

Door
Security & Safety
FOUNDATION

Presents:

Swinging Fire Door Assemblies with Builders Hardware

Design, Installation, Inspection, and
Maintenance

Speaker

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Design

- Swinging Fire Door Assemblies with Builders Hardware
 - Covered in Chapter 6 in NFPA 80
 - Component Based Systems

Design

- Swinging Fire Door Assemblies with Builders Hardware are Comprised of:
 - Labeled door frame
 - Labeled door(s)
 - Labeled or Listed Door Hardware Products
 - Hinges
 - Door Bolts
 - Locks and Latches
 - Door Closers
 - Etc.

Design

- Labeled Door Frames
 - Embossed Labels
 - Physical Labels
 - Mylar
 - Metal

Design

- Labeled Doors
 - Physical Labels
 - Mylar
 - Metal
 - States Hardware Requirements
 - Latch Throw
 - Fire Exit Hardware
 - S-Label for Smoke Door Assemblies
 - States Fire-Protection Rating in Hours or Minutes

Design

- Labeled and Listed Hardware Components
 - Marked with Emblems and Symbols
 - F, f, Ff
 - UL
 - Embossed, Stamped, or Applied

Design

- Glass and Glazing
 - 1/4-inch Clear Wire Glass
 - Fire Resistance Rated Glazing
 - Fire Protection Rated Glazing

Design

- Door Frame and Door Labels
 - Applied at Factory or Authorized Shop BEFORE Door Hardware is Installed
- Door Hardware Labels
 - Marked During Manufacturing
 - Some Products (e.g., Hinges) are only Listed



UNDERWRITERS LABORATORIES INC.®

CLASSIFIED

SWINGING TYPE FIRE DOOR

NO. [REDACTED]

FIRE RATING: [REDACTED] HR. MIN LATCH THROW: [REDACTED]



UNDERWRITERS LABORATORIES INC.®

CLASSIFIED

SWINGING TYPE FIRE DOOR

FIRE RATING: [REDACTED] HR. NO. [REDACTED]

FIRE DOOR TO BE EQUIPPED WITH FIRE EXIT HARDWARE



UNDERWRITERS LABORATORIES INC.®

CLASSIFIED

SWINGING TYPE FIRE DOOR

NO. [REDACTED]

FIRE RATING: [REDACTED] HR. MIN LATCH THROW: [REDACTED]

TEMP. RISE 30 MIN. [REDACTED] °F MAXIMUM



UNDERWRITERS LABORATORIES INC.®

CLASSIFIED

SWINGING TYPE FIRE DOOR

FIRE RATING: [REDACTED] HR. NO. [REDACTED]

TEMP. RISE 30 MIN. [REDACTED] °F MAXIMUM

FIRE DOOR TO BE EQUIPPED WITH FIRE EXIT HARDWARE



UNDERWRITERS LABORATORIES INC.®

LISTED

FIRE DOOR FRAME

NO.



UNDERWRITERS LABORATORIES INC.®

LISTED

FIRE DOOR FRAME
WITH PANELS

NO.



UNDERWRITERS LABORATORIES INC.®

LISTED

FIRE DOOR FRAME
FOR LIGHTS

NO.



UNDERWRITERS LABORATORIES INC.®

LISTED

FIRE WINDOW FRAME

NO.

Design

- NFPA 80 Allows Door Frames, Doors, and Hardware to be Products of Different Manufacturers
- NFPA 80 Allows Doors Frames, Doors, and Hardware to be Labeled and Listed by Different Testing Labs

Design

- Fire Door Ratings
 - 1/3-hour (20 minutes)
 - 1/2-hour (30 minutes)
 - 3/4-hour (45 minutes)
 - 1-hour (60 minutes)
 - 1-1/2 hour (90 minutes)
 - 3 hour (180 minutes)

Design

- Swinging Doors Rated Less than Walls
 - 4-hour walls requires 3-hour door assemblies
 - 2-hour walls requires 1-1/2 hour door assemblies
 - 1-hour walls requires 3/4-hour door assemblies
 - Exception: 1/3-hour door assemblies in some occupancies

Installation

- Component-Based Assemblies
 - Frame, Door, and Hardware Components
 - Virtually Infinite Combinations of Components
 - Each Component is Required to be Labeled or Listed
- ✓ ***Typically, the Label on the Door Establishes the Duration of Fire Protection Rating for the Assembly***

Installation

- Swinging Fire Doors with Fire Door Hardware
- Horizontally Sliding Fire Doors
- Vertically Sliding Fire Doors
- Rolling Steel Fire Doors
- Access Fire Doors
- More...

✓ ***The Label on These Types of Fire Doors Cover the Entire Assembly***

Installation

- Assemblies Commonly Consist of:
 - Hollow Metal Doors and Frames
 - Hollow Metal Frames and Wood Doors*
 - Pressed Steel Frames and Wood Doors*
 - Aluminum Frames and Wood Doors*
 - Aluminum Frames and Flush Aluminum Doors
 - Wood Composite Frames and Wood Doors*
 - Fiberglass Reinforced Polymer (FRP) Frames and Doors

****Fire Rated Wood Doors can be Flush or Stile and Rail Designs – High Pressure Decorative Laminate (e.g., Plastic Laminate) Fire Doors are a Type of Flush Wood Fire Door***

Installation

- NFPA 80 Requires Swinging Doors with Builders Hardware to be Installed within the Following Clearances:
 - Hollow Metal Doors: 1/8-inch (plus or minus 1/16-inch) at Vertical Edges and Top Edges of Doors
 - Wood Doors: 1/8-inch Maximum (No Over- or Under-Tolerance)
 - Doors of Other Materials are Treated the Same as Wood Doors

Installation

- Fire Door Tests Allow 1/8-inch Clearance with No Over- or Under-Tolerance
 - UL 10B, Standard for Safety Fire Tests of Door Assemblies
 - UL 10C, Standard for Positive Pressure Fire Tests of Door Assemblies
 - Other Fire Door Test Standards

Installation

- Clearance Under the Doors
 - Maximum of 3/4-inch Where Bottom of Door is Less than 38-inches Above the Floor
 - Maximum of 3/8-inch Where Bottom of Door is 38-inches or Higher Above the Floor
 - Access Doors

Installation

- Common Misconceptions
 - Label on Door(s) Indicates the Assembly is “OK”
 - Fire Doors are “OK” as Long as They Close and Latch
 - All Fire Doors are Inspected by the AHJ

Installation

- Label on Door Establishes Requirements for Hardware Components
 - Dimension of Latch Bolt Throw (Projection)
 - Application of Fire Exit Hardware
 - Temperature Rise (e.g., 650, 450, and 250 degrees)
- ✓ ***Some Labeled Hardware Items Have Restricted Applications***

Inspection

- Inspectors Need to be Cognizant of Applicable Code Requirements at Time of Installation
- Presumption of Correct Applications
- Practical Application of Inspection Criteria

Inspection

- Only the AHJ has the authority to enforce building and fire code compliance

Inspection

- NFPA 80 Requires Annual Inspection and Operational Testing of Swinging Fire Doors with Builders Hardware

– Chapter 5, Care and Maintenance

- List of Inspection Points
- Requires Qualified Persons
- Written Records Kept for AHJ's Inspection

✓ *Deficiencies Required to be Repaired **Without Delay***

Maintenance

- Door Assemblies are Comprised of Mechanical Equipment that are Subject to Wear and Tear
- ✓ ***Failure to Properly Maintain Fire Door Assemblies in Operating Condition is the Action or Inaction that Violates the Building and Fire Codes***

Maintenance

- Simple to Complex Functions
 - Fire Safety
 - Life Safety
 - Accessibility
 - Security
 - Access Controlled
- ✓ ***Fire Rating Requirements Take Precedence Over Other Code Requirements***

Maintenance

- Common Corrective Actions:
 - Tightening Fasteners
 - Replacing Fasteners
 - Builders Hardware Requires Special Fasteners
 - Filling Unused Fastener Holes in Doors and Frames
 - Steel/Stainless Steel Screws, Joint Compound, Wooden Dowels
 - New Caulking-type Products (Designed for Fire Doors)

Maintenance

- Common Corrective Actions:
 - Shimming Hinges to Adjust Door Clearances
 - Steel Shim Material
 - Replacing Small Parts
 - Strike Plates, End Caps, Covers, etc.
 - Replacing Worn Out Hardware
 - Hinges, Locks/Latches, Door Closers, Gasketing, etc.
 - Replacing Broken Glazing Materials
 - Clear Wired Glass, etc.

Maintenance

- Average Lifespan of Doors, Frames, and Hardware
 - Door Assemblies Subject to High Frequency Usage:
 - 400 to 5,000 Cycles per day (118,000 to 1,500,000/yr)
 - 3 to 7 years, Depending on the Hardware
 - Door Assemblies Subject to Ordinary Usage:
 - 50 to 200 Cycles per day (18,000 to 75,000/yr)
 - 7 to 15 years, Depending on the Hardware
 - Door Assemblies Subject to Low Frequency Usage:
 - 1 to 20 Cycles per day (300 to 7,000/yr)
 - Up to the Lifetime of the Building, Depending on the Hardware

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EXIT

EXIT

515





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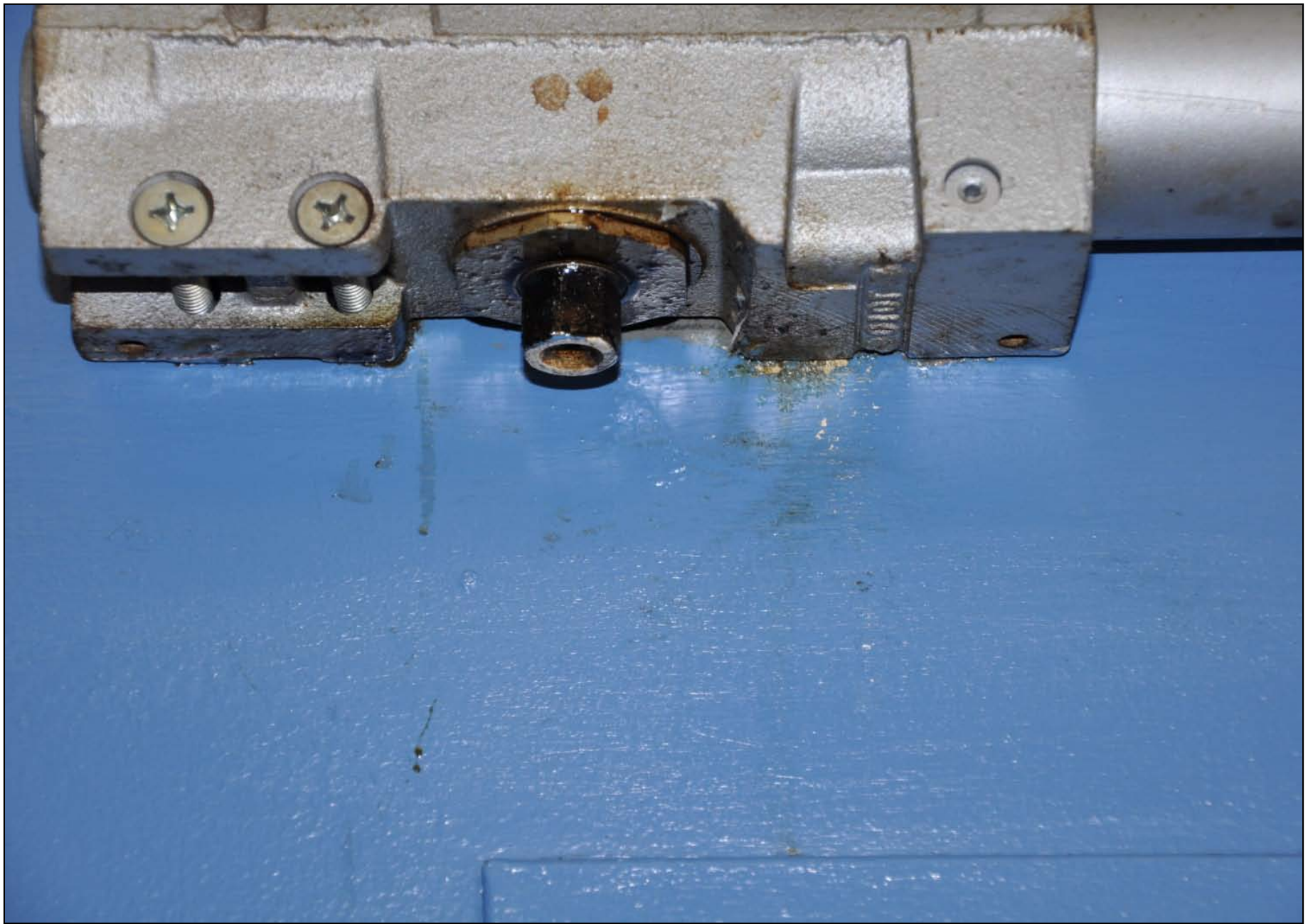














LISTED

FIRE EXIT HARDWARE

ISSUE NO. U - 332

CONFORMS TO STANDARDS
UL 10C AND UBC 7-2 (1997)

SARGENT MFG. CO.

NEW HAVEN, CONN.



For More Information:

- Door Security & Safety Foundation
 - Web Site: www.doorsecuritysafety.org
- Door and Hardware Institute
 - Web Site: www.dhi.org
- On LinkedIn
 - The Door and Hardware Institute's Fire Door Assembly Inspection Group



For More Information:

- Owner's Guide
- AHJ's Guide
- Reference Guide



✓ ***Available for purchase through DHI or the Foundation's web sites***