High Rise Buildings—What’s Going On? (The Walls)

Worldwide Problem
Combustible exterior wall assemblies are found around the world. As fires involving those assemblies occur, safety officials seek out buildings that utilize similar materials.

1. MARRIOTT WATERFRONT HOTEL
   Baltimore, Maryland
   According to published reports, the 35-story hotel may have been built with the same combustible exterior panels as the Grenfell Tower in London.

2. ADDRESS DOWNTOWN
   DUBAI HOTEL
   Dubai, UAE
   A fire on New Year’s Eve 2015 heavily damaged the 63-story hotel, with flames rapidly ascending the building’s exterior wall assembly.

3. APARTMENT BUILDING
   Shanghai, China
   An exterior wall assembly was blamed in published reports as contributing to a 2010 apartment fire that killed at least 58.

4. LACROSSE BUILDING
   Melbourne, Australia
   A fast-moving fire in 2014 caused millions of dollars in damage to an apartment building.
Recent Fires- London- June 14, 2017

- Grenfell Tower Fire
- At least 79 people died and 74 injured
- Began around 1 a.m. Wednesday morning
- Combustible exterior cladding contributed to fire spread

Photo credit: Getty
Exterior Walls

- Mid 1970’s foam plastic proposed for non-combustible exterior walls
  - EIFS (Exterior Insulation Finish Systems)
- Problems:
  - Combustible
  - Many construction types require non-combustible exterior walls
  - Flame propagation
    - Vertical over surface
    - Vertical within core
    - Lateral to adjacent compartments


- Why?
- What?
Anatomy

• What is the “assembly”
• Constituent parts
• Testing
• Installation
Grenfell Tower—Can It Happen in the US

- Grenfell Design
  - No sprinklers
  - Fire alarm system
  - Single exit
  - EAP lacking
  - BS 8414

- Unlikely, but
  - 5 states
  - Liberalized use
  - Equivalency
  - Identification
  - NFPA 285
Instrumentation

Thermocouples
**Window Burner**

Flame propagation shall be determined to occur if:

- Temperature of 1000°F reached by TC 11 & 14-17
- Flames from exterior face reach 10ft above window
- Flames from exterior face reach 5ft horizontally from window opening

**Failure**

**FIGURE 10.2.1.2** Limits of Flame Propagation — Exterior Surface of Test Specimen (not to scale).
Combustible Components in Exterior Walls

www.nfpa.org/exteriorwalls

- Online interactive tool to help determine Building Code requirements
- Additional resources
  - Journal Articles
  - FPRF Report
  - Videos

Combustible Components in Exterior Walls

Fire Hazards of Exterior Wall Assemblies Containing Combustible Components

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High rise buildings with combustible exterior façade systems: Fire risk assessment tool

Task 2 - Risk variables | 17 August 2017

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