


KOFFEL ASSOCIATES, INC.

Interactive Session on Codes

An Interactive Q&A Discussion of Regulatory Codes

William E. Koffel, P.E., FSFPE, SASHE
October 7, 2019



Expertly Engineering Safety From Fire®



William E. Koffel, P.E., FSFPE, SASHE


- President of Koffel Associates, Inc.
- Serves on numerous NFPA technical committees
 - Chair – NFPA 101® Health Care Occupancies
 - Chair – NFPA 25
 - Chair – NFPA 13 Correlating Committee
 - Chair – NFPA 72 Emergency Communication Systems
- 40+ years of industry experience



(2)

Regulatory Codes

- **NFPA 101®: The Life Safety Code® (LSC)**
 - 2012 Edition
- Referenced Standards (NFPA 10, NFPA 13, NFPA 25, NFPA 72, NFPA 80, and NFPA 105)



(3)

Polling Devices

- Press any key to turn on device
- Confirm Channel is **41**
- When instructed to do so, push appropriate **black** letter key



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The "Test" System

- Question displayed
- Use clicker to select response
- Further discussion and explanation based on percentage of correct responses

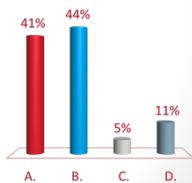


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Test Question

With the NFL schedule released, who will win the next Super Bowl?



- A. Bills
- B. Patriots
- C. Ravens
- D. Giants



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Standard for Portable Fire Extinguishers

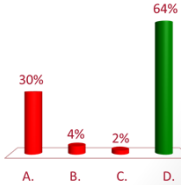
NFPA 10





NFPA 10 – Fire Extinguisher Installment

NFPA 10 – Fire Extinguisher Installment

- A. At a height not more than 5 ft above the floor.
- B. At a height not less than 4 in. from floor.
- C. At any height as long as it is readily accessible and visible.
- D. Both A and B



Option	Percentage
A	30%
B	4%
C	2%
D	64%






NFPA 10 – Fire Extinguisher Installment

Answer – d) Both A and B

2010 NFPA 10 §6.1.3.8

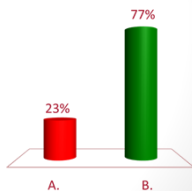
Extinguishers greater than 40 lbs shall not be installed more than 3.5 ft above the floor.



NFPA 10 – Fire Extinguisher Installment

Where at least monthly manual inspections are conducted, only the date of inspection needs to be recorded.

- A. True
- B. False



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NFPA 10 – Fire Extinguisher Inspection

Answer – b) False

2010 NFPA 10 §7.2.4

The records must indicate the date of inspection and the initials of the person performing the inspection.

Records should be kept for at least a year.



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Standard for the Installation of Sprinkler Systems

NFPA 13

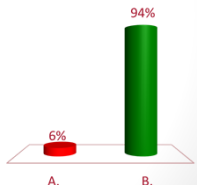


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NFPA 13 – Painted Sprinklers

If a sprinkler or cover plate has been painted by the manufacturer, the facility can apply touch-up paint for maintenance/appearance purposes.

- A. True
- B. False



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NFPA 13 – Painted Sprinklers

Answer – b) False

2010 NFPA 13 §6.2.6.2

Painting is only permitted by the manufacturer, any other application of paint will require replacement of the sprinkler and/or coverplate.



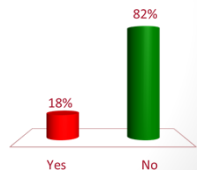
14



NFPA 13 – Sprinkler Sensitivity

Can different sprinkler types (standard and fast response) be used in the same compartment (room)?

- A. Yes
- B. No



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NFPA 13 – Sprinkler Sensitivity

Answer – b) No

2010 NFPA 13 §8.3.3.2

Where quick-response sprinklers are installed, all sprinklers within the compartment shall be quick-response.



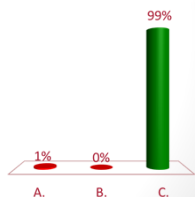
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NFPA 13 – Sprinkler Supports

What are the limitations on non-system components that can be supported by sprinkler piping or hangers?

- A. Acceptable as long as the components are less than 10 lbs.
- B. Acceptable as long as the components are tied to the sprinkler pipe.
- C. No items can be supported by sprinkler pipe.



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NFPA 13 – Sprinkler Supports

Answer – c) No items can be supported by sprinkler pipe.

2010 NFPA 13 §9.1.1.7



Citations have been noted for even a single wire on a sprinkler pipe.

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Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems

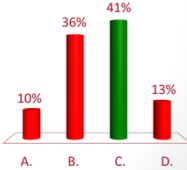
NFPA 25





NFPA 25 – Sprinkler Testing

At what point after installation are fast-response sprinklers required to be replaced or tested?

- A. Never
- B. Annually
- C. After 20 years
- D. After 50 years



Option	Percentage
A. Never	10%
B. Annually	36%
C. After 20 years	41%
D. After 50 years	13%





NFPA 25 – Sprinkler Testing

Answer – c) After 20 years

2011 NFPA 25 §5.3.1.1.1.3

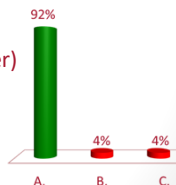
If a sampling is tested and the sprinklers are not replaced, retesting shall occur at 10-year intervals.



NFPA 25 – Sprinkler Replacement

Which of the following conditions does NOT require replacement of the sprinkler?

- A. Dust loading
- B. Corrosion
- C. Painting (not by manufacturer)



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NFPA 25 – Sprinkler Replacement

Answer – a) Dust loading

2011 NFPA 25 §5.2.1.1.2



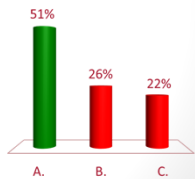
Removal of dust is permitted as long as the removal equipment does not touch the sprinkler (vacuum, compressed air).

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NFPA 25 – Internal Inspection of Piping

Internal inspection of piping shall be conducted:

- A. Every 5 years
- B. Every 15 years
- C. Upon request of the AHJ



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NFPA 25 – Internal Inspection of Piping

Answer – a) Every 5 years

2011 NFPA 25 §14.2.1

Alternative nondestructive examination methods may be permitted.

May also do alternate systems in buildings with multiple systems.



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National Fire Alarm and Signaling Code

NFPA 72

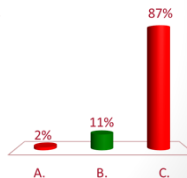


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NFPA 72 – Smoke Detection for Door Release

Where smoke detection is required for door release, and the lintel height above the door is less than 24 in. on side A and 24 in. on side B where is smoke detection required?

- A. Smoke detector required on side A.
- B. Smoke detector required on side B.
- C. Smoke detectors required on both sides of doors.



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NFPA 72 – Smoke Detection for Door Release

Answer – b) Smoke detector required on side B

2010 NFPA 72 §17.7.5.6.1

Lintel height less than 24 in. – smoke detector required on one side of doors within 5 ft.

Lintel height greater than 24 in. – smoke detectors required on both sides of doors within 5 ft.



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Standard for Fire Doors and Other Opening Protectives

NFPA 80

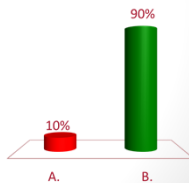


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NFPA 80 - Labeling

It is acceptable for a fire door label to be covered by a continuous hinge.

- A. True
- B. False



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NFPA 80 - Labeling

Answer – b) False

2010 NFPA 80 §4.2.2

Labels must be readily visible and convenient for identification by the Authority Having Jurisdiction.

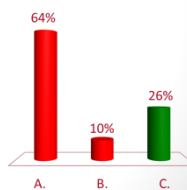


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NFPA 80 – Protection Plates

When are field-applied protection plates on fire doors required to be labeled?

- A. Always
- B. When the plate is greater than 48 in. tall.
- C. When the plate is greater than 16 in. above the bottom of the door.



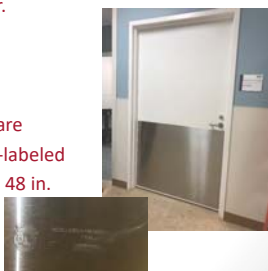
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NFPA 80 – Protection Plates

Answer – c) When the plate is greater than 16 in. above the bottom of the door.

2010 NFPA 80 §6.4.5.3

Hazardous area doors are permitted to have non-labeled protection plates up to 48 in.

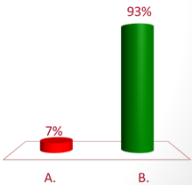


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NFPA 80 – Hardware

Fire doors shall be equipped with:

- A. Panic Hardware
- B. Fire Exit Hardware



Option	Percentage
A. Panic Hardware	7%
B. Fire Exit Hardware	93%

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NFPA 80 – Hardware

Answer – b) Fire Exit Hardware

2010 NFPA 80 §6.4.4.2

Fire exit hardware shall be labeled as such and include the serial number and manufacturer's name.




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NFPA 80 – Signs on Doors

Signs required on fire doors shall be mechanically attached to the door using screws or nails.

- A. True
- B. False



Option	Percentage
A. True	21%
B. False	79%

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NFPA 80 – Signs on Doors

Answer – b) False

2010 NFPA 80 §4.1.4.2.2

Any required signage must be placed using adhesive. Signs shall not be installed on glazing or placed to interfere with the operation of the fire door.



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Recommendations for Compliance, Mitigation and Documentation

FIRE/SMOKE DOOR FAILURES



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Agenda

- Why we are here
- Review of Fire/Smoke Door Requirements
- Survey Says
- Interactive Tool Development Session
- Winners!
- Q&A



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Requirements

- *NFPA 101-2012 Life Safety Code*
- NFPA 80 - 2010 – Fire Doors
- NFPA 105- 2010 – Smoke Door Assemblies



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Requirements

4.6.12 Maintenance, Inspection, and Testing. (NFPA 101-2012 Edition)

4.6.12.1 Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature is **required for compliance with the provisions of this Code**, such device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or other feature **shall thereafter be continuously maintained**. Maintenance shall be provided **in accordance with applicable NFPA requirements** or requirements developed as part of a performance-based design, or as directed by the authority having jurisdiction.

- *NFPA 101* – 2012 Edition references *NFPA 80* -2010 Edition
 - *NFPA 80* - New requirement to inspect all fire doors on an annual basis

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Requirements

- CMS - S&C 17-38 LSC – July 28, 2017
 - All fire doors are to be inspected annually as required by *NFPA 80*
 - New doors in horizontal exits are to be inspected annually
 - Compliance by January 1, 2018
- Local building/fire codes
 - Some editions of the IBC required S-labeled doors for openings in smoke barriers
 - International Fire Code also references *NFPA 80* and *NFPA 105*

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Fire Doors in Non-rated Barriers

- Doors must be inspected annually or the label must be removed per HITF
 - **LSC 4.6.12.3** Existing life safety features obvious to the public, if not required by Code shall either be maintained or removed
- *Perspectives – April 2018*
 - *Sticker may be placed over the label*



NFPA 80 Inspection and Testing Qualifications

- **5.2.3.1**testing of fire door and window assemblies shall be performed by individuals with knowledge and understanding of the operating components of the type of door being subject to testing.
- **NFPA 80 – 2013** changed to refer to qualified person
 - **3.3.95 Qualified Person.** A person who, by possession of a recognized degree, certification, professional standing, or skill or who, by knowledge, training, and experience, has demonstrated the ability to deal with the subject matter, the work, or the project




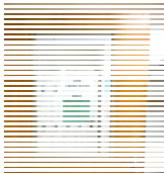

Clearances

- Maximum clearance between door and frame
 - $\leq 1/8$ in. for wood doors
 - $1/8 \pm 1/16$ in. for steel doors
- Maximum clearance under fire/smoke barrier doors 3/4 in.
- Maximum clearance under smoke-resistive doors 1 in. (per NFPA 101)



Fire/Smoke Door Glazing (Glass)

- Wired glass and labels
- Size limitations

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Inspection Checklist

Barrier	Door Requirements
<ul style="list-style-type: none"> 2-hour fire-rated barrier 1-hour fire-rated barrier 	<ul style="list-style-type: none"> 90 minute (2-hour barrier) / 45-minute (1-hour barrier) label provided and legible Self-closing device required and must close door completely <ul style="list-style-type: none"> Door is not permitted to be propped open unless on magnetic hold open tied to fire alarm system Positive latch required If coordinator is installed, the inactive leaf closes before the active leaf Gasketing and edge seals, where required, are inspected to verify their presence and integrity No field modifications to the door assembly that void the label Steel Fire Door <ul style="list-style-type: none"> Gap at meeting edges of doors \leq 1/16 inch \pm 1/16 inch Clearance under door \leq 3/4 inch Wood Fire Door <ul style="list-style-type: none"> Gap at meeting edges of doors \leq 1/16 inch Clearance under door \leq 3/4 inch

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Case Studies

- 75 bed Hospital – All 153 doors failed due to smoke seal issues
 - Analysis – None of the doors required smoke seals
- 120 bed Hospital – 250 deficiencies due to clearances
 - Analysis – Deficiencies reduced to 63 since many doors were not required to be fire doors
- 247 bed Hospital – 300 fire/smoke doors = 700 deficiencies
 - Analysis – Deficiencies reduced 50% due to doors not requiring smoke seals; further reduction anticipated upon completion of a barrier analysis

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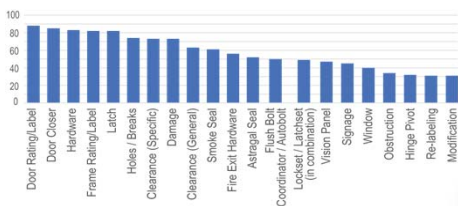
Summary

- NFPA 80/105 require inspections for compliance with the requirements of the standards.
 - Does not include an analysis of the Code requirements
 - 48 in. protection plates permitted by *NFPA 101*
 - Most inspections are done to the current, or possibly 2010, editions of NFPA 80/105
 - Both documents as well as the *NFPA 101* reference have a clause that the installation requirements do not apply to existing doors
 - If the door has a label, the inspector will inspect for compliance with the standards based upon the label
 - Many doors have fire door labels even though the door is not required to be a fire door.
 - Many doors have "S" labels even though they are not required
- The scope of work is typically to inspect to NFPA 80/105



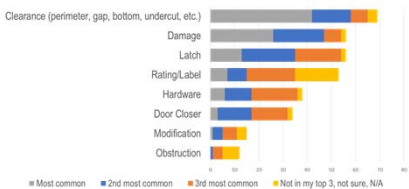
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Specific categories used to identify fire door deficiencies in your annual inspection report

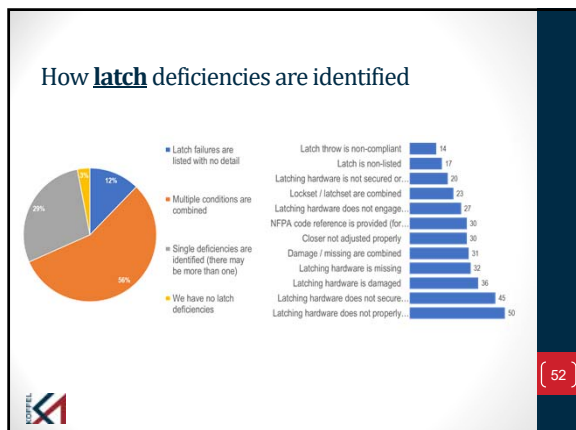


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Primary causes deficiencies/non-compliance



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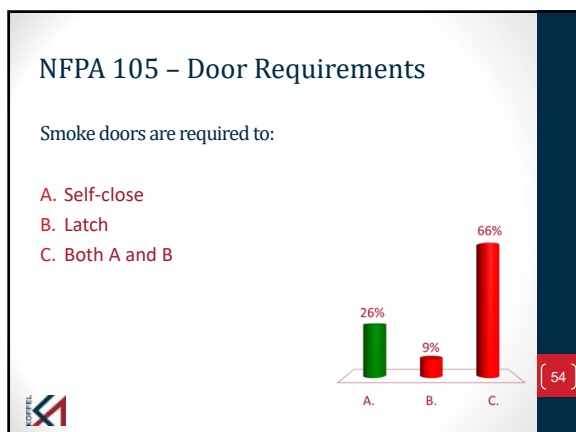


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Standard for Smoke Door Assemblies and Other Opening Protectives

NFPA 105

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NFPA 105 – Door Requirements

Answer – a) Self-close

2010 NFPA 105 §4.5.1




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NFPA 101 – Normally Unoccupied Rooms

Which provision below is required to allow an existing mechanical equipment room to open directly onto an exit enclosure?

- A. Room contains no fuel-fired equipment.
- B. Room contains no storage of combustible materials.
- C. Building is completely sprinkler protected.
- D. All of the above.

0% 0% 0% 0%

A. B. C. D.

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NFPA 101 – Normally Unoccupied Rooms

Answer - d) All of the above

2012 NFPA 101 §7.1.3.2.1(9)(c)

- Opening must also be protected by properly rated door assembly

2018 NFPA 101 permits the mechanical space to be provided with sprinkler protection AND smoke/heat detection in lieu of complete building sprinkler protection

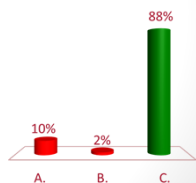


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NFPA 101 – Chapter 43

When a patient room in an Existing Health Care occupancy is converted to a storage room (less than 250 ft²) it is classified as:

- A. Renovation
- B. Reconstruction
- C. Change of use



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NFPA 101 – Chapter 43

Answer – c) Change of use

2012 LSC §43.7.1

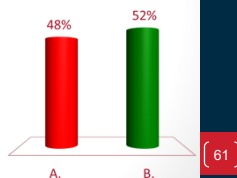


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NFPA 101 – Chapter 43

When a patient room in an Existing Health Care occupancy that is protected throughout with automatic sprinkler protection is converted to a storage room (less than 250 ft²), it shall meet the requirements of:

- A. New Construction
- B. Existing Construction



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NFPA 101 – Chapter 43

Answer – b) Existing Construction

2012 LSC §43.7.1.2(2)

- Smoke-resistive construction
- Self-closing door

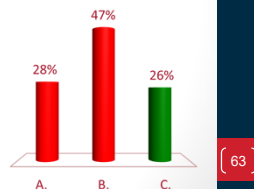


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NFPA 101 – Delayed Egress

How many delayed-egress locks are permitted in an egress path?

- A. 0
- B. 1
- C. 2+





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NFPA 101 – Delayed Egress

Answer – c) 2+

2012 LSC §18.2.2.2.4

- 2009 Edition removed the limit on only one delayed egress door in an exit path.
- IBC still limits to 1 Delayed Egress in occupancies other than Health Care.





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NFPA 101 – Suite Travel Distance

The 100 ft maximum allowable suite travel distance is measured from any point in the suite to which location?

- A. Smoke barrier door
- B. Exit stair door
- C. Exit access door
- D. All of the above



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NFPA 101 – Suite Travel Distance

Answer – c) Exit access door

2012 NFPA 101 §18/19.2.5.7.2.4(A) and 18/19.2.5.7.3.4(A)

2015 NFPA 101

- Suite travel distance can be measured to a horizontal exit or door to another suite
- "exit access door" replaced with "exit access corridor door"



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NFPA 101 – Locking Arrangements

When are two releasing operations permitted on a door in a means of egress?

- A. When fast-response sprinklers are provided.
- B. When complete coverage smoke detection is provided.
- C. When the hardware is existing and the occupant load of the room does not exceed three people.
- D. All of the above.



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NFPA 101 – Locking Arrangements

Answer – c) When the hardware is existing and the occupant load of the room does not exceed three people.

2012 NFPA 101 §7.2.1.5.10.6

Lock release cannot require simultaneous operations.



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NFPA 101 – Exit Discharge

What percentage of exit stairs are permitted to discharge to the interior of a building?

- A. Exit stairs are not permitted to discharge to the interior
- B. 50%
- C. 75%
- D. 100%





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NFPA 101 – Exit Discharge

Answer – b) 50%



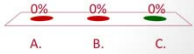
2012 NFPA 101 §7.7.2



NFPA 101 – Exit Discharge

Which of the following is required for an exit stair which discharges to the interior of the building?

- A. Complete smoke detection throughout the level of exit discharge.
- B. Exterior exit is readily visible from stair discharge.
- C. Automatic sprinkler protection of the level of exit discharge.



NFPA 101 – Exit Discharge



Answer – c) Automatic sprinkler protection of the level of exit discharge.

2012 NFPA 101 §7.7.2

Where complete building sprinkler protection is not provided the below are acceptable levels of protection:

- Complete sprinkler protection throughout the level of exit discharge.
- Sprinkler protection throughout portion of building containing exit discharge path where non-sprinklered areas of building are separated by 2-hr construction.

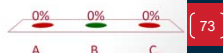
2012 NFPA 101 - Exit path must be readily visible and identifiable.
2018 NFPA 101 – Exit path must be identifiable by exit signage from point of discharge to exit.
2018 IBC – Exterior exit must be readily visible from the point of discharge.



NFPA 101 – Stair Signage

When are new enclosed exit stairs required to have signage?

- A. All new stairs require signage.
- B. When serving 3 or more floors.
- C. When serving 5 or more floors.



NFPA 101 – Stair Signage

Answer – b) When serving 3 or more floors.

2012 NFPA 101 §7.2.2.5.4

Existing stairs require signage when serving 5 or more floors.

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NFPA 101 – Corridor Projections

Where the corridor width is at least 8 ft wide, fixed furniture is permitted to remain permanently in the corridor as long as what clear width remains?

- A. 4 ft
- B. 5 ft
- C. 6 ft



NFPA 101 – Corridor Projections

Answer – c) 6 ft

2012 NFPA 101 §18/19.2.3.4(5)(b)

- Furniture must be on one side of the corridor.
- Furniture must be permanently fixed (bolted).



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NFPA 101 – Door Latching

Are fire pins permitted as a second point of latching for a set of doors in a 2-hr fire barrier?

- A. Yes
- B. No



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NFPA 101 – Door Latching

Answer – a) Yes

2012 NFPA 101 §7.2.1.5.2/
2010 NFPA 80 §7.4.3.3




Two points of latching are required per leaf for a pair of doors in a 2-hr barrier, or 3 points of latching per assembly if the door leaves interact.



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DON'T FORGET TO RETURN YOUR POLLING DEVICE



KOFFEL ASSOCIATES, INC.

Questions?

William E. Koffel, P.E., FSFPE, SASHE
wkoffel@koffel.com

Koffel Associates, Inc.
8815 Centre Park Drive,
Suite 200
Columbia, MD 21045-2107
410-750-2246
www.koffel.com

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