

## Residential Ventilation Issues

by Dara Bowser & Bob Allison

### Can B-Vented Furnaces be Classified as *Induced Draft*

The following article is based on actual events and circumstances. As the subject has not been completely resolved, the particular municipality and individuals involved are not named. The resolution of this situation will be reported in future articles.

#### The Problem:

A builder obtained a building permit after the interim changes to the OBC in July 1993 which involved ventilation.

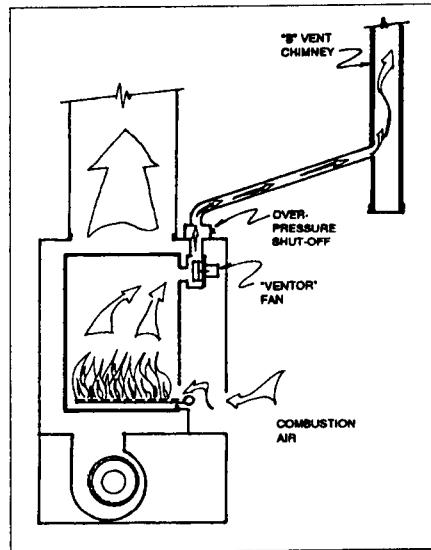
The builder submitted plans and commenced construction for a series of townhouse units based on a "Type-I" dwelling units [9.32.3.1.(2)(a)] with "Exhaust-only" ventilation systems. The ventilation system consisted generally of two bath fans and a kitchen range hood. The "Type-I" classification was based on the use of a positively vented (side-wall vented) hot water heater and a positively vented (side-wall vented) furnace which are classified as "Mechanically Vented Induced Draft" according to sentence 9.32.3.1.(1)(b).

During construction, the building official noted that the furnace as installed was connected to a "B-vent" (non-positive) type of chimney. The building official informed the builder that in his opinion, the existence of the B-Vent Chimney did not allow the type of ventilation system proposed because the dwelling unit would now be classified as "Type III" according to sentence 9.32.3.1.(2)(c). This was based on classification of the combustion appliance as "Natural Draft" according to sentence 9.32.3.1.(1)(c).

#### The Dispute:

The builder maintained, however, that the furnace and venting system continued to be *Induced Draft* because the furnace was the same as originally specified for side-wall venting. All

that had changed was that the furnace was vented vertically through the B-Vent. There were no openings in the chimney assembly such as a draft hood between the furnace and the B-Vent and there were no other combustion appliances connected to the B-Vent. The appliance could effectively be classified as "*induced draft*" because it conformed to the requirement that "*the products of combustion are positively conveyed to the outside by means of a dedicated sealed vent*" which is contained in sentence 9.32.3.1.(1)(b).



#### The Result:

The dispute was taken up with the Building Code Commission and the BCC ruled in favour of the Building Official, stating as reason that: "*The installed Type "B" Vent is not considered a dedicated sealed vent that positively conveys products of combustion to the outdoors*".

The builder's next step was to resubmit a design for the ventilation system based on Part 6 rules, which are required to be applied in a "Type III" dwelling. [9.32.3.2.(1)(a)].

The builder engaged a consultant to review the installed ventilation system and to prepare a report as to whether or not the ventilation systems conformed to the requirements of Part 6. As part of his on-site review, the consultant carried out a *depressurization test* according to the requirements of CSA Standard F326. [See articles on this subject in OBOA Journals Oct. '95 and Feb. '94]. The CSA F326 rules would permit the B-vented furnace to remain if it could be demonstrated by test that the depressurization of the dwelling unit would not exceed -5 Pa under specific operating conditions. For the dwelling units in question, this would require the operation of the two bathroom fans, and the dryer. Additionally, the *Ontario Gas Utilization Code* does not permit the use of a B-vent (or any

chimney) in a situation where the level of depressurization might exceed -5 pa.

The *depressurization test* of the first dwelling showed that the depressurization level was at least -13 Pa., or more than twice the allowable limit. Based on the "fail" test, the consultant recommended that the furnaces or venting systems be replaced with side-wall vented or sealed combustion type furnaces. The consultant noted that the air-tightness of the construction did not appear to be above normal, but the small size of the units made it very unlikely that any of the dwelling units would succeed in passing the -5 pa test requirement.

Currently, the builder is evaluating his options as to how to comply with the building code requirements.

**Summary:**

All appliances connected to Type "B" vents are considered to be "Natural Draft" according to sentence 9.32.3.1.(1)(c). This is true even if the appliance is fan-assisted and is the only appliance connected to the B-vent and there are no openings such as draft-hood in the chimney assembly.

Such an appliance brings Part 6 rules into effect. The standard of choice for residential ventilation systems is CSA F326. CSA F326 requires that where a "Natural Draft" combustion appliance

exists, the maximum depressurization under specific test conditions must not exceed -5 Pa. This requirement may be demonstrated by an on-site test after construction, or by a calculation. The *Ontario Gas Utilization Code* also contains a similar requirement, stating that conventional venting may not be used where the depressurization can exceed -5 Pa.

In this case, the dwelling unit failed to meet the -5 Pa criteria, the actual depressurization measured being -13 Pa.

**Important Observations:**

- A) Whenever a *B-vent* is installed in a dwelling unit, the dwelling unit is classified as Type III.
- B) *Type III* dwelling units must have a depressurization test carried out with a result not exceeding -5 Pa. Alternatively, a calculation may be submitted showing that -5 Pa will not occur under test conditions.

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*Special thanks to the individuals, Building Officials, and Ministry of Housing staff for their assistance with regards to this article.*

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