3M Fire Protection Products
Awareness & Introduction to 3M Fire Protection Products

Trust & Confidence
Even Under Fire
Agenda

- Why Fire Protection is Critical?
- Building Codes & Fire Test Standards
- Third-Party Listings
WHY FIRE PROTECTION IS CRITICAL?
Al Nasser Tower - Qatar
Every year, building fires kill or injure thousands, damage vital equipment and destroy billions of dollars in property.

So what can we do to help limit the destructive power of fires in commercial construction?

FIRESTOP!

NFPA estimates for 2009 were 103,500 nonresidential structure fires in the U.S. These fires resulted in 105 deaths, 1,690 injuries, and $3.0 billion in direct dollar loss.

Source: NFPA.org (Non-residential structure fires by year)
Areas that can allow for fire/smoke spread
Who is responsible for ensuring that buildings are properly firestopped?

- Owner
- Architect/Specifier
- General Contractor
- Installer
- Code Official
- Manufacturer
BUILDING CODES & FIRE TEST STANDARDS
Building Codes and “Approved Methods”

Building codes are written for all aspects of construction, including firestopping. Code bodies place an emphasis on “Approved Methods”, defined as a material, device or system tested in accordance to a nationally recognized test standard at a recognized testing facility.

Primary code bodies and codes concerning firestopping in commercial construction include:

- International Code Council (ICC)
- International Building Codes (IBC)
- National Fire Protection Agency (NFPA)
- International Mechanical Code (IMC)
- Uniform Plumbing Code (UPC)
- Uniform Mechanical Code (UMC)
Recognized Testing Agencies

- Underwriters Laboratories, Inc. (USA and Canada)
- Intertek
  - OPL and Warnock Hersey
- Factory Mutual Research (FM)
- Southwest Research Institute
Responsibilities of Testing Agencies

- To determine that a firestop system will pass the criteria of applicable test standards (e.g. ASTM E 814)
- To provide listed systems and system details for each approved manufacturer’s tested systems
- To establish a nomenclature for each category of listed systems

UL is the “Standard” for Through-Penetration Firestop Testing
FIRES TEST STANDARDS – THROUGH PENETRATIONS
Fires Test Standards – Through Penetrations

The most commonly cited fire protection standard for through penetrations is ASTM E 814. For example, in the case of a floor/ceiling assembly, to meet the ASTM standard all parts of the assembly, including through penetration firestopping products, must meet the established standards for containing a fire within the established test duration.

- **ASTM E 814** Standard Test Method for Fire Tests of Penetration Firestop Systems
- **UL 1479** Fire Tests of Through-Penetration Firestops
- **NFPA 251** Standard Methods of Tests of Fire Endurance of Building Construction and Materials
ASTM E-814 Time Temperature Curve

Temperature at 10 minutes = 1300 °F (704 °C)

Melting Points (approximate):

- PVC plastic pipe - 413 °F ¹ (211 °C)
- Fiberglass insulation - 1050 °F ² (565 °C)
- Aluminum - 1220 °F ³ (660 °C)

Sources:

1. SFPE Handbook of Fire Protection Engineering, 1st Ed. Table 1-12.1. Pg. 1-166.
2. Owens Corning SSL I or II Fiberglass Insulation specification sheet.
3. NFPA Fire Protection Handbook, 18th Ed. Table 4-16A. Pg 4-183.
ASTM E 814/UL 1479 Fire Tests of Penetration Firestop Systems

Criteria: A severe fire exposure under positive pressure

ASTM E 119 Time Temperature Curve
- Room temperature to 1000°F (537°C) in 5 minutes
- 1700° (926°C) at one hour
- 1850° (1010°C) at two hours
- 1925° (1052°C) at three hours
- 2000° (1093°C) at four hours

Criteria: A powerful water hose stream

Intended to test sample for impact, erosion, and cooling effect resistance
- 2 1/2 inch hose with 1 1/8 inch nozzle
- 1- to 3-hour test – Water applied at 30 PSI for prescribed length of time based on hourly rating and size of test surface
- 4-hour test – Water applied at 45 PSI for extended length of time based on size of test surface
ASTM E 814/UL 1479  Fire Tests of Penetration Firestop Systems

Criteria: F-Rating (fire resistance)
Flame does not pass through for fire test duration

Criteria: T-Rating (temperature)
The time at which the non-fireside reaches 325°F + ambient (approximately 400°F)

OPTIONAL TESTS
Criteria: L-Rating (air/smoke leakage)
The rate of air leakage through firestop systems in CFM/sq. ft.

Criteria: W-Rating (water intrusion)
3 ft. of water column for 72 hrs, no leakage allowed

To receive any of the above ratings, the firestop must pass the hose stream test.
ASTM E 814/UL 1479 Fire Tests of Penetration Firestop Systems
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Questions?

Thank You!

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