AGENDA

NFPA Technical Committee on Fire Doors and Windows
First Draft Meeting

Wednesday, September 7 and Thursday, September 8, 2016
Embassy Suites by Hilton Baltimore Inner Harbor
Baltimore, MD

1. **Call meeting to order.** Call meeting to order by Chair Keith Pardoe at 8:00 a.m. on Wednesday, September 7, 2016, at the Embassy Suites by Hilton Baltimore Inner Harbor, Baltimore, MD.

2. **Self-introduction of members and guests**. For a current committee roster**, see page 3.**

3. **Approval of Minutes.** Approve the September 30-October 1, 2014 Second Draft Meeting minutes, **see page 7**.

4. **Chair's Report and Agenda Review.**

5. **The Process. First Draft Presentation, see page 15.**

6. **Fire Protection Research Foundation Project Update, see page 21.**

7. **Report of NFPA 105 Task Group.**

8. **NFPA 80 First Draft preparation.** For Public Inputs, **see page 23**.

9. **NFPA 105 First Draft preparation.** For Public Inputs, **see page 98.**

10. **Other Business.**
    a. **Updates to 19.3.1, Pardoe, see page 116.**
    b. **Rope used on older sliding fire doors, Hahn, see page 118.**
    c. **Update Figure 4.7.3.1(a)**
    d. **Section 4.1.3.2 FAQs, Bigda**
    e. **New 4.8.4.1.1 and 4.8.4.1.2, Pardoe, see page 119.**
    f. **Automatic smoke and fire curtains, Hicks**

11. New Business.

12. Schedule Next meeting – A2018 Second Draft Meeting. Public Comment Closing Date is May 10, 2017. Final date to hold meeting is November 8, 2017.

13. Adjournment.

Address List No Phone

08/11/2016
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Fire Doors and Windows

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Fire Doors and Windows

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Second Draft Meeting Minutes

NFPA Technical Committee On Fire Doors and Windows

(FDW-AAA)

September 30-October 1, 2014
Courtyard Marriott Downtown
San Diego, CA

1. **Call meeting to order.** The meeting was called to order by Chair Bruce Campbell at 8:00 AM PST on Tuesday, September 30 at the Courtyard Marriott Downtown, San Diego, CA. Tracy Vecchiarelli served at Staff Liaison in attendance at the meeting. NFPA Staff Kristin Bigda attended by phone.

2. **Self-introduction of members and guests.**

TECHNICAL COMMITTEE MEMBERS PRESENT

NAME	COMPANY
Bruce Campbell, Chair	Hughes/RJA
Kristin Bigda, Staff Liaison (via teleconference)	National Fire Protection Association
William Connor, Principal	Bill Conner Associates LLC Rep: American Society of Theater Consultants
Richard Cravy, Principal	Ruskin Company
Luc Durand, Principal	Saskatoon Fire Department
Jeffrey Gould, Principal	FM Approvals/FM Global
Steven Hahn, Principal	Lawrence Roll-Up Doors, Inc. Rep: Door & Access Systems Manufacturers Assn. International
Harold Hicks, Principal (via teleconference)	Atlantic Code Consultants
Charles Holt, Principal	National Energy Management Institute
Thomas Janicak, Principal	Ceco Door Products Rep: Steel Door Institute
William Koffel, Principal	Koffel Associates, Inc. Rep: Glazing Industry Code Committee

Nancy Kokesh, Principal	Intertek Testing Services
Keith Lippincott, Principal	University of Maryland
John Mathews, Principal	J B Mathews Company Rep: International Door Association
James Peterkin, Principal	Heery International Rep: NFPA Health Care Section
Steven Reynolds, Principal	The Peelle Company Ltd. Rep: National Elevator Industry Inc.
Ronald Rispoli, Principal (via teleconference)	Entergy Corporation
Michael Savage, Principal	City of Rio Rancho, NM
Steve Schreiber, Principal	Masonite Rep.: Window & Door Manufacturers Association
Michael Tierney, Principal (via teleconference)	Kellen Company Rep: Builders Hardware Manufacturers Association
Garrett Tom, Principal	International Fire Door Inspector Association
Yunyong Utiskul, Principal (via teleconference)	Exponent, Inc.
Luke Woods, Principal	Underwriters Laboratories Inc.
Anthony Yuen, Principal	University of California
Thomas Rubright, Voting Alternate	William S. Trimble Company, Inc. Rep: Door and Hardware Institute
Daniel J. Culhane, Alternate to Jerrold Gorell	SECOA Rep: US Institute for Theatre Technology, Inc.
David Dawdy, Alternate to Steven Hahn	Cornell Iron Works Inc. Rep: Door & Access Systems Manufacturers Assn. International
Anne Guglielmo, Alternate to James Peterkin	The Joint Commission Rep: NFPA Health Care Section
Lynn Kenney, Alternate to Chad Beebe	American Society for Healthcare Engineering
John Woestman, Alternate to Michael Tierney	Kellen Company Rep: Builders Hardware Manufacturers Association

GUESTS

NAME	COMPANY
Mark Belke	Air Movement and Control Association/Greenheck Fan Corporation
Bob Cullum, AHC	Dugmore & Duncan
Curtis Gonzales	Smoke Guard, Inc.
Keith Pardoe	Blade Strike, LLC
Kate Steel	Steel Consulting Services
Tracy Vecchiarelli	NFPA
Thomas Zaremba	Roetzel & Andress

TECHNICAL COMMITTEE MEMBERS NOT PRESENT

NAME	COMPANY
Scott Groesbeck, Principal	AREVA NP, Inc.
Vernon Patton, Principal	First Energy Corporation
Grayson Sack, Principal	Cashins and Associates, Inc.
Thomas Salamone, Principal	Gannet Flemming Inc.

3. **Approval of Minutes.** The minutes of the November 13-14, 2013 Meeting were approved with no modifications.

4. **Second draft presentation and review of new codes and standards development process – T. Vecchiarelli.** Staff reviewed the second draft meeting procedures and timeline for subsequent activities (e.g., NITMAM submittals). See the meeting agenda for the PowerPoint slide presentation.

5. **Report of Fire/Smoke Curtains Task Group.** The task group presented their proposed changes for new NFPA 80 Chapter 21 and NFPA 105 Chapter 8. Second Revisions were developed as necessary.

6. **Fire Protection Research Foundation/Library Presentation.** NFPA Staff Librarian, Mary Elizabeth Woodruff, gave a presentation to the committee on NFPA resources available to Technical committees. These include the NFPA Library, Fire Analysis and Research Division, and Fire Protection Research Foundation. See Minutes Attachment XX

7. **Report of Fire Dampers Task Group.** The task group presented their proposed changes to NFPA 80, Chapter 19 and NFPA 105, Chapter 6. Second Revisions were developed as necessary.

8. **Act on proposed changes to NFPA 80.** All public comments and committee inputs were addressed. Additional Second Revisions were developed as needed. See Second Draft ballot package and draft.

9. **Report of NFPA 105 ITM Task Group.** The task group presented their proposed changes NFPA 105 for a new Chapter on Swinging Doors and updates to Inspection, Testing, and Maintenance provisions. Second Revisions were developed as necessary. The task group was reinstated for next cycle and was tasked with developing additional criteria for non-swinging doors. The task group will be chaired by K.Pardoe and other members include N.Kokesh, A.Yuen, H.Hicks, T.Janicak, S.Schreiber, and M.Savage.

10. **Act on proposed changes to NFPA 105.** All public comments and committee inputs were addressed. Additional Second Revisions were developed as needed. See Second Draft ballot package and draft.

11. **Scheduling of Next Meeting.** The next meeting of the Fire Doors and Windows Technical Committee will be the First Draft meeting for the Annual 2018 revisions cycle sometime in the fall of 2016.

12. Adjournment. The meeting was adjourned by Chair, Bruce Campbell, at 11:30 am PST on Wednesday, October 1, 2014.

Meeting Minutes Prepared By:

Kristin Bigda, NFPA Staff Liaison

RESOURCES FOR NFPA TECHNICAL COMMITTEES

September 2014

Research and Information Resources from NFPA

- Research Reports and Technical Notes from the *Fire Protection Research Foundation*
- Statistical Data and Analysis from the *Fire Analysis and Research Department*
- NFPA Archives and Research Services from the *Charles S. Morgan Library*

THE FIRE PROTECTION RESEARCH FOUNDATION

Role of the Foundation

- Plan, manage and communicate research in support of the NFPA mission
- Independent charitable organization
  - Formed by NFPA in 1982
  - Intended to provide data to support the needs of NFPA codes & standards
  - Research funds come primarily from:
    - Private and public sector consortia
    - Grants and government sources (e.g. DHS S&T, DOD, FEMA AFG, NIOSH, NIST, NSF, etc.)
    - Multiple other sources (including NFPA)

How the Foundation Operates

- Agenda Setting - research planning in emerging areas
- Research Programs
  - Research projects to meet the needs of NFPA Committees and others
  - Projects range from small literature search type studies to major fire testing programs
- Benchmarking - state of the art symposia

Project Participants… Who are they?

- Funding (Sponsors): *Where does it come from?*
  - Manufacturers, trade associations, NFPA, federal agencies, research organizations, nowhere, etc…
- Contractors: *Who Does the Work?*
  - Consultants, research organizations, test labs, universities, NFPA Fire Analysis, volunteers
- Advisory Oversight: *Project Technical Panel*
  - Typically small (6 to 15)
  - Meet at important stages of project (start/end/other)

Project Characteristics and Ideas

- Characteristics of Foundation Projects: (collaboration, cost sharing, independence, pipeline to implementation, communications network)
- Project Ideas:
  - TC struggling with an issue, via staff liaison
  - Industry wants to introduce new technology into standard; needs data
  - Two opposing views on an issue and data needed
  - Data presented is not trusted by committee
  - Emerging technical issue – e.g. alternative energy
  - TC establishes ongoing research planning activity

History of Code Fund

- 2006: 4 Selected Projects (of 13)
- 2007: 3 Selected Projects (of 22)
- 2008: 3 Selected Projects (of 17)
- 2009: 4 Selected Projects (of 17)
- 2010: 7 Selected Projects (of 15)
- 2011: 11 Selected Projects (of 40)
- 2012: 10 Selected Projects (of 74)
- 2013: 10 Selected Projects (of 51)
- 2014: 47 Submitted Ideas (final selections pending)

Previous Code Fund Projects

- NFPA 58: Quantifying Heavy Snowfall (2013)
- NFPA 415: Glass Boarding Bridges (2013)
- NFPA 101: Evaluating Occupant Load Factors for Business Use Areas (2013)
- NFPA 1800: Evaluation of PPE Electronic Safety Equipment Intrinsic Safety (2013)
- NFPA 1851: Defining PPE Care & Maintenance (2013)

Review of Current Projects

- NFPA 70: Marinas & Boatyards Stray Voltage/Current
- NFPA 400: Hazardous Waste Treatment Facility Fire Code Gap Analysis
- NFPA 1144: Geospatial Research Compendium
- NFPA 5000: Developing a Quantitative Method for Height & Area Limitations

2014 Code Fund Summary

- High number of submittals consistent with recent years
  - Due to growing understanding of FPRF role, growing awareness of funding, TC/TCC Chair training, outreach by FPRF staff
- Review Committee has prioritized the list of submittals
  - Attempt to balance selections across National Fire Codes
  - Considered technical relevance, problem magnitude, sense of urgency, likelihood of success, availability of other funding
- Still evaluating final selections, because:
  - Potential for outside support on several projects
  - Availability of intern or student for smaller, straight-forward selections
  - Increase in available funding, and thus able to do more

Contact Information:

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www.nfpa.org/foundation

THE FIRE PROTECTION RESEARCH FOUNDATION

Fire Analysis and Research

One-Stop Data Shop

FAR
Fire Analysis & Research

Our mission

- To measure the size and characteristics of the fire problem
- To communicate the results to those working to improve fire safety

What we research

- National fire incident estimates, including separate analyses of:
  - Fire protection equipment
  - Fire causes
  - Area of origin
  - Contributing factors, and more…
- Firefighter fatalities and injuries
- Fire department resources

Standard Reports

- Occupancy reports
  - Hotels & motels
  - Care of aged
  - Educational
  - Prisons & jails
  - Health care
  - Residential board & care
  - Dormitories
  - Industrial & manufacturing
- Homes
  - Overall, causal factors, and smoke alarms
  - Sprinklers and other AES

Custom Services

- Custom research and analyses
- Updates of existing analyses
- Review of third-party research
- Assistance with literature searches
- Literature reviews, published incidents & custom narratives to illustrate specific points

Examples of Custom Work for Committees

- Firefighter deaths while operating in and on structures
- Areas of origin in hotel or motel fires with and without automatic extinguishing systems
- Summaries of apparatus crash deaths while responding to or returning from an alarm
- Structure fires starting in the attic, with and without automatic extinguishing systems, by occupancy type
- Cooking and fireplace/chimney fires in residential board and care facilities
- Searched OSHA investigation summaries for deaths and injuries in spray paint booths and dipping tanks

We're Here to Help

Fire Analysis & Research Division
One-Stop Data Shop
(617) 984-7443
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Charles S. Morgan Technical Library

Library & NFPA Archives

National Fire Protection Association
Morgan Technical Library

A Research Collection Founded in 1945

- 30,000 books, reports, journals
- All editions of NFPA codes and standards dating from 1896, as well as Proceedings, ROPs/ROCs, all publications, and videos
- Digital collections—standards, ROPs/ROCs, handbooks, etc.
- Photographs
- News and academic journal databases

Information Services:

- Conduct research to learn background and intent of past code changes
- Monitor news and public sources to track new developments on relevant issues
- Identify similar regulations/plans
- Produce supporting/referenced materials
- Verify/update non-NFPA standards & editions
- Consult on copyright issues
- House referenced documents

Examples of Past Requests from Technical Committees:

- Research committee records to learn origin and intent of specific provisions in *many* NFPA Codes & Standards
- Provide the TC with all formal interpretations for NFPA 231C
- Purchase documents for a possible reference in NFPA 1
- Find examples of the importance of GSA participation in NFPA's code development process
- Research the history of NFPA 59A beyond what is in the Origin & Development page
- Research history of rewrite to chapter in NFPA 231
- Send documentation for the first version of NFPA 69

Requests from the technical committees take priority and we are able to respond to rush requests.

We look forward to hearing from you:
library@nfpa.org
www.nfpa.org/library

617.984.7445

National Fire Protection Association
The authority on fire, electrical and building safety

NFPA 80/NFPA 105 First Draft Meetings

Embassy Suites Inner Harbor
Baltimore, MD

September 7-8, 2016

NFPA First Draft Meeting

At this and all NFPA committee meetings we are concerned with your safety

If the fire alarm sounds, please egress the building

NFPA First Draft Meeting

Members

- Please verify/update your contact information on roster attached to sign-in list
- Members categorized in any interest category who have been retained to represent the interests of ANOTHER interest category (with respect to issues addressed by the TC) shall declare those interests to the committee and refrain from voting on those issues throughout the process

NFPA First Draft Meeting

Guests

- All guests are required to sign in and identify their affiliations
- Participation is limited to TC members or those individuals who have previously requested time to address the committee
- Participation by other guests is permitted at the Chair's discretion

NFPA First Draft Meeting

Members and Guests

- Use of audio recorders or other means capable of reproducing verbatim transcriptions of this meeting is not permitted

Annual 2018 Revision Cycle – Key Dates

- Public Input Stage (First Draft):
  - First Draft Meeting**: September 7-8, 2016**
  - Posting of First Draft for Balloting Date: **before January 25, 2017**
  - Posting of First Draft for Public Comment: **March 1, 2017**
- Comment Stage (Second Draft):
  - Public Comment Closing Date: **May 10, 2017**
  - Second Draft Meeting Period: **May 1-, 2017 to November 8, 2017**
  - Posting of Second Draft for Balloting Date: **December 20, 2017**
  - Posting of Second Draft for NITMAM: **January 24, 2018**
- Tech Session Preparation:
  - NITMAM Closing Date: **February 21, 2018**
  - NITMAM / CAM Posting Date: **April 4, 2018**
  - NFPA Annual Meeting: **June 4-7, 2018 (Las Vegas)**
- Standards Council Issuance:
  - Issuance of Documents with CAM: **August 14, 2018**

NFPA First Draft Meeting

Voting During the First Draft Meeting

- Either Principal or Alternate can vote; not both
- All Principals are encouraged to have an Alternate
- Voting (simple majority) during meeting is used to establish a sense of agreement on First Revisions
- Voting (simple majority) during meeting is also used to establish Public Input resolution responses and to create Committee Inputs

NFPA First Draft Meeting

General Procedures

- Follow Robert's Rules of Order
- Discussion requires a motion

NFPA First Draft Meeting

Motion to End Debate, Previous Question, or to "Call the Question"

- Not in order when another member has the floor
- Requires a second
- Not debatable and DOES NOT automatically stop debate
- 2/3 affirmative vote immediately closes debate, returns to the original motion
- Less than 2/3 allows debate to continue

NFPA First Draft Meeting

Committee member actions:

- Member addresses the chair
- Receives recognition from the chair
- Member introduces the motion
- Another member seconds the motion

NFPA First Draft Meeting

Committee chair actions:

- Restates the motion
- Calls for discussion
- Ensures all issues have been heard
- Calls for a vote
- Announces the vote result

NFPA First Draft Meeting

Committee Actions and Motions:

- Resolve Public Input (PI)
- Create a First Revision (FR)
- Create a Committee Input (CI) – a placeholder used to solicit Public Comments and permit further work at Second Draft stage

NFPA First Draft Meeting

Resolve a Public Input (PI)

- Committee develops a Committee Statement (CS) to respond to (i.e., resolve) a Public Input
- Committee indicates in CS its reasons for not accepting the recommendation and/or points to a relevant First Revision
- PI does not get balloted

NFPA First Draft Meeting

Create a First Revision (FR)

- FR is created to change current text or add new text
- Committee Statement (CS) is developed to substantiate the change
- Associated PIs get a committee response, often simply referring to the relevant FR
- Each FR gets balloted

NFPA First Draft Meeting

Create a Committee Input (CI)

- Committee is not ready to incorporate a change into the First Draft but wants to receive Public Comment on a topic that can be revisited at Second Draft stage
- Committee Statement (CS) is developed to explain committee's intent
- CI is not balloted

NFPA First Draft Meeting

Committee Statements (Substantiation):

- All Public Input must receive a Committee Statement
- Provide a valid technical reason
- Do not use vague references to "intent"
- Explain how the submitter's substantiation is inadequate
- Reference a First Revision if it addresses the intent of the submitter's Public Input

NFPA First Draft Meeting

Formal Voting on First Revisions

- In-meeting votes establish a sense of agreement on the development of First Revisions (FR)
- FRs are secured by electronic balloting (≥2/3 of completed ballots affirmative, and affirmative by ≥1/2 voting members)
- Only the results of the electronic ballot determine the official position of the committee on the First Draft

NFPA First Draft Meeting

Ballots

- Only First Revisions (FR) are balloted
  - Public Inputs and Committee Statements not balloted
  - Reference materials are available
    - First Draft, PI, CI, and CS
- Voting options:
  - Affirmative on all FRs
  - Affirmative on all FRs with exceptions specifically noted
- Ballot provides option to vote affirmative with comment
- Vote to reject or abstain requires a reason

NFPA First Draft Meeting

Electronic Balloting

- Web-based balloting system
- Alternates are encouraged to return ballots
- Ballot session will time out after 90 minutes
- Use “submit” to save your work – ballots can be revised until the balloting period is closed

NFPA First Draft Meeting

- Click link provided in ballot email
- Sign in with NFPA.org username and password

NFPA First Draft Meeting

- Select either ‘Affirmative All’ or ‘Affirmative with Exception(s)’

NFPA First Draft Meeting

- Use “See FR- #” link to review all First Revisions
- Use “edit election” to change individual votes or to modify vote after submitting ballot

NFPA First Draft Meeting

- Make selection: Affirmative with Comment, Negative, or Abstain
- No selection defaults to affirmative
- Must include comment (reason) on each vote other than Affirmative

NFPA First Draft Meeting

- To complete ballot click Participant Consent and Submit
- Return to edit any votes by ballot due date

NFPA First Draft Meeting

Balloting

- Initial ballot
- Circulation of negatives and comments – electronic balloting is re-opened to permit members to change votes
- Any First Revision that fails ballot becomes a Committee Input (CI)

Legal

Antitrust Matters

- Must comply with state and federal antitrust laws
- Participants are to conduct themselves in strict accordance with these laws
- Read and understand NFPA's Antitrust Policy which can be accessed at nfpa.org/regs

Legal

Antitrust Matters (cont'd)

- Participants must avoid any conduct, conversation or agreement that would constitute an unreasonable restraint of trade
- Conversation topics that are off limits include:
  - Profit, margin, or cost data
  - Prices, rates, or fees
  - Selection, division or allocation of sales territories, markets or customers
  - Refusal to deal with a specific business entity

Legal

Antitrust Matters (cont'd)

- NFPA's standards development activities are based on openness, honesty, fairness and balance
- Participants must adhere to the *Regulations Governing the Development of NFPA Standards* and the *Guide for the Conduct of Participants in the NFPA Standards Development Process* which can accessed at nfpa.org/regs
- Follow guidance and direction from your employer or other organization you may represent

Legal

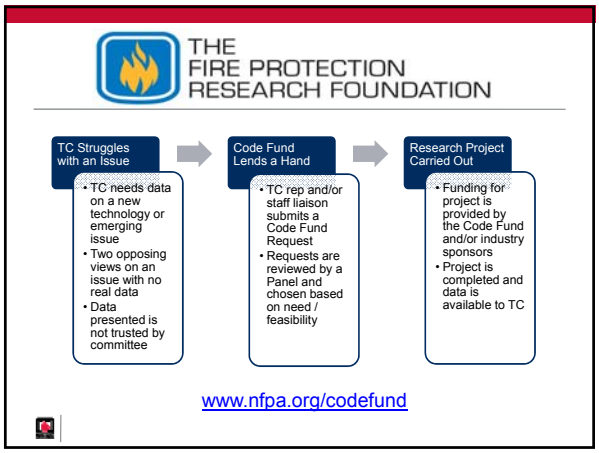
Antitrust Matters (cont'd)

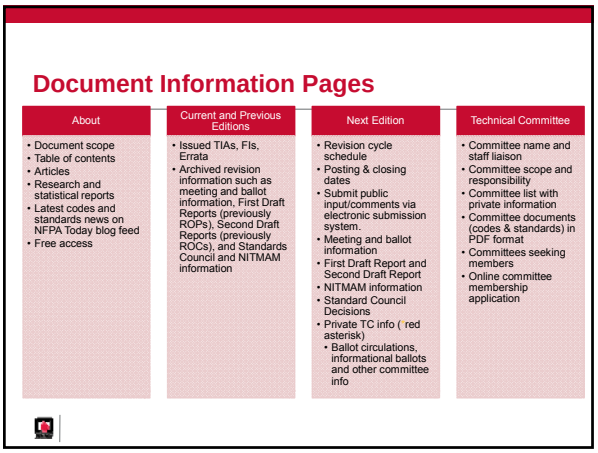
- Manner is which standards development activity is conducted can be important
- The *Guide of Conduct* requires standards development activity to be conducted with openness, honesty and in good faith
- Participants are not entitled to speak on behalf of NFPA
- Participants must take appropriate steps to ensure their statements whether written or oral and regardless of the setting, are portrayed as personal opinions, not the position of NFPA
- Be sure to ask questions if you have them

Legal

Patents

- Disclosures of essential patent claims should be made by the patent holder
- Patent disclosures should be made early in the process
- Others may also notify NFPA if they believe that a proposed or existing NFPA standard includes an essential patent claim
- NFPA has adopted and follows ANSI's Patent Policy
- It is the obligation of each participant to read and understand NFPA's Patent Policy which can accessed at nfpa.org/regs


THE
FIRE PROTECTION
RESEARCH FOUNDATION
TC Struggles with an Issue
• TC needs data on a new technology or emerging issue
• Two opposing views on an issue with no real data
• Data presented is not trusted by committee
Code Fund Lends a Hand
• TC rep and/or staff liaison submits a Code Fund Request
• Requests are reviewed by a Panel and chosen based on need / feasibility
Research Project Carried Out
• Funding for project is provided by the Code Fund and/or industry sponsors
• Project is completed and data is available to TC
www.nfpa.org/codefund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• Committee scope and responsibility
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• Committees seeking members
• Online committee membership application


National Fire Protection Association
The authority on fire, electrical and building safety
NFPA
Have a productive Meeting!

RESEARCH FOUNDATION

RESEARCH FOR THE NFPA MISSION

PROJECT PROSPECTUS

Influence of Gap Sizes around Swinging Doors on Fire Development

2 June 2016

Background: Fire development, smoke movement and ability of fire door to meet the test standards are affected by the gap sizes around the perimeter of the door, within the frame and between the bottom of the door and floor. Hence these gap sizes are regulated and the current regulations in NFPA 80 for the door clearances are from information and data gathered several years ago. Door clearances are one of the most frequently cited deficiencies on swinging doors with builders hardware. In the 2016 edition of NFPA 80, Section 6.3.1.7 addresses the clearance dimensions for gaps between the door leaves and door frames for fire-rated door assemblies with steel, and wood doors, and includes provisions for door assemblies of other construction. The clearance dimension allowed for steel doors (rated up to 3 hours) and 20-minute wood doors installed in hollow metal door frames is 1/8-inch (+/- 1/16- inch). A maximum clearance dimension of 1/8-inch is permitted for wood doors rated more than 20- minutes and fire door assemblies with doors and frames of other construction (of any level of fire rating). Further, paragraph 4.8.4.1 permits a maximum clearance dimension of 3/4-inch under the bottom of a door, regardless of the construction of the door. Of the clearance dimensions around the perimeter of door leaves, the clearance under the doors is the most difficult to comply with when the doors are installed since the floor itself is not a component of the door assembly. Frequently, the surface of concrete floors at door assemblies is not level (across the width of the opening) or might have low spots under the door. The surface of the floor creates situations where the clearance dimension under the door is greater than 3/4-inch and therefore non-compliant with NFPA 80's requirement. Additionally, current fire door tests in the United States (e.g., NFPA 252, UL 10B, and UL 10C) use a clearance dimension not greater than 3/8-inch under the door(s), which is not consistent with NFPA 80's allowance of a maximum of 3/4-inch and, more importantly, is not realistic to replicate in the field. Hence it is important to have a deeper understanding of these gap sizes.

Research Goal: The overall research goal is to determine the effect of an increased clearance dimension around a swinging fire door on fire development within the compartment and the smoke movement. Of specific interest: (1) the point at which the clearance under a fire door ceases to contain the fire and prevent it from spreading through the opening; (2) study the effect of additional 1/16-inch clearance along the vertical and top edges of the door leaves on door assemblies with wood fire protection-rated door leaves.

Project Tasks:

Task 1 – Literature review and data collections

- To conduct a thorough literature review and collect available data from the fire door test results consisting of hollow metal frames and 20-min wood door construction.
- Identify the critical variables involved to evaluate the effect of larger clearance under a fire door have on pressure differentials across the opening.
- Create a model plan for Task 2. Prepare a Task 1 draft report for Panel review and feedback.

Task 2 – Computer modelling

- Perform computer modelling to evaluate the effects of larger clearances (greater than ¾-inch) under the wood (20-minute rated) assemblies and steel doors – 1. Single door and 2. Standard swing pair of doors.

- Perform computer modelling to evaluate the effects of larger clearances (additional 1/16-inch clearance) along the vertical and top edge of wood (20-minute rated) assemblies and steel doors – 1. Single door and 2. Standard swing pair of doors.
- Prepare a report that summarizes the results of all simulations and provides analysis/conclusions to feed into Task 3.

Task 3 – Propose a Full-Scale Test Matrix

- Evaluate the simulations and define a full-scale test conditions for future work.
- Prepare a final report that contains the Task 1 work, a summary of Task 2 work, and the full-scale test matrix.

Implementation: This research program will be conducted under the auspices of the Research Foundation in accordance with Foundation Policies and will be guided by a Project Technical Panel who will provide input to the project, review periodic reports of progress and research results, and review the final project report. The Research Foundation will engage (through a technically competitive RFP process) a contractor with appropriate technical expertise to conduct the project.

Reporting and Deliverables: A Task 1 report, Task 2 (simulation) report, a draft final report, and final report will be developed for this project. The Research Foundation will retain rights to the final project report which will be published on the Foundation website. Final results will be presented to the NFPA 80: Standard for Fire Doors and Other Opening Protectives Technical Committee.

Schedule and Estimated Costs:

Task 1:	3 months after project initiation
Task 2:	6 months after project initiation
Task 3/Final report:	8 months after project initiation

Total cost of project is $40,000, which includes the cost of an engineering contractor, project management, dissemination and outreach (e.g. Webinar)

Intellectual Property: The Research Foundation will retain rights to the project report which will be published on the Foundation website.

Project Sponsors: The Foundation is presently seeking Project Sponsors to provide financial or in-kind support of the activity. Organizations and individuals interested in sponsorship should contact Sreeni Ranganathan, Project Manager at sranganathan@nfpa.org. The following levels of sponsorship are sought:

- As a *Principal Sponsor* at a level not to exceed $10,000. Principal Sponsors will have the opportunity to monitor results and provide guidance, comment and oversight to ensure that the overall project goals are met. You will receive periodic reports of project progress, receive early access to project results, and will be recognized for your contributions in the published final report and other outreach and dissemination (e.g., webinar, presentations, etc.).
- As a *Participating Sponsor* at a level not to exceed $5,000. Participating Sponsors will receive periodic reports of project progress, have an opportunity to witness tests if applicable, receive early access to project results, and will be recognized for your contributions in the published final report and other outreach and dissemination (e.g., webinar, presentations, etc.). Note that Participating Sponsors will not have the opportunity to provide direct guidance or oversight to the project.

Note: If the sponsorship commitment level exceeds the project costs, we will prorate accordingly. Once we have determined how many sponsors will be contributing to the project, we will invoice each sponsor for half of your proportionate share of the cost, the balance to be contributed upon completion of the project. If we do not reach our funding threshold by the anticipated start date for the project, we will convene the committed sponsors to realign the research program with available resources.

Public Input No. 2-NFPA 80-2015 [Chapter 2]

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing* , 2015 edition.

NFPA 72® , *National Fire Alarm and Signaling Code,* 2016 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2015 edition.

NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives,* 2016 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies,* 2012 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source,* 2015 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies,* 2012 edition.

NFPA 288, *Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance–Rated Assemblies,* 2012 edition.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films,* 2010 edition.

2.3 Other Publications.

2.3.1 ASME Publications.

American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.

ASME A17.1/CSA B44–2010, *Safety Code for Elevators and Escalators*, ~~2010~~ **2013** .

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM A36/A36M, *Standard Specification for Carbon Structural Steel*, ~~2012~~ **2014** .

ASTM D4157, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method)*, 2013.

ASTM D5034, *Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)*, 2009~~{~~ **, reapproved 2013** ~~}~~ .

ASTM D6193, *Standard Practice for Stitches and Seams*, 2011.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ **2015** .

2.3.3 BHMA Publications.

Builders Hardware Manufacturers Association, 355 Lexington Avenue, 15th Floor, New York, NY 10017.

ANSI/BHMA A156.1, *Standard for Butts and Hinges*, 2013.

ANSI/BHMA A156.4, *Standard for Door Controls (Closers)*, 2013.

ANSI/BHMA A156.17, *Standard for Self Closing Hinges & Pivots*, ~~2010~~ **2014** .

ANSI/BHMA A156.26, *American National Standard for Continuous Hinges*, 2012.

2.3.4 GSA Publications.

U.S. General Services Administration, 1800 F Street, NW, Washington, DC 20405.

Federal Specification A-A-1923A, *Shield Expansion (Lag, Machine and Externally Threaded Wedge)*, 1995.

Federal Specification A-A-1924A, *Shield, Expansion (Self Drilling Tubular Expansion Shell Bolt)*, 1995.

Federal Specification A-A-55614, *Shield, Expansion (Non-Drilling Expansion Anchors)*, 1995.

2.3.5 SMACNA Publications.

Sheet Metal and Air Conditioning Contractors' National Association, 4201 Lafayette Center Drive, Chantilly, VA 20151-~~1209~~ **1219** .

Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems, 2002.

2.3.6 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

~~ANSI/~~ UL 9, *Standard for Fire Tests of Window Assemblies*, 2009, revised ~~2009~~ **2015** .

~~ANSI/~~ UL 10A, *Standard for Tin-Clad Fire Doors*, 2009, revised ~~2009~~ **2013** .

~~ANSI/~~ UL 10D, *Fire Tests for Fire Protective Curtains*, 2014**, revised 2014** .

~~ANSI/~~ UL 14C, *Swing Hardware for Tin-Clad Fire Doors Mounted Singly and in Pairs*, 2006, revised 2013.

~~ANSI/~~ UL 33, *Standard for Heat Responsive Links for Fire-Protection Services*, 2010 **, revised** ~~2010~~ **2015** .

~~ANSI/~~ UL 263, *Standard for Fire Tests of Building Construction and Materials*, 2011**, revised 2015** .

~~ANSI/~~ UL 555, *Standard for Fire Dampers*, 2006, revised 2013.

~~ANSI/~~ UL 864, *Standard for Control Units and Accessories for Fire Alarm Systems*, ~~2003, revised 2013~~ **2014** .

2.3.7 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 72® , *National Fire Alarm and Signaling Code,* 2016 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment,* 2014 edition.

NFPA *101* ®, *Life Safety Code®,* 2015 edition.

NFPA 5000® , *Building Construction and Safety Code®,* 2015 edition.

Statement of Problem and Substantiation for Public Input

Referenced current editions.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3-NFPA 80-2015 [Chapter L]	

Submitter Information Verification

Submitter Full Name: Aaron Adamczyk
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Dec 24 17:15:48 EST 2015

Public Input No. 36-NFPA 80-2016 [Section No. 2.3.2]

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM A36/A36M, *Standard Specification for Carbon Structural Steel*, 2012.

ASTM D4157, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method)*, 2013.

ASTM D5034, *Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)*, 2009 (2013).

ASTM D6193, *Standard Practice for Stitches and Seams*, 2011.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ 2016 .

ASTM E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source, 2015 e1

Statement of Problem and Substantiation for Public Input

Updates date of ASTM E119 and adds reference to ASTM E648, per separate public input (PI 35).

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 35-NFPA 80-2016 [Section No. 4.8.5.1]	
Public Input No. 37-NFPA 80-2016 [Section No. L.1.2.3]	

Submitter Information Verification

Submitter Full Name: Marcelo Hirschler
Organization: GBH International
Street Address:
City:
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Submittal Date: Thu Jun 23 14:55:45 EDT 2016

Public Input No. 8-NFPA 80-2016 [Section No. 2.3.2]

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM A36/A36M, *Standard Specification for Carbon Structural Steel*, 2012.

ASTM D4157, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method)*, 2013.

ASTM D5034, *Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)*, 2009 (2013).

ASTM D6193, *Standard Practice for Stitches and Seams*, 2011.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ 2015 .

Statement of Problem and Substantiation for Public Input

Date updates

Submitter Information Verification

Submitter Full Name: Timothy Earl
Organization: GBH International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 04 13:26:36 EST 2016

Public Input No. 26-NFPA 80-2016 [Section No. 2.3.6]

2.3.6 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 9, *Standard for Fire Tests of Window Assemblies*, 2009, revised 2009.

ANSI/UL 10A, *Standard for Tin-Clad Fire Doors*, 2009, revised 2009.

ANSI/ UL 10B, Fire Tests of Dooor Assemblies, 2008

ANSI/UL 10C, Positive Pressure Fire Tests of Door Assemblies, 2009

ANSI/ UL 10D, *Fire Tests for Fire Protective Curtains*, 2014.

ANSI/UL 14C, *Swing Hardware for Tin-Clad Fire Doors Mounted Singly and in Pairs*, 2006, revised 2013.

ANSI/UL 33, *Standard for Heat Responsive Links for Fire-Protection Services*, revised 2010.

ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*, 2011.

ANSI/UL 555, *Standard for Fire Dampers*, 2006, revised 2013.

ANSI/UL 864, *Standard for Control Units and Accessories for Fire Alarm Systems*, 2003, revised 2013.

Additional Proposed Changes

File Name	Description	Approved
80_PC24_Held.pdf	PC 24 Held	

Statement of Problem and Substantiation for Public Input

This Public Input originated as Public Comment No. 24 which was held during the previous revision cycle.

Substantiation: Proposing to add two fire door tests methods for which products referenced in NFPA 80 are evaluated to.

Submitter Information Verification

Submitter Full Name: TC FDW-AAA
Organization: NFPA
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 04 14:13:44 EDT 2016

Public Comment No. 24-NFPA 80-2014 [New Section after 2.3.6]

UL 10B Fire Tests of Door Assemblies, 2008
UL 10C Positive Pressure Fire Tests of Door Assemblies, 2009

Statement of Problem and Substantiation for Public Comment

Proposing to add two fire door test methods for which products referenced in NFPA 80 are evaluated to.

Related Item

First Revision No. 1-NFPA 80-2013 [Section No. 2.3.3]

Submitter Information Verification

Submitter Full Name: Luke Woods
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 14:14:37 EDT 2014

Committee Statement

Committee Action: Rejected but held
Resolution: Committee wants to review places in NFPA 80 where 252 is equivalent to 10B and 10C

Public Input No. 48-NFPA 80-2016 [Section No. 2.3.6]

2.3.6 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 9, *Standard for Fire Tests of Window Assemblies*, 2009, revised ~~2009~~ 2015 .

ANSI/UL 10A, *Standard for Tin-Clad Fire Doors*, 2009, revised ~~2009~~ 2013 .

ANSI/UL 10D, *Fire Tests for Fire Protective Curtains*, 2014.

ANSI/UL 14C, *Swing Hardware for Tin-Clad Fire Doors Mounted Singly and in Pairs*, 2006, revised 2013.

ANSI/UL 33, *Standard for Heat Responsive Links for Fire-Protection Services*, revised ~~2010~~ 2015 .

ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*, ~~2011~~ 2015 .

ANSI/UL 555, *Standard for Fire Dampers*, 2006, revised ~~2013~~ 2014 .

ANSI/UL 864, *Standard for Control Units and Accessories for Fire Alarm Systems*, 2003, revised ~~2013~~ 2014 .

Statement of Problem and Substantiation for Public Input

This proposal updates the referenced UL Standards to the current edition.

Submitter Information Verification

Submitter Full Name: Ronald Farr
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 27 16:33:53 EDT 2016

Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]

2.3.6 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 9, *Standard for Fire Tests of Window Assemblies*, 2009, revised 2009.

ANSI/UL 10A, *Standard for Tin-Clad Fire Doors*, 2009, revised 2009.

ANSI/UL 10B, Standard for Fire Tests of Fire Door Assemblies, 2008, revisd 2015.

ANSI/UL 10C, Standard for Positive Pressure Fire Tests of Door Assemblies, 2009, revised 2015.

ANSI/ UL 10D, *Fire Tests for Fire Protective Curtains*, 2014.

ANSI/UL 14C, *Swing Hardware for Tin-Clad Fire Doors Mounted Singly and in Pairs*, 2006, revised 2013.

ANSI/UL 33, *Standard for Heat Responsive Links for Fire-Protection Services*, revised 2010.

ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*, 2011.

ANSI/UL 555, *Standard for Fire Dampers*, 2006, revised 2013.

ANSI/UL 864, *Standard for Control Units and Accessories for Fire Alarm Systems*, 2003, revised 2013.

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 58-NFPA 80-2016 [Section No. 3.3.57]	
Public Input No. 59-NFPA 80-2016 [Section No. 4.2.2]	
Public Input No. 60-NFPA 80-2016 [Section No. 4.4.4]	
Public Input No. 61-NFPA 80-2016 [Section No. 4.4.5 [Excluding any Sub-Sections]]	
Public Input No. 62-NFPA 80-2016 [Section No. 4.5]	
Public Input No. 63-NFPA 80-2016 [Section No. 16.2.2.3]	
Public Input No. 64-NFPA 80-2016 [Section No. A.1.1.4]	
Public Input No. 65-NFPA 80-2016 [Section No. A.3.3.56]	
Public Input No. 66-NFPA 80-2016 [Section No. A.4.4.1]	
Public Input No. 67-NFPA 80-2016 [Section No. A.4.4.4]	
Public Input No. 68-NFPA 80-2016 [Section No. A.4.4.5]	
Public Input No. 69-NFPA 80-2016 [Section No. A.4.8.4.1]	

Public Input No. 70-NFPA 80-2016 [Section No. A.6.3.3.3]

Public Input No. 71-NFPA 80-2016 [Section No. A.15.1.2]

Public Input No. 72-NFPA 80-2016 [Section No. A.17.2.1]

Public Input No. 73-NFPA 80-2016 [Section No. I.1]

Public Input No. 74-NFPA 80-2016 [Section No. K.5]

Submitter Information Verification

Submitter Full Name: Richard Walke
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 29 13:18:10 EDT 2016

Public Input No. 50-NFPA 80-2016 [New Section after 3.2.3]

TITLE OF NEW CONTENT 3.2.X Inspection Label

An identifying mark applied to equipment or materials, denoting compliance with annual inspection and testing requirements per Chapter 5 of this Standard.

Statement of Problem and Substantiation for Public Input

Chapter 5 of this Standard requires annual inspection, testing and maintenance of Swinging Doors with Builders Hardware or Fire Door Hardware. Multiple entities who perform such inspections subsequently apply a 'label' to the assembly indicating it has been inspected and by whom. This proposed definition provides clarity and differentiates an inspection label from a certification label.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 51-NFPA 80-2016 [New Section after 3.2.3]	
Public Input No. 53-NFPA 80-2016 [New Section after 5.2.3.5.2]	

Submitter Information Verification

Submitter Full Name: Kurt Roeper
Organization: ASSA ABLOY
Affilliation: Steel Door Institute
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 28 15:19:16 EDT 2016

Public Input No. 51-NFPA 80-2016 [New Section after 3.2.3]

TITLE OF NEW CONTENT **3.2.X Field Labeled**

A label, symbol, or other identifying mark applied under authority of the listing agency and outside a facility under the manufacturers' label service. Such mark shall be of an organization acceptable to the authority having jurisdiction, and concerned with product evaluation, and 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.

Statement of Problem and Substantiation for Public Input

Section 5.1.4 of this Standard prescribes the process and parameters for field labeling of equipment or materials, yet the Standard does not have a definition of 'field labeled'. This proposed definition provides clarity and differentiates a field label from a certification label or inspection label.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 50-NFPA 80-2016 [New Section after 3.2.3]	related subject
Public Input No. 52-NFPA 80-2016 [Section No. 5.1.4.1]	

Submitter Information Verification

Submitter Full Name: Kurt Roeper
Organization: ASSA ABLOY
Affilliation: Steel Door Institute
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 28 15:32:28 EDT 2016

Public Input No. 58-NFPA 80-2016 [Section No. 3.3.57]

3.3.57 Fire Protection Rating.

For the purposes of this standard, the designation indicating the duration of the fire test exposure to which a fire door assembly or fire window assembly was exposed and for which it successfully met all acceptance criteria as determined in accordance with NFPA 252

~~or NFPA 257~~

, ANSI/UL 10B or ANSI/UL 10C, or NFPA 257 or ANSI/UL 9, respectively. *(See also Annex D .)*

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 29 13:23:58 EDT 2016

Public Input No. 59-NFPA 80-2016 [Section No. 4.2.2]

4.2.2*

New fire protection–rated and fire resistance–rated glazing shall be marked in accordance with Table 4.2.2, and such marking shall be permanently affixed.

Table 4.2.2 Marking Fire-Rated Glazing Assemblies

Fire Test Standard	Marking	Definition of Marking
ASTM E119, or ANSI/UL 263[a]	W	Meets wall assembly criteria
NFPA 257 or ANSI/UL 263	OH	Meets fire window assembly criteria, including the hose stream test
NFPA 252, ANSI/UL 10B or ANSI/UL 10C	D	Meets fire door assembly criteria
	H	Meets fire door assembly hose stream test
	T	Meets 450°F (232°C) temperature rise criteria for 30 minutes
	XXX	The time, in minutes, of fire resistance or fire protection rating of the glazing assembly

[a]ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, and ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*.

[***101*:**Table 8.3.3.12]

Statement of Problem and Substantiation for Public Input

ANSI/UL 9 is generally considered to be a comparable standard to NFPA 257. ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the UL standards side-by side with all references to NFPA standards. As such, for consistency sake, it is respectfully requested that ANSI/UL 9, ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

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Submittal Date: Wed Jun 29 13:32:17 EDT 2016

Public Input No. 78-NFPA 80-2016 [New Section after 4.2.3]

4.2.3.1 Where a fire door is no longer required, the label shall be removed or covered such that the door is no longer identified as a fire protection feature. Removal of a label from a fire door voids the listed rating of the door.

Statement of Problem and Substantiation for Public Input

Some AHJ's require that doors that are no longer required to be rated (rated wall has moved to a different location of a fire barrier has been de-rated) must be maintained and tested since it is in view of the public and lack of adequate maintenance and testing therefore creates a false impression of protection..Removal of the label (or covering the label) will eliminate the false impression of protection.

Submitter Information Verification

Submitter Full Name: James Peterkin
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Affilliation: none
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Submittal Date: Wed Jun 29 22:14:47 EDT 2016

Public Input No. 46-NFPA 80-2016 [New Section after 4.4.4]

4.4.4.1. Fire protection glazing shall be permitted in fire doors having a 1 1/2-hour fire protection rating for use in 2 hour fire resistance rated exterior walls and shall be limited in size and area in accordance with Table 4.4.5.

Statement of Problem and Substantiation for Public Input

Nothing in NFPA 80 addresses 1- the allowable use of 1 1/2-hour fire protection-rated glazing in 1 1/2-hour fire doors or 2- the allowable use of 1 1/2-hour fire protection-rated glazing in side lights, transom lights, or both when they are part of the fire door assembly in 2-hour fire resistance rated exterior walls. Such fire protection-rated glazings in fire doors and in fire door assemblies are allowed by both NFPA 5000 and the International Building Code and should be addressed in NFPA 80. (This Public Input # 46 is related to Public Input #47).

Section 4.4.4 addresses fire protection glazing when used in fire doors having a 3-hour fire protection rating and fire doors having a 1 ½ -hour fire protection rating when used in "severe exterior fire exposure locations." However, nothing in this Standard currently addresses the use of 1 1/2-hour fire protection-rated glazing when used in fire doors or fire door assemblies that include side lights, transom lights, or both in exterior walls. This Public Input proposes to add Section 4.4.4.1 to the Standard in order to address the use of such fire protection-rated glazing in fire doors used in exterior walls. (Proposed modifications to Section 6.3.3.3 in Public Input #47 are intended to address the use of such fire protection-rated glazings in side lights, transom lights, or both, in fire door assemblies used in exterior walls.)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 47-NFPA 80-2016 [Section No. 6.3.3.3]	

Submitter Information Verification

Submitter Full Name: Tom Zaremba
Organization: Roetzel Andress
Affilliation: Alliance of Primary Fire Rated Glazing Manufacturers
Street Address:
City:
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Submittal Date: Mon Jun 27 10:46:22 EDT 2016

Public Input No. 60-NFPA 80-2016 [Section No. 4.4.4]

4.4.4*

Fire protection glazing not exceeding 100 $in.^2$ (0.065 m^2) shall be permitted in fire doors having a 3-hour fire protection rating or in fire doors having a 1 ½ -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, ANSI/Ul 10B or ANSI/UL 10C .

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Submittal Date: Wed Jun 29 13:36:59 EDT 2016

Public Input No. 45-NFPA 80-2016 [Section No. 4.4.5 [Excluding any Sub-Sections]]

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 and shall be limited in size and area in accordance with Table 4.4.5.

Table 4.4.5 Fire Door Rating

Fire Door Rating (hr)	Maximum Area of Glazing (per Door Leaf [a])
1/2 , 1/3	Limited to maximum area tested
3/4	Limited to maximum area tested [b]
1 [c] , 1 1/2 [a,c]	Limited to maximum area tested
3 [a]	100 in.^{2} (0.065 m^2)

[a] See also requirements in 4.4.4.

[b] See 4.4.5.1.

[c] ~~Fire protection-rated glazing materials exceeding 100 in.^{2} (0.065 m^2) in area are not permitted in temperature rise-rated doors.~~

Statement of Problem and Substantiation for Public Input

Foot note c to Table 4.4.5 is 1- vague and confusing 2- unnecessary, and 3- improperly and unfairly limits or precludes the use of listed, labeled and complying fire protection-rated glazing products in the marketplace. Accordingly, foot note c to Table 4.4.5 should be deleted.

1. Foot note c to Table 4.4.5 is vague and confusing and should be deleted.

Nothing in NFPA 80, NFPA 101 or NFPA 5000 defines "temperature rise-rated doors" and nothing in this Standard, NFPA 101 or NFPA 5000 specifies when or where "temperature rise-rated doors" are to be used as opposed to the use of any other fire door. In that regard, in accordance with Section 4.2.1.1, all fire doors must be labeled with their temperature rise at 30 minutes. Since all fire doors bear a label showing their temperature rise at 30 minutes, without greater definition, all fire doors are in a very real sense "temperature rise-rated doors." Accordingly, since nothing in this Standard or related NFPA codes define or specify any specific use for "temperature rise-rated doors," foot note c to Table 4.4.5 is vague, likely to result in confusion and should be deleted.

2. Foot note c to Table 4.4.5 is unnecessary and should be deleted.

Foot note c to Table 4.4.5 is also unnecessary since, as indicated above, Section 4.2.1.1 provides: “At a minimum, the label for fire doors shall contain the following information: … (7) The temperature transmission rise at 30 minutes. If the temperature transmission rise of a fire door exceeds 650*F, the temperature rise shall be permitted to be omitted.” Given that all fire doors must be labeled with their temperature rise at 30 minutes, the information needed for proper fire door design and to meet specifications found in construction plans, drawings and codes is contained on the fire door's label.

Accordingly, there, simply, is no reason for foot note c to Table 4.4.5. This is especially true since nothing in this Standard or related NFRC codes specify which fire doors are within the scope of foot note c and which fire doors are not.

3. Foot note c to Table 4.4.5 improperly and unfairly limits or precludes the use of listed, labeled and complying fire protection-rated glazing products and should be deleted.

There are fire protection-rated glazings on the market today in sizes greater than 100 sq.in. that are listed and labeled to limit the temperature rise of the door to 450 F or less at 30 minutes. Accordingly, foot note c to Table 4.4.5 artificially, inappropriately and unfairly limits the market and use for such products. Because foot note c to Table 4.4.5 improperly restricts or precludes the use of listed, labeled and complying fire protection-rated glazing products in fire doors, it is an inappropriate impediment to the use of competitive products in the marketplace and should be deleted.

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Submittal Date: Mon Jun 27 10:40:46 EDT 2016

Public Input No. 61-NFPA 80-2016 [Section No. 4.4.5 [Excluding any Sub-Sections]]

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, ANSI/UL 10B, or ANSI/UL 10C, and shall be limited in size and area in accordance with Table 4.4.5.

Table 4.4.5 Fire Door Rating

Fire Door Rating (hr)	Maximum Area of Glazing (per Door Leaf[a])
½ , ⅓	Limited to maximum area tested
¾	Limited to maximum area tested[b]
1[c], 1 ½ [a,c]	Limited to maximum area tested
3[a]	100 in.^{2} (0.065 m^2)

[a]See also requirements in 4.4.4.

[b]See 4.4.5.1.

[c]Fire protection–rated glazing materials exceeding 100 in.^{2} (0.065 m^2) in area are not permitted in temperature rise–rated doors.

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
Organization: UL LLC
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Submittal Date: Wed Jun 29 13:42:58 EDT 2016

Public Input No. 62-NFPA 80-2016 [Section No. 4.5]

4.5 Fire Resistance–Rated Glazing in Doors and Windows.

Fire resistance–rated glazing that limits the temperature rise on the unexposed surface and withstands the impact of the hose stream test as required for walls for the required duration in accordance with ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, or ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*, and is subsequently tested in accordance with NFPA 252, ANSI/UL 10B or ANSI/UL 10C, or NFPA 257 or ANSI/UL 9 shall be permitted in fire doors or windows having a fire protection rating of 3 hours or less and shall be limited to the maximum area tested. *(See 6.3.3.3, 6.3.3.4, and Annex D.)*

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. ANSI/UL 9 is generally considered comparable to NFPA 257. This is confirmed by the fact that NFPA 5000 includes the UL standards side-by side with all references to NFPA standards. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B, ANSI/UL 10C and ANSI/UL 9 be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Submittal Date: Wed Jun 29 13:46:02 EDT 2016

Public Input No. 75-NFPA 80-2016 [New Section after 4.8.4.3]

TITLE OF NEW CONTENT

4.8.4.4 Clearance under the bottom of the door shall be measured from the bottom of the door to the top of the flooring or threshold.

Statement of Problem and Substantiation for Public Input

Adding a requirement in NFPA 80 as to measuring the clearance under the bottom of a door is intended to provide clear guidance on this important item.

Submitter Information Verification

Submitter Full Name: John Woestman
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Street Address:
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Submittal Date: Wed Jun 29 15:38:33 EDT 2016

Public Input No. 35-NFPA 80-2016 [Section No. 4.8.5.1]

4.8.5.1

Combustible floor coverings shall be permitted to extend through openings required to be protected by 1 ½ -hour, 1-hour, or ¾ -hour rated fire protection fire door assemblies without a sill where they have a minimum critical radiant flux of 0.22 W/cm^2 in accordance with NFPA 253 or with ASTM E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source .

Statement of Problem and Substantiation for Public Input

ASTM E648 and NFPA 253 are the same test and most NFPA documents already have indicated that both can be used interchangeably.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 36-NFPA 80-2016 [Section No. 2.3.2]	

Submitter Information Verification

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Submittal Date: Thu Jun 23 14:44:03 EDT 2016

Public Input No. 52-NFPA 80-2016 [Section No. 5.1.4.1]

5.1.4.1 *

_

Field labeling shall be performed ~~only by individuals or companies that have been certified or listed, or by individuals or companies that are representatives of a labeling service~~ under authority of the listing agency that maintains periodic inspections of ~~production of~~ the labeled equipment or materials under review and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Statement of Problem and Substantiation for Public Input

Using the words ‘under authority of the listing agency’ provides a more clear and concise description of who is authorized to perform field labeling.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 51-NFPA 80-2016 [New Section after 3.2.3]	Definition of 'Field Labeled'

Submitter Information Verification

Submitter Full Name: Kurt Roeper
Organization: ASSA ABLOY
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City:
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Submittal Date: Tue Jun 28 15:45:22 EDT 2016

Public Input No. 53-NFPA 80-2016 [New Section after 5.2.3.5.2]

TITLE OF NEW CONTENT 5.2.3.5.3

Upon completion of inspection and remediation of any non-compliant items, an Inspection Label shall be applied to the assembly.

Statement of Problem and Substantiation for Public Input

This requirement provides a visual reference for the AHJ, building owner and manager that the opening has been inspected and tested per 5.2.3.5.1 and deemed in compliance.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 50-NFPA 80-2016 [New Section after 3.2.3]	definition

Submitter Information Verification

Submitter Full Name: Kurt Roeper
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Submittal Date: Tue Jun 28 16:08:04 EDT 2016

Public Input No. 55-NFPA 80-2016 [New Section after 5.2.3.5.2]

6.4.7.2* **Pairs of doors that require astragals shall have at least one attached in place ~~to project approximately 3?4 in. (19 mm) or~~ as ~~otherwise~~ indicated in the individual published listings.**

Statement of Problem and Substantiation for Public Input

The current language appears to be a legacy of the 1999 Edition of NFPA 80, section 2-4.7 Doors swinging in pairs and having a fire protection rating of more than 11/2 hours shall have an overlapping astragal. The statement 'as indicated in the individual published listings' is all that is needed and is more definitive than 'approximately ¾"'

Submitter Information Verification

Submitter Full Name: Kurt Roeper
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Submittal Date: Tue Jun 28 16:24:18 EDT 2016

Public Input No. 77-NFPA 80-2016 [Section No. 5.2.4.1]

5.2.4.1*

Periodic inspections and testing shall be performed not less than annually unless modified by the criteria of Annex J .

Statement of Problem and Substantiation for Public Input

Annex J is good work by the committee and should be identified more frequently in the core text.

Submitter Information Verification

Submitter Full Name:	Michael Anthony
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Submittal Date:	Wed Jun 29 16:39:47 EDT 2016

Public Input No. 47-NFPA 80-2016 [Section No. 6.3.3.3]

6.3.3.3 *

Frames with transom lights, side lights, or both installed with fire protection-rated glazing tested as an assembly in accordance with NFPA 252 shall be permitted where a fire protection rating of 1 1/2 hours or less is required in exterior walls. In other locations such assemblies shall be permitted where a fire protection rating of ¾ hour or less is required.

Statement of Problem and Substantiation for Public Input

Nothing in NFPA 80 addresses 1- the allowable use of 1 1/2-hour fire protection-rated glazing in 1 1/2-hour fire doors or, 2- the allowable use of 1 1/2-hour fire protection-rated glazing in side lights, transom lights, or both when they are part of a fire door assembly in 2-hour fire resistance rated exterior walls. Such fire protection-rated glazings, in fire doors and fire door assemblies are allowed in both NFPA 5000 and the International Building Code and should be addressed in NFPA 80. (This Public Input # 47 is related to Public Infput #46).

Currently, Section 6.3.3.3 provides: "Frames with transom lights, side lights, or both shall be permitted where a fire protection rating of ¾ hour or less is required." However, this section is incomplete since it fails to address the use of fire protection-rated glazing in side lights, transom lights, or both in fire door assemblies used in exterior walls. The proposed modifications to section 6.3.3.3 are intended to 1- address the use of fire protection-rated glazing in side lights and transom lights in fire door assemblies used in exterior walls as allowed in both NFPA 5000 and the International Building Code, and 2- coordinate the language found in Section 6.3.3.3 with the language found in Section 6.3.3.4. (Public Input 46 is related to this Public Input. It would add a new Section 4.4.4.1 which is intended to address the use of such fire protection-rated glazing in fire doors used in exterior walls.)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 46-NFPA 80-2016 [New Section after 4.4.4]	PI 46 addresses the use of fire protection-rated glazings in the door leafs of 1 1/2-hour fire doors that are used in exterior walls, whereas, PI 47 addresses the use of fire protection-rated glazings in the side lights, transom lights, or both, of fire door assemblies used in those exterior walls.

Submitter Information Verification

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Submittal Date: Mon Jun 27 10:55:53 EDT 2016

Public Input No. 76-NFPA 80-2016 [Section No. 6.4.1.4]

6.4.1.4*

All closing mechanisms shall be adjusted to overcome the resistance of the latch mechanism so that positive latching is achieved on each door operation. Spring hinges and hydraulic closers shall be adjusted to achieve positive latching when the door is allowed to close freely from an open position of no more than 30 degrees.

Statement of Problem and Substantiation for Public Input

Attempting to address these questions: "When testing a swinging fire door to determine whether it closes and latches properly, what degree of opening is used? A door fully open? Does the door have to close and latch from any position?"

The Annex currently states: Spring hinges should be adjusted to achieve positive latching when allowed to close freely from an open position of 30 degrees.

Is 30 degrees an appropriate requirement for (all) closers? Perhaps. Consider a 36" door opened 30 degrees – the space between the door hardware and the door frame is probably 14" or less. In normal operation, adults would open the door much further than 30 degrees. However, a child may open a door to about 30 degrees. Explanation: A 36" door open 30 degrees produces 18" between the edge of the door and the door stop (on the latch side). But, the door frame and door hardware take up some of that 18" resulting in no more than about 14" between the door hardware and the door frame.

Submitter Information Verification

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Submittal Date: Wed Jun 29 16:23:03 EDT 2016

Public Input No. 54-NFPA 80-2016 [Section No. 6.4.7.2]

6.4.7.2 *

Pairs of doors that require astragals shall have at least one attached in place ~~to project approximately~~ ~~3~~ / ~~2~~ ~~4~~ ~~in. (~~ ~~19 mm~~ ~~19 mm~~ ~~) or~~ as ~~otherwise~~ indicated in the individual published listings.

Statement of Problem and Substantiation for Public Input

The current language appears to be a legacy of the 1999 Edition of NFPA 80, section 2-4.7 Doors swinging in pairs and having a fire protection rating of more than 11/2 hours shall have an overlapping astragal. The statement 'as indicated in the individual published listings' is all that is needed and is more definitive than 'approximately ¾"'

Submitter Information Verification

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Submittal Date: Tue Jun 28 16:19:23 EDT 2016

Public Input No. 63-NFPA 80-2016 [Section No. 16.2.2.3]

16.2.2.3

Where the AHJ determines that a vertical access door is located in proximity to combustibles so that in a fire condition the door is likely to transmit heat to ignite the combustibles, the temperature rise on the unexposed face of the door shall not exceed 250°F (139°C) at the end of a 30-minute exposure to the standard fire test as described in NFPA 252, ANSI/UL 10B or ANSI .Ul 10C.

16.2.2.3.1

Such an access door as described in 16.2.2.3 shall bear a label indicating a maximum temperature rise of 250°F (139°C).

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Submittal Date: Wed Jun 29 13:50:38 EDT 2016

Public Input No. 44-NFPA 80-2016 [Sections 19.2.1, 19.2.2, 19.2.3, 19.2.4]

Sections 19.2.1, 19.2.2, 19.2.3, 19.2.4

~~* In accordance with ANSI/UL 555, *Standard for Fire Dampers* .~~

~~19.2.1.3.1 –~~

~~Connections between the sleeve and the duct shall be either the rigid type or the breakaway type.~~

~~19.2.1.3.2 –~~

~~When breakaway connections are provided between the damper sleeve and the ductwork, the gauge of the sleeve shall be in accordance with Table 19.2.1.3 .~~

~~19.2.1.3.2.1 –~~

~~The type of breakaway connection shall be in accordance with the damper manufacturer's installation instructions.~~

~~19.2.1.3.3 –~~

~~Where the thickness of the fire damper and combination fire/smoke damper frame is thicker than the fire resistance–rated assembly in which it is to be installed, the fire damper and combination fire/smoke damper shall be mounted in a sleeve, unless otherwise noted in the manufacturer's installation instructions.~~

~~19.2.1.4 * – – Sleeve Clearance Within Opening.~~

~~The sleeve clearance requirements given in the manufacturer's installation instructions shall be adhered to.~~

~~19.2.1.4.1 –~~

~~This void shall not be filled with any material unless shown on the manufacturer's installation instructions.~~

~~19.2.1.4.2 –~~

~~The maximum opening size shall be based upon the required thermal expansion clearance plus 1 in. (25.4 mm).~~

~~19.2.1.5 – Mounting Method.~~

~~The damper shall be installed in the orientation and airflow direction as indicated on the damper.~~

~~19.2.1.6 – Retaining Angles.~~

~~19.2.1.6.1 –~~

~~A damper, in its sleeve, shall be retained in the wall opening using steel retaining angle(s).~~

~~19.2.1.6.2 –~~

~~The gauge of the retaining angle shall be in accordance with the individual fire damper's manufacturer's installation instructions or in accordance with the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) publication, Fire, Smoke and Radiation Damper~~

19.2.1 * – – ~~Dampers.~~

The damper assembly shall be secured in the opening in such a manner as to prevent distortion and impairment of the damper operation by allowing the damper in the wall opening to expand under elevated temperature.

19.2.1.1 – Damper Sleeve.

19.2.1.1.1 –

Dampers shall be installed in accordance with the manufacturer's installation instructions and the listing.

19.2.1.1.2 –

A damper installed in a fire resistance–rated assembly shall be located with the blades of the damper in the closed position within the opening in the wall or floor unless listed otherwise.

19.2.1.1.3 –

The sleeve containing the fire damper and combination fire/smoke damper shall be installed perpendicular to the opening in which it is to be installed.

19.2.1.2 – Opening Preparation.

19.2.1.2.1 –

Prior to any installation, the opening in the wall, partition, or ceiling assembly shall be prepared in accordance with manufacturers' installation instructions.

19.2.1.2.2 –

The opening in a stud wall or partition shall be framed with headers, sills, and bucks, and the opening shall be lined with fire-resistant material to achieve the desired fire resistance rating of the assembly unless noted otherwise in the manufacturer's installation instructions.

19.2.1.3 – Sleeve Construction.

Depending on the duct type, duct size, and method of sleeve connection, the sleeve shall be constructed with material thickness as shown in Table 19.2.1.3 .

Table 19.2.1.3 Minimum Sleeve Thickness

Type of Connection Air Duct Diameter or Maximum Width Minimum Sleeve Thickness* in. mm gauge in. Breakaway 12 or less 305 26 0.018 13–30 330–762 24 0.024 31–54 787–1372 22 0.030 55–84 1397–2134 20 0.036 85 or more 2159 or more 18 0.047 Rigid 24 max. 610 round 16 0.060 24 max. height, 36 max. width 610 max. height, 914 max. width 16 0.060 Over 24 high and 36 wide Over 610 high and 914 wide 14 0.075

Installation

Guide for HVAC Systems.

19.2.1.7 – Duct-Sleeve Connections.

The rigid or breakaway duct-sleeve connection shall be installed per the manufacturer's installation instructions or in accordance with the SMACNA installation guideline.

~~19.2.2 Ceiling Radiation~~ **Dampers** .

~~The ceiling damper~~

shall be installed in accordance with the manufacturer's installation instructions

~~in fire resistance–rated floor–ceiling or roof–ceiling assemblies.~~

~~19.2.2.1 –~~

~~Ceiling radiation dampers~~

and

~~diffusers tested and listed as an assembly shall be installed in accordance with the manufacturer's installation instructions.~~

~~19.2.2.2 –~~

~~When required by the~~

listing

~~, a heat-resistive material shall be installed to cover any exposed surface on the top or sides of the diffuser that is not protected by the ceiling damper~~

.

~~19.2.3 – Access.~~

~~Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 in. (305 mm) square or provided with a removable duct section.~~

~~19.2.3.1 –~~

~~Dampers that are installed behind registers, diffusers, or grilles shall be serviceable by removal of these covers.~~

~~19.2.3.2 –~~

~~The damper access panel shall be labeled with the words “Fire Damper” in letters not less than~~ **1** ⁄ **2** ~~in. (13 mm) in height.~~

~~19.2.3.2.1 –~~

~~External insulation shall not conceal any access panel unless a label is attached to the insulation that clearly indicates the exact location of the access panel, and the insulation is installed for ease of removal or ease of removal with the access panel.~~

~~19.2.3.3 –~~

~~Unobstructed access shall be provided through the ceiling or wall to gain access for inspection and service of the damper's working parts.~~

~~19.2.4~~ * ~~– Wall Opening.~~

~~If the opening size in the wall is larger than the maximum listing size of the damper, an approved fire-rated damper mullion shall be used to separate the listed dampers, or the dampers shall be separated by construction equal to the fire-rated assembly.~~

Statement of Problem and Substantiation for Public Input

19.2 The general language used in section 19.2 applies to “traditional” fire damper installation methods. However, the testing of new fire damper installation methods is continually on going and varies by manufacturer. Thus the use of the general language found in this section can be confusing when non-traditional methods are being used. The acceptability of a given installation is ultimately

only based on the manufacturer's approved installation instructions thus there is no benefit to putting specific language in chapter 19.

Submitter Information Verification

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Submittal Date: Fri Jun 24 14:39:28 EDT 2016

Public Input No. 42-NFPA 80-2016 [Sections 19.4.1, 19.4.2, 19.4.3, 19.4.4, 19.4.5, 19.4.6]

Sections 19.4.1, 19.4.2, 19.4.3, 19.4.4, 19.4.5, 19.4.6

19.4.1

Acceptance testing of fire dampers shall be performed by a qualified person with knowledge and understanding of the operating components of the type of assembly being subject to testing and the system in which it is installed .

19.4.2

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.

19.4.3*

Acceptance testing ~~shall include the closing of the damper by all means.~~ of dampers designed to close via an electric or pneumatic actuator shall be conducted by removing electrical power or air pressure from the actuator and ensuring that the damper closes properly. Electrical power or air pressure shall then be reapplied to the damper to confirm that it returns to its full-open position.

19.4.4

Acceptance testing of dampers designed to close via a spring(s) shall be conducted by removing the fusible link and confirming that the spring(s) properly close the damper. The damper shall then be manually reset to its full-open position and the fusible link shall be reinstalled.

19.4.5

If the damper is equipped with a variable air volume system in accordance with 5.2.1 , acceptance testing shall be conducted after the building mechanical ventilation system has been balanced and in operation under maximum air flow.

19.4. ~~5~~

~~If a damper is equipped with heat-sensing elements, an electro-mechanical closing mechanism, and reset switches, each reset switch shall be tested to ensure the damper cannot be reopened until the respective heat sensing element is cooled below its rated temperature.~~

~~19.4.~~ 6

A record of these inspections and testing shall be made in accordance with ~~19.~~ 5. ~~3~~ 2 . 2 .

Statement of Problem and Substantiation for Public Input

19.4.1 – The proposal adds the phrase “and the system in which it is installed” to ensure that the person conducting the test is not only be familiar with the components they are testing but the system as well. Operating dampers at the wrong time can result in damage to the ductwork or other components within the system.

19.4.3 – The phrase “by all means” in this section is too open-ended and is subject to interpretation. The proposed new language describes specifically how the test is to be conducted.

19.4.5 – The purpose of this section is to confirm the proper operation of the reset feature on dampers

that activate via an electro mechanical temperature switch. The section implies that in order to conduct the test the sensor is to be manually heated. The most common means of conducting this test is by use of a heat gun or torch. The temperature generated by these devices is uncontrolled and has the potential to permanently damage the electro mechanical temperature switch. Therefore, the potential damage to the damper outweighs the concern that this section is trying to address. The electro mechanical switches used on these dampers are Listed devices and are not designed to reset prior to cooling below the rated temperature. The test required by this section is unnecessary.

Submitter Information Verification

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Submittal Date: Fri Jun 24 13:35:28 EDT 2016

Public Input No. 5-NFPA 80-2015 [Sections 19.4.4, 19.4.5, 19.4.6]

Sections 19.4.4, 19.4.5, 19.4.6

19.4.4

If the damper is equipped with a variable air volume system ~~in accordance with 5.2.1 , acceptance~~ , acceptance testing shall be conducted after the building mechanical ventilation system has been balanced and in operation under maximum air flow.

19.4.5

If a damper is equipped with heat-sensing elements, an electro-mechanical closing mechanism, and reset switches, each reset switch shall be tested to ensure the damper cannot be reopened until the respective heat sensing element is cooled below its rated temperature.

19.4.6

A record of these inspections and testing shall be made in accordance with 19. 5. ~~2.2.~~ 3

Additional Proposed Changes

File Name	Description Approved
Issued_TIA_80-16-1.pdf	TIA 80-16-1

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from TIA 16-1 issued by the Standards Council on December 8, 2015. According the NFPA Regs, this TIA must be reconsidered by the Technical Committee for the next edition of the document.

Submitter Information Verification

Submitter Full Name: TC FDW-AAA
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Street Address:
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Submittal Date: Thu Dec 31 11:25:10 EST 2015

Tentative Interim Amendment

NFPA® 80

Standard for Fire Doors and Other Opening Protectives

2016 Edition

Reference: 19.4.4, 19.4.6, 19.5.3.3 and 19.5.2.3
TIA 16-1
(SC 15-12-5 / TIA Log #1191)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2016 edition. The TIA was processed by the Technical Committee on Fire Doors and Windows and was issued by the Standards Council on December 8, 2015, with an effective date of December 28, 2015.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a public input of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Revise section 19.4.4 to read as follows:

19.4.4 If the damper is equipped with a variable air volume system, acceptance testing shall be conducted after the building mechanical ventilation system has been balanced and in operation under maximum air flow.

2. Revise section 19.4.6 to read as follows:

19.4.6 A record of these inspections and testing shall be made in accordance with 19.5.3.

3. Revise section 19.5.2.3 to read as follows:

19.5.2.3 Periodic Testing for Dampers that Do Not Use a Fusible Link to Operate.

4. Delete section 19.5.3.3.

Issue Date: December 8, 2015

Effective Date: December 28, 2015

Public Input No. 43-NFPA 80-2016 [Sections 19.5.1, 19.5.2, 19.5.3]

Sections 19.5.1, 19.5.2, 19.5.3

19.5.1 Testing Frequency.

19.5.1.1

Each damper shall be tested and inspected 1 year after acceptance testing.

19.5.1.2

The test and inspection frequency shall then be every 4 years, except in buildings containing a hospital, where the frequency shall be every 6 years.

19.5.2 Test Method.

19.5.2.1– General

All tests shall be completed in a safe manner by personnel wearing personal protective equipment.

19.5.2.2* Periodic Testing for Fusible Link Operated Dampers.

19.5.2.2.1

Fusible links or other moveable parts shall not be painted or coated, unless listed by the testing agency.

19.5.2.2.2

The fan shall be permitted to be shut off during testing.

19.5.2.2.3*

The fusible link shall be removed or activated with the damper in the fully open position.

19.5.2.2.4

With the fusible link removed or activated, the damper shall close completely without assistance.

19.5.2.2.5

Where the damper is designed with a latch to hold the damper in the fully closed position, the operation of the latch shall be confirmed.

19.5.2.2.6

At the completion of the test, the damper shall be returned to the fully open position, and the fusible link shall be reinstalled or replaced.

19.5.2.2.7

If the link appears damaged, it shall be replaced with a functionally ~~equivalent~~ equivalently listed link.

19.5.2.2.8

At the completion of the test, it shall be verified that the damper is unobstructed and in a fully operational mode.

19.5.2.3 Periodic Testing for Dampers that Do Not Use a Fusible Link to Operate.

19.5.2.3.1* General.

Fans shall not be permitted to be shut down during the test.

~~**19.5.2.3.2** – Dampers with Motorized Actuators.~~

~~Testing of dampers with actuators shall comply with the following procedure:~~

~~- **Visual Inspection Method**~~

~~**19.5.2.3.2.1** - Visually confirm that the damper is in the~~

~~fully~~

~~full- open- or full closed- position~~

~~-~~

- ~~Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.~~
- ~~Visually confirm that the damper closes completely.~~
- ~~Reapply electrical power or air pressure to reopen the damper.~~

~~Visually~~

~~as required by the system design.~~

~~**19.5.2.3.2.2** - Command and visually confirm the damper to the full closed or full open position.~~

~~**19.5.2.3.2.3** - Restore and visually confirm the damper to the original operating position as required by the system design.~~

19.5.2.3.3 Remote Inspection Method

19.5.2.3.3.1 General

19.5.2.3.3.1.1 Dampers inspected remotely shall be designed with the ability to indicate when the damper is fully open and fully closed

19.5.2.3.3.1.2 Prior to using remote inspection a visual inspection of the installed damper shall be performed.

19.5.2.3.3.1.3 The visual inspection shall confirm that the position indication method accurately reflects the full open and full closed position of the damper.

19.5.2.3.3.2 Test Procedure

19.5.2.3.3.2.1 Signal from the damper's position indication device to confirm that the damper is in the

~~fully~~

full- open or closed position as required by the system design .

19.5. 2. 3 .3.2.2 The damper shall be Commanded and confirmed to the full closed or full open position.

19.5.2.3.3.2.3 The damper shall be confirmed to the original operating position as required by the system design.

19.5.3 Documentation.

19.5.3.1

All inspections and testing shall be documented, indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.

19.5.3.2

All documentation shall be maintained for at least three test cycles and made available for review by the AHJ.

Additional Proposed Changes

File Name	Description	Approved
NFPA80_Proposal_3_Chapter_19-5_V3.docx	to clarify incorrect display of changes created by system.	

Statement of Problem and Substantiation for Public Input

19.5.2.1 – Adding the word “General” keeps this section consistent with other similar sections in the Standard.

19.5.2.2.7 – Adding the word “listed” clarifies that replacement fusible links must be listed by an approved agency.

19.5.2.3 – The proposal adds an option to perform Periodic Testing on dampers remotely using position indication switches. The remote periodic testing option would only pertain to dampers that do not have a fusible link (i.e. dampers that use electromechanical thermostats and an actuator) The proposal only allows remote periodic testing to be used after an initial visual inspection has been performed. For new construction this initial visual inspection will typically take place as part of the Acceptance Testing.

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Submittal Date: Fri Jun 24 13:47:38 EDT 2016

NFPA 80 Proposal 3 (Section 19.5 Periodic Testing)

Reason Statements for Proposed Changes

19.5.2.1 – Adding the word "General" keeps this section consistent with other similar sections in the Standard.

19.5.2.2.7 – Adding the word "listed" clarifies that replacement fusible links must be listed by an approved agency.

19.5.2.3 – The proposal adds an option to perform Periodic Testing on dampers remotely using position indication switches. The remote periodic testing option would only pertain to dampers that do not have a fusible link (i.e. dampers that use electromechanical thermostats and an actuator) The proposal only allows remote periodic testing to be used after an initial visual inspection has been performed. For new construction this initial visual inspection will typically take place as part of the Acceptance Testing.

Proposed Changes

19.5* Periodic Testing.

19.5.1 Testing Frequency.

19.5.1.1 Each damper shall be tested and inspected 1 year after acceptance testing.

19.5.1.2 The test and inspection frequency shall then be every 4 years, except in buildings containing a hospital, where the frequency shall be every 6 years.

19.5.2 Test method.

19.5.2.1 General. All tests shall be completed in a safe manner by personnel wearing personal protective equipment.

19.5.2.2 Periodic Testing for Fusible Link Operated Dampers

19.5.2.2.1 Fusible links or other moveable parts shall not be painted or coated, unless listed by the testing agency.

19.5.2.2.2 The fan shall be permitted to be shut off during testing.

19.5.2.2.3 The fusible link shall be removed or activated with the damper in the fully open position.

19.5.2.2.4 With the fusible link removed or activated, the damper shall close completely without assistance.

19.5.2.2.5 Where the damper is designed with a latch to hold the damper in the fully closed position, the operation of the latch shall be confirmed.

19.5.2.2.6 At the completion of the test, the damper shall be returned to the fully open position, and the fusible link shall be reinstalled or replaced.

19.5.2.2.7 If the link appears damaged, it shall be replaced with a functionally equivalently listed link.

19.5.2.2.8 At the completion of the test, it shall be verified that the damper is unobstructed and in a fully operational mode.

19.5.2.3 Periodic Testing for Dampers that Do Not Use a Fusible Link to Operate.

19.5.2.3.1* General. Fans shall not be permitted to be shut down during the test.

~~**19.5.2.3.2 Dampers with Motorized Actuators.** Testing of dampers with actuators shall comply with the following procedure:~~

~~1. Visually confirm that the damper is in the fully open position.~~
~~2. Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.~~
~~3. Visually confirm that the damper closes completely.~~
~~4. Reapply electrical power or air pressure to reopen the damper.~~
~~5. Visually confirm that the damper is in the fully open position.~~

19.5.2.3.2 Visual Inspection Method

19.5.2.3.2 .1 Visually confirm that the damper is in the full-open or full closed position as required by the system design.

19.5.2.3.2 .2 Command and visually confirm the damper to the full closed or full open position.

19.5.2.3.2 .3 Restore and visually confirm the damper to the original operating position as required by the system design.

19.5.2.3.3 Remote Inspection Method

19.5.2.3.3.1 General

19.5.2.3.3.1.1 Dampers inspected remotely shall be designed with the ability to indicate when the damper is fully open and fully closed

19.5.2.3.3.1.2 Prior to using remote inspection a visual inspection of the installed damper shall be performed.

19.5.2.3.3.1.3 The visual inspection shall confirm that the position indication method accurately reflects the full open and full closed position of the damper.

19.5.2.3.3.2 Test Procedure

19.5.2.3.3.2.1 Signal from the damper's position indication device to confirm that the damper is in the full-open or closed position as required by the system design.

19.5.2.3.3.2.2 The damper shall be Commanded and confirmed to the full closed or full open position.

19.5.2.3.3.2.3 The damper shall be confirmed to the original operating position as required by the system design.

19.5.3 Documentation

19.5.3.1 All inspections and testing shall be documented, indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.

19.5.3.2 All documentation shall be maintained for at least three test cycles and made available for review by the AHJ.

~~**19.5.3.3** Periodic inspections and testing of a combination fire/smoke damper shall also meet the inspection and testing requirements contained in Chapter 6 of NFPA 105.~~

Public Input No. 6-NFPA 80-2015 [Section No. 19.5.2.3]

No proposed change -see substantiation

19.5.2.3 Periodic Testing for Dampers that Do Not Use a Fusible Link to Operate.

Once the fusible link is removed, it shall be verified that the damper closes completely without assistance.

19.5.2.3.1* General.

Fans shall not be permitted to be shut down during the test.

19.5.2.3.2 Dampers with Motorized Actuators.

Testing of dampers with actuators shall comply with the following procedure:

(1) Visually confirm that the damper is in the fully open position.

(2) Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.

(3) Visually confirm that the damper closes completely.

(4) Reapply electrical power or air pressure to reopen the damper.

(5) Visually confirm that the damper is in the fully open position.

Additional Proposed Changes

File Name	Description	Approved
Issued_TIA_80-16-1.pdf	TIA 80-16-1	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from TIA 16-1 issued on December 8, 2015 by the Standards Council. According to the NFPA Regs., this TIA must be reconsidered by the Technical Committee for the next edition of the document.

Submitter Information Verification

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Submittal Date: Thu Dec 31 11:31:22 EST 2015

Tentative Interim Amendment

NFPA® 80

Standard for Fire Doors and Other Opening Protectives

2016 Edition

Reference: 19.4.4, 19.4.6, 19.5.3.3 and 19.5.2.3
TIA 16-1
(SC 15-12-5 / TIA Log #1191)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2016 edition. The TIA was processed by the Technical Committee on Fire Doors and Windows and was issued by the Standards Council on December 8, 2015, with an effective date of December 28, 2015.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a public input of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Revise section 19.4.4 to read as follows:

19.4.4 If the damper is equipped with a variable air volume system, acceptance testing shall be conducted after the building mechanical ventilation system has been balanced and in operation under maximum air flow.

2. Revise section 19.4.6 to read as follows:

19.4.6 A record of these inspections and testing shall be made in accordance with 19.5.3.

3. Revise section 19.5.2.3 to read as follows:

19.5.2.3 Periodic Testing for Dampers that Do Not Use a Fusible Link to Operate.

4. Delete section 19.5.3.3.

Issue Date: December 8, 2015

Effective Date: December 28, 2015

Public Input No. 30-NFPA 80-2016 [Section No. 19.5.3.3]

~~19.5.3.3~~ –

~~Periodic inspections and testing of a combination fire/smoke damper shall also meet the inspection and testing requirements contained in Chapter 6 of NFPA 105.~~

Additional Proposed Changes

File Name	Description	Approved
NFPA_80_PI5_TIA_16-1.pdf	TIA 16-1	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from TIA 16-1 issued on December 8, 2015 by the Standards Council. According to the NFPA Regs., this TIA must be reconsidered by the Technical Committee for the next edition of the document.

Submitter Information Verification

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Submittal Date: Tue Jun 07 09:22:46 EDT 2016

Tentative Interim Amendment

NFPA® 80

Standard for Fire Doors and Other Opening Protectives

2016 Edition

Reference: 19.4.4, 19.4.6, 19.5.3.3 and 19.5.2.3
TIA 16-1
(SC 15-12-5 / TIA Log #1191)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2016 edition. The TIA was processed by the Technical Committee on Fire Doors and Windows and was issued by the Standards Council on December 8, 2015, with an effective date of December 28, 2015.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a public input of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Revise section 19.4.4 to read as follows:

19.4.4 If the damper is equipped with a variable air volume system, acceptance testing shall be conducted after the building mechanical ventilation system has been balanced and in operation under maximum air flow.

2. Revise section 19.4.6 to read as follows:

19.4.6 A record of these inspections and testing shall be made in accordance with 19.5.3.

3. Revise section 19.5.2.3 to read as follows:

19.5.2.3 Periodic Testing for Dampers that Do Not Use a Fusible Link to Operate.

4. Delete section 19.5.3.3.

Issue Date: December 8, 2015

Effective Date: December 28, 2015

Public Input No. 56-NFPA 80-2016 [New Section after 20.6.1]

20.6.1.1

Blocks and drums supporting the fire curtain assembly shall be constructed from materials having a melting point greater than 2,000 degrees Fahrenheit (1,093 degrees Celsius).

Statement of Problem and Substantiation for Public Input

Synthetic sheave materials and winch drum coatings have become more common and less expensive in the rigging industry over the past several years. Many of us in the manufacturing area have been worried that synthetic sheaves and drum coatings might find their way into a fire safety curtain system creating a situation where the sheaves and drums supporting the weight of the fire safety curtain will become soft and not work properly in the elevated temperature environment of a fire. A common sheave material and drum coating is a Nylatron GSM (MoS2 FILLED TYPE 6 POLYAMIDE) with a melting temperature of 420 degrees Fahrenheit. We do not believe that utilizing synthetic sheaves and drum coatings would provide the level of protection that this standard seeks to provide.

Submitter Information Verification

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Submittal Date: Tue Jun 28 22:41:00 EDT 2016

Public Input No. 4-NFPA 80-2015 [Section No. 20.7.3.3 [Excluding any Sub-Sections]]

To provide for automatic emergency release when exposed to fire, an emergency control line (fire control line) shall be provided that utilizes a minimum of ⅜ in. diameter rope or ³⁄₃₂ in. (2.4 mm) diameter 7 × 19 specialty cord (aircraft cable) ~~fitted with fusible links~~ .

Statement of Problem and Substantiation for Public Input

In the last revision cycle the Committee eliminated fusible links from the fire curtain release line.

Citing:
Committee Statement:
A study, published by NFPA, has determined that “It is not likely that the descent of the fire safety curtain would be triggered by fusible links provided along the fire safety curtain release line due to their slow thermal responses. Further, the actuation of the release line fusible links is estimated to be preceded by the activation of sprinklers leading to cooling of the fusible links.” The proposed change eliminates fusible links because they will be ineffective in triggering the descent of the fire safety curtain. Fire Safety in Theatres - A New Design Approach, Final Report Published by: The Fire Protection Research Foundation, Quincy, MA, Sept. 2009

This is the only location in Chapter 20 where fusible links mentioned. Please complete the elimination of fusible links from the Fire curtain release line.

Submitter Information Verification

Submitter Full Name: Daniel Culhane
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Submittal Date: Wed Dec 30 19:14:34 EST 2015

Public Input No. 64-NFPA 80-2016 [Section No. A.1.1.4]

A.1.1.4

The fire performance evaluation of these assemblies is tested in accordance with ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials* or ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*, for horizontal access doors; NFPA 252, ANSI/UL 10B or ANSI/UL 10C for fire doors and shutters; NFPA 257 or ANSI/UL 9 for fire windows and glass block; and NFPA 288 for doors in horizontal fire-rated assemblies. It is not the intent of this standard to establish the degree of protection required or to constitute the approval of any product. These are determined by the AHJ.

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. ANSI/UL 9 is generally considered comparable to NFPA 257. This is confirmed by the fact that NFPA 5000 includes the UL standards side-by side with all references to NFPA standards. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B, ANSI/UL 10C and ANSI/UL 9 be likewise added to NFPA 80

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
Organization: UL LLC
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Submittal Date: Wed Jun 29 13:54:42 EDT 2016

Public Input No. 65-NFPA 80-2016 [Section No. A.3.3.56]

A.3.3.56 Fire Protection Glazing.

Safety is also an important consideration where glazing materials are used in fire doors and in fire resistance–rated walls subject to accidental human impact. In such applications, all model building codes contain requirements for safety glazing based on 16 CFR 1201, U.S. Consumer Product Safety Commission, “Standard for Architectural Glazing.”

Fire resistance–rated glazing materials are designed to limit the temperature rise on the unexposed surface and to withstand the impact of the hose stream test as required for walls in accordance with ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials* or ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*. Fire resistance–rated materials originally were intended to be used as a substitute for fire-resistive walls where large areas of glazing were required or desirable. Fire resistance–rated glazing materials achieve a fire resistance rating, whereas fire protection–rated glazing materials achieve a fire protection rating as defined in NFPA 257 or ANSI/UL 9, and NFPA 252, ANSI/UL 10B or ANSI/UL 10C . Fire resistance–rated glazing materials can be permitted to be used as a component of a fire door assembly to meet the fire performance requirements for a fire door rather than as a fire protection–rated glazing material installed in a fire door. The size and area limitations for fire protection–rated glazing materials defined in this standard do not apply to fire resistance–rated glazing materials.

Statement of Problem and Substantiation for Public Input

ANSI/UL 9 is generally considered comparable to NFPA 257. ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the UL standards side-by side with all references to NFPA standards. As such, for consistency sake, it is respectfully requested that ANSI/UL 9, ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Submittal Date: Wed Jun 29 13:58:54 EDT 2016

Public Input No. 66-NFPA 80-2016 [Section No. A.4.4.1]

A.4.4.1

The content of the labeling on individual fire protection–rated (tested to NFPA 252~~ or NFPA 257~~ , ANSI/UL 10B, ANSI/UL 10C, NFPA 257 or ANSI/Ul 9) and fire resistance–rated (tested to ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials* or ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*) glazing should identify the manufacturer, rating, third-party testing agency, test standard, and whether the hose stream test was successfully performed.

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. ANSI/UL 9 is generally considered comparable to NFPA 257. This is confirmed by the fact that NFPA 5000 includes the UL standards side-by side with all references to NFPA standards. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B, ANSI/UL 10C and ANSI/UL 9 be likewise added to NFPA 80

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Submittal Date: Wed Jun 29 14:07:42 EDT 2016

Public Input No. 67-NFPA 80-2016 [Section No. A.4.4.4]

A.4.4.4

A means of determining severity of exterior fire exposures is addressed in NFPA 80A. NFPA 252, ANSI/UL 10B and ANSI/Ul 10C permits the dislodging of small portions of glass lights (glazing material) during the hose stream test. Since the glazing material as used in this exception does not constitute a glass light, no dislodging of the glazing material is permitted.

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
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Submitter Full Name: Richard Walke
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Public Input No. 68-NFPA 80-2016 [Section No. A.4.4.5]

A.4.4.5

Doors containing fire resistance–rated glazing materials fabricated and tested as door assemblies in accordance with NFPA 252, ANSI/UL 10B or ANSI/UL 10C to determine a fire protection rating should be regulated by this standard as a fire assembly and not as a glazing material permitted in fire door assemblies as prescribed in Section 4.4.

Regarding Table 4.4.5, footnote c, consideration should be given to limiting fire protection glazing size in non–temperature rise doors where 60- and 90-minute fire protection is required due to radiant heat hazards. *(See Annex I.)*

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Public Input No. 69-NFPA 80-2016 [Section No. A.4.8.4.1]

A.4.8.4.1

The maximum clearance of ¾ in. (19 mm.) under fire doors as permitted by this standard is the accepted practice in the industry. NFPA 252 ~~is a test standard~~ , ANSI/UL 10B and ANSI/UL 10C are test standards , not ~~an~~ installation ~~standard~~ standards , and prescribes clearances and tolerances for swinging doors in the test wall opening.

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

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Submitter Full Name: Richard Walke
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Public Input No. 70-NFPA 80-2016 [Section No. A.6.3.3.3]

A.6.3.3.3

Where the codes and standards require the use of 60-minute or 90-minute fire doors, hollow metal sidelight/transom frames tested only to NFPA 252, ANSI/UL 10B or ANSI/UL 10C might not be permitted. For example, where a door assembly is required to be rated 60- or 90-minutes, although the door and door frame is rated 60- or 90-minutes in accordance with NFPA 252, ANSI/UL 10B or ANSI/UL 10C, the sidelight/transom frame should also be tested in accordance with ASTM E119 or UL 263. Some building codes further require the sidelight/transom portion of the assembly be rated equal to the wall. Although fire protection rated glazing has been tested in hollow metal sidelight/transom frames with listings of 60- and 90-minutes, the application might not be permitted.

A common misapplication of the hollow metal frame is in 1- and 2-hour stairwell enclosures where the building is fully sprinklered. Although a temperature rise door is not required under the model building codes, the sidelight/transom frame should meet this requirement for 60- and 90-minute door assemblies. Therefore, the frame should be a fire resistance–rated assembly.

Another area of confusion is where opening protectives tested to NFPA 252, ANSI/UL 10B or ANSI/UL 10C, or NFPA 257 or ANSI/UL 9 are not to be permitted to exceed a maximum of 25 percent of the wall area or length under some model building codes and NFPA *101*. A fire resistance–rated frame with fire resistance–rated glazing tested to ASTM E119 or UL 263 might be required.

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. ANSI/UL 9 is generally considered comparable to NFPA 257. This is confirmed by the fact that NFPA 5000 includes the UL standards side-by side with all references to NFPA standards. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B, ANSI/UL 10C and ANSI/UL 9 be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Public Input No. 71-NFPA 80-2016 [Section No. A.15.1.2]

A.15.1.2

Some chute doors, depending on location, might be required to have a temperature rise of not more than 250°F (139°C) at the end of a 30-minute exposure to the standard fire test as described in NFPA 252, ANSI/UL 10B or ANSI/UL 10C .

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

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Submitter Full Name: Richard Walke
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Public Input No. 72-NFPA 80-2016 [Section No. A.17.2.1]

A.17.2.1

The content of the labeling on individual fire protection–rated (tested to NFPA 252, ANSI/UL 10B or ANSI/UL 10C, or NFPA 257 or NPFA) and fire resistance–rated (tested to ASTM E119, *Standard Methods for Fire Tests of Building Construction and Materials* or ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*) glazing should identify the manufacturer, rating, third-party testing agency, test standard, and whether the hose stream test was successfully performed.

Statement of Problem and Substantiation for Public Input

ANSI/UL 10B and ANSI/UL 10C are generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the two UL standards side-by side with all references to NFPA 252. As such, for consistency sake, it is respectfully requested that ANSI/UL 10B and ANSI/UL 10C be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Submittal Date: Wed Jun 29 14:36:35 EDT 2016

Public Input No. 73-NFPA 80-2016 [Section No. I.1]

I.1 Background.

Fire windows were originally designed for protecting openings in exterior walls. In such applications, radiant heat transfer was not a significant consideration, since the main function of fire windows was to contain the flames within the building. However, where fire windows are used in interior partitions, users of this standard might need to consider radiant heat transfer during fire. Exiting through corridors and past fire windows could be compromised, and combustible materials on the unexposed side of fire windows could be ignited. The information that follows is a guide to the evaluation of radiant heat transfer through fire windows.

Recent revisions to this standard have permitted very large areas of fire protection–rated glazing materials to be used in interior partitions, limited only by the size of the test furnace. Also, recent technological advances in the glazing industry have compounded the problem of radiant heat transfer by making it possible to provide glazing materials with fire protection ratings of 60 minutes and 90 minutes. Historically, fire windows, including glass block, have been limited to a 45-minute rating by the standard fire ~~test~~ tests , NFPA 257 or ANSI/UL 9 . This time limit was predicated on the failure of wired glass at approximately 1600°F (870°C). [1] Some manufacturers also have developed fire resistance–rated glazing assemblies that meet the requirements of a fire resistance–rated wall assembly (currently up to 2 hours). These glazing materials, however, do not transmit excessive radiant heat, since they are required to limit the temperature rise on the unexposed face to 250°F (121°C).

Test Method. Because the present fire test ~~standard~~ standards , NFPA 257 and ANSI/UL 9 , ~~does~~ do not require measuring and reporting temperature rise on the unexposed face of the glazing material or radiant heat transmission, glazing products tested to ~~this standard~~ these standards have not been required to retard heat transfer. However, these data are required in many European fire test standards. [2] As a result, European building codes place limitations on the use of glazing in fire-resistant partitions inside buildings and require the use of insulating glazing in means of egress as well as where combustibles could be in close proximity. Research by Margaret Law, Bsc., Ministry of Technology and Fire Offices Committee, Joint Fire Research Organization, led to the development of such limitations in British building regulations. [3,4] This research provides a methodology for calculating safe distances from wired glass windows used to screen room fires from adjacent spaces.

Law's research properly identifies two major concerns for the use of fire protection–rated glazing in interior partitions as follows:

(1) The impact on occupants exiting past the glazing

(2) The potential for nonpiloted (auto)ignition of combustibles on the unexposed side of the glazing

Both of these concerns should be taken into consideration by users of this standard when evaluating a specific fire protection–rated glazing material for interior application.

The exiting concern relates mostly to corridor applications where evacuating occupants might pass directly in front of the glazing that screens them from fire. Calculation methods described in references 1 and 5 can be used to determine the radiant heat flux generated by a fire as well as the incident heat flux on a person located any distance beyond the unexposed face of the glazing. Safe distances for evacuees then can be determined from Figures 3-10.59 and 3-10.60 in the *SFPE Handbook of Fire Protection Engineering,* which provide data useful in estimating the time to reach pain threshold and the time taken to cause second-degree burns. [5]

Exit Enclosures. Traditional glazing materials have been prohibited from being used in fire windows in exit stair enclosures because of the concern of radiant heat transfer. Recently, the model building codes also incorporated requirements for limiting the temperature rise on the unexposed face of fire doors opening into exit stair enclosures in order to address the problem of heat transfer (both conducted and reradiated) that could expose evacuating occupants passing doors at each floor landing. Therefore, caution should be exercised when considering glazing materials with fire protection ratings of 1 hour or more in such applications, since they can transmit excessive radiant heat into the exit stair enclosure. However, glazing materials with fire resistance ratings are suitable in such situations, since they have been tested to limit heat

transfer.

Irradiation Levels. Addressing the problem of the nonpiloted (auto)ignition of combustibles stored near a fire window demands an understanding of critical irradiation levels. Incident flux levels for autoignition of various combustible materials have been developed. [3,6] Average values of 30 kW/m^2 to 35 kW/m^2 normally are used for ordinary (cellulosic) combustibles. Lower values have been identified for some synthetic materials.

The radiant intensity (heat flux) of the exposing fire depends on, among other factors, the type of materials burning (rate of heat release) and the ventilation rate of the enclosing room. For well-ventilated fires in light hazard occupancies, such as offices, schools, institutions, and residences, a peak radiation intensity (output) of 85 kW/m^2 has been used by Law to represent a 1-hour fire exposure. [3] Nelson provides a method for determining safe separation distances based on the radiant heat flux incident on a combustible material screened by wired glass (with a transmissivity of 0.5) from a fire (with an emissivity of 1.0; called a blackbody). [6] In general, a fully developed compartment fire is viewed as a blackbody and, therefore, is assigned an emissivity of 1.0. To determine the radiation intensity, the following formula can be used:

$$I = eoT^4 \qquad \textbf{[I.1a]}$$

where:

I = radiation intensity (kW/m^2)

e = emissivity

o = Stefan–Boltzmann constant (5.67 × 10^{-11} kW/m^2-K^4)

T = absolute temperature of the fire (K)

For most situations, the temperature of the compartment fire is the only unknown variable. *NFPA 72* provides some guidance for calculating room temperature based on different fire growth rates. Other methods base the temperature on the standard temperature–time curve used in ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials* or ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*. In a fully developed compartment fire assumed to have a temperature of 1600°F (870°C or 1140 K), the radiant heat flux would be approximately 105 kW/m^2.

To determine the incident radiant heat flux on the unexposed side of the glazing, the following formula can be used:

$$I_i = FtI \qquad \textbf{[I.1b]}$$

where:

I_i = incident radiation intensity (heat flux) (kW/m^2)

F = configuration factor for the glazed opening

t = transmissivity of the glazing material

I = radiation intensity of the fire (kW/m^2)

Transmissivity of ¼ in. (6.35 mm) wired glass has been reported in the range of 0.4 to 0.6. Many analyses have used 0.5 transmissivity to account for the effects of reradiation by the glazing product. Some manufacturers might be able to provide specific heat transfer information relative to their products.

Users should consider the significance of the source radiation, the transmissivity of the glazing material, the time of exposure, the separation distances, and the configuration of the glazed opening in relation to the target.

Continuing with the earlier example of a fire having a temperature of 1600°F (870°C), the incident radiation intensity (heat flux) (I_i) for a window opening having a configuration factor of

0.35 in relation to a combustible target would be approximately 18.4 kW/m^2. The referenced documents provide detailed guidance for this analysis.

Statement of Problem and Substantiation for Public Input

ANSI/UL 9 is generally considered to be comparable standards to NFPA 252. This is confirmed by the fact that NFPA 5000 includes the UL standard side-by side with all references to NFPA 257. As such, for consistency sake, it is respectfully requested that ANSI/UL 9 be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

Submitter Information Verification

Submitter Full Name: Richard Walke
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Public Input No. 74-NFPA 80-2016 [Section No. K.5]

K.5

Any assembly provided in accordance with the provisions of this standard does not necessarily provide the same degree of protection against the spread of fire that is provided by the wall in which the assembly is installed, assuming that the wall has fire resistance established in accordance with ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials* or ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*. Therefore, the size and number of openings in any wall required to have fire resistance should be kept to the minimum necessary for the normal or emergency operation of the occupancy. Building and fire codes generally limit the extent of wall openings permitted within a defined length of wall because the protection is not equivalent. The user of this standard is encouraged to become familiar with the limitations of these other standards.

The use of assemblies covered in this standard in fire-resistive walls only for decorative, aesthetic, and similar purposes is not recommended. However, there are glazing systems using fire-resistant glazing materials that are actually fire-resistive walls tested in accordance with ASTM E119. Such systems can be permitted to be used as fire-resistive walls and are not within the scope of this standard.

There are developments in the area of glazing that demonstrate a resistance to the passage of heat beyond that discussed in Annex I. Historically, the fire protection performance of glazing has been based on wired glass, which is capable of successfully meeting the fire exposure test criteria of NFPA 257 or ANSI/UL 9 , and which has been accepted as having a fire protection rating of 45 minutes. The fire protection–rated glazing materials are now capable of meeting the fire test criteria of NFPA 257 or ANSI/UL 9 for as long as 3 hours, and some have a low radiant heat transfer capability for as long as 1 hour and 1 ½ hours. Safety glazing is also an important consideration where glazing materials are used in fire doors and in fire resistance–rated walls that could be subject to accidental human impact. In such applications, all model building codes contain requirements for safety glazing based on 16 CFR 1201, U.S. Consumer Product Safety Commission, “Standard for Architectural Glazing.”

Statement of Problem and Substantiation for Public Input

ANSI/UL 9 is generally considered to be comparable standard to NFPA 257. This is confirmed by the fact that NFPA 5000 includes the UL standards side-by side with all references to NFPA 257. As such, for consistency sake, it is respectfully requested that ANSI/UL 9 be likewise added to NFPA 80.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 57-NFPA 80-2016 [Section No. 2.3.6]	

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Public Input No. 3-NFPA 80-2015 [Chapter L]

Annex L Informational References

L.1 Referenced Publications.

The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

L.1.1 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 72 ®, *National Fire Alarm and Signaling Code*, 2016 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2013 edition.

NFPA 80A, *Recommended Practice for Protection of Buildings from Exterior Fire Exposures*, 2012 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*, 2014 edition.

NFPA *101* ®, *Life Safety Code* ®, 2015 edition.

NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*, 2016 edition.

NFPA 232, *Standard for the Protection of Records*, 2012 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 2012 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, 2012 edition.

NFPA 288, *Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance–Rated Assemblies*, 2012 edition.

Fire Protection Handbook, 20th ed., 2008, Section 18, Chap 1, “Confinement of Fire in Buildings,” pp. 18–15 to 18–20, “Protection of Openings.”

SFPE Handbook of Fire Protection Engineering, 4th edition, 2008.

L.1.2 Other Publications.

L.1.2.1 AMCA Publications.

Air Movement and Control Association International, Inc., 30 West University Drive, Arlington Heights, IL 60004-1893.

AMCA 503, *Fire, Ceiling (Radiation), Smoke and Fire/Smoke Dampers Application Manual*, 2008.

L.1.2.2 ASME Publications.

~~American Society of Mechanical Engineers, Three~~ **ASME International** , **Two** Park Avenue, New York, NY 10016-5990.

ASME A17.1/CSA B44-~~2010~~ **13** , *Safety Code for ~~Existing~~ Elevators and Escalators*, ~~2010~~ **2013** .

ASME A17.3~~/CSA B44-13~~ , *Safety Code for Existing Elevators and Escalators*, ~~2013~~ **2015** .

L.1.2.3 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D5034, *Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)*, 2013.

ASTM E90, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*, 2009.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ **2016** .

ASTM E413, *Classification for Rating Sound Insulation*, ~~2010~~ **2016** .

L.1.2.4 ISO Publications.

International Organization for Standardization, ~~1, Ch. de la Voie-Creuse, Case postale 56, CH-1211 Geneva 20,~~ **ISO Central Secretariat, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva Switzerland** .

ISO 3009, *Fire Resistance ~~Tests — Glazed Elements~~* , ~~1976/Amendment 1:1984~~ *Tests* ***Elements of Building Construction*** *Glazed Elements* , **2003** .

L.1.2.5 NAAMM/HMMA Publications.

National Association of Architectural Metal Manufacturers/Hollow Metal Manufacturers Association, ~~8 South Michigan Avenue, Suite 1000, Chicago, IL 60603~~ **800 Roosevelt Rd,, Bldg. C** , Suite **312** , **Glen Ellyn** , IL **60137** .

ANSI/NAAMM-HMMA-862-13, *Guide Specifications for Commercial Security Hollow Metal Doors and Frames*, 2013.

ANSI/NAAMM-HMMA-863-~~04~~ **14** , *Guide Specifications for Detention Security Hollow Metal Doors and Frames*, ~~2005~~ **2014** .

ANSI/NAAMM-HMMA-866-12, *Guide Specifications for Stainless Steel Hollow Metal Doors and Frames*, 2012.

L.1.2.6 SMACNA Publications.

Sheet Metal and Air Conditioning Contractors' National Association, 4201 Lafayette Center Drive, Chantilly, VA 20151-~~1209~~ **1219** .

Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems, 2002.

L.1.2.7 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

~~ANSI/~~ UL 9, *Standard for Safety Fire Tests of Window Assemblies*, 2004, revised ~~April 2009~~ **2015** .

~~ANSI/~~ UL 10B, *Standard for Safety Fire Tests of Door Assemblies*, 2008, revised ~~2009~~ **2015** .

~~ANSI/~~ UL 10C, *Standard for Positive Pressure Fire Tests of Door Assemblies*, 2009**, revised 2015** .

~~ANSI/~~ UL 10D, *Standard for Fire Tests of Fire Protective Curtain Assemblies*, 2014**, revised 2014** .

~~ANSI/~~ UL 263, *Standard for Fire Tests of Building Construction and Materials*, 2011**, revised 2015** .

UL 752, *Standard for Safety Bullet-Resisting Equipment*, 2005, revised ~~2010~~ **2015** .

Fire Resistance Directory, 2010.

L.1.2.8 ULC Publications.

ULC Standards, 7 Underwriters Road, Toronto, ON, M1R 3A9, Canada.

ULC CAN ~~/ULC~~ **-S104** ~~-10~~ , *Standard Method for Fire Tests of Door Assemblies*, ~~2010~~ **2015** .

~~CAN4~~ **ULC CAN -S106** ~~-M80~~ , *Standard Method for Fire Test of Window and Glass Block Assemblies*, ~~1980~~ **2015** .

L.1.2.9 U.S. Government Publications.

U.S. ~~Government Printing~~ Government **Publishing** Office, **732 North Capitol Street, NW,** Washington, DC ~~20402~~ **20401-0001** .

Title 16, Code of Federal Regulations, Part 1201, “Standard for Architectural Glazing,” January 6, 1977.

L.1.2.10 Additional Publications.

Law, Margaret, “Heat Radiation from Fires and Building Separation,” Fire Research Technical Paper No. 5, London, 1963.

Law, Margaret, “Safe Distances from Wired Glass Screening a Fire,” *Institution of Fire Engineers Quarterly*, London, 1969.

Nelson, Harold E., “Radiant Energy Transfer in Fire Protection Engineering Problem Solving,” *Fire Technology*, Vol. 4, No. 3, August 1968, pp. 196–205.

L.2 Informational References.

The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

L.2.1 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSI A133.1*, Tin-Clad Fire Doors Mounted Singly and in Pairs,* 1993.

ANSI Z97.1, *Safety Glazing Materials Use in Buildings - Safety Performance Specifications and Methods of Test*, 2009**, Errata, 2010** .

L.3 References for Extracts in Informational Sections. (Reserved)

Statement of Problem and Substantiation for Public Input

Referenced current SDO names, addresses, standard names, numbers, and editions.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 80-2015 [Chapter 2]	Referenced current SDO names, addresses, standard names, numbers, and editions.

Submitter Information Verification

Submitter Full Name: Aaron Adamczyk
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Submittal Date: Thu Dec 24 17:45:43 EST 2015

Public Input No. 37-NFPA 80-2016 [Section No. L.1.2.3]

L.1.2.3 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D5034, *Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)*, 2013.

ASTM E90, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*, 2009.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ 2016 ..

ASTM E413, *Classification for Rating Sound Insulation*, 2010.

Statement of Problem and Substantiation for Public Input

update date of ASTM E119

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 36-NFPA 80-2016 [Section No. 2.3.2]	

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Public Input No. 9-NFPA 80-2016 [Section No. L.1.2.3]

L.1.2.3 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D5034, *Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)*, 2013.

ASTM E90, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*, 2009.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ~~2012a~~ 2015 .

ASTM E413, *Classification for Rating Sound Insulation*, 2010.

Statement of Problem and Substantiation for Public Input

Date updates

Submitter Information Verification

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Public Input No. 49-NFPA 80-2016 [Section No. L.1.2.7]

L.1.2.7 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 9, *Standard for Safety Fire Tests of Window Assemblies*, 2004, revised ~~April 2009.~~ 2015

ANSI/UL 10B, *Standard for Safety Fire Tests of Door Assemblies*, 2008, revised ~~2009~~ 2015 .

ANSI/UL 10C, *Standard for Positive Pressure Fire Tests of Door Assemblies*, 2009, revised 2016 .

ANSI/UL 10D, *Standard for Fire Tests of Fire Protective Curtain Assemblies*, 2014.

ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*, 2011, revised 2015 .

UL 752, *Standard for Safety Bullet-Resisting Equipment*, 2005, revised ~~2010~~ 2015 .

Fire Resistance Directory, 2010.

Statement of Problem and Substantiation for Public Input

This proposal updates the referenced UL Standards to the current edition.

Submitter Information Verification

Submitter Full Name: Ronald Farr
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Public Input No. 6-NFPA 105-2016 [Section No. 2.3.2]

2.3.2 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 10B, *Standard for Fire Tests of Door Assemblies*, ~~2009~~ 2015 .

ANSI/UL 10C, *Standard for Positive Pressure Fire Tests of Door Assemblies*, ~~2009~~ 2016 .

ANSI/UL 1784, *Air Leakage Tests of Door Assemblies*, ~~2009~~ 2015 .

Statement of Problem and Substantiation for Public Input

This proposal updates the referenced UL Standards to the current edition.

Submitter Information Verification

Submitter Full Name: Ronald Farr
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 27 17:01:01 EDT 2016

Public Input No. 8-NFPA 105-2016 [Section No. 7.4.1.2]

7.4.1.2

The operational test shall be conducted under normal HVAC airflow conditions as well as static ~~flow~~ pressurized conditions. The damper shall fully close/seal under both test conditions.

Statement of Problem and Substantiation for Public Input

Static pressure is not a "flow" condition. Static pressure is simply the pressure inside a vessel, and has nothing to do with flow.

Submitter Information Verification

Submitter Full Name: John Hamilton
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Street Address:
City:
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Submittal Date: Tue Jun 28 17:30:21 EDT 2016

Public Input No. 9-NFPA 105-2016 [Section No. 7.4.1.5]

7.4.1.5

All indicating devices shall be witness verified to work properly and report to the intended ~~location~~ interface .

Statement of Problem and Substantiation for Public Input

Consistent with field verifying the operation of dampers. Add interface reads better than location.

Submitter Information Verification

Submitter Full Name: John Hamilton
Organization: National Energy Management Ins
Street Address:
City:
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Submittal Date: Tue Jun 28 17:35:06 EDT 2016

Public Input No. 4-NFPA 105-2016 [Sections 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.5.5]

Sections 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.5.5

7.5.1

Acceptance testing of smoke dampers shall be performed by a qualified person with knowledge and understanding of the operating components of the type of assembly to be tested.

7.5.2

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

7.5.3*

Acceptance testing shall include the closing of the damper by every means.

7.5.

~~4~~

~~If the damper is equipped with a variable air volume system, acceptance~~ **3.3**

Acceptance testing shall be conducted by removing electrical power or air pressure from the actuator and ensuring that the damper closes properly.

7.5.3.4

Electrical power or air pressure shall then be reapplied to the damper to confirm that it returns to its full-open position.

7.5.4

Acceptance testing shall be conducted after the building mechanical ventilation system has been balanced , and in operation under maximum air flow , if equipped with a variable air volume system in accordance with 5 . 2.1.

7.5.5

A record of these inspections and testing shall be made in accordance with ~~7~~ 5 . ~~6~~ 2 . 4 2 .

Statement of Problem and Substantiation for Public Input

7.5.3 – The phrase “by all means” in this section is too open-ended and is subject to interpretation. The proposed new language describes specifically how the test is to be conducted.

Submitter Information Verification

Submitter Full Name: Vickie Lovell
Organization: Intercode Incorporated
Affilliation: Air Movement and Control Association International
Street Address:
City:
State:
Zip:

Submittal Date: Fri Jun 24 14:54:31 EDT 2016

Public Input No. 10-NFPA 105-2016 [Section No. 7.5.3]

7.5.3*

Acceptance testing shall include visual witnessing the closing of the damper by every means.

Statement of Problem and Substantiation for Public Input

Consistent with other NFPA requirments

Submitter Information Verification

Submitter Full Name: John Hamilton
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Street Address:
City:
State:
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Submittal Date: Tue Jun 28 17:42:06 EDT 2016

Public Input No. 11-NFPA 105-2016 [Section No. 7.5.4]

7.5.4

If the damper is ~~equipped with~~ installed in a variable air volume system, acceptance testing shall be conducted after the building mechanical ventilation system has been tested, adjusted, balanced, and in operation under maximum air flow.

Statement of Problem and Substantiation for Public Input

Dampers are installed in VAV systems they are not the VAV system. Added verbiage to identify completion of the testing after construction is complete.

Submitter Information Verification

Submitter Full Name: John Hamilton
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City:
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Submittal Date: Tue Jun 28 17:44:07 EDT 2016

Public Input No. 1-NFPA 105-2015 [Sections 7.5.4, 7.5.5]

Sections 7.5.4, 7.5.5

7.5.4

~~Acceptance~~ If the damper is equipped with a variable air volume sytem, acceptance testing shall be conducted after the building mechanical ventilation system has been balanced ~~,~~ and in operation under maximum air flow~~, if equipped with a variable air volume system in accordance with 5 . 2.1.~~

7.5.5

A record of these inspections and testing shall be made in accordance with ~~5~~ 7 . ~~2~~ 6 . ~~2~~ 4 .

Additional Proposed Changes

File Name	Description	Approved
Issued_TIA_105-16-1.pdf	TIA 16-1	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from TIA 105-16-1 issued on December 8, 2015 by the Standards Council. According to the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the document.

Submitter Information Verification

Submitter Full Name: TC FDW-AAA
Organization: NFPA
Street Address:
City:
State:
Zip:
Submittal Date: Thu Dec 31 11:35:37 EST 2015

Tentative Interim Amendment

NFPA 105

Standard for Smoke Door Assemblies and Other Opening Protectives

2016 Edition

Reference: 7.5.4, 7.5.5 and 7.6.3.3
TIA 16-1
(SC 15-12-7 / TIA Log #1192)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 105, *Standard for Smoke Door and Other Opening Protectives*, 2016 edition. The TIA was processed by the Technical Committee on Fire Doors and Windows and was issued by the Standards Council on December 8, 2015, with an effective date of December 28, 2015.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a public input of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Revise section 7.5.4 and 7.5.5 to read as follows:

7.5.4 If the damper is equipped with a variable air volume system, acceptance testing shall be conducted after the building mechanical ventilation system has been balanced and in operation under maximum air flow.
7.5.5 A record of these inspections and testing shall be made in accordance with 7.6.4.

2. Revise section 7.6.3.3 to read as follows:

7.6.3.3 Testing of dampers ~~with actuator~~ shall comply with the following procedure:
(1) Visually confirm that the damper is in the fully-open position.
(2) Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.
(3) Visually confirm that the damper closes completely.
(4) Reapply electrical power or air pressure to reopen the damper.
(5) Visually confirm that the damper is in the fully-open position.

Issue Date: December 8, 2015

Effective Date: December 28, 2015

Public Input No. 5-NFPA 105-2016 [Section No. 7.6]

7.6 Periodic ~~Inspection and~~ Testing.

7.6.1 General.

7.6.1.1

Smoke dampers for dedicated and nondedicated smoke control systems shall be inspected and tested in accordance with NFPA 92, Standard for Smoke Control Sytems.

7.6.1.2

Combination fire/smoke dampers shall be inspected and tested in accordance with NFPA 80, Standard for Fire Doors and Other Opening Protectives .

7.6.2* Testing Frequency.

7.6.2.1

Each damper shall be tested and inspected 1 year after installation.

7.6.2.2*

The test and inspection frequency shall then be every 4 years, except in buildings containing a hospital, where the frequency shall be every 6 years.

7.6.3 Test Method.

7.6.3.1 **General**

All tests shall be completed in a safe manner by personnel wearing personal protective equipment (PPE).

7.6.3.

2

1 **.1** All tests shall be completed in a safe manner by personnel wearing personal protective equipment (PPE).

7.6.3. **1** **.2** Fans shall not be permitted to be shut down during the test.

7.6.3.

3

Testing of dampers shall comply with the following procedure: **2** Visual Inspection Method

7.6.3.2.1 Visually confirm that the damper is in the fully- full open or full closed position .

- Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.
- Visually confirm that the damper closes completely.
- Reapply electrical power or air pressure to reopen the damper.

Visually as required by the system design.

7.6.3.2.2 Command and visually confirm the damper to the full closed or full open position.

7.6.3.2.3 Restore and visually confirm the damper to the original operating position as required by the system design.

7.6.3.3 Remote Inspection Method

7.6.3.3.1 General

7.6.3.3.1.1 Dampers inspected remotely shall be designed with the ability to indicate when the damper is fully open and fully closed.

7.6.3.3.1.2 Prior to using remote inspection a visual inspection of the installed damper shall be performed.

7.6.3.3.1.3 The visual inspection shall confirm that the position indication method accurately reflects the full open and full closed position of the damper.

7.6.3.3.2 Test Procedure

7.6.3.3.2.1 Signal from the damper's position indication device to confirm that the damper is in the

fully

full -open or closed position as required by the system design .

7.6. **3.3.2.2** The damper shall be Commanded and confirmed to the full closed or full open position.

7.6.3.3.2.3 The damper shall be confirmed to the original operating position as required by the system design.

7.6. 4 Documentation.

7.6.4.1

All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered.

7.6.4.2

The documentation shall have space to indicate when and how the deficiencies were corrected.

7.6.4.3

All documentation shall be maintained for at least three test cycles and made available for review by the AHJ.

Statement of Problem and Substantiation for Public Input

7.6 – The proposal modifies the section header to keep it consistent with the corresponding section in NFPA 80 (section 19.5).

7.6.1.1 and 7.6.1.2 – the proposal adds the names of the referenced standards to the text.

7.6.3.1 – The proposal adds the word “General” to keep this section consistent with other similar sections in the standard. The rest of the section is then renumbered accordingly.

7.6.3.3 – The proposal attempts to accomplish two objectives by rewriting this section.

First, the title of this section “Dampers with Motorized Actuators” is confusing as it implies that there is a periodic test method for dampers without a motorized actuator. That is not the case. UL555S requires that all smoke and combination fire smoke dampers have a factory supplied actuator.

The second objective of modifying this section is to add an option to perform periodic testing on dampers remotely using position indication switches. The proposal requires that an initial visual inspection be performed prior to utilizing the remote testing option. For new construction this initial visual inspection will typically take place as part of the Acceptance Testing.

Submitter Information Verification

Submitter Full Name: Vickie Lovell
Organization: Intercode Incorporated
Affilliation: Air Movement and Control Association International
Street Address:
City:
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Submittal Date: Fri Jun 24 15:10:53 EDT 2016

Public Input No. 12-NFPA 105-2016 [Section No. 7.6.2.1]

7.6.2.1

Each damper shall be tested and inspected within 1 year ~~after~~ of installation.

Statement of Problem and Substantiation for Public Input

Mandates the testing after job is complete and before the 1 year anniversary.

Submitter Information Verification

Submitter Full Name: John Hamilton
Organization: National Energy Management Ins
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 28 17:48:41 EDT 2016

Public Input No. 3-NFPA 105-2016 [Section No. 7.6.2.1]

7.6.2.1

Each damper shall be tested and inspected 1 year after ~~installation~~ acceptance testing .

Statement of Problem and Substantiation for Public Input

It is often difficult to determine the date a damper was installed on large projects which require installation of numerous dampers. This poses a problem during regulatory inspections related to damper testing. The date of commissioning is documented and would be easier to determine when to perform the 1 year test. This language is currently in the 2016 edition of NFPA 80.

Submitter Information Verification

Submitter Full Name: Lennon Peake
Organization: Koffel Associates, Inc.
Street Address:
City:
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Submittal Date: Tue Jan 05 08:24:11 EST 2016

Public Input No. 2-NFPA 105-2015 [Section No. 7.6.3.3]

7.6.3.3 Dampers with Motorized Actuators.

Testing of dampers ~~with actuators~~ shall comply with the following procedure:

(1) Visually confirm that the damper is in the fully-open position.

(2) Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.

(3) Visually confirm that the damper closes completely.

(4) Reapply electrical power or air pressure to reopen the damper.

(5) Visually confirm that the damper is in the fully-open position.

Additional Proposed Changes

File Name	Description	Approved
Issued_TIA_105-16-1.pdf	TIA 105-16-1	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from TIA was issued on December 8, 2015 by the Standards Council o. According to the NFPA Regs., this TIA must to be reconsidered by the Technical Committee for the next edition of the document.

Submitter Information Verification

Submitter Full Name: TC FDW-AAA
Organization: NFPA
Street Address:
City:
State:
Zip:
Submittal Date: Thu Dec 31 11:42:23 EST 2015

Tentative Interim Amendment

NFPA 105

Standard for Smoke Door Assemblies and Other Opening Protectives

2016 Edition

Reference: 7.5.4, 7.5.5 and 7.6.3.3
TIA 16-1
(SC 15-12-7 / TIA Log #1192)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 105, *Standard for Smoke Door and Other Opening Protectives*, 2016 edition. The TIA was processed by the Technical Committee on Fire Doors and Windows and was issued by the Standards Council on December 8, 2015, with an effective date of December 28, 2015.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a public input of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Revise section 7.5.4 and 7.5.5 to read as follows:

7.5.4 If the damper is equipped with a variable air volume system, acceptance testing shall be conducted after the building mechanical ventilation system has been balanced and in operation under maximum air flow.
7.5.5 A record of these inspections and testing shall be made in accordance with 7.6.4.

2. Revise section 7.6.3.3 to read as follows:

7.6.3.3 Testing of dampers ~~with actuator~~ shall comply with the following procedure:
(1) Visually confirm that the damper is in the fully-open position.
(2) Verify that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.
(3) Visually confirm that the damper closes completely.
(4) Reapply electrical power or air pressure to reopen the damper.
(5) Visually confirm that the damper is in the fully-open position.

Issue Date: December 8, 2015

Effective Date: December 28, 2015

Public Input No. 13-NFPA 105-2016 [Section No. 7.7.2]

7.7.2*

All exposed moving parts of the damper shall be lubricated (dry- ~~lubricated~~) as required by the manufacturer.

Statement of Problem and Substantiation for Public Input

What if the manufacture has a way to lubricate that is not dry? Should not be prescriptive follow the manufactures requirments.

Submitter Information Verification

Submitter Full Name: John Hamilton
Organization: National Energy Management Ins
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 28 17:58:30 EDT 2016

Public Input No. 7-NFPA 105-2016 [Section No. C.1.2.4]

C.1.2.4 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 1784, *Air Leakage Tests of Door Assemblies*, ~~2009~~ 2015 .

Statement of Problem and Substantiation for Public Input

This proposal updates the referenced UL Standards to the current edition.

Submitter Information Verification

Submitter Full Name: Ronald Farr
Organization: UL LLC
Street Address:
City:
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Zip:
Submittal Date: Mon Jun 27 17:02:57 EDT 2016

Bigda, Kristin

From: Keith Pardoe <kpardoe@pardoeconsultingllc.com>
Sent: Friday, September 11, 2015 12:11 PM
To: Bigda, Kristin
Subject: More on Chapter 19.

Hi Kristin,

I finished working my way through Chapter 19. Understand that I knew next to nothing about dampers when I started going through this chapter. I learned a lot. After going through this chapter I found that there doesn't seem to be a direct requirement that triggers when acceptance testing is needed. Using Chapter 5's requirements as a model, the following changes might be necessary in Chapter 19:

19.3.1 Fire Dampers. After the installation of a damper is completed, an operational test shall be conducted in accordance with 19.5.2.

19.3.2 Combination Fire/Smoke Dampers. After the installation of a dynamic combination fire/smoke damper is complete, an operational test shall be conducted in accordance with 19.5.2.

New 19.5.2.1.1 As a minimum, the provisions of 19.4 shall be included in the periodic testing procedure.

Modified 19.5.3.2 ~~All documentation~~ Periodic testing records shall be maintained for at least three test cycles and made available for review by the AHJ.

New 19.5.3.3 Records of acceptance tests shall be maintained for the life of the damper assembly.

New 19.5.3.4 The records shall be on a medium that will survive the retention period. Paper or electronic media shall be permitted. [**72**:14.6.2.3]

These changes will need to be held until the next revision cycle. In the meantime, I thought you might want to run them by the fire damper task group for their review and consideration. They can tweak them in time for the first draft meeting.

Regards,

Keith

Keith E. Pardoe, FDAI, DAHC, CDC, CDT
President

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Rope used on older sliding fire doors, Hahn, 5/2016

I believe NFPA 80 only addresses chain or cable as a component of a fusible link assembly. It was very common at one time for rope to be used on sliding fire doors – as shown in the attached photo – and some are apparently still in use today.

- Should 80 address rope as an alternate, or at least acknowledge its use as an annex note?
- If rope needs to be replaced, does it need to be replaced with rope (and what kind?) or is it acceptable to replace with chain or cable?
- Will chain or cable function satisfactorily with sheaves designed for rope?

4.8.4.1.1 Where latching hardware devices project from the bottom of the door, the maximum clearance dimension under the door shall be in accordance with the hardware manufacturer's published listing,

This requirement reflects industry practice (e.g., reduced clearance under fire doors that are equipped with concealed vertical rod fire exit hardware devices.

4.8.4.1.2 Where thresholds and saddles are installed under fire doors, the maximum clearance shall be 3/8-inch unless otherwise required by the hardware manufacturer's published listing.

This requirement reflects the need for the bottom of the doors to be within the threshold's manufacturer's clearance requirements. The 3/8-inch maximum is based on the clearance allowed by the fire door tests (e.g., NFPA 252, UL 10B, and UL 10C).