



BUILDING STANDARDS ADVISORY

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| Subject Combustible Drain, Waste and Vent Piping | Approved by <i>Margaret Kuzyle</i> | Advisory Number A-7 1 of 4 |
| | Effective Date September 1996 | NBC 1995 References(s) 3.1.9.4. & 3.1.5.15. |

Compliance with *The Uniform Building and Accessibility Standards Act* (the UBAS Act) and regulations is addressed in this advisory. NBC 1995 means the National Building Code of Canada 1995 as adopted by regulations under the UBAS Act. Words in italics, other than Act titles, are defined in the NBC 1995.

GENERAL

The NBC 1995 permits the use of *combustible* piping in *buildings* but sets some limitations depending on the use and location of the piping and the type of construction that may be used. The limitations are similar for *buildings* that fall under the scope of Part 3 or Part 9 of the NBC 1995.

Combustible sprinkler piping may be used within a fire compartment and may penetrate a *fire separation* without the penetration being protected with a fire stop system, if the fire compartments on both sides of the *fire separation* are *sprinklered*. [Sentence 3.1.9.4.(1)]

Combustible water distribution piping may be used within a fire compartment and may penetrate a vertical *fire separation* provided it has an outside diameter of not more than 30 mm and it is sealed at the penetration by a fire stop system that conforms to ULC CAN4-S115-M. The fire stop system used in this situation is often a listed system of mineral wool and fire stop caulking. [Sentence 3.1.9.4.(2)].

Combustible drain, waste and vent (DWV) piping is subject to more extensive provisions. If the DWV piping penetrates a horizontal or vertical *fire separation* or if the DWV piping is installed in a *building* required to be *noncombustible construction*, specific limitations apply.

IN BUILDINGS PERMITTED TO BE COMBUSTIBLE OR NONCOMBUSTIBLE CONSTRUCTION

Article 3.1.9.4. of the NBC 1995 states:

- 3) Except as permitted in Sentences (4) to (6), *combustible* piping shall not be used in a drain, waste and vent piping system if any part of that system penetrates
 - a) a *fire separation* required to have a *fire-resistance rating*, or
 - b) a membrane that forms part of an assembly required to have a *fire-resistance rating*.
- 4) *Combustible* drain, waste and vent piping is permitted to penetrate a *fire separation* required to have a *fire-resistance rating* or a membrane that forms part of an assembly required to have a *fire-resistance rating* provided
 - a) the piping is sealed at the penetration by a fire stop system that has a F rating not less than the *fire-resistance rating* required for the *fire separation* when subjected to the fire test method in CAN4-S115-M, "Standard Method of Fire Tests of Firestop Systems," with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side, and
 - b) the piping is not located in a vertical shaft.
- 5) *Combustible* drain piping is permitted to penetrate a horizontal *fire separation* provided it leads directly from a *noncombustible* water closet through a concrete floor slab.
- 6) *Combustible* drain, waste and vent piping is permitted on one side of a vertical *fire separation* provided it is not located in a vertical shaft.

Combustible DWV piping is not allowed to penetrate a fire separation having a fire-resistance rating or membrane that forms part of an assembly required to have a fire-resistance rating unless it conforms to Sentences (4) to (6).



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Sentence (4) permits *combustible* DWV piping to penetrate a rated assembly provided a listed fire stop system is used where the piping penetrates the assembly **and** the piping is not in a vertical shaft. The listed fire stop system must have a F rating not less than the fire-resistance of the *fire separation* that it is penetrating. The F rating must be determined by testing when subject to a pressure differential. (For example, in a vertical *fire separation* that requires a 1 hour *fire-resistance rating*, the fire stopping system must have a F rating of at least 1 hour.) Listed fire stop systems must be installed in accordance with manufacturer's instructions. Two examples of typical listed fire stop systems are shown in Figures 1 and 2.

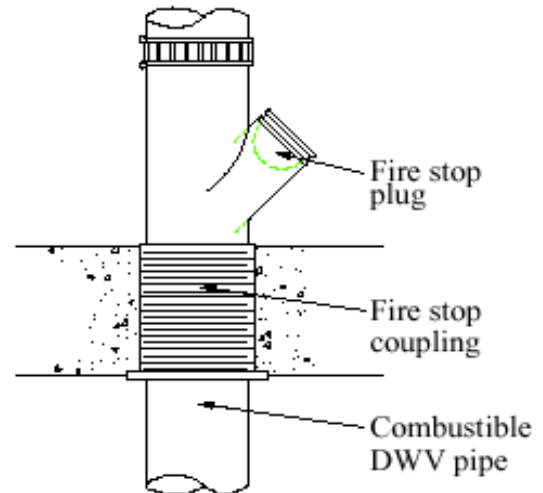


Figure 1

Sentence (5) permits *combustible* DWV piping to penetrate a horizontal *fire separation* without additional protection when it leads directly from a *noncombustible* water closet through a concrete floor slab, as shown in Figure 3.



Figure 2

Sentence (6) permits the use of *combustible* DWV piping on one side of a vertical *fire separation* provided it is not in a vertical shaft. This means that:

- *combustible* piping may be used throughout a fire compartment that is not a vertical shaft.
- a listed fire stop system is not required at the service penetration if the *combustible* piping is connected to *noncombustible* piping before it penetrates the *fire separation* that forms the fire compartment and the *noncombustible* piping is continued throughout the adjacent fire compartment.

Combustible DWV piping is not permitted in a concealed space between the ceiling and floor or ceiling and roof that is used as a plenum unless the piping has a *flame-spread rating* not more than 25 and a smoke development classification of not more than 50 (Article 3.6.4.3.). Most *combustible* pipes currently available do not meet these requirements.

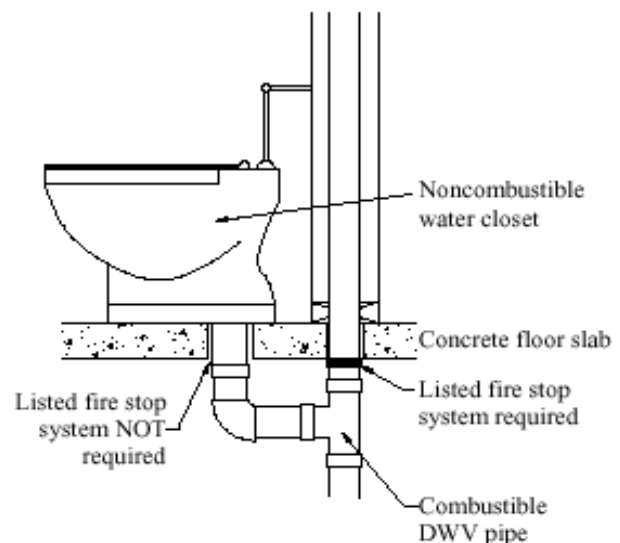


Figure 3



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IN BUILDINGS REQUIRED TO BE OF NONCOMBUSTIBLE CONSTRUCTION

The NBC 1995 places additional restrictions on the use of *combustible* piping in *buildings* required to be of *noncombustible construction*. Sentence 3.1.5.15.(1) sets limits for maximum *flame-spread ratings* and smoke development classifications for *combustible* piping used in *buildings* required to be of *noncombustible construction*. (In *buildings* permitted to be constructed of *combustible construction*, the maximum *flame-spread ratings* and smoke development classifications for *combustible* piping have not been set. If the piping is exposed, the *flame-spread rating* must not exceed 150.)

3.1.5.15. Combustible Piping Materials

- 1) Except as permitted in Clause 3.1.5.2.(1)(e) and Sentences (2) and (3), *combustible* piping and tubing and associated adhesives are permitted to be used in a *building* required to be of *noncombustible construction* provided that, except when concealed in a wall or concrete floor slab, they
 - a) have a *flame-spread rating* of not more than 25, and
 - b) if used in a *building* described in Subsection 3.2.6., have a smoke developed classification of not more than 50.
- 2) *Combustible* sprinkler piping is permitted to be used within a *sprinklered floor area* in a *building* required to be of *noncombustible construction*. (See also Article 3.2.5.14.)
- 3) Polypropylene pipes and fittings are permitted to be used for drain, waste and vent piping for the conveyance of highly corrosive materials and for piping used to distribute distilled or dialyzed water in laboratory and hospital facilities in a *building* required to be of *noncombustible construction*, provided
 - a) the *building* is *sprinklered* throughout,
 - b) the piping is not located in a vertical shaft, and
 - c) piping that penetrates a *fire separation* is sealed at the penetration by a fire stop system that, when subjected to the fire test method in CAN4-S115-M, "Standard Method of Fire Tests of Firestop Systems," has an FT rating not less than the *fire-resistance rating* of the *fire separation*.

In *buildings* required to be of *noncombustible construction*, a maximum *flame-spread rating* of 25 has been set. In addition, in *buildings* that are considered high *buildings* under Subsection 3.2.6., a maximum smoke developed classification of 50 has been set. However, where the piping is concealed in a wall or concrete floor slab, the requirements for limiting *flame-spread ratings* and smoke development classifications do not apply. Polypropylene pipes and fittings conveying highly corrosive materials or in laboratory and hospital facilities have additional restrictions [Clause 3.1.5.15.(3)].

The requirements for limiting *flame-spread rating* and smoke developed classification apply where the piping is in a plenum as described in Sentence 3.6.4.3.(1).

Where the *combustible* piping penetrates a fire separation having a *fire-resistance rating* or a membrane that forms part of an assembly required to have a *fire-resistance rating*, the requirements for a listed fire stop system as described in Article 3.1.9.4. must be met.

Most ABS piping has a *flame-spread rating* exceeding 25, meaning that it would not be permitted in *buildings* required to be of *noncombustible construction*.



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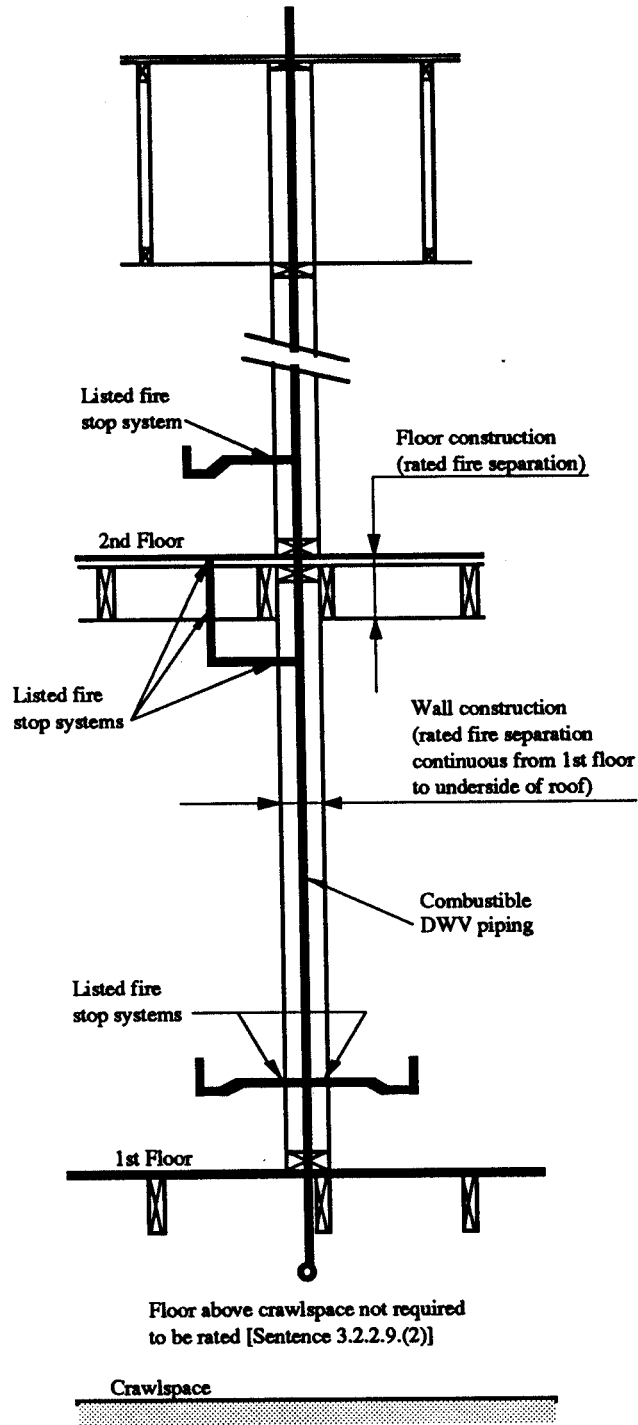


Figure 4
Combustible DWV Piping in a Fire Separation