

2021 Virginia Construction Code

CHAPTER 7 FIRE AND SMOKE PROTECTION FEATURES

SECTION 716 OPENING PROTECTIVES

716.1 General.

Opening protectives required by other sections of this code shall comply with the provisions of this section and shall be installed in accordance with [NFPA 80](#).

**TABLE 716.1(1)
MARKING FIRE-RATED GLAZING ASSEMBLIES**

FIRE TEST STANDARD	MARKING	DEFINITION OF MARKING
ASTM E119 or UL 263	W	Meets wall assembly criteria.
ASTM E119 or UL 263	FC	Meets floor/ceiling criteria ^a
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 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.

For SI: °C = [(°F) – 32]/1.8.

- a. See [Section 2409.1](#)

**TABLE 716.1(2)
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DO OR VISION PANEL SIZE ^a	FIRE-RATED GLAZING MARKING DOOR VISION PANEL ^b	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/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	See Note a	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3 ^d	See Note a	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	2	1½	100 sq. in.	≤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.	≤100 sq. in. = D-H-90 >100 sq. in. = D-H-W-90	Not Permitted	1½	Not Permitted	W-90

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Double fire walls constructed in accordance with NFPA 221	Single-wall assembly rating (hours) ^e	Each wall of the double-wall assembly (hours) ^f	—						
	4	3	3	See Note a	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	3	2	1½	100 sq. in.	≤ 100 sq. in. = D-H-90 >100 sq. in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
	2	1	1	100 sq. in.	≤ 100 sq. in. = D-H-60 > 100 sq. in. = D-H-W-60	Not Permitted	1	Not Permitted	W-60
Enclosures for shafts, interior exit stairways and interior exit ramps.	2		1½	100 sq. in. ^b	≤100 sq. in. = D-H-90 > 100 sq. in.= D-H-T-W-90	Not Permitted	2	Not Permitted	W-120
Horizontal exits in fire walls ^g	4		3	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.=D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3 ^d	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.=D-H-W-180	Not Permitted	3	Not Permitted	W-180
Fire barriers having a required fire-resistance rating of 1 hour: Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways and interior exit ramps; and exit passageway walls	1		1	100 sq. in.	≤100 sq. in. = D-H-60 >100 sq. in.=D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
Fire protection									
Other fire barriers	1		¾	Maximum size tested	D-H	¾ ^h		D-H ^h	

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Fire partitions: Corridor walls	1	$\frac{1}{3}^a$	Maximum size tested	D-20	$\frac{3}{4}^a$	D-H-OH-45	
	0.5	$\frac{1}{3}^a$	Maximum size tested	D-20	$\frac{1}{3}$	D-H-OH-20	
Other fire partitions	1	$\frac{3}{4}^i$	Maximum size tested	D-H-45	$\frac{3}{4}$	D-H-45	
	0.5	$\frac{1}{3}$	Maximum size tested	D-H-20	$\frac{1}{3}$	D-H-20	
Exterior walls	3	$1\frac{1}{2}$	100 sq. in. ^a	≤ 100 sq. in. = D-H-90 > 100 sq. in. = D-H-W-90	Not Permitted	3	Not Permitted W-180
	2	$1\frac{1}{2}$	Maximum size tested	D-H 90 or D-H-W-90	$1\frac{1}{2}^h$	2	D-H-OH-90 ^h W-120
					Fire protection		
	1	$\frac{3}{4}$	Maximum size tested	D-H-45	$\frac{3}{4}^h$	D-H-45 ^h	
					Fire protection		
Smoke barriers					Fire protection		
	1	$\frac{1}{3}$	Maximum size tested	D-20	$\frac{3}{4}$	D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

- Fire-resistance-rated glazing tested to [ASTM E119](#) in accordance with [Section 716.1.2.3](#) shall be permitted, in the maximum size tested.
- Under the column heading "Fire-rated glazing marking door vision panel," W refers to the fire-resistance rating of the glazing, not the frame.
- See [Section 716.1.2.2.1](#) and [Table 716.1\(1\)](#) for additional permitted markings.
- Two doors, each with a fire protection rating of $1\frac{1}{2}$ 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.

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- e. As required in Section 706.4.
- f. As allowed in Section 4.6 of NFPA 221.
- g. See Section 716.2.5.1.2.
- h. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 of the *International Fire Code* to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3, shall be permitted.
- i. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

TABLE 716.1(3)
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
Atrium separations (Section 707.3.6), Incidental use areas (Section 707.3.7), ^c Mixed occupancy separations (Section 707.3.9)	1	³ / ₄	OH-45 or W-60
Fire partitions	1	³ / ₄	OH-45 or W-60
	0.5	¹ / ₃	OH-20 or W-30
Smoke barriers	1	³ / ₄	OH-45 or W-60
Exterior walls	>1	1 ¹ / ₂	OH-90 or W-XXX ^b
	1	³ / ₄	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 716.1.2.3.
- b. XXX = The fire rating duration period in minutes, which shall be equal to the fire-resistance rating required for the wall assembly.
- c. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 of the *International Fire Code* to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3, shall be permitted.

716.1.1 Alternative methods for determining fire protection ratings.

The application of any of the alternative methods specified in this section shall be based on the fire exposure and acceptance criteria specified in [NFPA 252](#), [NFPA 257](#), [UL 9](#), [UL 10B](#) or [UL 10C](#). The required *fire resistance* of an opening protective shall be permitted to be established by any of the following methods or procedures:

1. Designs documented in *approved* sources.
2. Calculations performed in an *approved* manner.
3. Engineering analysis based on a comparison of opening protective designs having *fire protection ratings* as determined by the test procedures set forth in [NFPA 252](#), [NFPA 257](#), [UL 9](#), [UL 10B](#) or [UL 10C](#).
4. Alternative protection methods as allowed by [Section 112.2](#).

716.1.2 Glazing.

Glazing used in *fire door assemblies* and *fire window assemblies* shall comply with this section in addition to the requirements of [Sections 716.2](#) and [716.3](#), respectively.

716.1.2.1 Safety glazing.

Fire-protection-rated glazing and *fire-resistance-rated* glazing installed in *fire door assemblies* and *fire window assemblies* shall comply with the safety glazing requirements of [Chapter 24](#) where applicable.

716.1.2.2 Marking fire-rated glazing assemblies.

Fire-rated glazing assemblies shall be marked in accordance with [Tables 716.1\(1\)](#), [716.1\(2\)](#) and [716.1\(3\)](#).

716.1.2.2.1 Fire-rated glazing identification.

For *fire-rated glazing*, the *label* shall bear the identification required in [Tables 716.1\(1\)](#) and [716.1\(2\)](#). “D” indicates that the glazing is permitted to be used in *fire door assemblies* and meets the fire protection requirements of [NFPA 252](#), [UL 10B](#) or [UL 10C](#). “H” indicates that the glazing meets the hose stream requirements of [NFPA 252](#), [UL 10B](#) or [UL 10C](#). “T” indicates that the glazing meets the temperature requirements of [Section 716.2.2.3.1](#). The placeholder “XXX” represents the fire-rating period, in minutes.

716.1.2.2.2 Fire-protection-rated glazing identification.

For *fire-protection-rated* glazing, the *label* shall bear the following identification required in [Tables 716.1\(1\)](#) and [716.1\(3\)](#): “OH - XXX.” “OH” indicates that the glazing meets both the fire protection and the hose-stream requirements of [NFPA 257](#) or [UL 9](#) and is permitted to be used in fire window openings. The placeholder “XXX” represents the fire-rating period, in minutes.

716.1.2.2.3 Fire-resistance-rated glazing identification.

For fire-resistance-rated glazing, the label shall bear the identification required in [Section 703.4](#) and [Table 716.1\(1\)](#).

716.1.2.2.4 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.

716.1.2.3 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 E119](#) or [UL 263](#) and labeled in accordance with [Section 703.4](#) shall not otherwise be required to comply with this section where used as part of a wall or floor/ceiling assembly.

716.1.2.3.1 Glazing in fire door and fire window assemblies.

Fire-resistance-rated glazing shall be permitted in *fire door* and *fire window assemblies* where tested and installed in accordance with their listings and where in compliance with the requirements of this section.

716.2 Fire door assemblies.

Fire door assemblies required by other sections of this code shall comply with the provisions of this section. *Fire door* frames with transom lights, sidelights or both shall be permitted in accordance with [Section 716.2.5.4](#).

716.2.1 Testing requirements.

Approved *fire door* and fire shutter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of [Sections 716.2.1.1](#) through [716.2.1.4](#) and the *fire protection rating* indicated in [Table 716.1\(2\)](#).

Exceptions:

1. Labeled protective assemblies that conform to the requirements of this section or [UL 10A](#), [UL 14B](#) and [UL 14C](#) for tin-clad *fire door assemblies*.

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2. Floor fire door assemblies in accordance with [Section 712.1.13.1](#).

716.2.1.1 Side-hinged or pivoted swinging doors.

Fire door assemblies with side-hinged and pivoted swinging doors shall be tested in accordance with [NFPA 252](#) or [UL 10C](#). For tests conducted in accordance with [NFPA 252](#), the fire test shall be conducted using the positive pressure method specified in the standard.

716.2.1.2 Other types of assemblies.

Fire door assemblies with other types of doors, including swinging elevator doors, horizontal sliding fire doors, rolling steel fire doors, fire shutters, bottom- and side-hinged chute intake doors, and top-hinged chute discharge doors, shall be tested in accordance with [NFPA 252](#) or [UL 10B](#). For tests conducted in accordance with [NFPA 252](#), the neutral pressure plane in the furnace shall be maintained as nearly equal to the atmospheric pressure as possible at the top of the door, as specified in the standard.

716.2.1.3 Glazing in transoms lights and sidelights in corridors and smoke barriers.

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 716.3.1.1](#).

716.2.1.4 Smoke and draft control.

Fire door assemblies located in smoke barrier walls shall also meet the requirements for a smoke and draft control door assembly tested in accordance with [UL 1784](#).

716.2.2 Performance requirements.

Fire door assemblies shall be installed in the assemblies specified in [Table 716.1\(2\)](#) and shall comply with the fire protection rating specified.

716.2.2.1 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 716.1\(2\)](#) shall be tested in accordance with [NFPA 252](#) or [UL 10C](#) without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have not less than a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. Corridor door assemblies in occupancies of Group I-2 shall be in accordance with [Section 407.3.1](#).
3. Unprotected openings shall be permitted for corridors in multitheater complexes where each motion picture auditorium has not fewer than one-half of its required exit or exit access doorways opening directly to the exterior or into an exit passageway.
4. Horizontal sliding doors in smoke barriers that comply with [Sections 408.6](#) and [408.8.4](#) in occupancies in Group I-3.

716.2.2.1.1 Smoke and draft control.

The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.01524 m³/s × m²) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. [Terminated stops shall be prohibited on doors required by Section 405.4.3 to comply with Section 716.2.2.1 and prohibited on doors required by Item 3 of Section 3006.3, or Section 3007.6.3 or 3008.6.3 to comply with this section.](#)

716.2.2.2 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 716.1\(2\)](#) shall be tested in accordance with [NFPA 252](#), [UL 10B](#) or [UL 10C](#) with the hose stream test.

716.2.2.3 Doors in interior exit stairways and ramps and exit passageways.

Fire door assemblies in interior exit stairways and ramps and exit passageways shall have a maximum transmitted temperature rise of not more than 450°F (250°C) above ambient at the end of 30 minutes of standard fire test exposure.

Exception: The maximum transmitted temperature rise is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with [Section 903.3.1.1](#) or [903.3.1.2](#).

716.2.2.3.1 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. Listed fire-resistance-rated glazing in a fire door shall have a maximum transmitted temperature rise in accordance with [Section 716.2.2.3](#) when the fire door is tested in

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accordance with [NFPA 252](#), [UL 10B](#) or [UL 10C](#).

716.2.3 Fire doors

Fire doors installed within a *fire door assembly* shall meet the fire rating indicated in [Table 716.1\(2\)](#).

716.2.4 Fire door frames.

Fire door frames installed as part of a *fire door assembly* shall meet the fire rating indicated in [Table 716.1\(2\)](#).

716.2.5 Glazing in fire door assemblies.

Fire-rated glazing conforming to the opening protection requirements in [Section 716.2.1](#) shall be permitted in *fire door assemblies*.

716.2.5.1 Size limitations.

Fire-resistance-rated glazing shall comply with the size limitations in [Section 716.2.5.1.1](#). Fire-protection-rated glazing shall comply with the size limitations of [NFPA 80](#), and as provided in [Section 716.2.5.1.2](#).

716.2.5.1.1 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](#), [UL 10B](#) or [UL 10C](#) shall be permitted in *fire door assemblies* located in *fire walls* and in *fire barriers* in accordance with [Table 716.1\(2\)](#) to the maximum size tested and in accordance with their listings.

716.2.5.1.2 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 716.2.5.1.2.1](#) and [716.2.5.1.2.2](#).

716.2.5.1.2.1 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).

716.2.5.1.2.2 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).

716.2.5.2 Elevator, stairway and ramp protectives.

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

716.2.5.3 Glazing in door assemblies in corridors and smoke barriers.

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.

716.2.5.4 Fire door frames with transom lights and sidelights.

Fire-protection-rated glazing shall be permitted in door frames with transom lights, sidelights or both, where a ¾-hour *fire protection rating* or less is required and in 2-hour fire-resistance-rated *exterior walls* in accordance with [Table 716.1\(2\)](#). *Fire door frames* with transom lights, sidelights or both, 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 716.1\(2\)](#).

716.2.5.4.1 Energy storage system separation.

Fire-protection-rated glazing shall not be permitted in *fire door frames* with transom lights and sidelights in *fire barriers* required by [Section 1207](#) of the *International Fire Code* to enclose energy storage systems.

716.2.6 Fire door hardware and closures.

Fire door hardware and closures shall be installed on *fire door assemblies* in accordance with the requirements of this section.

716.2.6.1 Door closing.

Fire doors shall be latching and self- or automatic-closing in accordance with this section.

Exceptions:

1. *Fire doors* located in common walls separating *sleeping units* in Group R-1 shall be permitted without automatic- or *self-closing* devices.
2. The elevator car doors and the associated hoistway enclosure doors at the floor level designated for recall in accordance with [Section 3003.2](#) shall be permitted to remain open during Phase I emergency recall operation.

716.2.6.2 Latch required.

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Unless otherwise specifically permitted, single side-hinged *swinging fire doors* and both leaves of pairs of side-hinged swinging *fire doors* shall be provided with an active latch bolt that will secure the door when it is closed.

716.2.6.3 Chute intake door latching.

Chute intake doors shall be positive latching, remaining latched and closed in the event of latch spring failure during a fire emergency.

716.2.6.4 Automatic-closing fire door assemblies.

Automatic-closing *fire door assemblies* shall be *self-closing* in accordance with [NFPA 80](#).

716.2.6.5 Delayed-action closers.

Doors required to be *self-closing* and not required to be automatic closing shall be permitted to be equipped with *delayed-action closers*.

716.2.6.6 Smoke-activated doors.

Automatic-closing doors installed in the following locations shall be permitted to have hold-open devices. Doors shall automatically close 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. Automatic-closing doors that protect openings installed in the following locations shall comply with this section:

1. In walls that separate incidental uses in accordance with [Section 509.4](#).
2. In *fire walls* in accordance with [Section 706.8](#).
3. In *fire barriers* in accordance with [Section 707.6](#).
4. In *fire partitions* in accordance with [Section 708.6](#).
5. In *smoke barriers* in accordance with [Section 709.5](#).
6. In *smoke partitions* in accordance with [Section 710.5.2.3](#).
7. In *shaft enclosures* in accordance with [Section 713.7](#).
8. In waste and linen chutes, discharge openings and access and discharge rooms in accordance with [Section 713.13](#). Loading doors installed in waste and linen chutes shall meet the requirements of [Sections 716.2.6.1](#) and [716.2.6.3](#).

716.2.6.7 Doors in pedestrian ways.

Vertical sliding or vertical rolling steel *fire doors* in openings through which pedestrians travel shall be heat activated or activated by smoke detectors with alarm verification.

716.2.7 Swinging fire shutters.

Where fire shutters of the swinging type are installed in exterior openings, not less than one row in every three vertical rows shall be arranged to be readily opened from the outside, and shall be identified by distinguishing marks or letters not less than 6 inches (152 mm) high.

716.2.8 Rolling fire shutters.

Where fire shutters of the rolling type are installed, such shutters shall include *approved* automatic-closing devices.

716.2.9 Labeled protective assemblies.

Fire door assemblies shall be labeled by an *approved agency*. The *labels* shall comply with [NFPA 80](#), and shall be permanently affixed to the door or frame.

716.2.9.1 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 *interior exit stairways and ramps* and *exit passageways* by [Section 716.2.2.3](#), the maximum transmitted temperature end point. Smoke and draft control doors complying with [UL 1784](#) shall be *labeled* as such and shall comply with [Section 716.2.9.3](#). *Labels* shall be *approved* and permanently affixed. The *label* shall be applied at the factory or location where fabrication and assembly are performed.

716.2.9.1.1 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. *Fire doors* and *fire door assemblies* shall be permitted to consist of components, including glazing, vision light kits and hardware that are *listed* or classified and *labeled* for such use by different third-party agencies.

716.2.9.2 Oversized doors.

Oversized *fire doors* shall bear an oversized *fire door label* by an *approved agency* or shall be provided with a certificate of inspection furnished by an *approved* testing agency. Where a certificate of inspection is furnished by an *approved*

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testing agency, the certificate shall state that the door conforms to the requirements of design, materials and construction, but has not been subjected to the fire test.

716.2.9.3 Smoke and draft control door labeling requirements.

Smoke and draft control doors complying with [UL 1784](#) shall be *labeled* in accordance with [Section 716.2.9.1](#) and shall show the letter “S” on the fire-rating *label* of the door. This marking shall indicate that the door and frame assembly are in compliance where *listed or labeled* gasketing is installed.

716.2.9.4 Fire door frame labeling requirements.

Fire door frames shall be labeled showing the names of the manufacturer and the third-party inspection agency.

716.2.9.5 Labeling.

Fire-rated glazing shall bear a *label* or other identification showing the name of the manufacturer, the test standard and information required in [Table 716.1\(1\)](#) that shall be issued by an *approved agency* and shall be permanently identified on the glazing.

716.2.9.6 Fire door operator labeling requirements.

Fire door operators for horizontal sliding doors shall be *labeled* and *listed* for use with the assembly.

716.2.10 Installation of door assemblies in corridors and smoke barriers.

Installation of smoke doors shall be in accordance with [NFPA 105](#).

716.3 Fire window assemblies.

Fire window assemblies required by other sections of this code shall comply with the provisions of this section.

716.3.1 Testing requirements.

Fire window assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of [Sections 716.3.1.1](#) and [716.3.1.2](#) and the *fire protection rating* indicated in [Table 716.1\(3\)](#).

716.3.1.1 Testing under positive pressure.

[NFPA 257](#) or [UL 9](#) shall evaluate fire-protection-rated glazing under positive pressure. Within the first 10 minutes of a test, the pressure in the furnace shall be adjusted so not less than two-thirds of the test specimen is above the neutral pressure plane, and the neutral pressure plane shall be maintained at that height for the balance of the test.

716.3.1.2 Nonsymmetrical glazing systems.

Nonsymmetrical fire-protection-rated glazing systems in *fire partitions*, *fire barriers* or in *exterior walls* with a *fire separation distance* of 10 feet (3048 mm) or less pursuant to [Section 705](#) shall be tested with both faces exposed to the furnace, and the assigned *fire protection rating* shall be the shortest duration obtained from the two tests conducted in compliance with [NFPA 257](#) or [UL 9](#).

716.3.2 Performance requirements.

Fire window assemblies shall be installed in the assemblies and comply with the *fire protection rating* specified in [Table 716.1\(3\)](#).

716.3.2.1 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.

716.3.2.1.1 Where $\frac{3}{4}$ -hour-fire-protection window assemblies permitted.

Fire-protection-rated glazing requiring 45-minute opening protection in accordance with [Table 716.1\(3\)](#) shall be limited to *fire partitions* designed in accordance with [Section 708](#) and *fire barriers* utilized in the applications set forth in [Sections 707.3.6](#), [707.3.7](#) and [707.3.9](#) 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.

716.3.2.1.1.1 Energy storage system separation.

Fire-protection-rated glazing is not permitted for use in *fire window assemblies* in *fire barriers* required by [Section 1207](#) of the *International Fire Code* to enclose energy storage systems.

716.3.2.1.2 Area limitations.

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

716.3.2.1.3 Where $\frac{1}{3}$ -hour-fire-protection window assemblies permitted.

Fire-protection-rated glazing shall be permitted in window assemblies tested to [NFPA 257](#) or [UL 9](#) in *fire partitions* requiring $\frac{1}{3}$ -hour opening protection in accordance with [Table 716.1\(3\)](#).

716.3.3 Fire window frames.

Fire window frames installed with a *fire window assembly* shall meet the fire-protection rating indicated in [Table 716.1\(3\)](#).

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716.3.3.1 Window mullions.

Metal mullions that exceed a nominal height of 12 feet (3658 mm) shall be protected with materials to afford the same *fire-resistance rating* as required for the wall construction in which the protective is located.

716.3.4 Fire-protection-rated glazing.

Glazing in *fire window assemblies* shall be fire protection rated in accordance with this section and [Table 716.1\(3\)](#). 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](#). 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 $\frac{3}{4}$ hour. Fire-protection-rated glazing in $\frac{1}{2}$ -hour fire-resistance-rated partitions is permitted to have a 20-minute *fire protection rating*.

716.3.4.1 Glass and glazing.

Glazing in *fire window assemblies* shall be fire-protection-rated glazing installed in accordance with and complying with the size limitations set forth in [NFPA 80](#).

716.3.5 Labeled protective assemblies.

Glazing in *fire window assemblies* shall be *labeled* by an *approved agency*. The *labels* shall comply with [NFPA 80](#) and [Section 716.3.5.2](#).

716.3.5.1 Fire window frames.

Fire window frames shall be approved for the intended application.

716.3.5.2 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 716.1.2.2.2](#) and [Table 716.1\(3\)](#) that shall be issued by an *approved agency* and permanently identified on the glazing.

716.3.6 Installation.

Fire window assemblies shall be installed in accordance with the provisions of this section.

716.3.6.1 Closure.

Fire-protection-rated glazing shall be in the fixed position or be automatic-closing and shall be installed in *labeled frames*.

716.4 Fire protective curtain assembly.

Approved fire protective curtain assemblies shall be constructed of any materials or assembly of component materials tested without hose stream in accordance with [UL 10D](#), and shall comply with the [Sections 716.4.1 through 716.4.3](#).

716.4.1 Label.

Fire protective curtain assemblies used as opening protectives in fire-rated walls and *smoke partitions* shall be *labeled* in accordance with [Section 716.2.9](#).

716.4.2 Smoke and draft control.

Fire protective curtain assemblies used to protect openings where smoke and draft control assemblies are required shall comply with [Section 716.2.1.4](#).

716.4.3 Installation.

Fire protective curtain assemblies shall be installed in accordance with [NFPA 80](#).