

The 60-minute Fire Rated Application Explained

One of the most confusing aspects of the code is the 60-minute fire rated application, and it's easy to see why based on the questions that come up: Is 60-minutes really the correct rating requirement, or is it 45-minutes? Is fire protection or fire resistant rated glazing required? Can I use glazing that exceeds 100 sq. inches in the door vision panel? What about the sidelites and transoms? And the list goes on and on.

While the answers to these questions can be found in the IBC, it is not always easy to find or understand. To help clear up the confusion surrounding 60-minute fire rated applications, the succeeding sections will explain the code requirements by application (i.e. Doors, Sidelites/Transoms, Openings and Walls) and by assembly (i.e., Fire Barriers, Fire Partitions, Exterior Walls, etc.).

Important Note! While this handout references the 2012 IBC Tables, the fire rated glazing requirements represented in the tables are clarifications of existing requirements of the 2006 and 2009 editions of the IBC. Therefore, the provisions in these tables apply in jurisdictions currently enforcing the 2006, 2009 and 2012 IBC.

A. Doors

Under the IBC (International Building Code), there are very few applications where a 60-minute door is required in a 1-hour rated wall:

Excerpt from 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	Fire Rated Glazing Marking Door Vision Panel	Minimum Sidelite/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 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

c. Fire Resistance rated glazing tested to ASTM E-119 in accordance with Section 716.2 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 716.5.5.

Many 1-hour walls actually require either a 45-minute or a 20-minute door. Those applications will be addressed in Section D. Doors, Sidelites and Transoms in 1-hour Fire Partitions, Corridors and Smoke Barriers.

60-Minute Door Vision Panel Size Limits: Under the **2012 IBC**, where 60-minute fire doors are required, vision panels glazed with **fire protection rated glazing** (i.e. filmed and laminated ceramics, filmed wired glass and specialty tempered) are limited to 100 sq. inches. However, **fire resistance rated glazing** (i.e. ASTM E-119 tested fire resistive filled tempered units such as SuperLite II-XL) is not limited, and may be used to the maximum size tested (see Footnote 'c' in Table 716.5). This gives architects the opportunity to exceed 100 sq. inches in the vision panel and still meet code requirements.

Under the **2006 and 2009 IBC**, larger fire protection glazing vision panels may be used in 1-hour exit enclosure and exit passageway doors only where the building is fully sprinklered.

Important Note! *In the 2012 IBC, fire protection glazing used in the vision panel of a 60 minute door will always be limited to 100 sq. inches, whether the building is fully sprinklered or not.*



Photo 1:

The architects specified **PYRAN Platinum F** filmed ceramic for the door vision panel in this 1-hour stairwell. Filmed ceramic products, along with laminated ceramic, filmed wired glass and specialty tempered are all fire protection rated products, and therefore limited to 100 sq. inches in the door vision panel.

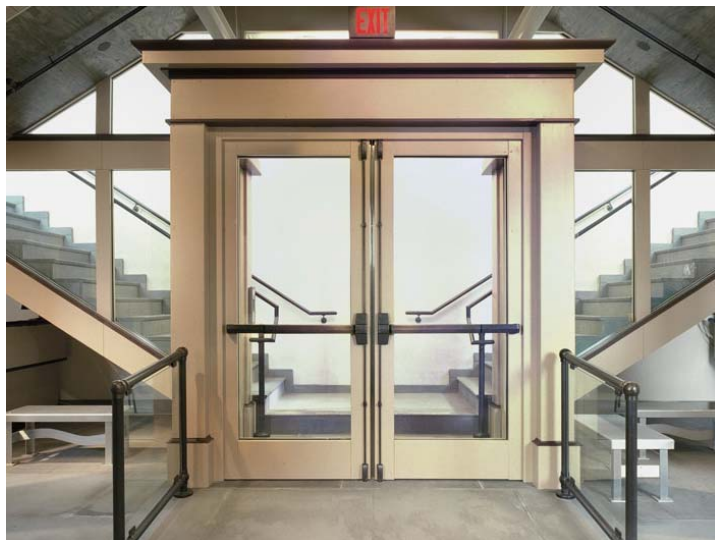


Photo 2:

In order to exceed 100 sq. inches in the door vision panel in this 1-hour stairwell, the architects specified **SuperLite II-XL 60 in GPX Framing**. Both products meet ASTM E-119 requirements, are listed and labeled by UL and Intertek/WHI and made by SAFTI FIRST here in the USA.

Note: Glazing everywhere else in the stairwell must be 1-hour fire resistance as well.

B. Sidelites and Transoms in a 60-minute Door Assembly

Excerpt from 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	Fire Rated Glazing Marking Door Vision Panel	Minimum Sidelite/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 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

The IBC also makes it clear that for the sidelites and transoms surrounding the 60-minute door assembly, **fire protection glazing** (i.e. filmed and laminated ceramics, filmed wired glass and specialty tempered) is not permitted. However, the code does allow 60 min. **fire resistance glazing** (i.e. ASTM E-119 tested fire resistive filled tempered units such as SuperLite II-XL) for the sidelites and transoms.



Photo 3:

To meet code requirements, the architects specified **SuperLite II-XL 60 in GPX Framing** for the sidelites and openings in this 1-hour stairwell. Both products meet ASTM E-119 requirements.

In order to exceed 100 sq. in. in the door vision panel, the architects specified **SuperLite II-XL 60 in HMTR Framing**.

All of these products are made by SAFTI FIRST here in the USA and are listed and labeled by UL and Intertek/WHI.

C. Fire Window Openings and Wall Assemblies

The IBC differentiates between Fire Windows (Openings) and Wall Assemblies by the test standards they meet:

Table 716.3 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 H T	Meets fire door assembly criteria. Meets fire door assembly "Hose Stream" test. Meets 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

- Fire Windows (i.e., Openings) are tested to NFPA 257 or UL 9. They typically carry a 20-45 minute rating in interior uses and are marked 'OH' to indicate that the assembly also meets the hose stream test. Where the code permits 45-minute openings, it cannot exceed 25% of the total wall area.
- Walls Assemblies are tested to ASTM E-119 or UL 263. They typically carry a 60-120 minute rating and are marked 'W' to indicate that the assembly meets the wall criteria. Glazing assemblies tested as walls may be used in wall applications where the code prohibits fire windows.

Important Note: *There are no requirements for 60-minute fire windows, in either interior or exterior walls. If a building design calls for an opening in a 1-hour wall, in some applications a 45-minute fire window is permitted up to 25% area limits. In others, a 60-minute fire resistive glazing assembly is required. Fire protection glazing (i.e. filmed and laminated ceramics, filmed wired glass and specialty tempered) can only be used in 1-hour walls where 45-minute windows are permitted.*

That being said, *where are 45-minute fire windows permitted in interior 1-hour walls? Where are 60-minute fire resistive assemblies required in interior 1-hour walls?* The answers are found in the succeeding sections.

C.1. Fire Window Openings and Walls – Interior Applications

45-minute windows are permitted in some, but not all, 1-hour rated interior walls. Where 45-minute windows are permitted, they are limited to a maximum of 25% of the common wall area.

For most 1-hour fire barriers (e.g., exit access stairways, interior exit stairways, interior exit ramps and exit passageway walls), 45-minute, fire protection windows are not permitted. However, footnote 'a' makes an exception for resistance rated glazing. Architects and designers can still use glass, as long as the assembly tested to ASTM E-119 and is fire rated to 60 minutes, which equals the rating of the wall. (See Photos 2 & 3 for project examples).

Table 716.6 Fire Window Assembly Fire Protection Ratings

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE RATED GLAZING MARKING
Interior walls			
Fire walls	All	NP ^a	W-xxx ^b
Fire barriers	>1	NP ^a	W-xxx ^b
	1	NP ^a	W-xxx ^b
Incidental use areas (707.3.6), Mixed occupancy separations (707.3.8)	1	¾	OH-45 or W-60
Smoke barriers and fire partitions	1	¾	OH-45 or W-60
	0.5	1/3	OH-20 or W-30
Smoke barriers	1	¾	OH-45 or W-60
Exterior walls	>1	1-1/2	OH-90 or W-XXX ^b
	1	¾	OH-45 or W-60
	0.5	1/3	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 716.2

For 1-hour fire partitions, smoke barriers, incidental use areas and mixed occupancy separations, 45-minute fire protection windows are allowed as long as they are limited to 25% of the common wall. If the architect wants to exceed 25%, 1-hour fire resistance glazing tested to ASTM E119 (such as SuperLite II-XL) must be used.

Table 716.6 Fire Window Assembly Fire Protection Ratings

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE RATED GLAZING MARKING
Interior walls			
Fire walls	All	NP ^a	W-xxx ^b
Fire barriers	>1	NP ^a	W-xxx ^b
	1	NP ^a	W-xxx ^b
Incidental use areas (707.3.6), Mixed occupancy separations (707.3.8)	1	¾	OH-45 or W-60
Smoke barriers and fire partitions	1	¾	OH-45 or W-60
	0.5	1/3	OH-20 or W-30
Smoke barriers	1	¾	OH-45 or W-60
Exterior walls	>1	1-1/2	OH-90 or W-XXX ^b
	1	¾	OH-45 or W-60
	0.5	1/3	OH-20 or W-30
Party wall	All	NP	Not Applicable



Photo 4:

The openings in this 1-hour exit corridor are under 25% of the wall area; therefore, 45-minute windows were allowed. To meet code requirements, the architects used **SuperLite II-XL 45 in HM Framing**.

All of these products are made by SAFTI FIRST here in the USA and are listed and labeled by UL and Intertek/WHI.



Photo 5:

The glazing used in this 1-hour exit corridor exceeds 25% of the wall area; therefore, 45-minute windows are not permitted. To meet code requirements, the architects used ASTM E-119 rated **SuperLite II-XL 60 in GPX Framing**.

All of these products are made by SAFTI FIRST here in the USA and are listed and labeled by UL and Intertek/WHI.

C.2. Fire Window Openings and Walls – Exterior Applications

Where the code permits a fire rated window opening in a 1-hour exterior wall, the required fire rating for the window and glazing is 45-minutes, with the caveat that there are 25% width and length limits. If the designer wants to exceed those limits, then the required rating for the window/wall assembly is 60-minutes, tested to ASTM E-119.

Important Note! Even where the code does not permit any openings in a 1-hour exterior wall (e.g., where the lot line is 0 to 3 feet), the code does permit the use of a 1-hour **fire resistive glazed assembly tested to ASTM E-119**.

Table 716.6 Fire Window Assembly Fire Protection Ratings

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE RATED GLAZING MARKING
Interior walls			
Fire walls	All	NP ^a	W-xxx ^b
Fire barriers	>1	NP ^a	W-xxx ^b
	1	NP ^a	W-xxx ^b
Incidental use areas (707.3.6), Mixed occupancy separations (707.3.8)	1	¾	OH-45 or W-60
Smoke barriers and fire partitions	1	¾	OH-45 or W-60
	0.5	1/3	OH-20 or W-30
Smoke barriers	1	¾	OH-45 or W-60
Exterior walls	>1	1-1/2	OH-90 or W-XXX ^b
	1	¾	OH-45 or W-60
	0.5	1/3	OH-20 or W-30
Party wall	All	NP	Not Applicable



Photo 6:

*The exterior window openings near the property line were less than 25% of the wall area, so 45-minute fire windows were allowed. To meet fire and energy requirements, SAFTI FIRST supplied **NFRC certified SuperLite II-XL 45 IGU in GPX Framing**.*

All of these products are made by SAFTI FIRST here in the USA and are listed and labeled by UL and Intertek/WHI.



Photo 7:

*The exterior openings near the property line exceeded 25% of the wall area, so 1-hour fire resistance glazing equal to the wall rating was required. SAFTI FIRST supplied **SuperLite II-XL 60 IGU in Custom CW Framing**.*

All of these products are made by SAFTI FIRST here in the USA and are listed and labeled by UL and Intertek/WHI.

D. Doors, Sidelites and Transoms in 1-hour Fire Partitions, Corridors and Smoke Barriers

As discussed above, there are very few applications where a 60-minute door is required in a 1-hour wall. In contrast, there are many 1-hour wall applications where the door rating is either 45-minutes, or even 20-minutes.

In 1-hour fire partitions used as an exit corridors, and in a 1-hour smoke barrier, the code allows a 20-minute rated door with a vision panel tested without hose stream. The sidelites and transoms, however, must have a minimum fire protection rating of 45-minutes with hose stream.

In other 1-hour fire partitions, a 45-minute door, sidelite and transom are required.

Excerpt from 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	Fire Rated Glazing Marking Door Vision Panel	Minimum Sidelite/Transom Assembly Rating (Hours)	Fire Rated Glazing Marking Sidelite/Transom Panel
					Fire Protection	Fire Protection
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
Smoke barriers	1	1/3	Maximum size tested	D-20	3/4	D-H-OH-45



Photo 8:

SuperLite I 20-minute specialty tempered glazing was used in the door vision panel, and SuperLite II-XL 45 was used for the sidelites in this 1-hour exit corridor.

All of these products are made by SAFTI FIRST here in the USA and are listed and labeled by UL and Intertek/WHI.

If you have additional questions on this topic, or if you have other code-related questions, please send them to codesupport@safti.com. Our team of experts will be happy to help you select the correct, code-approved fire rated glass and framing products for any current or upcoming project that you may have.

You may also contact us toll-free at 888.653.3333 or view our comprehensive selection of fire rated glass and framing products at www.safti.com.

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SAFTI *FIRST* is a leading USA-manufacturer of fire rated glass and framing systems, and a preferred choice of architects, specifiers and contract glaziers for over 30 years. As the first USA-company to introduce fire resistive, ASTM E-119 rated transparent wall and door assemblies to the US market, we continue to be the ***only single-source manufacturer*** of fire resistive, ASTM E-119 rated transparent wall and door assemblies through our SuperLite II-XL and GPX Framing products.

SAFTI *FIRST* is also a North American distributor for PYRAN® Platinum fire rated ceramics, the only environmentally friendly, C2C Silver Certified ceramic specifically designed for architectural applications.