



Fire-Resistance Codes, Standards, Testing & Listings

Rich Walke, Consultant to the NFCA

NFCA FREE Webinar Series

Learn – Network – Grow

January 16, 2024

Today's Presentation

“Fire-Resistance Codes, Standards and Testing”



Rich Walke, Consultant to the NFCA

Thanks Members...

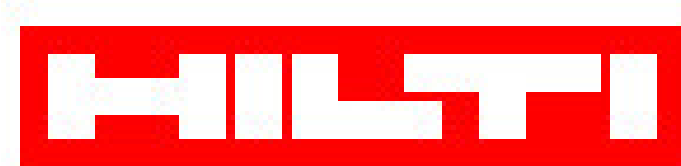
- NFCA Contractors
- NFCA Associates
- NFCA Manufacturers

Thanks Members...

NFCA GOLD Sponsors



NFCA SILVER Sponsors



NFCA Members @ Social Media....

Martin Bros.
2,018 followers
9mo •

+ Follow

Congrats to Joe Colavita for being the newest member of the Board of Directors for the National Fireproofing Contractors Association! He has been a Martin Bros. employee for 9 years now (in the industry for 36) and continues to go above and beyond...see more

MARTIN BROS.

Rucheeeka Chhugani • 1st
Marketing & Communications | Exhibitions & Events
11mo •

Super interesting and engrossing workshop by **Bill McHugh** from **Firestop Contractors International Association** @national fireproofing contractors association on the topic of Design, Installation, Inspection and Maintenance of Protection of Fireproofing...see more

Travis Miller • 1st
Segment Director - Fire Protection at Hilti North America
9mo •

...always for Hilti to participate in and contribute to the NFCA Learning good to work with partners in the steel protection industry. #learning

Isolatek International
4K followers
9mo •

always have a great time at the National Fireproofing Contractors Association! Thank you to everyone who came out to learn and chat about Fireproofing and safety...see more

Proud to be part of this amazing project an #270Park #Monokote #TrueSustainability

MONOKOTE fire protection
2,221 followers
3mo •

From NYC...perhaps the home of the skyscrapers #270Park. Thanks to Nick Patti Jr., Richard their choice of MONOKOTE fire protection

Albi Protective Coatings

2023 THE JOLIEST BUNCH OF ELVES THIS SIDE OF THE NUTHOUSE

Coating Society of Houston • 2nd
Coating Society of the Houston Area | Non Profit
9mo •

Have you seen our second speaker in our Coating Society of Houston Technical Presentation at this years Annual Tradeshow? ...see more

2023 TRADESHOW

TECHNICAL PRESENTATIONS

Gordon Walker

Gordon Walker is currently employed by Jotun Paints as PFP Business Development Manager for the Americas

Prior to joining Jotun approximately 11 years ago he spent 26 years working for Lehigh's Paints UK (SW Europe), starting in the labs before progressing through technical service into sales and then on into a Business Development role. For a significant portion of his career he has specialized in passive fire protection for both the civil and oil & gas disciplines. He has over 38 years total experience in the coatings industry, much of which he has been involved with fire protection.

HyFlex Corporation
1,362 followers
1yr •

All about #NFCA National Fireproofing Contractors Association! If you're in the #fireproofing industry, check out the benefits of joining this valuable organization from NFCA Executive Director **Bill McHugh**...see more

FlameOFF® Coatings, Inc.
1,198 followers
1yr •

FlameOFF® has become a Gold Supplier Member of National Fireproofing Contractors Association (NFCA) <https://buff.ly/3C8KjzE>...see more

member of the National Fireproofing Contractors Association

CAROL KIMMEL SCHARY • 1st
Nathan Kimmel Company is a local, national and international provider...
9mo •

Another great National Fireproofing Contractors Association WEEK OF LEARNING Conference.
♦NKC was a proud sponsor and participant.

FIRETEX FX RANGE
INTUMESCENT PASSIVE FIRE PROTECTION SOLUTIONS

NFCA TOP 10 LIST

1. Building height and load capacity
2. Fire Rating - ISO
3. Project Sizing - how to do it
4. Working with teams and contractors on roof traffic, utilities, etc.
5. What support does the market have that can help?
6. How long should you wait for a quote?
(Guest Speaker: Carboline)

BREAKING

NATIONAL FIREPROOFING CONTRACTORS ASSOCIATION

2023/2024 MEMBERSHIP CERTIFICATE THIS CERTIFIES

ABATEMENT PRO INC.
CALGARY, ALBERTA
CANADA

IS A NFCA INTERIM CONTRACTOR OF THE NATIONAL FIREPROOFING CONTRACTORS ASSOCIATION AND PLEDGES TO FURTHER THE MISSION

NFCA Member Since 2023

NECA®

Carboline
44K followers
9mo •

NFCA Week of Learning is next week. We look forward to a complete program with valuable information, updates, and networking opportunities. Our Kevin Twyford is going to be presenting at a special event on Wednesday, March 29, at 3:00pm...see more

March 27-31, 2023

Stop by and visit us at the show!

NFCA Conference
March 27-31 2023

Week of Learning Special

Nathan Kimmel
Charlotte, North Carolina

NFCA AWARD OF EXCELLENCE
Recognizing Innovation & Safety Excellence

2023/2024 NFCA Board of Directors

President	Mathew Stephenson, Rolling Plains Construction, Dallas, TX
1 st V. P.	Steve Winston, American Coatings Corp., Ashland, VA
2 nd V. P.	Nikita Gordon, Gunnlaugson spray-On (2010) Ltd, Winnipeg, MB
Treasurer	Adam Carter, Superior Industrial Insulation Company, Cleveland, OH
Secretary	Bob Pool, Alfred Miller Co.
Past President	Carl Fernald, Rolling Plains Construction
Director	Don Armand, Donalco, Edmonton, AB
Director	Joe Colavita, Martin Bros.
Director	George Fine, True Fireproofing, Tulsa, OK
Director	Bob Pool, Alfred Miller Contracting, Lake Charles, LA
Director	Neal Rivers, Easley and Rivers, Pittsburgh, PA
Director	Paul Steele, The Raymond Group, Orange, CA
Director	Matthew Strieter, Southern Insulation Inc., Hyattsville, MD
Director	Daniella Lopez, Nevell Group, Inc. Concord, CA
Dir Emeritus	John Taglienti, East Coast Fireproofing, Wrentham, MA
Dir Emeritus	Howard Towler - Acme Fireproofing, Jenks, OK
Dir Emeritus	Bubba Winston - American Coatings, Ashland, VA



What does NFCA Do?

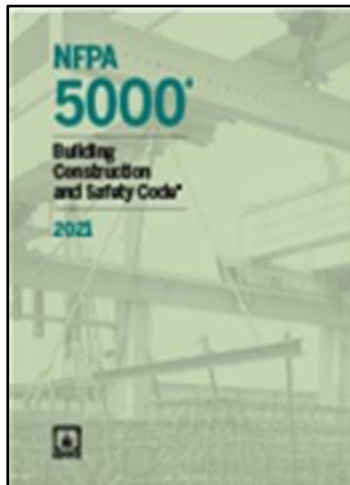
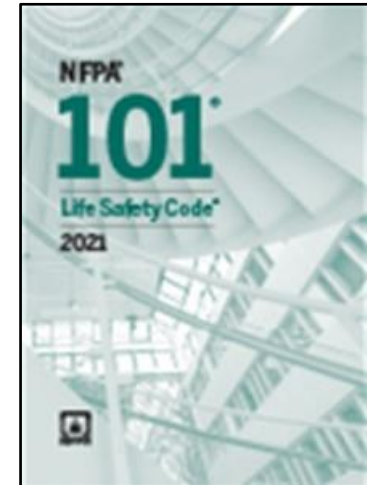
- NFCA @ ICC Codes...
 - 2021/2024 SFRM/IFRM Proposals...
- NFCA @ ASTM Task Groups - Fireproofing
- NFCA @ NFPA Fire Protection Features
- NFCA @ AISC, AISI
- NFCA @ National Codes, Canada
- NFCA @ American Institute of Steel Construction & American Iron and Steel Institute
- Industry Articles
 - Thermal Barriers, Patching, more...
- NFCA @ SFPE/ASCE Meetings
- NFCA requests IAS add NFCA Fireproofing Exam
- NFCA Committee ACTIONS



What Does NFCA Provide?

- **Fireproofing Education & Exams**
 - World-Class SFRM & IFRM Fireproofing Instruction
- **NFCA Contractor Accreditation Program for IFRM & SFRM**
 - Educated fireproofing Companies
 - **UL Qualified SFRM Contractor Program**
- **Week of Learning - Educational Conference**
 - Network with top Fireproofing Contractors, Manufacturers, Associates
 - A forum for suppliers and contractors to learn from one another
- **NFCA 100-400 Standards** for quality and life safety
- **Technical expertise, Standards and Code development**
- **NFCA Website** to find Fireproofing Leaders – www.NFCA-online.org

NFCA @ ICC, NFPA, Canada CDP



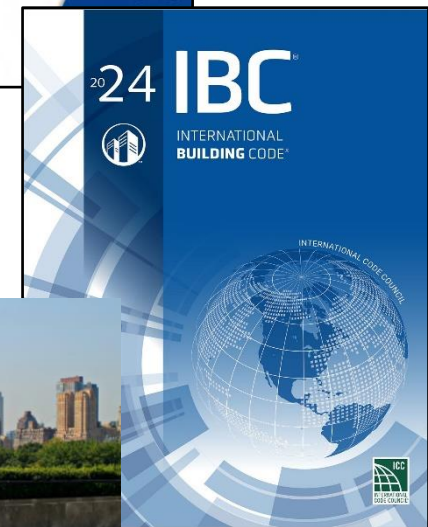
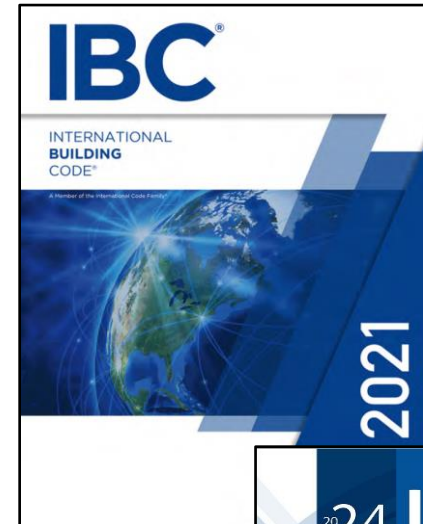
NFCA @ ICC Codes...

- 2021-2024 NFCA Results
 - Inspection – Ongoing, 2nd visual inspection before concealment
 - International Fire Code – Maintain Protection - Fireproofing
 - International Fire Code Commentary – How to Maintain
 - Intumescent Coatings / Mastic Coatings to IFRM
 - SFRM – Resistant to Resistive
 - “Fire Resistance NOT Eliminated”
 - In Section 104.11, Fire Safety, refers to all aspects of fire protection, **including** Chapter 7



NFCA @ 2027 IBC CDP

- **Table 601 - 20' Rule; Clarifications**
- **Occupiable Roofs – Fire-Resistance-Rated**
 - High Rise
 - Low Rise
- **Fireproofing Special Inspection**
 - ASTM Standards – SFRM, IFRM, Boards/Wraps
- **Parking Garage Fire-Resistance**
- **Attachments**
- **ICC Existing Building Inspection Guide**
 - “Milestone Inspections”



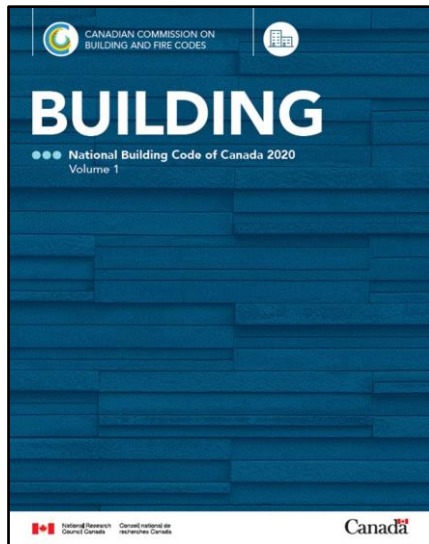
NFCA @ NFPA 1, 101, 5000

- **NFCA @ NFPA 1, 101/5000 Codes...**
 - Fire Protection Features Committee
 - Proposals Due June 2024
 - Insert ASTM Fireproofing Inspection Standards
 - Replicate recent IBC changes into NFPA 101, 5000
 - Clarify Maintaining Protection in NFPA 1, 101



NFCA @ Canada's CDP

- **2025/2030 NBCC – National Building Code of Canada**
 - Attachments
 - Fireproofing Special Inspection
 - ASTM Standards – SFRM, IFRM, Boards/Wraps

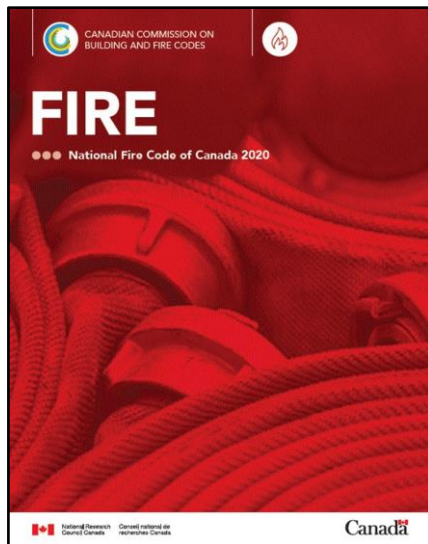


- Occupiable Rooftops
- Installation in accordance with Manufacturers Instructions and Listings
- Replicate recent IBC changes



NFCA @ Canada's CDP

- **2030 NBCC – National Fire Code of Canada**
 - Maintaining protection
- **Educate About Existing Buildings**



NFCA Handbook of Accepted Fireproofing Knowledge (HAFK)



- Study Resource for NFCA Fireproofing Exams
- Fireproofing in 'One Place'
- NFCA Members = \$500 Discount
- **FREE HAFK PDF for AHJ's & Specifiers with Design Firms, Independent Specifiers**
- **SAFETY HANDBOOK INCLUDED**
- More New Chapters coming...
- www.nfca-online.org

NFCA Contractor Accreditation Program

- **NFCA LIVE & VIRTUAL EDUCATION/EXAMS**
 - **Contractor Designated Responsible Individual**
 - **Focus on Fire-Resistance & Fireproofing**
 - **2024 Spring & 2024 NFCA Week of Learning**
 - **LIVE Education & Exams March 11-13**
 - **LIVE Conference, Exhibits March 13-15**



UL Qualified Fireproofing Contractor Program

- **Relaunched - April, 2020**
 - **NFCA DRI**
 - **Management System (MS)**
 - **Audited**
 - **Contractor's Office**
 - **A Jobsite**
 - **Several Contractors working on MS Manuals**

UL Qualified Spray-Applied Fire Resistive Material (SFRM) Contractor Program requirements

Mark Integrity Program

Introduction:
This document outlines the contractor company requirements for participation in the UL Qualified Spray-Applied Fire Resistive Material (SFRM) Contractor Program.

The SFRM installation industry serves residential, institutional, commercial and industrial structures. The industry addresses the need to limit the damaging effects of fire by insulating structural building elements from fire. SFRMs help horizontal assemblies including floor/ceiling, roof/ceiling and building elements such as beams and columns obtain fire endurance ratings. SFRM contractors install certified SFRMs to establish a protective system for a structure to protect fire and life safety and comply with specification and customer requirements.

In order for a SFRM installation contractor organization to qualify for UL's SFRM Contractor Program, the contractor organization shall employ a knowledgeable individual who successfully demonstrates their competency to UL through successful completion of the Designated Responsible Individual (DRI) program at a contractor company that has been recognized in the NFCA Contractor Accreditation Program (CAP).

The company that enrolls in the UL Qualified SFRM Contractor program also has to establish, implement and maintain a management system focused on the application of SFRMs. A management system is used to describe the contractor's SFRM operations.

The Management System approach requires the Contractor

may be determined by the construction documents that have had final approval by code authorities. Where special inspection is implemented, the AHJ ultimately determines the acceptability of the installation.

Because the SFRM contractor firm's selection and installation of SFRMs to requirements relies on staff knowledge, the UL Qualified SFRM Contractor Program requires at least one individual employed by the Contractor organization to be designated as a Designated Responsible Individual (DRI) who has demonstrated his/her knowledge via examination and meets other related requirements defined in this document.

Definitions

Authority Having Jurisdiction (AHJ) — The organization, office or individual responsible for implementing the adopted code. This is typically the building official or fire marshal, or another governmental agency who may also be the final authority signing the "Certificate of Occupancy Permit".

Certificate — The SFRM Contractor Certificate. This is a document issued after an audit has been completed, and conformance to all UL Qualified SFRM Contractor Program Requirements has been determined. The Certificate is valid until Dec. 31 of the following year from which the certificate was issued.

Continuing Education Unit (CEU) — For purposes of awarding CEU credit, the International Association of Continuing Education and Training (IACET) definition will be used for those individuals involved in the UL Qualified SFRM Contractor Program as follows: One (1) CEU is equal to 10 contact hours of participation in an organized education.

NFCA Award of Excellence CALL FOR ENTRIES



- Recognizes NFCA Contractor Members for an exceptional fireproofing project demonstrating innovation & safety.
- Projects submitted should exceed standard fireproofing practices and should be unique and creative, demonstrating excellence in innovation and safety.
- **Entry Deadline – January 31, 2023**
- Go to www.NFCA-online.org for entry form and details.
- Winners announced at the 2023 NFCA Fireproofing Educational Conference

What Makes Fire Resistance?

UL 263 & ASTM E119 – The Details....

NFCA [Fireproofing Contractors](#) install passive fireproofing products such as Sprayed Fire-Resistive Material (SFRM) and Intumescent Fire-Resistive Material (IFRM), Boards and Wraps, to protect building structural materials from fire, as required by building codes, and the [manufacturers](#) and [associates](#) who provide those products. NFCA represents the fireproofing industry - [manufacturers](#), [equipment](#), [inspection](#) and [installation](#). Looking for a [NFCA Accredited Fireproofing Contractor](#) or [UL Qualified SFRM Contractor](#) ? Visit NFCA's [Member Lists!](#)

About

The NFCA represents [fireproofing contractors](#) and [manufacturers](#), [equipment suppliers](#), [inspection agencies](#), who install, inspect or provide passive fire protection for structures as required by building codes for the preservation of life

News/Events

NEW FOR 2022 - [FREE NFCA Fire-Resistance Webinar Recording](#). - Contractors, inspection agencies, code officials, specifiers, fire inspectors, get a detailed look at structural fireproofing. Check out fire test standards ASTM E119, UL 263 and CAN/ULC-S-101. Testing products - in a full scale furnace with loads applied where applicable - proves fire-resistance. [FREE NFCA Fire-Resistance Education PPT Slides](#)

NFCA Membership

Welcome New Branch Contractor Interim Member

PCI - [Phoenix Interior](#)

[Not a member?](#)

NFCA Membership

- Thank you NFCA Members – You make NFCA programs possible!
- **Not a Member? Join Now!**
- Annual Contractor Membership \$1495
- **NFCA CAP SFRM / IFRM Program**
- **UL Qualified Fireproofing Contractor Program**
- Contact info@NFCA-online.org for an application
- **NFCA Membership is an investment in your company and your industry**



NFCA Fireproofing Class

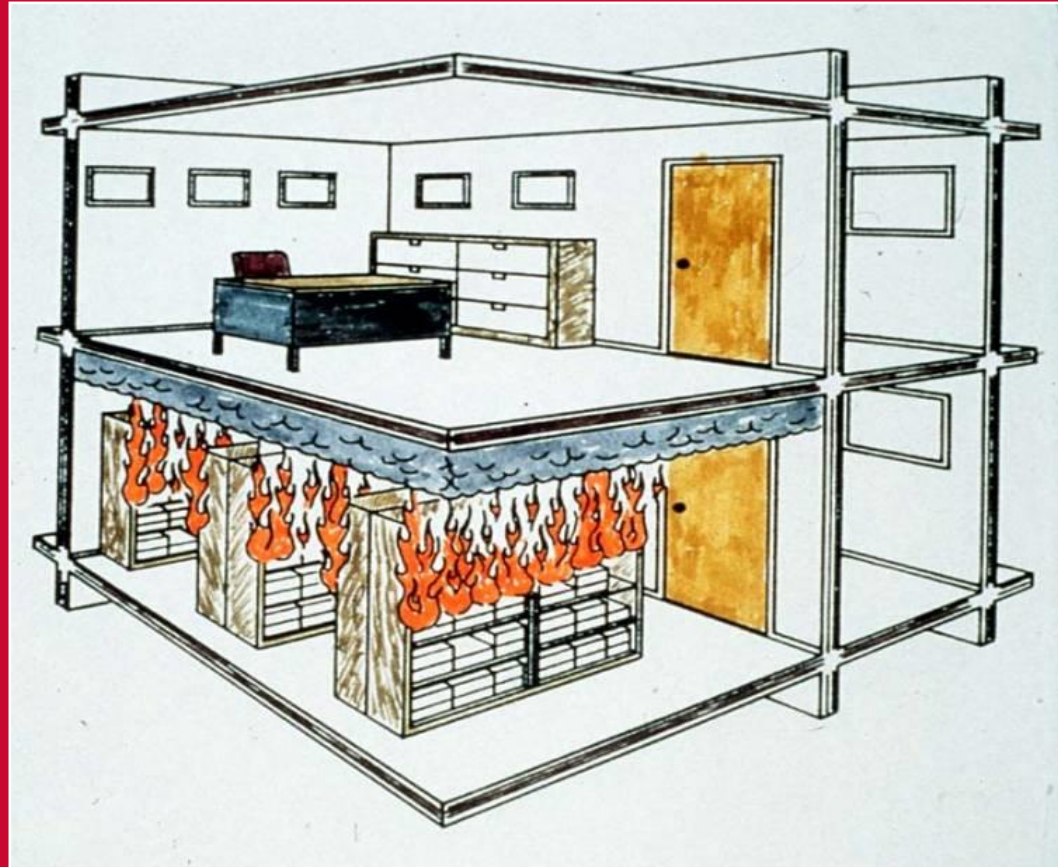
Today's Presentation

“Fire-Resistance Codes, Standards and Testing”



Rich Walke, Consultant to the NFCA

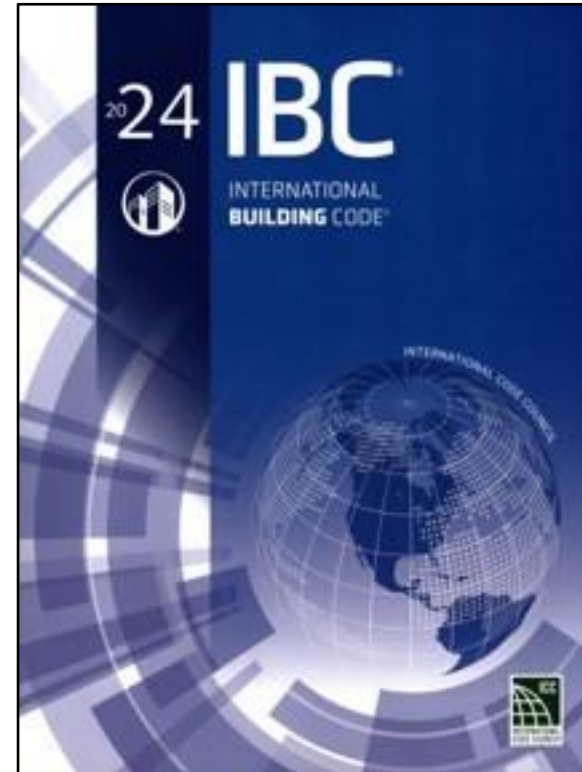
Fire-Resistance-Rated Construction



UL Image

Fire-Resistance-Rated Construction

Code Requirements for
Fire-Resistance-Rated
Construction



IBC Requirements

- Chapters 3, 4, 5, 6, 7 and 10 of the IBC
- Chapters 3 and 4 – Defines Occupancies
- Chapter 5 – General Building Heights and Areas
 - Permitted building area based on four factors:
 - Type of construction
 - Occupancy
 - Available frontage
 - Use of sprinklers

Code Requirements Cont.

- Section 508 – Covers mixed use considerations
- Chapter 6 – Types of Construction
 - Table 601 – Establishes hourly rating required for building elements based on Type of Construction
 - Table 705.5 (Formerly Table 602) – Establishes hourly rating required for exterior walls based on fire separation distance, type of construction and occupancy

Code Requirements Cont.

- Chapter 7 – Fire and Smoke Protection Features
 - 703.2 – Fire-resistance ratings shall be determined in accordance with Section 703.2.1 or 703.2.2 without the use of automatic sprinklers or any other fire suppression system being incorporated, or in accordance with Section 703.2.3
 - **703.2.1 Tested assemblies** – Fire-resistance ratings shall be determined in accordance with ASTM E119 or UL 263
 - 703.2.1.1 – Nonsymmetrical walls shall be tested from both faces

Code Requirements Cont.

- 703.2.1.3 – Assemblies considered unrestrained unless registered design professional provides evidence satisfactory to AHJ that construction qualifies for restrained classification per ASTM E119 or UL 263

Code Requirements Cont.

- **703.2.2 Analytical methods** – Methods for determining fire resistance shall be based on fire exposure and acceptance criteria of ASTM E119 or UL 263

Code Requirements Cont.

- 703.2.2 Cont. – Required fire resistance permitted to be established based on any of the following:
 - Designs documented from approved sources
 - Prescriptive requirements from Section 721
 - Calculations in accordance with Section 722
 - Engineering analysis based on ASTM E119 or UL 263
 - Fire-resistance designs certified by an approved agency

Code Requirements Cont.

- **703.2.3 Approved alternate methods** – Required fire resistance permitted to be established by alternate protection methods in accordance with Section 104.11
- **Chapter 10 – Means of Egress**

Fire Resistance – Summary

- Chapters 3, 4, 5, 6 and 10 establish the required ratings
- Chapter 7 establishes how the rating is determined
- Rating expressed as an Hourly Time Period
- Ratings range from 1/2 to 4 hours
- Contain Fire to Room or Floor of Origin and Maintain Structural Integrity



Fire-Resistance-Rated Construction

Establishing
Fire-Resistance Ratings



UL Image

Standards

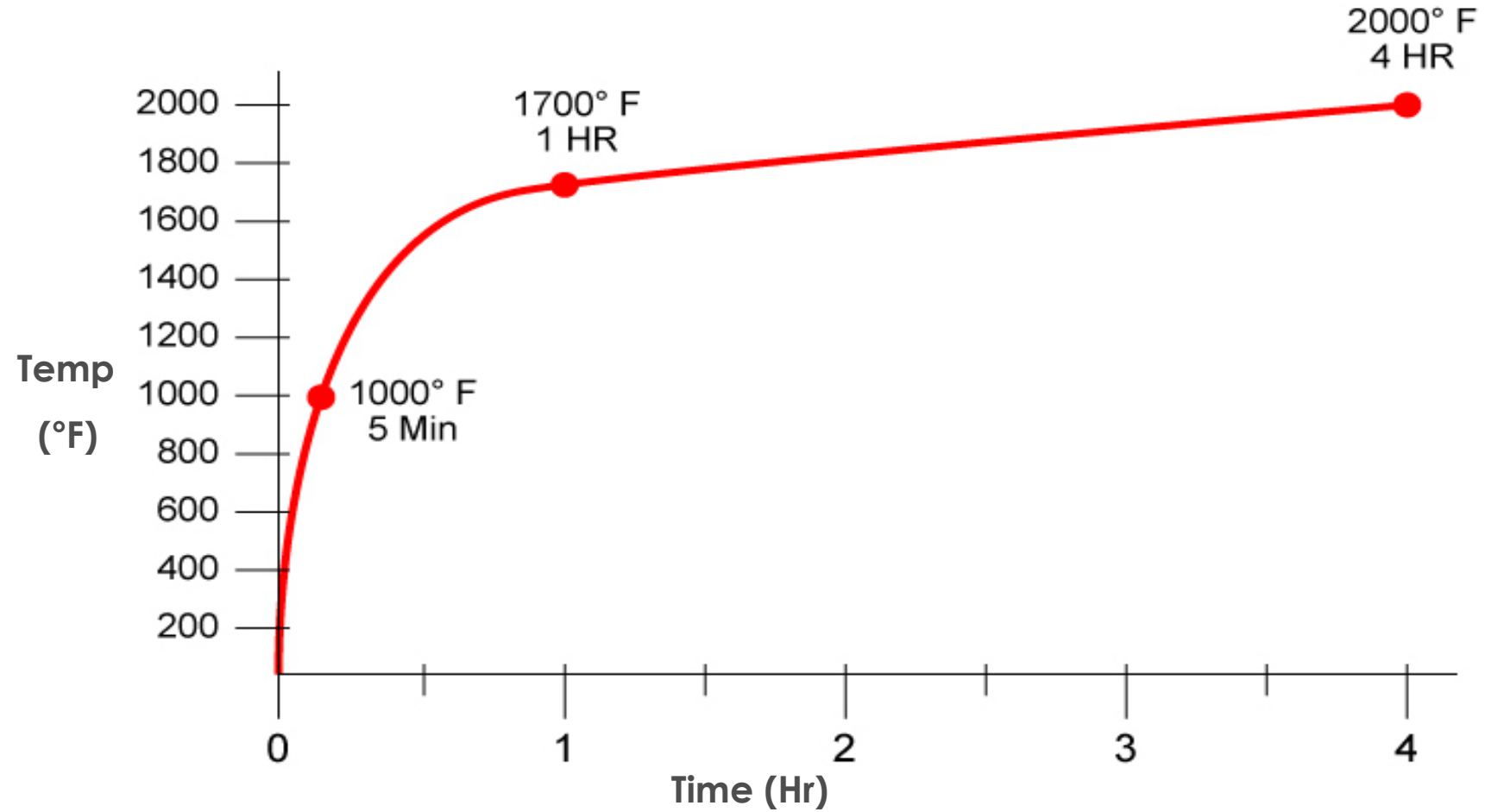
- US
 - ASTM E119
 - NFPA 251 (Withdrawn)
 - UL 263
- Canada
 - ULC-S101



Building Components

- Columns
- Beams
- Floor/Ceilings or Roof/Ceilings
- Walls

Time – Temperature Curve



Columns

- Sample size – Minimum 9 ft
- Most often tested unloaded



UL Image



UL Image

Conditions of Acceptance – Columns

- **1000°F / 1200°F**

OR

Support load if tested load bearing



UL Image



UL Image

Beams

- Sample size – Minimum 12 ft
- Load applied – Per design



UL Image



UL Image



UL Image



UL Image



UL Image



UL Image



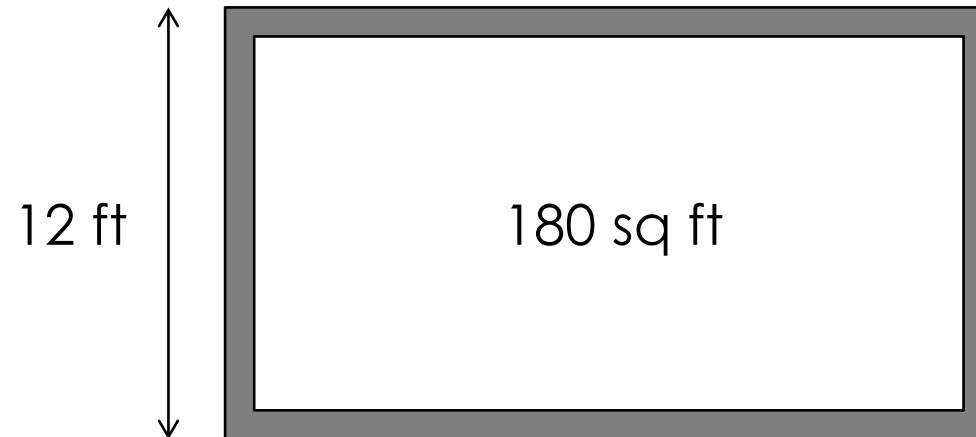
UL Image

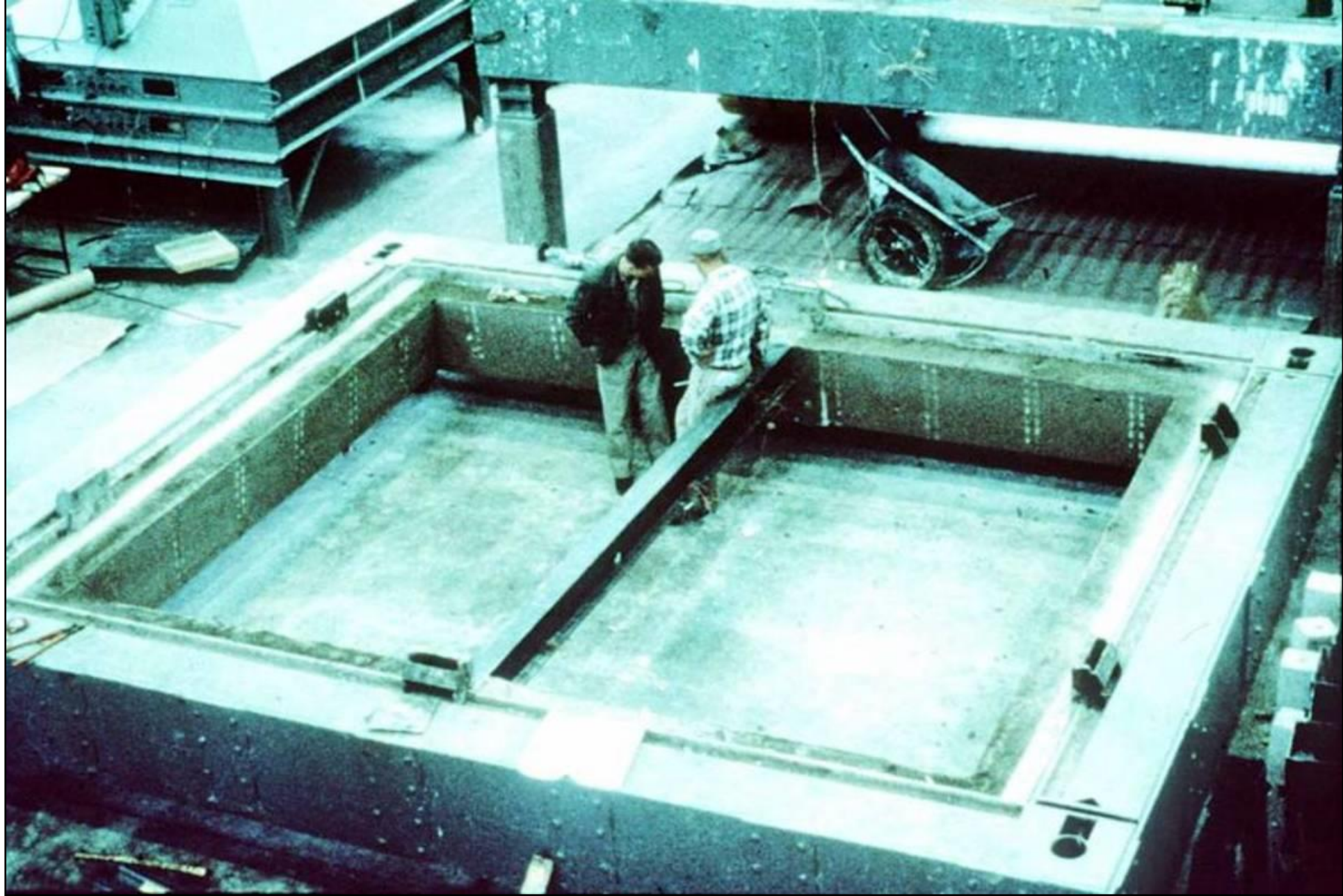
Conditions of Acceptance – Beams

- Support load
- 1100°F / 1300°F

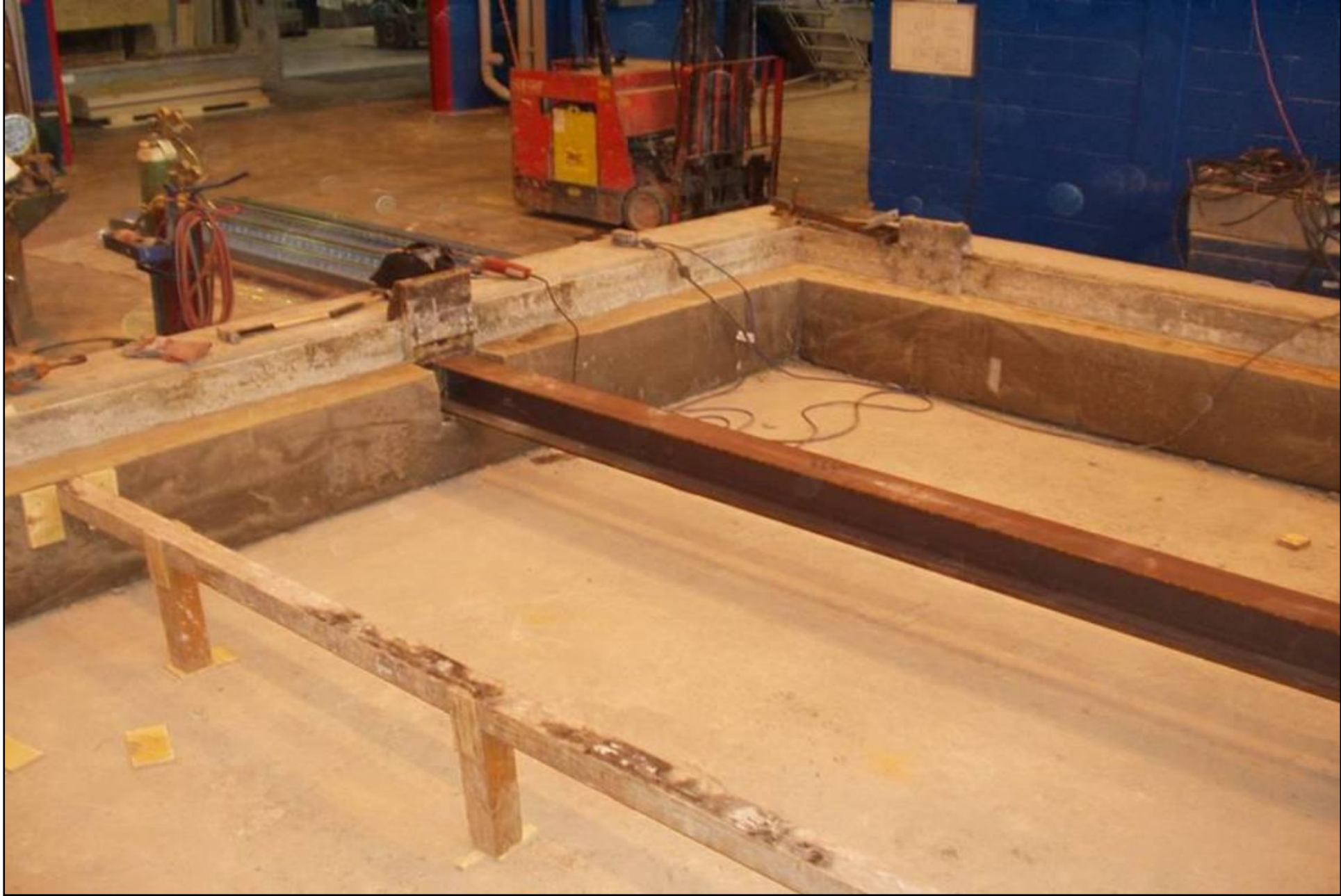
Floor/Ceiling or Roof/Ceilings

- Sample size – 180 sq ft / 12 ft
- Load applied – Per design





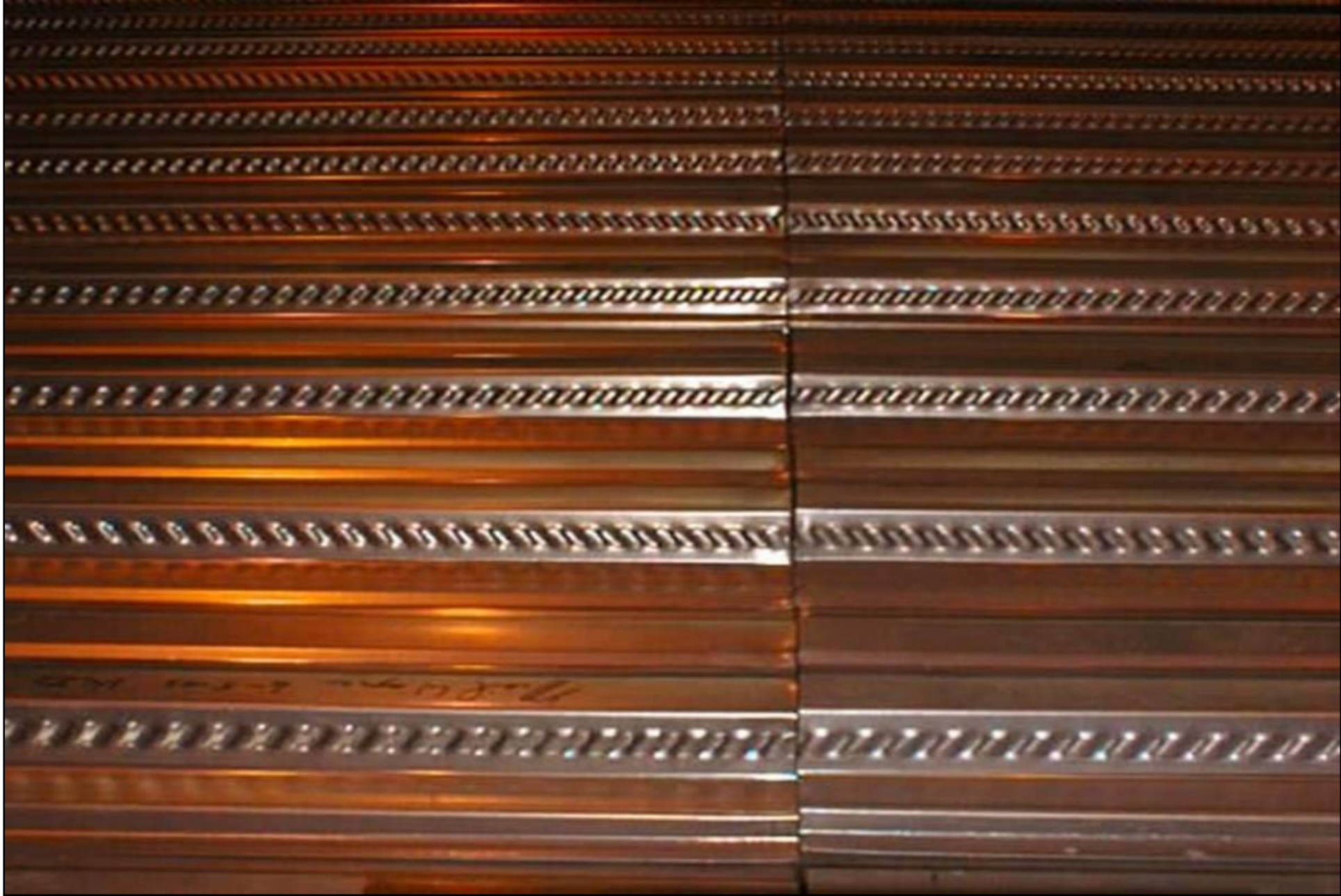
UL Image



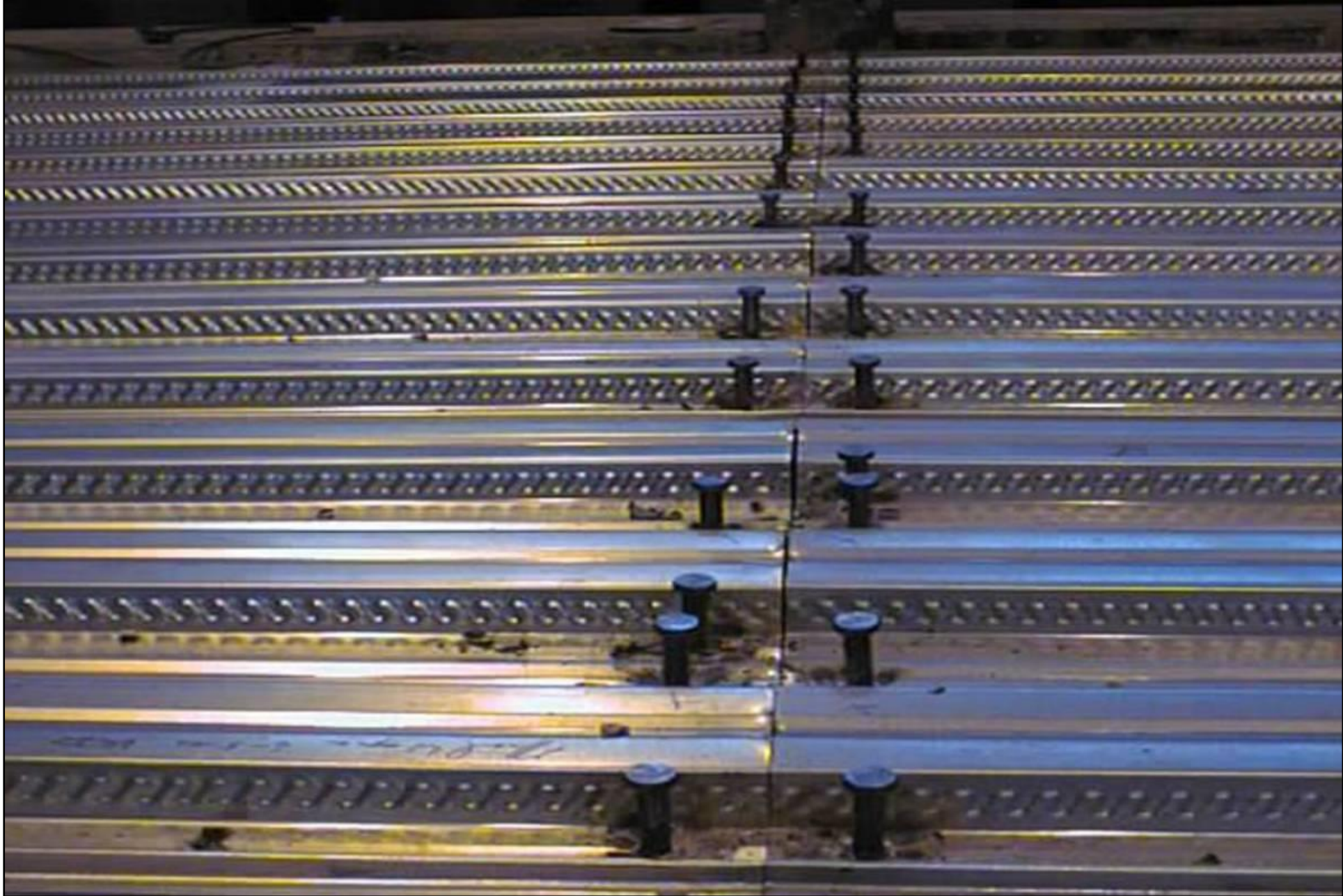
UL Image



UL Image



UL Image



UL Image



UL Image



UL Image



UL Image



UL Image



UL Image

Conditions of Acceptance Floor/Ceilings or Roof/Ceilings

- Support load
- Flame passage
- 250°F / 325°F
- Support temperatures





UL Image

Fire-Resistance-Rated Construction

Common Questions,
Misconceptions and
Misunderstandings



Question, Misconception or Misunderstanding No. 1

- What is the difference between ASTM E119 / UL 263 and ULC-S101?
 - ASTM E119 and UL 263 are US based standards and are referenced in US based codes and international codes which are based on US codes (e.g. UAE Fire & Life Safety Code)
 - ULC-S101 is Canadian based, published by Underwriters' Laboratories of Canada and is referenced in Canadian based codes
 - Technical content is identical

Question, Misconception or Misunderstanding No. 2

- What is the difference between a UL listing, a cUL listing and a ULC listing?
 - A UL listing is issued by UL Solutions (UL) based on US standards and is intended to address US based code requirements. A UL listed product will bear a mark which will include one of the following UL logos.



Question, Misconception or Misunderstanding No. 2 Cont.

- A cUL listing is issued by UL Solutions (UL) based on Canada standards and is intended to address Canadian based code requirements. A cUL listed product will bear a mark which will include one of the following UL logos.



Question, Misconception or Misunderstanding No. 2 Cont.

- A ULC listing is issued by UL Solutions of Canada (ULC) based on Canada standards and is intended to address Canadian based code requirements. A ULC listed product will bear a mark which will include the following UL logo.



Question, Misconception or Misunderstanding No. 2 Cont.

- Many products will bear a UL and a cUL mark issued by UL Solutions. This mark signifies the product was investigated by UL Solutions based on both US and Canada standards and is intended to address both US and Canadian based code requirements. Such product will bear a mark which will include one of the following logos.



Question, Misconception or Misunderstanding No. 3

- Is it necessary to leave space around a building element which is protected with an intumescent fire-resistive material?
 - Yes, an intumescent fire-resistive material need space for free expansion in order to develop the proper char formation. The UL Guide Information for Fire-resistance Ratings – ANSI/UL 263 states: “Unless otherwise detailed in the individual designs, mastic and intumescent coatings are tested without any covering adjacent to the tested member that might interfere with the expansion of the coating. The effect on the fire-resistance rating of steel members (beams, columns, etc.) caused by any covering that would interfere with the expansion of a mastic and intumescent coating during a fire has not been investigated. Contact the manufacturer for their required clearance around structural members protected with mastic and intumescent coatings.”

Question, Misconception or Misunderstanding No. 4

- The building configuration prevents the application of protection on one side of a beam or column. What can be done to properly protect this element?
 - Tested and listed designs from UL and other are tested with protection on all exposed sides. As such, some type of protection is needed.
 - Mfrs have developed a number of creative solutions, typically ending in an Engineering Judgment.
 - Contact your manufacturer when the situation develops.

Question, Misconception or Misunderstanding No. 5

- Does “small-scale” testing have a place within fire-resistive construction?
 - Generally no! ASTM E119 and UL 263 require min sample sizes to allow for realistic deflection during the fire tests. “Small scale” testing does not allow for this deflection resulting in a less critical test. Also, small-scale assemblies typically can not be loaded as required by the standards.
 - “Small-scale” testing is used very judiciously to ***supplement*** full-scale testing.
 - If “small-scale” testing is suspected, ASK THE QUESTION!!!

Question, Misconception or Misunderstanding No. 6

- Are horizontal assemblies (floors and roofs) required to be loaded during a fire resistance test?
 - Yes, ASTM E119 and UL 263 require assemblies be loaded to their maximum-load condition allowed under nationally recognized structural design criteria unless limited design criteria are specified
 - Very few assemblies have been tested at a reduced load
 - If tested at a reduced load, design will clearly specify the loading applied
 - If loading is not specified in documentation, ASK THE QUESTION!!!

Question, Misconception or Misunderstanding No. 7

- Engineering judgments (EJs) represent a “Get out of Jail Free” card to avoid the use of a tested design!
 - Absolutely not! Engineering judgments are not a substitute for tested designs and should only be used after exhausting the search for a tested design.
 - Concept of EJs based on IBC Section 703.2.2:
 - 703.2.2 – Methods for determining fire resistance shall be based on fire exposure and acceptance criteria of ASTM E119 or UL 263. The required fire resistance permitted to be established based on any of the following:
 4. Engineering analysis based on ASTM E119 or UL 263

Question, Misconception or Misunderstanding No. 7 Cont.

- EJs should only be issued by those with a thorough understanding of the performance of the materials and assemblies in question
 - PE
 - FPE
 - Manufacturer
 - Testing Lab
- **Ask for a Resume or CV of the individual issuing the EJ to better understand their qualifications**
- EJs issued for a specific job site



Thanks for Attending!!!



Rich Walke, Consultant to the NFCA
National Fireproofing Contractors Association
800 Roosevelt Road – Building C, Suite 312
Glen Ellyn, IL 60137
(708) 236-3411 – Info@NFCA-online.org
www.NFCA-online.org