Fire-Resistance Test Standards for Elements and Assemblies

Rich Walke
UL Codes and Regulatory Services
Fire-Resistance-Rated Construction
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Code Requirements for Fire-Resistance-Rated Construction
Code Requirements

• IBC Section 703.2 – Fire-resistance ratings shall be determined in accordance with ANSI/UL 263 or ASTM E119

• LSC 8.2.3.1 – The fire resistance of structural elements and building assemblies shall be determined in accordance with test procedures set forth in ANSI/UL 263 or ASTM E119
Fire Resistance

• Expressed as an Hourly Time Period
• Ratings range from 1/2 to 4 hours
• Containment of Fire to Room or Floor of Origin, and Structural Fire Resistance
Fire-Resistance-Rated Construction

Establishing Fire-Resistance Ratings
Standards

• ANSI/UL 263
• ASTM E119
• NFPA 251 (Withdrawn)
Building Components

• Columns
• Beams
• Floor/Ceilings or Roof/Ceilings
• Walls
Time - Temperature Curve

- 1000°F in 5 min
- 1700°F in 1 HR
- 2000°F in 4 HR
Columns

- Sample size – Minimum 9 ft
- Tested unloaded
Conditions of Acceptance – Columns

• 1000°F / 1200°F
Beams

• Sample size – Minimum 12 ft
• Load applied – Per design
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
Conditions of Acceptance
Floor/Ceilings or Roof/Ceilings

• Support load
• Flame passage
• 250°F / 325°F
• Support temperatures
Walls

- Sample size - 100 sq ft / 9 ft
- Load applied - Per design
Conditions of Acceptance – Walls

- Flame passage
- 250°F / 325°F
- Support load
- Hose stream
Where Can I Find The Most Current Listing?

UL Product iQ on www.ul.com
Breaches in Fire-Resistance-Rated Construction

- Penetrations
- Joint Systems
- Opening Protectives
- Ducts and Air Transfer Openings
Breaches in Fire-Resistance-Rated Construction Cont.

Do breaches really impact the performance of a fire-resistance-rated assembly?

Absolutely!!!
Breaches in Fire-Resistance-Rated Construction Cont.

• Unsealed or improperly sealed breaches cost lives and property!
  • MGM Grand, Las Vegas, NV – Fire confined to 1st floor. Eighty-four fatalities, most on upper floors.
  • Hilton Hotel, Las Vegas, NV – Fire spread from 8th to 23rd floor in 25 minutes at exterior of building. Eight fatalities.
  • First Interstate Bank, Los Angeles, CA – Fire spread from 12th to 16th floor through improperly protected penetrations and through unprotected perimeter joint. One fatality.
  • One Meridian Plaza, Philadelphia, PA – Fire spread from 22nd to 30th floor through improperly protected penetrations and through perimeter joint. Three fatalities.
IBC Requirements

• IBC – Breaches shall be protected
  • Section 714 – Penetrations
  • Section 715 – Fire-Resistant Joint Systems
  • Section 716 – Opening Protectives
  • Section 717 – Ducts and Air Transfer Openings
LSC Requirements

• LSC – Breaches shall be protected
  • Penetrations
  • Joint Systems
  • Opening Protectives
  • Ducts and Air Transfer Openings
Code Requirements

• Each type of breach has a unique fire test standard associated with it which compliments ANSI/UL 263 and ASTM E119

• Where breach occurs in, through or between assemblies intended to restrict the movement of smoke, the code also sets limits on the leakage through the breach
Where Can I Find The Most Current Listing?

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Fire Resistive Construction

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Building Materials and Systems

Search for designs, systems, assemblies, and products that include, or are related to, hourly fire-resistance ratings.

Dampers
The category Dampers for Fire Barrier and Smoke Applications covers fire dampers, smoke dampers (leakage-rated dampers), combination fire and smoke dampers (fire and leakage-rated dampers), and corridor dampers.

Electrical Circuit Protective Systems (FHT)
Electrical Circuit Protective Systems consist of components and materials that are intended for installation as protection for specific electrical wiring systems, with respect to the disruption of electrical circuit integrity upon exterior fire exposure.

Fire Door and Fire Window Related Certifications
Fire door assemblies and window assemblies are construction details and the fire ratings for fire door assemblies and fire window assemblies that are more complex than those typically associated with these assemblies.

Fire Rated Roofs, Walls, Floors, Beams and Columns
This category covers floor-ceilings, roof-ceilings, beams, columns, walls and partitions investigated for an hourly fire-resistance rating.

Fire-rated Grease Duct Assemblies
Fire-resistance Ratings of Structural Steel Used in Petrochemical Facilities
This category covers hourly fire-resistance ratings of steel columns intended for use in petrochemical facilities investigated using a rapid rise fire exposure.
Questions / Comments
Thank You for Attending!!!

Rich Walke
Codes and Regulatory Services Department
Underwriters Laboratories
750 Anthony Trail
Northbrook, IL 60062
Richard.N.Walke@UL.com
(847) 664-3084

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