

All You Ever Wanted to Know About Fire Doors



1

Presented By:

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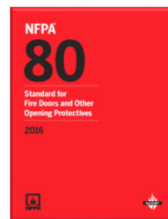
- Websites:
 - DoorSafety.com
 - PardoeConsultingLLC.com



2

Today's Topics Include

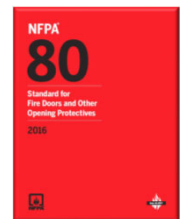
- Introduction to NFPA 80
- Labeling Requirements for Swinging Fire Doors with Builders Hardware



3

Today's Topics Include



- Repairing Swinging Fire Doors
- NFPA 80's Inspection and Testing Requirements for Swinging Fire Doors
- Older Existing Fire Door Assemblies



4

Handouts

- Presentation slides (pdf file)
- Door Safety's publication *Recommendations for Measuring Door Gap Dimensions* (pdf file)






5

A Constant State of Readiness

- **Fire doors have one job; preventing a fire from spreading.**
- Swinging doors, in general, also provide:
 - Convenience
 - Security
 - Privacy
 - Protection from equipment (e.g., lead-lined shielding)
 - Environmental control (e.g., heating and cooling, sterile/soiled conditions, and sound control)

✓ **Preventing a fire from spreading takes precedence over all other functions.**



6

A Constant State of Readiness

- All swinging fire doors must:
 - Swing easily and freely
 - Close completely
 - Positively latch

NFPA 80's functional requirements are the same for each level of fire ratings.

✓ **Every swinging fire door must have positive latching hardware; there are no exceptions!**






7

A Constant State of Readiness

- **Self-Closing Door Operation**
 - Doors are intended to be kept closed.
 - Closing devices on swinging fire doors resist opening by occupants.
 - Doors become obstacles to occupants.
 - Occupants block-open, disable, or otherwise tamper with closing devices and latching hardware.

✓ **Self-closing doors must close completely from any partially opened position. ALWAYS!**

8

A Constant State of Readiness

• **Automatic-Closing Operation**

- Electrically held open self-closing doors
- Must close complete and latch
 - Upon actuation of smoke detectors
 - Upon signal from fire alarm system
 - Upon loss of power

✓ **Automatic-closing swinging fire doors become self-closing upon release of the hold-open device.**



9

A Constant State of Readiness

- The fire rating of an assembly is valid **ONLY** when:
 - All the required components are installed in accordance with their listings and installation instructions, and
 - The doors function as required by the codes.

✓ **Listings refer to how the components were tested for use on fire door assemblies.**

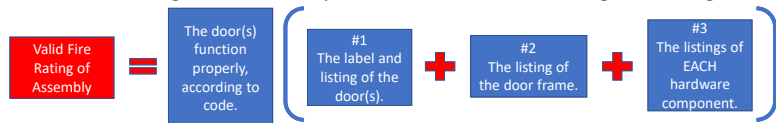


10

A Constant State of Readiness

The rating of an assembly is the rating of the door frame or door, whichever is less.

The fire rating of an assembly starts with the door's rating and listing:



✓ **ALWAYS in this order. Each component must be labeled or listed and be installed in accordance with its listing and installation instructions.**



11

Introduction to NFPA 80



12

Introduction to NFPA 80

- NFPA 80, **Standard for Fire Doors and Other Opening Protectives**
 - It's a **standard**, not a code
 - It defines what fire doors are, not where they are used
- Building, fire, and life safety codes require fire doors to comply with NFPA 80
 - Codes mandate the placement and minimum fire protection ratings of all types of fire doors.

✓ **The 2022 edition is available now!**



13

The screenshot shows the NFPA.org website interface. At the top, there's a navigation bar with links like 'Catalog', 'NFPA LINK™', 'Xchange™', 'NFCS™', 'NFPA Journal®', 'Sparky®', 'Fire Prevention Week™', 'Firewise USA®', and 'Conference Series'. Below that is the NFPA logo and the text 'NATIONAL FIRE PROTECTION ASSOCIATION The leading information and knowledge resource on fire, electrical and related hazards'. The main content area is titled 'CODES & STANDARDS' and features a 'Codes & Standards / All codes & standards / List of NFPA codes & standards / NFPA 80' breadcrumb. A 'BUY NFPA 80' button is visible. A yellow starburst graphic on the left says 'It's FREE!'. A yellow box in the top right corner says 'Go to: NFPA.org/80 Set up a FREE website account.' A red arrow points to a 'FREE ACCESS' button in the 'View this Document' section.

14

Introduction to NFPA 80

- Consists of 21 chapters and 12 annex sections
- **Base chapters (apply to all door types)**
 - Chapter 1: Administration
 - Chapter 2: Referenced Publications
 - Chapter 3: Definitions
 - Chapter 4: General Requirements
 - Chapter 5: Inspection, Testing, and Maintenance



15

Introduction to NFPA 80



- **Opening protectives chapters**
 - Chapter 6: Swinging Doors with Builders Hardware
 - Chapter 7: Swinging Doors with Fire Door Hardware
 - Chapter 8: Horizontally Sliding Doors
 - Chapter 9: Special-Purpose Horizontally Sliding Accordion or Folding Doors
 - Chapter 10: Vertically Sliding Doors
 - Chapter 11: Rolling Steel Doors



16

Introduction to NFPA 80

- *Opening protectives chapters*
 - Chapter 12: Fire Shutters
 - Chapter 13: Service Counter Fire Doors
 - Chapter 14: Hoistway Doors for Elevators and Dumbwaiters
 - Chapter 15: Chute Doors
 - Chapter 16: Access Doors
 - Chapter 17: Fire Windows
 - Chapter 18: Glass Block Assemblies
 - Chapter 19: Fire Dampers
 - Chapter 20: Fabric Fire Safety Curtains
 - Chapter 21: Fire Curtains



17

Introduction to NFPA 80

Study these sections of NFPA 80.

- Today's presentation is an overview of:
 - Chapter 4, *General Requirements*
 - Chapter 5, *Inspection, Testing, and Maintenance*
 - Chapter 6, *Swinging Doors with Builders Hardware*
 - Annex A, *Explanatory Material*

✓ **Chapter 7, *Swinging Doors with Fire Door Hardware* are NOT USED in most buildings and occupancies!**

18



Swinging Door with Builders Hardware (Chapter 6)



Swinging Door with Fire Door Hardware (Chapter 7)

Full mortise hinges and surface-mounted door closer (other side)

Fire exit hardware.

Strap hinges.

Latch bar.



Counterweight, rope, and pulley closing mechanism

19

Chapter 4: General Requirements

- Contains provisions and requirements for several types of fire doors
- Covers installation work that anyone can do
 - Drilling round holes for fasteners
 - Drilling round holes for surface-mounted hardware
 - Drilling round holes for mortise lock trim and cylinders
 - Prohibits certain types of work
 - Any work **other than** drilling round holes for fasteners

✓ **Installation work can be done for maintenance purposes.**

20

Chapter 4: General Requirements

- Other topics covered in this chapter:
 - Components
 - Each component must be labeled or listed
 - Components can be products from different manufacturers
 - Components can be labeled by different certification and testing labs (e.g., FM, Intertek/Warnock Hersey, QAI Labs, and UL)
 - Unmarked components are permitted where they comply with NFPA 80's specifications
 - Components must be used according to their installation instructions and listings (how they were tested).
 - Components cannot be used on assemblies requiring higher ratings.



21

Chapter 4 Labels on Door Frames

- Hollow metal door frames
 - Most labels do not list the hourly rating.
 - Frames in masonry construction can be rated up to 3 hours.
 - Frames in drywall partitions can be rated up to 1-1/2 hours.
 - Standard sidelight frames are rated up to 3/4-hour (fire protection-rated), regardless of wall construction.
 - Special sidelight frames are rated up to 1-1/2 hours (fire resistance-rated), provided they pass ASTM E119 or UL 263 fire tests.
- Door frame of other construction include the hourly ratings on their labels (e.g., 20 minutes, 45 minutes, and 90 minutes)



22

Chapter 4: General Requirements

- Requirements for labels on door frames, doors, and hardware components
- Labels on door frames and doors are not required to match!
- An assembly's rating is the rating of the door frame or door, whichever is less.



23

Chapter 4: General Requirements

- There are no standard labels!



24

Fire Door Labels



25

Fire Door Labels



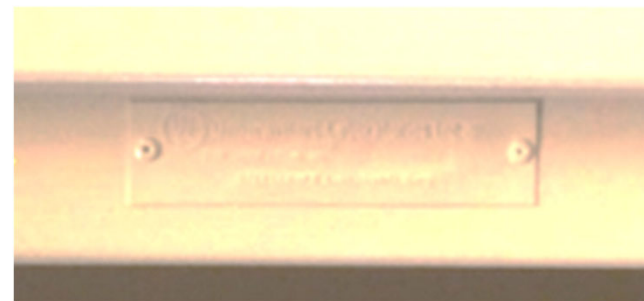
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AMERICAN STEEL PROD. CORP. FARMINGDALE, N.Y. 1-1/2 HOUR RATED FIRE DOOR BY ASTM E 152 LATCH THROW 1/2 IN. SERIAL NO. 05494	FACTORY MUTUAL APPROVED
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27



28

Labels on Door Frames



29



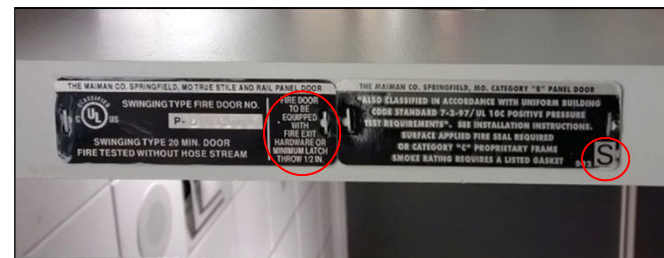
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No Standard Fire Door Label



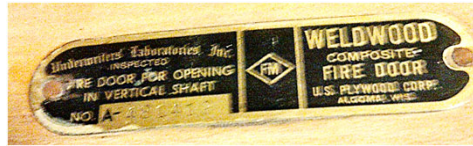
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No Standard Fire Door Label



32

What's Wrong With This Label?



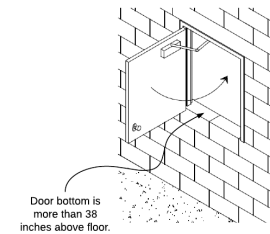
Underwriters' Laboratories Inc INSPECTED FIRE DOOR FOR OPENING IN VERTICAL SHAFT No. A-489419		WELDWOOD COMPOSITE FIRE DOOR U.S. PLYWOOD CORP. ALGOMA, WI
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33

Chapter 4: General Requirements

- Clearance dimensions UNDER swinging fire doors.
 - 3/4-inch (19 mm) maximum, unless hardware requires LESS clearance
 - 3/8-inch (9 mm) maximum when the bottom of the door is more than 38 inches above the floor.



34

Chapter 5: Inspection, Testing, and Maintenance

- Applies to all types of fire door and window assemblies
- New and existing installations
- Covers repair and replacement of fire door assemblies
- Includes inspection checklist for some types of doors
 - Chapter 6: Swinging Doors with Builders Hardware



35

Chapter 5: Inspection, Testing, and Maintenance

- Acceptance Testing
 - Visual Inspection and Functional Testing
 - Upon Installation
 - Upon Maintenance Affecting Operation
 - Records retained for life of installations
 - Each fire door and fire window assembly
- Periodic Safety Inspections
 - Same process as above
 - Records retained for at least three years



36

Chapter 5: Inspection, Testing, and Maintenance

- Replacement of door assemblies
 - New doors in existing door frames
 - New door assemblies
 - New glass and glazing in existing door assemblies
- Repairing door frames and doors
 - Filling fastener holes
 - Filling other types of holes



37

Chapter 6: Swinging Doors with Builders Hardware

- Component-based systems and hybrid assemblies (unit-based systems)
 - Fire protection-rated assemblies
 - Fire resistance-rated assemblies



38

2-hour Fire Resistance-Rated Assembly:
it's tested to **ASTM E119** or **UL 263** as part of the wall construction.

It's also an NFPA 80, Chapter 6-Type Assembly

Frame, Doors, Glass, and Hinges/Pivots are covered by the door label. Mortise lock and door closer are added separately.



39

Chapter 6: Swinging Doors with Builders Hardware

- Door operations
 - Self-closing operation
 - Automatic-closing operation
 - Powered operation



40

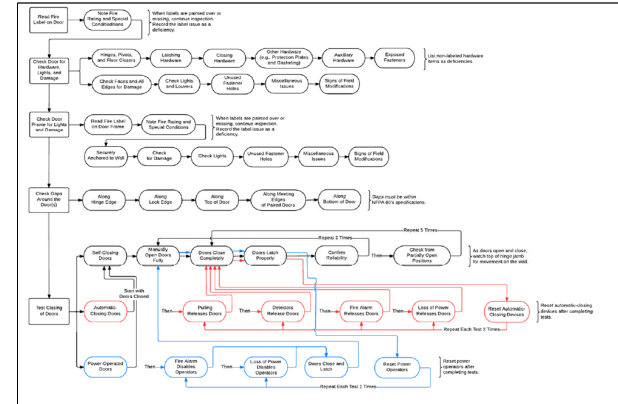
Chapter 6: Swinging Doors with Builders Hardware

- Clearance dimensions on the pull-side of the assemblies
 - Between vertical and top edges of doors and door frames
 - Between vertical edges of pairs of doors

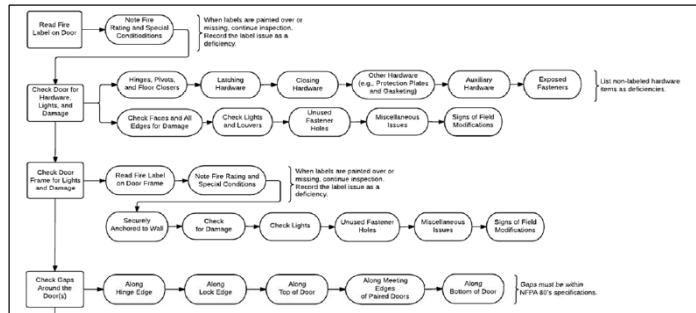
✓ Chapter 4, General, specifies clearances under swinging doors.



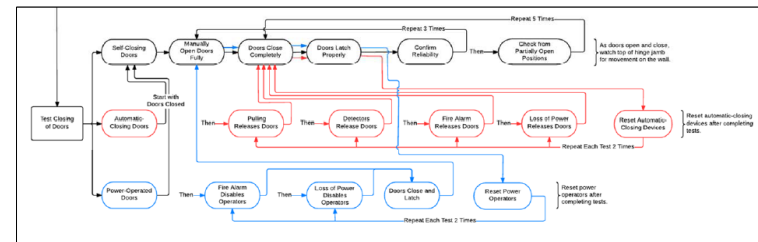
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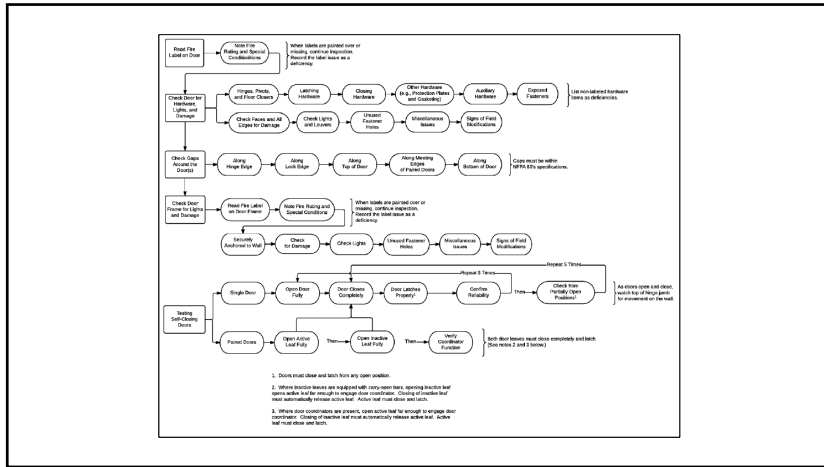
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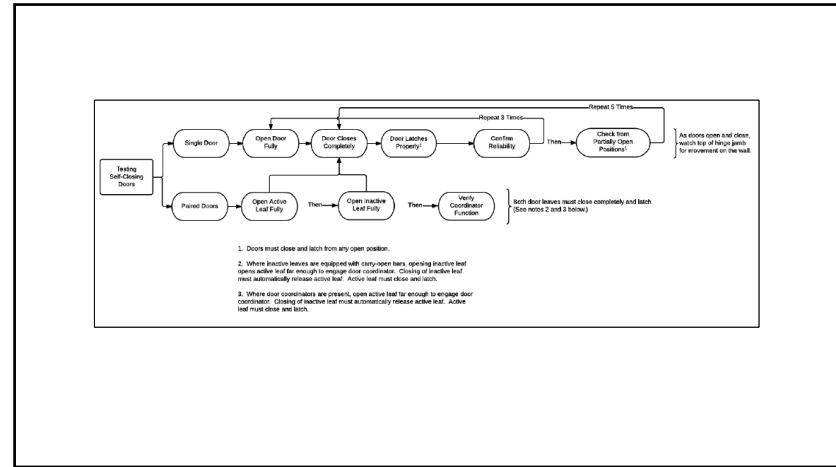
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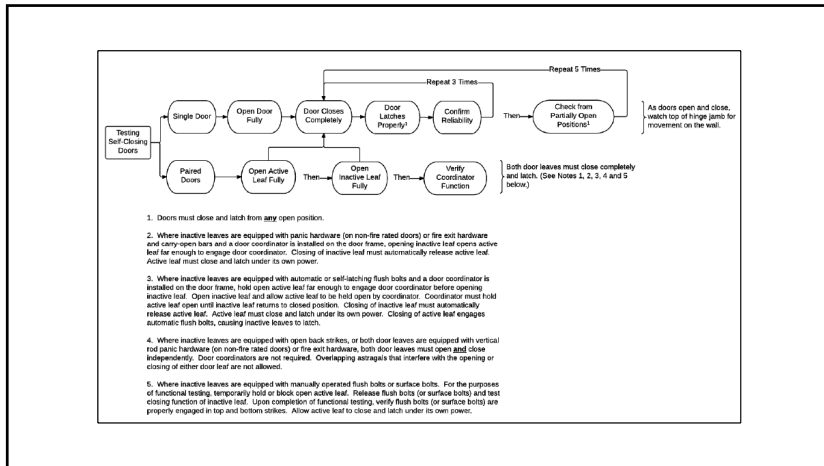
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46





47

Summary

- Swinging fire doors are specially engineered systems
 - They have one job; preventing a fire from spreading.
- They require increased attention during installation, and throughout their service lives.

Fire doors must be kept in a Constant State of Readiness.

48

Questions?

