

**713.4.1.1.2 Through-penetration firestop system.** *Through penetrations* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

**Exception:** Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.

**713.4.1.2 Membrane penetrations.** Penetrations of membranes that are part of a *horizontal assembly* shall comply with Section 713.4.1.1.1 or 713.4.1.1.2. Where floor/ceiling assemblies are required to have a *fire-resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.

**Exceptions:**

1. *Membrane penetrations* by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the *annular space* is protected either in accordance with Section 713.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm<sup>2</sup>) in any 100 square feet (9.3 m<sup>2</sup>) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour *horizontal assemblies* by steel electrical boxes that do not exceed 16 square inches (10 323 mm<sup>2</sup>) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm<sup>2</sup>) in any 100 square feet (9.29 m<sup>2</sup>) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed <sup>1</sup>/<sub>8</sub> inch (3.2 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been *listed* as part of an opening protective material system for use in *horizontal assemblies* and are installed in accordance with the instructions included in the listing.
4. *Membrane penetrations* by *listed* electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The *annular space* between the ceiling membrane and the box shall not exceed <sup>1</sup>/<sub>8</sub> inch (3.2 mm) unless *listed* otherwise.
5. The *annular space* created by the penetration of a fire sprinkler, provided it is covered by a metal escutcheon plate.

**713.4.1.3 Ducts and air transfer openings.** Penetrations of *horizontal assemblies* by ducts and air transfer openings shall comply with Section 716.

**713.4.1.4 Dissimilar materials.** Noncombustible penetrating items shall not connect to combustible materials beyond the point of firestopping unless it can be demonstrated that the fire-resistance integrity of the *horizontal assembly* is maintained.

**713.4.2 Nonfire-resistance-rated assemblies.** Penetrations of nonfire-resistance-rated floor or floor/ceiling assemblies or the ceiling membrane of a nonfire-