

# TECHNICAL BULLETIN

TT-03



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## The Difference Between Flexible Air Ducts and Flexible Air Connectors

by Dave Fetters

Flexible air ducts and flexible air connectors share many of the same traits, yet are different enough that they are uniquely separate products. All of the national codes share similar language, as represented by the International Mechanical Code, 2003 edition (paraphrased):

*Flexible air ducts and flexible air connectors, both metallic and nonmetallic, shall be tested in accordance with UL 181. Such ducts and connectors shall be listed and labeled as Class 0 or Class 1 flexible air ducts or flexible air connectors and shall be installed in accordance with the terms of their listing and the manufacturer's installation instructions.*

It goes on to say:

*Flexible air ducts shall not be limited in length.*

*Flexible air connectors shall be limited in length to 14 feet. Flexible air connectors shall not pass through any wall, floor, or ceiling.*

These last two entries define the primary difference between the two products. Air ducts must pass 15 UL tests, whereas connectors are not required to pass the flame penetration, puncture, or impact tests.

All Hart & Cooley flexible ducts are insulated and have a rectangular label that shows the UL listing mark and clearly states that it is an air duct. Hart & Cooley flexible connectors have no insulation, but have a round label with the UL listing mark, the words "air connector," and the words "For installation in length not over 14 ft."

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~~Oregon~~  
Alternate Method Ruling No. 92-25  
**CEILING "FIRE SEPARATION" DWELLING/GARAGE AND DWELLING/DWELLING  
UNDER THE ONE AND TWO FAMILY DWELLING SPECIALTY CODE**  
(revised 7-15-99, editorial only)

Requested By: Gary Phillips, President, Gary's Vacuflo  
December 5, 1991

**QUESTIONS CONSIDERED**

What protection is required for penetrations of ceiling fire separation between dwelling/garage and between dwelling under the One and Two Family Dwelling Specialty Code? O R S C

**CODE SECTION**

Sections 309.1 and 309.2 say:

**309.1 Opening protection.** Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with either solid wood doors not less than 1 $\frac{3}{8}$  inch (35 mm) in thickness or 20-minute fire-rated doors.

**309.1.1 Duct.** Ducts penetrating the wall or ceiling separating the dwelling from the garage are permitted provided such ducts within the garage are constructed of steel having a thickness not less than 26 gage and having no supply or return air openings into the garage. When a vibration isolator is used in the garage duct, it must be installed at least 18 inches (457mm) from the penetration. Vibration isolators shall be installed in accordance with Section 1901.2.2.

**309.2 Separation required.** The garage shall be separated from the dwelling and its attic area by means of minimum  $\frac{1}{2}$ -inch (12.7 mm) gypsum board applied to the garage side of the wall. Where the separation is a floor-ceiling assembly, the structure supporting the separation shall be protected by  $\frac{1}{2}$ -inch (12.7mm) gypsum board or equivalent.

Exception: A carport need not be separated from a dwelling.

and;

**320.1 Two-family dwellings.** Dwelling units in two-family dwellings shall be separated from each other by wall and/or floor assemblies of not less than a 1-hour fire-resistance rating when tested in accordance with ASTM E 119. Fire-resistance-rated floor-ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend to the underside of the roof sheathing.

**BACKGROUND**

ORS 455.060 gives the Agency the authority to issue alternate methods and materials rulings.

The original request was related to a local inspector's order that a plastic vacuum line penetrating a ceiling be protected by a metal sleeve. The 1996 Edition of the Mechanical Specialty Code provides for vacuum system piping in Chapter 6, Section 609.2(2). (The 1999 Edition of the Mechanical Specialty Code does not include the same provisions). The Oregon One and Two Family Dwelling Code has no specific requirements for vacuum system piping. The Dwelling Code reduces the requirements for the "separation" between the garage and the dwelling from what was earlier required in the Structural Specialty Code. The Dwelling Code, however, has the same requirements as the Structural Code for the separation between two attached dwellings, a duplex.

**STAFF ANALYSIS**

Before the *Dwelling Code* was adopted, the *Structural Code* specified the fire separation between the Dwelling and garage as one-half of a one-hour fire wall, on the garage side. The most used method of protection was  $\frac{5}{8}$  inch Type "X" gypsum board on studs spaced 16 o.c. and nailed and taped as required for one-hour construction. Penetrations were permitted only under certain conditions.

The *Dwelling Code* now requires only  $\frac{1}{2}$  inch gypsum or equivalent on the garage side. The type of gypsum, stud spacing, nailing and taping are not specified. However, under the Dwelling Code the garage is to be "separated from the residence and its attic area" (except for the specified doors).

Conditions vary in a room containing a fire. Since products of combustion rise due to convection, the hottest gasses are at the ceiling. The risk is higher for plastic materials penetrating near the top of walls and at the ceiling. In this area plastics can melt, burn or collapse leaving an opening for fire to pass through and involve the dwelling. Therefore, if plastic is allowed, it is desirable to have a penetration low on the wall and not through the ceiling.

#### BOARD FINDINGS

- The Dwelling Code requires separation between the garage/dwelling with ½-inch gypsum board (except for the door that is permitted by Section 309.F).
- While Section 108 allows acceptance of alternates in lieu of those specified in the Dwelling Code, this section does not authorize the building official to specify more restrictive requirements than those required in the code.
- Section 108 authorizes the building official to accept alternate materials and systems which satisfy certain safety criteria of this section. Any penetration allowed must be approved under the provisions of Section 108 by the building official having jurisdiction.
- ORS 455.060 authorizes the Agency to issue statewide rulings on alternate materials and methods.
- Within the limits of the *Dwelling Code*, alternate methods and materials should be consistent between the *Structural Code* and the *Dwelling Code*. Systems permitted in the *Structural Code* for a more restrictive firewall are deemed to satisfy the requirements for protection of the *Dwelling Code's* reduced separation requirements.

**BOARD'S DISCUSSION AND RECOMMENDATION:** At the March 18, 1992 meeting the Structural Code Advisory Board specified a solution to the wall penetration portion of this requested interpretative ruling and referred the ceiling portion of the request to the Board's Code Changes Committee for a recommendation.

This Board has concluded that the Dwelling Code is inadequate to address this issue and is also deemed to be too restrictive in this case. Revisions to this code will take some time to complete. In the meantime, it is in the public interest for the board to recognize alternate and equivalent methods for penetration of the garage/dwelling fire separation as authorized by ORS 455.060.

For these reasons the following conclusions are made:

**Q 1:** What is the extent of the occupancy separation between the dwelling and the garage when such separation is horizontal? May the walls, and any other structural members which support the horizontal ceiling separation, be required to be protected on the garage side?

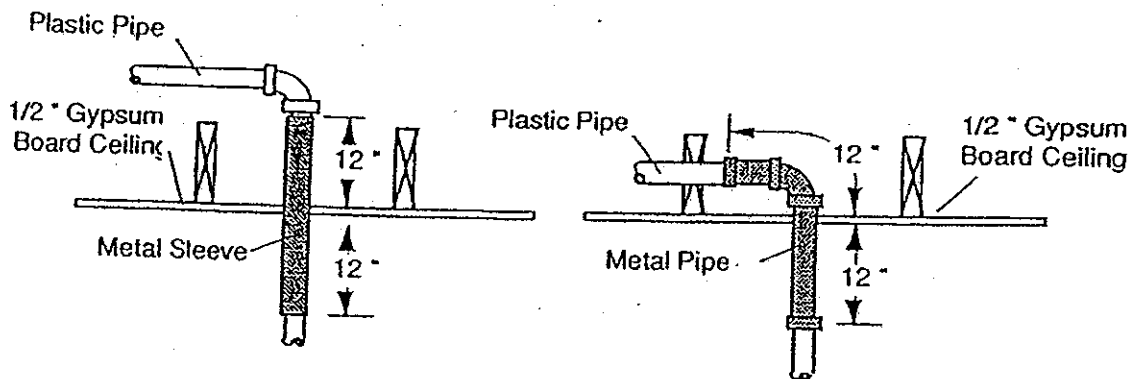
**A1:** Where the building layout dictates a horizontal separation in the garage, the walls and any other structural members, which support the horizontal ceiling separation, are not required to be protected on the garage side because there is no code language in the *Dwelling Code* requiring this. If the separation is a floor/ceiling assembly, the structure supporting the assembly shall be protected by ½ inch (12.7mm) gypsum board or equivalent.

**Q 2:** Can the entire occupancy separation occur on the common walls between the dwelling and the garage with no protection provided for the exposed trusses which constitute an integral part of the dwelling?

**A 2:** Yes. The occupancy separation can be placed solely on the common wall between the dwelling and garage. Under previous codes if framing and trusses run parallel to the protected wall and protection extends to the underside of the roof sheathing, trusses and framing were required no added protection. Under the previous code protection was required for the exposed portion of the trusses or other framing material run perpendicular to the protected wall if the truss or framing supported the floor, roof or ceiling of the dwelling. Under the Dwelling Code walls supporting the structure are not required to be protected nor would it be required to protect the ceiling structure because there is no specific language requiring this.

**Q 3:** When plastic vacuum tubing penetrates a garage ceiling does the pipe need to have a metal sleeve and/or need to be protected with metal fittings all the way to the [vacuum system's] power unit [located in the garage]?

**A 3:** This response applies to all plastic material penetrating the ceiling separation. Section 309.2 requires the garage and the dwelling to be "separated" on the garage side by 1/2-inch gypsum board (except for the provisions permitted by Sections 309.1 & 309.1.1). Therefore, plastic piping is not permitted to penetrate the ceiling separation. The building official may accept a metal sleeve extending 12 inches on either side of the penetration or metal piping extending 12 inches on either side of the penetration or building official approved alternate as authorized by Section 108.



**Q 4:** If a hatch is provided into the attic or through a wall, what type of construction is permitted?

**A 4:** Construction shall be comparable to 1/2-inch gypsum board or equal to the door specified or of frame construction covered with 1/2 inch gypsum board on the garage side. In addition, the door or hatch cover must be held in place by metal hinges, hasps or locks designed to keep the assembly in place during a fire. Although not specified in the code, all openings are assumed to be trimmed with solid wood or metal casings. In this answer, openings are required to be similarly cased on the garage side.

(signed October 20, 1992)

John Talbott, Chairman  
Structural Code Advisory Board

Date

The recommendations and findings of the Structural Code Advisory Board are accepted and are adopted:

(signed October 23, 1992)

Gary J. Wicks, Administrator  
Building Codes Agency

Date

*This Interpretive Ruling was written in conjunction with Interpretive Ruling 92-5B. The Interpretive Rulings are identical except for the "Question and Answer" portions. The questions, answers and drawing are an addition to those found in Interpretive Ruling 92-5B.*