



Presented by: *PSA*

**POWERING
WHAT'S POSSIBLE**

MAY 7 - 11, 2017 | WESTMINSTER, CO

NFPA 80 – Fire Doors

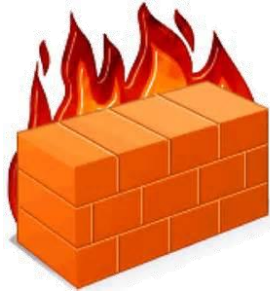
Russell J Corriveau CFDI, CAI, RL

Fire Door Overview



NFPA 80: Swing Fire Doors & NFPA 101: Delayed Egress Devices 20170429 R1

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Fire Doors

Most commercial buildings
have Fire Walls.

All openings within a Fire
Wall must have a Fire Rated
Door according to NFPA 80.



NFPA 80 is the standard for Fire doors and other Opening Protectives



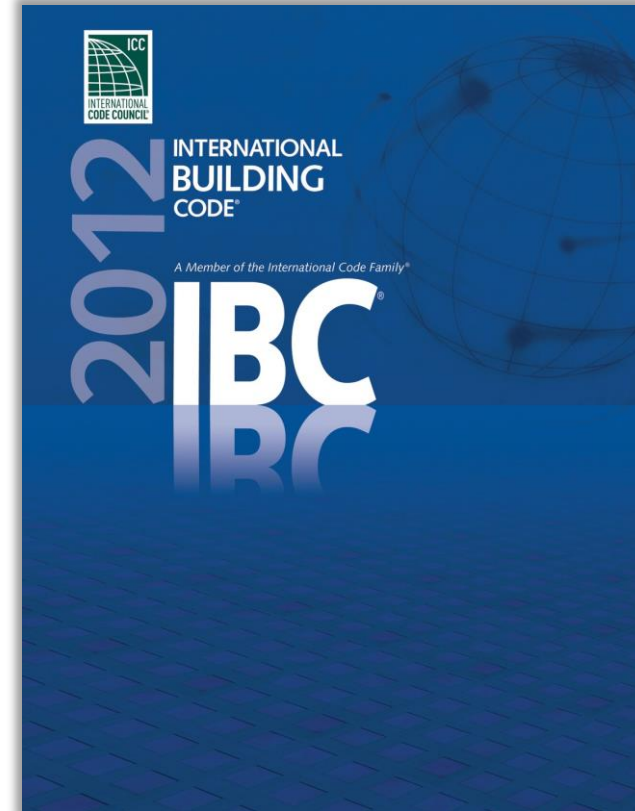
NFPA is the National Fire
Protection Association



Why are Fire Doors and NFPA 80 critical to you?

According to the IBC 2012
(International Building Codes),
Chapter 35 Referenced Standards;

NFPA 80 is referenced in IBC
410.3.5, 509.4.2, 716.5, 716.5.7,
716.5.8.1, 716.5.9.2, 716.6, 716.6.4,
1008.1.4.2, 1008.1.4.3



What is the IBC? International Building Code

The IBC provides minimum standards to insure the public safety, health and welfare in the design and construction of buildings.



International Code Adoption by State as of January 2016

Jurisdiction	IBC
Alabama	S09, L
Alaska	X09
Arizona	S12, L
Arkansas	X12
California	X12
Colorado	S15, L
Connecticut	X03
Delaware	L12
District of Columbia	X12
Florida	X12
Georgia	X12
Hawaii	X06
Idaho	X12
Illinois	S09, L
Indiana	X12
Iowa	S09, L
Kansas	L
Kentucky	X12
Louisiana	X12
Maine	X09
Maryland	X15
Massachusetts	X09
Michigan	X12

Minnesota	X12
Mississippi	S12, L
Missouri	S12, L
Montana	X12
Nebraska	S12, L
Nevada	S12, L
New Hampshire	X09
New Jersey	X15
New Mexico	X09
New York	X06
North Carolina	X09
North Dakota	S12, L
Ohio	X09
Oklahoma	X15
Oregon	X12
Pennsylvania - 16 2015 Amendments in effect 12/31 plus accessibility provisions.	X09

X = Effective Statewide
 S = Statewide adoptions with limitations
 L = Adopted by Local Governments
 ## = Edition of IBC

Rhode Island	X12
South Carolina	X12
South Dakota	S15, L
Tennessee	S06, L
Texas	L
Utah	X12
Vermont	
Virginia	X12
Washington	X12
West Virginia	X12
Wisconsin	X09
Wyoming	X15, L
U.S. Territories	IBC
Guam	X09
Northern Marianas Islands	X09
Puerto Rico	X09
U.S. Virgin Islands	X12

According to the IBC 2012 (International Building Codes),
Chapter 35 Referenced Standards;

NFPA 80 is referenced in IBC 410.3.5, 509.4.2, **716.5**, 716.5.7,
716.5.8.1, 716.5.9.2, 716.6, 716.6.4, 1008.1.4.2, 1008.1.4.3

IBC 716.5 Fire door and shutter assemblies.

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 Section 716.5.1, 716.5.2 or 716.5.3 and the fire protection rating indicated in Table 716.5. Fire door frames with transom lights, sidelights or both shall be permitted in accordance with Section **716.5.6**. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and **NFPA 80**.



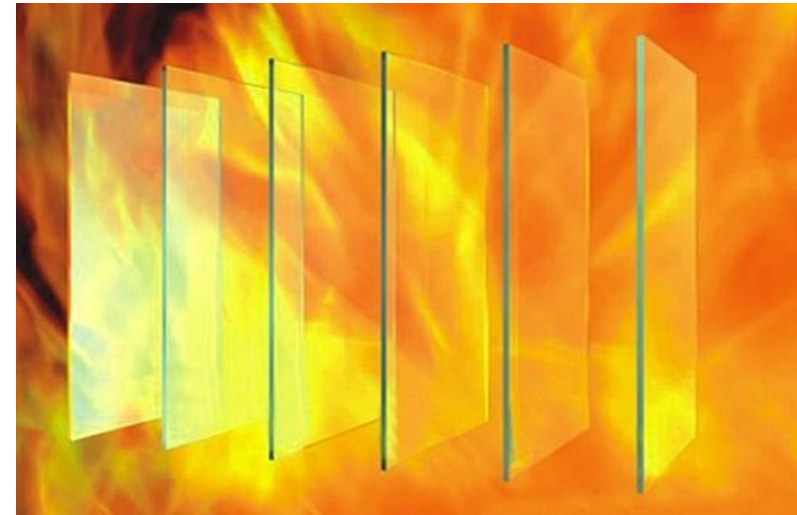
According to the IBC 2012 (International Building Codes),
Chapter 35 Referenced Standards;

NFPA 80 is referenced in IBC 410.3.5, 509.4.2, 716.5, 716.5.7,
716.5.8.1, 716.5.9.2, 716.6, 716.6.4, 1008.1.4.2, 1008.1.4.3

IBC 716.5.8.1 Size limitations.

Fire-protection-rated glazing shall
comply with the size limitations of

NFPA 80, and as provided in Sections
716.5.8.1.1 and 716.5.8.1.2.



According to the IBC 2012 (International Building Codes),
Chapter 35 Referenced Standards;

NFPA 80 is referenced in IBC 410.3.5, 509.4.2, 716.5, 716.5.7,
716.5.8.1, **716.5.9.2**, 716.6, 716.6.4, 1008.1.4.2, 1008.1.4.3

IBC 716.5.9.2 Automatic-closing fire door
assemblies.

Automatic-closing fire door
assemblies shall be self-closing
in accordance with **NFPA 80**



According to the IBC 2012 (International Building Codes),
Chapter 35 Referenced Standards;

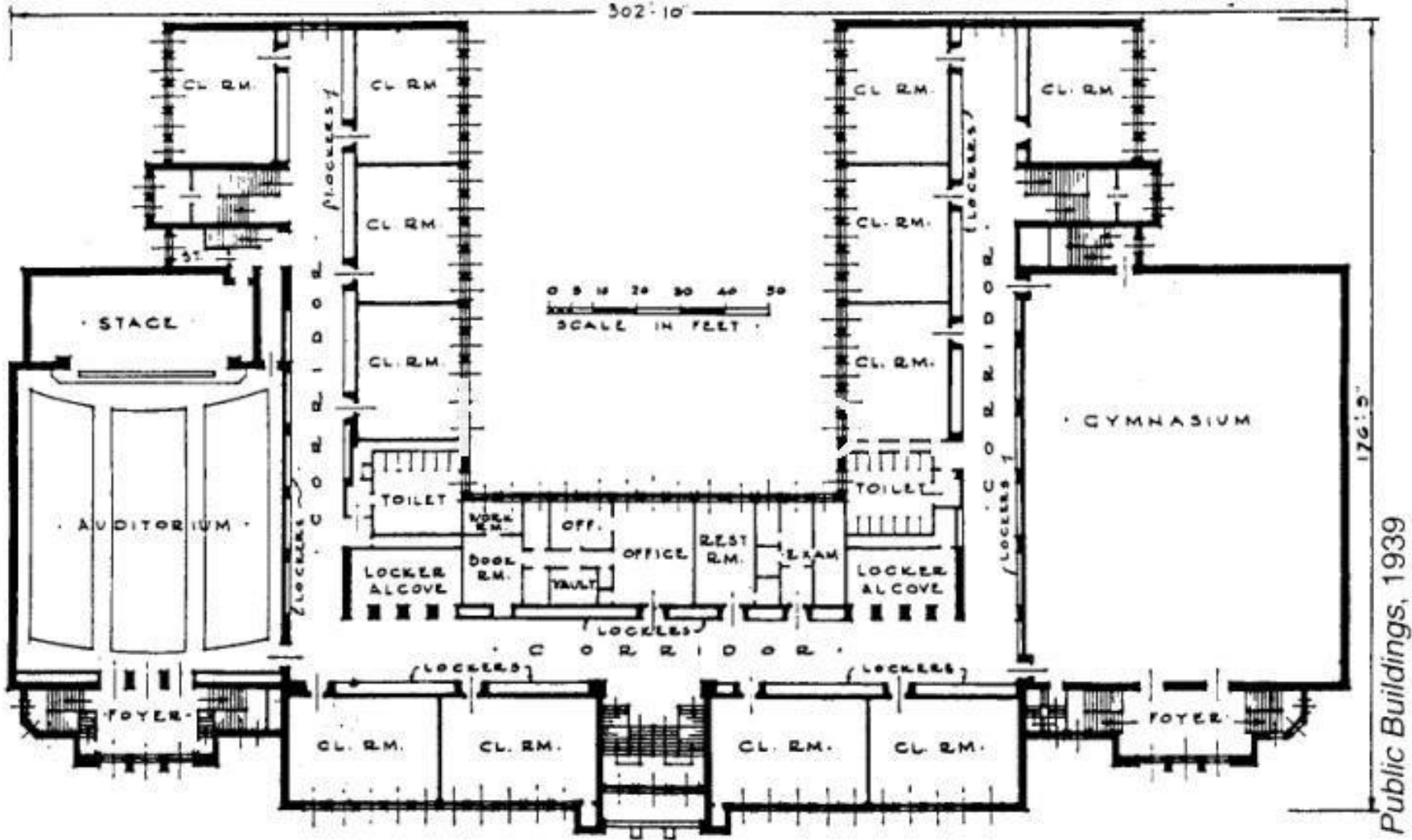
NFPA 80 is referenced in IBC 410.3.5, 509.4.2, 716.5, 716.5.7,
716.5.8.1, 716.5.9.2, 716.6, **716.6.4**, 1008.1.4.2, 1008.1.4.3

IBC 716.6.4 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.**



Where are Fire Walls and doors located within a facility?



Fire Doors Locations

Fire Walls & Doors partition a building to prevent the spread of fire from one section to another.



Fire Doors Locations

Fire Walls and Doors surrounding a stairwells and some corridors.



Fire Doors Locations

Fire walls and doors are also located around hazardous material and/or equipment















Fire Doors Locations



Exterior Walls and Doors may also be fire rated when buildings are in close proximity.

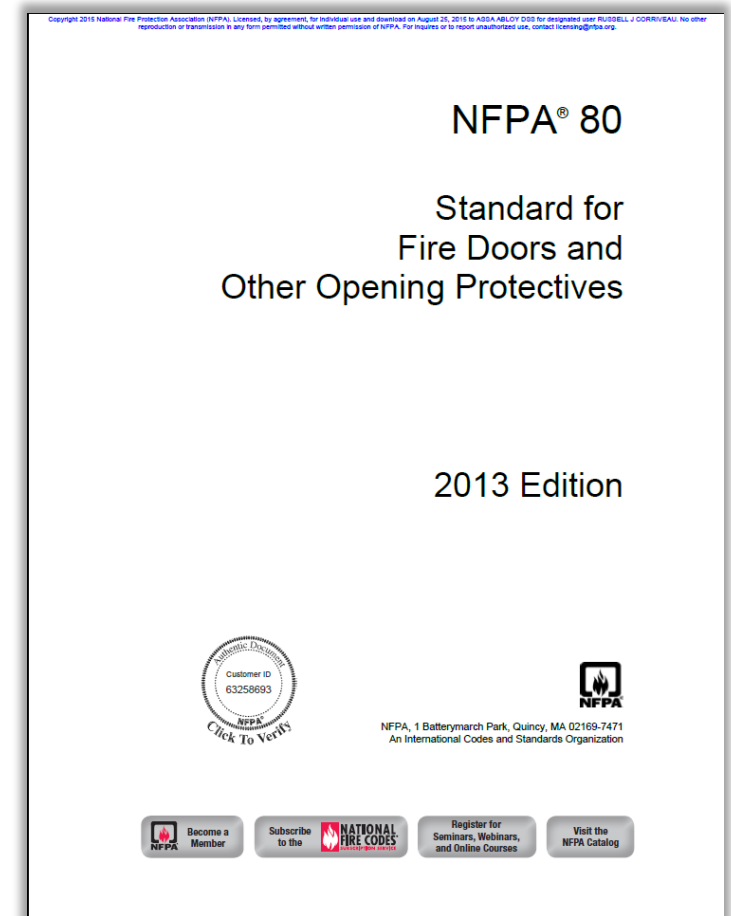
Fire Door Classified Opening

Opening	Class	Rating		Glass
	A	3 Hours		100 Sq. In. per Door Leaf Fire Lite Glass ONLY
	B	1½ Hours		100 Sq. In. per Door Leaf
	C	¾ Hours		1296 Sq. In. per Light more than 1 light allowed
	D	1½ Hours		None
	E	¾ Hours		1296 Sq. In per Light
	No Class Designation	½ Hours (20 Minutes)		1296 Sq. In per Light

Terms

Some important terms

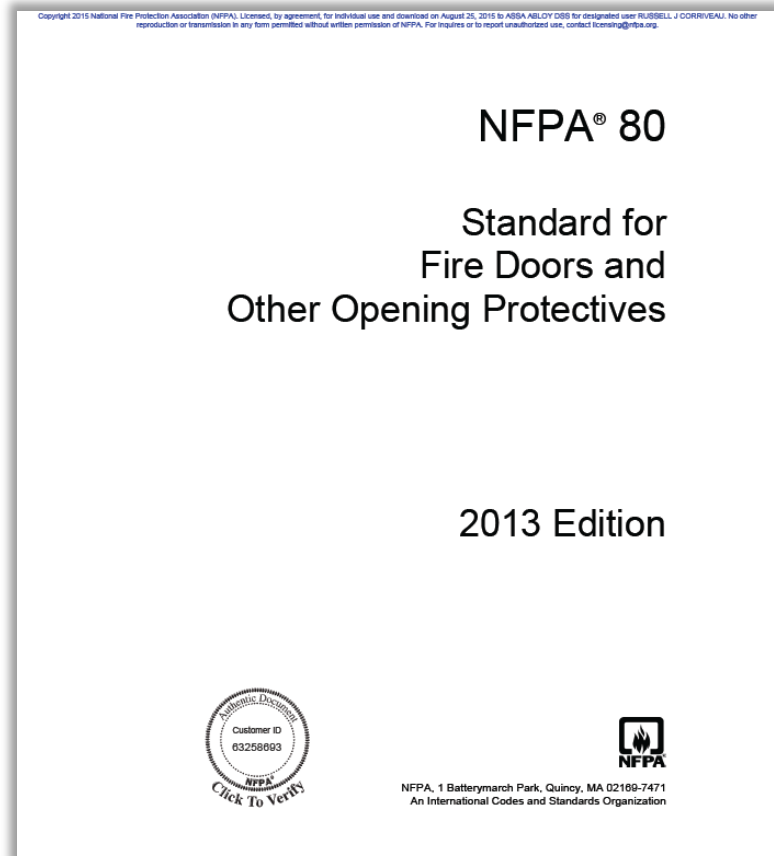
NFPA National Fire Protection Association



NFPA is an independent, non-profit organization which publishes standards and codes relating to many fire related issues and materials

Presentation Explanation

Red Text with a Box is the
exact wording from
NFPA 80 2013



The black text is a simplified
explanation of the requirement.

3.2.2 Authority Having Jurisdiction (AHJ).

An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.¹



The individual,
who makes the
final decisions.

3.2.3 Labeled.

Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.²



Labeled means a Fire Rated Items must have a physically Labeled as specified by code.

3.2.4* Listed.

Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.³

Listed means that a Fire Rated Item must be
Listed and Published by an Organization
acceptable to the AHJ.

How to Locate UL Listed Products



Google Search I'm Feeling Lucky



3.2.5 Shall.

Indicates a mandatory requirement.⁵

Shall means:
No option, Must be done

3.2.6 Should.

Indicates a recommendation or that which is advised but not required.⁶

Should means:
Recommended, but not required

3.3.125 Temperature Rise.

The temperature increase above ambient that has developed on the unexposed face of the fire door assembly at the end of 30 minutes of exposure to the standard fire test.⁷

Temperature Rise

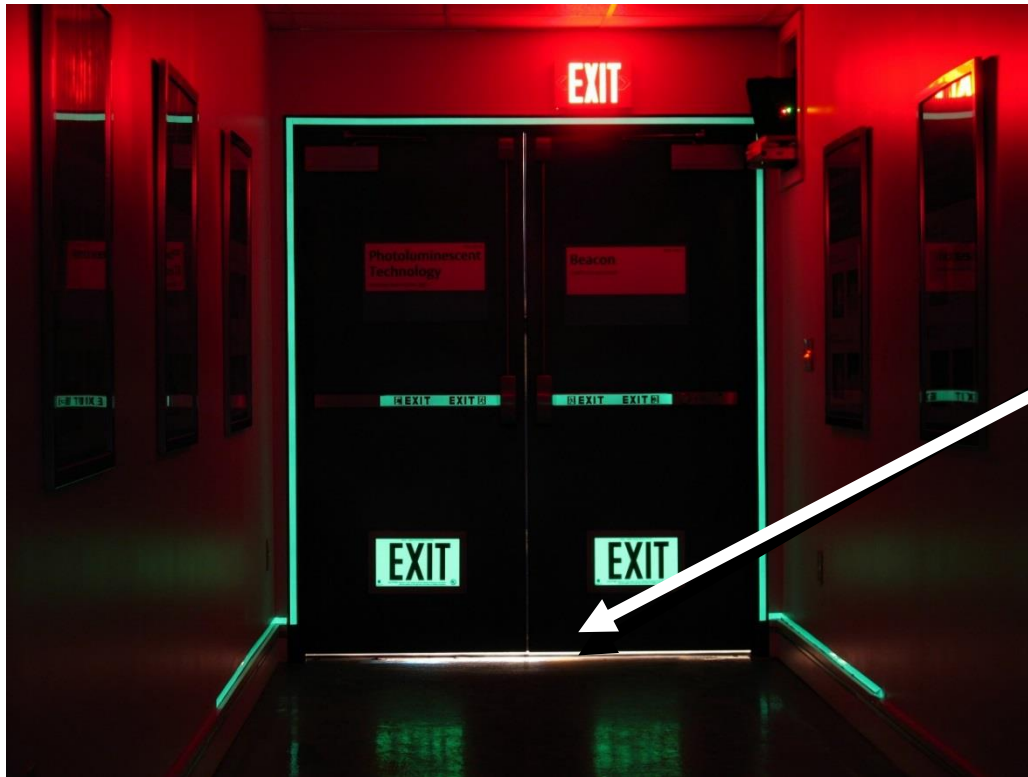
means:

The change in Temperature on the unexposed face of the door after 30 minutes.



4.1.3 Appurtenances.

4.1.3.2 For job site preparation of surface-applied hardware, function holes for mortise locks, and holes for labeled viewers, a maximum 3/4 in. wood and composite door undercutting, and protection plates (see 6.4.5) shall be permitted.⁸



Maximum
Undercut
allowed is
 $\frac{3}{4}$ "



1" Maximum Hole

4.1.3.3 Surface-applied hardware shall be applied to the door or frame without removing material other than drilling round holes to accommodate cylinders, spindles, similar operational elements, and through-bolts in doors.

4.1.3.4 The holes described in 4.1.3.3 shall not be permitted to exceed a diameter of 1 in. with the exception of cylinders.⁹

Field Preparation of Fire Doors:
Only Round holes allowed as required for the hardware,
Maximum hole size 1"; Except a for cylinder

NFPA 80 Chapter 4 General Requirements

4.1.4 Signage. Informational signs shall be permitted to be installed on the surfaces of fire doors in accordance with 4.1.4.1 through 4.1.4.4 or in accordance with the manufacturer's published listing.

4.1.4.1 The total area of all attached signs shall not exceed 5 percent of the area of the face of the fire door to which they are attached.¹⁰

Informative Signage allowed,
Size not to exceed 5%

5% of 7x3 Door is 1 square foot

5% of 10x4 Door is 2 square feet



4.1.4.2 Means of Attachment.
4.1.4.2.1 Signs shall be attached to fire doors by use of an adhesive.¹¹



Signage to be attached with Adhesive only,



4.1.4.2 Means of Attachment.

4.1.4.2.2 Mechanical attachments such as screws or nails shall not be permitted.

NFPA80-2013¹²



No Screws, Tacks, hooks, and/or nails as a means of attachment.



4.1.4.2 Means of Attachment.

4.1.4.3 Signs shall not be installed on glazing material in fire doors. ¹³

No signs may be located over any windows in a fire door.





4.1.4.2 Means of Attachment.

4.1.4.4 Signs shall not be installed on the surface of fire doors so as to impair or otherwise interfere with the proper operation of the fire door.¹⁴

Signage shall not interfere with proper operation of the fire door.



4.3.1 Only labeled fire doors shall be used.

4.3.2 Swinging fire doors shall be permitted to be furnished separately from labeled door frames and builders hardware if the complete fire door assembly, including the door, frame, and builders hardware, comprises a labeled fire door assembly.¹⁵



The labeled Fire Doors, Frames and builders hardware can be installed at the construction site, as long as it consist of a labeled fire door assembly .

NFPA 80 Chapter 4 General Requirements

4.3 Classifications and Types of Doors.

4.3.3 Fire doors furnished with or prepared for fire exit hardware shall bear a label stating “Fire Door to Be Equipped with Fire Exit Hardware.”¹⁶









Fire doors supplied with or prepped for fire exit hardware shall bear a labeled.
“Fire Door to Be Equipped with Fire Exit Hardware.”



NFPA 80 Chapter 4 General Requirements

4.4.4* Fire protection glazing not exceeding 100” square 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 ¹⁷

LABEL	OPENING	RATING	GLASS	DOOR SERIES					
				REGENT™ OMEGA™	LEGION™ ULTRADOR™	IMPERIAL™ VERSADOOR™	MEDALLION™	MEDALLION™ 450°	FUEGO™ 250°
A	Walls separating buildings or walls dividing a building into fire zones	3 hr (180 min.)	100 SQ. Inches per Door Leaf. Min. 6” Stiles						

Fire Glazing/glass not to exceed 100 square inches in 3 hour fire rated doors or 1-1/2-hour fire rating for severe exterior fire exposure locations.

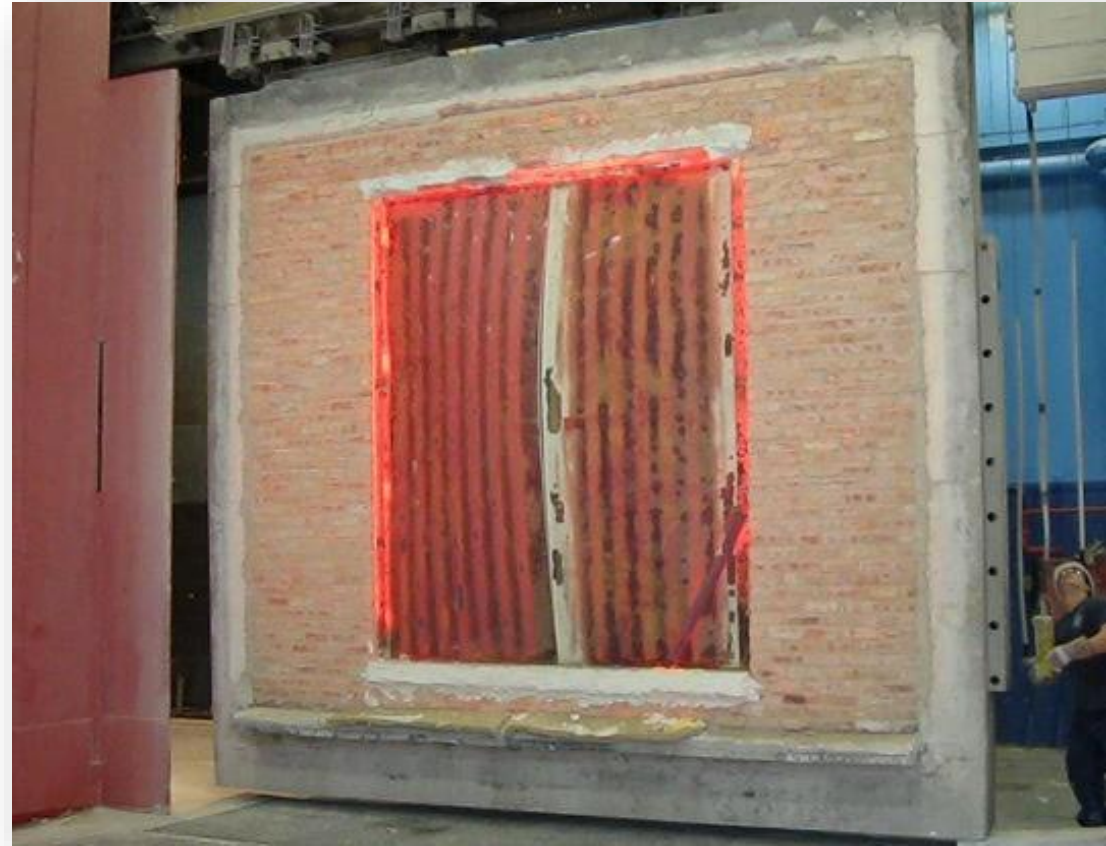
NFPA-252 Standard Methods of Fire

Testing Labs Simulating Real Conditions

NFPA-252 Standard Methods of Fire

Shown is a
8' x 10' pair of doors
mounted in a brick wall after
a 3 hour fire test,

Temperatures exceed 2000 F





After 3 hours in the furnace, the red hot doors are subjected to the hose stream test; after which the Door must remain closed and latched.

Methods of Fire Tests of Door Assemblies.

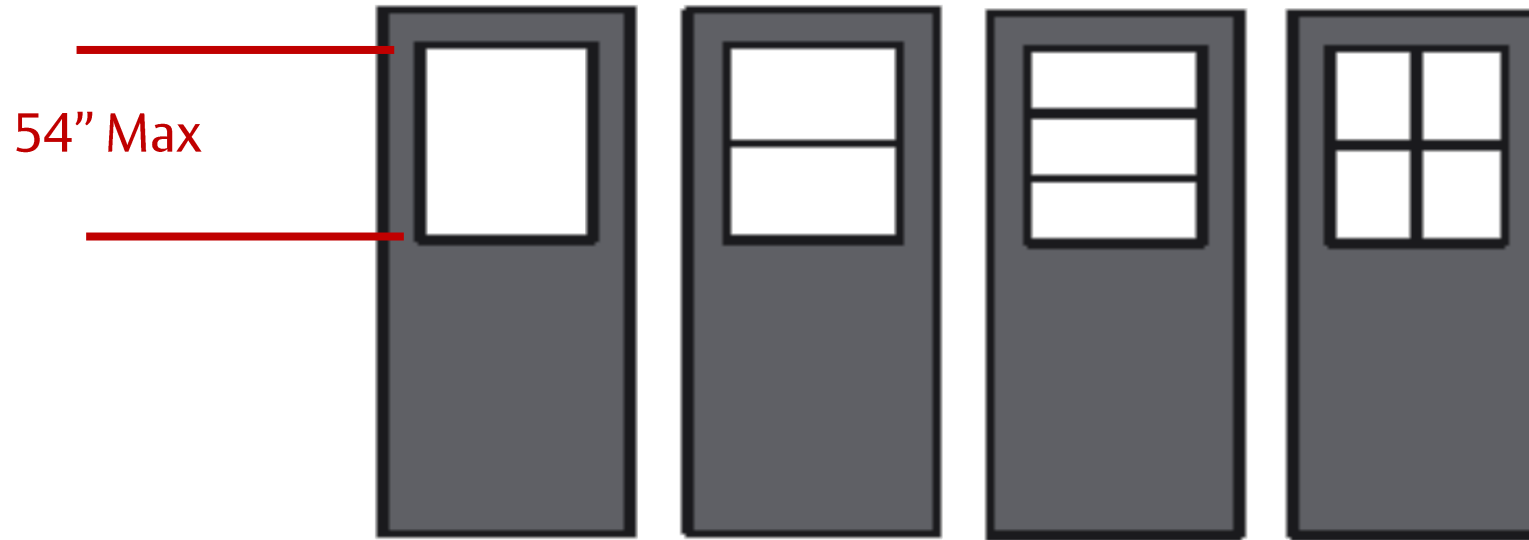
4.4.5* Glazing material shall be permitted in fire doors having the fire protection ratings shown in Table 4.4.5 when tested in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, and shall be limited in size and area in accordance with Table 4.4.5 ¹⁸

Glazing/Glass in Fire Rated Doors must be Fire Rated



Methods of Fire Tests of Door Assemblies.

4.4.5.1 Maximum area of individual exposed lights shall be 1296”sq with no dimension exceeding 54” unless otherwise tested.¹⁹



Maximum Exposed lights 1296"

54" x 24"

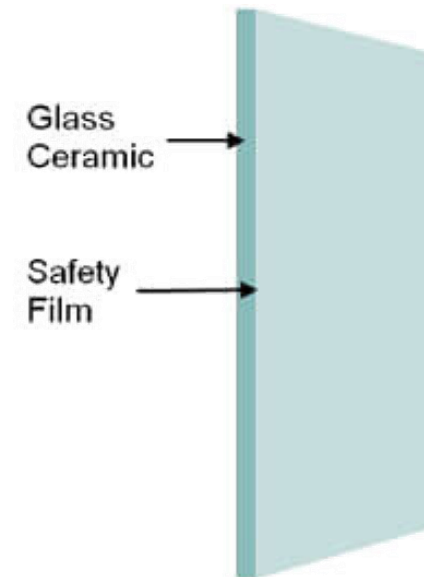
(Maximum Dimension)

(Calculated Minimum Dimension)

Methods of Fire Tests of Door Assemblies.

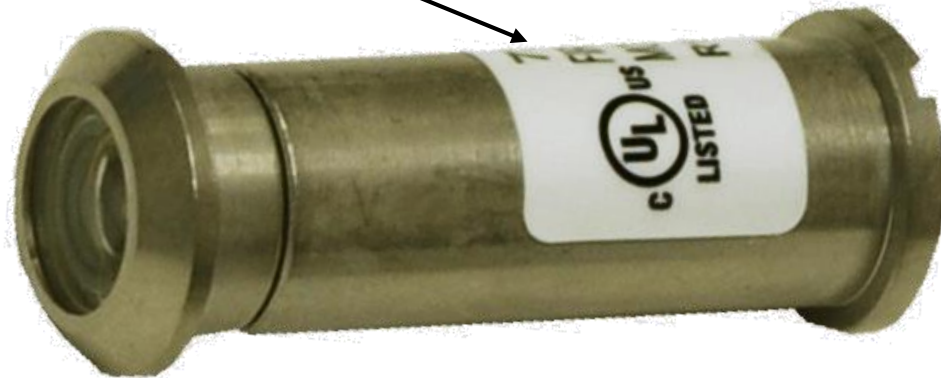
4.4.6 Each individual glazing unit shall be identified with a label that is visible after installation.²⁰

Glazing or glass in a fire rated doors must have a visible Label.



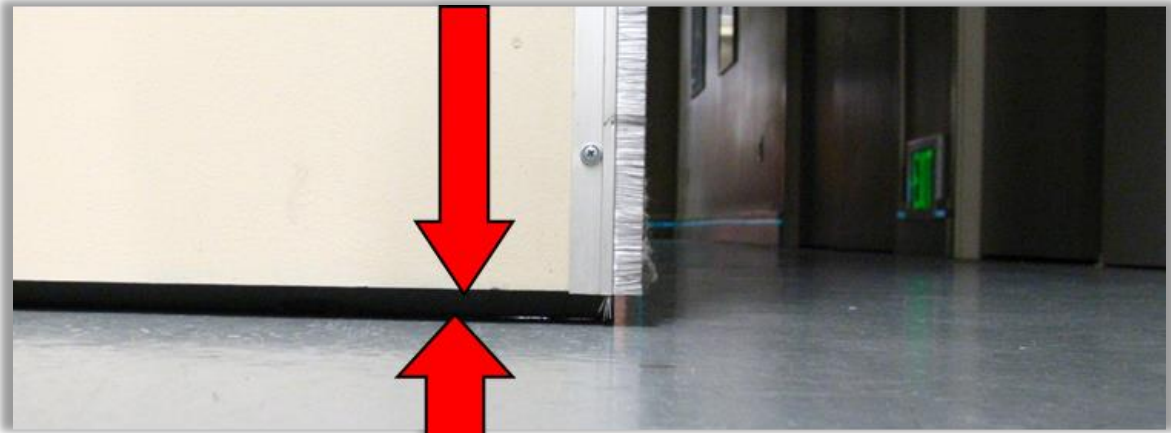
Methods of Fire Tests of Door Assemblies.
4.4.7 Viewers in fire doors shall be labeled.²¹

Viewer's must have an Actual
Label, not just Listed





4.8.4 Clearance.
4.8.4.1* The clearance under the bottom of a door shall be a maximum of 3/4 in.²²



Maximum of 3/4" Undercut

5.1.2 Operability

5.1.2.1 Doors, shutters, and windows shall be operable at all times. ²³

Doors & Windows
must be fully
functional



5.1.2 Operability

5.1.2.2 Doors, shutters, and windows shall be kept closed and latched or arranged for automatic closing.²⁴

Doors & Windows will be kept closed & latched or arranged to do so automatically.



Chapter 5 Care & Maintenance

5.2.3 Acceptance Testing

5.2.3.1* Acceptance testing of fire door and window assemblies shall be performed by a qualified person with knowledge and understanding of the components of the type of assembly being subject to testing.²⁵



Testing and inspection of fire doors must be performed by an individual with the knowledge and understanding of how the door is to operate.

5.2.3 Acceptance Testing.

5.2.3.2* Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting. ²⁶



Visually inspect the opening for damaged or missing part.

5.2.3 Acceptance Testing.

5.2.3.3 Acceptance testing shall include the closing of the door by all means of activation.²⁷

Testing includes closing the door.



Chapter 5 Care & Maintenance

5.2.3 Acceptance Testing.

5.2.3.4 A record of these inspections and testing shall be made in accordance with 5.2.2.²⁸

A record of the inspection must be created and available at the request of the AHJ

CITY OF WALLA WALLA FIRE DEPARTMENT SELF INSPECTION REPORT

Business Name:	Business Phone #:		
Address:	E-mail:		
Building Owner:	Contact Phone #:		
2. After-Hours Emergency Contact:	Contact Phone #:		
3. After-Hours Emergency Contact:	Contact Phone #:		
Access and Premises:	Yes	No	N/a
Are Address numbers for the building visible from the street?			
Is the exterior fire department access unobstructed?			
Does your building have a Knox Box? If so, will the keys inside it open all doors? If locks are changed contact City of Walla Walla Fire Department to install new keys.			
Is combustible vegetation removed so as to not create a fire hazard?			
Is there maintained a minimum 3' clearance around fire hydrants?			
Egress (Exiting)			
Are the exit ways and doors easily recognizable, unobstructed, and maintained functional?			
If the main exit door is provided with key-locking hardware is there a sign above the door that states "THIS DOOR MUST REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED" and are the other exit doors operable from the inside w/o the use of a key or any special knowledge or effort?			
Are the exits and exit enclosures free of storage?			
Are doors with self-closing hinges maintained in the closed position (not blocked open)?			
Electrical			
Are all electrical outlets, switches and junction boxes properly covered with cover plates? Is the electrical system safe from any apparent shock and/or other electrical hazards?			
Are circuit breakers/fuses labeled so as to identify the area protected?			
Is the area in front of the electrical panel(s) clear, by at least 30"?			
Are extension cords used only for temporary use? (90 DAYS)			
Are extension cord(s) of heavy duty construction, maintained in good condition, and only used as temporary wiring, or to service small portable appliances?			
Are extension cord(s) plugged directly into an approved receptacle, power tap or multi-plug adapter and, except for approved multi-plug extension cord(s), serve only one portable appliance?			
Is the capacity of the extension cord(s) greater than the rated capacity of the portable appliance supplied by the cord(s)?			
If multiple items need to be plugged in, is a power tap utilized with a built-in circuit breaker and is the power tap plugged directly into a permanently installed receptacle?			
Emergency Lighting/ Egress Illumination			
If emergency lighting is provided, is it maintained in operable condition?			
Is the means of egress illuminated when the building or structure is occupied?			
Exit Signs			

5.2.3.5.2 As a minimum, the following items shall be verified:

(1) Labels are clearly visible and legible.²⁹



Labels on Fire doors must be clearly visible and legible.

Chapter 5 Care & Maintenance

5.2.3.5.2 As a minimum, the following items shall be verified:

(2) No open holes or breaks exist in surfaces of either the door or frame. ²⁹

Doors & frames must not have any holes or breaks.



5.2.3.5.2 As a minimum, the following items shall be verified:
(3) Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped. ³⁰

Glazing/Glass and
beading must be
intact and secure.



5.2.3.5.2 As a minimum, the following items shall be verified:

- (4) The door, frame, hinges, hardware, and noncombustible threshold are secured, aligned, and in working order with no visible signs of damage.
- (5) No parts are missing or broken.³¹



All parts of the opening must be intact and operable.

5.2.3.5.2 As a minimum, the following items shall be verified:

(6) Door clearances do not exceed clearances listed in 4.8.4 and 6.3.1.7 ³²

Frame & Door
1/8" clearance
top & sides
and
3/4" at the bottom



5.2.3.5.2 As a minimum, the following items shall be verified:

(7) The self-closing device is operational; that is, the active door completely closes when operated from the full open position.³³



The Door Closing mechanism must be fully functional and causing the door to latch.

5.2.3.5.2 As a minimum, the following items shall be verified:

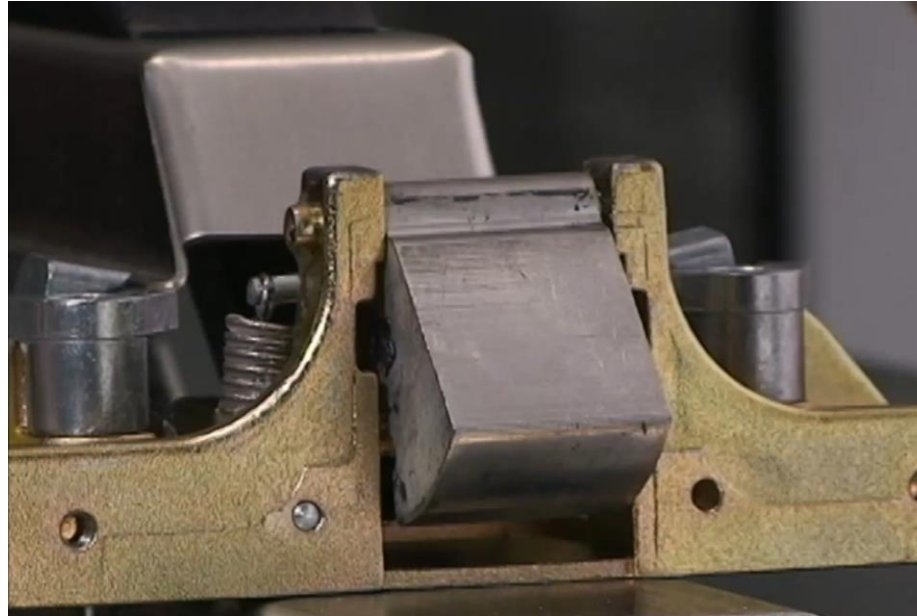
(8) If a coordinator is installed, the inactive leaf closes before the active leaf. ³⁴



The door coordinator must ensure the inactive leaf closes before the active.

5.2.3.5.2 As a minimum, the following items shall be verified:

(9) Latching hardware operates and secures the door when it is in the closed position. ³⁵

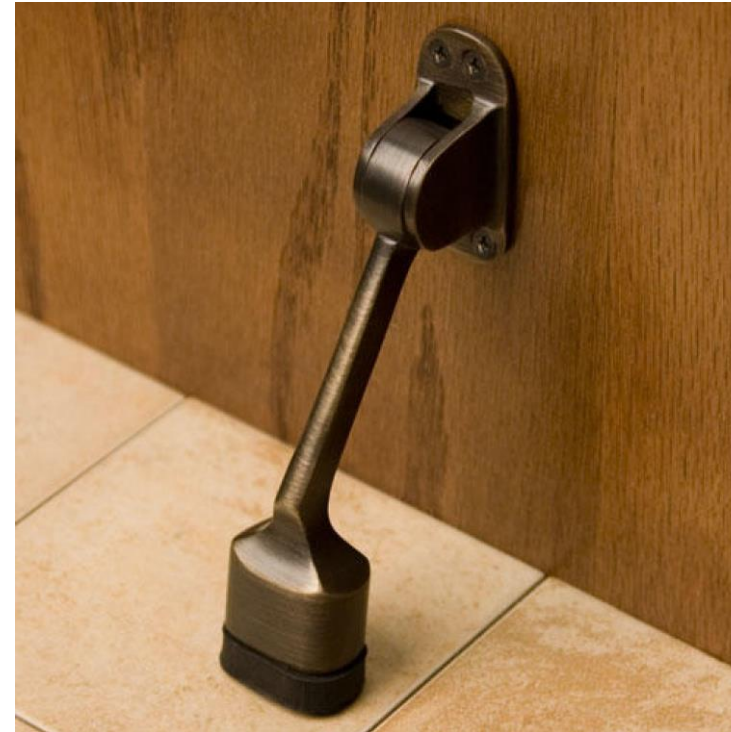


Latching Hardware must operate and secure the door when closed.

5.2.3.5.2 As a minimum, the following items shall be verified:

(10) Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame in 4.1.4. ³⁶

Any hardware that interferes and prevents the door from operating or closing is not allowed.



5.2.3.5.2 As a minimum, the following items shall be verified:

(11) No field modifications to the door assembly have been performed that void the label.³⁷

Field modifications to the door, frame and hardware will void the Fire label and is not allowed.



5.2.3.5.2 As a minimum, the following items shall be verified:

(12) Meeting edge protection, gasketing and edge seals, where required, are inspected to verify their presence and integrity.³⁸

Protection Edges, Gasketing & Edge Seals must be inspected to verify their presence and integrity, where required.



Chapter 5 Care & Maintenance

5.2.4 Periodic Inspection and Testing.

5.2.4.1* Periodic inspections and testing shall be performed not less than annually.

5.2.4.2 As a minimum, the provisions of 5.2.3 shall be included in the periodic inspection and testing procedure.³⁹

Fire Rated doors must be inspected and tested annually.

January						
S	M	T	W	T	F	S

February						
S	M	T	W	T	F	S

March						
S	M	T	W	T	F	S

April						
S	M	T	W	T	F	S

May						
S	M	T	W	T	F	S

June						
S	M	T	W	T	F	S

July						
S	M	T	W	T	F	S

August						
S	M	T	W	T	F	S

September						
S	M	T	W	T	F	S

October						
S	M	T	W	T	F	S

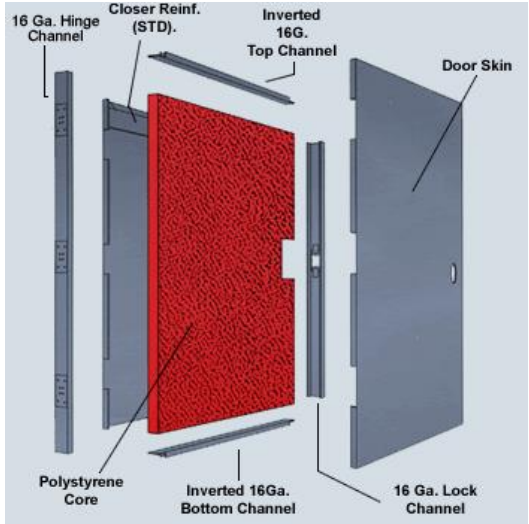
November						
S	M	T	W	T	F	S

December						
S	M	T	W	T	F	S

6.1 Doors.

6.1.1 General. This chapter shall cover the installation of swinging doors with builders hardware. ⁴⁰

6.1.2 Mounting of Doors. Swinging composite, hollow metal, flush sheet metal, metal-clad and wood core doors with builders hardware shall be flush mounted in labeled door frames. ⁴⁰



Doors must be Flush Mounted in Labeled frames.

6.1.3.2 Self-Closing Doors.

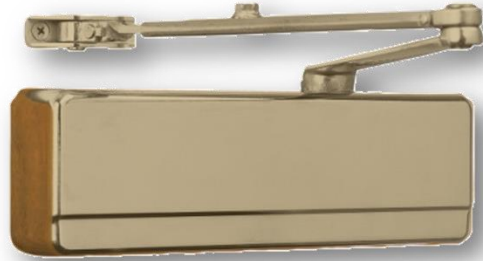
All swinging doors shall be closed and latched at the time of fire.

For the purposes of 6.1.3, the operation of doors shall be divided into the following categories:

- (1) Self-closing doors
- (2) Automatic-closing doors
- (3) Power-operated fire doors ⁴¹



Swing Doors to be closed and latch at time of fire.
Doors are broken up into three categories.



6.1.3.2.1 Self-closing doors shall swing easily and freely and shall be equipped with a closing device to cause the door to close and latch each time it is opened.

6.1.3.2.2 The closing mechanism shall not have a hold-open feature.⁴²

1) Door must be self closing and latching.
Mechanical features to hold the door open is not allowed.

Chapter 6 Swinging Doors with Builders Hardware

6.1.3.3 Automatic-Closing Doors



Electro-Mechanical Closer-Holder
Release Devices



Electromagnetic Door Holder

6.1.3.3 Automatic-Closing Doors.

Automatic-closing doors shall be permitted to close automatically by means of the installation of a closing device and one of the following:

- (1) A separate, labeled, fail-safe door holder/release device or a hold-open mechanism that shall be permitted to be an integral part of the basic closing device
- (2) An integral closing device that allows the door to swing freely and that automatically closes the door during an alarm condition, provided the hold-open mechanisms are released by one or a combination of automatic fire detectors acceptable to the AHJ

6.1.3.3.1 The fire door shall latch upon closure. ⁴³

2) Electro mechanical hold open devices can be used, if an alarm condition automatically allows the door to close and latch.

The Doors shown are in a Double Egress application. This set up allows Egress in both directions. These doors are usually Fire Rated doors and require Fire Rated Hardware.

These Doors are held open with Electro Magnets integrated into the Fire Alarms System which will release the doors upon activation of the fire alarm system.



Electro Magnets



Chapter 6 Swinging Doors with Builders Hardware
6.1.3.4 Power-Operated Fire Doors



Low Energy
Door Operator



6.1.3.4 Power-Operated Fire Doors.

Power-operated fire doors shall be equipped with a releasing device that shall automatically disconnect the power operator at the time of fire, allowing a self-closing or automatic device to close and latch the door regardless of power failure or manual operation.⁴⁴

3) Fire Doors with Power Operators must disconnect power at the time of fire allowing the door to self close and latch

ANSI A117.1 STANDARDS

404.2.9 Door Opening Force

Fire doors shall have the minimum opening force allowable by the appropriate administrative authority.

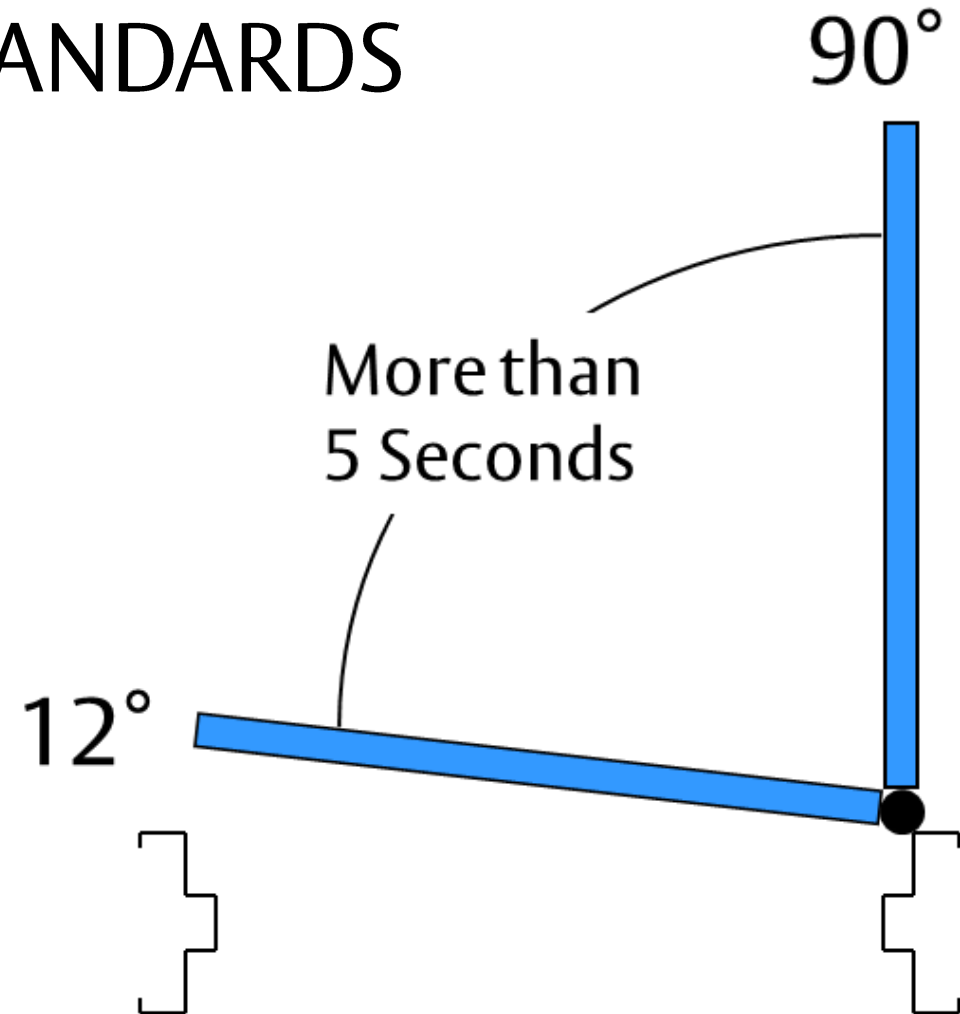
The maximum force for pushing open or pulling open doors other than fire doors shall be as follows:

1. Interior hinged door:
5.0 pounds



ANSI A117.1 STANDARDS

404.2.8.1 Door Closers.
Door closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.



6.3 Openings.

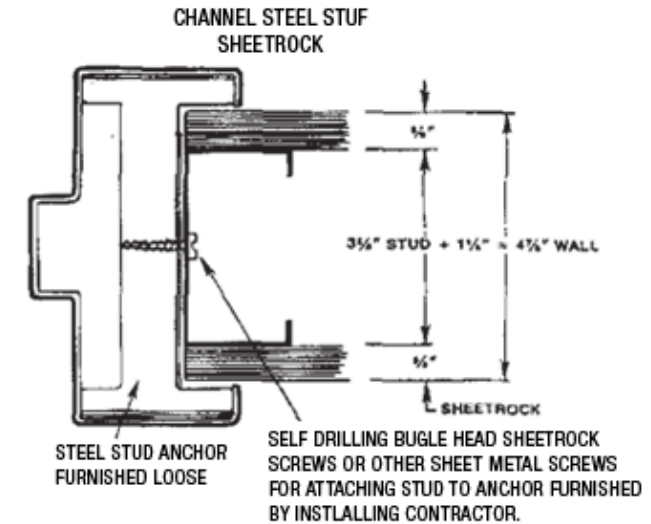
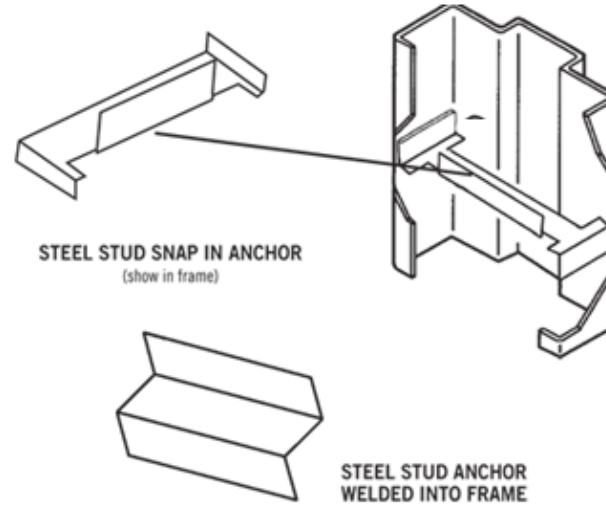
6.3.1 Door Frames.

6.3.1.1* Only labeled door frames shall be used.

6.3.1.2* Methods of anchoring shall be as shown in the listing.⁴⁵

CURRIES HOLLOW METAL FRAME ANCHORS

Steel Stud Wall Anchors



Fire Rated opening must have fire rated frames

Chapter 6 Swinging Doors with Builders Hardware

6.3.1.7* Clearances



6.3.1.7* Clearances.

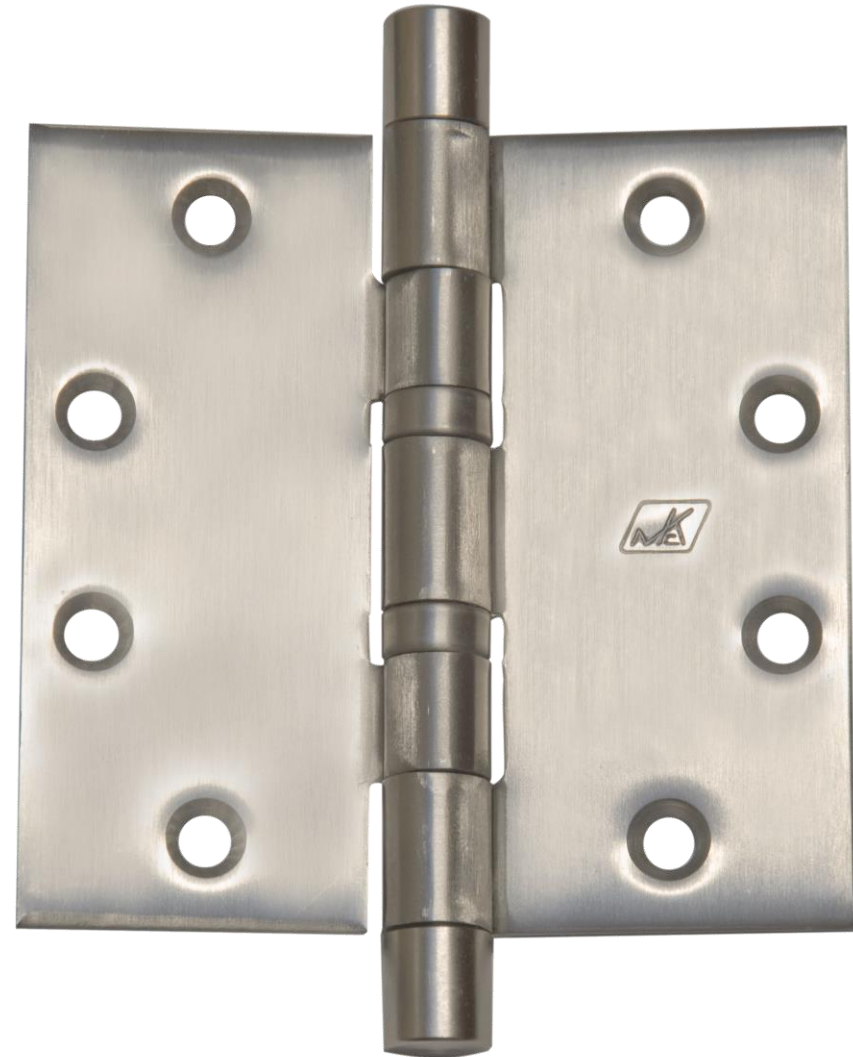
6.3.1.7.1 The clearances between the top and vertical edges of the door and the frame, and the meeting edges of doors swinging in pairs, shall be $1/8'' \pm 1/16''$ for steel doors and shall not exceed $1/8''$ for wood doors.

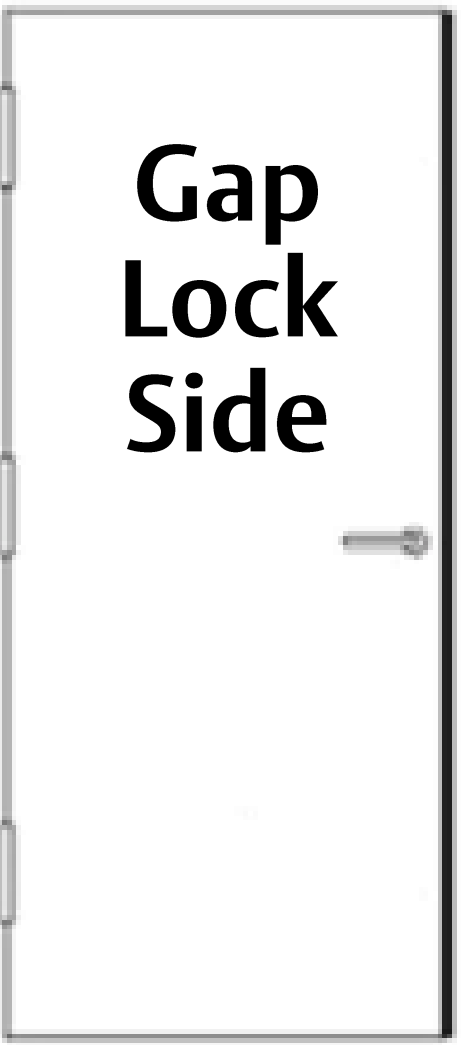
6.3.1.7.2 Clearances shall be measured from the pull face of the door(s).⁴⁶

Clearances measured on the pull side are an $1/8'' \pm 1/16''$ for steel doors and shall not exceed $1/8''$ for wood doors

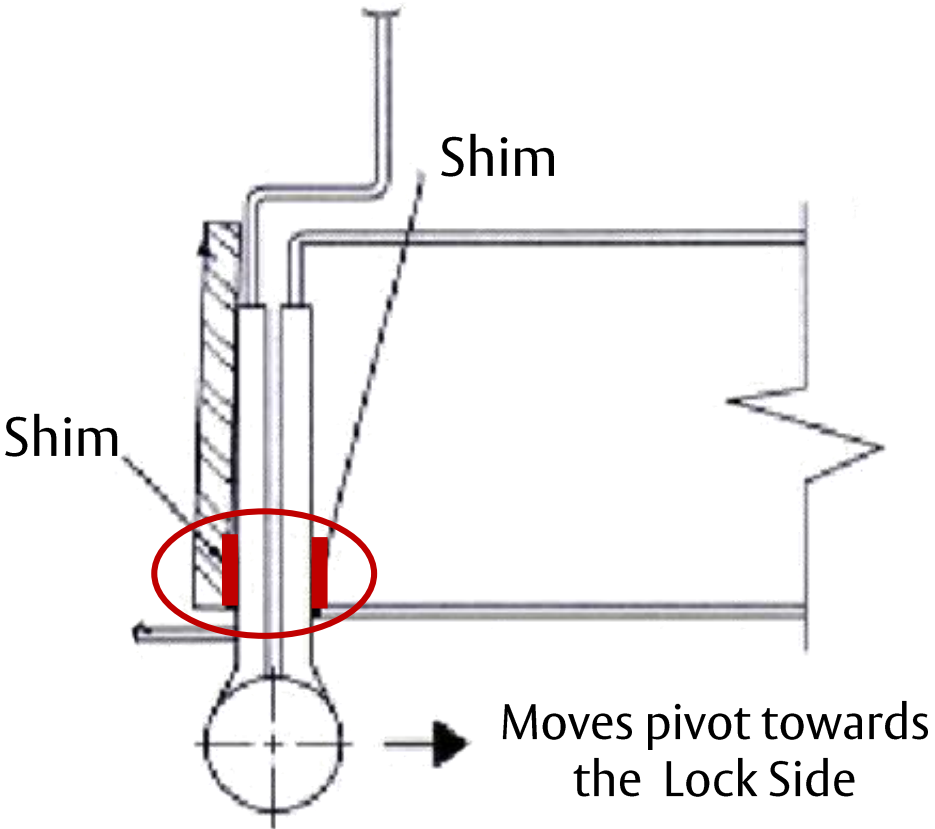
Since Door
Clearances are
critical to NFPA 80

We are going to
review how to shim
hinges to correct
door clearances.

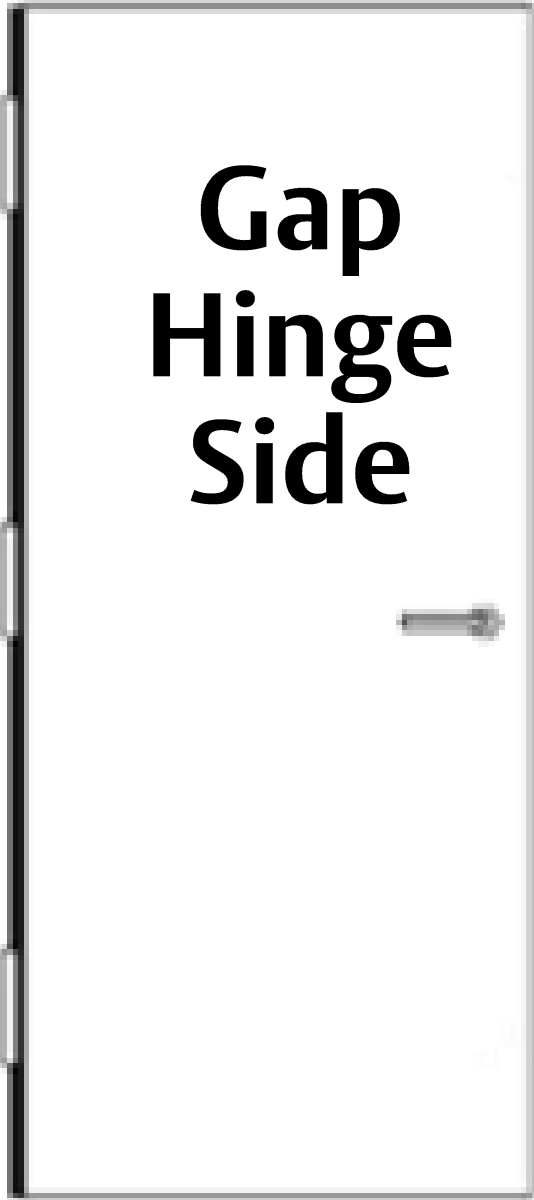
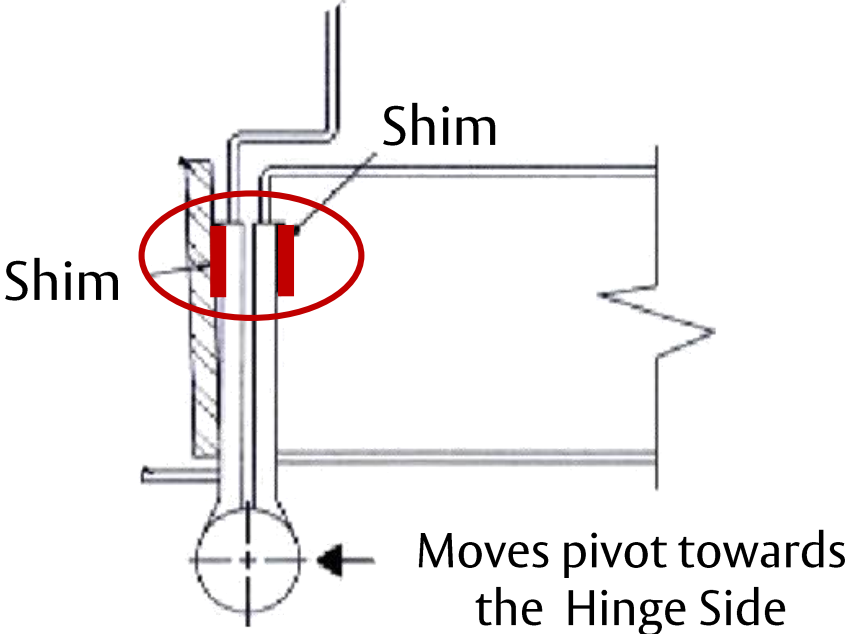




If There's a Big Gap Along the Lock Side



If There's a Big Gap Along the Hinge Side



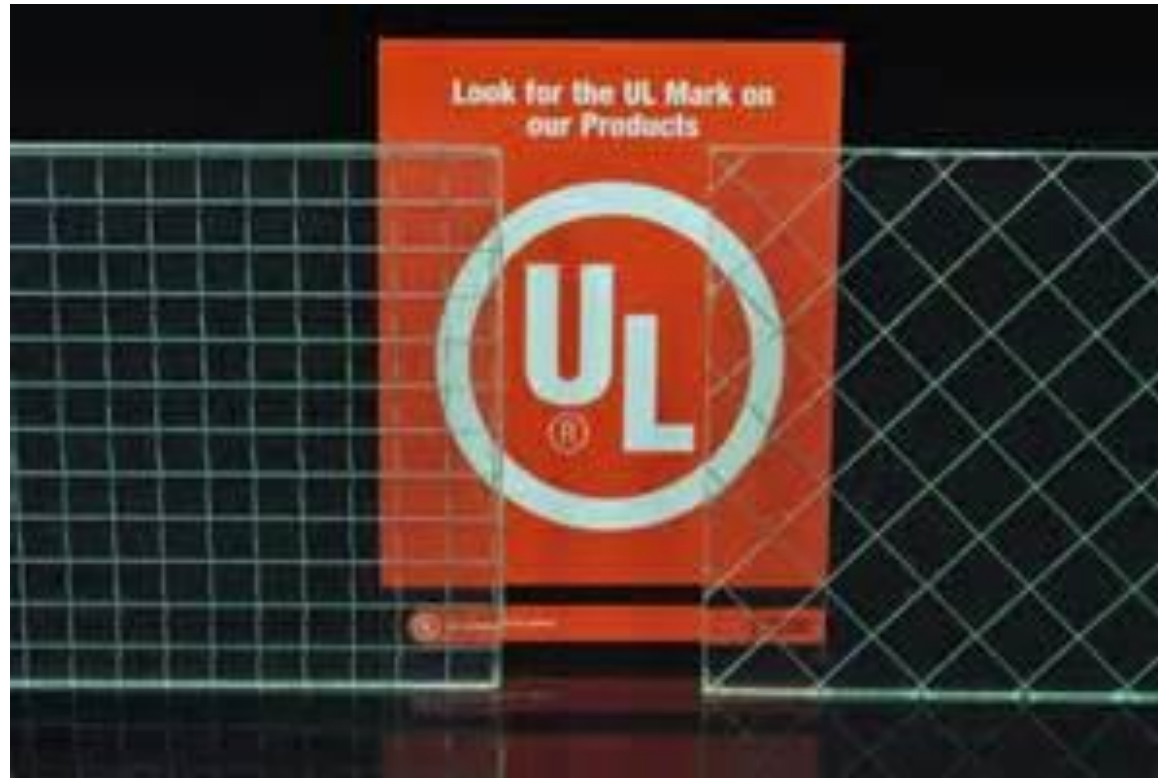
If There's a Gap at the
Top & Tight at the
Bottom



Shimming



6.3.3.5 Only labeled fire protection glazing or fire resistance glazing shall be used to glaze the light openings.⁴⁷



All glazing used in Fire Rated Doors must be Labeled for fire.

6.4 Assembly Components.

6.4.1 Closing Devices.

6.4.1.1* Unless otherwise permitted by the AHJ, a closing device shall be installed on every fire door. ⁴⁸

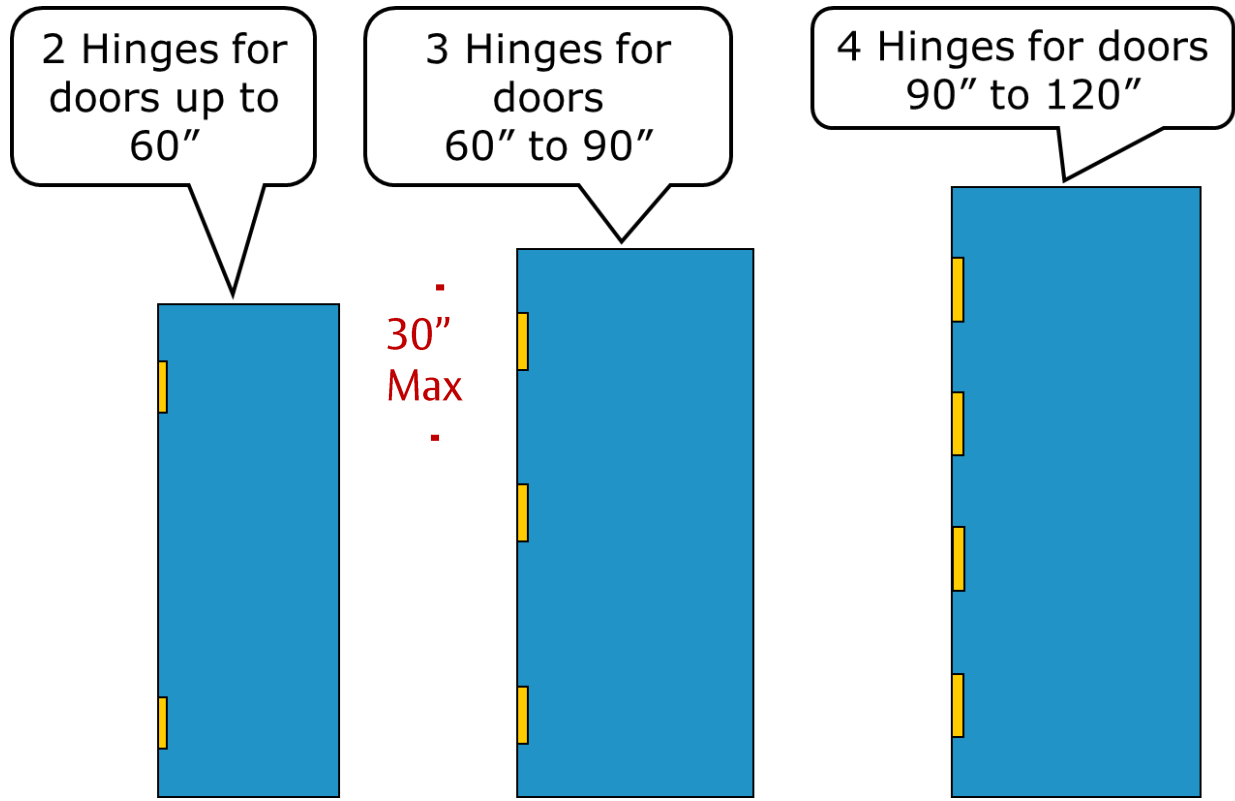


A closing device must be installed on every fire rated door unless permitted by the AHJ

Chapter 6 Swinging Doors with Builders Hardware

6.4.3.1.1* Doors up to 60 in

6.4.3.1.1* Doors up to 60 in. in height shall be provided with two hinges and an additional hinge for each additional 30 in. of door height or fraction thereof.
6.4.3.1.1.1 The distance between hinges shall be permitted to exceed 30 in.⁴⁹



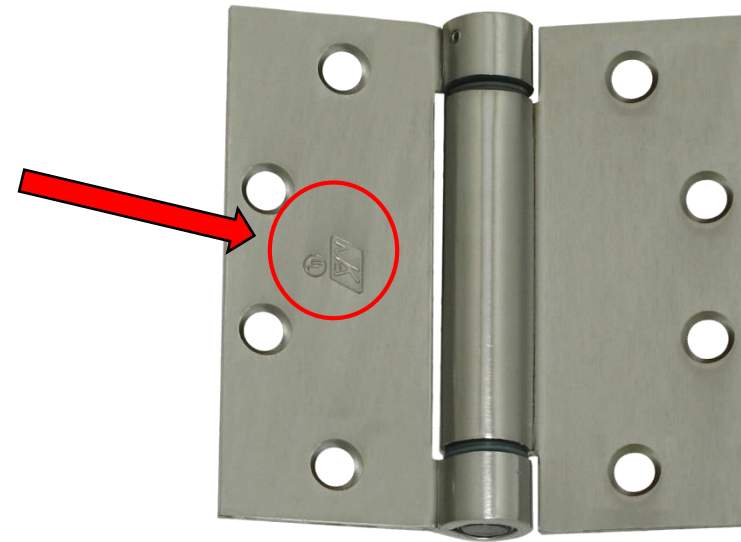
Fire Rated Doors up to 60" require 2 hinges, An additional hinge for every 30" or fraction of and a maximum distance of 30" between Hinges

6.4.3.1.1.2 Where spring hinges are used, at least two shall be provided.

6.4.3.1.2.2 Spring hinges shall be labeled and shall meet the requirements of ANSI/BHMAA156.17, Standard for Self Closing Hinges & Pivots, Grade 1.⁵⁰

Spring hinges are acceptable on fire rated doors if the hinges are labeled (Example bear the “UL” symbol.)

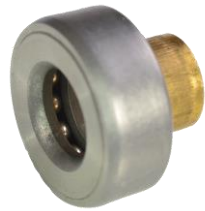
NFPA requires a minimum of two (2) spring hinges on labeled doors.



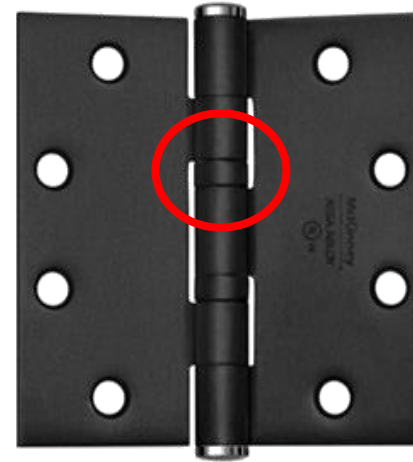
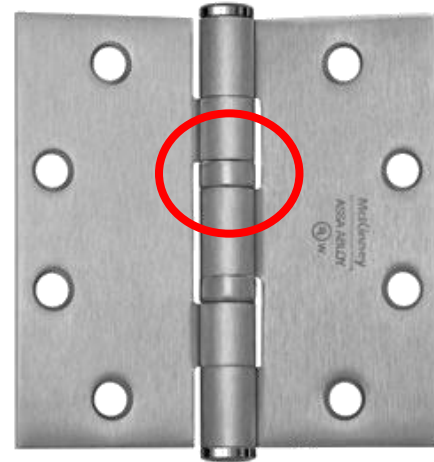
Chapter 6 Swinging Doors with Builders Hardware

6.4.3.1.2 All hinges or pivots

6.4.3.1.2 All hinges or pivots, except spring hinges, shall be of the ball bearing type.
6.4.3.1.2.1 Hinges or pivots employing other antifriction bearing surfaces shall be permitted if they meet the requirements of ANSI/BHMA A156.1, Standard for Butts and Hinges ⁵¹



McKinney
TB Hinges



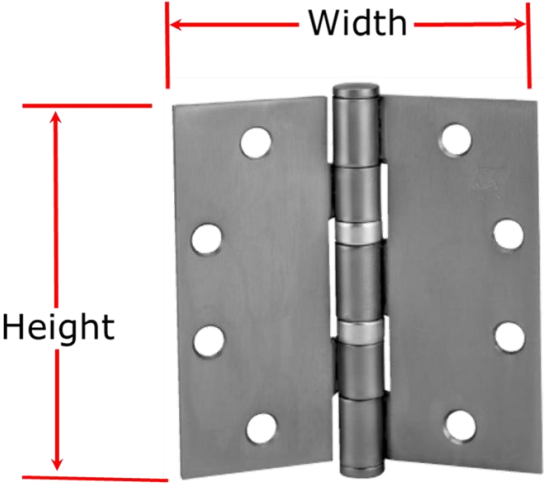
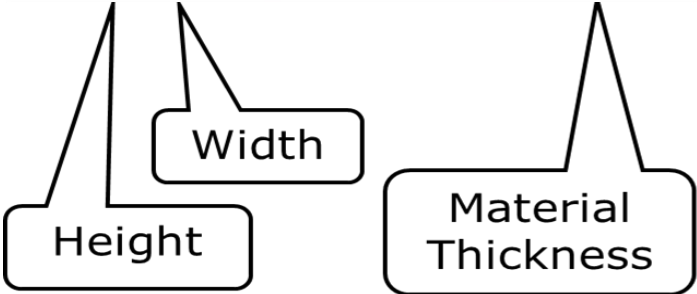
McKinney
TA Hinges

All hinges and Pivots used on Fire Rated Doors
must be Ball Bearing or Anti Friction Bearing

Chapter 6 Swinging Doors with Builders Hardware

6.4.3.1.3 Hinges 4-1/2" high and 0.180" thick shall be permitted for use on wide and heavy doors or doors that are subjected to heavy use or unusual stress. ⁵²

Available Sizes		
Inches	MM	Gauge
4½ x 4½	114.3 x 114.3	.180
5 x 4½	127 x 114.3	.190
5 x 5	127 x 127	.190
6 x 5	152.4 x 127	.203
6 x 6	152.4 x 152.4	.203
8 x 6*	203.2 x 152.4	.225



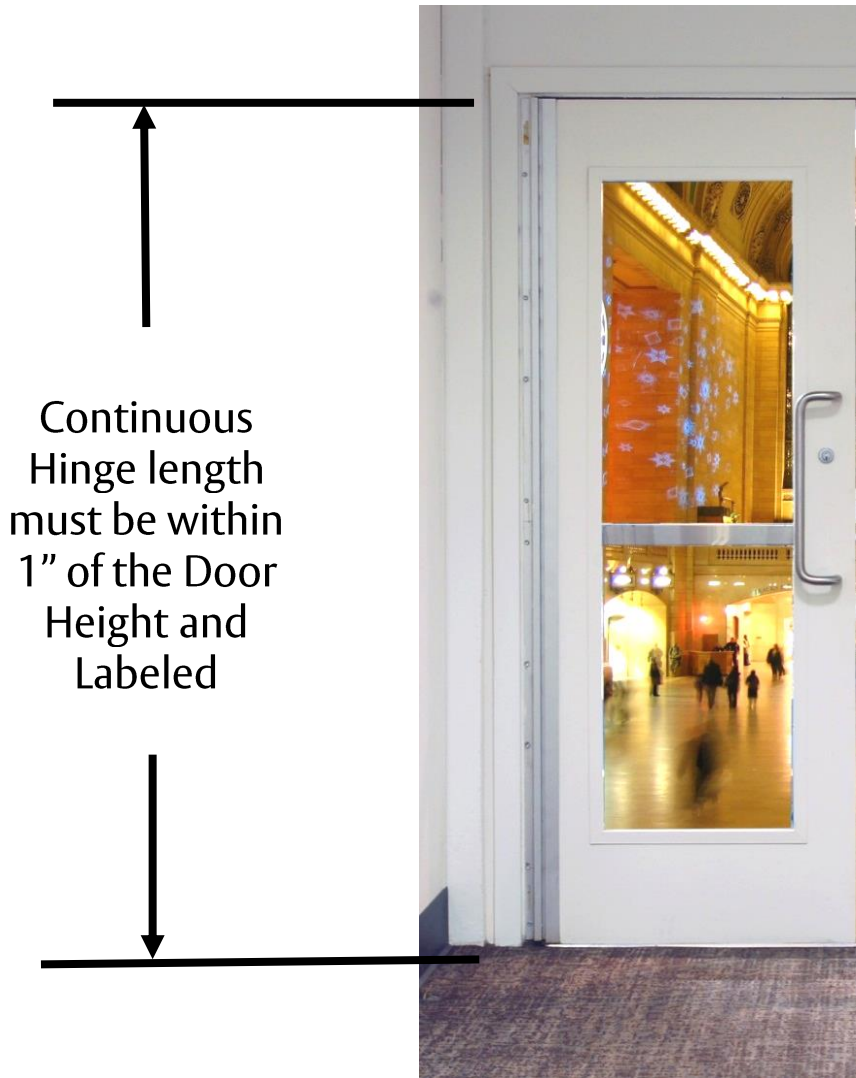
Heavy Duty Hinges

Hinges 4-1/2" x .180" are acceptable of Fire Doors

Chapter 6 Swinging Doors with Builders Hardware

6.4.3.1.6 The length of continuous hinges shall be within 1" of the height of the door leaves.

6.4.3.1.7 Continuous hinges shall be labeled and shall meet the requirements of ANSI/BHMA A156.26, American National Standard for Continuous Hinges.⁵³

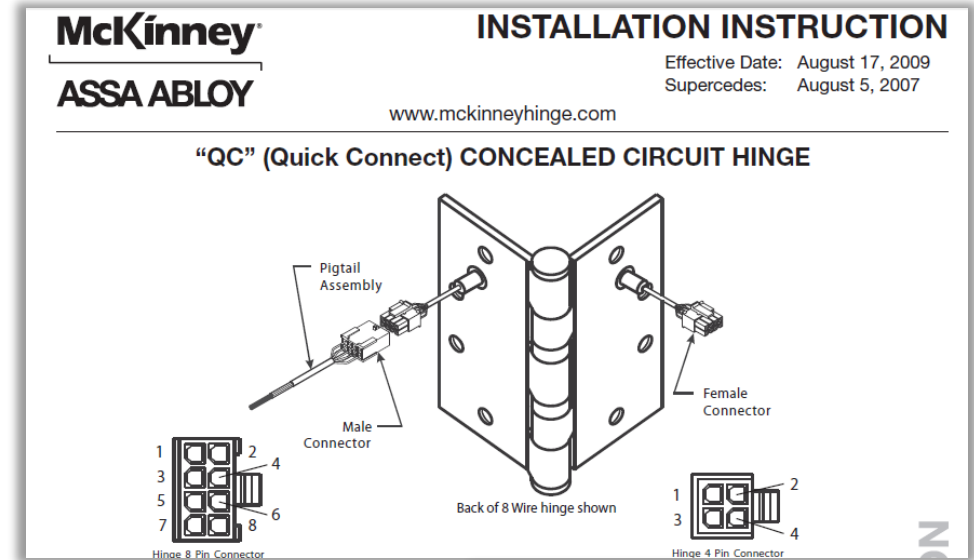


6.4.3.2 Attaching Hinges to Doors.

6.4.3.2.1 Hinges shall be secured in accordance with the listing and the manufacturer's installation instructions.

6.4.3.2.2 Mortise hinges shall be secured to reinforcements in the doors with steel machine screws. ⁵⁴

Hinges to be installed according to Manufacturer instructions and Mortise hinges must be attached with Steel screws to reinforcements in the door.



Chapter 6 Swinging Doors with Builders Hardware

6.4.3.2 Attaching Hinges to Doors. (cont.)

6.4.3.2.3 Mortise hinges shall be secured to wood and plastic-covered composite doors or wood core doors with No. 12 × 1-1/4 in. flat, threaded-to-the-head, steel wood screws. Pilot holes shall be drilled that are 5/32" in diameter.

6.4.3.2.4 Surface hinges shall be attached with steel through bolts. ⁵⁵

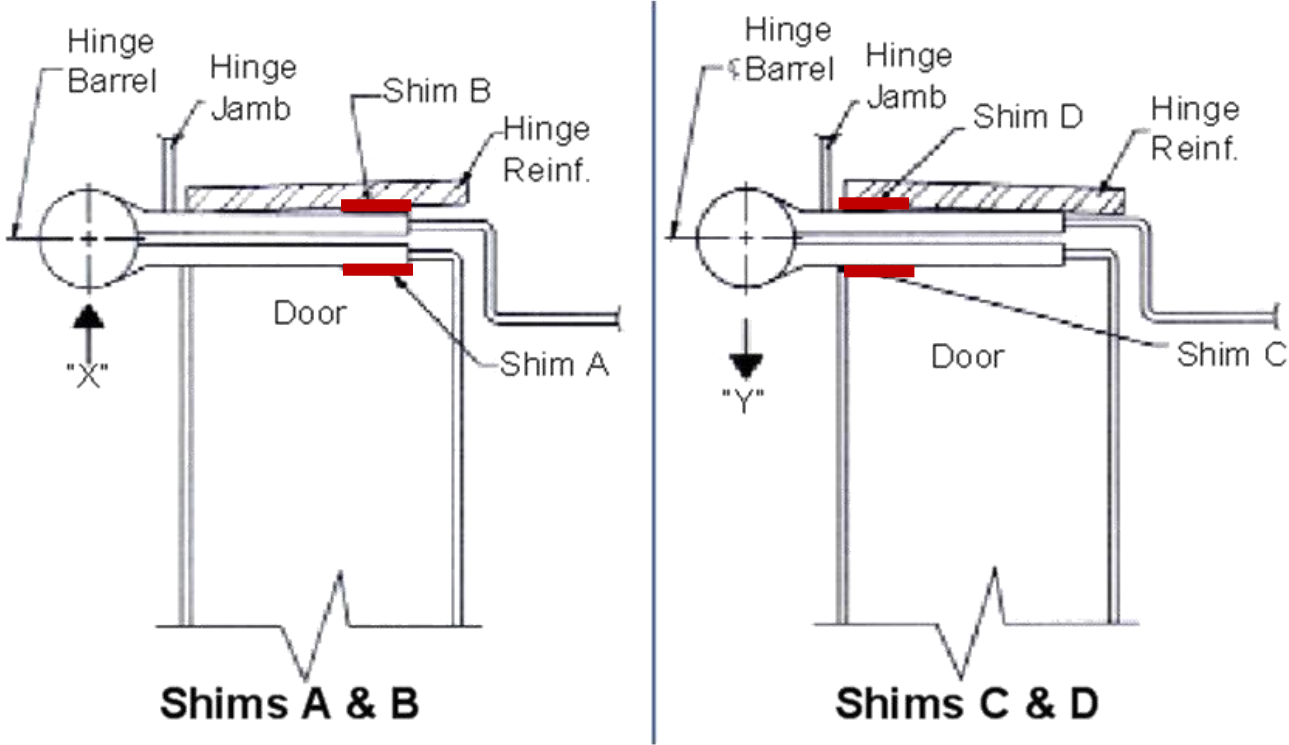
For Wood and composite doors,
Mortise Hinges must be attached using 5/32" Pilot hole with #12 × 1-1/4 in. flat, threaded-to-the-head, steel wood screws.

Surface Hinges must be attached with steel through bolts



⁵⁵ Copyright 2015, NFPA 80 2013 Edition Chapter 6.4.1

6.4.3.4 Shimming. When required to meet the clearances stated in 6.3.1.7, the shimming of hinges using steel shims shall be permitted.⁵⁶



Only steel shims are allowed to be used on Fire Rated Doors

Chapter 6 Swinging Doors with Builders Hardware

6.4.4 Locks or Latches

6.4.4 Locks or Latches.

6.4.4.1 Only labeled locks and latches or labeled fire exit hardware (panic devices) meeting both life safety requirements and fire protection requirements shall be used. ⁵⁷



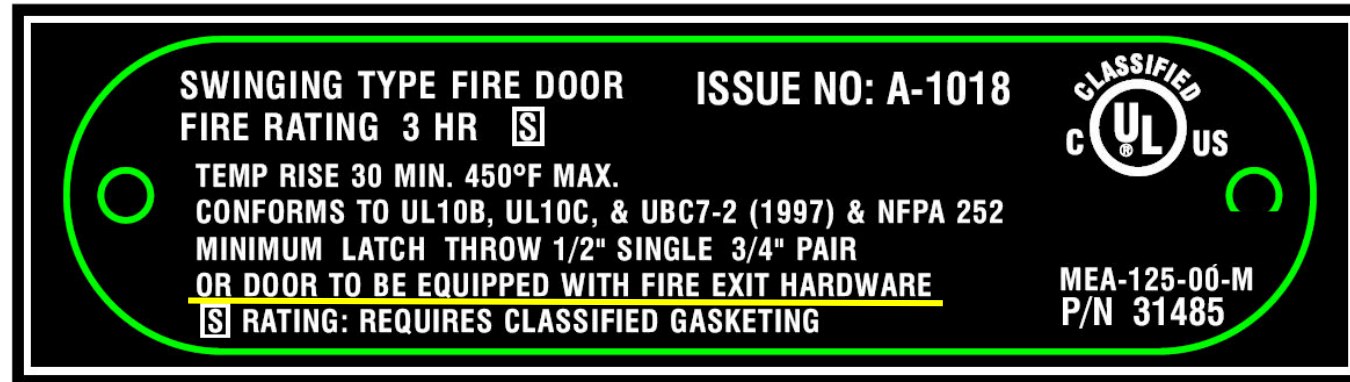
Look for the
UL Mark
and the
Letter F for Fire



Only Labeled locks, latches and fire exit hardware meeting both life safety requirements and fire protection can be used.

6.4.4 Locks or Latches.

6.4.4.2 Fire exit hardware shall be installed only on fire doors bearing a label stating "Fire Door to Be Equipped with Fire Exit Hardware."⁵⁸



Fire Exit Hardware can only be installed on Fire Doors bearing a Label stating
DOOR TO BE EQUIPPED WITH FIRE EXIT HARDWARE

Chapter 6 Swinging Doors with Builders Hardware

6.4.4.2 Fire exit hardware



6.4.4 Locks or Latches.

6.4.4.2.1 Fire exit hardware shall be labeled for both fire and panic.⁵⁹

Fire Exit Hardware must be labeled for both Fire and Panic

Chapter 6 Swinging Doors with Builders Hardware

6.4.4.2.2 Fire exit hardware

6.4.4 Locks or Latches.

6.4.4.2.2 Fire exit hardware shall have a permanently attached label that bears the serial number and shows the manufacturer's name and type of approval. ⁶⁰



Fire Exit Hardware must be labeled with Serial Number, Manufacturer and type of approval.

Chapter 6 Swinging Doors with Builders Hardware

6.4.4.2.3 The label shall differentiate

6.4.4 Locks or Latches.

6.4.4.2.3 The label shall differentiate between panic hardware, which is not acceptable for use on fire doors, and fire exit hardware. ⁶¹



Panic Hardware

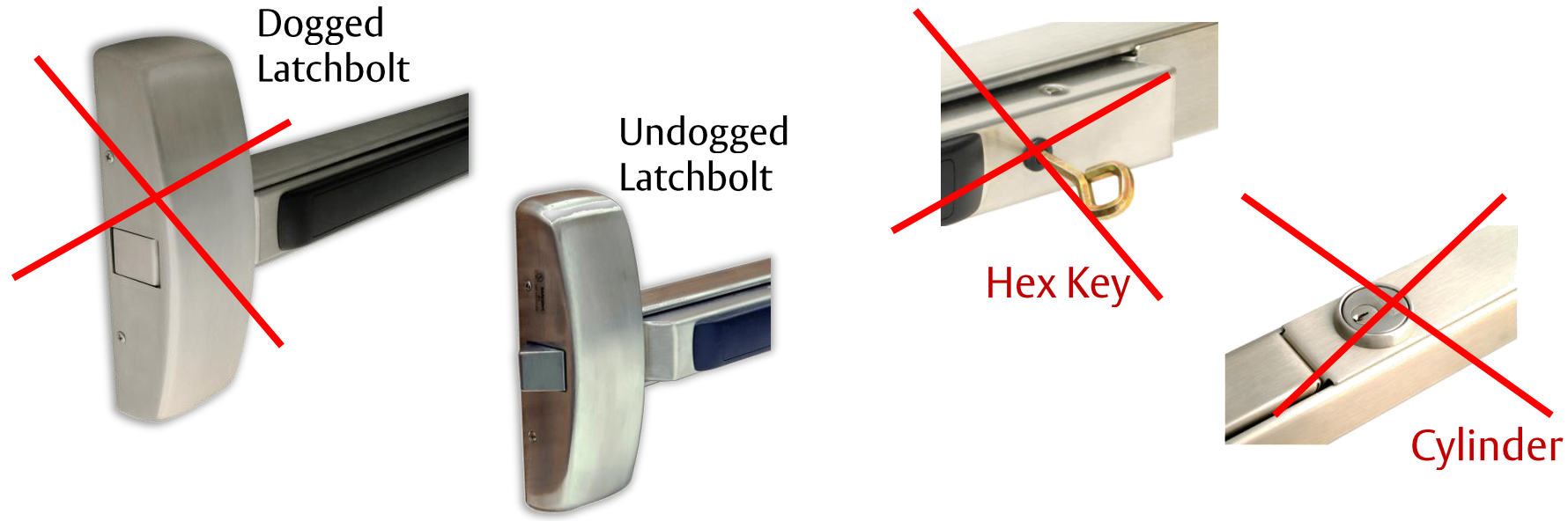


Fire Exit Hardware

Labels for Panic and Fire Rated Device must be different and Panic Hardware can not be used on Fire Rated Doors.

Chapter 6 Swinging Doors with Builders Hardware
6.4.4.3 All single doors

6.4.4.3 All single doors and active leaves of pairs of doors shall be provided with an active latch bolt that cannot be held in a retracted position as specified in the individual manufacturer's published listings.⁶²



A Fire Rated Hardware can not be mechanically dogged. A fire device will never have Hex Key Dogging or Cylinder Dogging.

Chapter 6 Swinging Doors with Builders Hardware

6.4.4.3.1 Doors other than those used in means of egress

6.4.4.3.1 Doors other than those used in means of egress shall be permitted to be provided with dead bolts in addition to the active latch bolts or as otherwise permitted by the AHJ.⁶³



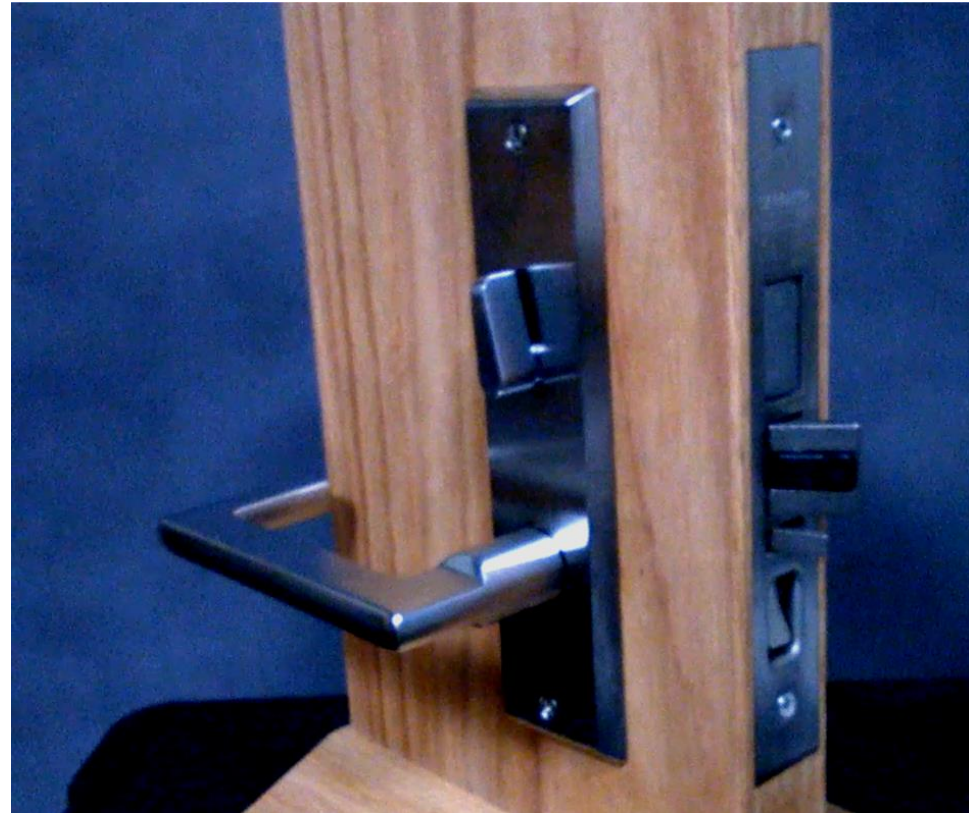
Deadbolt maybe used on doors that **are not** used as a means egress.

Chapter 6 Swinging Doors with Builders Hardware

6.4.4.3.1 Doors other than those used in means of egress

6.4.4.3.2 Locks with dead bolts that are interconnected with latch bolts and retract when the latch bolt is retracted shall be permitted for use on fire doors within a means of egress. ⁶⁴

Interconnected locks such as Mortise Locks are permitted on Fire Doors in a means for Egress as long as it allows for single motion exiting.



6.4.4.4 Where both leaves are required for exit purposes, they shall be provided with labeled fire exit hardware. ⁶⁵

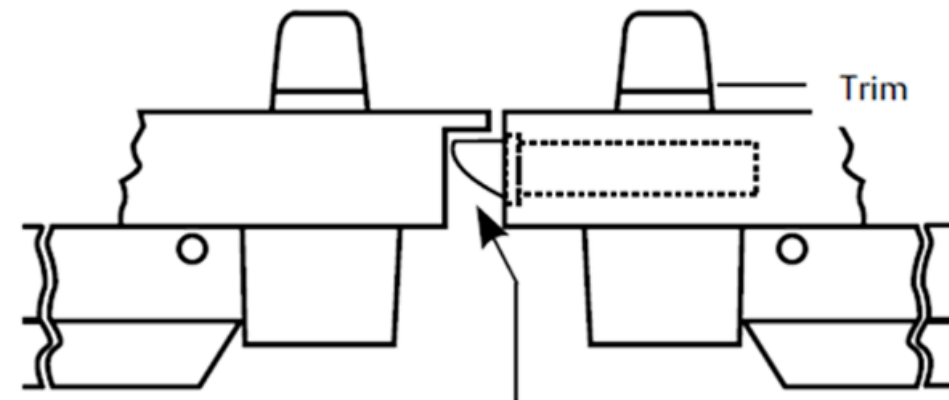
In a pair of doors where both leaves are used for exiting, Fire Exit Hardware shall be installed only on both leaves.



6.4.4.4.1 Where permitted by the AHJ, pairs of doors not provided with an astragal shall be permitted to have labeled fire exit hardware and an open back strike installed on the inactive leaf, and either labeled fire exit hardware or any labeled latch capable of being opened by one obvious operation from the egress side installed on the active leaf.⁶⁶

Where allowed by the AHJ, a pair of fire doors, do not require an Astragal and Open Back Strikes are allowed on the inactive leaf as long as fire hardware is installed.

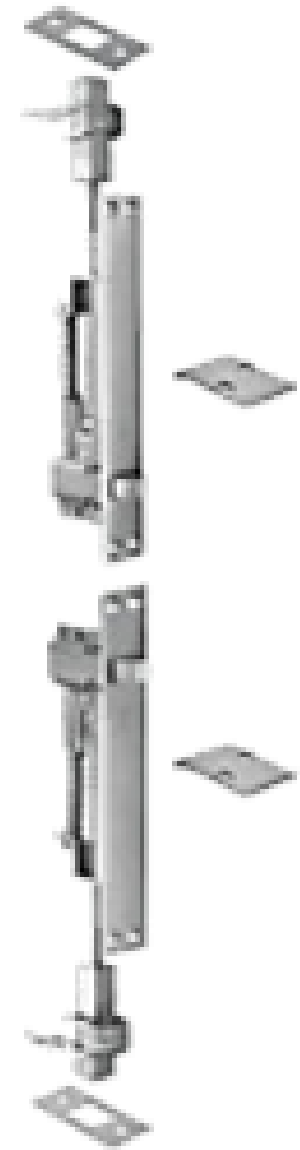
Pair of Doors



815 Open back strike;
Inactive door with vertical rods

6.4.4.5 Where a pair of doors is needed for the movement of equipment and where the inactive leaf of the pair of doors is not required for exit purposes, labeled, top and bottom, self-latching or automatic flush bolts, or labeled two-point latches shall be permitted.⁶⁷

A pair of fire doors not in a means egress and where the inactive door is not required for exiting; labeled, top and bottom, self-latching or automatic flush bolts, or labeled two-point latches is permitted.



6.4.4.5.1* Manually operated, labeled, top and bottom flush mounted or surface-mounted bolts on the inactive leaf of a pair of doors shall be permitted to be used where acceptable to the AHJ, provided they do not pose a hazard to safety to life. ⁶⁸

Labeled manually operated bolts maybe used on the inactive leaf where acceptable by the AHJ and is not a threat to life safety.



6.4.5 Protection Plates.

6.4.5.1 Factory-installed protection plates shall be installed in accordance with the listing of the door.

6.4.5.2 Field-installed protection plates shall be labeled and installed in accordance with their listing.

6.4.5.3 Labeling shall not be required where the top of the protection plate is not more than 16" above the bottom of the door.⁶⁹

Protection Plates must be installed according to its listing and if more than 16" above the door bottom must be labeled

not more than 16"



Chapter 6 Swinging Doors with Builders Hardware

6.5 Application, Installation, and Adjustment.

6.5.1 General.

The installation of all components of a fire door assembly shall be in accordance with the listing of each component.

6.5.3 Attachment.

All components of a fire door assembly shall be attached firmly to walls, doors, and frames in a manner acceptable to the AHJ.⁷⁰

All fire hardware must be installed in accordance with the listing and must be attached firmly in a manner acceptable by the AHJ.



6.5 Application, Installation, and Adjustment. (cont.)

6.5.2 Manufacturers' Instructions. All components shall be installed in accordance with the manufacturers' installation instructions and shall be adjusted to function as described in the listing.⁷¹

All components on the door must be installed and adjusted based on the instruction sheet.

INSTALLATION INSTRUCTIONS
8700, 12-8700, HC8700 & HC4-8700
SURFACE VERTICAL ROD EXIT DEVICE
 U.S. Patent No. 268,003 Canadian Patent No. RD 1981

SARGENT
ASSA ABLOY

ASSA ABLOY, the global leader in door opening solutions

FOR ASSISTANCE, CONTACT SARGENT AT 800-727-5477 or www.sargentlock.com

Standard 8700 Exit Shown

CYLINDER DOGGING (16- PREFIX)
 For complete assembly information see Instruction Sheet A6848
 Must be installed with opening in plastic cam
 Slide mounting rail insert with cylinder dogging (16- prefix) into mounting rail

TO OPERATE:

- Depress push rail
- Insert key and turn counterclockwise to lockdown (dog) push rail

CAUTION: CHECK BEFORE STARTING DOOR PREP
 Door should be fitted and hung.
 Check box label for size of exit device, function, hand and design.

Surface of the door must be flush. Clear away any raised projections to allow exit device to rest on flat surface of the door.

THIS EXIT DEVICE IS HANDED

Right hand reverse bevel Left hand reverse bevel

AVAILABLE STOCK LENGTHS

Length "E": 32" door, no cut off required.
 Can be cut to fit doors down to 24" wide.

Length "F": 36" door, no cut off required.
 Can be cut to fit doors down to 33" wide.

Length "J": 42" door, no cut off required.
 Can be cut to fit doors down to 37" wide.

Length "G": 48" door, no cut off required.
 Can be cut to fit doors down to 43" wide.

TOOLS REQUIRED

- Measuring tape
- Power drill
- Drill bits: #7, #16, #25, 3/32", 1/4", 11/32", 3/8", 25/64", and 3/4"
- Taps: #10-24, #12-24, 1/4"-20 and 7/16"-20
- Hacksaw or any power cutter (to cut rail if necessary)
- Screwdrivers: Phillips #2 and #3
- Hex Wrenches: 3/16" and 3/8"
- Level

A6701L
11-30-11 **1**

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6.5.4 Mounting. All mounting screws, bolts, or shields shall be steel except where otherwise permitted by this standard. ⁷²



All mounting hardware must be steel unless otherwise permitted by the standard.

Fire Door Repairs



Never make repairs to fire rated doors in the field.

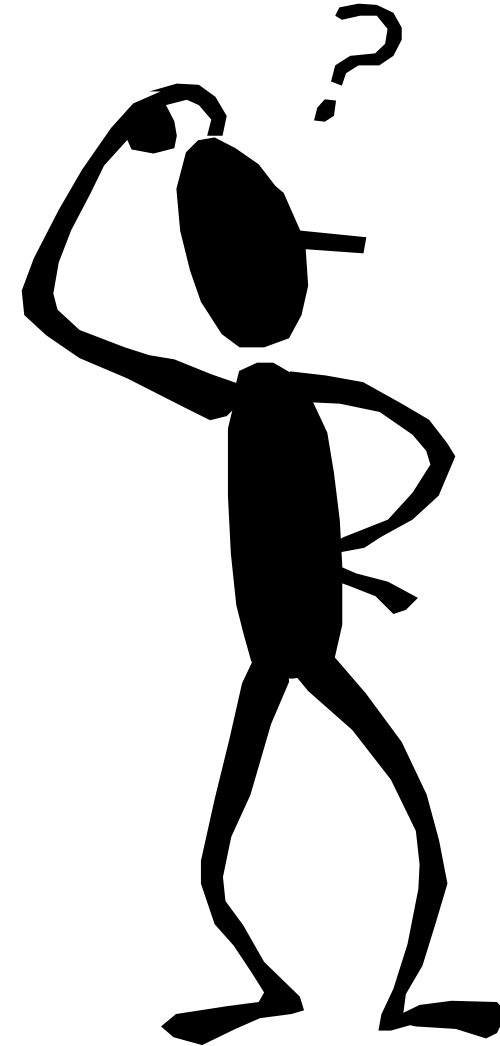
Repairs and new door preps are required to be done in a licensed shop !



When in doubt on what can be done to a
Fire Rated Opening

Check with Door & Frame

Manufacturer !!!!



What about Delayed Egress Exit Devices?

The words “Delayed Egress” are not even included in
NFPA 80 2013

Delayed Egress Devices are addressed under
NFPA 101 2015

Chapter 7.2.1.6*
Special Locking Arrangements.

NFPA 101 is the Life Safety Code

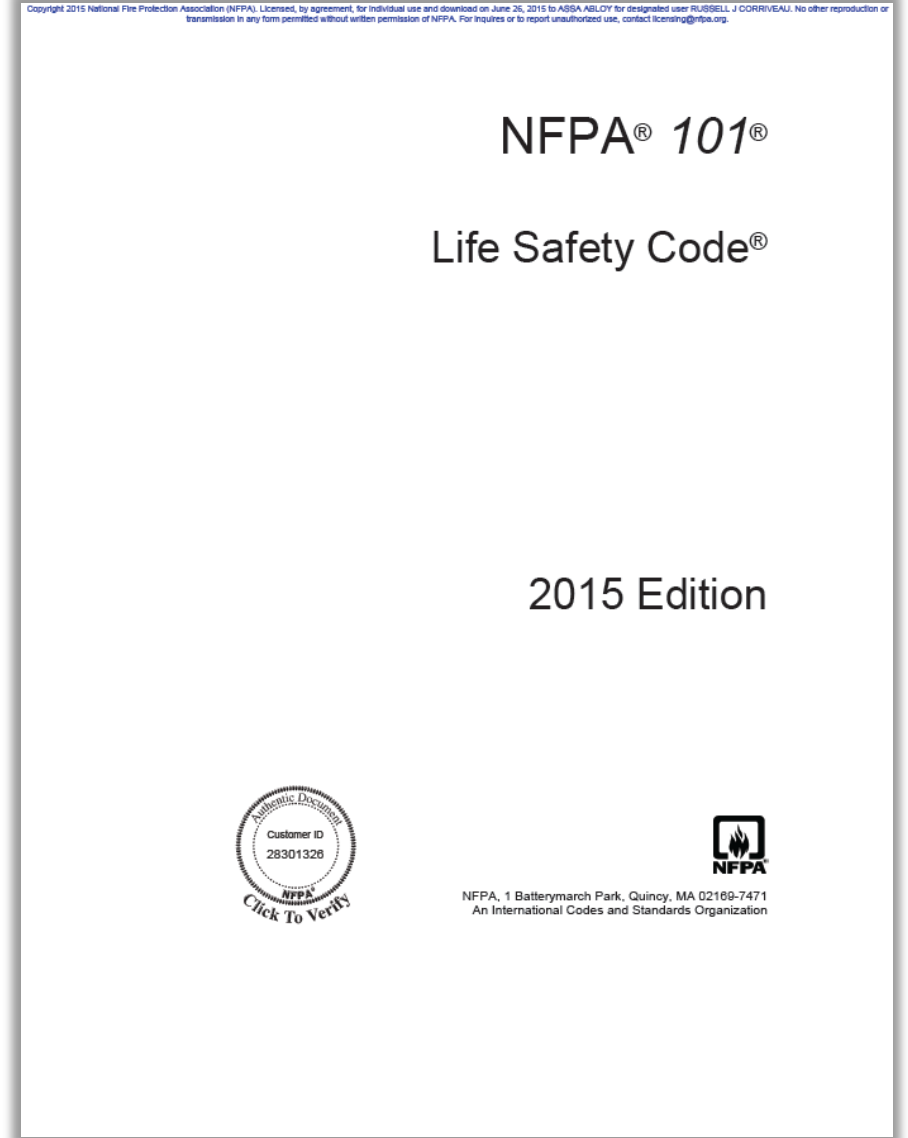
Chapter 7 Mean of Egress

7.1 General

7.1.1* Application.

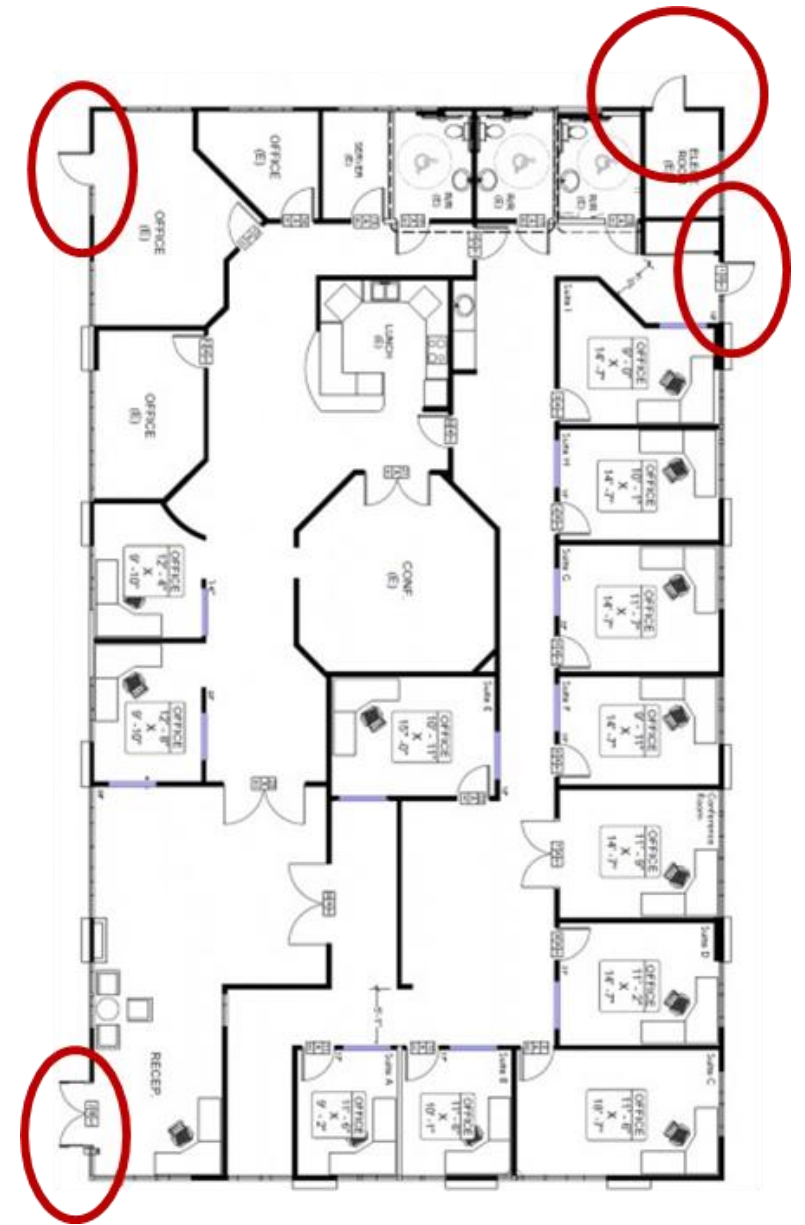
Means of egress for both new and existing buildings shall comply with this chapter. (See also 4.5.3.)

4.5.3 Means of Egress.



4.5.3.1 Number of Means of Egress. Two means of egress, as a minimum, shall be provided in every building or structure, section, and area where size, occupancy, and arrangement endanger occupants attempting to use a single means of egress that is blocked by fire or smoke. The two means of egress shall be arranged to minimize the possibility that both might be rendered impassable by the same emergency condition.

A minimum of 2 means of egress are required for all occupied building and structures.



4.5.3.2 Unobstructed Egress. In every occupied building or structure, means of egress from all parts of the building shall be maintained free and unobstructed. Means of egress shall be accessible to the extent necessary to ensure reasonable safety for occupants having impaired mobility.

All means of egress from all parts of the building shall be clear and unobstructed.

Exit and Exit Sign



4.5.3.3 Awareness of Egress System.

Every exit shall be clearly visible, or the route to reach every exit shall be conspicuously indicated. Each means of egress, in its entirety, shall be arranged or marked so that the way to a place of safety is indicated in a clear manner.

Every means of egress
must be clearly
identified as well as
the path of egress.



4.5.3.3 Awareness of Egress System.

Every exit shall be clearly visible, or the route to reach every exit shall be conspicuously indicated. Each means of egress, in its entirety, shall be arranged or marked so that the way to a place of safety is indicated in a clear manner.

Every means of egress
must be clearly
identified as well as
the path of egress.



4.5.3.4 Lighting.

Where artificial illumination is needed in a building or structure, egress facilities shall be included in the lighting design.

End of Section: 4.5.3

Where artificial lights is needed to locate an exit, the lighting must be included in the design.



7.1.9 Impediments to Egress.

Any device or alarm installed to restrict the improper use of a means of egress shall be designed and installed so that it cannot, even in case of failure, impede or prevent emergency use of such means of egress, unless otherwise provided in 7.2.1.6 and Chapters 18, 19, 22 and 23.

Any device used to prevent egress through a restricted exit, can not prevent emergency use unless otherwise specified in 7.2.1.6 and Chapters 18, 19, 22 and 23



7.2.1.15 Inspection of Door Openings.

7.2.1.15.6 As a minimum, the following items shall be verified:

(13) Emergency lighting on access-controlled egress doors and doors equipped with **delayed-egress locking systems** is present and functioning in accordance with Section 7.9.



Emergency lighting on
Delayed Egress Systems must
be present and functioning.

What is Section 7.9?

7.9 Emergency Lighting.

7.9.1 General.

7.9.1.1* Emergency lighting facilities for means of egress shall be provided in accordance with Section 7.9 for the following:

(4) Doors equipped with delayed-egress locks

Emergency Lighting
required for doors
equipped with Delayed
Egress Devices



Let's examine some existing Swing Fire Doors

Unacceptable Conditions

Multiple
Locking
Mechanism

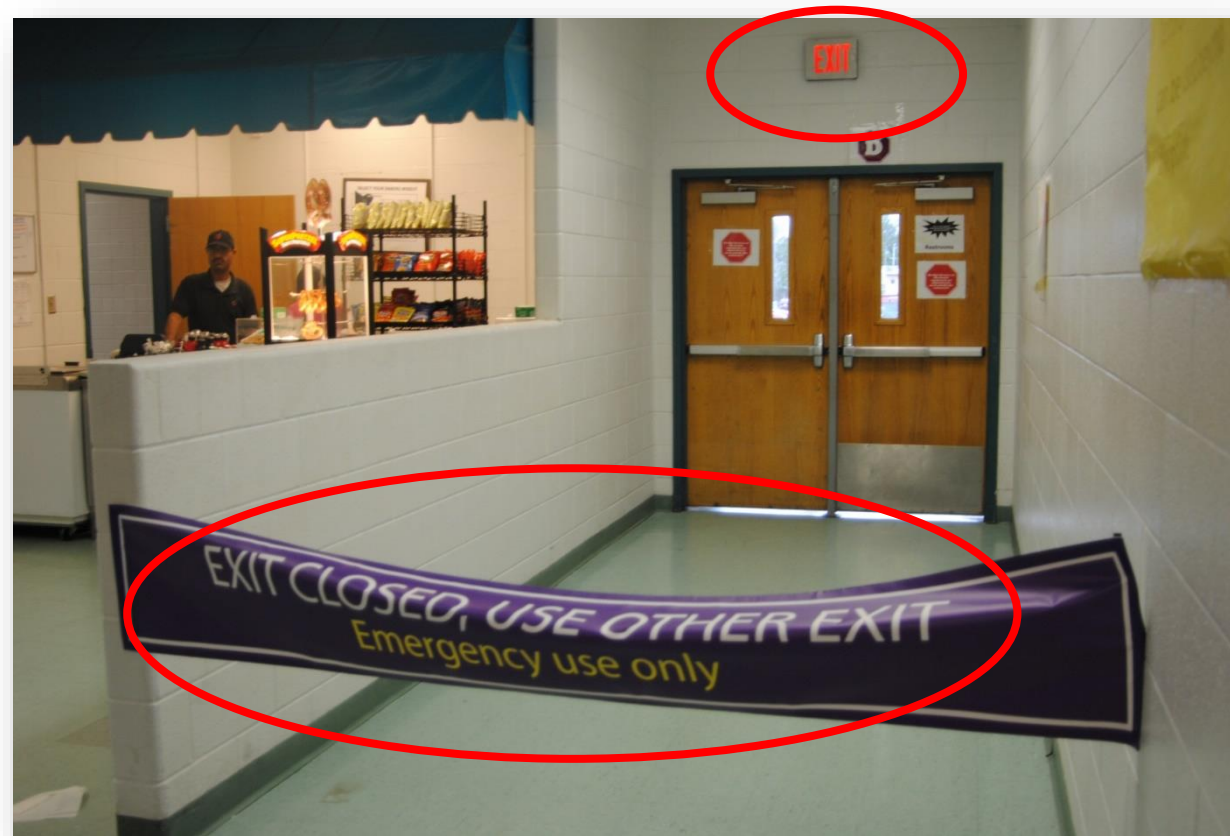
Exiting must be
accomplished in a
single motion



Unacceptable Conditions

Blocking Exit Routes

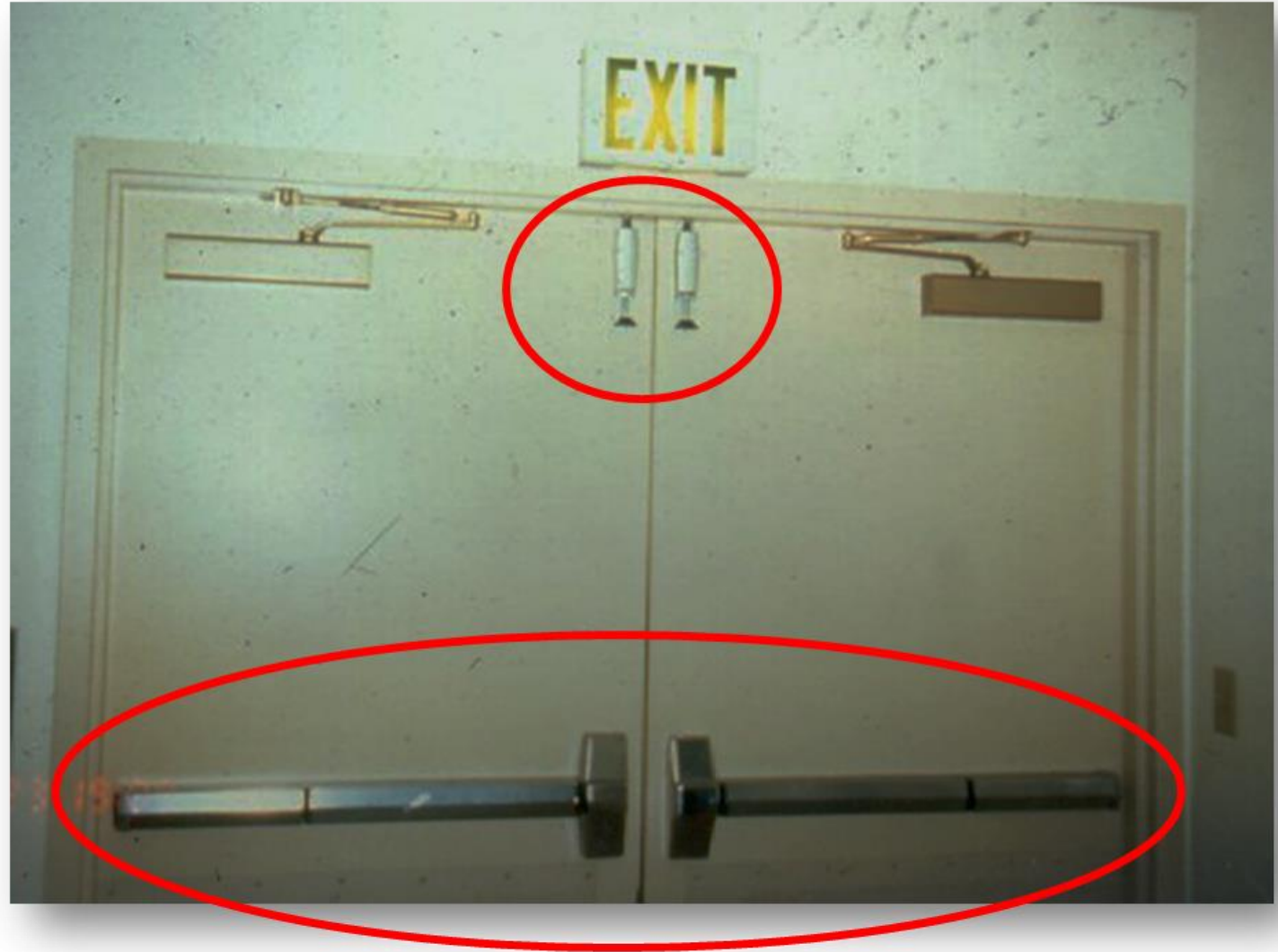
Never Block
Exit Routes.
They are
there for a
reason.



Unacceptable Conditions

Surface
Bolts & Fire
Hardware

Fire Rated
Doors can
never be
bolted closed



Unacceptable Conditions

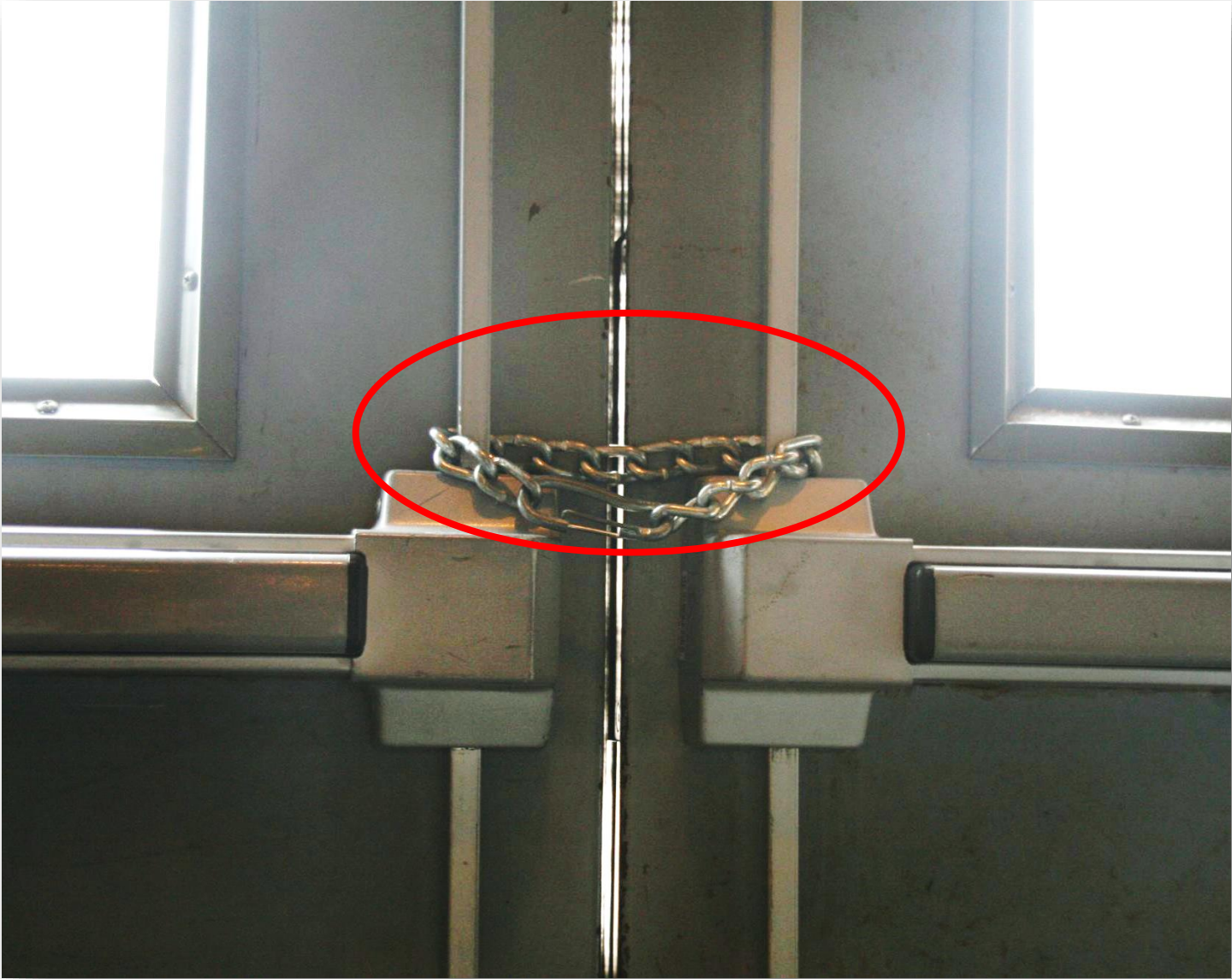
Exit
Locations
can not be
locked

Never Chain
doors closed



Unacceptable Conditions

Even if it's
a pair of
Doors



Unacceptable Conditions

Door Hardware

Frequently
check that
the Door and
Hardware are
operating
properly



Unacceptable Conditions

Excessive
Hardware

Limit your
creativity to the
Codes and
Standards



Unacceptable Conditions

Multiple
Signs

Avoid
Confusion:
Is it an Exit or
Not?



Unacceptable Conditions

Fire Door hold
open blocks

Fire Rated Doors
can not be
mechanically held
open.



Unacceptable Conditions

Even if the product is designed to hold the door open.

Fire Rated Doors can not be mechanically held open.



Unacceptable Conditions

Taping back the
Latchbolt

Illegal use of
Duct Tape and a
Fire Code Violation



Unacceptable Conditions

Means of
Egress

Never
block the
path to
Exit



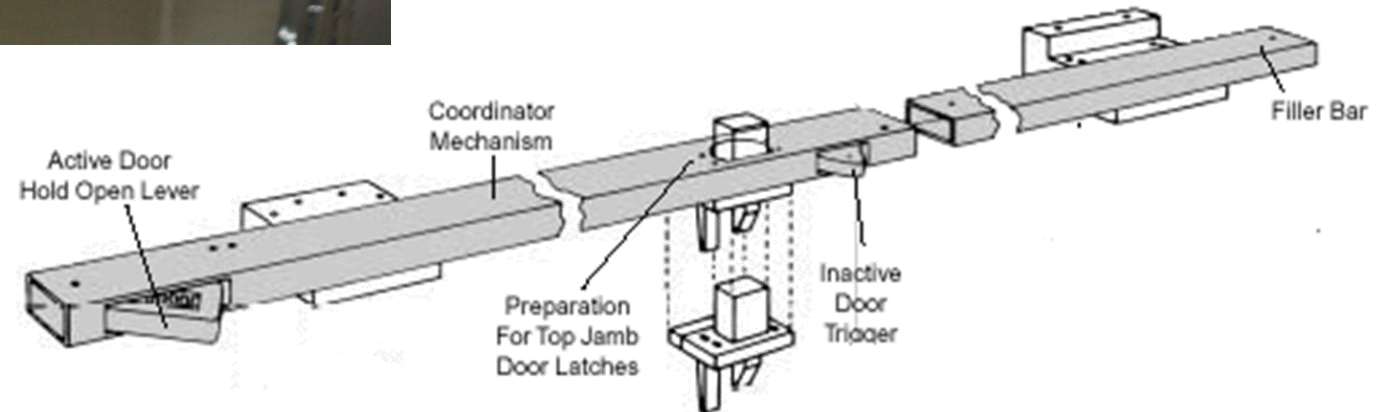
Unacceptable Conditions



Unacceptable Conditions



Unacceptable Conditions



Unacceptable Conditions



Questions?

13 Point Fire Door Inspection Check list

- 1) *Labels are clearly visible and legible.*
- 2) *No open holes or breaks exist in surfaces of either the door or frame.*
- 3) *Glazing, vision light frames, & glazing beads are intact and securely fastened in place, if so equipped*
- 4) *The door, frame, hinges, hardware, and noncombustible threshold are secured, aligned, and in working order with no visible signs of damage.*
- 5) *No parts are missing or broken.*
- 6) *Door clearances do not exceed clearances listed in 4.8.4 and 6.3.1.7.*
- 7) *The self-closing device is operational; that is, the active door completely closes when operated from the full open position.*

13 Point Fire Door Inspection Check list

8) *If a coordinator is installed, the inactive leaf closes before the active leaf.*

9) *Latching hardware operates and secures the door when it is in the closed position.*

10) *Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame.*

11) *No field modifications to the door assembly have been performed that void the label.*

12) *Meeting edge protection, gasketing and edge seals, where required, are inspected to verify their presence and integrity.*

13) *Signage affixed to a door meets the requirements listed in 4.14.*

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