

CODE CONSIDERATIONS IN FIRE RATED GLASS

PRESENTED BY



Objectives

- To review updated IBC and fire test requirements when designing for life safety.
- To understand the relationship of fire safety and human impact safety.
- To clarify the difference between fire protective vs. fire resistive glazing products as it relates to protecting people and property.
- To provide you with the latest fire rated glazing product information.



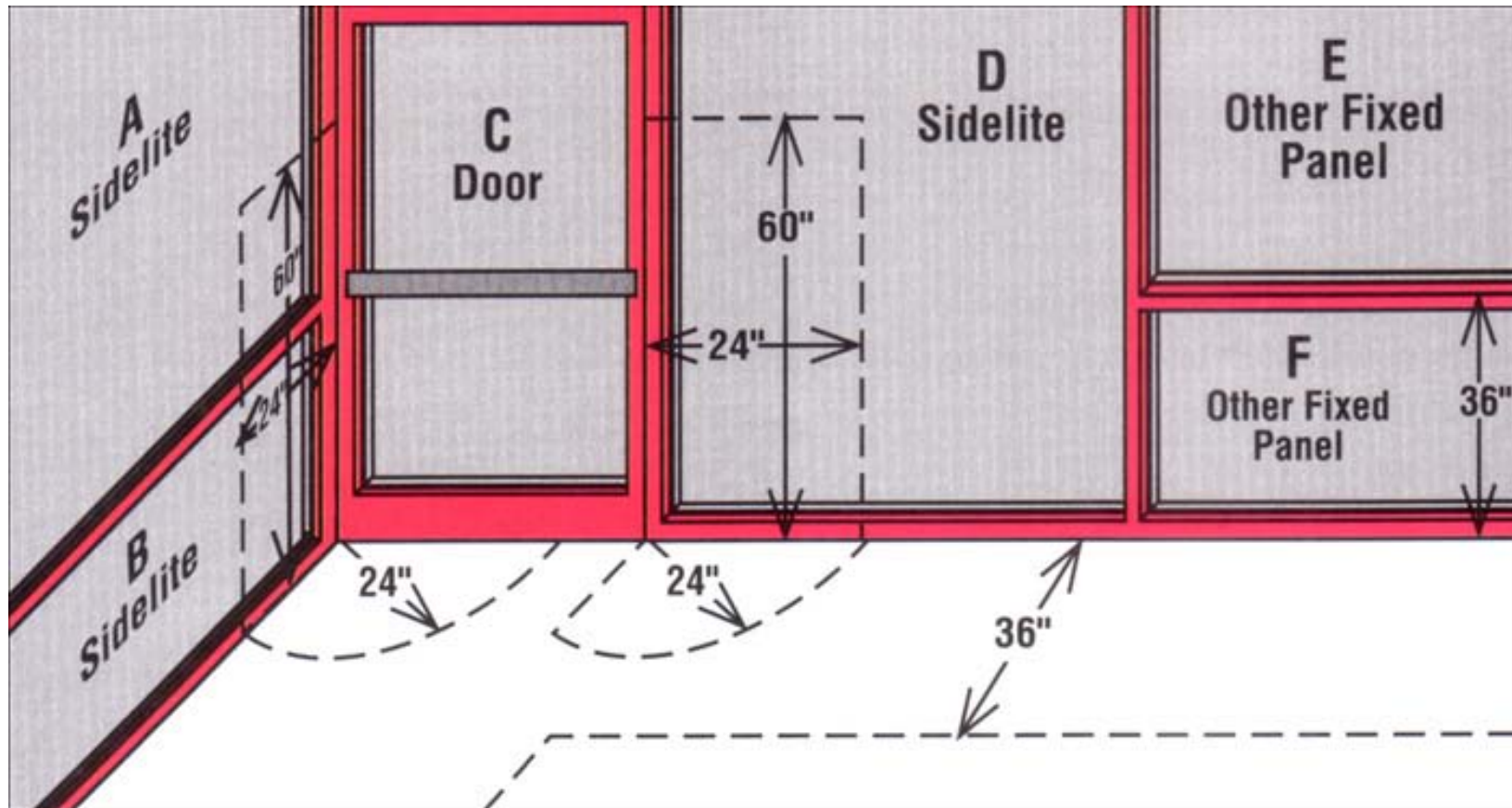
Does Fire Rated Mean Safety Rated?

Does a fire rating ensure that a product meets human impact safety standards?

- No, a fire rating only indicates that the glass has been tested to a fire standard, not an impact safety standard.



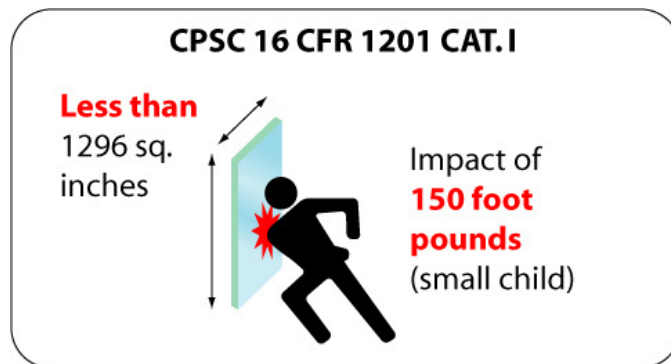
Hazardous Locations (Illustration)



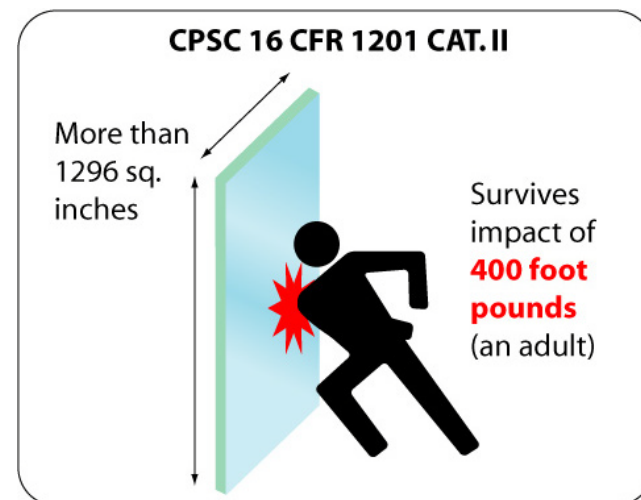
What is Consumer Product Safety Commission 16 CFR 1201?

- A federal safety glazing minimum standard established in 1977 to protect people from injuries due to accidental impact with glazing.
- Two categories were established:

Cat. I = for small glazing areas (**less than 1296 square inches**) to survive impact of 150 foot pounds - a small child.



Cat. II = for large glazing areas (more than 1296 square inches.) to survive an impact of 400 foot pounds - an adult.





Fire Protective vs. Fire Resistive

Fire-rated tests are created for specific applications depending upon the level of protection required by code

Window / Door Test **FIRE PROTECTIVE** NFPA 257/252



Contains flame and smoke

45 minutes and under

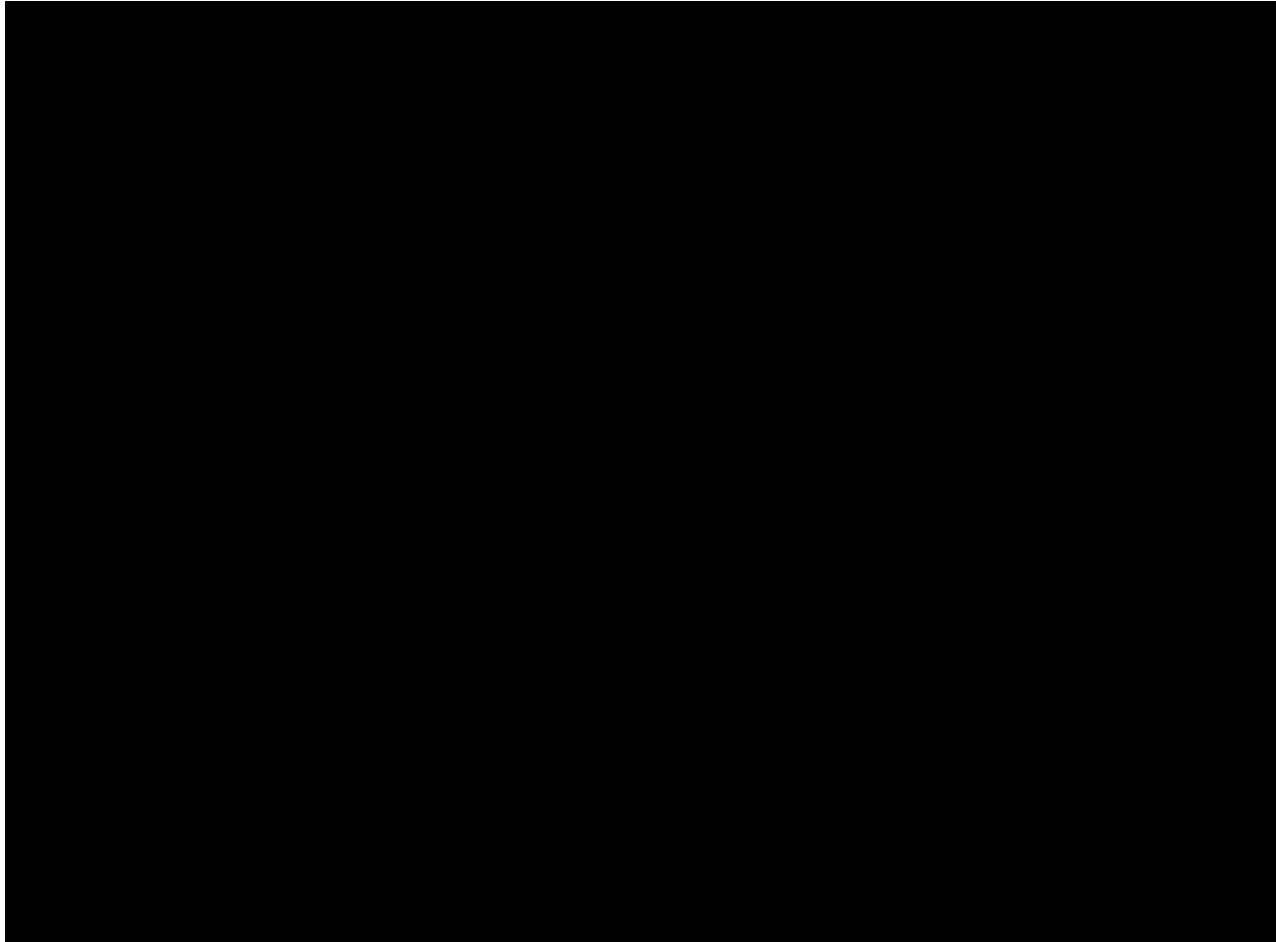
Wall Test **FIRE RESISTIVE** ASTM E119/NFPA 251



Contains flame and smoke AND
blocks radiant heat for applications

over 45 minutes

Fire-Resistive vs. Fire Protective Glazing





Fire Rated Glazing Code Applications

Glazing Marking Requirements

2012 IBC Table 716.3 (New)
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

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20 min.
door with
45 min.
sidelites



60 min.
doors,
sidelites
and
transoms

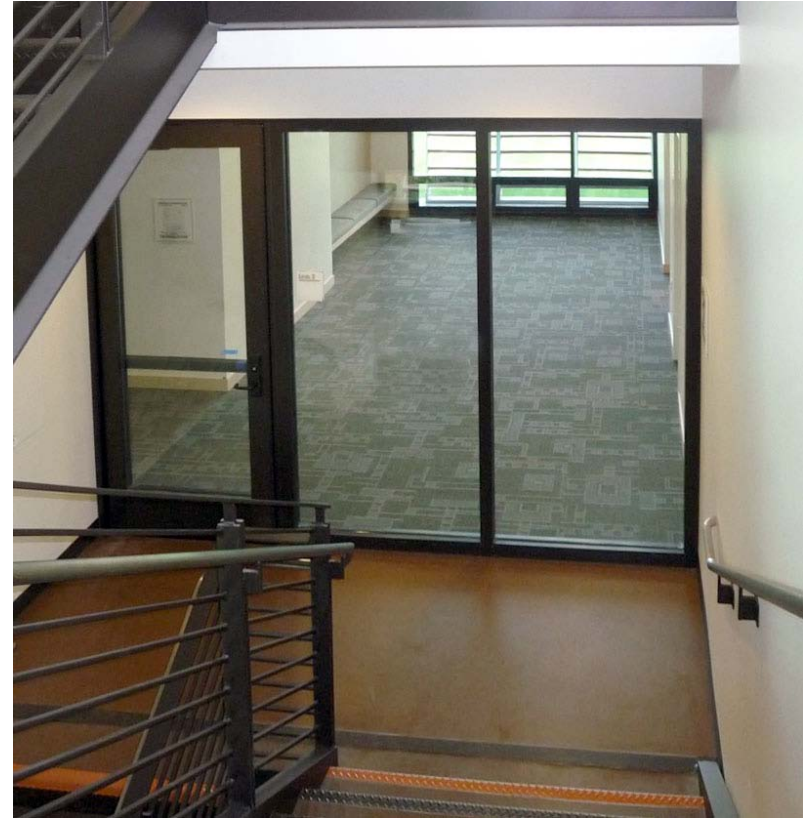


45 min. door with 45 min. sidelites



90 min. door with 120 min.
sidelites/transoms

Stairwell Enclosures



2 hour Stairwells with 90 min. full vision door and 120 min. wall glazing

EXCERPT from 2012 IBC Table 716.5 (rev. 715.4) Opening Fire Protection Assemblies, Ratings and Markings

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (HRS.)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (HRS.)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL ^e	MINIMUM SIDELITE/TRANSOM ASSEMBLY RATING (HRS.)		FIRE RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire Protection	Fire Resistance	Fire Protection	Fire Resistance
Shaft, exit enclosures and exit passageway walls	2	1-1/2	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	2	Not Permitted	W-120
Fire Barriers having a required rating of 1 hour: Enclosures for shafts, exit access stairways, etc.	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			
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	D-H-20	1/3		D-H-20	

2012 IBC Table 716.6 (rev. 715.5) 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
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 E-119 or UL 263, as specified in Sec. 716.2**
- b. xxx – The fire rating duration in minutes, which shall be equal to the fire rating required for the wall assembly

FIRE PARTITIONS FOR 1 HOUR CORRIDOR WALLS

Product Options:

20-Minute Tempered

45-Minute (safety) wired

45-Minute (safety)

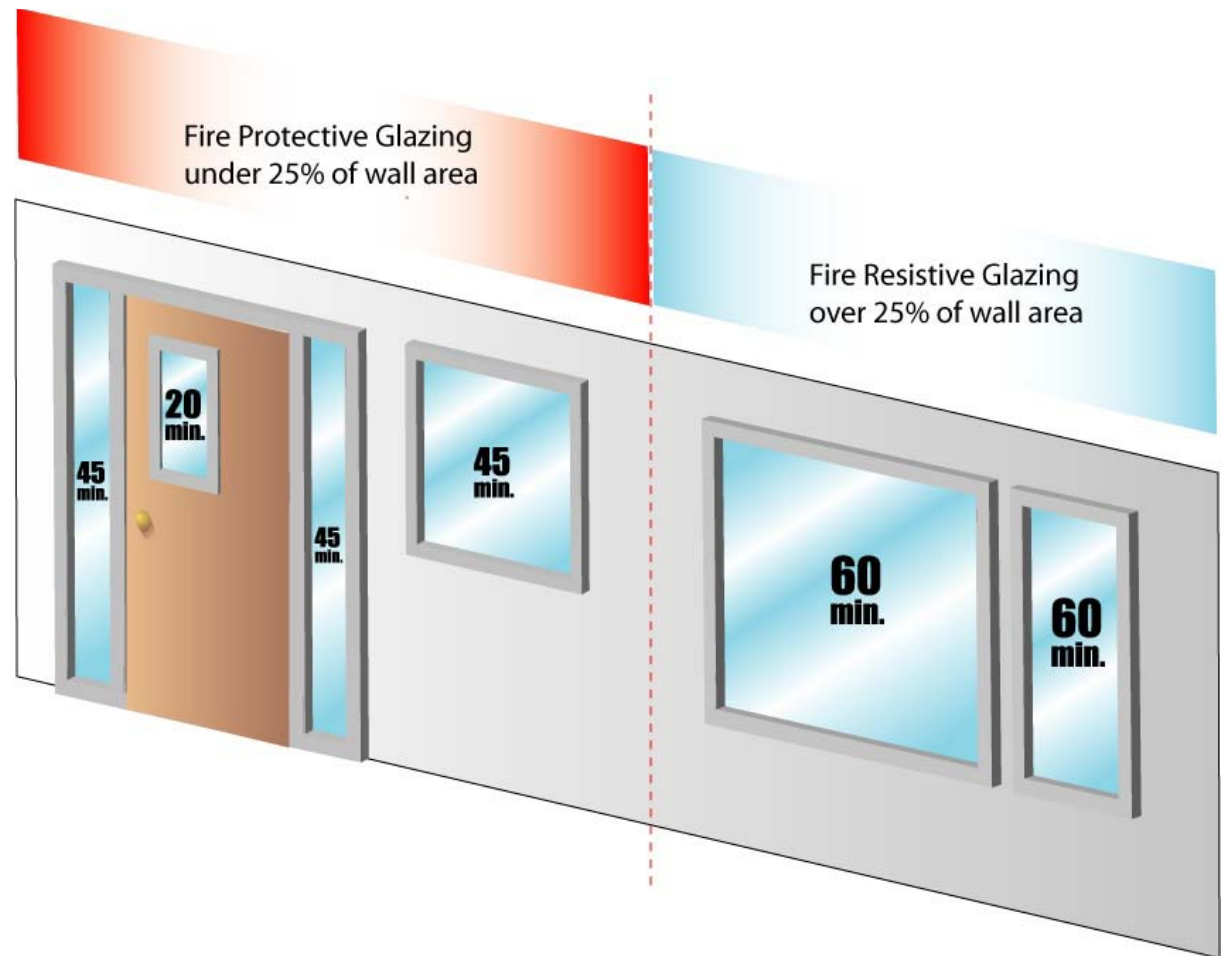
ceramic

45-Minute tempered*

45-Minute fire resistive

***w/o hose stream with
AHJ approval**

60-Minute fire resistive

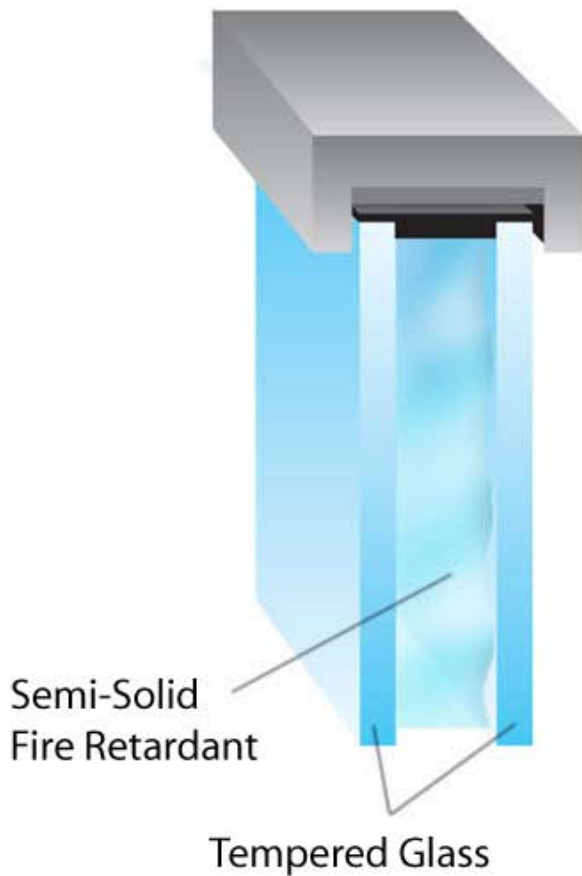


The image shows a curved glass balcony railing in a modern building. The railing is made of multiple glass panels held together by a metal frame. A semi-transparent dark grey horizontal band is overlaid across the middle of the image, containing the text. The background on the left is a bright, fiery orange and yellow, suggesting a fire. The ceiling above the railing has a curved, ribbed design.

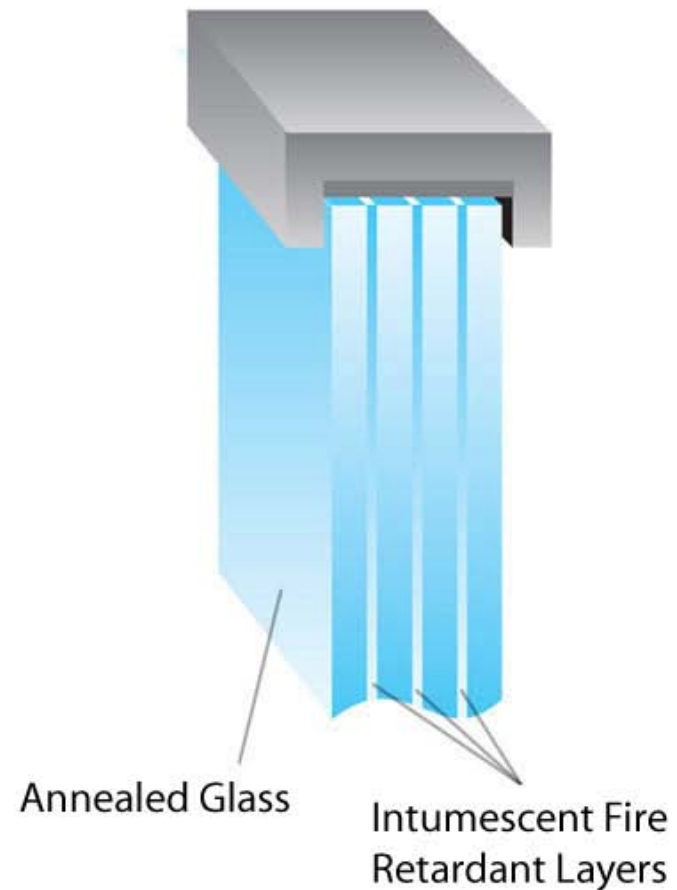
Types of Fire Resistive Glazing

Fire-rated glass products that meet fire resistive (wall) requirements

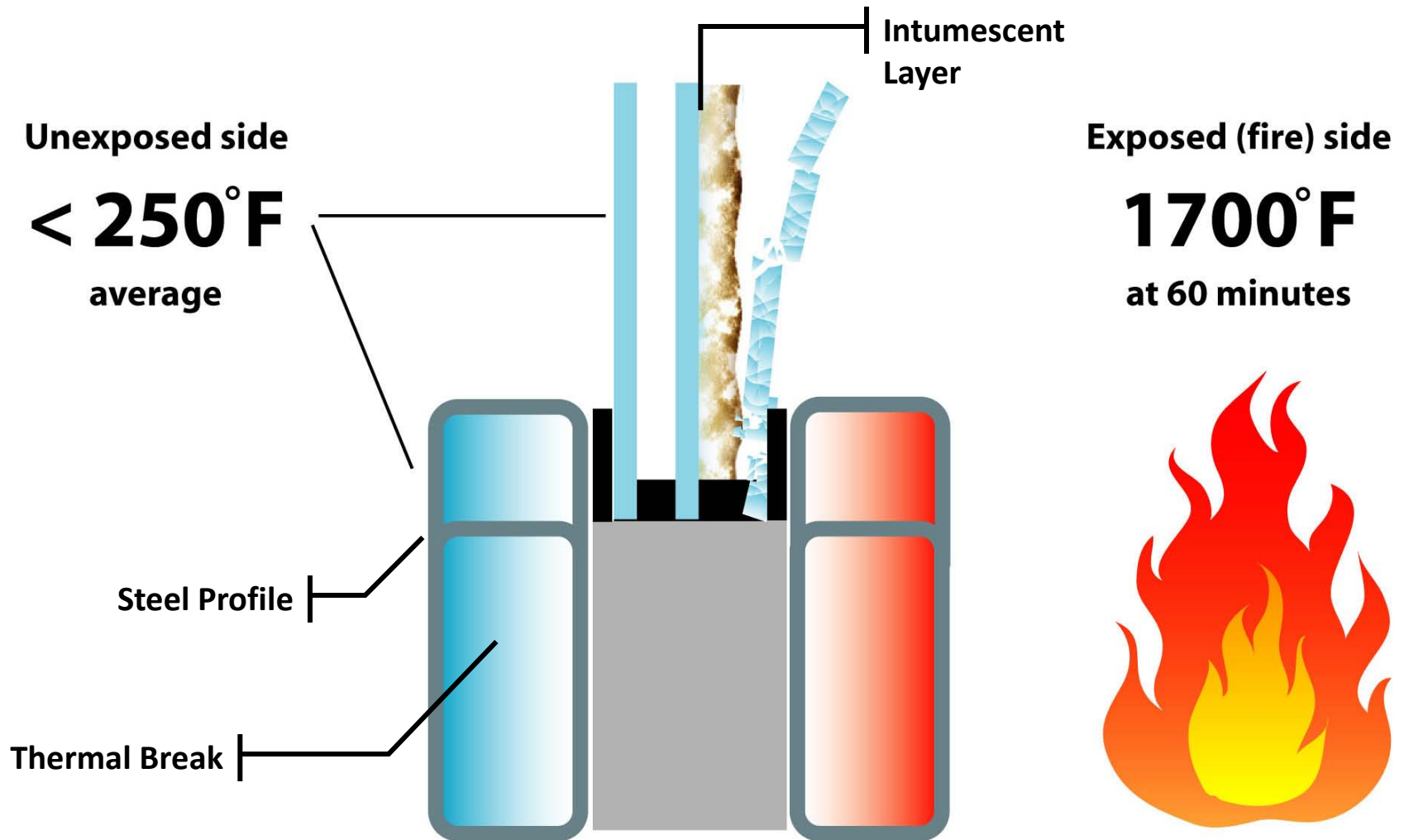
Fire Retardant Filled Glass



Multi-Laminate Fire Retardant Glass



Fire Resistive Framing

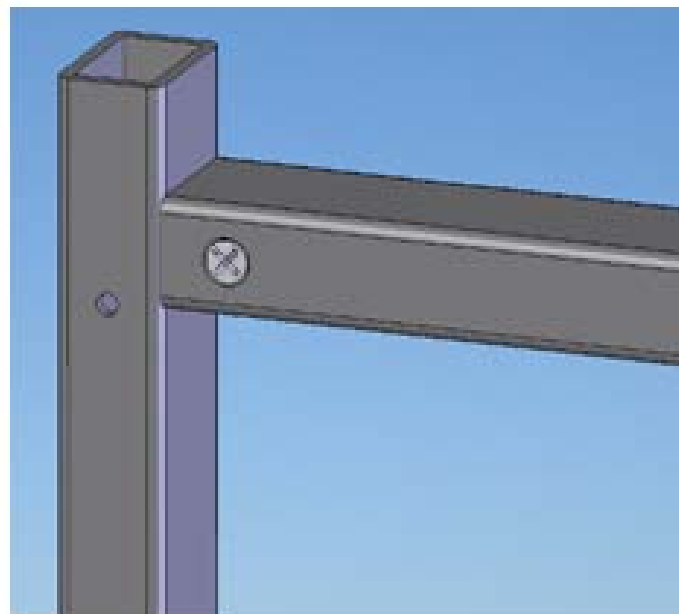
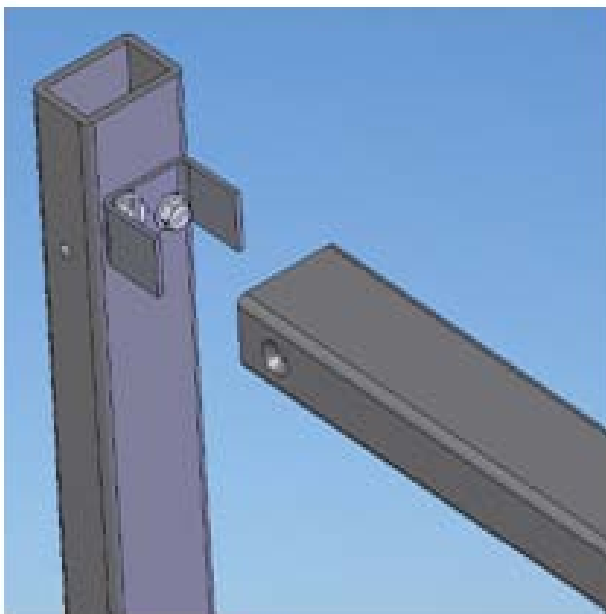


The image features a curved glass balcony with a white railing, set against a background of bright orange and yellow light rays. The balcony is on the right side of the frame, and the light rays are on the left. The word "Installation" is centered in the middle of the image.

Installation

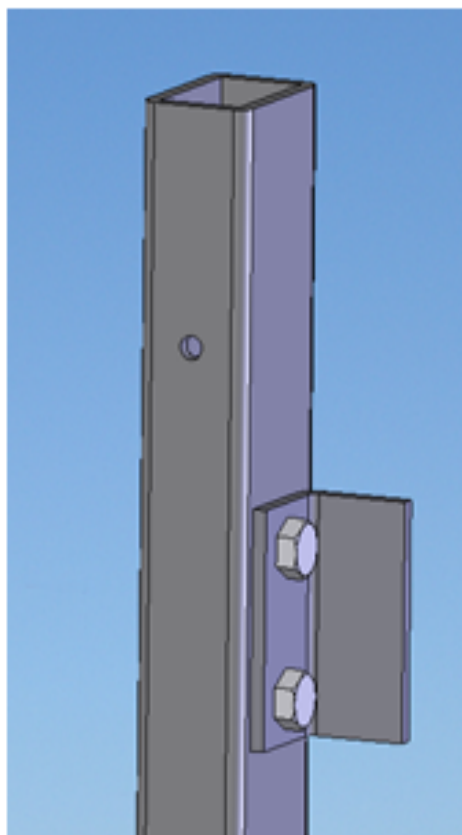


HORIZONTAL / VERTICAL CONNECTION

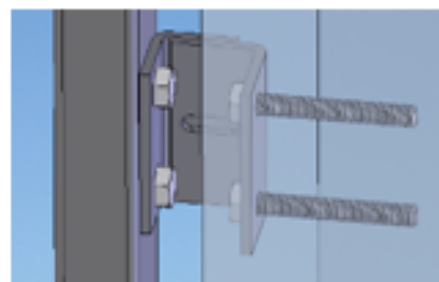




GPX Doors and Framing



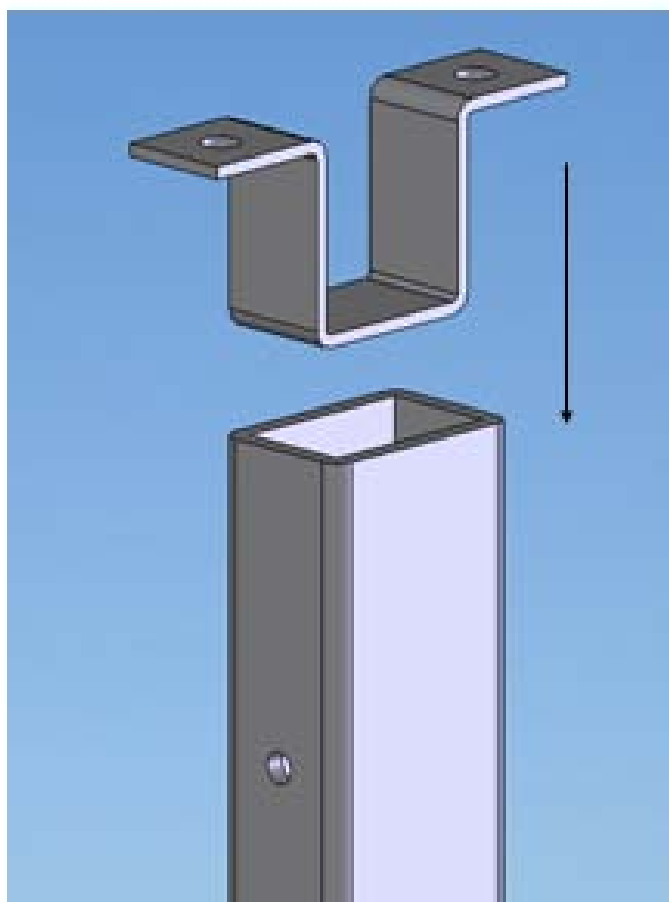
ATTACH ONE HALF OF THE JAMB MOUNTING CLIP TO THE WALL AND THE OTHER HALF TO THE TUBE STEEL



THE JAMB CLIP LOCATIONS ARE DETERMINED BY THE INSTALLER



GPX Doors and Framing

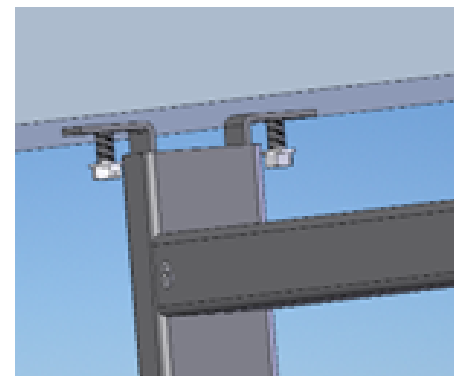
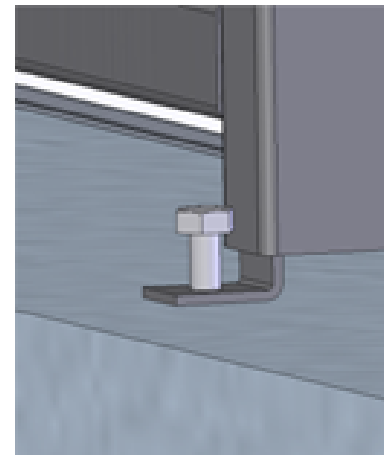
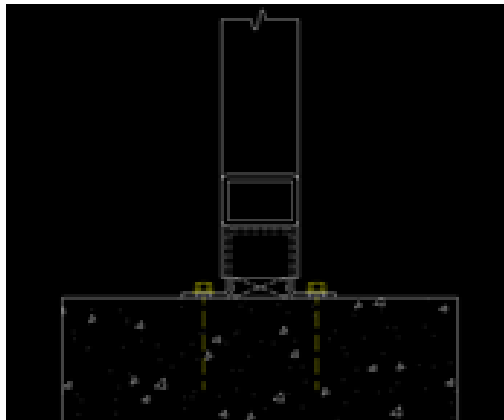


FIT HAT CLIPS INTO
VERTICAL TUBE
STEEL AT BOTH
ENDS



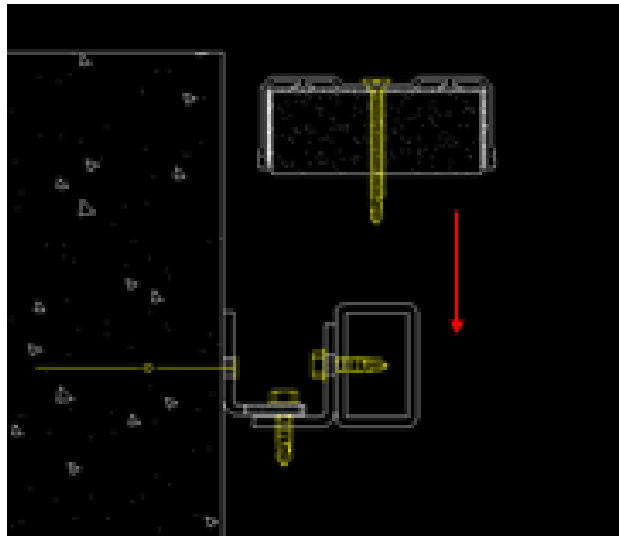
GPX Doors and Framing

SET ASSEMBLED
FRAMING IN OPENING,
THEN FASTEN TO
PERIMETER STRUCTURE

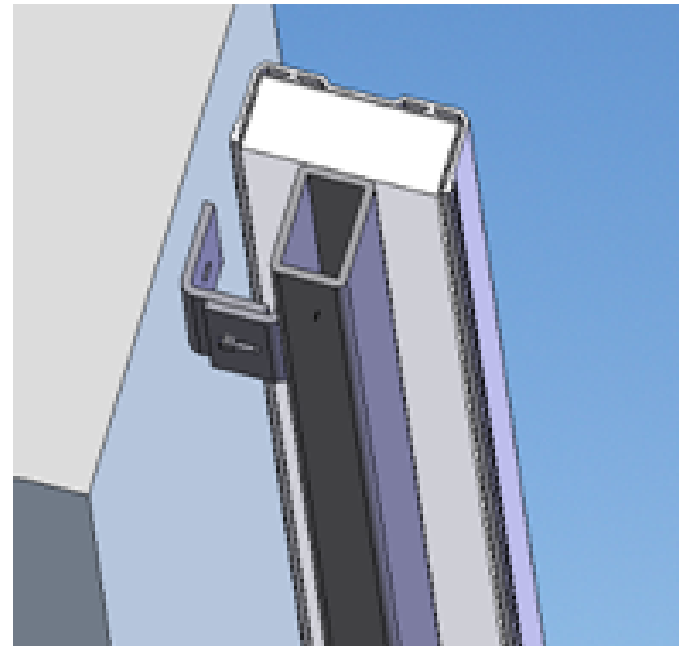




GPX Doors and Framing



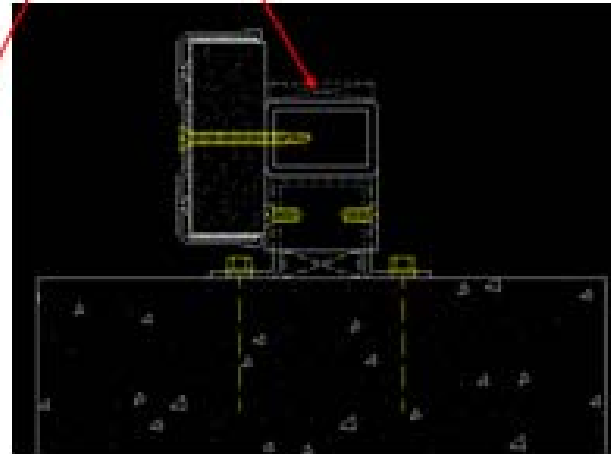
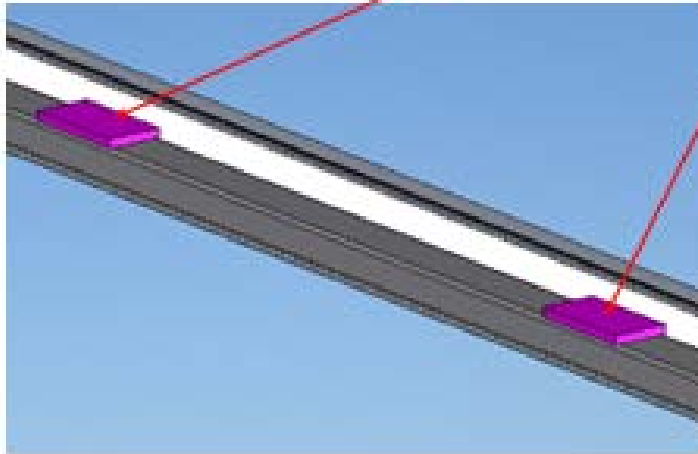
FASTEN PRESSURE CAP
ASSEMBLY ON ONE SIDE OF
TUBE STEEL FRAMING, THEN
ALIGN AND CONNECT JAMB
CLIPS



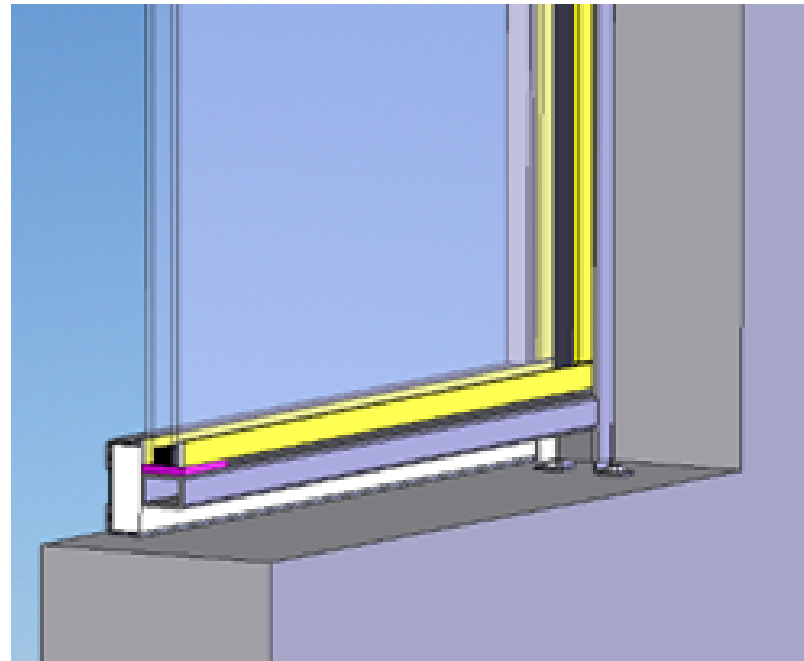
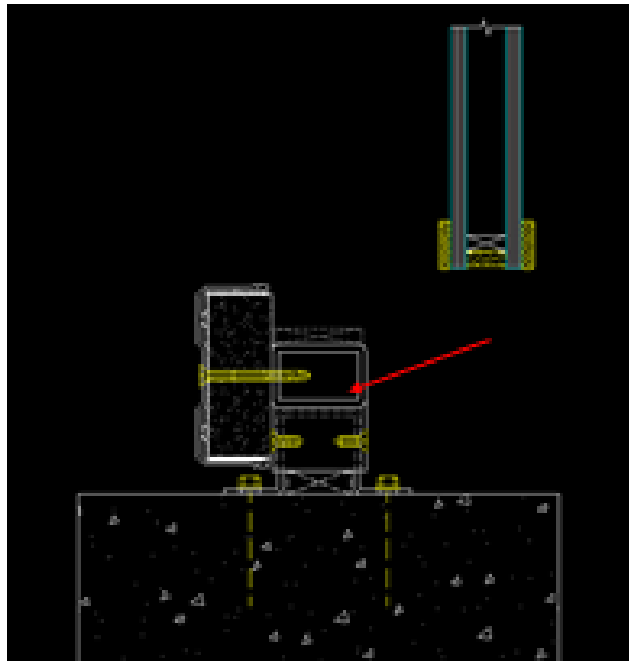


GPX Doors and Framing

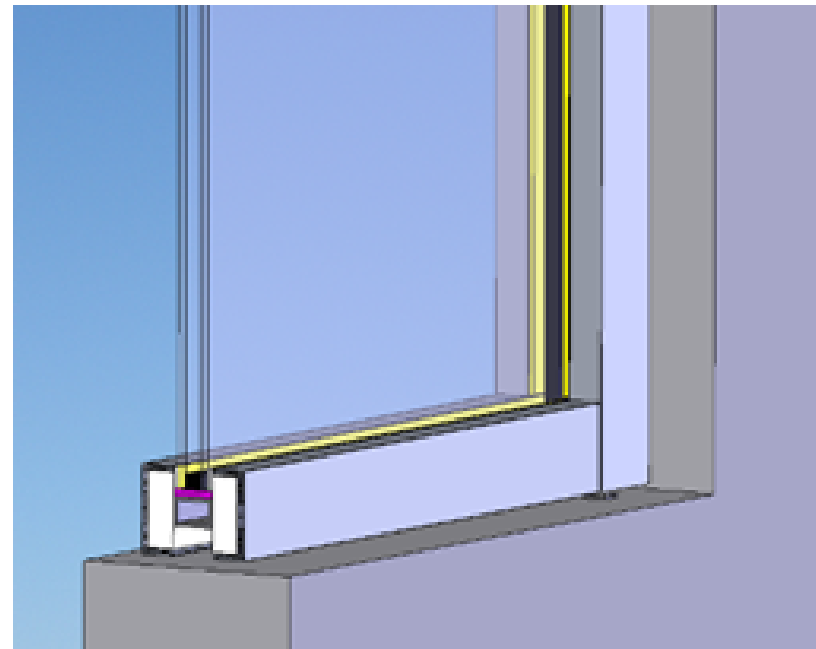
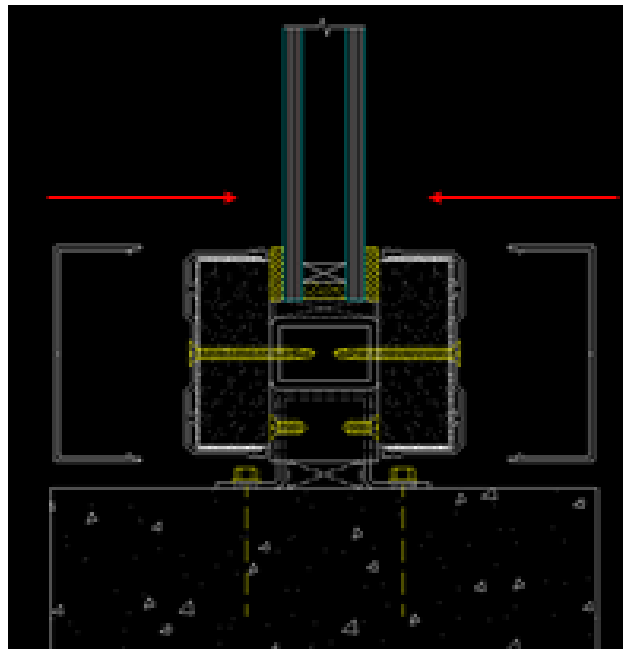
SETTING BLOCK
(2 PER LITE)



SET GLAZING ON SETTING BLOCK



ATTACH SNAP-ON COVERS

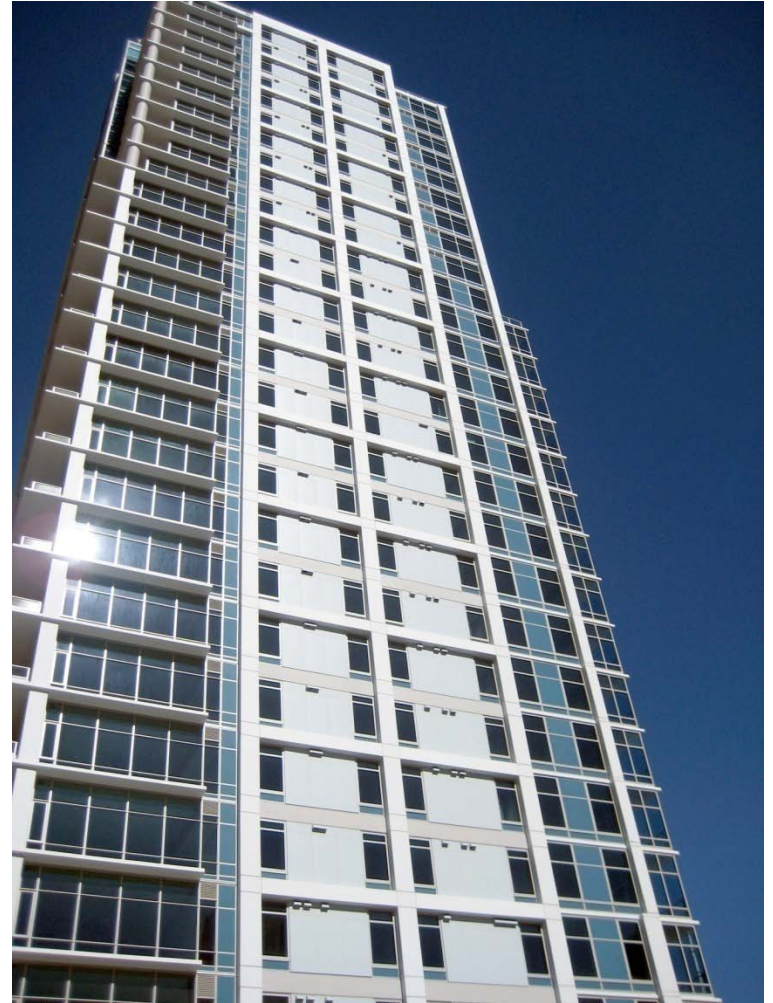


Fire Resistive Glazing and Framing Applications

- Wall/Window systems up to 2 hours



- Property Line Applications (with energy efficient and sound reducing make-ups)



Fire Rated Door, Sidelite/Transom Guidelines

Application	Rating	Product	Limits
Door vision panel	20	20-Minute Tempered	Max. size tested
Door, Sidelite/transom	45	45-Minute Fire Resistive Safety wired Safety ceramic Specialty tempered ¹	Max. size tested
Door vision panel	60/90	60/90 Specialty Fire Protective Safety Wired Safety Ceramic	100 sq. ins. ²
Door vision panel	60/90	60 or 90-Minute Fire Resistive	Max. size tested
Sidelite/transom	60	60-Minute Fire Resistive	Max. size tested
Sidelite/transom	120	120-Minute Fire Resistive	Max. size tested

¹ AHJ approval needed.

² Some AHJs may allow larger sizes. Consult with the local AHJ for clarification.

Fire Rated Window Opening/Wall Guidelines

Application	Rating	Product	Limits
Interior windows	20	Fire resistive tempered Wired glass and safety wired glass Ceramic and safety ceramic Fire protective ¹	Max. size tested Is safety rating required? 25% area limits
Interior and exterior windows	45	Fire resistive 45 Wired glass and safety wired glass Ceramic and safety ceramic Specialty fire protective ¹	Max. size tested Is safety rating required? 25% area limits
Interior exit enclosures/passageways	60	Fire resistive 60	Fire protection glazing not allowed Max. size tested
Exterior windows	90	Fire resistive tempered Wired glass and safety wired glass Ceramic and safety ceramic	Max. size tested Is safety rating required? 25% limits
Interior 2 hour walls	120	Fire resistive 120	Max. size tested

¹ AHJ approval needed.

Questions

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