Fire Door Annual Inspection
Understanding the Fire Rated Opening

Door Security & Safety Foundation
The Foundation & DHI

- **Foundation** – First to create awareness for fire door inspections.

- **DHI** – Set the standard for education that qualifies individuals as the knowledgeable resource to perform fire door inspections.
- Not Familiar with Code Requirements
- Belief that frequency of use ensures proper operation
Annual Inspection of Fire Door Assemblies…

• **Who Is Going To Do These Inspections and When?**
  – Paragraph 5-2.3, Functional Testing
    • Individuals who are KNOWLEDGEABLE about the openings being inspected
  – Paragraph 5-2.1, ‘…not less than annually, and a written record of the inspection shall be kept for inspection by the AHJ.’
DAI 600 - Fire Door Assembly Inspection Class

Flowchart Key:
#1- DHI Certified Professionals may bypass the 4 required classes and take the FDAI class. If they pass DAI 600, they may participate in the Intertek Certification Program (ICP). If they fail, they must take the 4 required classes (or challenge exams), pass them, and then take the FDAI *retake exam/class until they pass. Upon passing they will be able to participate in the ICP.

#2- Those without the aforementioned credentials must take the 4 classes (or challenge exams) until they pass. Upon passing they may take the FDAI class. If they fail DAI 600, they will need to take the FDAI *retake exam/class until they pass. If they pass, they may participate in the ICP.

#3- This track illustrates the “failure extension” that will occur when a member of track #1 or track #2 fails DAI 600.

*Exam retake policy: Students failing the exam are permitted to retake the exam one time without retaking the entire class. The retake can be attempted after a mandatory six week wait period (beginning on the date of failure) and upon approval of the student’s retake application and payment of the exam retake fee. Retake exams will be administered during regularly scheduled sessions of the FDAI class (or at DHI headquarters) and must be taken within one year of the date of failure. Individuals retaking the DAI 600 exam (for the first time and within the first year) are not required to retake the entire class, but are welcome to do so upon payment of the full class registration fee.
MGM Grand – Nov. 11th, 1980
Las Vegas – 85 killed, 700 injured
Fire Doors Performing as Designed
Fire Door Performing as Designed
Properly Closed Fire Door
Educational

Contribution of Built-In Fire Protection
Educational Non-residential Buildings, 2003

Measure of fire containment without benefit of additional active fire protection
Additional containment from sprinklering

Fire Spread

Percent of Fires

Object Room Floor Building Beyond

Operating Sprinkler Built Protection (No Operating Sprinkler)
Healthcare

Contribution of Built-In Fire Protection
Health-related Non-residential Buildings, 2003

- Additional containment from sprinkling
- Measure of fire containment without benefit of additional active fire protection

Percent of Fires

Fire Spread

- Operating Sprinkler
- Built Protection (No Operating Sprinkler)
Codes vs. Standards

• Codes are Intended to be Adopted as Legal Documents
  – Enforceable as Laws

• Standards are Intended to be Used to Meet the Requirements of Codes
  – Unenforceable until REFERENCED by a CODE.
NFPA 80 – 2007 Edition

- Establishes Basic Requirements for New Fire-Rated Door Assemblies
- Establishes Care and Maintenance Requirements
Fire Door Inspection - Background

- Fire Doors are governed by the building code and NFPA throughout design, specification, installation and occupancy permitting.
Fire Door Inspection -- IBC

- The International Building Code is used until the certificate of occupancy is issued.

- 715.4 Fire door and shutter assemblies. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.
Fire Door Inspection - Background

• Once a Certificate of Occupancy (CO) has been issued, the building code is closed. The International Fire Code or Life Safety Code is now in effect for the operation and maintenance of the facility.

• Formerly, the IFC did not contain language for post-occupancy inspection of fire-rated doors.
IFC 2009 -- 703.1.3

- Fire walls, fire barriers and fire partitions. Required fire walls, fire barriers and fire partitions shall be maintained to prevent the passage of fire. All openings protected with approved doors and fire dampers shall be maintained in accordance with NFPA 80.
Fire Door Inspection – NFPA 101

- 7.2.1.15.2 – Fire-rated door assemblies shall be inspected and tested in accordance with NFPA 80, *Standard for Fire Doors and Other Opening Protectives*. 
Inspection Examples
Inspection Examples
Inspection Examples
Inspection Examples
Existing Fire Doors Today

Heat Release Mechanism
Existing Fire Doors Today
Confused?
Changes to NFPA 80 - Chapter 1

Administration
NFPA 80 – Chapter 1

• Administration

  – Provides guidance to Authority Having Jurisdiction (AHJ’s) so they can determine if an assembly meets the requirements and standards in this document. [1.2.2]
Chapter 4

General Requirements
NFPA 80 – Chapter 4
General Requirements

• Fire Door Assemblies
  – Prepared for Hardware Under Door/Frame Manufacturer’s Inspection Service Procedure and Under Label Service [4.1.3.1]

• Listed and Labeled Products
  – Listed items shall be identified by a label, which is readily visible to AHJ. [4.2]
NFPA 80 – Chapter 4

• What Modifications Can Be Done in the Field?

  – Function Holes for Mortise Locks/Latches
  – Holes for Labeled Door Viewers
  – Round Holes for Surface Applied Hardware (up to 1” in Diameter)
    • Throughbolts
  – Wood/Composite Doors Trimmed to Maximum 3/4” Undercutting

[4.1.3.2, 4.1.3.3 and 4.1.3.4]
NFPA 80 - Chapter 4

Field Modifications that cannot be done in the field

• Doors
  – No Vision Panel Cut Outs
  – No Louver Cut Outs
  – No Mortise Lock Pockets
  – No Face or Edge Bores for Bored Locks
  – No Mortise Hinge Preparations

• Frames
  – No Mortise Hinge Preparations
  – No Cut Outs
NFPA 80 – Chapter 4

• Clearances Under Doors
  – Swinging Doors with Builders Hardware
    • Maximum Clearance of 3/4” Under Door Bottom

[4.8.4.1]
Chapter 6

Swinging Doors with Builders Hardware
NFPA 80 – Chapter 6

• Builders Hardware Consists of:

  – Hinges & Pivots
  – Door Bolts
  – Locks or Latches
  – Fire Exit Hardware (a.k.a. Exit Devices)
  – Door Closers
  – Protection Plates
  – Astragals
  – Gasketing
Fire Resistance Classifications

- **Hourly Ratings**
  
  1/3  =  20-Minutes  
  3/4  =  45-Minutes  
  1    =  60-Minutes (Wood Doors)  
  1-1/2 =  90-Minutes  
  3    =  180-Minutes  

**Note:** This information is listed under Annex D “Fire Doors and Fire Window Classifications.” The hourly designation indicates duration of the fire test exposure; known as the fire protection rating.
Fire Labels for Frames

UNDERWRITERS LABORATORIES INC.®
LISTED
FIRE DOOR FRAME
NO.

WARNOCK HERSEY®
LISTED FIRE DOOR FRAME
WHI-
3 HOUR RATING

UNDERWRITERS LABORATORIES INC.®
LISTED
FIRE DOOR FRAME
WITH PANELS
NO.

WARNOCK HERSEY®
LISTED FIRE DOOR FRAME
WITH TRANSOM AND/OR SIDE PANEL
WHI-
1 1/2 HOUR RATING

UNDERWRITERS LABORATORIES INC.®
LISTED
FIRE DOOR FRAME
FOR LIGHTS
NO.

WARNOCK HERSEY®
LISTED FIRE DOOR FRAME
WITH TRANSOM AND/OR SIDELIGHT
WHI-
3/4 HOUR RATING

UNDERWRITERS LABORATORIES INC.®
LISTED
FIRE WINDOW FRAME
NO.

WARNOCK HERSEY®
LISTED FIRE WINDOW FRAME
WHI-
3/4 HOUR RATING
Fire Labels for Doors

UNDERWRITERS LABORATORIES INC.

SWINGING TYPE FIRE DOOR

FIRE RATING: __ HR. MIN LATCH THROW: ___

FIRE DOOR TO BE EQUIPPED WITH FIRE EXIT HARDWARE

WARNock HERSEY

LISTED FIRE DOOR

WHI-

US

3 HOUR RATING
MIN LATCH THROW
SINGLES: 1/2", PAIRS: 3/4"

WARNock HERSEY

LISTED FIRE DOOR

WHI-

US

3 HOUR RATING
TO BE EQUIPPED WITH
FIRE EXIT HARDWARE

WARNock HERSEY

LISTED FIRE DOOR

WHI-

US

3 HOUR RATING
TEMP. RISE: 30 MINS - 250°F MAX
MIN LATCH THROW
SINGLES: 1/2", PAIRS: 3/4"

WARNock HERSEY

LISTED FIRE DOOR

WHI-

US

3 HOUR RATING
TEMP. RISE: 30 MINS - 250°F MAX
TO BE EQUIPPED WITH
FIRE EXIT HARDWARE
Criteria Listed on Label

- Warnock Hersey listed fire door
- WHI-
- 3 hour rating
- Min latch throw
- Singles: 1/2”, pairs: 3/4”
- To be equipped with fire exit hardware
- Temp. rise: 30 mins - 250°F max
- Min latch throw
- Singles: 1/2”, pairs: 3/4”
- To be equipped with fire exit hardware

Door Security & Safety Foundation
Label Placement

Label should be attached to the hinge edge of the door.
NFPA 80 – Chapter 4

• Glazing Material (Glass) in Fire Doors
  – Labeled Fire-Resistance Materials [4.4.1]
  – Installed in Labeled or Tested Frames [4.4.3]
  – Permitted in 3 Hour Interior or 1-1/2 Hour Exterior in Severe Fire Exposure -- Limited to 100 sq. in. as tested in accordance with NFPA 252 [4.4.4], Standard Methods of Fire Tests of Door Assemblies.
Glazing in Doors

- Glazing can be categorized into three major groupings:
  - Fire-Rated Only (walls, transoms, borrowed lights)
  - Safety/Impact Rated Only (non-fire rated doors and other hazardous or security applications)
  - Fire & Safety Rated (fire rated doors or any application deemed a hazardous location)
Glass Label
(Permanent etching, per NFPA 80)

SAFE-Wire™
FROM Anemostat
FIRE & SAFETY GLAZING
R13236 48S1
D-NT-H
CAT II
UP TO 90 MIN.

D – Door
NT – Not Temperature Rise
H – Hose Stream Tested

SAFE-Wire™
FROM Anemostat
FIRE & SAFETY GLAZING
R13236 48S1
D-NT-H
CAT II
UP TO 90 MIN.

Product Name
UL File Number
Minutes of Rating
Cat II – Safety Rating

Door Security & Safety Foundation
Annual Inspection Requirements – NFPA 80
Swinging Doors with Builders Hardware

Door Security & Safety Foundation
Chapter 5 Care & Maintenance

5.1.1.2 The requirements of this chapter shall apply to new and existing installations.
NFPA 80 2007 – Standard for Fire Doors

Chapter 5 Care & Maintenance

5.2.1* Fire door assemblies shall be inspected and tested not less than annually, and a written record of the inspection shall be signed and kept for inspection by the AHJ.
NFPA 80 2007 – Standard for Fire Doors

Chapter 5 Care & Maintenance

5.2.3.1 Functional 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.
Annual Inspection of Fire Door Assemblies

• **What Do Inspectors Need to Know?**
  – Immense product application and installation knowledge
    • Hollow metal doors and frames
    • Wood fire doors
    • Builders Hardware Application
  – Thorough understanding of NFPA 80 requirements
  – Benchmark program – Fire Door Assembly Inspector (FDAI). Years of industry experience to qualify for AHC and/or CDC.
Annual Inspection of Fire Door Assemblies

- Inspector’s Responsibilities
  - Status of door openings on date of inspection
  - Recommend necessary corrections
  - Providing written inspection reports
Annual Inspection of Fire Door Assemblies

• Inspectors Are Not Responsible For:
  – Making sure openings are repaired
  – Determining the correct fire-rating of door openings
  – Alerting AHJ of problems
5.2.2 Performance-Based Option

5.2.2.1 As an alternate means of compliance with 5.2.1, subject to the AHJ, fire door assemblies shall be permitted to be inspected, tested, and maintained under a written performance-based program.
5.2.2.2 Goals established under a performance-based program shall provide assurance that the fire door assembly will perform its intended function when exposed to fire conditions.

5.2.2.3 Technical justification for inspection, testing, and maintenance intervals shall be documented.

5.2.2.4 The performance-based option shall include historical data acceptable to the AHJ.
MGM Grand Hotel Fire Door Inspection

Example. Without Performance-Based Option

• January 1st -- 2 inspectors start inspecting doors.
• Each inspector works 40 hours a week for a full year.
• December 31st, all doors have been inspected.
• January 1st – Start all over again.
Preparing for the Inspection
Identifying Fire Door Assemblies

• Maintenance personnel–access to the ‘as built’ floor plans.
• AHJ’s office archived copies of floor plans
• No plans available–should physically check each door opening looking for labels.
Locating Fire Doors in Buildings

- Interior doors opening into and out of stairwells and corridors.
- Door openings placed at building separations.
- Identify fire labels on frame and hinge side of door.
Performing the Inspections

• Presumption of Correct Application
• Original Building, Fire and Life Safety Code Requirements
• Practical Application of Inspection Criteria
Original Building, Fire and Life Safety Requirements

- Inspectors should be cognizant of the building, fire and life safety codes that were applicable at the time of installation.
- Should not apply the capabilities, limitations and requirements for modern products to assemblies installed years ago.
- NFPA 80 standard is applicable to all existing fire door assemblies, regardless of when they were installed.
Cataloging Fire Doors

• Door Number (Code or Symbol)
• Location of Assembly in Building
• Type of Door Assembly
• Fire-Protection Rating
• Comments/Remarks
Door Security & Safety Foundation

Inspection Summary Report Form

INSPCTION SUMMARY REPORT 2008

BUILDING NAME

ADDRESS

SUMMARY

The undersigned acknowledges and agree that Inspector only inspecting the Buildings & door assemblies existing on the date of the inspection and identified on the Inspection Report in accordance with the acts and rules of Part 605, Chapter 9, Division 24 of the Building Code. The undersigned hereby agrees that the Building as located on the date of the inspection and on the date of the Inspection Report is the Building existing at the time of the inspection. The undersigned hereby agrees that the Building is not damaged, altered, or amended in any way by any person or entity within the Building or by any person or entity outside the Building in any way related to the Building or any person or entity outside the Building or any person or entity residing or occupying the Building.

SIGNATURES

Signature of Inspector

Signature of Building Manager

*Please retain for records.

("White" copy is ORIGINAL • "Pink" copy is DUPLICATE COPY • "Yellow" copy is INSPECTOR'S COPY)
## FDAI Inspection Report

**FIRE-RATED SWINGING DOOR INSPECTION SURVEY 2008**

<table>
<thead>
<tr>
<th>Door Number</th>
<th>Compliant</th>
<th>Non-Compliance Code(s)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>Q NO</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>Q NO</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>Q NO</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>Q NO</td>
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<tr>
<td></td>
<td>YES</td>
<td>Q NO</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>Q NO</td>
</tr>
</tbody>
</table>

* (Please use codes found on back of this sheet as a general guide)

**BUILDING NAME**

Date ________, 2008

Pg. ______ of ______

* Exceptions/Comments/Remarks are to be noted below.

**COMMENTS:**

---

Door Security & Safety Foundation
## FDAI Code Violations Defined

Please use the following codes to identify problems on the door openings listed on other side of page.

<table>
<thead>
<tr>
<th>FRAME</th>
<th>DOOR (cont.)</th>
<th>FIRE EXIT HARDWARE</th>
<th>DOOR CLOSERS</th>
<th>MISCELLANEOUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Loose Frame</td>
<td>Miss Fire Exit Device</td>
<td>C1</td>
<td>Missing Door Closer(s)</td>
</tr>
<tr>
<td>F2</td>
<td>Damaged Frame</td>
<td>Miss Bottom Flush Bolt</td>
<td>C2</td>
<td>Leaking Door Closer(s)</td>
</tr>
<tr>
<td>F3</td>
<td>Rust-through on Frame</td>
<td>Miss Strike Bottom Bolt</td>
<td>C3</td>
<td>Missing Arm(s)</td>
</tr>
<tr>
<td>F4</td>
<td>Missing Label</td>
<td>Miss Strike Top Bolt</td>
<td>C4</td>
<td>Broken Arm(s)</td>
</tr>
<tr>
<td>F5</td>
<td>Frame Is Out of Alignment</td>
<td>Miss Strike Bolt Assembly</td>
<td>C5</td>
<td>Missing Closer(s)</td>
</tr>
<tr>
<td>F6</td>
<td>Incorrect Glass in Sidelight or Transom-light</td>
<td>Miss Vertical Rod (Top)</td>
<td>C6</td>
<td>Does NOT Close Door Completely</td>
</tr>
<tr>
<td>F7</td>
<td>Broken Glass in Sidelight or Transom-light</td>
<td>Miss Vertical Rod (Bottom)</td>
<td>C7</td>
<td>Missing Screw(s)</td>
</tr>
<tr>
<td>F8</td>
<td>Missing Glazing Bead at Light(s)</td>
<td>Push Bar Does NOT Extend Halfway Across Door Width</td>
<td>C8</td>
<td>Missing Drop and/or Adapter Plate(s)</td>
</tr>
<tr>
<td>F9</td>
<td>Missing Glazing Bead Screw(s)</td>
<td>Non-Fire Rated Panic Hardware (Grabbing)</td>
<td>C9</td>
<td>Hold-open Arm(s)</td>
</tr>
<tr>
<td>F10</td>
<td>Improper Field Modification (Explain Modification)</td>
<td>Missing Lever or Knob</td>
<td>C10</td>
<td>Missing Coordinator</td>
</tr>
<tr>
<td>F11</td>
<td>Incorrect Hardware Preparation (Explain)</td>
<td>Missing Screw(s)</td>
<td>C11</td>
<td>Missing Curtain Bar</td>
</tr>
<tr>
<td>F12</td>
<td>Unused Fastener Hole(s) in Frame</td>
<td>Missing Screw(s)</td>
<td>C12</td>
<td>Broken Coordinator</td>
</tr>
<tr>
<td>F13</td>
<td>Other</td>
<td>Missing Sex Nuts and Bolts</td>
<td>C13</td>
<td>Broken Carry Bar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C14</td>
<td>Overhead Hold-open (Surface or Concealed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C15</td>
<td>Other</td>
</tr>
</tbody>
</table>

### Operational Test
- T1: Door Does NOT Swing Freely
- T2: Door Does NOT Close Completely
- T3: Door Does NOT Securely Latch
- T4: Electric Door Plate does NOT Allow Door to Close
- T5: Door Bottom Drags Against Floor Material
- T6: Door Rubs Against Frame
- T7: Edges of Paired Doors Overlap
- T8: Coordinator Does NOT Function Properly
- T9: Other

### Locks
- L1: Missing Lock
- L2: Incorrect Lock Bolt Assembly
- L3: Non-Fire Rated Lock Bolt Throw
- L4: Latch Bolt Bind
- L5: Latch Bolt Misses
- L6: Loose Lever(s) or Knob(s)
- L7: Latch Bolt Does NOT Engage Strike
- L8: Missing Strike Plate
- L9: Missing Screw(s)
- L10: Missing Flush Bolt
- L11: Missing Flush Bolt Strike
- L12: Other

### Hinges/Pivots
- H1: Missing Hinge(s)
- H2: Incorrect Hinge(s)
- H3: Loose Hinge(s)
- H4: Missing Screw(s)
- H5: Replace Hinge(s)
- H6: Other

### Door Security & Safety Foundation
Items to be Verified During Fire Door Inspection
Three Main Operational Requirements

• Swinging Fire-Doors with Builders Hardware Must:
  – Swing Freely
  – Be self or automatic closing or power operated
  – Positively latch when in the closed position.
5.2.4.2 As a minimum, the following items shall be verified:

1. No open holes or breaks exist in surfaces.
2. Glazing, vision light frames, and glazing beads are intact.
3. The door, frame, hinges, hardware, and noncombustible threshold are secured, aligned, and in working order.
4. No parts are missing or broken.
5. Door clearances do not exceed the clearances listed.
NFPA 80 2007 – Standard for Fire Doors

• 5.2.4.2 As a minimum, the following items shall be verified:

(6) The self-closing device is operational
(7) If a coordinator is installed, the inactive leaf closes before active leaf.
(8) Latching hardware operates and secures the door when it is in the closed position.
NFPA 80 2007 – Standard for Fire Doors

• 5.2.4.2 As a minimum, the following items shall be verified:

(9) Auxiliary hardware items that interfere or prohibit operation are not installed.
(10) No field modifications to the door have been performed.
(11) Gasketing and edge seals are inspected.
NFPA 80 – Annual Fire Door Inspection
Foundation Published Guides

• AHJ Guide & Owner’s Guide
• Reference Guide for Inspecting Swinging Fire Doors with Builders Hardware
• www.doorsecuritysafety.org - PDF of steps for simple inspection.
Summary

• Not possible to list all of the applications of doors, frames and builders hardware products for swinging fire door assemblies.

• Covered the most commonly used products and give you, the AHJ, GUIDELINES on how to accurately evaluate the operating condition of swinging fire door assemblies.
Summary

• Many swinging fire door assemblies can be:
  – Complicated.
  – Contain sophisticated hardware products.
  – These assemblies require a high-level of expertise to coordinate their functions with their fire-protection properties.
Summary

• **New fire-rated products are:**
  – Continually being developed.
  – Requires inspectors to stay current on their knowledge and understanding of these product’s applications, capabilities and limitations.
Where Inspections are Today

- California
- Pennsylvania
- Denver
- West Virginia
- Massachusetts
- Maine
- New Jersey
- Hawaii
Where Inspections are Today (con’t)

• Maryland
• New Hampshire
• Oregon
• Oklahoma
• Illinois
• Iowa
• Washington state
• Utah
• New York end of 2010
For More Information
Contact:

The Foundation or
Door and Hardware Institute

Phone (703) 222-2010, Fax (703)222-2410

Online at:
www.doorsecuritysafety.org
www.dhi.org

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