

Excerpts from the
Uniform Building Code
(UBC) For The US

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4308 THROUGH-PENETRATION FIRE STOPS

Sec.4308 Through-Penetration

General Sec. 4301

(a) Standards of Quality. In addition to all other requirements of this code, fire-resistive materials shall meet the requirements for fire-resistive construction given in this Chapter.

The standards listed below labeled a "U.B.C. Standard".

1. U.B.C. Standard No.43-1, Fire Tests of Building Construction and Materials
2. U.B.C. Standard No.43-2, Fire Tests of Door Assemblies
3. U.B.C. Standard No.43-3, Tinclad Fire Doors
4. U.B.C. Standard No.43-4, Fire Tests of Window Assemblies
5. U.B.C. Standard No.43-7, Fire Dampers

6. U.B.C. Standard No. 43-8, Thickness and Density Determination for Spray applied Fireproofing.
7. U.B.C. Standard No.43-9, Methods for Calculating Fire Resistance of Steel, Concrete, Masonry and Wood Construction.

(b) Definitions. 'F' rating is the time period that a Through-penetration fire stop limits the spread of fire, flame and hot gases through the fire stop assembly, including penetrating elements, when tested in accordance with the time-temperature curve defined in U.B.C. Standard No.43-1.

'T' rating is the time period that a through-penetration fire stop limits temperature rise through the fire-stop assembly, including penetrating elements, when tested in accordance with the time-temperature curve defined in U.B.C. Standard No.43-1.

Walls and Partitions

Sec.4304

(a) General. Fire-resistive walls and partitions shall be assumed to have the fire-resistance ratings set forth in table No. 43-B.

(b) Combustible Members. Combustible members framed into a wall shall be protected at their ends by not less than one half the required fire-resistive thickness of such wall.

(c) Exterior walls. In fire-resistive exterior wall construction, the fire-resistive rating shall be maintained for such walls passing through attic areas .

(d) Nonsymmetrical Wall Construction. Walls and partitions of non-symmetrical construction shall be tested with both faces exposed to the furnace, and the assigned fire-resistive rating will be the shortest duration obtained from the two tests conducted in conformance with U.B.C. Standard No. 43-1. When evidence is furnished to show that the wall was tested with the least fire-resistive side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side.

(e) Through Penetration. Penetrating items passing entirely through both protective membranes of bearing walls required to have a fire-resistance rating and walls requiring protected openings shall be protected with through - penetration fire stops suitable for the method of penetration.

EXCEPTION: Penetrations not larger than a 4-inch nominal pipe or 16 square inches in overall cross-sectional area containing noncombustible penetrating items, where the annular space between the penetrating items and the wall assembly being penetrated is filled with a material which will prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to U.B.C. Standard No.43-1. Time-temperature fire conditions under a minimum positive pressure differential of 0.01-inch water column at the location of the penetration for the time period at least equal to the fire-resistance rating of the wall assembly.

The 'T' rating for through-penetration fire stops in fire-rated walls requiring protected openings shall apply to penetrations in the following locations:

(f) Membrane Penetrations. Walls may have openings for steel electrical outlet boxes not exceeding 16 square inches in area , provided the aggregate area of such openings is not more than 100 square inches for any 100 square feet of wall or partition area . Outlet boxes on opposite sides of walls and

partitions shall be separated by a horizontal distance of at least 24 inches . Where wall-protective membranes are penetrated by other materials or where larger openings are required than permitted above, the penetrating items shall be:

1. Protected with membrane-penetration fire stops suitable for the methods of penetration.
2. Installed in accordance with the installation instructions of their listing for such use.

EXCEPTION: Penetrations not larger than a 4-inch nominal pipe or 16 square inches in overall cross-sectional area containing noncombustible penetrating items, where the annular space between the penetrating items and the protective membrane being penetrated is filled with a material which will prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to U.B.C. Standard No.43-1. Time-temperature fire conditions under a minimum positive pressure differential of 0.01-inc water column at the location of the penetration for the time period at least equal to the fire-resistance rating of the wall assembly.

(g) Construction Joints. Construction Joints shall comply with the requirements of section 1707.

Floor-Ceilings or Roof-Ceilings

Sec. 4305

(a) General. Fire-resistive floors, floor ceiling or roof-ceiling assemblies shall be assumed to have the fire-resistance ratings set forth in table No. 43-C. When materials are incorporated into an otherwise fire-resistive assembly which may change the capacity for heat dissipation, fire test results or other substantiating data shall be made available to the building official to show that the required fire-resistive time period is not reduced.

(b) Ceiling Membrane Protection. When a ceiling forms the protective membrane for a fire-resistive floor-ceiling assembly, the ceiling shall be without openings in order to protect structural elements.

EXCEPTIONS:

1. Openings for noncombustible sprinkler pipe and openings for steel electrical outlet boxes not greater than 16 square inches in area may be installed, provided the aggregate area of such openings through the ceiling is not more than 100 square inches for any 100 square feet of ceiling area.
2. Duct openings protected with approved ceiling fire dampers.
3. In other than corridors that are required to have fire-resistive ceilings, duct openings may be unprotected when tests, conducted in accordance with U.B.C. Standard No.43-1, have shown that opening protection is not required to maintain the fire resistance of the assembly
4. Other ceiling openings and penetrations may be installed where such openings and penetrations and the assemblies in which they are utilized are tested in accordance with the provisions of U.B.C. Standard No. 43-1.
5. Openings enclosed in fire-resistance rated shaft enclosures.
6. Access doors may be installed in such ceilings when they are approved horizontal access door assemblies listed for such purpose.

(c) Floors. Fire-resistive floors which are part of floor-ceiling assembly shall be continuous without openings or penetrations in order to completely separate one story or basement from another.

Exceptions:

1. Openings enclosed in fire-resistive rated shaft enclosures in accordance with Section 1706 (a)

2. Exit enclosures in accordance with Chapter 33

3. Openings permitted in accordance with Section 1706 (c)

4. Atria constructed in accordance with Section 1716.

5. Penetrations protected with through -penetration fire stops installed to provide an 'F' rating or a 'T' rating in accordance with Section 4301 (b). The 'T' rating shall apply only to:

a. Penetrations which are not contained within a wall at the point where they penetrate the floor, or

b. Penetrations which are larger than a 4-inch nominal pipe or 16 square inches in overall cross-sectional area.

6. Penetrations not larger than a 4- inch nominal pipe or 16 square inches in overall cross-sectional area containing noncombustible penetrating items, where the annular space between the penetrating items and the floor assembly being penetrated is filled with a material which will prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to U.B.C. Standard No.43-1. Time-temperature fire conditions under a minimum positive pressure differential of 0.01-inch water column at the location of the penetration for the time period at least equal to the fire-resistance rating of the floor assembly.

(d) Roofs. Fire-resistive roofs may have unprotected openings. See Chapter 34 for skylight construction.

(e) Wiring in Plenums. Wiring in Plenums shall comply with the Mechanical Code.

(f) Construction joints. Construction Joints such as those used to accommodate wind, seismic or expansion movements when located in fire-resistive floors shall comply with the requirements of Section 1707 .

**Through-penetration Fire Stops
Sec. 4308.**

Through-penetration fire stops required by this code shall have an 'F' or a 'T' rating as determined by tests conducted in accordance with U.B.C. Standard No. 43-6. Through-penetration fire stops may be used for membrane penetrations. The 'F' rating shall apply to all through penetrations and shall not be less than the required fire-resistance rating of the assembly penetrated. The

'T' rating shall apply to those through-penetration locations required to have 'T' rating as specified in Sections 4304 (e) and 4305 (c) and shall not be less than the required fire-resistance of the assembly penetrated.