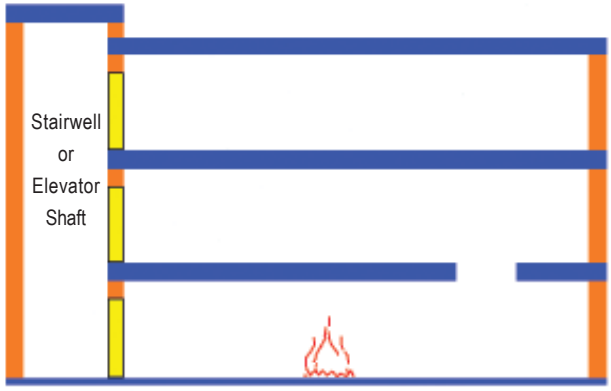
***The Bilco Company**, a world leader in the design and manufacture of specialty access products, is pleased to offer a series of technical bulletins designed to address issues related to access products within the construction industry.*

Performance Criteria for a

Floor Fire Door

Flush-mounted floor doors are widely used in buildings for access between floors. As fire protection standards become more stringent, code officials and specifiers have identified the need for a floor door with a fire rating that matches the floor-ceiling assembly. This bulletin examines the product performance criteria for this demanding application.



ASTM E152
NFPA252

Fire Test of Door Assemblies in Wall Systems

- Test Specimen Mounted Vertically
- Heat Transmission Not Considered -Only Distortion Limits
- No Live Load Require ment
- Doors May Carry Lesser Rating than Wall System (It is assumed that no combustibles will be stored against vertical fire doors)
- Test Will Evaluate:
  - Structural Integrity

ASTM E119
NFPA251

Fire Test of Floor-Ceiling Assemblies

- Test Specimen Mounted Horizontally
- Heat Transmission Critical ... (250°F average above ambient, 325°F maximum above ambient at a single thermocouple)
- Tested Under Maximum Live Load Expected
- Penetrations Must Maintain Heat Transmission Performance of Floor-Ceiling Assembly (To prevent ignition of combustibles on the topside)
- Test Will Evaluate:
  - Structural Integrity
  - Thermal Protection

As the diagram illustrates, when a fire penetrates a vertical fire door into a stairwell or elevator shaft, the fire would need to breach another fire door to endanger another floor. Conversely, if a fire penetrates a floor-mounted fire door, two floors are immediately endangered. Thus the severity of the E119 test is demanded when evaluating a floor fire door.

Vertical fire doors are common place in modern building construction. Designed for fire protection of openings in wall systems, these doors are generally tested in accordance with ASTM E152 (NFPA 252) and are UL Listed. Essentially, vertical fire doors serve only to block the passage of flames between lateral compartments or rooms within the building.

A questionable area exists in that if combustibles (ie: furniture, drapery, supplies, or even a person's clothing) were to be stored up against, or were to come in contact with a vertical door during a fire, heat radiation alone through the door could cause such items to ignite, allowing the fire to spread from room to room. ASTM E152 (NFPA 252) *assumes* that no combustibles will be stored against a vertical fire door, allowing it to carry a lesser rating than the wall system in which it is installed.

Since fire will aggressively seek an upward (as opposed to lateral) path within a building, a potentially more vulnerable condition is created when the floor-ceiling assembly is penetrated to allow for necessary access to the floor above or below.

Penetrations in floor-ceiling assemblies must perform (in a fire protection sense) as well as the rated deck to ensure containment of the fire. Since the door is flush mounted in the floor, it is *not reasonable* to assume that combustible items will not be located near or stored directly on the door. Heat transmission becomes a critical issue. For this reason, the floor fire door must meet a significantly higher performance standard than its vertical counterpart.

Therefore ASTM E152 (NFPA 252) , the vertical fire door standard, is not appropriate for floor fire doors. To be effective, the floor fire door must conform to ASTM E119 (NFPA 251).

What to look for . . .

- **UL Listed**
- **Tested in accordance with ASTM E119**
- **Limits on Heat Transmission**
- **Automatic Closing and Self-Latching**
- **Smooth, Easy Operation**