is made with typical polypropylene that has not been treated, the siding is a very dangerous product and polypropylene siding should not be allowed to be used based only on the requirements of ASTM D 7254.

It is also notable that the IRC-BE committee agreed that polypropylene siding should not be added to the IRC code but the IBC-FS committee supported its addition to the IBC code, where it would be allowed into more severe applications. This is not safe.

Polypropylene siding should only be approved if it meets some type of added fire safety requirements beyond those the industry incorporated into ASTM D 7254, for example as required by the public comments I submitted for RB148 (for the IRC) and by FS143 (for the IBC). If that level of safety cannot be required, the use of polypropylene siding should not be approved by the code.

The figure that follows shows what happens when normal non flame retarded polypropylene (the material that is used in siding) burns: it forms a pool fire. The photograph is not polypropylene siding but its component material.



Final Action: AS AM AMPC____ D

FS144-09/10, Part II

IRC R202, 703.13, 703.13.1, Chapter 44

Proposed Change as Submitted

Proponent: Matthew Dobson, representing Vinyl Siding Institute

1. Add new text as follows:

R202 DEFINITIONS

Polypropylene Siding. A shaped material made principally from polypropylene that is used to clad exterior walls covering.

2. Add new text as follows:

TABLE R703.4
WEATHER-RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

SIDING MATERIAL	NOMINAL THICKNESS ^a (inches)	JOINT TREATMENT	Water Resistive Barrier Required	Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud	Direct to studs	Number or spacing of fasteners
(NEW) Polypropylene Siding ^x	<u>Varies</u>	<u>Lap</u>	<u>Yes</u>	<u>0.120 nail (shank) with a .313 head^{y,z}</u>	<u>Not allowed^{aa,bb}</u>	<u>Not allowed^{aa,bb}</u>	<u>Not allowed^{aa,bb}</u>	<u>Not allowed</u>	<u>As specified by the manufacturer instructions or test report</u>

(Portions of table and footnotes not shown remain unchanged)

aa. Where the sheathing is applied directly over wood structural panels or other approved backing capable of independently resisting the design wind pressure, the polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

bb. Where the polypropylene siding manufacturer's product specifications provide an approved design wind pressure rating for installation over fiberboard, gypsum or foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacture's installation instructions.

3. Add new text as follows:

R703.13 Polypropylene Siding. Polypropylene siding shall comply with requirements of ASTM D 7254.

R703.13.1 Installation. Polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

4. Add new text to Chapter 44 standards as follows:

ASTM D7254 – 07 Standard Specification for Polypropylene (PP) Siding...Table R703.4, R703.13

Reason: The purpose of this change is to assist code officials with the recognition of polypropylene (PP) siding. This product has reached a level of maturity including the establishment of an acceptance criterion through ES and an ASTM product standard. By providing this recognition in the code, building officials will be able to quickly reference the product and installation provisions.

Currently there is confusion in the market place between vinyl siding and PP siding. In many instances the PP siding is thought to be vinyl siding, this new language will help the code official to understand the requirements of the product established by ES and ASTM and what to enforce relative to its installation.

D7254 – 07 Standard Specification for Polypropylene (PP) Siding
The ASTM standard provides all necessary manufacturing tests and specifications to ensure the product meets the intent of the code from safety and welfare to wind performance. Included with this proposal are copies of the acceptance criteria and the ASTM standard D7254.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposal FS143 and FS144 address new requirements for polypropylene siding. The committee needs to make its intent clear with respect to these provisions. A review of the standard(s) proposed for inclusion in the code, ASTM D7254-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: DOBSON-FS1-1404.8; RB2-202 PART II

Public Hearing Results

Note: The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

Analysis: Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

PART II - IRC

Committee Action:

Disapproved

Committee Reason: Based on the committee's previous action on RB148-09/10. Also, this material is not permitted in the IBC.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment 1:

Matthew Dobson, Vinyl Siding Institute Inc (VSI), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

Polypropylene Siding. A shaped material, made principally from polypropylene homopolymer, or copolymer, which in some cases may contain fillers and/or reinforcements, that is used to clad exterior walls of buildings covering.

**Table R703.4
WEATHER-RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS**

SIDING MATERIAL	NOMINAL THICKNESS ^a (inches)	JOINT TREATMENT	Water Resistive Barrier Required	Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud	Direct to studs	Number or spacing of fasteners
(NEW) Polypropylene Siding ^x	Varies	Lap	Yes	Min. 0.120 nail (shank) with a .313 head ^{y,z}	Not allowed ^{aa,bb}	Not allowed ^{aa,bb}	Not allowed ^{aa,bb}	Not allowed	As specified by the manufacturer instructions or test report

aa. Where the sheathing is applied directly over wood structural panels or other approved backing capable of independently resisting the design wind pressure, the polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

bb. Where the polypropylene siding manufacturer's product specifications provide an approved design wind pressure rating for installation over fiberboard, gypsum or foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions.

703.13 Polypropylene Siding. Polypropylene siding shall comply with requirements of ASTM D 7254.

703.13.1 Installation. Polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

CHAPTER 44

ASTM D7254 – 07 Standard Specification for Polypropylene (PP) Siding...Table R703.4, R703.13

Commenter's Reason: The companion version of this proposal was accepted by the IBC Fire Safety Committee (see FS144 Part I). One of the reasons the IRC Building/Energy Committee did not accept the proposal is because the provision is not currently in the IBC. The IBC Fire Safety committee has accepted this proposal for the IBC so it is logical to have the similar provision placed in the IRC.

This change will help code officials understand how to identify the difference between vinyl siding and polypropylene siding by using the established ASTM standard as criteria for acceptance in the IRC and IBC. Currently polypropylene siding is recognized through the established acceptance criteria which includes the ASTM standard and will continue to be in the future.

By recognizing polypropylene siding in both the IRC and IBC building officials will be able to easily determine when polypropylene siding is allowed and when it is not allowed. For example in higher density settings when lot-line requirements and fire rated assemblies are applied in section R302 of the IRC, polypropylene siding would not be allowed where vinyl siding is allowed.

This change will make buildings safer and give building and fire officials a clearer understanding of how the products are different and should be regulated differently.

Public Comment 2:

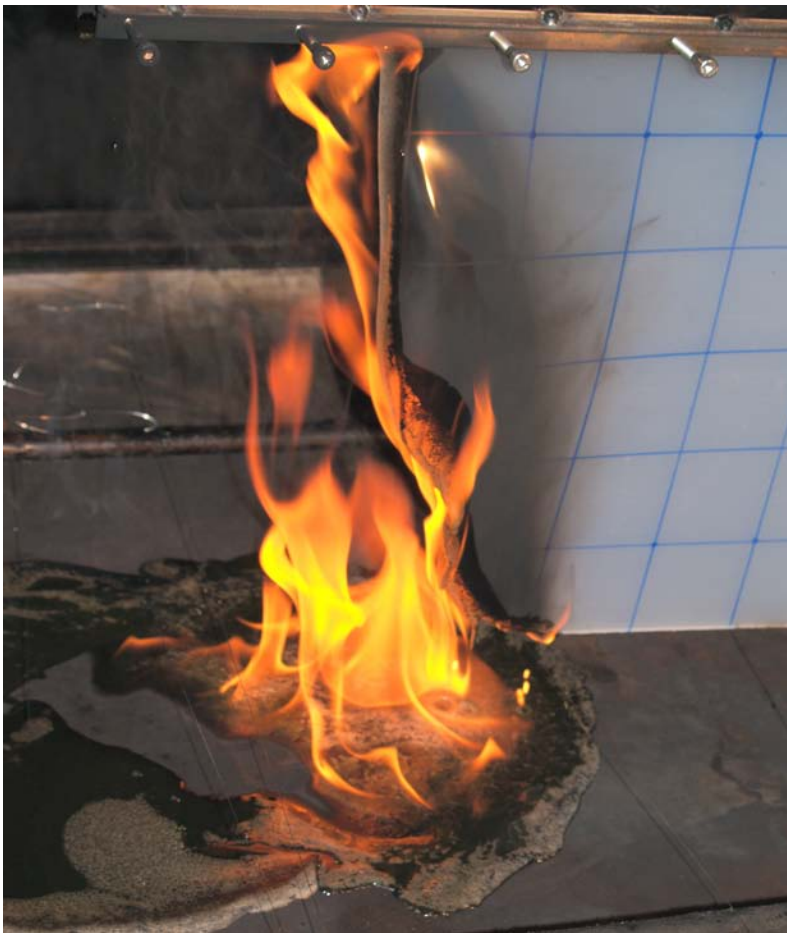
Marcelo M. Hirschler (GBH International), representing American Fire Safety Council, requests Disapproval.

When polypropylene siding is normally sold it is made with material that neither contains flame retardants nor contains any other additives that will prevent it from forming a pool fire as soon as it is exposed to a flame. Therefore, when polypropylene siding is exposed to the flame in the ASTM E 84 Steiner tunnel test it immediately starts melting and burning occurs in the floor of the tunnel, with no material left in the tunnel ceiling where the test sample should be. This material gets a low flame spread index (ASTM D 7254 requires a flame spread index under 200, just like for wood siding) but it is not a valid result because the material is no longer in the test position when the flame comes by. Therefore if polypropylene siding is made with typical polypropylene that has not been treated, the siding is a very dangerous product and polypropylene siding should not be allowed to be used based only on the requirements of ASTM D 7254.

It is also notable that the IRC-BE committee agreed that polypropylene siding should not be added to the IRC code but the IBC-FS committee supported its addition to the IBC code, where it would be allowed into more severe applications. This is not safe.

Polypropylene siding should only be approved if it meets some type of added fire safety requirements beyond those the industry incorporated into ASTM D 7254, for example as required by the public comments I submitted for RB148 (for the IRC) and by FS143 (for the IBC). If that level of safety cannot be required, the use of polypropylene siding should not be approved by the code.

The figure that follows shows what happens when normal non flame retarded polypropylene (the material that is used in siding) burns: it forms a pool fire. The photograph is not polypropylene siding but its component material.



Final Action: AS AM AMPC_____ D

FS145-09/10

1402 (New), 1404.13 (New), Table 1405.2, 1405.10.2 (New)

Proposed Change as Submitted

Proponent: Olene Bigelow, representing International Masonry Institute

1. Add new text as follows:

1402 DEFINITIONS

COMPOSITE NATURAL STONE. A veneer consisting of natural stone laminated to, or combined with, other like units to form a larger unit, or to dissimilar materials to form a cladding to be anchored or adhered to an approved substrate.

2. Add new text as follows:

1404.13 Porcelain Tile. Porcelain tile shall conform to the requirements of ANSI 137.1.3 for ceramic tile having an absorption of 0.5% or less according to ANSI 137.4.1 – Class Table and ANSI 137.1.6.1 Allowable Properties by Tile Type – Table 10.

3. Revise as follows:

**TABLE 1405.2
MINIMUM THICKNESS OF WEATHER COVERINGS**

Covering Type	Minimum Thickness (Inches)
Porcelain Tile	0.25
Composite Natural Stone	0.50

(Portions of table not shown remain unchanged)

4. Add new text as follows:

1405.10.2 Exterior adhered masonry veneers - porcelain tile and composite natural stone. Adhered units shall not exceed 5/8" thickness and a maximum of 24" in any face dimension nor more than 3 square feet in total face area and shall not weigh more than 9 pounds per square foot. Porcelain tile and composite natural stone shall be adhered to an approved backing system.

Reason: There is currently no definition for composite natural stone in the IBC. This proposal would add that definition. Currently, there is no definition for porcelain tile in the IBC. As one of myriad types of ceramic tile, its unique characteristics and extremely low absorption rate requires it be dealt with differently from other materials, especially when applied as an exterior adhered veneer. These materials are relatively new in exterior applications and fall outside the scope of TMS 402/ACI 530/ASCE 6. With no specific code requirements found in IBC, installations of these materials are being found inadequate and some significant failures have occurred. See attached photographs. When these units and/or their adhesion system fail, for whatever ultimate reason, public safety is put at risk.



Here, only a few units have fallen, so far. No mechanical attachment.



Another project: Upon stripping the façade, it appears an attempt was made to “anchor” the units, but it was clearly unsuccessful

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standards ANSI A137 are currently referenced in the I-codes.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee was concerned about the disposition of the referenced standard, ANSI 137. Further, the committee felt the proposal should be limited to porcelain tiles only and suggests the proponent bring the change back for final action with the approved standard and the suggested revisions.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Olene Bigelow, representing International Masonry Institute, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1402 DEFINITIONS

COMPOSITE NATURAL STONE. A veneer consisting of natural stone laminated to, or combined with, other like units to form a larger unit, or to dissimilar materials to form a cladding to be anchored or adhered to an approved substrate.

~~1404.13 Porcelain Tile.~~ **PORCELAIN TILE.** Porcelain tile shall conform to the requirements of ANSI 137.1.3 for ceramic tile having an absorption of 0.5% or less according to ANSI 137.4.1 – Class Table and ANSI 137.1.6.1 Allowable Properties by Tile Type – Table 10.

**TABLE 1405.2
MINIMUM THICKNESS OF WEATHER COVERINGS**

Covering Type	Minimum Thickness (Inches)
Porcelain Tile	0.25
Composite Natural Stone	0.50

(Portions of table not shown remain unchanged)

1405.10.2 Exterior adhered masonry veneers - porcelain tile and composite natural stone. Adhered units shall not exceed 5/8" thickness and a maximum of 24" in any face dimension nor more than 3 square feet in total face area and shall not weigh more than 9 pounds per square foot. Porcelain tile ~~and composite natural stone~~ shall be adhered to an approved backing system.

Commenter's Reason: Currently, there is no definition for porcelain tile in the IBC. As one of myriad types of ceramic tile, its unique characteristics and extremely low absorption rate requires it be dealt with differently from other materials, especially when applied as an exterior adhered veneer. These materials are relatively new in exterior applications and fall outside the scope of TMS 402/ACI 530/ASCE 6. With no specific code requirements found in IBC, installations of these materials are being found inadequate and some significant failures have occurred. Since no code provisions exist to cover these exterior applications, installers are sometimes using the same setting materials that are used for interior applications, which is inappropriate in most cases. When these units and/or their adhesion system fail, for whatever ultimate reason, public safety is put at risk.

In response to the committee's request, the proposal as submitted for final action is limited to porcelain tile only. Further, as requested by the committee, two printed and two digital copies of the referenced standard in question, ANSI 137.1 – 2008 edition have been forwarded to ICC staff.

Final Action: AS AM AMPC_____ D

FS149-09/10 1405.7

Proposed Change as Submitted

Proponent: Gary J. Ehrlich, PE, representing National Association of Home Builders

Revise as follows:

1405.7 Stone veneer. Stone veneer units not exceeding 10 inches (254 mm) in thickness shall be anchored directly to masonry, concrete or to stud construction by one of the following methods:

1. *(No change to current text)*
2. With wood stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) corrosion-resistant wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to wood studs spaced a maximum of 16 inches (406 mm) o.c. On studs, the mesh shall be attached with 2-inch-long (51 mm) corrosion-resistant steel wire furring nails at 4 inches (102 mm) o.c. providing a minimum 1.125-inch (29 mm) penetration into each stud and with 8d common nails at 8 inches (203 mm) o.c. into top and bottom plates or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, looped through the mesh for every 2 square feet (0.2 m²) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the

stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer.

3. With cold-formed steel stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) corrosion-resistant wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to steel studs spaced a maximum of 16 inches (406 mm) o.c. The mesh shall be attached with 2-inch-long (51 mm) corrosion-resistant #8 self-drilling, tapping screws at 4 inches (102 mm) o.c. providing a minimum 0.5-inch (12.7 mm) penetration into each stud, and at 8 inches (203 mm) o.c. into top and bottom tracks or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, looped through the mesh for every 2 square feet (0.2 m²) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer. The cold-formed steel framing members shall have a minimum uncoated thickness of 0.043 inches (1.09 mm).

Reason: The purpose of this proposal is to provide guidance for stone veneer anchored to cold-formed steel stud backing. The current language only addresses wood studs, leaving attachment to cold-formed steel stud backing as an alternate means and methods. The language mirrors the wood stud language, with appropriate revisions based on ICC-ES stone veneer reports and BIA Technical Note 28B on Brick Veneer/Steel Stud Walls.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: Ehrlich-FS1-1405 7

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1405.7 Stone veneer. Stone veneer units not exceeding 10 inches (254 mm) in thickness shall be anchored directly to masonry, concrete or to stud construction by one of the following methods:

1. *(No change to current text)*
2. With wood stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) corrosion-resistant wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to wood studs spaced a maximum of 16 inches (406 mm) o.c. On studs, the mesh shall be attached with 2-inch-long (51 mm) corrosion-resistant steel wire furring nails at 4 inches (102 mm) o.c. providing a minimum 1.125-inch (29 mm) penetration into each stud and with 8d common nails at 8 inches (203 mm) o.c. into top and bottom plates or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, looped through the mesh for every 2 square feet (0.2 m²) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer.
3. With cold-formed steel stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) ~~corrosion-resistant zinc-coated or non-metallic coated~~ wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to steel studs spaced a maximum of 16 inches (406 mm) o.c. The mesh shall be attached with ~~2-inch-long (51 mm)~~ corrosion-resistant #8 self-drilling, tapping screws at 4 inches (102 mm) o.c. ~~providing a minimum 0.5-inch (12.7 mm) penetration into each stud, and at 8 inches (203 mm) o.c. into top and bottom tracks or with equivalent wire ties. All screws shall extend through the steel connection a minimum of three exposed threads.~~ There shall be not less than a 0.1055-inch (2.68 mm) ~~corrosion-resistant zinc-coated or non-metallic coated~~ wire, or approved equal, looped through the mesh for every 2 square feet (0.2 m²) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer. The cold-formed steel framing members shall have a minimum ~~uncoated bare steel~~ thickness of 0.04283 inches (1.0879 mm).

Committee Reason: This proposal provides a reasonable extension of stone veneer to steel studs in Section 1405.7, item 3. It also clarifies that current item 2 is specifically applicable for anchoring to wood studs. The modification substitutes wording in item 3 that is more in line with common steel industry terminology. The addition of appropriate steel stud requirements exposes problems with the current wood stud requirement (item 2) that should be addressed by a public comment.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment 1:

Gary J. Ehrlich, PE, representing National Association of Home Builders (NAHB), requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

1405.6 Stone veneer. Stone veneer units not exceeding 10 inches (254 mm) in thickness shall be anchored directly to masonry, concrete or to stud construction by one of the following methods:

1. *(No change to current text)*
2. With wood stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) ~~zinc-coated or non-metallic coated corrosion-resistant~~ wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to wood studs spaced a maximum of 16 inches (406 mm) o.c. On studs, the mesh shall be attached with 2-inch-long (51 mm) corrosion-resistant steel wire furring nails at 4 inches (102 mm) o.c. providing a minimum 1.125-inch (29 mm) penetration into each stud and with 8d common nails at 8 inches (203 mm) o.c. into top and bottom plates or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) ~~zinc-coated or non-metallic coated corrosion-resistant~~ wire, or approved equal, ~~looped through the mesh attached to the stud with 8d annular threaded~~ nails 0.113 inches in diameter (2.807 mm) minimum for every 2 square feet (0.2 m²) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer.
3. With cold-formed steel stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) zinc-coated or non-metallic coated wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to steel studs spaced a maximum of 16 inches (406 mm) o.c. The mesh shall be attached with corrosion-resistant #8 self-drilling, tapping screws at 4 inches (102 mm) o.c., and at 8 inches (203 mm) o.c. into top and bottom tracks or with equivalent wire ties. All screws shall extend through the steel connection a minimum of three exposed threads. There shall be not less than a 0.1055-inch (2.68 mm) zinc-coated or non-metallic coated wire, or approved equal, ~~looped through the mesh attached to the stud with corrosion-resistant #8 self-drilling, tapping screws~~ for every 2 square feet (0.2 m²) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer. The cold-formed steel framing members shall have a minimum bare steel thickness of 0.0428 inches (1.087 mm).

Commenter's Reason: The purpose of this public comment is to correlate the stone veneer attachment provisions for wood and cold-formed steel studs and provide further technical improvements. The language for corrosion-resistant mesh and wire under the wood stud section is amended to match the change to zinc- or non-metallic coated mesh and wire made by a Steel Framing Alliance floor modification. Also, at the request of the seismic engineering community, the requirements for the stone tie are changed to require the tie be attached directly to the studs. This is a significantly more stable connection than attaching the tie just to the mesh.

Public Comment 2:

Steven Winkel, FAIA, PE; J. Daniel Dolan, PhD, PE, representing the Federal Emergency Management Agency/Building Seismic Safety Council Code Resource Support Committee (FEMA/BSSC CRSC), requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

1405.7 Stone veneer. Stone veneer units not exceeding 10 inches (254 mm) in thickness shall be anchored directly to masonry, concrete or to stud construction by one of the following methods:

1. *(No change to current text)*
2. With wood stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) corrosion-resistant wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to wood studs spaced a maximum of 16 inches (406 mm) o.c. On studs, the mesh shall be attached with 2-inch long (51 mm) corrosion-resistant steel wire furring nails at 4 inches (102 mm) o.c. providing a minimum 1.125-inch (29 mm) penetration into each stud and with 8d ~~common annular threaded~~ nails at 8 inches (203 mm) o.c. into top and bottom plates or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, ~~looped through the mesh attached to the stud with a minimum of a 8d (0.131 in. diameter) annular threaded nail~~ for every 2 square feet (0.2 m²) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer.
3. With cold-formed steel stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) zinc-coated or non-metallic coated wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to steel studs spaced a maximum of 16 inches (406 mm) o.c. The mesh shall be attached with corrosion-resistant #8 self-drilling, tapping screws at 4 inches (102 mm) o.c., and at 8 inches (203 mm) o.c. into top and bottom tracks or with equivalent wire ties. All screws shall extend through the steel connection a minimum of three exposed threads. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, ~~looped through the mesh attached to the stud with a minimum of a #8 self-drilling, tapping screw extending through the steel framing a minimum of three exposed threads~~ for every 2 square feet (0.2 m²) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg

shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer. The cold-formed steel framing members shall have a minimum base steel thickness of 0.0428 inches (1.087 mm).

Commenter's Reason Statement: The modification is proposed for two reasons:

1. In order for the ties between the structural framing and the stone masonry veneer to function properly, they need to be attached to the wall framing (studs). As the two requirements are currently written, the ties (wires) can simply be looped through a steel mesh that is attached to the studs. The wire mesh has too much flexibility to effectively hold the stone in place and, therefore, this modification is submitted to require that the wires or ties be directly attached to the studs.
2. Recent shake table testing at the University of California at San Diego showed that smooth shank nails did not perform satisfactorily when used in withdrawal to hold masonry veneer on a wood light-frame wall system. The nails withdrew from the framing at accelerations below the design load. The requirement that annular threaded (ring-shank) nails be used will correct this problem because of their increased withdrawal strength and lower sensitivity to moisture changes.

Final Action: AS AM AMPC_____ D

FS150-09/10, Part I

1405.10.2 (New), 1405.10.2.1 (New), 1405.10.2.2 (New), 1405.10.2.3 (New)

Proposed Change as Submitted

Proponent: John Woestman, The Kellen Company, Representing the Masonry Veneer Manufacturers Association (MVMA)

PART I – IBC FIRE SAFETY

Add new text as follows:

1405.10 Adhered masonry veneer. Adhered masonry veneer shall comply with the applicable requirements in Section 1405.10.1 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

1405.10.1 Interior adhered masonry veneers. Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m²) and shall be installed in accordance with Section 1405.10. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit deflection to 1/600 of the span of the supporting members.

1405.10.2 Exterior adhered masonry veneer. Exterior adhered masonry veneer shall be in accordance with section 1405.10

1405.10.2.1 Water-resistive barriers. Water-resistive barriers shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper.

Exception: Where the water-resistive barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60-minute Grade D paper and is separated from the adhered masonry veneer by an intervening, substantially nonwater-absorbing layer or drainage space.

1405.10.2.2 Flashing at foundation. A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gage galvanized or plastic with a minimum vertical attachment flange of 3 ½ inches (89 mm) shall be installed a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section 1405.4 to direct moisture to the exterior. The water-resistive barrier shall lap over the exterior of the attachment flange of the screed or flashing.

1405.10.2.3 Installation. Adhered masonry veneer shall be installed in accordance with the manufacturer's instructions..

Reason:

PART I-The added section for exterior adhered masonry veneer compliments the existing section for interior adhered masonry veneer.

The proposed language for water-resistive barriers is modeled after similar requirements for stucco (section 2510.6).

The proposed language for flashing at the foundation is similar to the weep screed requirements for stucco and compliments the performance requirements of section 1405.4 Flashing (*Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior*) while at the same time allowing for alternates to the stucco-specific weep screed.

Adhered masonry veneer manufacturers require their products to be installed per their instructions and the building code should support this requirement with enforceable language.

Cost Impact: The code change proposal will not increase the cost of construction

ICCFILENAME: WOESTMAN -FS3-1410.2 PART I AND WOESTMAN-RB2-703.12.1 PART II

Public Hearing Results

PART I- IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The committee felt that the proposal was confusing because of the circular code references. Reference back to 1405.10 does not get the code user forward to the subsection of 1405.10.2.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

John Woestman, Kellen Company, representing Masonry Veneer Manufacturers Association (MVMA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1405.10 Adhered masonry veneer. Adhered masonry veneer shall comply with the applicable requirements in Section 1405.10.4 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

1405.10.21 Exterior adhered masonry veneer. Exterior adhered masonry veneer shall be installed in accordance with section 1405.10 and in accordance with the manufacturer's instructions.

1405.10.21.1 Water-resistive barriers. Water-resistive barriers shall be installed as required in Section ~~1404.2~~ 2510.6, ~~and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper.~~

Exception: ~~Where the water-resistive barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60-minute Grade-D paper and is separated from the adhered masonry veneer by an intervening, substantially nonwater-absorbing layer or drainage space.~~

1405.10.21.2 Flashing at foundation. A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gauge galvanized or plastic with a minimum vertical attachment flange of 3 1/2 inches (89 mm) shall be installed ~~to extend~~ a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section 1405.4 ~~to direct moisture to the exterior.~~ The water-resistive barrier shall lap over the exterior of the attachment flange of the screed or flashing.

1405.10.42 Interior adhered masonry veneers. Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m²) and shall be installed in accordance with Section 1405.10. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit deflection to 1/600 of the span of the supporting members.

Commenter's Reason: This public comment addresses comments at the committee hearings last fall. The section numbering has been revised. Requirements for exterior adhered masonry veneer are placed ahead of existing requirements for interior adhered masonry veneer because code requirements for exterior adhered masonry veneer are expected to be needed more often.

Adhered masonry veneer manufacturers require their products to be installed per their instructions (which complement building code requirements) and the building code should support the requirement to be installed consistent with the manufacturer's instructions with enforceable language.

Requirements for water-resistive barriers are revised to refer to Section 2510.6 (stucco) instead of copying that text to this section of the code. Wall preparation for stucco and for exterior adhered masonry veneer is very similar (flashing, WRB, lath, scratch coat . . .) and referring to Section 2510.6 helps with consistency in the code for WRB requirements.

The proposed language for flashing at the foundation is similar to the flashing at foundation / weep screed requirements for stucco and compliments the performance requirements of Section 1405.4 Flashing (*Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior*) while at the same time allowing for alternates to the stucco-specific weep screed.

Final Action:

AS

AM

AMPC_____

D

FS150-09/10, Part II

IRC R703.12.1 (New)

Proposed Change as Submitted

Proponent: John Woestman, The Kellen Company, Representing the Masonry Veneer Manufacturers Association (MVMA)

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R703.12 Adhered masonry veneer installation. Adhered masonry veneer shall be installed in accordance with the manufacturer's instructions.

R703.12.1 Flashing at foundation. A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gage galvanized or plastic with a minimum vertical attachment flange of 3 ½ inches (89 mm) shall be installed a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section R703.8 to direct moisture to the exterior. The water-resistive barrier, as required by Table R703.4 Footnote w, shall lap over the exterior of the attachment flange of the screed or flashing.

Reason:

PART II- The proposed language for flashing at the foundation is similar to the weep screed requirements for stucco and compliments the flashing performance requirements of section R703.8 Flashing (*Approved* corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components . . .) while at the same time allowing for effective alternates to the stucco-specific weep screed.

Cost Impact: The code change proposal will not increase the cost of construction

ICCFILENAME: WOESTMAN -FS3-1410.2 PART I AND WOESTMAN-RB2-703.12.1 PART II

Public Hearing Results

PART II - IRC

Committee Action:

Approved as Submitted

Committee Reason: This change provides a prescriptive method for flashing or weep screeds for adhered masonry veneer. The committee suggests the proponent improve the language to clarify where the flashing should start, above or below the plate.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

John Woestman, Kellen Company, representing Masonry Veneer Manufacturers Association (MVMA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

R703.12 Adhered masonry veneer installation. Adhered masonry veneer shall be installed in accordance with the manufacturer's instructions.

R703.12.1 Flashing at foundation. A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gage galvanized or plastic with a minimum vertical attachment flange of 3 1/2 inches (89 mm) shall be installed to extend a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section R703.8 to direct moisture to the exterior. The water-resistive barrier, as required by Table R703.4 Footnote w, shall lap over the exterior of the attachment flange of the screed or flashing.

Commenter's Reason: This public comment addresses the committee suggestion to clarify where the flashing should be placed. In addition, this public comment addresses concerns shared with MVMA members regarding the proposed language. Installing flashing in accordance with Section R703.8 requires flashing to "extend to the surface of the exterior wall finish" and requires flashing to "prevent entry of water into the wall cavity or penetration of water to the building structural framing components." The text proposed to be deleted is redundant.

Final Action: AS AM AMPC_____ D

FS151-09/10, Part I

1405.10.2 (New), 1405.2.1 (New)

Proposed Change as Submitted

Proponent: John Woestman, The Kellen Company, Representing the Masonry Veneer Manufacturers Association (MVMA)

PART I – IBC FIRE SAFETY

Add new text as follows:

1405.10 Adhered masonry veneer. Adhered masonry veneer shall comply with the applicable requirements in Section 1405.10.1 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

1405.10.1 Interior adhered masonry veneers. Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m²) and shall be installed in accordance with Section 1405.10. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit deflection to 1/600 of the span of the supporting members.

1405.10.2 Exterior adhered masonry veneer. Exterior adhered masonry veneer shall be in accordance with section 1405.10

1405.10.2.1 Clearances. Adhered masonry veneer shall be installed a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas or ½ inch (12 mm) above exterior walking surfaces supported by the same foundation which supports the exterior wall.

Reason:

PART I: The added section for exterior adhered masonry veneer compliments the existing section for interior adhered masonry veneer.

The clearance requirements are consistent with stucco applications and go one step further by specifying a minimum of ½" clearance to exterior walking surfaces which are supported by the same foundation that supports the wall to which the exterior veneer is adhered. The proposed requirement that both the wall and the walking surface be supported by the same foundation, along with existing IBC flashing performance requirements of section 1405.4 for exterior wall intersections with porches, decks, balconies, and similar architectural features, limits this ½" clearance to building elements stable to each other and required to be flashed to manage water. This ½" clearance requirement allows for architectural and aesthetic improvements in the installation of adhered masonry veneer.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: WOESTMAN -FS4-1410.2 PART I AND WOESTMAN-RB3-R703.12.1 PART II

Public Hearing Results

PART I- IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The committee felt that the proposal was confusing because of the circular code references. Reference back to 1405.10 does not get the code user forward to the subsection of 1405.10.2.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

John Woestman, Kellen Company, representing Masonry Veneer Manufacturers Association (MVMA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1405.10 Adhered masonry veneer. Adhered masonry veneer shall comply with the applicable requirements in Section 1405.10-4 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

1405.10.21 Exterior adhered masonry veneer. Exterior adhered masonry veneer shall be installed in accordance with section 1405.10 and in accordance with the manufacturer's instructions.

1405.10.21.1 Clearances. On exterior stud walls, adhered masonry veneer shall be installed a minimum of 4 inches (102 mm) above the earth, or a minimum of 2 inches (51 mm) above paved areas, or a minimum of 1/2 inch (12 mm) above exterior walking surfaces which are supported by the same foundation which that supports the exterior wall.

1405.10.42 Interior adhered masonry veneers. Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m²) and shall be installed in accordance with Section 1405.10 and the manufacturer's instructions. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit deflection to 1/600 of the span of the supporting members.

Commenter's Reason: This public comment follows the format proposed in FS150 Part I which addresses the committee comments of a circular code reference.

Also, the "clearances" text is revised to clarify the requirements are for exterior stud walls. The clearance requirements are consistent with stucco applications and go one step further by specifying a minimum of ½" clearance to exterior walking surfaces which are supported by the same foundation that supports the wall to which the exterior veneer is adhered. The proposed requirement that both the wall and the walking surface be supported by the same foundation, along with existing IBC flashing performance requirements of section 1405.4 for exterior wall intersections with porches, decks, balconies, and similar architectural features, limits this ½" clearance to building elements stable to each other and required to be flashed to manage water. This ½" clearance requirement allows for architectural and aesthetic improvements in the installation of adhered masonry veneer.

Final Action: AS AM AMPC _____ D

FS151-09/10, Part II

IRC R703.12.1 (New)

Proposed Change as Submitted

Proponent: John Woestman, The Kellen Company, Representing the Masonry Veneer Manufacturers Association (MVMA)

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R703.12 Adhered masonry veneer installation. Adhered masonry veneer shall be installed in accordance with the manufacturer's instructions.

R703.12.1 Clearances. Adhered masonry veneer shall be installed a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas or ½ inch (12 mm) above exterior walking surfaces supported by the same foundation which supports the exterior wall.

Reason:

PART I: The added section for exterior adhered masonry veneer compliments the existing section for interior adhered masonry veneer.

The clearance requirements are consistent with stucco applications and go one step further by specifying a minimum of ½" clearance to exterior walking surfaces which are supported by the same foundation that supports the wall to which the exterior veneer is adhered. The proposed requirement that both the wall and the walking surface be supported by the same foundation, along with existing IBC flashing performance requirements of section 1405.4 for exterior wall intersections with porches, decks, balconies, and similar architectural features, limits this ½" clearance to building elements stable to each other and required to be flashed to manage water. This ½" clearance requirement allows for architectural and aesthetic improvements in the installation of adhered masonry veneer.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: WOESTMAN -FS4-1410.2 PART I AND WOESTMAN-RB3-R703.12.1 PART II

Public Hearing Results

PART II- IRC B/E
Committee Action:

Disapproved

Committee Reason: The committee feels this is a good start but the list needs to be reworked so that the application is clear. The list should appear as numbered items as is done in other sections of the code. The proponent should rework this and bring it back.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

John Woestman, Kellen Company, representing Masonry Veneer Manufacturers Association (MVMA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

R703.12 Adhered masonry veneer installation. Adhered masonry veneer shall be installed in accordance with the manufacturer's instructions.

R703.12.1 Clearances. On exterior stud walls, ~~Ad~~hered masonry veneer shall be installed

1. ~~a-m~~Minimum of 4 inches (102 mm) above the earth, or
2. Minimum of 2 inches (51 mm) above paved areas, or
3. Minimum of 1/2 inch (12 mm) above exterior walking surfaces which are supported by the same foundation ~~which that~~ supports the exterior wall.

Commenter's Reason: This public comment addresses the committee recommendation to list the proposed requirements as numbered items.

This proposal also clarifies the proposed requirements are applicable to stud walls.

The clearance requirements proposed are consistent with stucco applications and go one step further by specifying a minimum of ½" clearance to exterior walking surfaces which are supported by the same foundation that supports the wall to which the exterior veneer is adhered. The proposed requirement that both the wall and the walking surface be supported by the same foundation, along with existing IRC flashing performance requirements of section R703.8 for exterior wall intersections with porches, decks, or stairs, limits this ½" clearance to building elements stable to each other and required to be flashed to manage water. This ½" clearance requirement allows for architectural and aesthetic improvements in the installation of adhered masonry veneer.

Final Action: AS AM AMPC____ D

FS155-09/10, Part I

1406.2.1

Proposed Change as Submitted

Proponent: Michael Love, representing Metropolitan Washington DC Fire Marshal's Committee

PART I – IBC Fire Safety

Revise as follows:

1406.2.1 Ignition resistance. Combustible exterior wall coverings shall be tested in accordance with NFPA 268.

Exceptions:

1. Wood or wood-based products.
2. Other combustible materials covered with an exterior covering other than vinyl sidings listed in Table 1405.2.
3. Aluminum having a minimum thickness of 0.019 inch (0.48mm).
4. Exterior wall coverings on exterior walls of Type V construction.

1406.2.1.1 Fire separation 5 feet or less. Where installed on exterior walls having a fire separation distance of 5 feet (1524 mm) or less to buildings, structures or decks, combustible exterior wall coverings shall not exhibit sustained flaming as defined in NFPA 268.

Exceptions:

1. Decks constructed of fire retardant treated wood
2. Exterior balconies and decks protected by automatic sprinklers as provided for in Section 903.3.1.2.1

1406.2.1.2 Fire separation greater than 5 feet. For fire separation distances greater than 5 feet (1524 mm) to buildings, structures or decks, an assembly shall be permitted that has been exposed to a reduced level of incident radiant heat flux in accordance with the NFPA 268 test method without exhibiting sustained flaming. The minimum fire separation distance required for the assembly shall be determined from Table 1406.2.1.2 based on the maximum tolerable level of incident radiant heat flux that does not cause sustained flaming of the assembly.

Exceptions:

1. Decks constructed of fire retardant treated wood
2. Exterior balconies and decks protected by automatic sprinklers as provided for in Section 903.3.1.2.1

Reason:

Part I- A technical change is needed to Section 1406 relating to the lack of fire resistance of the exterior surface of exterior combustible walls when directly exposed to combustible decks. It is likely that code development did not consider the need to require fire resistance for the exterior wall from these structures but there is a growing concern for the number of fires that start on and under combustible decks which when ignited burn fiercely.

This code change proposal is not intended to address all fires that could present an exposure to combustible exterior walls. It focuses on the higher risk and increased likelihood for a fire involving a combustible deck that is directly attached or within five feet of the combustible exterior wall. Since decks would have a limited exposure to a building any additional expenditure for more fire resistant materials is reduced. Ultimately a sheathing of gypsum even in thin layers increases the resistance.

1406.2.1.1 and 1406.2.1.2 both add the same language to include proximity to buildings, structures or decks and allows an exception for decks constructed of fire retardant wood.

This code change proposal is not intended to address all fires that could present an exposure to combustible exterior walls. It focuses on the higher risk and increased likelihood for a fire involving a combustible deck that is directly attached to or within five feet of the combustible exterior wall. Since decks would have a limited exposure to a building any additional expenditure for more fire resistant materials is reduced. Ultimately a sheathing of gypsum even in thin layers increases the resistance.

These fires are rarely extinguished before it has spread into the void of the exterior combustible wall or up the exterior surface of the walls and into the attic. While the most frequent facing surface of the exterior wall is vinyl siding this is listed in specs as non-combustible. There is experience that indicates no effective resistance to fire though as the siding readily melts away to allow fire access to the substrate sheathing which most often is a combustible material such as Oriented Strand Board (OSB), low density fiber board and Rigid Foam Insulation. These common materials are combustible but OSB resists direct flame longer than rigid foam insulation. Tests conducted by the National Institute for Standards and Technology showed that when a plume of heated gases and flame impinges on a combustible exterior wall it will ignite the combustible exterior wall that is within five feet. This scenario may actually be less dramatic than a well advanced fire involving an attached deck which could preheat the combustible wall and directly expose it to a vertical flame. This exposure and create a more intense flame spread vertically on the wall. Some materials used as a substrate to the exterior siding will resist fire more than others; some materials readily spread fire vertically directly to the roof along the exterior surface; into a non-fire resistant soffit then into the attic, or destroys the integrity of the substrate material and the enters the wall void.

Decks have become more like exterior rooms with furniture, outdoor kitchens and primarily the presence of people. Barbecue grills, lighting and the inappropriate disposal of smoking materials are all hazards that have been the causes of fires that first ignite decks then spread easily to and into the structure of a home or similar building. Once ignited decks burn violently with direct flame and radiant heat exposure to combustible exterior walls. The fact that the fuel in a deck is open on all sides which enhances oxidization for complete combustion and ample direct flame as well as preheating from radiant heat make them a perfect primary fire source to feed fires that most often spread to and involve the roof and attic of homes. The direct flaming attack on these walls cause nearly immediate destruction of combustible and easily degraded sidings to allow immediate access and exposure to the interior structure. Due to the unique flow of the heat and gases from the deck fires into the structure these fires most often result in near total loss of structure. In the Washington D.C Metro area these fires have resulted in many fires one incident which killed a firefighter and another fire incident that severely burned multiple firefighters.

Cost Impact: Part I & II- Product information indicates that a product such as a gypsum-based exterior sheathing is comparable to other sheathing and is more resistant to fire.

ICCFILENAME: LOVE-FS1-1406.2.1.1-RB-1-R302.1.2

Public Hearing Results

PART I- IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The committee felt the proposal was not coordinated with the definition of fire separation distance, was too broad in its application and was already cover in the projection requirements of the code.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Marcelo M. Hirschler (GBH International), representing American Fire Safety Council; Robert J. Davidson (Davidson Code Concepts, LLC) representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1406.2.1 Ignition resistance. Combustible exterior wall coverings shall be tested in accordance with NFPA 268.

Exceptions:

1. Wood or wood-based products.
2. Other combustible materials covered with an exterior covering other than vinyl sidings listed in Table 1405.2.
3. Aluminum having a minimum thickness of 0.019 inch (0.48mm).
4. Exterior wall coverings on exterior walls of Type V construction.

1406.2.1.1 Fire separation 5 feet or less. Where installed on exterior walls having a fire separation distance of 5 feet (1524 mm) or less to buildings, structures or decks, combustible exterior wall coverings shall not exhibit sustained flaming as defined in NFPA 268.

Exceptions:

- ~~1. Decks constructed of fire retardant treated wood~~
1. Decks constructed of noncombustible materials or of materials that, when tested in accordance with the test procedures set forth in ASTM E 84, or UL 723, for a test period of 30 minutes, comply with the following:
 - 1.1. The material shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the extended 30 minute test;
 - 1.2. The 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; and
 - 1.3. The deck boards shall bear a label indicating the required performance levels.
2. Exterior balconies and decks protected by automatic sprinklers as provided for in Section 903.3.1.2.1

1406.2.1.2 Fire separation greater than 5 feet. For fire separation distances greater than 5 feet (1524 mm) to buildings, structures or decks, an assembly shall be permitted that has been exposed to a reduced level of incident radiant heat flux in accordance with the NFPA 268 test method without exhibiting sustained flaming. The minimum fire separation distance required for the assembly shall be determined from Table 1406.2.1.2 based on the maximum tolerable level of incident radiant heat flux that does not cause sustained flaming of the assembly.

Exceptions:

- ~~1. Decks constructed of fire retardant treated wood~~
- ~~2. Exterior balconies and decks protected by automatic sprinklers as provided for in Section 903.3.1.2.1~~

Commenter's Reason: The comment restricts the requirement for improved fire performance decks (or sprinklered decks) to buildings with fire separations of up to 5 feet and does not address those where the fire separation is greater. Moreover, the requirement for the decks is more generic than in the original proposal and allows both noncombustible materials and materials that meet a fire test (which fire-retardant-treated wood also meets) so that the materials to be used are not exclusive. Finally, the enforceability is enhanced by the requirement to add a label to the deck boards with the required performance levels.

Final Action: AS AM AMPC_____ D

FS155-09/10, Part II

IRC R302.1.2 (New)

Proposed Change as Submitted

Proponent: Michael Love, representing Metropolitan Washington DC Fire Marshal's Committee

PART II – IRC Building/Energy

Add new text as follows:

R302.1 Exterior walls. Construction, projections, openings and penetrations of *exterior walls of dwellings* and accessory buildings shall comply with Table R302.1.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *dwelling*s and *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the *lot*. Projections beyond the *exterior wall* shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

R302.1.2. Combustible Exterior Walls and Combustible Decks . Combustible exterior wall coverings and sheathing that are ignitable below 12.5 KW/m² and exhibit sustained flaming shall not be used where installed on exterior walls having a fire separation distance of 5 feet (1524 mm) to combustible decks or balconies.

Exception: Decks constructed of fire retardant treated wood

Reason:

Part II- Add a new section to IRC Chapter 3 as R302.1.2 to increase fire resistance of combustible exterior walls when directly exposed to combustible decks. It is likely that the code development process did not consider the need to require fire resistance for the exterior wall from decks but there is a growing concern for the number of fires that start on and under combustible decks which when ignited burn fiercely. IRC considers exposure buildings in regard to fire spread but does not include the hazard of combustible deck fires. While IRC has some limited passive fire resistance of residential construction through use of fire blocking and compartmentation it does not recognize the hazard of a deck involved in fire to the structure of the main building through the exterior facing of the wall.

This code change proposal is not intended to address all fires that could present an exposure to combustible exterior walls. It focuses on the higher risk and increased likelihood for a fire involving a combustible deck that is directly attached to or within five feet of the combustible exterior wall. Since decks would have a limited exposure to a building any additional expenditure for more fire resistant materials is reduced. Ultimately a sheathing of gypsum even in thin layers increases the resistance.

These fires are rarely extinguished before it has spread into the void of the exterior combustible wall or up the exterior surface of the walls and into the attic. While the most frequent facing surface of the exterior wall is vinyl siding this is listed in specs as non-combustible. There is experience that indicates no effective resistance to fire though as the siding readily melts away to allow fire access to the substrate sheathing which most often is a combustible material such as Oriented Strand Board (OSB), low density fiber board and Rigid Foam Insulation. These common materials are combustible but OSB resists direct flame longer than rigid foam insulation. Tests conducted by the National Institute for Standards and Technology showed that when a plume of heated gases and flame impinges on a combustible exterior wall it will ignite the combustible exterior wall that is within five feet. This scenario may actually be less dramatic than a well advanced fire involving an attached deck which could preheat the combustible wall and directly expose it to a vertical flame. This exposure and create a more intense flame spread vertically on the wall. Some materials used as a substrate to the exterior siding will resist fire more than others; some materials readily spread fire vertically directly to the roof along the exterior surface; into a non-fire resistant soffit then into the attic, or destroys the integrity of the substrate material and the enters the wall void.

Decks have become more like exterior rooms with furniture, outdoor kitchens and primarily the presence of people. Barbecue grills, lighting and the inappropriate disposal of smoking materials are all hazards that have been the causes of fires that first ignite decks then spread easily to and into the structure of a home or similar building. Once ignited decks burn violently with direct flame and radiant heat exposure to combustible exterior walls. The fact that the fuel in a deck is open on all sides which enhances oxidization for complete combustion and ample direct flame as well as preheating from radiant heat make them a perfect primary fire source to feed fires that most often spread to and involve the roof and attic of homes. The direct flaming attack on these walls cause nearly immediate destruction of combustible and easily degraded sidings to allow immediate access and exposure to the interior structure. Due to the unique flow of the heat and gases from the deck fires into the structure these fires most often result in near total loss of structure. In the Washington D.C Metro area these fires have resulted in many fires one incident which killed a firefighter and another fire incident that severely burned multiple firefighters.

Cost Impact: Part I & II- Product information indicates that a product such as a gypsum-based exterior sheathing is comparable to other sheathing and is more resistant to fire.

ICCFILENAME: LOVE-FS1-1406.2.1.1-RB-1-R302.1.2

Public Hearing Results

PART II- IRC B/E

Committee Action:

Disapproved

Committee Reason: This is intended for a specific type of housing but the language addresses more than intended. This change would create permit issues with respect to replacement. This will make compliance difficult. Also, the content of the deck could ignite even though the exception is used.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Marcelo M. Hirschler (GBH International), representing American Fire Safety Council; Robert J. Davidson (Davidson Code Concepts, LLC) representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

R302.1 Exterior walls. Construction, projections, openings and penetrations of *exterior walls* of *dwelling*s and accessory buildings shall comply with Table R302.1.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *dwelling*s and *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the *lot*. Projections beyond the *exterior wall* shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

~~**R302.1.2 Combustible Exterior Walls and Combustible Decks.** Combustible exterior wall coverings and sheathing that are ignitable below 12.5 kW/m² and exhibit sustained flaming shall not be used where installed on exterior walls having a fire separation distance of 5 feet (1524 mm) to combustible decks or balconies.~~

~~**Exception:** Decks constructed of fire retardant treated wood.~~

R302.1.2 Combustible Exterior Walls and Combustible Decks. In areas where the authority having jurisdiction determines that there is elevated danger of fires starting on or under decks and where decks or balconies are separated from exterior walls by a fire separation distance of 5 feet (1524 mm) or less, the exterior walls and decks shall comply with one R302.1.2.1 or R302.1.2.2.

R302.1.2.1 Exterior Walls. The exterior walls shall have exterior wall coverings and sheathing constructed of materials that, when exposed to an incident heat flux of 12.5 kW/m², do not ignite or spread flame.

R302.1.2.2 Deck Construction. The decks shall be constructed of noncombustible materials or of materials that, when tested in accordance with the test procedures set forth in ASTM E 84, or UL 723, for a test period of 30 minutes, comply with the R302.1.2.2.1 through R302.1.2.2.3.

R302.1.2.2.1 Flame spread. Material shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the extended 30 minute test.

R302.1.2.2.2 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.

R302.1.2.2.3 Label. The deck boards shall bear a label indicating the required performance levels.

Commenter's Reason: The technical committee was concerned that the proposal addressed too many different types of occupancies and this was addressed by limiting the application to construction in areas where the ahj determines that there is an elevated danger of fires starting under decks. Moreover, additional concerns involved compliance and clarification of fire performance; the enforceability is enhanced by the requirement to add a label to the deck boards with the required performance levels. This was also clarified by amending the language. Finally, the concern about the use of a single material, fire retardant treated wood was also addressed by discussing fire performance of the deck. The heat flux of 12.5 kW/m² was chosen because it is the heat flux used in NFPA 268, and that ensures that the ignitability and flame spread is minimized and that some degree of fire protection is applied. NFPA 268 is required in Chapter 14 of the IBC but is not referenced in the IRC and it is not included in the comment.

Final Action: AS AM AMPC____ D

FS156-09/10, Part I

1404.12, 1405.2, 1405.18 (New), 1405.18.1 (New), Table 1405.18.1 (New), 1405.18.2 (New), 1405.18.2.1 (New), Table 1405.18.2.1 (New), 1405.18.2.2 (New), Table 1405.18.2.2 (New), 1405.14.1, 1405.14.2 (New), 1405.14.2.1 (New), 1405.14.2.2 (New), 1405.14.2.3 (New), 2304.6;

Proposed Change as Submitted

Proponent: Jay H. Crandell, PE, d/b/a ARES Consulting, representing the Foam Sheathing Coalition

PART I – IBC STRUCTURAL

1. Add new text as follows:

1404.12 Foam plastic sheathing. Foam plastic sheathing shall comply with requirements for foam plastic insulation in Section 2603. When used as a water-resistive barrier, the foam plastic sheathing material and installation shall be approved in accordance with Section 1404.2.

2. Revise as follows:

1405.2 Weather protection. Exterior walls shall provide weather protection for the building. The materials of the minimum nominal thickness specified in Table 1405.2 shall be acceptable as approved weather coverings. Foam plastic sheathing used in exterior wall covering assemblies with approved exterior weather coverings shall comply with Section 1405.18.

3. Add new text as follows:

1405.18 Foam plastic sheathing. Foam plastic sheathing used in exterior wall covering assemblies shall comply with this section, Section 2603, Chapter 13, and the foam sheathing manufacturer's approved installation instructions.

1405.18.1 Minimum thickness. The thickness of foam plastic sheathing shall comply with Table 1405.18.1.

Exception: Where foam plastic sheathing is applied directly over or behind wall sheathing or other solid substrate capable of separately resisting the required wind pressure, the limitations of Table 1405.18.1 shall not apply.

**TABLE 1405.18.1
REQUIREMENTS FOR FOAM PLASTIC SHEATHING
IN EXTERIOR WALL COVERING ASSEMBLIES^{1,2}**

Foam Plastic Sheathing Material ³	Foam Sheathing Thickness (in) ³	Maximum Wind Speed (mph) – Exposure B ⁴			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16”oc framing	24”oc framing	16”oc framing	24”oc framing
Siding Attached Directly Over Foam Plastic Sheathing per Section 1405.18.2.1					
EPS	<u>3/4”</u>	<u>110</u>	<u>NP</u>	<u>90</u>	<u>NP</u>
	<u>1”</u>	<u>130</u>	<u>100</u>	<u>125</u>	<u>NP</u>
	<u>≥1-1/2”</u>	<u>130</u>	<u>130</u>	<u>130</u>	<u>125</u>
Polyiso-cyanurate	<u>1/2” (faced)</u>	<u>130</u>	<u>90</u>	<u>115</u>	<u>NP</u>
	<u>3/4” (faced)</u>	<u>130</u>	<u>120</u>	<u>130</u>	<u>100</u>
	<u>1” (faced)</u>	<u>130</u>	<u>130</u>	<u>130</u>	<u>110</u>
	<u>≥1-1/2” (faced)</u>	<u>130</u>	<u>130</u>	<u>130</u>	<u>115</u>
XPS	<u>1/2” (faced)</u>	<u>125</u>	<u>85</u>	<u>105</u>	<u>NP</u>
	<u>3/4”</u>	<u>110</u>	<u>NP</u>	<u>90</u>	<u>NP</u>
	<u>1”</u>	<u>130</u>	<u>95</u>	<u>120</u>	<u>NP</u>
	<u>≥1-1/2”</u>	<u>130</u>	<u>130</u>	<u>130</u>	<u>115</u>
Siding Offset from Foam Sheathing per Section 1405.18.2.2					
EPS	<u>3/4”</u>	<u>95</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>
	<u>1”</u>	<u>125</u>	<u>85</u>	<u>105</u>	<u>NP</u>
	<u>≥1-1/2”</u>	<u>130</u>	<u>130</u>	<u>130</u>	<u>105</u>
Polyiso-	<u>1/2” (faced)</u>	<u>120</u>	<u>NP</u>	<u>100</u>	<u>NP</u>

<u>cyanurate</u>	<u>3/4" (faced)</u>	<u>130</u>	<u>100</u>	<u>130</u>	<u>85</u>
	<u>1" (faced)</u>	<u>130</u>	<u>110</u>	<u>130</u>	<u>95</u>
	<u>≥1-1/2" (faced)</u>	<u>130</u>	<u>120</u>	<u>130</u>	<u>100</u>
<u>XPS</u>	<u>1/2" (faced)</u>	<u>110</u>	<u>NP</u>	<u>90</u>	<u>NP</u>
	<u>3/4"</u>	<u>95</u>	<u>NP</u>	<u>NP</u>	<u>NP</u>
	<u>1"</u>	<u>125</u>	<u>85</u>	<u>105</u>	<u>NP</u>
	<u>≥1-1/2"</u>	<u>130</u>	<u>120</u>	<u>130</u>	<u>100</u>

For SI: 1 inch = 25.4 mm, 1 mile per hour = 1.609 km/h

NP = not permitted

1. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
2. Foam plastic sheathing panels shall be permitted to be oriented parallel or perpendicular to framing members.
3. Foam plastic sheathing shall meet or exceed the following material standards: Expanded Polystyrene (EPS) – ASTM C578 (Type II, min. 1.35 lb/ft³ density), Polyisocyanurate – ASTM C1289 (Type 1, min.), and extruded polystyrene (XPS) – ASTM C578 (Type X, min. 1.30 lb/ft³ density). Where a "faced" product is indicated, a facer shall be provided on both faces of the foam plastic sheathing. Where facing is not indicated in the table, faced and unfaced foam plastic sheathing shall be permitted. For all foam plastic sheathing products, approved manufacturer data shall be permitted in lieu of the table requirements.
4. Multiply tabulated maximum wind speed by 0.85 for wind exposure C or by 0.78 for wind exposure D.
5. Interior finish shall be minimum 1/2-inch (12.7 mm) thick gypsum wall board or an approved product with equivalent or greater out-of-plane bending strength and stiffness.

1405.18.2 Siding attachment over foam sheathing. Siding shall be attached over foam sheathing in accordance with Section 1405.18.2.1, Section 1405.18.2.2, or an approved design. In no case shall the siding material be used in a manner that exceeds its application limits.

Exception: Where the siding manufacturer has provided approved installation instructions for application over foam sheathing, those requirements shall apply.

1405.18.2.1 Direct siding attachment. Approved weather coverings installed directly over foam sheathing without separation by an air space shall comply with Table 1405.18.2.1 in regard to nail diameter, penetration, and nail spacing for the applicable foam sheathing thickness and wind speed condition. The siding fastener and siding installation shall otherwise comply with Chapter 14.

Exceptions:

1. For adhered masonry veneer, refer to Section 1405.10
2. For vinyl siding, refer to Section 1405.14.
3. For exterior insulation and finish systems, refer to Section 1408.

**TABLE 1405.18.2.1
FASTENING REQUIREMENTS FOR DIRECT SIDING
ATTACHMENT OVER FOAM PLASTIC SHEATHING^{1,2}**

Minimum Nail Diameter ³ (inches)	Nail Spacing along Stud ⁴ (inches)	Maximum Foam Sheathing Thickness ⁵ (inches)	16"oc WALL FRAMING			24"oc WALL FRAMING		
			Maximum Wind Speed (mph)			Maximum Wind Speed (mph)		
			Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.113	6	2	140	120	110	120	100	90
	8	2	130	110	100	100	85	DR
	12	1	100	85	DR	85	DR	DR
0.120	6	3	140	120	110	120	100	90
	8	2	130	110	100	110	90	85
	12	1.5	110	90	85	90	DR	DR
0.135	6	3	140	120	110	130	110	100
	8	3	140	120	110	110	90	85
	12	2	110	90	85	90	DR	DR

For SI: 1 inch = 25.4 mm; 1 mph = 1.609 km/h

DR = design required

1. Maximum wind speed values are based on a minimum 1-1/4 inch (31.8 mm) penetration of a smooth shank nail fastener into wood framing of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDs.

2. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
3. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths to provide a minimum 1-1/4 inch (31.8 mm) penetration into wood framing. Specified nails in accordance with Chapter 1405 or the siding manufacturer's approved installation instructions shall meet all other requirements in ASTM F1667 or be otherwise approved for the intended application.
4. 'Nail spacing along stud' refers to spacing of siding fasteners in the vertical direction. A minimum of one fastener shall be applied at each intersection of an individual siding member with a wall stud.
5. Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing, a maximum siding dead load of 11 psf (0.53 kPa), and S_{DS} per Section 1613.5.4 not exceeding 0.83g. Siding dead load shall not exceed 8 psf (0.39 kPa) for and S_{DS} of 1.17g, 6 psf (0.29 kPa) for S_{DS} of 1.5g, or 3.0 psf (0.14 kPa) for S_{DS} of 3.0 g.

1405.18.2.2 Offset siding attachment. When an airspace separates the siding from direct contact with the foam plastic sheathing, the approved weather coverings shall be attached in accordance with Chapter 14 to minimum 1x3 wood furring strips placed over the foam sheathing. Furring shall be attached through the foam sheathing to wall framing in accordance with Table 1405.18.2.2. When placed horizontally, wood furring strips shall be preservative treated wood in accordance with Section 2303.1.8 or naturally durable wood and fasteners shall be corrosion resistant in accordance with Section 2304.9.5.

Exception: Furring strips shall not be required over foam plastic sheathing behind anchored stone and masonry veneer installed in accordance with Section 1405.6. Veneer ties shall be installed on the surface of the foam plastic sheathing with fasteners of sufficient length to pass through the thickness of foam plastic sheathing and penetrate framing to provide required pull-out resistance determined in accordance with Chapter 16.

TABLE 1405.18.2.2
FASTENING REQUIREMENTS FOR WOOD FURRING
OVER FOAM PLASTIC SHEATHING^{1,2,3}

Fastener Type	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring ⁴ (inches)	Maximum Thickness of Foam Sheathing ⁵ (inches)	16"oc FURRING			24"oc FURRING		
				Maximum Wind Speed (mph)			Maximum Wind Speed (mph)		
				Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.120" diameter smooth shank nail	1-1/4	8	2	130	110	100	110	90	85
		12	1.5	110	90	85	90	DR	DR
		16	1	90	DR	DR	DR	DR	DR
0.135" diameter smooth shank nail	1-1/4	8	3	130	110	100	110	90	85
		12	2	110	90	85	90	DR	DR
		16	1.5	100	85	DR	DR	DR	DR
#8 wood screw	1	12	3	140	120	110	140	120	110
		16	2	140	120	110	140	120	110
1/4" lag screw ⁶	1-1/2	24	3	140	120	110	140	120	110

For SI: 1" = 25.4 mm; 1 mph = 1.609 km/h

DR = design required

1. Furring strips shall be spaced a maximum of 24"oc in a vertical or horizontal orientation. Table values are based on minimum 3/4-inch (19.1 mm) thick furring strip and wood studs of Spruce-Pine-Fir or any softwood species with a specific gravity of 0.42 or greater per AFPA/NDS.
2. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
3. Where minimum required siding fastener penetration exceeds 3/4 inch (19.1 mm), a minimum 2x furring strip shall be used unless approved deformed shank siding nails or siding screws are used to provide equivalent withdrawal strength.
4. In a vertical orientation, furring strips shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, furring strips shall be fastened at each stud intersection with a number of fasteners equivalent to the required fastener spacing. In no case shall fasteners be spaced more than 24 inches (0.6 m) apart.
5. Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing, a maximum siding dead load of 11 psf (0.53 kPa), and S_{DS} per Section 1613.5.4 not exceeding 0.83g. Siding dead load shall not exceed 8 psf (0.39 kPa) for and S_{DS} of 1.17g, 6 psf (0.29 kPa) for S_{DS} of 1.5g, or 3.0 psf (0.14 kPa) for S_{DS} of 3.0 g.
6. Lag screws shall be installed with a standard cut washer and shall be pre-drilled in accordance with AF&PA NDS-05. Approved self-drilling screws of equal or greater shear and withdrawal strength shall be permitted without pre-drilling.

4. Revise as follows:

1405.14.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6 or foam plastic sheathing in accordance with Sections 1405.14.2 and 1405.18. Siding shall be applied to conform with 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 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 3/4 inch (19 mm). 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.

5. Add new text as follows:

1405.14.2 Foam Plastic Sheathing. Vinyl siding used with foam plastic sheathing shall be installed in accordance with 1405.14.2.1, 1405.14.2.2., and 1405.14.2.3.

Exception: Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing, or other approved backing capable of independently resisting the design wind pressure, the vinyl siding shall be installed in accordance with 1405.14.1.

1405.14.2.1 Basic Wind Speed Not Exceeding 90 mph and Exposure Category B. Where the basic wind speed does not exceed 90 mph, the Exposure Category is B and gypsum wall board or equivalent is installed on the side of the wall opposite the foam plastic sheathing, the minimum siding fastener penetration into wood framing shall be 1-1/4 inches (32 mm) using minimum 0.120-inch diameter nail (shank) with a minimum 0.313-inch diameter head, and fastened 16 inches on center. The foam plastic sheathing shall comply with Section 1405.18.1 and shall not exceed a maximum thickness of 1.5 inches (38 mm) for a 0.120-inch diameter nail or 2.0 inches (51 mm) for a 0.135-inch diameter nail. Vinyl siding shall be permitted to be installed on furring strips in accordance with Section 1405.18.2.2 and the siding manufacturer's installation instructions when foam plastic sheathing thickness complies with Section 1405.18.1.

1405.14.2.2 Basic Wind Speed Exceeding 90mph or Exposure Categories C and D. Where the basic wind speed exceeds 90 mph or the Exposure Category is C or D, or all conditions of 1405.14.2.1 are not met, the adjusted design pressure rating for the assembly shall meet or exceed the wind loads required by Chapter 16. The design wind pressure rating of the vinyl siding for installation over solid sheathing as provided in the vinyl siding manufacturer's product specifications shall be adjusted for the following wall assembly conditions:

1. For wall assemblies with foam plastic sheathing on the exterior side and minimum ½-inch (12.7 mm) thick gypsum wall board or equivalent on the interior side of the wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.39.
2. For wall assemblies with foam plastic sheathing on the exterior side and no gypsum wall board or equivalent on the interior side of wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.27.

Exception: The above adjustments shall not apply when vinyl siding is attached to wood furring strips installed over the foam plastic sheathing in accordance with Section 1405.18.2.2 and such installation is in accordance with the vinyl siding manufacturer's installation instructions.

1405.14.2.3 Manufacturer Specification. Where the vinyl siding manufacturer's product specifications provide an approved design wind pressure rating for installation over foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions.

6. Revise as follows:

2304.6 Wall sheathing. Except as provided for in Section 1405 for weatherboarding or where stucco construction that complies with Section 2510 is installed, enclosed buildings shall be sheathed with one of the materials of the nominal thickness specified in Table 2304.6, foam sheathing in accordance with Section 1405.18, or any other approved material of equivalent strength and durability.

Reason:

Part I-As with a related IRC proposal, this proposal is a comprehensive clarification and upgrading of requirements for foam plastic sheathing and siding installation over foam plastic sheathing. It primarily addresses adequate foam sheathing thickness and siding attachment over foam sheathing to resist a range of design wind load conditions, beyond which design is required or installation in accordance with manufacturer instructions specific to application of siding over foam sheathing. It also provides siding connections through foam sheathing that provide adequate support to resist the dead load of siding installed over foam sheathing and limits the siding weight, particularly in higher seismic conditions (beyond which design is required or approved installation guidelines). As a whole, these provisions are necessary to ensure appropriate use of foam sheathing and siding materials together on exterior wall assemblies in a way that best complements existing exterior wall covering provisions in Chapter 14. A detailed explanation of the test data and analysis justifying the proposed requirements can be found at www.foamsheathing.org.

In support of proposed new Section 1405.18.1, the wind pressure resistance of foam sheathing used in this proposal is based on certified full-scale (4'x8' panel) testing conducted at the NAHB Research Center, Inc. Samples included specimens from various manufacturers representing the industry at large. The design wind speed data (without rounding or capping values) is shown in the table below for informational purposes. The

values in the proposed table have been rounded to the nearest 5 mph increment and capped at 130 mph (Exposure B) which corresponds to a maximum wind speed of 110 mph in exposure C or 100 mph Exposure D. This proposal is needed to avoid potential exclusion of foam sheathing products due to the incompleteness of current code requirements which can negatively affect other concerns such as energy conservation code requirements and green building interests. Most importantly, these requirements will ensure that foam sheathing is used appropriately to prevent building envelope damage, particularly in higher wind conditions and with thinner material used on more widely spaced studs (e.g., 24"oc center on gable roof ends which typically have no interior finish). These requirements also agree reasonably well with the generally successful use of foam sheathing on typical wall assemblies (e.g., 16"oc framing or 24"oc framing with interior finish) on many buildings in lower wind regions of the U.S.

TABLE R703.3.1- Part A (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH DIRECTLY ATTACHED SIDING PER SECTION R703.3.2.1

Foam Sheathing Material ³	Foam Sheathing Nominal Thickness (in)	Maximum Wind Speed (mph) – Exposure B ⁴			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾" (unfaced)	110	73	92	61
	1" (unfaced)	147	98	123	82
	1-1/2" (unfaced)	222	148	186	124
Polyiso-cyanurate	½" (faced)	136	91	114	76
	¾" (faced)	177	118	148	99
	1" (faced)	193	129	162	108
	1-1/2" (faced)	207	138	173	116
XPS	½" (faced)	125	84	105	70
	¾" (unfaced)	109	73	91	61
	1" (unfaced)	145	97	121	81
	1-1/2" (unfaced)	208	139	174	116

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 positive pressure design loads for wall corner zone and a 10 sq ft wind effective area (negative pressure is resisted by the foam sheathing and siding assembly). Because the 1.5 safety factor is applied to a minimum test value (not the average), these requirements are more stringent than safety margins required for other building envelop components such as doors and windows which are also important to envelope integrity. This "minimum test value" basis also serves to better control safety margins with regard to variability in material properties or performance.

TABLE R703.3.1 – Part B (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH FURRED SIDING PER SECTION R703.3.2.1¹

Foam Plastic Sheathing Material ²	Foam Sheathing Nominal Thickness (in) ²	Maximum Wind Speed (mph) – Exposure B ^{3,4}			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾"	95	63	80	53
	1"	127	85	106	71
	≥1-1/2"	192	128	161	107
Polyiso-cyanurate	½" (faced)	118	78	98	66
	¾" (faced)	153	102	128	85
	1" (faced)	167	112	140	93
	≥1-1/2" (faced)	179	120	150	100
XPS	½" (faced)	108	72	91	61
	¾"	94	63	79	53
	1"	126	84	105	70
	≥1-1/2"	180	120	151	101

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 negative pressure design loads for wall corner zone and a 10 sq ft wind effective area. Because the siding is spaced away from foam sheathing in this wall covering assembly condition, it does not contribute to foam sheathing resistance. Thus, the foam sheathing must independently resist the negative wind pressure load. The furring strips provide adequate bearing at connection to secure the foam sheathing as well as the siding material.

In support of proposed new Section 1405.18.2, the generalized connection requirements for siding over foam sheathing are based on an analysis using the AF&PA NDS-2005 connection design provisions in consideration of withdrawal to resist wind pressure and shear strength to resist siding dead load. To account for the "gap" in the connection caused by the presence of foam sheathing, the provisions of AF&PA TR12 were used to downgrade connection strength based on the thickness of foam sheathing (i.e., width of gap in the connection). The design shear strength was based on calculated ultimate capacity divided by a safety factor of 2 while conservatively ignoring any benefit of the foam material filling the gap in the siding or furring connection to wall framing. Wind loads were based on application of the full ASCE 7-05 components and cladding wind pressure applied to the exterior wall covering while conservatively ignoring any distribution of wind pressure to other wall layers. In addition, the wind pressures were based on the most stringent wall corner zone condition and an effective wind area of 10 sq ft.

Addition of new Section 1405.14.2 provides special requirements and limitations for use of foam plastic sheathing with vinyl siding. The proposed changes are consistent approved changes now included in the 2009 IRC. These changes are needed to ensure appropriate use of vinyl siding wind pressure ratings when foam sheathing is used, thus preventing inadequate performance.

Limited changes to other parts of the code are made in coordination with the above improvements.

Part II- As with a related IBC proposal, this proposal is a comprehensive clarification and upgrading of requirements for foam sheathing and siding installation over foam sheathing. It primarily addresses adequate foam sheathing thickness and siding attachment over foam sheathing to resist design wind loads within the scope of the IRC (e.g., up to 110 mph, Exposure D). It also provides siding connections through foam sheathing that provide adequate support to resist the dead load of siding installed over foam sheathing. As a whole, these provisions are necessary to ensure appropriate use of foam sheathing and siding materials together on exterior wall assemblies in a way that best compliments existing exterior wall covering provisions in Section R703 of the code. A detailed explanation of the test data and analysis justifying the proposed requirements can be found at www.foamsheathing.org.

In support of proposed new Section R703.3.1, the wind pressure resistance of foam sheathing used in this proposal is based on certified full-scale (4'x8' panel) testing conducted at the NAHB Research Center, Inc. Samples included specimens from various manufacturers representing the industry at large. The design wind speed data (without rounding or capping values) is shown in the table below for informational purposes. The values in the proposed table have been rounded to the nearest 5 mph increment and capped at 130 mph (Exposure B) as this corresponds to a maximum wind speed of 110 mph in exposure C, which is essentially the scope limit of the IRC. This proposal is needed to avoid potential exclusion of foam sheathing products due to the incompleteness of current code requirements which can negatively affect other concerns such as energy conservation code requirements and green building interests. Most importantly, these requirements will ensure that foam sheathing is used appropriately to prevent building envelope damage, particularly in higher wind conditions and with thinner material used on more widely spaced studs (e.g., 24"oc center on gable roof ends which typically have no interior finish). These requirements also agree reasonably well with the generally successful use of foam sheathing on typical wall assemblies (e.g., 16"oc framing or 24"oc framing with interior finish) on many homes in lower wind regions of the U.S.

TABLE R703.3.1- Part A (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH DIRECTLY ATTACHED SIDING PER SECTION R703.3.2.1

Foam Sheathing Material ³	Foam Sheathing Nominal Thickness (in)	Maximum Wind Speed (mph) – Exposure B ⁴			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾" (unfaced)	110	73	92	61
	1" (unfaced)	147	98	123	82
	1-1/2" (unfaced)	222	148	186	124
Polyiso-cyanurate	½" (faced)	136	91	114	76
	¾" (faced)	177	118	148	99
	1" (faced)	193	129	162	108
	1-1/2" (faced)	207	138	173	116
XPS	½" (faced)	125	84	105	70
	¾" (unfaced)	109	73	91	61
	1" (unfaced)	145	97	121	81
	1-1/2" (unfaced)	208	139	174	116

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 positive pressure design loads for wall corner zone and a 10 sqft wind effective area (negative pressure is resisted by the foam sheathing and siding assembly). Because the 1.5 safety factor is applied to a minimum test value (not the average), these requirements are more stringent than safety margins required for other building envelop components such as doors and windows which are also important to envelope integrity. This "minimum test value" basis also serves to better control safety margins with regard to variability in material properties or performance.

TABLE R703.3.1 – Part B (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH FURRED SIDING PER SECTION R703.3.2.2¹

Foam Plastic Sheathing Material ²	Foam Sheathing Nominal Thickness (in) ²	Maximum Wind Speed (mph) – Exposure B ^{3,4}			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾"	95	63	80	53
	1"	127	85	106	71
	≥1-1/2"	192	128	161	107
Polyiso-cyanurate	½" (faced)	118	78	98	66
	¾" (faced)	153	102	128	85
	1" (faced)	167	112	140	93
	≥1-1/2" (faced)	179	120	150	100
XPS	½" (faced)	108	72	91	61
	¾"	94	63	79	53
	1"	126	84	105	70
	≥1-1/2"	180	120	151	101

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 negative pressure design loads for wall corner zone and a 10 sqft wind effective area. Because the siding is spaced away from foam sheathing in this wall covering assembly condition, it does not contribute to foam sheathing resistance. Thus, the foam sheathing must independently resist the negative wind pressure load. The furring strips provide adequate bearing at connection to secure the foam sheathing as well as the siding material.

In support of proposed new Section R703.3.2, the generalized connection requirements for siding over foam sheathing are based on an analysis using the AF&PA NDS-2005 connection design provisions in consideration of withdrawal to resist wind pressure and shear strength to resist siding dead load. To account for the "gap" in the connection caused by the presence of foam sheathing, the provisions of AF&PA TR12 were used to downgrade connection strength based on the thickness of foam sheathing (i.e., width of gap in the connection). The design shear strength was based on calculated ultimate capacity divided by a safety factor of 2 while conservatively ignoring any benefit of the foam material filling the gap in the siding or furring connection to wall framing. Wind loads were based on application of the full ASCE 7-05 components and cladding wind pressure applied to the exterior wall covering while conservatively ignoring any distribution of wind pressure to other wall layers. In addition, the wind pressures were based on the most stringent wall corner zone condition and an effective wind area of 10 sqft.

Changes to other parts of Section R703, including changes to Table R703.4 and various siding attachment requirements, are made in coordination with the above improvements.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: ASTM standards within this proposed are currently referenced in the I-codes.

Public Hearing Results

PART I- IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The proponent requested disapproval at this time so that the proposal requirements for foam plastic sheathing can be better coordinated with the energy code. This includes the treatment of positive and negative wind pressures, performance of the lateral force system as well as fastener requirements.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Jay H. Crandell, PE, ARES Consulting, representing Foam Sheathing Coalition; Mark Nowak, representing Steel Framing Alliance, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1404.12 Foam plastic sheathing. Foam plastic sheathing shall comply with requirements for foam plastic insulation in Section 2603. When used as a water-resistive barrier, the foam plastic sheathing material and installation shall be approved in accordance with Section 1404.2. When used in exterior wall covering assemblies in accordance with Table 1405.18.1 of Section 1405.18.1, foam sheathing shall be identified by the trademarks of an approved testing and inspection agency in accordance with Section 1703 and 2603.2 indicating compliance with the wind pressure resistance requirements of Table 1405.18.1 where not already addressed in the applicable material standards.

1405.18 Foam plastic sheathing. Foam plastic sheathing used in exterior wall covering assemblies shall comply with this section, Section 2603, Chapter 13, and the foam sheathing manufacturer's approved installation instructions. Wall assemblies with foam plastic sheathing that are intended to serve as part of the lateral force resisting system of a structure shall be braced with approved materials designed to resist the in-plane shear force determined in accordance with Chapter 16. Wall assemblies with foam plastic sheathing attached to gravity load supporting members that require buckling restraint shall have such restraint provided by other approved materials. The use of foam plastic sheathing in accordance with this section shall not be permitted where the basic wind speed exceeds 110 mph.

1405.18.1 Minimum thickness. ~~The thickness of foam plastic sheathing shall comply with Table 1405.18.1.~~

Exceptions:

1. Where foam plastic sheathing is covered with applied directly over or behind wall sheathing or other solid material substrate capable of separately resisting the required wind pressure, the limitations of Section 1405.18.1 and the basic wind speed limit of 110 mph ~~Table 1405.18.1~~ shall not apply.
2. Where foam plastic sheathing is covered with cladding and applied directly over wall sheathing or other solid material, all capable of separately resisting the full design wind pressure, the limitations of Section 1405.18.1 and the basic wind speed limit of 110 mph shall not apply.

1405.18.1 Minimum thickness. The thickness of foam plastic sheathing shall comply with Table 1405.18.1. The components and cladding design wind pressure determined in accordance with Section 1609 shall not exceed the allowable wind pressure value in accordance with Table 1405.18.1.

**TABLE 1405.18.1
REQUIREMENTS FOR FOAM PLASTIC SHEATHING
IN EXTERIOR WALL COVERING ASSEMBLIES^{1,2}**

Foam Plastic Sheathing Material ³	Foam Sheathing Thickness (in) ³	IN EXTERIOR WALL COVERING ASSEMBLIES			
		Maximum Wind Speed (mph) — Exposure B ⁴			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
Siding Attached Directly Over Foam Plastic Sheathing per Section 1405.18.2.1					
EPS	¾"	110	NP	90	NP
	1"	130	100	125	NP
	≥1-1/2"	130	130	130	125
Polyiso-cyanurate	½" (faced)	130	90	115	NP
	¾" (faced)	130	120	130	100
	1" (faced)	130	130	130	110
	≥1-1/2" (faced)	130	130	130	115
XPS	½" (faced)	125	85	105	NP
	¾"	110	NP	90	NP
	1"	130	95	120	NP
	≥1-1/2"	130	130	130	115
Siding Offset from Foam Sheathing per Section 1405.18.2.2					
EPS	¾"	95	NP	NP	NP

	4"	125	85	105	NP
	≥1-1/2"	130	130	130	105
Polyiso-cyanurate	1/2" (faced)	120	NP	100	NP
	3/4" (faced)	130	100	130	85
	1" (faced)	130	110	130	95
	≥1-1/2" (faced)	130	120	130	100
XPS	1/2" (faced)	110	NP	90	NP
	3/4"	95	NP	NP	NP
	1"	125	85	105	NP
	≥1-1/2"	130	120	130	100

For SI: 1 inch = 25.4 mm, 1 mile per hour = 1.609 km/h

NP = not permitted

1. Tabulated maximum wind speed values are based on a mean roof height of 30 feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
2. Foam plastic sheathing panels shall be permitted to be oriented parallel or perpendicular to framing members.
3. Foam plastic sheathing shall meet or exceed the following material standards: Expanded Polystyrene (EPS) – ASTM C578 (Type II, min. 1.35 lb/ft³ density), Polyisocyanurate – ASTM C1289 (Type 1, min.), and extruded polystyrene (XPS) – ASTM C578 (Type X, min. 1.30 lb/ft³ density). Where a "faced" product is indicated, a facer shall be provided on both faces of the foam plastic sheathing. Where facing is not indicated in the table, faced and unfaced foam plastic sheathing shall be permitted. For all foam plastic sheathing products, approved manufacturer data shall be permitted in lieu of the table requirements.
4. Multiply tabulated maximum wind speed by 0.85 for wind exposure C or by 0.78 for wind exposure D.
5. Interior finish shall be minimum 1/2-inch (12.7 mm) thick gypsum wall board or an approved product with equivalent or greater out-of-plane bending strength and stiffness.

TABLE 1405.18.1
ALLOWABLE WIND PRESSURE VALUE (PSF) FOR FOAM PLASTIC SHEATHING
IN EXTERIOR WALL COVERING ASSEMBLIES¹

Foam Plastic Sheathing Material ²	Foam Sheathing Thickness (in)	Allowable (ASD) Components and Cladding Design Wind Pressure (psf) (basic wind speed not to exceed 110 mph per Section 1405.18)			
		Walls with Interior Finish ³		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	3/4"	21.8	NP	15.3	NP
	1"	38.8	19.4	27.2	13.6
	≥1-1/2"	89.0	39.5	62.3	27.7
Polyiso-cyanurate	1/2" (faced)	33.3	14.8	23.3	10.4
	3/4" (faced)	56.4	25.1	39.5	17.6
	1" (faced)	67.5	30.0	47.2	21.0
	≥1-1/2" (faced)	77.4	34.4	54.1	24.1
XPS	1/2" (faced)	28.3	12.6	19.8	NP
	3/4"	21.4	NP	15.0	NP
	1"	38.0	29.0	26.6	20.3
	≥1-1/2"	78.2	34.7	54.7	24.3

For SI: 1 inch = 25.4 mm, 1 pound per square foot (psf) = 0.0479 kPa.

NP = not permitted (allowable design wind pressure less than 10 psf)

1. Foam plastic sheathing panels shall be permitted to be oriented parallel or perpendicular to framing members.
2. Foam plastic sheathing shall meet or exceed the following material standards: Expanded Polystyrene (EPS) – ASTM C578 (Type II, min. 1.35 lb/ft³ density), Polyisocyanurate – ASTM C1289 (Type 1, min.), and extruded polystyrene (XPS) – ASTM C578 (Type X, min. 1.30 lb/ft³ density). Where a "faced" product is indicated, a facer shall be provided on both faces of the foam plastic sheathing. Where facing is not indicated in the table, faced and unfaced foam plastic sheathing shall be permitted. For all foam plastic sheathing products, approved manufacturer data shall be permitted in lieu of the table requirements.
3. Interior finish shall be minimum 1/2-inch (12.7 mm) thick gypsum wall board or an approved product with equivalent or greater out-of-plane bending strength and stiffness.

1405.18.2 Siding attachment over foam sheathing. Siding shall be attached over foam sheathing in accordance with Section 1405.18.2.1, Section 1405.18.2.2, or an approved design. In no case shall the siding material be used in a manner that exceeds its application limits. When required by the basic wind speed and wind exposure applicability of Section 1706, wall cladding installation over foam sheathing shall be subject to special inspection in accordance with Section 1706.4.

Exception: Where the siding manufacturer has provided approved installation instructions for application over foam sheathing, those requirements shall apply.

1405.18.2.1 Direct siding attachment. Approved weather coverings installed directly over foam sheathing without separation by an air space shall comply with Table 1405.18.2.1 in regard to minimum fastening requirements, nail diameter, penetration, and nail spacing and maximum foam sheathing thickness limitations to support siding dead load for the applicable foam sheathing thickness and wind speed condition. The siding fastener and siding installation shall otherwise comply with Chapter 14, shall be capable of resisting all other applicable design loads determined in accordance with Chapter 16, and in no case shall result in a less stringent fastening requirement than required by Chapter 14 or the manufacturer's installation instructions for the specific siding material used.

Exceptions:

1. For adhered masonry veneer, refer to Section 1405.10.
2. For vinyl siding, refer to Section 1405.14.
3. For exterior insulation and finish systems, refer to Section 1408.

**TABLE 1405.18.2.1
FASTENING REQUIREMENTS FOR DIRECT SIDING
ATTACHMENT OVER FOAM PLASTIC SHEATHING^{1,2}**

Minimum Nail Diameter ³ (inches)	Nail Spacing along Stud ⁴ (inches)	Maximum Foam Sheathing Thickness ⁵ (inches)	16"oc WALL FRAMING			24"oc WALL FRAMING		
			Maximum Wind Speed (mph)			Maximum Wind Speed (mph)		
			Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.113	6	2	140	120	110	120	100	90
	8	2	130	110	100	100	85	DR
	12	1	100	85	DR	85	DR	DR
0.120	6	3	140	120	110	120	100	90
	8	2	130	110	100	110	90	85
	12	1.5	110	90	85	90	DR	DR
0.135	6	3	140	120	110	130	110	100
	8	3	140	120	110	110	90	85
	12	2	110	90	85	90	DR	DR

For SI: 1 inch = 25.4 mm; 1 mph = 1.609 km/h

DR = design required

- Maximum wind speed values are based on a minimum 1-1/4 inch (31.8 mm) penetration of a smooth shank nail fastener into wood framing of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS.
- Tabulated maximum wind speed values are based on a mean roof height of 30 feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
- Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths to provide a minimum 1-1/4 inch (31.8 mm) penetration into wood framing. Specified nails in accordance with Chapter 1405 or the siding manufacturer's approved installation instructions shall meet all other requirements in ASTM F1667 or be otherwise approved for the intended application.
- 'Nail spacing along stud' refers to spacing of siding fasteners in the vertical direction. A minimum of one fastener shall be applied at each intersection of an individual siding member with a wall stud.
- Maximum foam sheathing thickness values are based on a maximum 24 inch (0.6 m) stud spacing, a maximum siding dead load of 11 psf (0.53 kPa), and S_{DS} per Section 1613.5.4 not exceeding 0.83g. Siding dead load shall not exceed 8 psf (0.39 kPa) for and S_{DS} of 1.17g, 6 psf (0.29 kPa) for S_{DS} of 1.5g, or 3.0 psf (0.14 kPa) for S_{DS} of 3.0 g.

**TABLE 1405.18.2.1
SIDING MINIMUM FASTENING REQUIREMENTS
FOR DIRECT SIDING ATTACHMENT OVER FOAM PLASTIC SHEATHING
TO SUPPORT SIDING DEAD LOAD¹**

Siding Fastener Through Foam Sheathing into:	Siding Fastener -Type and Minimum Size ²	Siding Fastener Vertical Spacing (inches)	Maximum Foam Sheathing Thickness (inches)					
			16"oc Fastener Horizontal Spacing			24"oc Fastener Horizontal Spacing		
			Siding Weight:			Siding Weight:		
			3 psf	11 psf	25 psf	3 psf	11 psf	25 psf
Wood Framing (minimum 1-1/4 inch penetration)	0.113" diameter nail	6	4	3	1	4	2	0.75
		8	4	2	0.75	4	1.5	DR
		12	4	1.5	DR	3	0.75	DR
	0.120" diameter nail	6	4	3	1.5	4	2	0.75
		8	4	2	1	4	1.5	0.5
		12	4	1.5	0.5	3	1	DR
	0.131" diameter nail	6	4	4	1.5	4	3	1
		8	4	3	1	4	2	0.75
		12	4	2	0.75	4	1	DR
Steel Framing (minimum penetration of steel thickness + 3 threads)	#8 screw into 33 mil steel or thicker	6	3	3	1.5	3	2	DR
		8	3	2	0.5	3	1.5	DR
		12	3	1.5	DR	3	0.75	DR
	#10 screw into 33 mil steel	6	4	3	2	4	3	0.5
		8	4	3	1	4	2	DR
		12	4	2	DR	3	1	DR
	#10 screw into 43 mil steel or thicker	6	4	4	3	4	4	2
		8	4	4	2	4	3	1.5
		12	4	3	1.5	4	3	DR

For SI: 1 inch = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa

DR = design required

- Tabulated requirements are based on wood framing of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS and minimum 33 ksi steel for 33 mil and 43 mil steel and 50 ksi steel for 54 mil steel or thicker.
- Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths. Self-drilling tapping screw fasteners for connection of siding to steel framing shall comply with the requirements of AISI S200. Specified fasteners in accordance with Chapter 1405 or the siding manufacturer's approved installation instructions shall meet all other requirements in ASTM F1667, AISI S200 or be otherwise approved for the intended application.

1405.18.2.2 Offset siding attachment. When an airspace separates the siding from direct contact with the foam plastic sheathing, the approved weather coverings shall be attached in accordance with Chapter 14 to minimum 1x3 wood or minimum 33 mil steel hat channel furring strips placed over the foam sheathing. Furring shall be attached through the foam sheathing to wall framing in accordance with Table 1405.18.2.2 in regard to

2010 ICC FINAL ACTION AGENDA

minimum fastening requirements and maximum foam sheathing thickness limitations to support siding dead load. Furring and connections shall be separately designed to resist all other applicable loads determined in accordance with Chapter 16. When placed horizontally, wood furring strips shall be preservative treated wood in accordance with Section 2303.1.8 or naturally durable wood and fasteners shall be corrosion resistant in accordance with Section 2304.9.5. Steel hat channel furring shall have a minimum G60 galvanized coating.

Exception: Furring strips shall not be required over foam plastic sheathing behind anchored stone and masonry veneer installed in accordance with Section 1405.6. Veneer ties shall be installed on the surface of the foam plastic sheathing with fasteners of sufficient length to pass through the thickness of foam plastic sheathing and penetrate framing to provide required pull-out resistance determined in accordance with Chapter 16.

TABLE 1405.18.2.2
FASTENING REQUIREMENTS FOR WOOD FURRING
OVER FOAM PLASTIC SHEATHING^{1,2,3}

Fastener Type	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring ⁴ (inches)	Maximum Thickness of Foam Sheathing ⁵ (inches)	16"oc FURRING			24"oc FURRING		
				Maximum Wind Speed (mph)			Maximum Wind Speed (mph)		
				Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.120" diameter smooth shank nail	1-1/4	8	2	130	110	100	110	90	85
		12	1.5	110	90	85	90	DR	DR
		16	1	90	DR	DR	DR	DR	DR
0.135" diameter smooth shank nail	1-1/4	8	3	130	110	100	110	90	85
		12	2	110	90	85	90	DR	DR
		16	1.5	100	85	DR	DR	DR	DR
#8 wood screw	4	12	3	140	120	110	140	120	110
		16	2	140	120	110	140	120	110
1/4" lag screw	1-1/2	24	3	140	120	110	140	120	110

For SI: 1" = 25.4 mm; 1 mph = 1.609 km/h

DR = design required

- Furring strips shall be spaced a maximum of 24"oc in a vertical or horizontal orientation. Table values are based on minimum 3/4-inch (19.1 mm) thick furring strip and wood studs of Spruce-Pine-Fir or any softwood species with a specific gravity of 0.42 or greater per AF&PA/NDS.
- Tabulated maximum wind speed values are based on a mean roof height of 30 feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
- Where minimum required siding fastener penetration exceeds 3/4-inch (19.1 mm), a minimum 2x furring strip shall be used unless approved deformed shank siding nails or siding screws are used to provide equivalent withdrawal strength.
- In a vertical orientation, furring strips shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, furring strips shall be fastened at each stud intersection with a number of fasteners equivalent to the required fastener spacing. In no case shall fasteners be spaced more than 24 inches (0.6 m) apart.
- Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing, a maximum siding dead load of 11 psf (0.53 kPa), and S_{DS} per Section 1613.5.4 not exceeding 0.83g. Siding dead load shall not exceed 8 psf (0.39 kPa) for and S_{DS} of 1.17g, 6 psf (0.29 kPa) for S_{DS} of 1.5g, or 3.0 psf (0.14 kPa) for S_{DS} of 3.0g.
- Lag screws shall be installed with a standard cut washer and shall be pre-drilled in accordance with AF&PA NDS-05. Approved self-drilling screws of equal or greater shear and withdrawal strength shall be permitted without pre-drilling.

TABLE 1405.18.2.2
FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION
OVER FOAM PLASTIC SHEATHING TO SUPPORT SIDING DEAD LOAD^{1,2}

Furring Material	Framing Member	Fastener Type and Minimum Size	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring (inches)	Maximum Thickness of Foam Sheathing (inches)					
					16"oc FURRING ⁴			24"oc FURRING ⁴		
					Siding Weight:			Siding Weight:		
					3 psf	11 psf	25 psf	3 psf	11 psf	25 psf
Minimum 1x Wood Furring ³	Minimum 2x Wood Stud	0.120" diameter nail	1-1/4	8	4	4	1.5	4	2	1
				12	4	2	1	4	1.5	0.5
				16	4	2	0.5	4	1	DR
		0.131" diameter nail	1-1/4	8	4	4	2	4	3	1
				12	4	3	1	4	2	0.75
				16	4	2	0.75	4	1.5	DR
		#8 wood screw ⁵	1	12	4	4	1.5	4	3	1
				16	4	3	1	4	2	0.5
				24	4	2	0.5	4	1	DR
		1/4" lag screw	1-1/2	12	4	4	3	4	4	1.5
				16	4	4	2	4	3	1
				24	4	3	1	4	2	0.5
Minimum 33mil Steel Hat Channel or Minimum 1x Wood Furring ³	33 mil Steel Stud	#8 screw	Steel thickness + 3 threads	12	3	1.5	DR	3	0.5	DR
				16	3	1	DR	2	DR	DR
				24	2	DR	DR	2	DR	DR
		#10 screw	Steel	12	4	2	DR	4	1	DR

Furring Material	Framing Member	Fastener Type and Minimum Size	Minimum Penetration into Wall Framing (inches) thickness + 3 threads	Fastener Spacing in Furring (inches)	Maximum Thickness of Foam Sheathing (inches)					
					16"oc FURRING ⁴			24"oc FURRING ⁴		
					Siding Weight:			Siding Weight:		
					3 psf	11 psf	25 psf	3 psf	11 psf	25 psf
	43 mil or thicker Steel Stud	#8 Screw	Steel thickness + 3 threads	16	4	1.5	DR	3	DR	DR
				24	3	DR	DR	2	DR	DR
				12	3	1.5	DR	3	0.5	DR
				16	3	1	DR	2	DR	DR
				24	2	DR	DR	2	DR	DR
				12	4	3	1.5	4	3	DR
	#10 screw	Steel thickness + 3 threads		16	4	3	0.5	4	2	DR
				24	4	2	DR	4	0.5	DR
				12	4	2	DR	4	0.5	DR
				16	4	2	DR	4	0.5	DR

For SI: 1" = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa.

DR = design required

- Table values are based on: (1) minimum ¾-inch (19.1 mm) thick wood furring and wood studs of Spruce-Pine-Fir or any softwood species with a specific gravity of 0.42 or greater per AFPA/NDS, (2) minimum 33 mil steel hat channel furring of 33 ksi steel, and (3) steel framing of indicated nominal steel thickness and minimum 33 ksi steel for 33mil and 43 mil steel and 50 ksi steel for 54 mil steel or thicker.
- Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths. Self-drilling tapping screw fasteners for connection of siding to steel framing shall comply with the requirements of AISI S200. Specified fasteners in accordance with Chapter 1405 or the siding manufacturer's approved installation instructions shall meet all other requirements in ASTM F1667 or AISI S200 or be otherwise approved for the intended application.
- Where the required siding fastener penetration into wood material exceeds ¾ inch (19.1 mm) and is not more than 1-1/2 inches (38.1 mm), a minimum 2x wood furring shall be used unless approved deformed shank siding nails or siding screws are used to provide equivalent withdrawal strength allowing connection to 1x wood furring.
- Furring shall be spaced a maximum of 24"oc in a vertical or horizontal orientation. In a vertical orientation, furring shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, furring strips shall be fastened at each stud intersection with a number of fasteners equivalent to the required fastener spacing. In no case shall fasteners be spaced more than 24 inches (0.6 m) apart.
- Lag screws shall be installed with a standard cut washer. Lag screws and wood screws shall be pre-drilled in accordance with AF&PA/NDS. Approved self-drilling screws of equal or greater shear and withdrawal strength shall be permitted without pre-drilling.

1405.14.2 Foam Plastic Sheathing. Vinyl siding used with foam plastic sheathing shall be installed in accordance with 1405.14.2.1, 1405.14.2.2 and 1405.14.2.3.

Exception: Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing, or other approved backing capable of independently resisting the design wind pressure, the vinyl siding shall be installed in accordance with 1405.14.1.

1405.14.2.1 Basic Wind Speed Not Exceeding 90 mph and Exposure Category B. Where the building mean roof height does not exceed 30 feet (9.1 m), the basic wind speed does not exceed 90 mph, the Exposure Category is B and gypsum wall board or equivalent is installed on the side of the wall opposite the foam plastic sheathing, the minimum siding fastener penetration into wood framing shall be 1-1/4 inches (32 mm) using minimum 0.120-inch diameter nail (shank) with a minimum 0.313-inch diameter head, and fastened 16 inches on center. The foam plastic sheathing shall comply with Section 1405.18.1 and shall not exceed a maximum thickness of 1.5 inches (38 mm) for a 0.120-inch diameter nail or 2.0 inches (51 mm) for a 0.135-inch diameter nail. Vinyl siding shall be permitted to be installed on furring strips in accordance with Section 1405.18.2.2 and the siding manufacturer's installation instructions when foam plastic sheathing thickness complies with Section 1405.18.1.

1405.14.2.2 Basic Wind Speed Exceeding 90mph or Exposure Categories C and D. Where the basic wind speed exceeds 90 mph or the Exposure Category is C or D, or all conditions of 1405.14.2.1 are not met, the adjusted design pressure rating for the assembly shall meet or exceed the wind loads required by Chapter 16. The design wind pressure rating of the vinyl siding for installation over solid sheathing as provided in the vinyl siding manufacturer's product specifications shall be adjusted for the following wall assembly conditions:

- For wall assemblies with foam plastic sheathing on the exterior side and minimum ½-inch (12.7 mm) thick gypsum wall board or equivalent on the interior side of the wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.39.
- For wall assemblies with foam plastic sheathing on the exterior side and no gypsum wall board or equivalent on the interior side of wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.27.

Exception: The above adjustments shall not apply when vinyl siding is attached to wood furring strips installed over the foam plastic sheathing in accordance with Section 1405.18.2.2 and such installation is in accordance with the vinyl siding manufacturer's installation instructions.

1405.14.2.3 Manufacturer Specification. Where the vinyl siding manufacturer's product specifications provide an approved design wind pressure rating for installation over foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions.

(Portions of proposal not shown, remain unchanged).

Commenter's Reason: This public comment responds to constructive criticism and supportive recommendations received at the first hearing. Every effort has been made to follow-up with the various interests and to respond with improvements to the original proposal. These improvements are also coordinated with a complimentary PC on FS156-09/10 Part 2 (IRC) as also requested by the IRC CDC which approved the original proposal with a request for further refinements at Final Action. These refinements are coordinated and comprehensively made in this one PC for reasons addressed separately as follows:

Inclusion of Steel Framing

Tables 1405.18.2.1 and 1405.18.2.2 now include siding connections for use with light-frame cold-formed steel in addition to light-frame wood as requested at the first hearing. These are needed to provide siding connection solutions applicable to light-frame cold-formed steel construction to ensure coordination with IECC energy code requirements for this type of construction (as mentioned in the IBC-S committee's reason for disapproval). The Steel Framing Alliance (SFA), American Iron and Steel Institute (AISI), and the Foam Sheathing Coalition (FSC) have worked together toward this end.

The original proposal included connection solutions for attachment of siding over foam sheathing only for wood framing. But, the scope of the original proposal was not otherwise limited to wood framing (i.e., requirements in Table 1405.18.1 of the original proposal are applicable to both wood and steel framing). The IRC committee approved the original FS156-09/10 proposal, but also expressed concern to "work with industry and bring the needed improvement back to the Final Action."

Steel framing was not addressed in the original proposal only because test data was not available at that time to justify appropriate solutions. Subsequently, the steel industry together with New York State Research and Energy Development Authority (NYSERDA) has conducted a testing program to provide justification to the solutions proposed in this PC. A report on this testing will be made available at the Final Action hearing and, as soon as available, by request to the proponent (Mark Nowak, SFA, mnowak@steel framing.org). These tests provide the necessary performance data for appropriately designing siding connections to steel framing that span through a thickness of foam sheathing.

These proposed provisions for light-frame cold-formed steel construction are not only coordinated with ICC energy code requirements, but they are necessary to ensure that foam insulation requirements as required by the ICC energy code are implemented in a structurally sound manner. Support of this PC is urged.

Inclusion of Additional Siding Weight Categories:

The original proposal was based on a minimum 11 psf siding dead load (for siding attachment requirements over foam sheathing). While various siding manufacturers supported the original proposal (or remained neutral), several expressed the desire to be included, such as the Masonry Veneer Manufacturers Association. Thus, a 25 psf siding weight category and connection requirements have been included in this PC. This also required inclusion of a 3 psf siding weight category such that the lighter weight sidings would not be unduly penalized by basing the table only on heavier siding types.

Simplification, Clarification and Editorial Improvements:

Content from table footnotes moved into tables for visual clarity and ease of access.

Removed confusing wind speed requirements from siding attachment table otherwise intending to address connection requirements for support of siding dead load and limit foam thickness. The text is clarified to more explicitly require that the siding attachment be separately designed to resist other loading conditions, including wind.

Adjusted fastener sizes to be compatible with pneumatic fasteners at request of ISANTA

Various editorial improvements to language, table headings, etc.

Additional technical justification for siding connections over foam sheathing

The FSC has also done additional testing of siding over foam sheathing connection assemblies for attachments to wood framing. These tests add further confirmation of the adequacy of the proposed siding attachment requirements for wood framing and support of siding weight. It also confirms that siding deflections will be limited to less than 0.015" as commonly used as a design basis for wood connections. A report documenting this testing will also be made available at the final action hearing and will be posted at www.foam sheathing.org as soon as available.

Strengthened QC requirements for foam sheathing wind pressure resistance properties

One of the concerns raised at the first code development hearing on FS156 was related to having assurance that foam sheathing products meet the wind pressure performance requirements upon which the proposal (namely Table 1405.18.1) is based. This public comment addresses that concern by clarifying implementation a code-recognized "approved agency" approach that already exists and is commonly used for foam sheathing and other products.

First, 2009 IBC Section 2603.2 gives foam plastic insulation requirements for use of an approved agency and labeling to ensure end use complies with code requirements as follows:

2603.2 Labeling and identification. Packages and containers of foam plastic insulation and foam plastic insulation components delivered to the job site shall bear the *label* of an *approved agency* showing the manufacturer's name, product listing, product identification and information sufficient to determine that the end use will comply with the code requirements.

Second, 2009 IBC Section 2603.5.4 provides an example of product performance criteria (test method and minimum performance indices) which the "approved agency" must consider in meeting the requirements of Section 2603.2:

2603.5.4 Flame spread and smoke-developed indexes. Foam plastic insulation, exterior coatings and facings shall be tested separately in the thickness intended for use, but not to exceed 4 inches (102 mm), and shall each have a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723.

Third, the Approved Agency is defined in Sections 202 and 1702.1 of the 2009 IBC as follows:

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved*.

And, the responsibilities of the Approved Agency include:

1703.1 Approved agency. An *approved agency* shall provide all information as necessary for the *building official* to determine that the agency meets the applicable requirements.

1703.1.1 Independence. An *approved agency* shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

1703.5 Labeling. Where materials or assemblies are required by this code to be *labeled*, such materials and assemblies shall be *labeled* by an *approved agency* in accordance with Section 1703. Products and materials required to be labeled shall be labeled in accordance with the procedures set forth in Sections 1703.5.1 through 1703.5.3.

This approach is also used for other materials such as:

2303.1.4 Wood structural panels. Wood structural panels, when used structurally (including those used for siding, roof and wall sheathing, subflooring, diaphragms and built-up members), shall conform to the requirements for their type in DOC PS 1 or PS 2. Each panel or member shall be identified for grade and glue type by the trademarks of an *approved* testing and grading agency. Wood structural panel components shall be designed and fabricated in accordance with the applicable standards listed in Section 2306.1 and identified by the trademarks of an *approved* testing and inspection agency indicating conformance with the applicable standard. In addition, wood structural panels when permanently exposed in outdoor applications shall be of exterior type, except that wood structural panel roof sheathing exposed to the outdoors on the underside is permitted to be interior type bonded with exterior glue, Exposure 1.

Additionally, a Fabricated Item is defined as follows:

FABRICATED ITEM. Structural, load-bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel-reinforcing bars, masonry units, and wood structural panels or in accordance with a standard, listed in Chapter 35, which provides requirements for quality control done under the supervision of a third-party quality control agency shall not be considered "fabricated items."

The above described "approved agency" process has shown itself effective and this public comment merely clarifies the application of this process to assure the structural properties (wind pressure resistance) of foam sheathing align with the basis of the proposed end-use requirements and limitations. The minimum performance requirements are based on a representative sample of currently manufactured products of each type as reported by the NAHB Research Center, Inc. (report available at www.foamsheathing.org). Support for this PC is urged.

Strengthened Scope Limitations on Foam Sheathing Applications

At the request of the insurance industry, a 110 mph wind speed limit has also been implemented in this proposal for foam sheathing. In addition, wind pressure requirements have been strengthened to require use of negative pressure values in all cases, even when siding is placed over foam sheathing and the siding is separately capable of resisting the full negative design wind pressure.

These provisions are needed for the above reasons, provide improvements for appropriate use of foam sheathing, and provide needed solutions for coordination with the energy code requirements. Again, your approval as modified is urged.

Final Action: AS AM AMPC_____ D

FS156-09/10, Part II

IRC R703.3 (New), R703.3.1 (New), Table R703.3.1 (New), R703.3.2 (New), R703.3.2.1 (New), Table R703.3.2.1 (New), R703.3.2.2 (New), Table R703.3.2.2 (New), R703.4, Table R703.4, R703.5.1, R703.6.1, R703.7.4.1, R703.11.2, R703.11.2.1, R703.11.2.2, R703.11.2.3

Proposed Change as Submitted

Proponent: Jay H. Crandell, PE, d/b/a ARES Consulting, representing the Foam Sheathing Coalition

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

R703.3 Foam plastic sheathing. Foam plastic sheathing used in exterior wall covering assemblies shall comply with this section, Section R316, Chapter 11 and the manufacturer's installation instructions.

R703.3.1 Minimum thickness. The thickness of foam plastic sheathing shall comply with Table R703.3.1.

Exception: Where foam plastic sheathing is applied directly over or behind wall sheathing or other solid substrate capable of separately resisting the required wind pressure, the limitations of Table R703.3.1 shall not apply.

**TABLE R703.3.1
REQUIREMENTS FOR FOAM PLASTIC SHEATHING
IN EXTERIOR WALL COVERING ASSEMBLIES^{1,2}**

Foam Plastic	Foam Sheathing	Maximum Wind Speed (mph) – Exposure B ⁴
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Sheathing Material ³	Thickness (in) ³	Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
Siding Attached Directly Over Foam Plastic Sheathing per Section R703.3.2.1					
EPS	3/4"	110	NP	90	NP
	1"	130	100	125	NP
	≥1-1/2"	130	130	130	125
Polyiso-cyanurate	1/2" (faced)	130	90	115	NP
	3/4" (faced)	130	120	130	100
	1" (faced)	130	130	130	110
	≥1-1/2" (faced)	130	130	130	115
XPS	1/2" (faced)	125	85	105	NP
	3/4"	110	NP	90	NP
	1"	130	95	120	NP
	≥1-1/2"	130	130	130	115

Siding Offset from Foam Sheathing per Section R703.3.2.2					
	3/4"	EPS	NP	NP	NP
	1"		85	105	NP
	≥1-1/2"		130	130	105
Polyiso-cyanurate	1/2" (faced)	120	NP	100	NP
	3/4" (faced)	130	100	130	85
	1" (faced)	130	110	130	95
	≥1-1/2" (faced)	130	120	130	100
XPS	1/2" (faced)	110	NP	90	NP
	3/4"	95	NP	NP	NP
	1"	125	85	105	NP
	≥1-1/2"	130	120	130	100
EPS	3/4"	95	NP	NP	NP
	1"	125	85	105	NP
	≥1-1/2"	130	130	130	105

For SI: 1 inch = 25.4 mm, 1 mile per hour = 1.609 km/h

NP = not permitted

1. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).
2. Foam plastic sheathing panels shall be permitted to be oriented parallel or perpendicular to framing members.
3. Foam plastic sheathing shall meet or exceed the following material standards: Expanded Polystyrene (EPS) – ASTM C578 (Type II, min. 1.35 lb/ft³ density), Polyisocyanurate – ASTM C1289 (Type 1, min.), and extruded polystyrene (XPS) – ASTM C578 (Type X, min. 1.30 lb/ft³ density). Where a "faced" product is indicated, a facer shall be provided on both faces of the foam plastic sheathing. Where facing is not indicated in the table, faced and unfaced foam plastic sheathing shall be permitted. For all foam plastic sheathing products, approved manufacturer data shall be permitted in lieu of the table requirements.
4. Multiply tabulated maximum wind speed by 0.85 for wind exposure C or by 0.78 for wind exposure D.
5. Interior finish shall be minimum 1/2-inch (12.7 mm) thick gypsum wall board or an approved product with equivalent or greater out-of-plane bending strength and stiffness.

R703.3.2 Siding attachment over foam sheathing. Siding shall be attached over foam sheathing in accordance with Section R703.3.2.1, Section R703.3.2.2, or an approved design. In no case shall the siding material be used in a manner that exceeds its application limits.

Exception: Where the siding manufacturer has provided installation instructions for application over foam sheathing, those requirements shall apply.

R703.3.2.1 Direct siding attachment. Siding installed directly over foam sheathing without separation by an air space shall comply with Table R703.3.2.1 in regard to nail diameter, penetration, and nail spacing for the applicable foam sheathing thickness and wind speed condition. The siding fastener and siding installation shall otherwise comply with Section R703.4 and Table R703.4.

Exceptions:

1. For vinyl siding, refer to Section R703.11.2.
2. For exterior insulation and finish systems, refer to Section R703.9.
3. For adhered veneer, refer to Section R703.12.

TABLE R703.3.2.1
FASTENING REQUIREMENTS FOR DIRECT SIDING
ATTACHMENT OVER FOAM PLASTIC SHEATHING^{1,2}

Minimum Nail Diameter ³ (inches)	Nail Spacing along Stud ⁴ (inches)	Maximum Foam Sheathing Thickness ⁵ (inches)	16"oc WALL FRAMING			24"oc WALL FRAMING		
			Maximum Wind Speed (mph)			Maximum Wind Speed (mph)		
			Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.113	6	2	140	120	110	120	100	90
	8	2	130	110	100	100	85	DR
	12	1	100	85	DR	85	DR	DR
0.120	6	3	140	120	110	120	100	90
	8	2	130	110	100	110	90	85
	12	1.5	110	90	85	90	DR	DR
0.135	6	3	140	120	110	130	110	100
	8	3	140	120	110	110	90	85
	12	2	110	90	85	90	DR	DR

For SI: 1 inch = 25.4 mm; 1 mph = 1.609 km/h

DR = design required

- Maximum wind speed values are based on a minimum 1-1/4 inch (31.8 mm) penetration of a smooth shank nail fastener into wood framing of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS.
- Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).
- Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths to provide a minimum 1-1/4 inch (31.8 mm) penetration into wood framing. Specified nails in accordance with Section R703.4 or the siding manufacturer's installation instructions shall meet all other requirements in ASTM F1667 or be otherwise approved for the intended application.
- 'Nail spacing along stud' refers to spacing of siding fasteners in the vertical direction. A minimum of one fastener shall be applied at each intersection of an individual siding member with a wall stud.
- Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing and a maximum siding dead load of 11 psf (0.53 kPa) based on 7/8-inch (22 mm) thick Portland cement plaster. For Seismic Design Category D2, the maximum siding dead load shall be 8 psf.

Fastener Type	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring ⁴ (inches)	Maximum Thickness of Foam Sheathing ⁵ (inches)	16"oc FURRING			24"oc FURRING		
				Maximum Wind Speed (mph)			Maximum Wind Speed (mph)		
				Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.120" diameter smooth shank nail	1-1/4	8	2	130	110	100	110	90	85
		12	1.5	110	90	85	90	DR	DR
		16	1	90	DR	DR	DR	DR	DR
0.135" diameter smooth shank nail	1-1/4	8	3	130	110	100	110	90	85
		12	2	110	90	85	90	DR	DR
		16	1.5	100	85	DR	DR	DR	DR
#8 wood screw	1	12	3	140	120	110	140	120	110
		16	2	140	120	110	140	120	110
1/4" lag screw ⁶	1-1/2	24	3	140	120	110	140	120	110

R703.3.2.2 Offset siding attachment. When an airspace separates the siding from direct contact with the foam plastic sheathing, the siding shall be attached in accordance with Section R703.4 and Table R703.4 to minimum 1x3 wood furring strips placed over the foam sheathing. Furring shall be attached through the foam sheathing to wall framing in accordance with Table R703.3.2.2. When placed horizontally, wood furring strips shall be preservative treated wood or naturally durable wood and fasteners shall be corrosion resistant in accordance with Section R317.

Exception: Furring strips shall not be required over foam plastic sheathing located behind anchored stone and masonry veneer installed in accordance with Section R703.7. Veneer ties shall be installed in accordance with Section R703.7.4.1.

TABLE R703.3.2.2
FASTENING REQUIREMENTS FOR WOOD FURRING
OVER FOAM PLASTIC SHEATHING^{1,2,3}

For SI: 1" = 25.4 mm; 1 mph = 1.609 km/h

DR = design required

- Furring strips shall be spaced a maximum of 24"oc in a vertical or horizontal orientation. Table values are based on minimum 3/4-inch (19.1 mm) thick furring strip and wood studs of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater per AFPA/NDS.
- Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).

3. Where minimum required siding fastener penetration exceeds ¾ inch (19.1 mm), a minimum 2x furring strip shall be used unless approved deformed shank siding nails or siding screws are used to provide equivalent withdrawal strength.
4. In a vertical orientation, furring strips shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, furring strips shall be fastened at each stud intersection with a number of fasteners equivalent to the required fastener spacing. In no case shall fasteners be spaced more than 24 inches (0.6 m) apart.
5. Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing and a maximum siding dead load of 11 psf (0.53 kPa) based on 7/8-inch (22 mm) thick Portland cement plaster. For Seismic Design Category D2, the maximum siding dead load shall be 8 psf.
6. Lag screws shall be installed with a standard cut washer and shall be pre-drilled in accordance with AF&PA NDS-05. Approved self-drilling screws of equal or greater shear and withdrawal strength shall be permitted without pre-drilling.

(Renumber subsequent sections)

2. Revise as follows:

R703.4 Attachments. Unless specified otherwise, all wall coverings shall be securely fastened in accordance with Table R703.4 or with other *approved* aluminum, stainless steel, zinc-coated or other *approved* corrosion-resistive fasteners. Additional requirements in accordance with Section R703.3.2 shall apply when siding is installed over foam sheathing. Where the basic wind speed per Figure R301.2(4) is 110 miles per hour (49 m/s) or higher, the attachment of wall coverings shall be designed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3).

**TABLE R703.4
WEATHER-RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS**

SIDING MATERIAL		NOMINAL THICKNESS ^a (inches)	JOINT TREATMENT	WATER RESISTIVE BARRIER REQUIRED	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS ^{b,c,d}					
					Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud ^{aa}	Direct to studs	Number or spacing of fasteners
Horizontal aluminum ^e	Without insulation	0.019 ^f	Lap	Yes	0.120 nail 1½" long	0.120 nail 2" long	0.120 nail 2" long	0.120 nail ^y	Not allowed	Same as stud spacing
		0.024	Yes	Yes	0.120 nail 1½" long	0.120 nail 2" long	0.120 nail 2" long	0.120 nail ^y	Not allowed	
	With insulation	0.019	Yes	Yes	0.120 nail 1½" long	0.120 nail 2½" long	0.120 nail 2½" long	0.120 nail ^y	0.120 nail 1½" long	
Anchored veneer; brick, concrete, masonry or stone		2	Section R703	Yes	See Section R703 and Figure R703.7 ^g					
Adhered veneer; concrete, stone or masonry ^w		—	Section R703	Yes Note w	See Section R703.6.1 ^g or in accordance with the manufacturer's instructions					
Hardboard ^k Panel siding-vertical		7/16	—	Yes	Note m	Note m	Note m	Note m	Note m	6" Panel edges 12" inter. Sup."
Hardboard ^k Lap-siding horizontal		7/16	Note p	Yes	Note o	Note o	Note o	Note o	Note o	Same as stud spacing 2 per bearing
Steel ^h		29 ga.	Lap	Yes	0.113 nail and 1¼" Staple-1¼"	0.113 nail and 2¾"Staple 2 ½"	0.113 nail and 2½" Staple-2¼"	0.113 nail ^v Staple ^v	Not allowed	Same as stud spacing
Particleboard panels		3/8-1/2	—	Yes	6d box nail (2" x 0.099")	6d box nail (2" x 0.099")	6d box nail (2" x 0.099")	box nail ^v	6d box nail (2"x0.099), 3/8 not allowed	6" panel edge, 12"inter. sup.
		3/8	—	Yes	6d box nail (2" x 0.099")	8d box nail (2" x 0.099")	8d box nail (2" x 0.099")	box nail ^v	6d box nail (2" x0.099")	
Wood structural panel siding ⁱ (exterior grade)		3/8	Note p	Yes	0.099 nail-2"	0.113 nail-2½"	0.113 nail-2½"	0.113 nail ^v	0.099 nail-2"	6" panel edge. 12" inter.sup.
Wood structural panel lapsiding		3/8-1/2	Note p Note x	Yes	0.099 nail-2"	0.113 nail-2½"	0.113 nail-2½"	0.113 nail ^f	0.099 nail-2"	8" along bottom edge
Vinyl siding ^l		0.035	Lap	Yes	0.120 nail (shank) with a 0.313 head or 16 gauge	0.120 nail (shank) with a 0.313 head or 16 gauge staple with	0.120 nail (shank) with a 0.313 head or 16 gauge	0.120 nail (shank) with a 0.313 head per Section	Not allowed	16 inches on center or specified by the manufacturer instructions

SIDING MATERIAL	NOMINAL THICKNESS ^a (inches)	JOINT TREATMENT	WATER RESISTIVE BARRIER REQUIRED	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS ^{b,c,d}					
				Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud ^{aa}	Direct to studs	Number or spacing of fasteners
				staple with 3/8 to 1/2-inch crown ^{y,z}	3/8 to 1/2-inch crown ^y	staple with 3/8 to 1/2-inch crown ^y	R ^{203.11.2}		or test report
Wood ⁱ rustic, drop	3/8 Min	Lap	Yes	Fastener penetration into stud-1"				0.113 nail-2 1/2" Staple-2"	Face nailing up to 6" widths, 1 nail per bearing, 8" widths and over, 2 nails per bearing
Shiplap	19/32 Average	Lap	Yes						
Bevel	7/16	Lap	Yes						
Butt tip	3/16	Lap	Yes						
Fiber cement panel siding ^q	5/16	Note q	Yes Note u	6d common corrosion-resistant nail ^f	6d common corrosion-resistant nail ^f	6d common corrosion-resistant nail ^f	6d common corrosion-resistant (12" x 0.113") nail ^f	6d common corrosion-resistant nail ^f	6" o.c. on edges, 12" o.c. on intermed. Studs
Fiber cement lap siding ^s	5/16	Note s	Yes Note u	6d common corrosion-resistant nail ^f	6d common corrosion-resistant nail ^f	6d common corrosion-resistant nail ^f	6d common corrosion-resistant (12" x 0.113") nail ^f	6d common corrosion-resistant nail or 11 gage roofing nail ^f	Note t

For SI: 1 inch = 25.4 mm.

- Based on stud spacing of 16 inches on center where studs are spaced 24 inches, siding shall be applied to sheathing approved for that spacing.
- Nail is a general description and shall be T-head, modified round head, or round head with smooth or deformed shanks.
- Staples shall have a minimum crown width of 7/16-inch outside diameter and be manufactured of minimum 16 gage wire.
- Nails or staples shall be aluminum, galvanized, or rust-preventative coated and shall be driven into the studs where for fiberboard, or gypsum, or foam plastic sheathing backing is used
- Aluminum nails shall be used to attach aluminum siding.
- Aluminum (0.019 inch) shall be unbacked only when the maximum panel width is 10 inches and the maximum flat area is 8 inches. The tolerance for aluminum siding shall be +0.002 inch of the nominal dimension.
- All attachments shall be coated with a corrosion-resistant coating.
- Shall be of approved type.
- Three-eighths-inch plywood shall not be applied directly to studs spaced more than 16 inches on center when long dimension is parallel to studs. Plywood 1/2-inch or thinner shall not be applied directly to studs spaced more than 24 inches on center. The stud spacing shall not exceed the panel span rating provided by the manufacturer unless the panels are installed with the face grain perpendicular to the studs or over sheathing approved for that stud spacing.
- Wood board sidings applied vertically shall be nailed to horizontal nailing strips or blocking set 24 inches on center. Nails shall penetrate 1 1/2 inches into studs, studs and wood sheathing combined or blocking. For application over foam sheathing, refer to Section R703.3.2.2.
- Hardboard siding shall comply with CPA/ANSI A135.6.
- Vinyl siding shall comply with ASTM D 3679.
- Minimum shank diameter of 0.092 inch, minimum head diameter of 0.225 inch, and nail length must accommodate sheathing and penetrate framing 1 1/2 inches. For application over foam sheathing, minimum shank diameter and penetration into framing shall comply with Section R703.3.2.
- When used to resist shear forces, the spacing must be 4 inches at panel edges and 8 inches on interior supports.
- Minimum shank diameter of 0.099 inch, minimum head diameter of 0.240 inch, and nail length must accommodate sheathing and penetrate framing 1 1/2 inches. For application over foam sheathing, minimum shank diameter and penetration into framing shall comply with Section R703.3.2.
- Vertical end joints shall occur at studs and shall be covered with a joint cover or shall be caulked.
- See Section R703.10.1.
- Fasteners shall comply with the nominal dimensions in ASTM F 1667. For application over foam sheathing, refer to Section R703.3.2
- See Section R703.10.2.
- Face nailing: one 6d common nail through the overlapping planks at each stud. Concealed nailing: one 11 gage 11/2 inch long galv. roofing nail through the top edge of each plank at each stud.
- See Section R703.2 exceptions.
- Minimum nail length must accommodate sheathing and penetrate framing 11/2 inches. For application over foam sheathing, refer to Section R703.3.2
- Adhered masonry veneer shall comply with the requirements of Section R703.6.3 and shall comply with the requirements in Sections 6.1 and 6.3 of ACI 530/ASCE 5/TMS-402.
- Vertical joints, if staggered shall be permitted to be away from studs if applied over wood structural panel sheathing.
- Minimum fastener length must accommodate sheathing and penetrate framing .75 inches or in accordance with the manufacturer's installation instructions. For application over foam sheathing, fastener penetration into framing shall comply with Section R703.3.2.

- z. Where approved by the manufacturer's instructions or test report siding shall be permitted to be installed with fasteners penetrating not less than .75 inches through wood or wood structural sheathing with or without penetration into the framing.
- aa. Refer to Section R703.3 for additional requirements.
- bb. For siding application over foam sheathing, fastener spacing shall comply with the more stringent requirement of this table or Section R703.3.2.

R703.5.1 Application. Wood shakes or shingles shall be applied either single-course or double-course over nominal 1/2-inch (13 mm) wood-based sheathing or to furring strips over nominal 1/2-inch (13 mm) nonwood sheathing.

Exception: Wood shakes or shingles over foam plastic sheathing, shall be applied to wood furring strips in accordance with Section R703.3.2.2.

A ~~permeable~~ water-resistive barrier shall be provided in accordance with Section R703.2 over all sheathing, with horizontal overlaps in the membrane of not less than 2 inches (51 mm) and vertical overlaps of not less than 6 inches (152 mm). Where furring strips are used, they shall be 1 inch by 3 inches or 1 inch by 4 inches (25 mm by 76 mm or 25 mm by 102 mm), and shall be fastened horizontally to the studs with 7d or 8d box nails. For application over foam plastic sheathing, furring strips shall be fastened in accordance with Section R703.3.2.2, and Furring strips shall be spaced a distance on center equal to the actual weather exposure of the shakes or shingles, not to exceed the maximum exposure specified in Table R703.5.2. The spacing between adjacent shingles to allow for expansion shall not exceed 1/4 inch (6 mm), and between adjacent shakes, it shall not exceed 1/2 inch (13 mm). The offset spacing between joints in adjacent courses shall be a minimum of 1 1/2 inches (38 mm).

R703.6.1 Lath. All lath and lath attachments shall be of corrosion-resistant materials. Expanded metal or woven wire lath shall be attached with 1 1/2-inch-long (38 mm), 11 gage nails having a 7/16-inch (11.1 mm) head, or 7/8-inch-long (22.2 mm), 16 gage staples, spaced at no more than 6 inches (152 mm), or as otherwise *approved*. For application of maximum 7/8-inch-thick Portland cement plaster over foam plastic sheathing, nail length and shank diameter shall comply with Section R703.3.2.

R703.7.4.1 Size and spacing. Veneer ties, if strand wire, shall not be less in thickness than No. 9 U.S. gage [(0.148 in.) (4 mm)] wire and shall have a hook embedded in the mortar joint, or if sheet metal, shall be not less than No. 22 U.S. gage by [(0.0299 in.) (0.76 mm)] 7/8 inch (22 mm) corrugated. Each tie shall be spaced not more than 24 inches (610 mm) on center horizontally and vertically and shall support not more than 2.67 square feet (0.25 m²) of wall area. For application over foam plastic sheathing, corrugated metal ties shall be fastened through the foam plastic sheathing using a 10d common nail with a minimum penetration of 1 1/2 inches (38 mm) into wood framing for a maximum wind condition of 90 miles per hour (40 m/s) in wind exposure B. For a basic wind speed not exceeding 110 miles per hour (49 m/s) in any wind exposure and in Seismic Design Categories C, D₀, D₁, and D₂, a #8 wood screw with a minimum 1 inch (25.4 mm) penetration into wood wall framing shall be used in each tie. Alternatively, an approved fastener with equivalent withdrawal strength shall be permitted.

Exception: In Seismic Design Category D₀, D₁ or D₂ or townhouses in Seismic Design Category C or in wind areas of more than 30 pounds per square foot pressure (1.44 kPa), each tie shall support not more than 2 square feet (0.2 m²) of wall area.

R703.11.2 Foam plastic sheathing. Vinyl siding used with foam plastic sheathing shall be installed in accordance with Section R703.11.2.1, R703.11.2.2, or R703.11.2.3.

Exception: Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing or other *approved* backing capable of independently resisting the design wind pressure, the vinyl siding shall be installed in accordance with Section R703.11.1.

R703.11.2.1 Basic wind speed not exceeding 90 miles per hour and Exposure Category B. Where the basic wind speed does not exceed 90 miles per hour (40 m/s), the Exposure Category is B and gypsum wall board or equivalent is installed on the side of the wall opposite the foam plastic sheathing, the minimum siding fastener penetration into wood framing shall be 1 1/4 inches (32 mm) using minimum 0.120-inch diameter nail (shank) with a minimum 0.313-inch diameter head, 16 inches on center. The foam plastic sheathing minimum thickness shall comply with Section R703.3.1 and shall not exceed a maximum thickness of 1.5 inches (38 mm) for a 0.120-inch diameter nail or 2.0 inches (51 mm) for a 0.135-inch diameter nail. shall be 1/2-inch thick (12.7 mm) (nominal) extruded polystyrene per ASTM C578, 1/2-inch thick (12.7 mm) (nominal) polyisocyanurate per ASTM C1289, or 1-inch thick (25 mm) (nominal) expanded polystyrene per ASTM C578. Vinyl siding shall be permitted to be installed on furring strips in accordance with Section R703.2.2 using the siding manufacturer's installation instructions when foam plastic sheathing thickness complies with Section R703.3.1.

R703.11.2.2 Basic wind speed exceeding 90 miles per hour or Exposure Categories C and D. Where the basic wind speed exceeds 90 miles per hour (40 m/s) or the Exposure Category is C or D, or all conditions of Section R703.11.2.1 are not met, the adjusted design pressure rating for the assembly shall meet or exceed the loads listed in Tables R301.2(2) adjusted for height and exposure using Section R301.2(3). The design wind pressure rating of the vinyl siding for installation over solid sheathing as provided in the vinyl siding manufacturer's product specifications shall be adjusted for the following wall assembly conditions:

1. For wall assemblies with foam plastic sheathing on the exterior side and minimum ½-inch-thick gypsum wall board or equivalent on the interior side of the wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.39.
2. For wall assemblies with foam plastic sheathing on the exterior side and no gypsum wall board or equivalent on the interior side of wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.27.

Exception: The above adjustments shall not apply when vinyl siding is attached to wood furring strips installed over the foam plastic sheathing in accordance with Section R703.3.2.2 and such installation is in accordance with the vinyl siding manufacturer's installation instructions.

R703.11.2.3 Manufacturer specification. Where the vinyl siding manufacturer's product specifications provide an *approved* design wind pressure rating for installation over foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions.

Reason:

Part II- As with a related IBC proposal, this proposal is a comprehensive clarification and upgrading of requirements for foam sheathing and siding installation over foam sheathing. It primarily addresses adequate foam sheathing thickness and siding attachment over foam sheathing to resist design wind loads within the scope of the IRC (e.g., up to 110 mph, Exposure D). It also provides siding connections through foam sheathing that provide adequate support to resist the dead load of siding installed over foam sheathing. As a whole, these provisions are necessary to ensure appropriate use of foam sheathing and siding materials together on exterior wall assemblies in a way that best compliments existing exterior wall covering provisions in Section R703 of the code. A detailed explanation of the test data and analysis justifying the proposed requirements can be found at www.foamsheathing.org.

In support of proposed new Section R703.3.1, the wind pressure resistance of foam sheathing used in this proposal is based on certified full-scale (4'x8' panel) testing conducted at the NAHB Research Center, Inc. Samples included specimens from various manufacturers representing the industry at large. The design wind speed data (without rounding or capping values) is shown in the table below for informational purposes. The values in the proposed table have been rounded to the nearest 5 mph increment and capped at 130 mph (Exposure B) as this corresponds to a maximum wind speed of 110 mph in exposure C, which is essentially the scope limit of the IRC. This proposal is needed to avoid potential exclusion of foam sheathing products due to the incompleteness of current code requirements which can negatively affect other concerns such as energy conservation code requirements and green building interests. Most importantly, these requirements will ensure that foam sheathing is used appropriately to prevent building envelope damage, particularly in higher wind conditions and with thinner material used on more widely spaced studs (e.g., 24"oc center on gable roof ends which typically have no interior finish). These requirements also agree reasonably well with the generally successful use of foam sheathing on typical wall assemblies (e.g., 16"oc framing or 24"oc framing with interior finish) on many homes in lower wind regions of the U.S.

**TABLE R703.3.1- Part A (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH DIRECTLY ATTACHED SIDING PER SECTION R703.3.2.1**

Foam Sheathing Material ³	Foam Sheathing Nominal Thickness (in)	Maximum Wind Speed (mph) – Exposure B ⁴			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾" (unfaced)	110	73	92	61
	1" (unfaced)	147	98	123	82
	1-1/2" (unfaced)	222	148	186	124
Polyiso-cyanurate	½" (faced)	136	91	114	76
	¾" (faced)	177	118	148	99
	1" (faced)	193	129	162	108
	1-1/2" (faced)	207	138	173	116
XPS	½" (faced)	125	84	105	70
	¾" (unfaced)	109	73	91	61
	1" (unfaced)	145	97	121	81
	1-1/2" (unfaced)	208	139	174	116

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 positive pressure design loads for wall corner zone and a 10 sqft wind effective area (negative pressure is resisted by the foam sheathing and siding assembly). Because the 1.5 safety factor is applied to a minimum test value (not the average), these requirements are more stringent than safety margins required for other building envelop components such as doors and windows which are also important to envelope integrity. This "minimum test value" basis also serves to better control safety margins with regard to variability in material properties or performance.

**TABLE R703.3.1 – Part B (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH FURRED SIDING PER SECTION R703.3.2.2¹**

Foam Plastic Sheathing Material ²	Foam Sheathing Nominal Thickness (in) ²	Maximum Wind Speed (mph) – Exposure B ^{3,4}			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾"	95	63	80	53
	1"	127	85	106	71
	≥1-1/2"	192	128	161	107
Polyiso-cyanurate	½" (faced)	118	78	98	66
	¾" (faced)	153	102	128	85
	1" (faced)	167	112	140	93
	≥1-1/2" (faced)	179	120	150	100
XPS	½" (faced)	108	72	91	61
	¾"	94	63	79	53
	1"	126	84	105	70
	≥1-1/2"	180	120	151	101

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 negative pressure design loads for wall corner zone and a 10 sqft wind effective area. Because the siding is spaced away from foam sheathing in this wall covering assembly condition, it does not contribute to foam sheathing resistance. Thus, the foam sheathing must independently resist the negative wind pressure load. The furring strips provide adequate bearing at connection to secure the foam sheathing as well as the siding material.

In support of proposed new Section R703.3.2, the generalized connection requirements for siding over foam sheathing are based on an analysis using the AF&PA NDS-2005 connection design provisions in consideration of withdrawal to resist wind pressure and shear strength to resist siding dead load. To account for the "gap" in the connection caused by the presence of foam sheathing, the provisions of AF&PA TR12 were used to downgrade connection strength based on the thickness of foam sheathing (i.e., width of gap in the connection). The design shear strength was based on calculated ultimate capacity divided by a safety factor of 2 while conservatively ignoring any benefit of the foam material filling the gap in the siding or furring connection to wall framing. Wind loads were based on application of the full ASCE 7-05 components and cladding wind pressure applied to the exterior wall covering while conservatively ignoring any distribution of wind pressure to other wall layers. In addition, the wind pressures were based on the most stringent wall corner zone condition and an effective wind area of 10 sqft.

Changes to other parts of Section R703, including changes to Table R703.4 and various siding attachment requirements, are made in coordination with the above improvements.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: ASTM standards within this proposed are currently referenced in the I-codes.

ICCFILENAME: CRANDELL-FS1-1404.12

Public Hearing Results

PART II- IRC B/E

Committee Action:

Approved as Submitted

Committee Reason: This is a needed addition to the code and will provide an efficient method to provide energy savings. The committee is concerned that this needs improvement but this is a good start. The proponent should work with industry and bring the needed improvement back to the Final Action.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment 1:

Jay H. Crandell, PE, ARES Consulting, representing Foam Sheathing Coalition; Mark Nowak, representing Steel Framing Alliance, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

R703.3 Foam plastic sheathing. Foam plastic sheathing used in exterior wall covering assemblies shall comply with this section, Section R316, Chapter 11 and the manufacturer's installation instructions. Light frame wood and cold-formed steel braced wall lines including foam plastic sheathing shall be braced with approved materials in accordance with Chapter 6. Where lateral buckling restraint of light-frame wood and cold-formed steel studs also is required in Chapter 6, foam sheathing shall not be permitted to provide the required lateral buckling restraint. When used in exterior wall covering assemblies in accordance with Table 703.3.1 of Section R703.3.1, foam sheathing shall be identified by the trademarks of an approved testing and inspection agency in accordance with Section 316.2 indicating compliance with the wind pressure resistance requirements of Table R703.3.1 where not already addressed in the applicable material standards. The use of foam plastic sheathing in accordance with this section shall not be permitted where the basic wind speed exceeds 110 mph.

~~**R703.3.1 Minimum thickness.** The thickness of foam plastic sheathing shall comply with Table R703.3.1.~~

Exceptions:

1. Where foam plastic sheathing is covered with applied directly over or behind wall sheathing or other solid material substrate capable of separately resisting the required wind pressure, the limitations of Section R703.3.1 and the basic wind speed limit of 110 mph Table 703.3.1 shall not apply.
2. Where foam plastic sheathing is covered with cladding and applied directly over wall sheathing or other solid material, all capable of separately resisting the full design wind pressure, the limitations of Section R703.3.1 and the basic wind speed limit of 110 mph shall not apply.

R703.3.1 Minimum thickness. The thickness of foam plastic sheathing shall comply with Table R703.3.1. The components and cladding design wind pressure determined in accordance with Table R301.2(2) shall not exceed the allowable wind pressure value in accordance with Table R703.3.1.

**TABLE R703.3.1
REQUIREMENTS FOR FOAM PLASTIC SHEATHING
IN EXTERIOR WALL COVERING ASSEMBLIES^{1,2}**

Foam Plastic Sheathing Material ³	Foam Sheathing Thickness (in) ³	Maximum Wind Speed (mph) — Exposure B ⁴			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
Siding Attached Directly Over Foam Plastic Sheathing per Section R703.3.2.1					
EPS	¾"	110	NP	90	NP
	1"	130	100	125	NP
	≥1-1/2"	130	130	130	125
Polyiso-cyanurate	½" (faced)	130	90	115	NP
	¾" (faced)	130	120	130	100
	1" (faced)	130	130	130	110
	≥1-1/2" (faced)	130	130	130	115
XPS	½" (faced)	125	85	105	NP
	¾"	110	NP	90	NP
	1"	130	95	120	NP
	≥1-1/2"	130	130	130	115
Siding Offset from Foam Sheathing per Section R703.3.2.2					
	¾"	EPS	NP	NP	NP
	1"		85	105	NP
	≥1-1/2"		130	130	105

Foam Plastic Sheathing Material ³	Foam Sheathing Thickness (in) ³	Maximum Wind Speed (mph) — Exposure B ⁴			
		Walls with Interior Finish ⁵		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
Polyiso-cyanurate	½" (faced)	120	NP	100	NP
	¾" (faced)	130	100	130	85
	1" (faced)	130	110	130	95
	≥1-1/2" (faced)	130	120	130	100
XPS	½" (faced)	110	NP	90	NP
	¾"	95	NP	NP	NP
	1"	125	85	105	NP
	≥1-1/2"	130	120	130	100
EPS	¾"	95	NP	NP	NP
	1"	125	85	105	NP
	≥1-1/2"	130	130	130	105

For SI: 1 inch = 25.4 mm, 1 mile per hour = 1.609 km/h

NP = not permitted

1. Tabulated maximum wind speed values are based on a mean roof height of 30 feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).
2. Foam plastic sheathing panels shall be permitted to be oriented parallel or perpendicular to framing members.
3. Foam plastic sheathing shall meet or exceed the following material standards: Expanded Polystyrene (EPS) — ASTM C578 (Type II, min. 1.35 lb/ft³ density), Polyisocyanurate — ASTM C1289 (Type 1, min.), and extruded polystyrene (XPS) — ASTM C578 (Type X, min. 1.30 lb/ft³ density). Where a "faced" product is indicated, a facer shall be provided on both faces of the foam plastic sheathing. Where facing is not indicated in the table, faced and unfaced foam plastic sheathing shall be permitted. For all foam plastic sheathing products, approved manufacturer data shall be permitted in lieu of the table requirements.
4. Multiply tabulated maximum wind speed by 0.85 for wind exposure C or by 0.78 for wind exposure D.
5. Interior finish shall be minimum 1/2-inch (12.7 mm) thick gypsum wall board or an approved product with equivalent or greater out-of-plane bending strength and stiffness.

TABLE R703.3.1
ALLOWABLE WIND PRESSURE VALUE (PSF) FOR FOAM PLASTIC SHEATHING
IN EXTERIOR WALL COVERING ASSEMBLIES¹

Foam Plastic Sheathing Material ²	Foam Sheathing Thickness (in)	Allowable (ASD) Components and Cladding Design Wind Pressure (psf) (basic wind speed not to exceed 110 mph per Section R703.3)			
		Walls with Interior Finish ³		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾"	21.8	NP	15.3	NP
	1"	38.8	19.4	27.2	13.6
	≥1-1/2"	89.0	39.5	62.3	27.7
Polyiso-cyanurate	½" (faced)	33.3	14.8	23.3	10.4
	¾" (faced)	56.4	25.1	39.5	17.6
	1" (faced)	67.5	30.0	47.2	21.0
	≥1-1/2" (faced)	77.4	34.4	54.1	24.1
XPS	½" (faced)	28.3	12.6	19.8	NP
	¾"	21.4	NP	15.0	NP
	1"	38.0	29.0	26.6	20.3
	≥1-1/2"	78.2	34.7	54.7	24.3

For SI: 1 inch = 25.4 mm, 1 pound per square foot (psf) = 0.0479 kPa.

NP = not permitted (allowable design wind pressure less than 10 psf)

1. Foam plastic sheathing panels shall be permitted to be oriented parallel or perpendicular to framing members.
2. Foam plastic sheathing shall meet or exceed the following material standards: Expanded Polystyrene (EPS) — ASTM C578 (Type II, min. 1.35 lb/ft³ density), Polyisocyanurate — ASTM C1289 (Type 1, min.), and extruded polystyrene (XPS) — ASTM C578 (Type X, min. 1.30 lb/ft³ density). Where a "faced" product is indicated, a facer shall be provided on both faces of the foam plastic sheathing. Where facing is not indicated in the table, faced and unfaced foam plastic sheathing shall be permitted. For all foam plastic sheathing products, approved manufacturer data shall be permitted in lieu of the table requirements.
3. Interior finish shall be minimum 1/2-inch (12.7 mm) thick gypsum wall board or an approved product with equivalent or greater out-of-plane bending strength and stiffness.

R703.3.2 Siding attachment over foam sheathing. Siding shall be attached over foam sheathing in accordance with Section R703.3.2.1, Section R703.3.2.2, or an approved design. In no case shall the siding material be used in a manner that exceeds its application limits.

Exception: Where the siding manufacturer has provided installation instructions for application over foam sheathing, those requirements shall apply.

R703.3.2.1 Direct siding attachment. Siding installed directly over foam sheathing without separation by an air space shall comply with Table R703.3.2.1 in regard to minimum fastening requirements nail diameter, penetration, and nail spacing and maximum foam sheathing thickness limitations to support siding dead load for the applicable foam sheathing thickness and wind speed condition. The siding fastener and siding installation shall otherwise comply with Section 703.4 and Table R703.4 and in no case shall result in a less stringent fastening requirement than required by Section R703.4 or the manufacturer's installation instructions for the specific siding material used.

Exceptions:

1. For adhered masonry veneer, refer to Section 1405.10.
2. For vinyl siding, refer to Section 1405.14.
3. For exterior insulation and finish systems, refer to Section 1408.

TABLE R703.3.2.1

**FASTENING REQUIREMENTS FOR DIRECT SIDING
ATTACHMENT OVER FOAM PLASTIC SHEATHING^{1,2}**

Minimum Nail Diameter ³ (inches)	Nail Spacing along Stud ⁴ (inches)	Maximum Foam Sheathing Thickness ⁵ (inches)	16"oc WALL FRAMING			24"oc WALL FRAMING		
			Maximum Wind Speed (mph)			Maximum Wind Speed (mph)		
			Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.113	6	2	140	120	110	120	100	90
	8	2	130	110	100	100	85	DR
	12	4	100	85	DR	85	DR	DR
0.120	6	3	140	120	110	120	100	90
	8	2	130	110	100	110	90	85
	12	1.5	110	90	85	90	DR	DR
0.135	6	3	140	120	110	130	110	100
	8	3	140	120	110	110	90	85
	12	2	110	90	85	90	DR	DR

For SI: 1 inch = 25.4 mm; 1 mph = 1.609 km/h

DR = design required

- Maximum wind speed values are based on a minimum 1-1/4 inch (31.8 mm) penetration of a smooth shank nail fastener into wood framing of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS.
- Tabulated maximum wind speed values are based on a mean roof height of 30 feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).
- Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths to provide a minimum 1-1/4 inch (31.8 mm) penetration into wood framing. Specified nails in accordance with Section R703.4 or the siding manufacturer's installation instructions shall meet all other requirements in ASTM F1667 or be otherwise approved for the intended application.
- 'Nail spacing along stud' refers to spacing of siding fasteners in the vertical direction. A minimum of one fastener shall be applied at each intersection of an individual siding member with a wall stud.
- Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing and a maximum siding dead load of 11 psf (0.53 kPa) based on 7/8-inch (22 mm) thick Portland cement plaster. For Seismic Design Category D2, the maximum siding dead load shall be 8 psf.

**TABLE R703.3.2.1
SIDING MINIMUM FASTENING REQUIREMENTS
FOR DIRECT SIDING ATTACHMENT OVER FOAM PLASTIC SHEATHING
TO SUPPORT SIDING WEIGHT¹**

Siding Fastener Through Foam Sheathing into:	Siding Fastener Type and Minimum Size ²	Siding Fastener Vertical Spacing (inches)	Maximum Foam Sheathing Thickness (inches)					
			16"oc Fastener Horizontal Spacing			24"oc Fastener Horizontal Spacing		
			Siding Weight:			Siding Weight:		
			3 psf	11 psf	25 psf	3 psf	11 psf	25 psf
Wood Framing (minimum 1-1/4 inch penetration)	0.113" diameter nail	6	4	3	1	4	2	0.75
		8	4	2	0.75	4	1.5	DR
		12	4	1.5	DR	3	0.75	DR
	0.120" diameter nail	6	4	3	1.5	4	2	0.75
		8	4	2	1	4	1.5	0.5
		12	4	1.5	0.5	3	1	DR
	0.131" diameter nail	6	4	4	1.5	4	3	1
		8	4	3	1	4	2	0.75
		12	4	2	0.75	4	1	DR
Steel Framing (minimum penetration of steel thickness + 3 threads)	#8 screw into 33 mil steel or thicker	6	3	3	1.5	3	2	DR
		8	3	2	0.5	3	1.5	DR
		12	3	1.5	DR	3	0.75	DR
	#10 screw into 33 mil steel	6	4	3	2	4	3	0.5
		8	4	3	1	4	2	DR
		12	4	2	DR	3	1	DR
	#10 screw into 43 mil steel or thicker	6	4	4	3	4	4	2
		8	4	4	2	4	3	1.5
		12	4	3	1.5	4	3	DR

For SI: 1 inch = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa.

DR = design required

- Tabulated requirements are based on wood framing of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS and minimum 33 ksi steel for 33mil and 43 mil steel and 50 ksi steel for 54 mil steel or thicker.
- Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths. Self-drilling tapping screw fasteners for connection of siding to steel framing shall comply with the requirements of AISI S230. Specified fasteners in accordance with Section R703.4 or the siding manufacturer's approved installation instructions shall meet all other requirements in ASTM F1667, AISI S230 or be otherwise approved for the intended application.

R703.3.2.2 Offset siding attachment. When an airspace separates the siding from direct contact with the foam plastic sheathing, the siding shall be attached in accordance with Section R703.4 and Table R703.4 to minimum 1x3 wood or minimum 33 mil steel hat channel furring strips placed over the foam sheathing. Furring shall be attached through the foam sheathing to wall framing in accordance with Table R703.3.2.2 in regard to minimum fastening requirements and maximum foam sheathing thickness limitations to support siding dead load. The components and cladding design wind pressure determined in accordance with Table R301.2(2) shall not exceed the allowable design wind pressure value in accordance with Table R703.3.2.2. For 25 psf siding weight in accordance with Table R703.3.2.2, the Seismic Design Category shall not exceed D₀ for 16"oc furring

2010 ICC FINAL ACTION AGENDA

or C for 24"oc furring. When placed horizontally, wood furring strips shall be preservative treated wood or naturally durable wood and fasteners shall be corrosion resistant in accordance with Section R317. Steel hat channel furring shall have a minimum G60 galvanized coating.

Exception: Furring strips shall not be required over foam plastic sheathing located behind anchored stone and masonry veneer installed in accordance with Section R703.7. Veneer ties shall be installed in accordance with Section R703.7.4.1.

TABLE R703.3.2.2
FASTENING REQUIREMENTS FOR WOOD FURRING
OVER FOAM PLASTIC SHEATHING^{1,2,3}

Fastener Type	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring (inches)	Maximum Thickness of Foam Sheathing ⁵ (inches)	16"oc FURRING			24"oc FURRING		
				Maximum Wind Speed (mph)			Maximum Wind Speed (mph)		
				Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.120" diameter smooth shank nail	1-1/4	8	2	130	110	100	110	90	85
		12	1.5	140	90	85	90	DR	DR
		16	1	90	DR	DR	DR	DR	DR
0.135" diameter smooth shank nail	1-1/4	8	3	130	110	100	110	90	85
		12	2	140	90	85	90	DR	DR
		16	1.5	100	85	DR	DR	DR	DR
#8 wood screw	4	12	3	140	120	110	140	120	110
		16	2	140	120	110	140	120	110
1/4" lag screw ⁶	1-1/2	24	3	140	120	110	140	120	110

For SI: 1" = 25.4 mm; 1 mph = 1.609 km/h

DR = design required

- Furring strips shall be spaced a maximum of 24"oc in a vertical or horizontal orientation. Table values are based on minimum 3/4-inch (19.1 mm) thick furring strip and wood studs of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater per AF&PA/NDS.
- Tabulated maximum wind speed values are based on a mean roof height of 30 feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).
- Where minimum required siding fastener penetration exceeds 3/4 inch (19.1 mm), a minimum 2x furring strip shall be used unless approved deformed shank siding nails or siding screws are used to provide equivalent withdrawal strength.
- In a vertical orientation, furring strips shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, furring strips shall be fastened at each stud intersection with a number of fasteners equivalent to the required fastener spacing. In no case shall fasteners be spaced more than 24 inches (0.6 m) apart.
- Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing and a maximum siding dead load of 11 psf (0.53 kPa) based on 7/8-inch (22 mm) thick Portland cement plaster. For Seismic Design Category D2, the maximum siding dead load shall be 8 psf.
- Lag screws shall be installed with a standard cut washer and shall be pre-drilled in accordance with AF&PA NDS-05. Approved self-drilling screws of equal or greater shear and withdrawal strength shall be permitted without pre-drilling.

TABLE R703.3.2.2
FURRING MINIMUM FASTENING REQUIREMENTS
FOR APPLICATION OVER FOAM PLASTIC SHEATHING
TO SUPPORT SIDING WEIGHT^{1,2}

Furring Material	Framing Member	Fastener Type and Minimum Size	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring (inches)	Maximum Thickness of Foam Sheathing (inches)						Allowable Design Wind Pressure (psf)	
					16"oc Furring ⁴			24"oc Furring ⁴				
					Siding Weight:			Siding Weight:				
					3 psf	11 psf	25 psf	3 psf	11 psf	25 psf	16"oc Furring	24"oc Furring
Minimum 1x Wood Furring ³	Minimum 2x Wood Stud	Nail (0.120" shank; 0.271" head)	1-1/4	8	4	4	1.5	4	2	1	42.6	28.4
				12	4	2	1	4	1.5	0.5	28.4	18.9
				16	4	2	0.5	4	1	DR	21.3	14.2
		Nail (0.131" shank; 0.281" head)	1-1/4	8	4	4	2	4	3	1	46.5	31.0
				12	4	3	1	4	2	0.75	31.0	20.7
				16	4	2	0.75	4	1.5	DR	23.3	15.5
		#8 wood screw ⁵	1	12	4	4	1.5	4	3	1	98.9	66.0
				16	4	3	1	4	2	0.5	74.2	49.5
				24	4	2	0.5	4	1	DR	35.1	23.4
		¼" lag screw ⁵	1-1/2	12	4	4	3	4	4	1.5	140.4	93.6
				16	4	4	2	4	3	1	79.0	52.7
				24	4	3	1	4	2	0.5	35.1	23.4
Minimum 33mil Steel Hat Channel	33 mil Steel Stud	#8 screw (0.285" head)	Steel thickness +3 threads	12	3	1.5	DR	3	0.5	DR	52.9	35.3
				16	3	1	DR	2	DR	DR	39.7	26.5
				24	2	DR	DR	2	DR	DR	26.5	17.6
		#10 screw	Steel	12	4	2	DR	4	1	DR	62.9	41.9

or Minimum 1x Wood Furring ⁵	43 mil or thicker Steel Stud	(0.333" head)	thickness +3 threads	16	4	1.5	DR	3	DR	DR	47.1	31.4	
				24	3	DR	DR	2	DR	DR	31.4	21.0	
		#8 screw (0.285" head)	Steel thickness +3 threads	12	3	1.5	DR	3	0.5	DR	69.0	46.0	
				16	3	1	DR	2	DR	DR	51.8	34.5	
				24	2	DR	DR	2	DR	DR	34.5	23.0	
		#10 screw (0.333" head)	Steel thickness +3 threads	12	4	3	1.5	4	3	DR	81.9	54.6	
				16	4	3	0.5	4	2	DR	61.5	41.0	
				24	4	2	DR	4	0.5	DR	35.1	23.4	

For SI: 1" = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa. DR = design required

1. Table values are based on: (1) minimum ¾-inch (19.1 mm) thick wood furring and wood studs of Spruce-Pine-Fir or any softwood species with a specific gravity of 0.42 or greater per AFPA/NDS, (2) minimum 33 mil steel hat channel furring of 33 ksi steel, and (3) steel framing of indicated nominal steel thickness and minimum 33 ksi steel for 33mil and 43 mil steel and 50 ksi steel for 54 mil steel or thicker. Steel hat channel shall have a minimum 7/8-inch (22.2 mm) depth.
2. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths. Self-drilling tapping screw fasteners for connection of siding to steel framing shall comply with the requirements of AISI S230. Specified fasteners in accordance with Section R703.4 or the siding manufacturer's approved installation instructions shall meet all other requirements in ASTM F1667 or AISI S230 or be otherwise approved for the intended application.
3. Where the required siding fastener penetration into wood material exceeds ¾ inch (19.1 mm) and is not more than 1-1/2 inches (38.1 mm), a minimum 2x wood furring shall be used unless approved deformed shank siding nails or siding screws are used to provide equivalent withdrawal strength allowing connection to 1x wood furring.
4. Furring shall be spaced a maximum of 24"oc in a vertical or horizontal orientation. In a vertical orientation, furring shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, furring strips shall be fastened at each stud intersection with a number of fasteners equivalent to the required fastener spacing. In no case shall fasteners be spaced more than 24 inches (0.6 m) apart.
5. Lag screws shall be installed with a standard cut washer. Lag screws and wood screws shall be pre-drilled in accordance with AF&PA/NDS. Approved self-drilling screws of equal or greater shear and withdrawal strength shall be permitted without pre-drilling.

(Portion of proposal not shown, remain unchanged.)

Commenter's Reason: While the original proposal was approved as submitted, IRC CDC recommended further refinements at Final Action. Every effort has been made to follow-up with the various interests and to respond with improvements to the original proposal, even though approved as submitted. The improvements in this PC are also coordinated with a complimentary PC on FS156-09/10 Part1 (IBC). These refinements are coordinated in this one PC for reasons addressed separately as follows:

Inclusion of Steel Framing

Tables R703.2.1 and R703.2.2 now include siding connections for use with light-frame cold-formed steel siding in addition to light-frame wood as requested at the first hearing. These are needed to provide siding connection solutions applicable to light-frame cold-formed steel construction to ensure coordination with IRC Ch11 and IECC energy code requirements for this type of construction. The Steel Framing Alliance (SFA), American Iron and Steel Institute (AISI), and the Foam Sheathing Coalition (FSC) have worked together toward this end.

The original proposal included connection solutions for attachment of siding over foam sheathing only for wood framing. But, the scope of the original proposal was not otherwise limited to wood framing (i.e., requirements in Table 1405.18.1 of the original proposal are applicable to both wood and steel framing). The IRC committee approved the original FS156-09/10 proposal, but also expressed concern to "work with industry and bring the needed improvement back to the Final Action."

Steel framing was not addressed in the original proposal only because test data was not available at that time to justify appropriate solutions. Subsequently, the steel industry together with New York State Research and Energy Development Authority (NYSERDA) has conducted a testing program to provide justification to the solutions proposed in this PC. A report on this testing will be made available at the Final Action hearing and, as soon as available, by request to the proponent (Mark Nowak, SFA, mnowak@steelframing.org). These tests provide the necessary performance data for appropriately designing siding connections to steel framing that span through a thickness of foam sheathing.

These proposed provisions for light-frame cold-formed steel construction are not only coordinated with ICC energy code requirements, but they are necessary to ensure that foam insulation requirements as required by the ICC energy code are implemented in a structurally sound manner. Support of this PC is urged.

Inclusion of Additional Siding Weight Categories:

The original proposal was based on a minimum 11 psf siding dead load (for siding attachment requirements over foam sheathing). While various siding manufacturers supported the original proposal (or remained neutral), several expressed the desire to be included, such as the Masonry Veneer Manufacturers Association. Thus, a 25 psf siding weight category and connection requirements have been included in this PC. This also required inclusion of a 3 psf siding weight category such that the lighter weight sidings would not be unduly penalized by basing the table only on heavier siding types.

Simplification, Clarification and Editorial Improvements:

Content from table footnotes moved into tables for visual clarity and ease of access.

Removed confusing wind speed requirements from siding attachment table otherwise intending to provide minimum connections for support of siding dead load only and limit foam thickness accordingly. The text is clarified to more explicitly require that the siding attachment be separately designed to resist wind loads.

Adjusted fastener sizes to be compatible with pneumatic fasteners at request of ISANTA

Various editorial improvements to language, table headings, etc.

Additional technical justification for siding and furring connections over foam sheathing

The FSC has also funded additional testing of siding over foam sheathing connection assemblies for attachments to wood framing. These tests add further confirmation of the adequacy of the proposed siding attachment requirements for wood framing. It also confirms that siding deflections

will be limited to less than 0.015" as commonly used as a design basis for wood connections. A report documenting this testing will also be made available at the final action hearing and will be posted at www.foamsheathing.org as soon as available.

Strengthened QC requirements for foam sheathing wind pressure resistance properties

One of the concerns raised at the first code development hearing on FS156 was related to having assurance that foam sheathing products meet the wind pressure performance requirements upon which the proposal (namely Table R703.3.1) is based. This public comment addresses that concern by clarifying implementation a code-recognized "approved agency" approach that already exists and is commonly used for foam sheathing and other products. The "approved agency" process has shown itself effective and this public comment merely clarifies the application of this process to assure the structural properties (wind pressure resistance) of foam sheathing align with the basis of the proposed end-use requirements and limitations. The minimum performance requirements are based on a representative sample of currently manufactured products of each type as reported by the NAHB Research Center, Inc. (report available at www.foamsheathing.org).

Strengthened Scope Limitations on Foam Sheathing Applications

At the request of the insurance industry, a 110 mph wind speed limit has also been implemented in this proposal for foam sheathing. In addition, wind pressure requirements have been strengthened to require use of negative pressure values in all cases, even when siding is placed over foam sheathing and the siding is separately capable of resisting the full negative design wind pressure.

These provisions are needed for the above reasons, provide improvements for appropriate use of foam sheathing, and provide needed solutions for coordination with the energy code requirements. Again, your approval as modified is urged.

Public Comment 2:

Kimdolyn Boone representing DuPont Building Innovations, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

R703.5.1 Application. Wood shakes or shingles shall be applied either single-course or double-course over nominal 1/2-inch (13 mm) wood-based sheathing or to furring strips over nominal 1/2-inch (13 mm) nonwood sheathing.

Exception: Wood shakes or shingles over foam plastic sheathing, shall be applied to wood furring strips in accordance with Section R703.3.2.2.

A permeable water-resistive barrier shall be provided in accordance with Section R703.2. Where furring strips are used, they shall be 1 inch by 3 inches or 1 inch by 4 inches (25mm by 76 mm or 25mm by 102 mm), and shall be fastened horizontally to the studs with 7d or 8d box nails. For application over foam plastic sheathing, furring strips shall be fastened in accordance with Section R703.3.2.2. and Furring strips shall be spaced a distance on center equal to the actual weather exposure of the shakes or shingles, not to exceed the maximum exposure specified in Table R703.5.2. The spacing between adjacent shingles to allow for expansion shall not exceed 1/4 inch (6 mm), and between adjacent shakes, it shall not exceed 1/2 inch (13 mm). The offset spacing between joints in adjacent courses shall be a minimum of 1 1/2 inches (38 mm).

(Portions of proposal not shown, remain unchanged.)

Commenter's Reason: The purpose of this public comment is to re-insert the word "permeable" which is already in the 2009 code and was removed by the original proposal.

In the technical hearings the committee approved this proposal but also noted that the proposal requires work. This public comment addresses one of the flaws with the original proposal. We look forward to combining this public comment with other public comments from the industry that address other flaws.

It is not appropriate to remove the descriptor "permeable". The removal of the word "permeable" changes the water-resistive barrier requirement because the "permeable" designation is specific to shingle/shake cladding and is not included in Section 703.2. Reducing the water-resistive barrier permeability may result in the reduction in the wall structure's ability to dry and thus be detrimental to building performance. The proponent provided no information to support the removal of the word "permeable".

This proponent also proposed or supported modifications to remove "permeable" from other agenda items (FS150 part 1 and RB134) at the technical hearings. All of these modifications/proposals were disapproved by the technical committee. As stated in the Report of Hearings, the FS156 proposal listed in the monograph did not strike this word; it was stricken in the errata (which was not published to the ICC website). The permeability requirement was not a topic of discussion in the public hearing on this item.

Public Comment 3:

John Ingargiola, Federal Emergency Management Agency, requests Disapproval.

FEMA is opposed to requirements for foam plastic sheathing in exterior wall coverings as shown in code change proposal FS156. A number of technical concerns were expressed by FEMA at the Baltimore hearings and these concerns and others are summarized herein. In many cases, recommendations are provided to the proponent of FS156 so that FEMA concerns can be addressed and a revised proposal can be supported. The following are among concerns with requirements of FS156:

- A) Wall sheathing applications under FS156 extend far beyond results from tests raising questions over safe application of the requirements. For siding applied directly over foam plastic sheathing, several installation details are used in the tests which are not included as construction requirements or limitations for use of foam sheathing. These include the following: (i) foam sheathing attached to all framing at 12" on center with 7/16" head x 0.120" shank diameter galvanized roofing nails, (ii) all foam sheathing edges backed with and nailed to framing, and (iii) no adjoining foam sheathing panel edge joints over a common stud. Also, FS156 broadly permits use of foam sheathing in thicknesses greater than 1-1/2" yet the maximum thickness tested in negative pressure assembly tests was 1/2". Additional product testing is recommended to ensure that failure mechanisms are properly addressed for each product based on code required construction methods.

- B) Table R703.3.2.1 Fastening Requirements for Direct Siding Attachment Over Foam Plastic Sheathing does not identify fastener head size for use to attach siding. Negative pressure tests utilized siding nails with 3/8" diameter head; however, a smaller head size is permitted to be used per other requirements of the code. Therefore, the strength of the overall system based on tests may be in excess of strength for actual applications where smaller head sizes are permitted.
- C) The Factor of Safety of 1.5 used to adjust test pressures to allowable pressures is too small relative to that provided by structural sheathing. The factor of safety of 1.5 for vinyl siding wind ratings has previously been identified as an area of concern in a FEMA Mitigation Assessment Team Report (Hurricane Ike) due to observed failures of siding. An increased safety factor for applications where the foam sheathing and siding are assumed to act as a composite structural element to resist wind is needed to ensure the integrity of the building envelop and to protect against a "through wall" wind pressure failure of the building envelope should either the siding or foam sheathing fail. In some cases, interior gypsum wallboard failure may precipitate a "through wall" failure given the system approach used to establish vinyl siding and foam sheathing requirements in the IRC (e.g. interior gypsum wallboard considered to resist a portion of wind pressures). A safety factor of 3 is commonly associated with structural wall sheathing applications based on the average factor of safety for nail withdrawal. If a safety factor of 3 were to be used rather than 1.5, tabulated wind speeds for many of the products would be reduced by approximately 30%.
- D) There is no assurance that the structural properties of the foam sheathing used in the tests, which are necessary to ensure resistance to wind pressures, are representative of structural characteristics of foam sheathing permitted under FS156. FS156 broadly permits applications for foam sheathing including those with and without proprietary "facers" that contribute to the strength of the product. It is recommended that a mechanism for "fingerprinting" structural characteristics of foam sheathing products used in wind resistance tests be established and monitored as part of a product standard to ensure wind resistance performance is maintained in wall sheathing applications. These characteristics include bending capacity, bending stiffness, and nail head pull through.
- E) The testing and analysis does not represent the effect of fluctuating positive and negative pressures expected in real wind events. The allowable pressure rating of 1-1/2" EPS foam sheathing (e.g. 89 psf or wind speed of 222 mph) appears high relative to wood structural panel products used in wall sheathing applications. For example 19/32" wood structural panel has an allowable pressure capacity of 90 psf in accordance with the *Special Design Provisions for Wind and Seismic* (SDPWS). The similarity in allowable pressure ratings is due in part to differences in safety levels, differences in test methods, and differences in analysis methods between foam sheathing and commonly used structural products for wall sheathing applications.

Public Comment 4:

Edward L. Keith, PE, representing APA – The Engineered Wood Association, requests Disapproval.

Request that the body overturn the committee's recommendation for approval as submitted and disapprove the code change proposal.

The intent of the original code change proposal is to prescriptively permit the use of non-structural foam insulation as a structural wall sheathing for all wall locations that are not required as wall bracing. This proposal would permit the use of non-structural foam sheathing in areas with a design wind speed of 130 mph. This proposal is seriously flawed by ignoring the life-safety consideration mandated by the IRC, not to mention the increased risk for property damage.

Provisions of Section R301.2.1, reproduced below, clearly require the wall sheathing to be designed for the loads normal to the wall surface (important provisions are underlined for clarity).

R301.2.1 Wind limitations. *Buildings and portions thereof shall be limited by wind speed, as defined in Table R301.2(1) and construction methods in accordance with this code. Basic wind speeds shall be determined from Figure R301.2(4). Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section for each portion shall apply. Where loads for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors are not otherwise specified, the loads listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) shall be used to determine design load performance requirements for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors...*

This proposal takes the advantage of a loop hole in the IRC found in Section R301.1: The loop hole permits prescriptive portions to be deemed-to-comply with the intent of the code, as seen below:

R301.1 Applications. *...Buildings and structures constructed as prescribed by this code are deemed to comply with the requirements of this section.*

The intent of this provision is to permit methods with a proven history of adequate performance not to be required to meet the engineering requirements of the code. It is disingenuous to use these provisions to permit systems with known performance issues to be exempt from the structural requirements of the code.

Thunderstorms in the Midwest (Evansville, Indiana and Southwest Missouri, areas of nominal 85 mph wind speed) have left countless houses stripped of siding and foam wall sheathing. In most cases the actual wind loads were well below the maximum design wind speed. In some cases only the wall sections containing the wall bracing panels were left to protect the interior of the home (see photos below). Additional photos are available in the Spring and Summer issues of the 2008 Wood Design Focus.



Figure 1. – Foam and vinyl wall covering failure.
(Storm damage – Southern IN, 2005)



Figure 2 – Foam and vinyl wall covering failure while wall bracing panel remains.
(Storm damage, Springfield, MO, 2006)

Please note that the legacy codes, the ICC, as well as their corresponding product evaluation organizations have long required all structural products to meet all of the below 3 requirements:

1. They must be manufactured to proprietary or consensus based structural standards. These standards describe the minimum physical properties, testing criteria, and durability requirements that must be met by the material for its intended end use.
2. An established quality control program must be in place and supported by the manufacturer to insure that the minimum standards are being met by the production facility.
3. An approved third-party quality assurance inspection agency must be under contract to monitor the manufacturer's QC program and issue trademark stamps.

These requirements are designed to protect the public from unsafe construction. While foam insulation boards are manufactured to insulation standards, these products meet none of the structural requirements specified for all other structural products. Unlike wood structural panels or structural fiberboard sheathing, foam insulation is not manufactured to consensus-based structural product manufacturing standards. As such, the structural performance of foam sheathing is undefined and uncontrolled. Furthermore, the quality control and quality assurance programs adopted by the foam sheathing manufacturers are limited to the control of insulation characteristics of the products, but not the structural performance. The use of non-structural sheathing for structural applications is a serious life-safety issue.

Sections R612.5 and R612.6 require the same level of protection for windows and doors as is required for wood structural panels and structural fiberboard products:

R612.5 Performance. Exterior windows and doors shall be designed to resist the design wind loads specified in Table R301.2(2) adjusted for height and exposure per Table R301.2(3).

R612.6 Testing and labeling. Exterior windows and sliding doors shall be tested by an approved independent laboratory, and bear a label identifying manufacturer, performance characteristics and approved inspection agency to indicate compliance with AMA/WDMA/CSA 101/I.S.2/A440...

It is interesting to note that these requirements for windows and doors will be maintained in place while the walls are prescriptively permitted to be protected only by non-structural foam insulation that has none of the historic manufacturing safeguards in place. We used to hope that our windows and doors were as strong as our walls in a storm; this proposal effectively reverses this expectation!

We urge overturning of the committee due to the serious flaw of the proposal in ignoring the important life-safety issue.

Public Comment 5:

Dennis Pitts representing American Wood Council, American Forest & Paper Association, requests Disapproval.

While some limited testing of rigid foam sheathing has been conducted, these products are not structural materials. Structural properties and requirements have not been quantified, quality control requirements to have not been specified, and product labeling to ensure proper selection and structural performance do not exist. To date, these products rely on the contribution of other construction elements to resist racking and out-of-plane loads. At the IBC Structural Committee hearings during discussion of FS156 Part I, a number of issues of concern were identified by various groups and the proponent of Part I asked for it to be denied. These same issues were raised at the IRC Committee hearings during the discussion of Part II, but the proponent chose to ignore them, as did a majority of the IRC Committee members. In review, the following points were made:

1. The various foam sheathing insulation board products on the market are proprietary products manufactured and qualified under various material specifications; Expanded Polystyrene (EPS) – ASTM C578 (Type II), Polyisocyanurate – ASTM C1289 (Type 1), and Extruded Polystyrene (XPS) – ASTM C578 (Type X). These material specifications ensure that the product meets minimum density, thermal, and consistency requirements; however, these material specifications are not product standards and do not reference testing or state structural requirements needed to determine and regulate these products in structural applications.
2. Testing provided by the Foam Sheathing Coalition in support of this change and verified by others suggests that a significant portion of the out-of-plane bending capacity of the foam sheathing board results from the proprietary facers that are applied to the insulation. These facers are neither identified nor required. Since there are no product standards to regulate these products, the manufacturer can use any facer material to qualify the board but use anything else or leave the facer off completely if so chosen. As a result, any claims as to the capacity of any specific product would be limited to a single manufacturer and, potentially, to a single run of the product.
3. Fastener requirements outlined in the proposal are unreasonable. For example, Table 1405.18.2.1 recommends the use of a 0.120" nail, penetrating at least 1.25" into the wood framing, to attach 3" thick foam sheathing. This would require a nail that is at least 4.25" long to be driven through the foam and hit the 1.5" thick framing member... nearly 50% longer than the standard length of this size nail. In addition, without high-strength proprietary nails, a nail of this length would likely bend or buckle before penetrating the wood member... but without detection because it would buckle within the 3" foam.
4. Installation provisions, verified by limited negative load (suction) testing, require that the exterior covering, such as vinyl siding, be used to hold the foam sheathing on to the exterior wall. In this application, the exterior covering becomes the "structural element" of the building envelope. Efforts have been made to show that the exterior covering and foam sheathing act as a system to resist the wind loads; however, the suitability of this design approach is questionable because the survival of the entire wall envelope is dependant on the exterior covering (e.g. vinyl siding). Dynamic loading effects caused by wind turbulence are ignored in the proposed change. Fluctuating positive and negative pressures will play a greater role in the loss of flexible coverings than negative pressures alone as utilized in testing.

Based on these concerns, we strongly recommend that the ICC membership reconsider the IRC Committee's recommendation and follow the IBC Structural Committee's recommendation and deny this change. Until such time as a product standard for these products is developed that addresses structural requirements, product changes, proprietary facers, structural quality control, and product labeling, these products should continue to be reviewed and evaluated by one of the Evaluation Services as an alternative material and used as an alternative means of meeting the requirements of the code.

Final Action: AS AM AMPC_____ D

FS166-09/10

2603.4.1.5, 2603.6

Proposed Change as Submitted

Proponent: Tony Crimi, AC Consulting Solutions Inc., representing North American Insulation Manufacturers Association

Revise as follows:

2603.4.1.5 Roofing. Foam plastic insulation under a roof assembly or roof covering having a smoke-developed index of not more than 450, and that is installed in accordance with the code and the manufacturer's instructions shall be separated from the interior of the building by wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints or other approved type of edge support, or an equivalent material. A thermal barrier is not required for foam plastic insulation that is a

part of a Class A,B or C roof-covering assembly, provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256.

2603.6 Roofing. Foam plastic insulation meeting the requirements of Sections 2603.2, 2603.3 and 2603.4 and having a smoke-developed index of not more than 450, shall be permitted as part of a roof-covering assembly, provided the assembly with the foam plastic insulation is a Class A, B or C roofing assembly where tested in accordance with ASTM E 108 or UL 790.

Reason: Fires in roofing materials can occur during installation or maintenance of roofing, during the normal course of operations, or during maintenance and installation of building equipment. While ASTM E108 and UL 790 are a means of evaluating fire spread, they do not measure smoke production.

Although roofing materials are installed on the exterior of a building, the smoke from burning roof insulations can be a hazard to both firefighters and the environment. Combustible smoke and off-gassing from combustible insulating materials pose a serious risk to building occupants and firefighters. Excessive quantities of smoke emanating from burning roofing materials also prevent effective firefighting operations, potentially delay response times or the effectiveness of fire fighting operations. There are also documented cases of fires starting in roofing materials causing sprinklers inside the building to activate and cause additional property damage.

Even when a fire is contained within the building, sufficient heat can be generated through a metal roof deck to cause smoldering combustion and smoke release. While a smoke developed index of 450 is consistent with some interior applications, it still represents a limit which most foam plastic insulations can conform with.

Several foam plastic insulation products have direct-to-steel-deck approvals from both FM and UL. FM approval for Class 1 roof systems based on passing FM 4450 and UL 1256. Both of these tests are specifically referenced in the IBC. The International Building Code (IBC) already waives the requirements for a thermal barrier for foam plastic roof insulation used in roof deck construction that complies with FM 4450 or UL 1256. Some minimum smoke developed rating should be maintained.

Cost Impact: This proposal should not increase the cost of construction.

ICCFILENAME: CRIMI FS9 AND FS10

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that Section 2603.3 already has this requirement and therefore this proposal is redundant.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Tony Crimi, AC Consulting Solutions Inc, representing North American Insulation Manufacturers' Association (NAIMA), requests Approval as Submitted.

Commenter's Reason: Fires in roofing materials can occur during installation or maintenance of roofing, during the normal course of operations, or during maintenance and installation of building equipment. While ASTM E108 and UL 790 are a means of evaluating fire spread, they do not measure smoke production. In this case, contrary to the published committee reason, smoke development ratings for roofing insulations and coverings are clearly exempted in 2603.3 Exception #3, and in 2603.6.

Although roofing materials are installed on the exterior of a building, the smoke from burning roof insulations can be a hazard to both firefighters and the environment. Air intakes are often installed through the roofing. In the event of a fire on the roof, smoke will be drawn back into the building through these intakes. Similarly, occupants of adjacent buildings and neighborhoods can also be affected by smoke emanating from combustible roof insulations. Emissions from fires in roofing materials have a serious impact on the environment. Not only are the combustion gases toxic at the site of the fire, but during a fire, very large quantities of particulates are also released into the environment. The particles consist among others of soot, tar, unburned materials, and inorganic debris.

In addition to the reasons include with the original Proposal, it should also be acknowledged that rooftop Occupancies are becoming increasingly popular. The existing provisions for rooftop structures in Chapter 15 are largely prescriptive and do not envision facilities such as restaurant seating, gardens, or performances on rooftops.

Final Action: AS AM AMPC_____ D

FS167-09/10

2603.4.1.5, 2603.4.1.5.1, 2603.4.1.5.2

Proposed Change as Submitted

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI), representing the Single Ply Roofing Industry (SPRI)

Revise as follows:

2603.4.1.5 Roofing. Foam plastic insulation under a roof assembly or roof covering shall comply with Sections 2603.4.1.5.1 and 2603.4.1.5.2 as applicable.

2603.4.1.5.1 Wood roof decks. A thermal barrier is not required for foam plastic insulation that is part of a Class A, B or C roof-covering assembly, ~~provided the assembly under a roof assembly or roof covering that~~ is installed in accordance with the code and the manufacturer's instructions ~~and is shall be~~ separated from the interior of the building by wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints or other approved type of edge support, or an equivalent material.

2603.4.1.5.2 Any roof deck. A thermal barrier is not required for foam plastic insulation that is part of a Class A, B or C roof-covering assembly, provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256.

Reason: The proposed wording is offered to clarify when the two exceptions for a thermal barrier in Section 2603.4.1.5 are applicable. The first sentence in the current version 2603.4.1.5 is only applicable when a wood roof deck is used. The second sentence is applicable for any type of roof deck. The proposed wording provides clarification without changing the intent.

Cost Impact: The code change proposal will not increase the cost of construction

ICCFILENAME: ENNIS-FS2-2603.4.1.5

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that the current language was clearer than the proposal.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Mike Ennis, representing Single Ply Roofing Industry (SPRI), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

2603.4.1.5 Roofing. A thermal barrier is not required for foam plastic insulation under a roof assembly or roof covering if either of the following conditions are met: shall comply with Sections 2603.4.1.5.1 and 2603.4.1.5.2 as applicable.

2603.4.1.5.1 Wood roof decks. 1. A thermal barrier is not required for foam plastic insulation that is part of a Class A, B or C roof-covering assembly, provided the assembly is installed in accordance with the code and the manufacturer's instructions and is separated from the interior of the building by wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints or other approved type of edge support, or an equivalent material.

2603.4.1.5.2 Any roof deck. 2. A thermal barrier is not required for foam plastic insulation that is part of a Class A, B or C roof-covering assembly, provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256.

Commenter's Reason: The original code change proposal was submitted to provide clarification to the thermal barrier exception language for roofing contained in Section 2603.4.1.5 Roofing. This section provides two separate conditions for which the thermal barrier is not required. The first is a construction option. Roof decks constructed with minimum 0.47" thick structural wood panel sheathing, with edges supported by blocking,

tongue and groove joints or other approved types of edge support do not require a thermal barrier. The second option offered in this Section is a testing option. If the roof assembly has passed UL1256 or FM4450, then a thermal barrier is not required. In the current Section 2603.4.1.5 these options are contained in the same paragraph and it is not clear that they are two separate options. During the code change hearings the Committee felt the proposed wording was more confusing than the current wording. This modification is offered to provide additional clarification.

Final Action: AS AM AMPC_____ D

FS180-09/10

2606.5, 2609.1.1 (New), 2610.1.1 (New)

Proposed Change as Submitted

Proponent: J. Nigel Ellis, representing Ellis Fall Safety Solutions, LLC

1. Revise as follows:

2606.5 Structural requirements. Light-transmitting plastic materials in their assembly shall be of adequate strength and durability to withstand the loads indicated in Chapter 16. Technical data shall be submitted to establish stresses, maximum unsupported spans and such other information for the various thicknesses and forms used as deemed necessary by the *building official*. Every skylight shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides. Skylight screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 lbs applied perpendicularly at any one area on the screen. They shall also be of such construction and mounting that under ordinary loads or impacts, they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork with openings not more than 4 inches long or of slatwork with openings not more than 2 inches wide with length unrestricted.

2. Add new text as follows:

2609.1 General. Light-transmitting plastic roof panels shall comply with this section and Section 2606. Light-transmitting plastic roof panels shall not be installed in Groups H, I-2 and I-3. In all other groups, light-transmitting plastic roof panels shall comply with any one of the following conditions:

1. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. The roof construction is not required to have a fire-resistance rating by Table 601.
3. The roof panels meet the requirements for roof coverings in accordance with Chapter 15.

2609.1.1 Guarding. Light-transmitting roof panels and assemblies shall be guarded as required by Section 2606.5.

3. Add new text as follows:

2610.1 Light-transmitting plastic glazing of skylight assemblies. Skylight assemblies glazed with light-transmitting plastic shall conform to the provisions of this section and Section 2606. Unit skylights glazed with light-transmitting plastic shall also comply with Section 2405.5.

Exception: Skylights in which the light-transmitting plastic conforms to the required roof-covering class in accordance with Section 1505.

2610.1.1 Guarding. Unit skylight assemblies shall be guarded as required by Section 2606.5.

Reason: The proposed wording is verbatim Federal OSHA standard from 1971 and needs to be reflected in the building code because Chapter 16 loading is inadequate for human falls onto skylights and skylight manufacturers are not the only users of the skylights they produce. In other words some building owners may not be employers who maintain the roof skylights and therefore need the protection from the manufacturers in each installation going forward with the inclusion or design integration of a necessary hazard control.

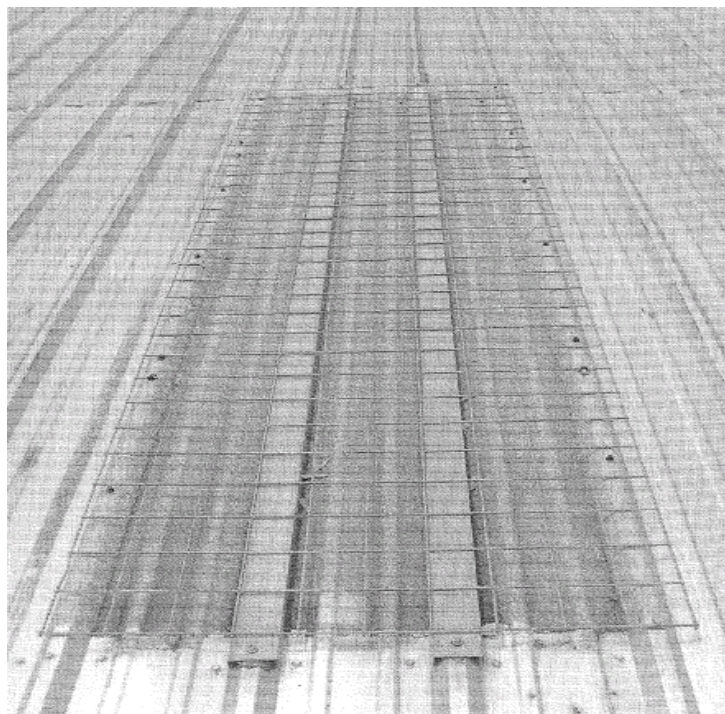
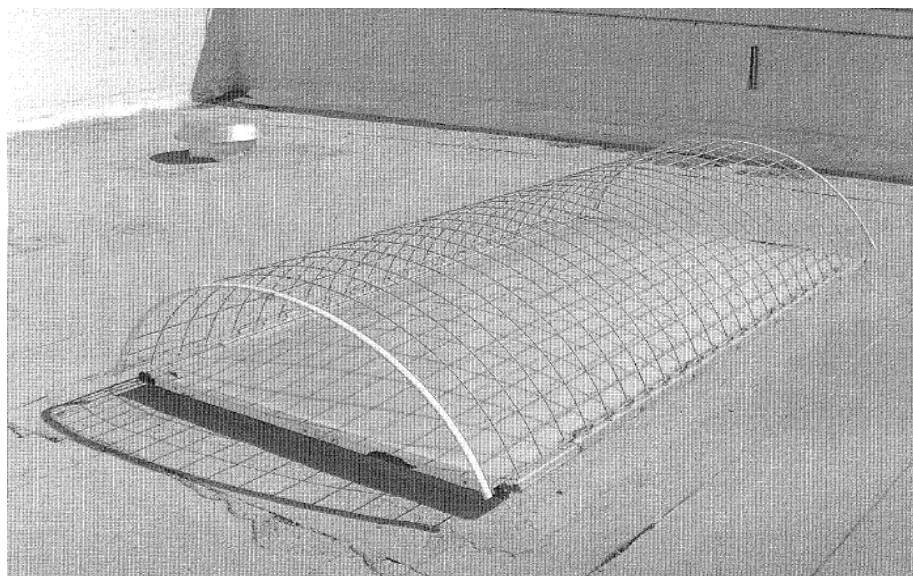
Fatalities from falls through skylights which category for inclusion includes light-transmitting panels and smoke vents are documented by the Bureau of Labor Statistics which in 2006 accounted for 36 deaths in non-government buildings in the USA www.bls.gov. Skylights have their own fatal fall category as opposed to roof or floor openings that also have their own listing. The Federal requirement for General Industry is 29CFR1910.23(a)(4) and (e)(8) which became mandatory in 1971 for employers.

There are also similar requirements in the 1926.500-503 Construction regulations that equate skylights with open holes and require the use of adequate covers. The ANSI A1264.1 and A10.18 are similarly worded but all are aimed ineffectively at employers with exposed employees but not exposed independent contractors who visit dozens of building roofs each month without a feasible protection method e.g. HVAC, Laborers, roofers, Window Cleaners etc.).

However after 38 years not even 1% of skylights have the required screen protection. Ref Plasteco President Key Sandow. Skylight manufacturers do not mark their skylights clearly in the same way that auto glazers do, so that manufacturers may never know their skylight ever failed to support a falling worker. Instead, the blame falls on the injured person for not knowing to stay away from or be careful around skylights. My experience is that workers do not know the degree of danger stepping close to skylights until it is too late nor do their employers.

Plastic skylights may survive impacts from falling or tripping by the trades (of which there may be 25 or more) when new but almost all suffer from uv light degradation over the years. An alternative that also takes care of controlling intruders is under-skylight grills especially for opening smoke vents and similar skylights and corrosive conditions and sometimes both to reduce fall distances to 4 ft or less per OSHA General Industry requirements. Skylights are maintained today by sealing leaks with silicone, fiberglass or equivalent and appear in "good" condition on maintenance company reports to the building owner if they do not presently leak despite the fact that they have cracks after a few years in the sun and are patched regularly. There is no common lifetime for plastic skylights that may now be 50+ years old and users do not currently replace a skylight unless a leak cannot be stemmed.

The request is to include the federal requirement in the IBC Building Code and carry the responsibility to architects, engineers and building owners and managers to protect the work trades that maintain the roof systems in those buildings by including adequate protection in specifications. No building owner expects that a skylight will have a disastrously weak strength that a worker can step onto and through as the years progress eventually almost as easily as pushing a finger through. The OSHA interpretation by John Miles in 1984 does not anticipate the degradation that occurs with almost all synthetic-related skylights nor the dynamic force of a slip, trip and/or fall by a passing worker. Use of personal fall arrest is a last resort but no system is legal without a 5,000 lbs anchorage point which is simply unavailable on a roof unless designed by a structural engineer and regularly recertified (OSHA 1926.500-503 and ANSI Z359-2007 The Fall Protection Code) and building owners do not contract or pay for 5000 lbs anchors in their roofs or confirm roof strengths with any contractors at this time (ref: 1926.501(a)(2) adequate surface strength requirements). Examples of skylight screens follow:



Public Hearing Results

This code change was heard by the IBC Structural Code Development Committee.

Committee Action:

Disapproved

Committee Reason: As worded, the proposal would require guards or screens at all skylights and that is considered unnecessary. The requirement should also apply to skylights that are not glass, yet the proposed text specifically refers to the glass below the guard. In addition the area of the screen over which the 200 pound force should be applied is not specified. A consensus test standard is being worked on currently that should resolve this.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

J. Niegel Ellis, Ellis Fall Safety Solutions LLC, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

2606.5 Structural requirements. Light-transmitting plastic materials in their assembly shall be of adequate strength and durability to withstand the loads indicated in Chapter 16. Technical data shall be submitted to establish stresses, maximum unsupported spans and such other information for the various thicknesses and forms used as deemed necessary by the *building official*. Every plastic unit skylight shall be guarded by a standard metal skylight screen ~~or a fixed standard railing on all exposed sides or equivalent~~. Skylights and their screens ~~or equivalent barriers~~ shall be of such construction and mounting that they are each capable of withstanding a load of at least 200 lbs falling 48 inches or of equivalent energy applied perpendicularly at any one area on the skylight or screen ~~that represents a falling body part~~. ~~They shall also be of such construction and mounting that under ordinary loads or impacts, they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork with openings not more than 4 inches long or of slatwork with openings not more than 2 inches wide with length unrestricted.~~

(Portions of proposal not shown remain unchanged.)

Commenter's Reason: The proposed wording is Federal OSHA standard from 1971 amended based on Committee recommendations at the ICC Baltimore meeting and should be reflected in the building code because Chapter

16 loading is inadequate for human falls onto skylights and skylight manufacturers are not the only users of the skylights they produce. In other words some building owners may not be employers who maintain the roof skylights and therefore need the protection from the manufacturers in each installation going forward with the inclusion or design integration of a necessary hazard control.

Fatalities from falls through skylights which category for inclusion includes light-transmitting panels and smoke vents are documented by the Bureau of Labor Statistics which in 2006 accounted for 36 deaths in non-government buildings in the USA www.bls.gov and 22 in 2007. Skylights have their own fatal fall category as opposed to roof or floor openings that also have their own listing. The Federal requirement for General Industry is 29CFR1910.23(a)(4) and (e)(8) which became mandatory in 1971 for employers. However hazard prevention is the goal that we seek.

There are also similar requirements in the 1926.500-503 Construction regulations that equate skylights with open holes and require the use of adequate covers. The ANSI A1264.1 and A10.18 are similarly worded but all are aimed ineffectively at employers with exposed employees but not exposed independent contractors who visit dozens of building roofs each month without a feasible protection method e.g. HVAC, Laborers, roofers, Window Cleaners etc.).

However after 38 years not even 1% of plastic skylights have the required screen protection. Ref: Plasteco President Key Sandow. Skylight manufacturers do not mark their skylights clearly in the same way that auto glazers do, so that manufacturers may never know their skylight ever failed to support a falling worker. Instead, the blame falls on the injured person for not knowing to stay away from or be careful around skylights. My experience is that workers do not know the degree of danger stepping close to skylights until it is too late nor do their employers.

Plastic skylights may survive impacts from falling or tripping by the trades (of which there may be 28 or more) when new but almost all suffer from progressive uv light degradation over a few years where even sitting and leaning against a skylight is often sufficient to cause breakage like an egg shell due to stress crack crazing. An alternative that also takes care of controlling intruders is under-skylight grills especially for opening smoke vents and similar skylights and corrosive conditions and sometimes both to reduce fall distances to 4 ft or less per OSHA General Industry requirements. Skylights are maintained t-day by sealing leaks with silicone, fiberglass or equivalent and appear in "good" condition on maintenance company reports to the building owner if they do not presently leak despite the fact that they have cracks after a few years in the sun and are patched regularly. There is no common lifetime for plastic skylights that may now be 50+ years old and users do not currently replace a skylight unless a leak cannot be stemmed.

The request is to include the amended federal requirement in the IBC Building Code and carry the responsibility to architects, engineers and building owners and managers to protect their work force and the work trades that maintain the roof systems in those buildings by including adequate protection in specifications. No building owner expects that a skylight will have a disastrously weak strength that a worker can step or trip onto and through as the years progress eventually almost as easily as pushing a finger through the light. The OSHA interpretation by John Miles in 1984 does not anticipate the degradation that occurs with almost all synthetic-related skylights nor the dynamic force of a slip, trip and/or fall by a passing worker. Use of personal fall arrest is a last resort but no such system is legal without a 5,000 lbs anchorage point which is simply unavailable on a roof unless designed by a structural engineer and regularly recertified (OSHA 1926.500-503 and ANSI Z359-2007 the Fall Protection Code) and building owners typically do not contract or pay for 5000 lbs anchors in their roofs or confirm roof strengths with any contractors at this time (ref: 1926.501(a)(2) for adequate surface strength requirements).

Note: Glazed skylight already must have screens under the glass under some circumstances; see IBC 2405.3, so the precedent is already set for much more stable and safe skylighting. Plastic skylights will always degrade and hence they and their screen or equivalent protection should be available to building users as soon as possible. The ASTM E06.51.25 standards committee is working to finalize the estimated size of body parts to give further testing guidance. Examples of skylight screens a. and b. follow:

a.



b. I cannot upload a. and b. so I will forward to Dave Bowman separately (same as previous two pictures from 09/10)



Cost Impact: a. Approx. \$400 including a 4'x8' domed skylight screen and installation with security screws/bolts (b. alt. 10'x3' approx. light transmitting panel screen)

Final Action: AS AM AMPC____ D

FS181-09/10 2610.2

Proposed Change as Submitted

Proponent: Ennis, representing the Single Ply Roofing Industry (SPRI))

Revise as follows:

2610.2 Mounting. The light-transmitting plastic shall be mounted above the plane of the roof on a curb constructed in accordance with the requirements for the type of construction classification, but at least 4 inches (102 mm) above the plane of the roof. ~~Edges of the light-transmitting plastic skylights or domes shall be protected by metal or other approved noncombustible material, or the~~ The light transmitting plastic dome or skylight shall be shown to be able to resist ignition where exposed at the edge to a flame from a Class B brand as described in ASTM E 108 or UL 790.

Exceptions:

1. Curbs shall not be required for skylights used on roofs having a minimum slope of three units vertical in 12 units horizontal (25-percent slope) in occupancies in Group R-3 and on buildings with a nonclassified roof covering.
2. ~~The metal or noncombustible edge material is not required where nonclassified roof coverings are permitted.~~

Reason: The flames of the Class B brand can extend above the noncombustible edge and contact the dome, allowing for the possibility of catching fire and test failure. ASTM E108 tests have been conducted on products with non-combustible edge material in which the flame extended beyond the noncombustible edge material and contacted the dome. This could result in ignition of the dome depending upon the type of material used for the dome. Testing per ASTM E108 or UL790 with a Class B brand should be the accepted requirement.

Cost Impact: The code change proposal will not increase the cost of construction

ICCFILENAME: ENNIS-F3-2610.2 AND ENNIS-F5-2610.2

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt there was a lack of data to indicate that a plastic skylight with metal edge protection is a fire exposure problem.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Mike Ennis representing Single Ply Roofing Industry (SPRI), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

2610.2 Mounting. The light-transmitting plastic shall be mounted above the plane of the roof on a curb constructed in accordance with the requirements for the type of construction classification, but at least 4 inches (102 mm) above the plane of the roof. The light transmitting plastic dome or skylight shall be shown to be able to resist ignition where exposed at the edge to a flame from a Class B brand as described in ASTM E 108 or UL 790.

Exceptions:

1. Curbs shall not be required for skylights used on roofs having a minimum slope of three units vertical in 12 units horizontal (25-percent slope) in occupancies in Group R-3 and on buildings with a nonclassified roof covering.
2. Class B brand testing is not required where nonclassified roof coverings are permitted.

Commenter's Reason: The original code change proposal was submitted to delete the exception for fire testing of light-transmitting plastic skylights in cases where the edges of the skylight were protected by metal or other approved non-combustible material. This proposal was submitted because test experience has shown that non-combustible edge material will not prevent the flames of the burning brand from igniting the plastic dome. The proposed revision is being submitted to address the following comments from the code change hearings:

- 1) The Committee felt there was a lack of data to indicate that a plastic skylight with metal edge protection is a fire exposure problem. Manufacturers have conducted Class B brand testing in accordance with ASTM E108 and UL790 and have observed flames extending above the non-combustible edge material and contacting the plastic dome. Video evidence of this occurrence can be viewed at the following web link: <http://www.spri.org/publications/policy.htm>
- 2) The Committee felt it was inappropriate to require fire testing of skylights where non-classified roof coverings are permitted. In the current code language, there is an exception that allows the use of skylights without non-combustible edge materials where non-classified roof coverings are permitted. In the original proposal this exception was deleted. In the proposed revision an exception to testing skylights is provided where non-classified roof coverings are permitted.

Final Action: AS AM AMPC_____ D

FS193-09/10

711.5.2, 711.5.3, 711.5.4 (New), 711.7

Proposed Change as Submitted

Proponent: Mike Ashley, C.B.O., representing: Alliance for Fire & Smoke Containment & Control (AFSCC)

Revise as follows:

711.5.2 Smoke and draft control doors. Where required elsewhere in ~~the~~ this code to comply with this section, doors in smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.015424 m³/(s • m²)) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.

711.5.3 Self- or automatic-closing doors. Where required elsewhere in ~~the~~ this code to comply with this section, doors in smoke partitions shall be self-closing or automatic-closing by smoke detection in accordance with Section 715.4.8.3.

711.5.4 Latching of doors. Where required elsewhere in this code to comply with this section, doors in smoke partitions shall be provided with latches as required for fire doors in accordance with Section 715.4.8.1.

711.7 Ducts and air transfer openings. The space around a duct penetrating a smoke partition shall be filled with an approved material to limit the free passage of smoke. Air transfer openings in smoke partitions shall be provided with a smoke damper complying with Section 716.3.2.2. Where required elsewhere in this code to comply with this section, ducts penetrating a smoke partition shall be provided with smoke dampers as required for corridors in accordance with Section 716.5.4.1.

Exception: Where the installation of a *smoke damper* will interfere with the operation of a required smoke control system in accordance with Section 909, *approved* alternative protection shall be utilized.

Reason: The purpose of this proposed code change is to clarify the application of these sections we're revising, as well as a new Section 711.5.4 which addresses latching requirements for doors that may be installed in smoke partitions under certain conditions. The intent of Sections 711.5.2 and 711.5.3 is to provide a set of criteria for the smoke and draft control doors that might be required elsewhere in the code for smoke partitions depending upon the specific application, without mandating that all doors in smoke partitions meet these requirements where they may not be necessary for the specific application.

A case in point is Section 708.14.1 which was revised during the last code development cycle to include references to Sections 711.5.2 and 711.5.3 in Exception 5 regarding how the doors in the smoke partition are to be protected where the smoke partition substitutes for the 1-hour fire-resistive enclosure for elevator lobbies in sprinklered buildings. It should also be noted that a direct reference to Section 716.5.1 for the protection of duct penetrations of those smoke partitions was also provided in Exception 5. Since that may occur more often than not where certain applications for smoke partitions are prescribed in the future, we decided to incorporate that provision into Section 711.7 in a similar manner to that in Sections 711.5.2 and 711.5.3. We have also provided a reference to Section 715.4.8.1 in our proposed new Section 711.5.4 Latching of Doors in smoke partitions. This is also similar in style to Sections 711.5.2 and 711.5.3 but specifically relates to a latch being required for doors in smoke partitions when prescribed elsewhere in the code, again, such as is the case for Exception 5 to Section 708.14.1.

We believe this will make the code easier to understand, apply, and enforce so that one does not get into a loop when referred back to one of these sections that states "where required elsewhere in this code" and then try to determine how that is intended to apply. So by adding the phrase "to comply with this section," when another section of the code specifies compliance with any of these sections, it will be clear that it is intended to apply to that situation. We believe that with the new Section 711.5.4 and the proposed revisions to Section 711.7, the majority of the situations where opening protectives may be required by other provisions of the code for specific applications of smoke partitions in the future will be covered.

This will eliminate the need to reference other sections throughout the code to implement these requirements. In this way, someone referencing the provisions in smoke partitions will find the various options that are available for protecting openings in such smoke partitions in one location.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: ASHLEY-FS2-711.5.2

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this proposal appropriately clarifies the intent and application of the requirements for smoke and draft control doors.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

David S. Collins, FAIA, The Preview Group Inc, representing The American Institute of Architects, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

711.5.2 Smoke and draft control doors. Where ~~required elsewhere in this code to comply with this section~~ smoke partitions are permitted by the exceptions to Section 708.14.1 of this code, doors in such smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.015424 m³/s • m²) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.

711.5.3 Self- or automatic-closing doors. Where ~~required elsewhere in this code to comply with this section~~ smoke partitions are permitted by the exception to Section 708.14.1 of this code, doors in such smoke partitions shall be self-closing or automatic-closing ~~by smoke detection in accordance with Section 716.4.8.3. by the actuation of smoke detectors installed in accordance with Section 907.3 or by loss of power to the smoke detector or hold-open device.~~ Doors that are automatic-closing by smoke detection shall not have more than a 10-second delay before the door starts to close after the smoke detector is actuated.

711.5.4 Latching of doors. Where ~~required elsewhere in this code to comply with this section~~ smoke partitions are permitted by exception number 5 to Section 708.14.1 of this code, doors in such smoke partitions ~~shall be provided with latches as required for fire doors in accordance with Section 716.4.8.1. shall be provided with an active latch bolt that will secure the door when it is closed.~~

711.7 Ducts and air transfer openings. Ducts and air transfer openings shall comply with this section.

711.7.1 Annular space. The space around a duct penetrating a smoke partition shall be filled with an approved material to limit the free passage of smoke.

711.7.1 Air transfer openings. Air transfer openings in smoke partitions shall be provided with a smoke damper complying with Section 716.3.2.2.

711.7.2 Ducts. Where ~~required elsewhere in this code to comply with this section~~, smoke partitions are permitted by the exception 5 to Section 708.14.1 ducts penetrating a smoke partition that is also a corridor wall shall be provided with smoke dampers as required for corridors in accordance with Section 716.5.4.1.

Commenter's Reason: The provision for latching doors is new and, similar to the charging language in this section of the code, many of the smoke partition sections indicate that they apply only "where required elsewhere in this code." This leaves the door open for inappropriate application and confusion by the users of the code. It would be simpler and clearer to indicate specifically when latching of doors or dampers in ductwork are required to conform to these sections.

The only places that the 2009 I-Codes that requires smoke partitions is where it is permitted as an alternate to a smoke barrier for elevator lobbies:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 711 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 711.5.2, 711.5.3, and 715.4.8 and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 716.5.4.1.

The exception describes the requirements for smoke and draft control doors (711.5.2), self- or automatic-closing doors (711.5.3) and door closing for fire doors (715.4.8) as well conforming with the requirements for ductwork if the partition is also a corridor (716.5.4.1). By making these changes, the application of the code is much clearer and the code user isn't burdened with finding a hidden section somewhere in the code that may require these features. By including the specific requirements for the smoke partition, additional confusion in design and enforcement will be avoided.

Final Action: AS AM AMPC_____ D

FS195-09/10, Part I

712.9

Proposed Change as Submitted

Proponent: John L. Williams, CBO representing Washington State Department of Health, Construction Review Services

PART I- IBC FIRE SAFETY

Delete without substitution:

~~**712.9 Smoke barrier.** Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition for smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 713.5 and 714.6. Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 708.14.1. Openings through horizontal assemblies shall be protected by shaft enclosures complying with Section 708. Horizontal assemblies shall not be allowed to have unprotected vertical openings.~~

Reason: These two sections are new to the 2009 code. They add cost and complicate the design process with no significant benefit. These sections are targeted toward I-2 occupancies, which are required to divide each floor into smoke compartments. There was no evidence provided by the author of this section that smoke transfer between floors in a sprinklered, compartmented building poses a significant hazard. If there was a significant transmission of smoke from one of the smoke compartments on the floor below, the occupants on the higher floor have another smoke compartment to horizontally evacuate to.

The addition of elevator lobbies and enclosing doors could also hamper the horizontal evacuation process. The added number of doors that a patient must be pushed through to get to the adjacent smoke compartment slows the evacuation time.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: WILLIAMS-FS1-712.9

Public Hearing Results

PART I- IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The committee felt these sections should remain as the definition of smoke compartment indicates that smoke compartments are enclosed by smoke barriers on all sides, including the top and bottom. Also, this action is consistent with the committee's action on FS196-09/10.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

John Williams representing Washington State Department of Health, Construction Review Services, requests Approval as Submitted.

Commenter's Reason: These two new sections were added in the previous code cycle with the intent to coordinate and clarify the application of the definition of a "smoke compartment." Since the 2000 version of the IBC, a smoke compartment is defined as a space enclosed by smoke barriers, including the top and bottom. The code has given clear instructions on how to deal with vertical smoke barriers, but has been silent on the construction of horizontal smoke barriers. If coordination was the goal, and equally viable solution would be to modify the smoke compartment definition and remove the reference to "top and bottom."

I believe that the previous code's silence regarding the horizontal component of a smoke compartment were intentional. Floors, elevator shafts, stair doors were not intended to meet the requirements of a smoke barrier. The IBC has always required Group I-2 occupancies to be separated into at least two smoke compartments. If smoke migrates vertically from one smoke compartment to the floor above, it will likely be contained by a smoke compartment on that upper floor.

Smoke compartments exist in three types of facilities: Healthcare facilities (Group I-2), prisons (Group I-3) and ambulatory health care facilities (Group B, new to the 2009 code). The facilities operate on a defend-in-place concept. Staff are available to aid in the relocation of incapacitated or restrained occupants to a safer area. All of these occupancies are incredibly fire safe due to the amount of precautions taken in the IBC. The 2009 NFPA report "Structure Fires in Medical, Mental Health and Substance Abuse Facilities" states that during 2003-2006 there have been an annual average of 3,750 fires in these facilities. This resulted in a yearly average of 1 civilian death and 57 injuries. The 2006 NFPA report "U.S. fires in selected occupancies – Prisons and Jails" reports and a yearly average of 1,360 structure fires from 1999-2002. This resulted in no loss of civilian life and 19 injuries.

The NFPA report on healthcare facilities lists a selection of published incidents. Many of these incidents note that there was vertical migration of smoke to upper floors, but they also state that the staff evacuated patients to a safe area. None of these cases implicate vertical smoke migration as a cause of death. For example:

Illinois Hospital fire: "Some smoke also migrated to the third floor through a loose fitting on a pneumatic tube delivery system. The hospital staff quickly moved patients out of the affected area." No casualties.

Ohio hospital fire: "Before the fire department's arrival, hospital staff had already accounted for all other nearby patients and moved them from the affected area without injury. Fire damage was confined to the bedding and the mattress, and smoke damage was limited to the wing of origin." One casualty in the room of fire origin.

More recent hospital fire reports also support this concept:

2009 New York hospital fire: 600 patients were relocated from the east wings to the west wings of a 12 story hospital building. No casualties.

2010 South Carolina hospital fire: Two wings were evacuated to another part of the hospital. No casualties.

These facility types have been safe without the horizontal smoke barrier requirements. In the 2009 codes, we've added retroactive fire sprinkler requirements to hospitals to make them even safer. Existing fire safety systems within hospitals perform well. These new sections that were presented as coordination changes actually added significant requirements to the code without justification. Please approve the original change as submitted.

Final Action: AS AM AMPC____ D

FS195-09/10, Part II

407.4.3

Proposed Change as Submitted

Proponent: John L. Williams, CBO representing Washington State Department of Health, Construction Review Services

PART II- IBC GENERAL

Delete without substitution:

~~**407.4.3 Horizontal assemblies.** Horizontal assemblies supporting smoke barriers required by this section shall be designed to resist the movement of smoke and shall comply with Section 712.9.~~

Reason: These two sections are new to the 2009 code. They add cost and complicate the design process with no significant benefit. These sections are targeted toward I-2 occupancies, which are required to divide each floor into smoke compartments. There was no evidence provided by the author of this section that smoke transfer between floors in a sprinklered, compartmented building poses a significant hazard. If there was a

significant transmission of smoke from one of the smoke compartments on the floor below, the occupants on the higher floor have another smoke compartment to horizontally evacuate to.

The addition of elevator lobbies and enclosing doors could also hamper the horizontal evacuation process. The added number of doors that a patient must be pushed through to get to the adjacent smoke compartment slows the evacuation time.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: WILLIAMS-FS1-712.9

Public Hearing Results

PART II- IBC GENERAL

Committee Action:

Disapproved

Committee Reason: The committee felt these sections should remain as the definition of smoke compartment indicates that smoke compartments are enclosed by smoke barriers on all sides, including the top and bottom. Also, this action is consistent with the committee's action on FS196-09/10.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

John Williams representing Washington State Department of Health, Construction Review Services, requests Approval as Submitted.

Commenter's Reason: These two new sections were added in the previous code cycle with the intent to coordinate and clarify the application of the definition of a "smoke compartment." Since the 2000 version of the IBC, a smoke compartment is defined as a space enclosed by smoke barriers, including the top and bottom. The code has given clear instructions on how to deal with vertical smoke barriers, but has been silent on the construction of horizontal smoke barriers. If coordination was the goal, and equally viable solution would be to modify the smoke compartment definition and remove the reference to "top and bottom."

I believe that the previous code's silence regarding the horizontal component of a smoke compartment were intentional. Floors, elevator shafts, stair doors were not intended to meet the requirements of a smoke barrier. The IBC has always required Group I-2 occupancies to be separated into at least two smoke compartments. If smoke migrates vertically from one smoke compartment to the floor above, it will likely be contained by a smoke compartment on that upper floor.

Smoke compartments exist in three types of facilities: Healthcare facilities (Group I-2), prisons (Group I-3) and ambulatory health care facilities (Group B, new to the 2009 code). The facilities operate on a defend-in-place concept. Staff are available to aid in the relocation of incapacitated or restrained occupants to a safer area. All of these occupancies are incredibly fire safe due to the amount of precautions taken in the IBC. The 2009 NFPA report "Structure Fires in Medical, Mental Health and Substance Abuse Facilities" states that during 2003-2006 there have been an annual average of 3,750 fires in these facilities. This resulted in a yearly average of 1 civilian death and 57 injuries. The 2006 NFPA report "U.S. fires in selected occupancies – Prisons and Jails" reports and a yearly average of 1,360 structure fires from 1999-2002. This resulted in no loss of civilian life and 19 injuries.

The NFPA report on healthcare facilities lists a selection of published incidents. Many of these incidents note that there was vertical migration of smoke to upper floors, but they also state that the staff evacuated patients to a safe area. None of these cases implicate vertical smoke migration as a cause of death. For example:

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Ohio hospital fire: "Before the fire department's arrival, hospital staff had already accounted for all other nearby patients and moved them from the affected area without injury. Fire damage was confined to the bedding and the mattress, and smoke damage was limited to the wing of origin." One casualty in the room of fire origin.

More recent hospital fire reports also support this concept:

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These facility types have been safe without the horizontal smoke barrier requirements. In the 2009 codes, we've added retroactive fire sprinkler requirements to hospitals to make them even safer. Existing fire safety systems within hospitals perform well. These new sections that were presented as coordination changes actually added significant requirements to the code without justification. Please approve the original change as submitted.

Final Action: AS AM AMPC_____ D

FS196-09/10

708.14.1

Proposed Change as Submitted

Proponent: John L. Williams, CBO representing Washington State Department of Health, Construction Review Services

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
 - 4.1. Group I-2 occupancies,
 - 4.2. Group I-3 occupancies, and
 - 4.3. High-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 711 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 711.5.2, 711.5.3, and 715.4.8 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 716.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 708.14.2.
7. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.3.
8. Enclosed elevator lobbies are not required on floors in I-2 occupancies that are subdivided as required by Section 407.4.

Reason: Elevator lobbies serve no purpose on floors of these types of facilities that "protect in place". Floors that contain patient sleeping are required to be subdivided into smoke compartments by section 407.4 so that bed ridden patients can be moved from one compartment to another. A small elevator lobby would be no where near the size needed to accommodate bed ridden patients. It is inappropriate to evacuate bed ridden patients from a facility unless there is some catastrophic failure way beyond the intent of the code. This protect in place concept is the reason that these facilities are limited in size based on construction type and required to be sprinklered and fully detected for early detection and response. Additionally, these facilities are required to provided quarterly training and fire alarm drills.

Cost Impact: The code change proposal will not increase the cost of construction.

ICCFILENAME: WILLIAMS-FS2-707.14

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The reference to 407.4 is not appropriate as this section eventually requires enclosed elevator lobbies; further correlation is required. Further, the proposal seems redundant with exception #4. Lastly, removing the lobby enclosure for these buildings would inhibit the ability to defend a fire in place.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

John Williams representing Washington State Department of Health, Construction Review Services, requests Approval as Submitted.

Commenter's Reason: The committee questioned whether the reference to section 407.4 was appropriate, because it would eventually require smoke barriers. References to require elevator lobbies at Group I-2 and any floors containing smoke compartments are all recent additions to the 2009 version of the code. I am also proposing remove the requirement in 407.4 as part of FS 195.

The committee was concerned that the proposal seems redundant with exception #4. Exception #4 deals with sprinklered buildings, not buildings with smoke compartmentation. All existing hospitals will be sprinklered (per the new retroactive sprinkler provisions in the IFC) but not all hospitals have smoke compartments. Smoke compartments provide a function similar to that of an elevator lobby by compartmentalizing the floor and limiting the spread of smoke. They are an adequate trade-off for this occupancy.

The final concern was that the lack of lobbies would inhibit a facilities ability to defend in place. This is simply not supported by the recent fire data, please see my public comment for FS 195. Facilities today are successfully providing a defend in place strategy without elevator lobbies. Please support this change as submitted.

Final Action: AS AM AMPC____ D
