

# HRAI TECHNICAL COMMENTARY

## Residential Ventilation Issues

by Dara Bowser & Bob Allison

### Oil Side-Wall Vented Equipment: Positive Venting or Not?

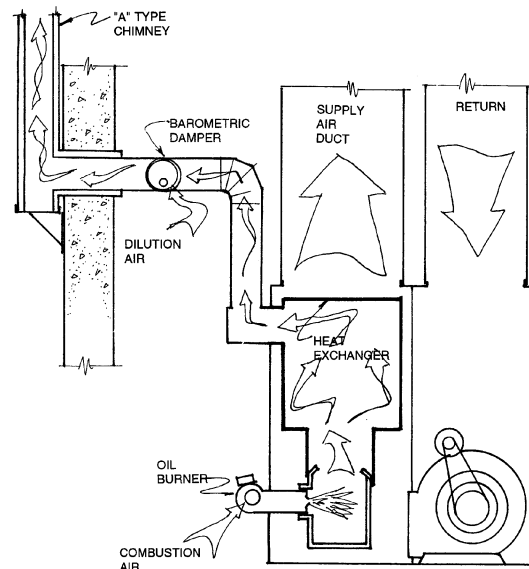
**9.32.3.1.(1) For the purposes of this section, a non-solid fuel fired appliance shall be classified as:**

**(b) mechanically vented induced draft whereby combustion air is supplied from within the building envelope and the products of combustion are positively conveyed to the outdoors by means of a dedicated sealed vent.**

This sentence is a key to correctly interpreting whether or not a *Type III* house exists for the purposes of Section 9.32 and therefore whether or not a *Part 6 Ventilation Design* is required.

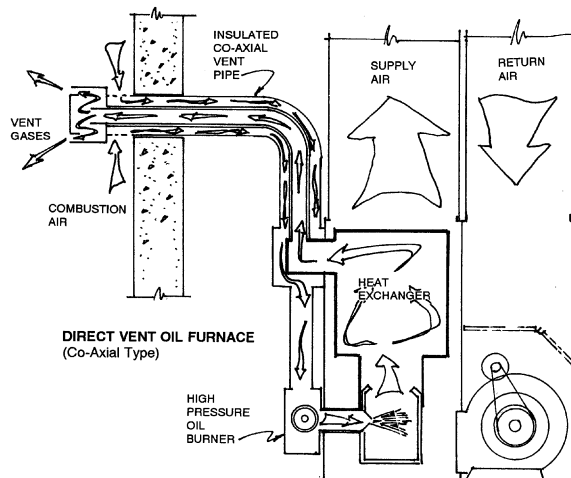
It is well accepted by the industry that gas-fired combustion equipment which is side-wall vented does meet the test of this sentence and the house will not be Type III. (*Note: There is a specific exception for induced-draft type side-wall vented gas fireplaces which occurs in sentence 9.32.3.1.(2) (c). For the purposes of the OBC, induced draft gas fireplaces are always considered to be "Natural Draft"*). This acceptance occurred in large part due to testing undertaken by the Ontario Natural Gas Association (ONGA) which showed that gas-fired induced draft furnaces, water-heaters, and dryers did not spill combustion gases, even at extreme negative pressure levels of 50 Pa. Induced draft fireplaces were not tested and are not considered to be "positive venting" because of a loop-hole in the certification standard which allows them to be operated with the front doors open.

With oil-fired induced draft appliances, however, the situation is not so clear. At this time the oil heating industry has not conducted any tests which would show that their induced draft appliance is "generically" safe when subjected to negative pressure in a house. In addition, the various types of oil appliances on the market are not easily recognized as being one type or another. The following illustrations will help in recognizing the different types:



**Figure 1:  
NATURAL DRAFT**

This is traditional type of oil appliance installation. It is connected to a chimney and always considered to be type *natural draft* as described in 9.32.3.1.(1)(c).

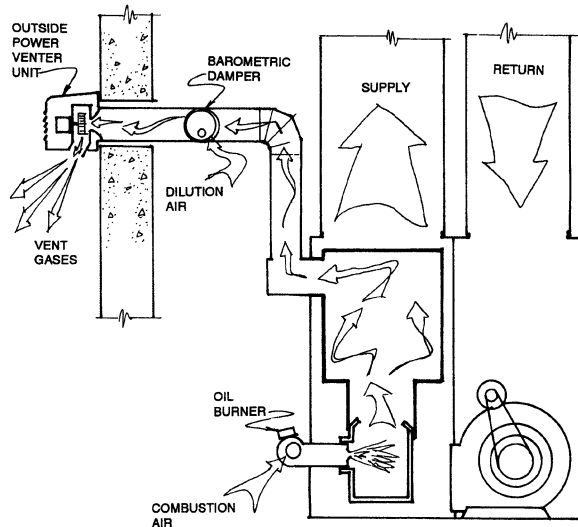


**Figure 2:  
DIRECT VENT/SEALED COMBUSTION**

In this case, both the combustion air and the combustion gas passages are sealed from the house so it is considered a *direct vent* type as described in 9.32.3.1.(1)(a).

*Note: The code language for this type is "direct vent". What it really means is "sealed combustion".*

The furnace illustrated is "Co-axial vent" type. At the present time, only one manufacturer makes this type of oil furnace. One other manufacturer sells a type of oil furnace which can be converted to *direct vent* by installing a combustion air kit. This makes the furnace a "two-pipe direct-vent" design.



**Figure 3:  
INDUCED DRAFT/SIDE-WALL VENTED**

These units appear to meet the "positive venting" requirements of sentence 9.32.3.1.(1) (b), but they do not meet the "sealed vent for combustion gases" requirement of the same sentence. The pipe connecting the combustion appliance (furnace or water heater) to the outside is of the non-sealed type (usually single-wall galvanized pipe) and there is a "barometric damper" opening between the unit and the power-venter. The power-venter is usually located at the outside wall.

There is often an argument made that, despite the lack of sealing on the combustion products venting pipe, the venting is sufficiently "positive" because the pipe is on the suction side of the fan. The fan gives much more powerful and reliable suction than a chimney, and so the arrangement should be much less likely to experience combustion gas spillage.

The barometric opening which exists is very similar to the dilution opening which exists on the suction side of the

venter fan on most side-wall vented gas water heaters. The key difference between this appliance and gas is that the gas industry has conducted tests to demonstrate that the gas-fired appliance of this type is suitable for installation in Type I houses. Unfortunately, the oil industry has not undertaken testing to verify that there is no danger of back-spillage.

Induced draft oil-fired equipment must then be considered to be *natural draft* within the meaning of section 9.32. Ventilation design must then be according to Part 6. When a part 6 design is applied, there are several options available to the designer/installer. One of these is to perform an on-site test such as the F326 5 Pa depressurization test.

#### **SUMMARY:**

In the final analysis, Induced-Draft Oil fired appliance must be considered to be *natural draft* on the basis that the vent pipe is not sealed and it does not meet the test of 9.32.3.1.(b). There is no established precedent for acceptance as "*equivalent to positive induced draft*" and the industry has not done any testing to show that the appliance performs so as to meet the intent of this sentence. This type of testing has been done by the gas industry and it seems that the situation with these appliances could be improved significantly if the oil industry would provide the same kind of testing.

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