

Code Technologies Committee Report Fire Rated Glazing – Group A changes:

There are 11 areas of study currently listed under CTC.

1. Balanced Fire Protection
 - 1.1. Vertical Opening
 - 1.2. Roof Vents
2. Carbon Monoxide Detectors
3. Nursing Care Facilities
4. Child Window Safety
5. Climbable Guards
6. Elevator Lobby
7. Emergency Evacuation with Elevators
8. ADA/IBC Coordination
9. Fire rated glazing
10. Relocatable Modular Building
11. Unenclosed Exit Stairs

Following are code change proposals submitted through CTC from Fire Rated Glazing study group and related changes.

Fire rated glazing

Code Change #	Section	CTC (x) or Related (o)	Position					Comments
			Oppose & Testify	Oppose	No Position	Support	Support & Testify	
FS083	716.2	X						
FS084	716.3	X						
FS085	716.5	X						
FS086	716.5	o						
FS089	716.5.3.2	o						
FS090	716.5.3.2	o						
FS091	716.5.5.1	o						
FS094	716.5.8.1	o						
FS095	716.5.8.4	x						

FS83 – 12

716.2

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

716.2 Fire-resistance-rated glazing. Fire-resistance-rated glazing tested as part of a fire-resistance-rated wall or floor/ceiling assembly in accordance with ASTM E 119 or UL 263 and labeled in accordance with Section 703.6 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 when used as part of a wall or floor/ceiling assembly. Fire-resistance-rated glazing shall be permitted in fire door and fire window assemblies where tested and installed in accordance with their listings and when in compliance with the requirements of this section.

Reason: 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/CTC/Pages/default.aspx>. Since its inception in April/2005, the CTC has held twenty two 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 changes proposed for Section 716.2 clarify how the code currently provides fire-resistance-rated glazing. The modifications to the first sentence clarify that when fire-resistance-rated glazing tested in accordance with ATM E119 and used as part of a wall or floor/ceiling assembly, it is not subject to the provisions of Section 716.

However, the second sentence clarifies that when fire-resistance-rated glazing is used as part of a fire door or fire window assembly there are provisions in Section 716 that apply to its use. As currently worded the user could be misled as to the application of the additional requirements for applications involving fire door and window assemblies.

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

FS83-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.2-FS-BALDASSARRA-CTC

FS84 – 12

716.3.1, 716.3.2 (New), 716.5.8.3, 716.5.8.3.1 and 716.6.8

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

716.3 Marking fire-rated glazing assemblies. *Fire-rated glazing* assemblies shall be marked in accordance with Tables 716.3, 716.5, and 716.6.

716.3.1 Identification. For fire-rated glazing, the *label* shall bear the identification required in Table 716.3 and Table 716.5. “D” indicates that the glazing is permitted to be used in *fire door* assemblies and that the glazing meets the fire protection requirements of NFPA 252. “H” shall indicate that the glazing meets the hose stream requirements of NFPA 252. “T” shall indicate that the glazing meets the temperature requirements of Section 716.5.5.1. The placeholder “XXX” represents the fire -rating period, in minutes.

716.3.2 Identification. For fire-protection-rated glazing, the *label* shall bear the following identification required in Table 716.3 and Table 716.6: “OH – XXX.” “OH” indicates that the glazing meets both the fire protection and the hose-stream requirements of NFPA257 or UL9 and is permitted to be used in fire window openings. The placeholder “XXX” represents the fire-rating period, in minutes.

716.3.4 716.3.3 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.

716.5.8.3 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 716.3.1 716.5.8.3.4 that shall be issued by an *approved agency* and shall be permanently identified on the glazing.

716.5.8.3.1 Identification. For fire-protection-rated glazing, the *label* shall bear the following four-part identification: “D – H or NH – T or NT – XXX.” “D” indicates that the glazing shall be used in *fire door* assemblies and that the glazing meets the fire protection requirements of NFPA 252. “H” shall indicate that the glazing meets the hose stream requirements of NFPA 252. “NH” shall indicate that the glazing does not meet the hose stream requirements of the test. “T” shall indicate that the glazing meets the temperature requirements of Section 716.5.5.1. “NT” shall indicate that the glazing does not meet the temperature requirements of Section 716.5.5.1. The placeholder “XXX” shall specify the fire-protection-rating period, in minutes.

716.6.8 Labeling requirements. 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 716.3.2 and Table 716.6 that shall be issued by an approved agency and shall be permanently identified on the glazing.

Reason: 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/CTC/Pages/default.aspx>. Since its inception in April/2005, the CTC has held twenty two 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 proposed changes to Section 716.3 (the addition of Section 716.3.1 and 716.3.2) clarify the requirements for marking of fire-rated glazing assemblies. No technical changes are being introduced.

Section 716.3.1 was moved from Section 716.5.8.3.1. The language was modified to clarify that the provisions of the section apply to fire-rated glazing used in fire door assemblies. Additionally, consistent with Tables 716.3 and Table 716.5, the language was modified to reflect the fact that fire-rated glazing assemblies that do not meet the temperature or hose stream requirements of this section are not required to be labeled as "NT" and "NH" respectively.

Section 716.3.2 was added to clarify that Tables 716.3 and 716.6 are the appropriate tables to be used for fire-protection-rated glazing, and to provide details of the required label and standards for performance, consistent with such tables. This section essentially reflects the same language as contained in Section 715.5.9.1 of the 2009 IBC.

The remaining changes are made to update cross-references to reflect the new section numbers.

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

FS84-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.3-FS-BALDASSARRA-CTC

FS85 – 12

Table 716.5

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

**TABLE 716.5
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE ^b	FIRE RATED GLAZING MARKING DOOR VISION PANEL ^{e,d}	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	Not Permitted See note <u>b</u>	Not Permitted <u>D-H-W-240</u>	Not Permitted	4	Not Permitted	W-240
	3	3 ^a	Not Permitted See note <u>b</u>	Not Permitted <u>D-H-W-180</u>	Not Permitted	3	Not Permitted	W-180
	2	1½	100 sq. in. ^{c,e}	<input type="checkbox"/> 100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
	1½	1½	100 sq. in. ^{c,e}	<input type="checkbox"/> 100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	1½	Not Permitted	W-90
<u>Horizontal exits in fire walls</u> ^e	<u>4</u>	<u>3</u>	<u>100 sq. in.</u>	<input type="checkbox"/> 100 sq.in. = D-H-180 > 100 sq.in.= <u>D-H-W-240</u>	<u>Not Permitted</u>	<u>4</u>	<u>Not Permitted</u>	<u>W-240</u>
	<u>3</u>	<u>3^a</u>	<u>100 sq. in.</u>	<input type="checkbox"/> 100 sq.in. = D-H-180 > 100 sq.in.= <u>D-H-W-180</u>	<u>Not Permitted</u>	<u>3</u>	<u>Not Permitted</u>	<u>W-180</u>
Shaft, exit enclosures and exit passageway walls	2	1½	100 sq. in. ^{c,e}	<input type="checkbox"/> 100 sq.in. = D-H-90 > 100 sq.in.= D-H-T or D-H-T-W-90	Not Permitted	2	Not Permitted	W-120

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE ^b	FIRE RATED GLAZING MARKING DOOR VISION PANEL ^{e d}	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire barriers having a required fire-resistance rating of 1 hour: Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways, interior exit ramps and exit passageway walls	1	1	100 sq. in. ^{c-d}	□ 100 sq.in. = D-H-60 >100 sq.in.= D-H-T-60 or D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					Fire protection			
Other fire barriers	1	³ / ₄	Maximum size tested	D-H-NT-45		³ / ₄		D-H-NT-45
Fire partitions: Corridor walls	1	¹ / ₃ ^b	Maximum size tested	D-20		³ / ₄ ^b		D-H-OH-45
	0.5	¹ / ₃ ^b	Maximum size tested	D-20		¹ / ₃		D-H-OH-20
Other fire partitions	1	³ / ₄	Maximum size tested	D-H-45		³ / ₄		D-H-45
	0.5	¹ / ₃	Maximum size tested	D-H-20		¹ / ₃		D-H-20

(continued)

TABLE 716.5—continued
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE ^b	FIRE RATED GLAZING MARKING DOOR VISION PANEL ^{e,d}	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL		
					Fire protection	Fire resistance	Fire protection	Fire resistance	
Exterior walls	3	1½	100 sq. in. ^{e,b}	□ 100 sq.in. = D-H-90 >100 sq.in = D-H-W-90	Not Permitted	3	Not Permitted	W-180	
	2	1½	100 sq. in. ^{e,b}	□ 100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120	
						Fire Protection			
	1	¾	Maximum size tested	D-H-45	¾		D-H-45		
Smoke barriers						Fire protection			
	1	1/3 ^b	Maximum size tested	D-20	¾		D-H-OH-45		

For SI: 1 square inch = 645.2 mm.

- a. Two doors, each with a fire protection rating of 1½ 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 716.6.3.
- b.e. Fire-resistance-rated glazing tested to ASTM E 119 in accordance with Section 716.2 shall be permitted, in the maximum size tested.
- c.d. Except where the building is equipped throughout with an automatic sprinkler and the fire-rated glazing meets the criteria established in Section 716.5.5.
- d.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.
- e. See Section 716.5.8.1.2.1.

Reason: 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/CTC/Pages/default.aspx>. Since its inception in April/2005, the CTC has held twenty two 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.

Table 716.5 was heavily modified for the 2012 edition of the International Building Code to serve as a reference summary of current code requirements, i.e., the items located in the table are specified by technical language found in the code. Based upon a review of the table as currently depicted in the 2012 IBC as compared to the current language of the IBC additional items require inclusion and some items require modification to reflect the current code as modified by other proposals during the last cycle.

There are no technical changes to current code requirements proposed, the changes are editorial.

A section was added to the table for "Horizontal Exits in Fire Walls" to provide for a summary of current glazing requirements for openings in those assemblies.

Note b, (formerly note c), has been relocated to the top of the column "Door Vision Panel Size" because the allowance for fire-resistance rated glazing in the maximum size tested applies in all cases depicted.

Specific reference is added to Note b for door vision panels in fire doors located in 3 and 4 hour fire walls because only fire-resistance rated glazing is permitted to be utilized, fire protection rated glazing is not permitted in any size. The appropriate marking requirements have been added as well in the next column, "Fire Rated Glazing Marking Door Vision Panel".

"D-H-T" or and "D-H-T-60 or" have been stricken from 2 hr "Shaft, exit enclosures and exit passageway walls" and from 1 hr "Fire barriers having a required fire-resistance rating of 1 hour." requirements since fire-protection rated glazing is limited to the 100 sq. in. size and only fire-resistance rated glazing can be utilized in larger proportions.

NT has been stricken in several locations as the requirement for marking glazing as "not tested" for a particular feature has been eliminated as a code consideration. Glazing is simply required to be marked for those attributes it has been tested and listed for.

Existing Note b is being deleted as no longer accurate or necessary for application of the table.

Note e is added to provide guidance on where the requirements for the horizontal exit in fire walls glazing requirements are located and to highlight that there is a dimension restriction in addition to the maximum size limitation.

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

FS85-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5-FS-BALDASSARRA-CTC

FS86 – 12

Table 716.5, 716.5.8.1.2.1, 716.5.8.1.2.2

Proponent: Thomas S. Zaremba, Roetzel & Address, representing Glazing Industry Code Committee and Primary Fire Rated Glazing Manufacturers (tzaremba@ralaw.com)

Revise as follows:

**TABLE 716.5
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND 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	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	Not Permitted	Not Permitted	Not Permitted	4	Not Permitted	W-240
	3	3 ^a	Not Permitted	Not Permitted	Not Permitted	3	Not Permitted	W-180
	2	1½	400 sq. in. <u>Maximum size tested</u> ^c	≤100 sq. in. = D-H-90 >100 sq. in. = <u>or D-H-W-90</u>	Not Permitted	2	Not Permitted	W-120
	1½	1½	400 sq. in. <u>Maximum size tested</u> ^c	≤100 sq. in. = D-H-90 >100 sq. in. = <u>or D-H-W-90</u>	Not Permitted	1½	Not Permitted	W-90
Shaft, exit enclosures and exit passageway walls	2	1½	100 sq. in. ^{c,d}	≤100 sq. in. = D-H-90 >100 sq. in. = D-H-T-or D-H-T-W-90	Not Permitted	2	Not Permitted	W-120

Fire barriers having a required fire- resistance rating of 1 hour: Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways, interior exit ramps and exit passageway walls	1	1	100 sq.in. ^{cd}	≤100 sq.in. = D-H-60 >100 sq.in.= D-H-T-60 or D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					Fire protection			
Other fire barriers	1	3/4	Maximum size tested	D-H-NT-45	3/4		D-H-NT-45	
Fire partitions: Corridor walls	1 0.5	1/3 ^b 1/3 ^b	Maximum size tested Maximum size tested	D-20 D-20	3/4 ^b 1/3		D-H-OH-45 D-H-OH-20	
Other fire partitions	1 0.5	3/4 1/3	Maximum size tested Maximum size tested	D-H-45 D-H-20	3/4 1/3		D-H-45 D-H-20	

**TABLE 716.5—continued
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**

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	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Exterior walls	3	1½	400 sq. in. Maximum size tested _c	≤100 sq.in. = D-H-90 >100 sq.in. = or D-H-W-90	Not Permitted	3	Not Permitted	W-180
	2	1½	400 sq. in. Maximum size tested _c	≤100 sq.in. = D-H-90 >100 sq.in. = or D-H-W-90	Not Permitted	2	Not Permitted	W-120
					Fire Protection			
	1	¾	Maximum Size tested	D-H-45	¾		D-H-45	
Smoke barriers					Fire protection			
	1 ₁	1 ³ _b	Maximum Size tested Size Tested size tt	D-20	¾		D-H-OH-45	

For SI: 1 square inch = 645.2 mm

- Two doors, each with a fire protection rating of 1½ 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.
- For testing requirements, see Section 716.6.3.
- Fire-resistance-rated glazing tested to ASTM E 119 in accordance with Section 716.2 shall be permitted, in the maximum size tested.
- Except where the building is equipped throughout with an automatic sprinkler and the fire-rated glazing meets the criteria established in Section 716.5.5.
- Under the column heading "Fire-rated glazing marking door vision panel," W refers to the fire-resistance rating of the glazing, not the frame.

716.5.8.1.2.1 Horizontal exits. Fire-protection rated glazing shall be permitted as vision panels in 1½-hour fire protection rated, self-closing swinging fire door assemblies serving as horizontal exits in fire walls where limited to 100 square inches (0.065 m²) with no dimension exceeding 40 inches (0.3 m²).

716.5.8.1.2.2 Fire barriers. Fire-protection-rated glazing shall be permitted in fire doors having a 1½-hour fire protection rating intended for installation in fire barriers, where limited to 100 square inches (0.065 m²).

Reason: This proposal eliminates an inconsistency in the IBC and an inconsistency between the IBC and NFPA 80. In that regard, IBC section 716.5 says that “fire door assemblies and shutters shall be installed in accordance with ... NFPA 80.” In turn, NFPA 80 provides that fire protection rated glazing may be used to the maximum sizes tested in 1½ hour fire protection rated doors in fire walls and fire barriers. In allowing fire protection rated glazing in the maximum sizes tested in these applications, NFPA 80 correctly recognizes that, since the doors in these applications are not fire-resistance or temperature rise rated, there is no reason to limit their use of fire protection rated glazing to 100 sq. in. If adopted, this proposal would reconcile these sections of the IBC and NFPA 80.

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

FS86-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

T716.5-FS-ZAREMBA

FS89 – 12

716.5.3.2, 716.5.3.2.1 (New), 716.6.7.4 (New)

Proponent: Robert J Davidson, Davidson Code Concepts, LLC, representing SaftiFirst a Division of O'Keefes, Inc. (rjd@davidsoncodeconcepts.com)

Revise as follows:

716.5.3 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 716.5 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions: (No change to current text)

716.5.3.2 Glazing in door assemblies. In a 20-minute *fire door assembly*, the glazing material in the door itself shall have a minimum fire-protection-rated glazing of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lights and sidelights, shall be tested in accordance with NFPA 257 or UL 9, including the hose stream test, in accordance with Section 716.6, subject to the limitations in Section 716.5.3.2.1.

716.5.3.2.1 Glazing in sidelites. The use of fire protection rated glazing in sidelites shall be limited to a minimum of 44 inches above the finished floor surface.

716.6.7 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.

716.6.7.4 Interior fire windows in fire-resistant rated corridors and exit passageways. Fire protection-rated glazing in fire windows tested to NFPA 257 used in fire-resistant rated corridors and exit passageways shall be limited to applications where the bottom edge of the window frame is a minimum of 44-inches above the finished floor surface. The bottom edge height of fire resistance rated glazing tested as an assembly to ASTM E119 or UL 263 and rated a minimum of 1-hour shall not be limited.

Reason: The purpose of this proposal is to provide for protection of specific egress paths against radiant heat exposure that can occur through the use of fire protection rated glazing. Building codes in other countries such as New Zealand and the United Kingdom have taken this exposure problem into account in the application of their requirements with height above egress path limitations of 1100 mm (43.3 inches) and up to 2 M (6.6 feet).

Fire protection rated glazing materials do not protect against radiant heat. The unrestricted use of these materials in exit corridors in the large sizes for which they have been tested and listed threaten the life safety of building occupants attempting to exit past them in a fire as well as firefighters using the same protected path for rescue and firefighting. By restricting the use of these materials to above 44" from the floor along specific egress paths, occupants and firefighters can crawl below the level of the fire windows, and combustibles piled on the floor are not as likely to pose a threat to windows installed at this height.

This proposal addresses the radiant heat issue by providing for a height limitation in the application of fire protection rated glazing in sidelights with proposed Section 716.5.3.2.1 and the use of fire protection rated glazing in specific egress paths in proposed Section 716.6.7.2.

The recognition of this issue is not restricted to overseas; NFPA 80 provides background information and recommends that the consideration be given to the issue.

NFPA 80-2010

4.4.5* *Glazing material shall be permitted in fire doors having the fire protection ratings shown in Table 4.4.5 when tested in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, and shall be limited in size and area in accordance with Table 4.4.5.*

A.4.4.5 *Doors containing fire resistance-rated glazing materials fabricated and tested as door assemblies in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, to determine a fire protection rating should be regulated by this standard as a fire assembly and not as a glazing material permitted in fire door assemblies as prescribed in Section 4.4.*

Regarding Table 4.4.5, footnote c, consideration should be given to limiting fire protection glazing size in non-temperature rise doors where 60- and 90-minute fire protection is required due to radiant heat hazards. See Annex I.

If the limited amount of glazing in a fire door presents a risk, fire windows along a corridor or exit passageway would be a greater risk. Within NFPA 80 Appendix I the opening paragraph states:

I.1 Background. Fire windows were originally designed for protecting openings in exterior walls. In such applications, radiant heat transfer was not a significant consideration, since the main function of fire windows was to contain the flames within the building. However, where fire windows are used in interior partitions, users of this standard might need to consider radiant heat transfer during fire. Exiting through corridors and past fire windows could be compromised, and combustible materials on the unexposed side of fire windows could be ignited. The information that follows is a guide to the evaluation of radiant heat transfer through fire windows.

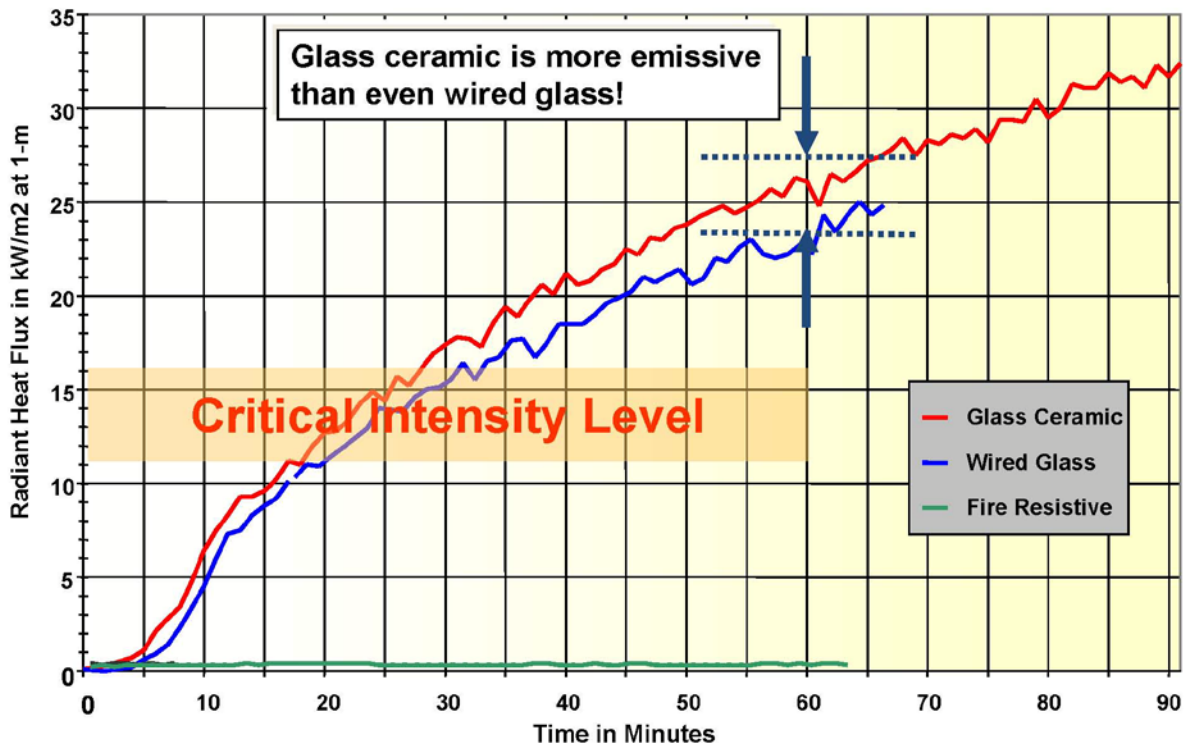
The third paragraph of NFPA 80 Appendix I states:

Test Method. Because the present fire test standard, NFPA 257, does not require measuring and reporting temperature rise on the unexposed face of the glazing material or radiant heat transmission, glazing products tested to this standard have not been required to retard heat transfer. However, these data are required in many European fire test standards. [2] As a result, European building codes place limitations on the use of glazing in fire-resistant partitions inside buildings and require the use of insulating glazing in means of egress as well as where combustibles could be in close proximity

This code change at the same time permits use in larger sizes of products that meet fire resistance radiant heat and temperature rise limits of ASTM E119, as those products do not transmit dangerous levels of radiant heat.

Fire test data show that at 45-minutes, these products transmit in excess of 20 kW/m², at 20 minutes of fire exposure, these materials transmit in excess of 10 kW/m², and at 10 minutes of fire exposure, transmit 5 kW/m². <http://vimeo.com/13218481> See below, Chart Cumulative Radiant Heat Energy Data Chart, prepared by the test sponsor of the test cited above. The Society of Fire Protection Engineers Fire Protection Engineering Handbook identifies a fairly obvious tolerance limit for exposure to radiant heat of 2.5 kW/m² due to unbearable pain. (See SFPE Handbook of Fire Protection Engineering, 2nd edition, page 2-114).

Radiant Heat Flux: Comparison



Also included as further support of this code change are two test reports from the Coast Guard testing of (1) Ceramic (FireLite) in steel bulkheads (Report No. CG-D-37-95), and (2) wired glass in steel bulkheads (Report No. CG-D-38-95). Temperature rise and radiant heat flux measurements were recorded. The tests were intended to measure radiant heat flux and surface temperature performance at 60 minutes.

The tests can be summarized as follows:

Wired Glass Test

The test of the wired glass panels resulted in glazing failure prior to 60-minutes, so radiant heat and temperature rise were only recorded up to the time of the wired glass failure.

Test 1

- Heat flux at end of test (41:24 minutes) - 71 kW/m sq.
- Surface temperature - wired glass temperature - 730 degrees C; steel frame - 540 degrees C

Test 2

- Heat flux at end of test (37:46 minutes) - 48 kW/m sq.
- Surface temperature - wired glass temperature - 730 degrees C; steel frame - 550 degrees C

Test 3

- Heat flux at end of test (48:30 minutes) - 57 kW/m sq.
- Surface temperature - wired glass temperature - 760 degrees C; steel frame - 585 degrees C

Conclusion on page 8 - As the window panes began to reach their melting point and flow out of the test frame, the recorded heat flux levels showed obvious increases. In all three tests, the recorded heat flux increased approximately 5-7 kW/m sq. until the wire glass fell out of the test frame and the test was terminated.

Ceramic (FireLite) Test

Test 1

- Heat flux at end of test (60:00 minutes) - 75 kW/m sq.
- Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

Test 2

- Heat flux at end of test (60:00 minutes) - 69 kW/m sq.
- Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

Test 3

- Heat flux at end of test (60:00 minutes) - 73 kW/m sq.
- Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

According to these test reports, the surface temperature is significantly higher on the glazing than it is on the steel frame. Also, the report notes that the radiant heat measurements taken that included the "cooler steel frame" were several percentages lower than the view that included just the glazing. (see Ceramic test report (Report No. CG-D-37-95), page 6.)

Limitations on area uses of fire protection-rated glazing products is long overdue. In Europe, code regulators have recognized the need for restricting use of fire protection-rated glazing materials based on radiant heat hazards, particularly their use in egress paths. Reasonable limits protecting life safety are achieved by limiting the height of windows in exit corridors, permitting building occupants safe egress. The restriction on use in other fire barriers and fire partitions reduces the possibility of fire spread due to auto-ignition, which test data show can occur well before the 45-minute fire exposure to which fire protection-rated glazing products have been tested.

Bibliography

1. Test Report, Fire Performance of Three Wired Glazed Window Assemblies, Report No. CG-D-38-95
<http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA302226>
2. Test Report, Fire Performance Evaluation of Three A-O Glazed Window Assemblies, Report No. CG-D-37-95
<http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA302316>
3. New Zealand Compliance Document for New Zealand Building Code Clauses C1, C2, C3, C4 Fire Safety
<http://www.dbh.govt.nz/UserFiles/File/Publications/Building/Compliance-documents/C-fire-safety-1st-edition-amendment-9.pdf>
4. United Kingdom Building regulations Fire Safety, Volume 2 – Buildings Other than Dwellinghouses
http://www.planningportal.gov.uk/uploads/br/BR_App_Doc_B_v2.pdf
5. NFPA 80-2010 "Standard for Fire Doors and Other Opening Protectives"
<http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=80>

Cost Impact: This code change will not increase construction costs, as fire protection-rated glazing materials are still permitted, and the cost of fire resistance products permitted for larger applications and next to the floor is now comparable to safety rated fire protection products that pass hose stream testing.

FS89-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.6.7.3 (NEW)-FS-DAVIDSON

FS90 – 12

716.5.3.2, 716.5.4, 716.5.4.1 (New)

Proponent: Robert J Davidson, Davidson Code Concepts, LLC, representing SaftiFirst a Division of O'Keeffes, Inc. (rjd@davidsoncodeconcepts.com)

Revise as follows:

716.5.3.2 Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material ~~in the door itself~~ shall have a minimum fire-protection-rated glazing of 20 minutes and shall be exempt from the hose stream test. ~~Glazing material in any other part of the door assembly, including transom lights and sidelights, shall be tested in accordance with NFPA 257 or UL 9, including the hose stream test, in accordance with Section 716.6.~~

716.5.4 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 716.5 shall be tested in accordance with NFPA 252, UL 10B or UL 10C ~~with~~ without the hose stream test.

716.5.4.1 Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material shall have a minimum fire-protection-rated glazing of 20 minutes and shall be exempt from the hose stream test.

Reason: This code change proposal is intended to eliminate an unnecessary hose stream test requirement, provide for increased consistency in the code requirements and increased consistency with the referenced standards for fire door assemblies.

The first change is at Section 716.5.3.2. A 20 minute fire door in a corridor or smoke barrier does not require a hose stream test. Section 716.5.3.2 does not require a hose stream test for the glazing in the door itself, but it then requires the hose stream test for the glazing located anywhere else in the fire door assembly. This does not make sense, it is one assembly and it should be consistently tested as an assembly to the same standard. The hose stream test is either needed or it is not.

The next proposed change is to eliminate the hose stream test requirement for 20 minute doors in other fire partitions. Since we have eliminated the requirement for 20 minute doors in corridors (the means of egress protection) and smoke barriers (patient protection), why would we then require the hose test in other cases of 20 minute doors located in fire partitions that only have a 0.5 hour rating? This lacks consistency.

The final proposed change is to add glazing requirement language for the "other fire partition" door assemblies, matching the language proposed for the doors in corridors and smoke barriers.

It should be noted that NFPA 80 "Standard for Fire Doors and Other Opening Protectives" 2010 edition provides for the door and the glazing to be tested as an assembly in accordance with NFPA 252 which is consistent with Section 716.5.3 and points out the difference between glazing tested separately as fire protection rated glazing and then installed in a fire door as compared to glazing tested as part of the door assembly. (See A.4.4.5)

NFPA 80-2010

4.4.4* Fire protection glazing not exceeding 100 in.2 (0.065m²) shall be permitted in fire doors having a 3-hour fire protection rating or in fire doors having a 1 1/2-hour fire protection rating for use in severe exterior fire exposure locations where the fire protection glazing has been tested for the desired rating period with no through-openings in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

4.4.5* Glazing material shall be permitted in fire doors having the fire protection ratings shown in Table 4.4.5 when tested in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, and shall be limited in size and area in accordance with Table 4.4.5.

A.4.4.5 Doors containing fire resistance-rated glazing materials fabricated and tested as door assemblies in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, to determine a fire protection rating should be regulated by this standard as a fire assembly and not as a glazing material permitted in fire door assemblies as prescribed in Section 4.4.

The NFPA 252 "Standard Methods of Fire Tests of Door Assemblies" 2008 edition provides for the elimination of the hose stream test at the option of the sponsor, recognizing that there are codes that allow for elimination of the hose stream test and it goes on to explain that the elimination is based upon the field application.

NFPA 252-2008

6.2 Hose Stream Test.

6.2.1* *Within the 2 minutes immediately following the fire test, the fire-exposed side of the fire door assembly shall be subjected to the impact, erosion, and cooling effects of a standard hose stream, unless otherwise permitted by 6.2.2.*

6.2.2* *For 20-minute fire protection-rated fire door assemblies, at the option of the test sponsor, the hose stream test shall not be required to be performed.*

A.6.2.2 *The elimination of the hose stream test for some 20-minute-rated assemblies is based on their field application.*

Since NFPA 80 identifies that the glazing be tested as part of the fire door assembly in accordance with NFPA 252, and NFPA 252 recognizes the elimination of the hose stream test with no special requirement that the glazing be subjected to the hose stream test anyway, this proposal will provide for better harmony between the IBC and the referenced standards.

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

FS90-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.3.2-FS-DAVIDSON

FS91 – 12

716.5.5.1

Proponent: Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee and Primary Fire Rated Glazing Manufacturers (tzaremba@ralaw.com)

Revise as follows:

716.5.5.1 Glazing in doors. Fire-protection-rated glazing in excess of 100 square inches (0.065 m²) is not permitted. Fire-resistance-rated glazing in excess of 100 square inches (0.065 m²) shall be permitted in *fire doors*, ~~assemblies when tested as components of the door assemblies, and not as glass lights, and shall have a maximum transmitted temperature rise of 450o F (250o C) in accordance with Section 716.5.5.~~ Fire doors using listed fire-resistance-rated glazing shall have a maximum transmitted temperature rise in accordance with Section 716.5.5 when tested in accordance NFPA 252, UL 10B or UL 10C.

Reason: This proposal is not intended to change the underlying requirements of section 716.5.5.1. It is intended to provide uniformity for testing fire-resistance-rated glazing when it is used in temperature rise fire doors.

When glazing in temperature rise fire doors exceeds 100 sq. in., it must be fire-resistance-rated glazing. An issue arises as to the sequence of testing when fire-resistance-rated glazing is used in a fire door because fire-resistance-rated glazing is tested to ASTM E119 and the fire door is tested to NFPA 252. Working closely with UL, this code change proposal was developed to answer the question as to how to test a fire door when it uses fire-resistance-rated glazing. In that regard, the proposal would require the glazing to be tested first, and, if it meets the ASTM E119 acceptance criteria, it is listed as a fire-resistance-rated glazing. That "listed fire-resistance rated glazing" is then installed in a fire door and tested in accordance with NFPA 252, the fire door test, including tests for the maximum transmitted temperature rise requirements of Section 716.5.5.

If adopted, this proposal will provide uniformity for testing ASTM E119 fire-resistance-rated glazing when used in NFPA 252 tested fire doors.

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

FS91-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.5.1-FS-ZAREMBA

FS94 – 12

716.5.8, 716.5.8.1, 716.5.8.1.2.1, 716.5.8.3

Proponent: Bob Eugene, representing Underwriters Laboratories (Robert.Eugene@ul.com)

Revise as follows:

716.5.8 Glazing material. ~~Fire-protection-rated~~ glazing conforming to the opening protective requirements in Section 716.5 shall be permitted in *fire door* assemblies.

716.5.8.1 Size limitations. ~~Fire-resistance-rated glazing shall comply with the size limitations in Section 716.5.8.1.1.~~ Fire-protection-rated glazing shall comply with the size limitations of NFPA 80, except as provided in Sections ~~716.5.8.1.1 and~~ 716.5.8.1.2.

716.5.8.1.1 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 E 119 or UL 263 and NFPA 252, UL 10B or UL 10C shall be permitted in *fire door assemblies* located in *fire walls* and in *fire barriers* in accordance with Table 716.5 to the maximum size tested in accordance with their listings.

716.5.8.1.2 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 Sections 716.5.8.1.2.1 and 716.5.8.1.2.2.

716.5.8.1.2.1 Horizontal exits. 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 (0.065 m²) with no dimension exceeding 10 inches (0.3 m~~m~~).

716.5.8.1.2.2 Fire barriers. Fire-protection-rated glazing 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 (0.065 m²).

716.5.8.2 Elevator, stairway and ramp protectives. Approved fire-protection-rated glazing used in *fire door* assemblies in elevator, stairways and ramps enclosures shall be so located as to furnish clear vision of the passageway or approach to the elevator, stairway or ramp.

716.5.8.3 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 ~~716.5.8.3.4~~ Table 716.3 that shall be issued by an *approved agency* and shall be permanently identified on the glazing.

Reason: The charging language of Section 716.5.8 references fire-protection-rated glazing. The sub sections which follow detail requirements for both fire-protection-rated glazing and fire-resistance-rated glazing. The proposed changes to Section 716.5.8 editorially correct this along with several other typographical errors. No technical changes are being introduced.

Cost Impact: None

FS94-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.8-FS-EUGENE

FS95 – 12

716.5.8.4, 716.6.3

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee

Revise as follows:

716.5.8.4 Safety glazing. ~~Fire-protection-rated glazing installed in *fire doors assemblies* in areas subject to human impact in hazardous locations shall also comply with the safety glazing requirements of Chapter 24 where applicable.~~

716.6.3 Safety glazing. ~~Fire-protection-rated glazing installed in *fire window assemblies* in areas subject to human impact in hazardous locations shall also comply with the safety glazing requirements of Chapter 24 where applicable.~~

Reason: 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/CTC/Pages/default.aspx>. Since its inception in April/2005, the CTC has held twenty two 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 proposed changes to Section 716.5.8.4 and 716.6.3 are needed to clarify the code changes approved in the last code cycle to ensure that there is no question that Chapter 24 language covers both fire-protection-rated glazing and fire-resistance-rated glazing. Proposed language also addresses requirements for safety glazing not defined as hazardous locations by referencing compliance with Chapter 24. No technical changes are being introduced.

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

FS95-12

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

716.5.8.4-FS-BALDASSARRA-CTC