

Clearing The Air

Residential Ventilation Issues

by Dara Bowser & Bob Allison

Potable Hot Water (Combo) Heating Systems: What are the Requirements?

Until recently, Potable Hot Water Heating Systems (mostly referred to as "Combo" Heating Systems) were not mentioned in the Ontario Building Code. In fact, there were no reference standards or documents for the design and installation of these systems.

Combo systems are particularly suited to retro-fit (conversion from electric) and smaller dwelling uses, however newer large-capacity systems are beginning to be installed in larger homes and businesses.

Combo Systems have a history of good service in the U.S. and Canada. Installations have been popular in Ohio since 1980. Building-Official enforcement of Combo-system installations in Ohio began in 1985.

In Ontario however, in the absence of any published rules, there have been cases of under-performing combo systems in both new and existing housing. This situation was painfully clear when systems were installed that did not actually keep the dwellings warm in the winter. Many of the problems arise due to lack of proper system design, such as:

Over-Sized Air-Handler Relative to the Hot Water Tank: Although the hot water tank may be large enough for the heat loss of the dwelling, if the airhandler is larger it can cool down the hot water tank too much, leaving the occupants without hot water.

Air Handler too Small: Combo systems require more airflow than an equivalent capacity gas, oil or electric furnace. This is because the temperature of the air leaving the air handler is lower, primarily due to the lower water temperatures (130°F) used in hot water tanks. If the air handler is sized using "rule of thumb" methods that usually work for furnaces, it will be too small. Some air-handler manufacturers have contributed to the problem by publishing heat output ratings based on 60°F entering air temperatures.

When the air-handler is too small, it cannot deliver enough heat, even if the hot water tank is big enough. A "quickfix" to this problem usually

involves jacking up the hot water tank temperature to get more heat out the system. Unless a temperature-reducing mixing valve is used however, at-the-tap temperatures can exceed 140°F which contravenes sentence 9.31.6.1. of the OBC, and can result in serious scalding to children and seniors.

The major gas utilities have made an effort to correct these problems by publishing sizing and installation guides, however these varied slightly from jurisdiction to jurisdiction and could not be referenced directly in the OBC. Some utilities offered free design services. Most contractors would follow the manufacturers guidelines, some did not, resulting in complaints from homeowners. As well, due to the nature of combo systems it was possible for some unlicensed and unqualified

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operators to install systems without encountering any regulatory requirements from Municipal, Gas Utility or Provincial agencies. If a dispute arose with a building official over correct design or installation, there was no code-referenced standard to rely on.

This has changed with the publication of the UNIFIED CANADIAN GUIDELINE for Integrated Combo Systems (UCG) by HRAI in July of 1997. This guideline will be referenced directly in the 1998 OBC revisions in sentence 6.2.1.1.(1) "Good Engineering Practice".

The UCG contains requirements for:

- heat loss calculation and duct design;
- air handler selection at standard design conditions;
- air handler construction and certification;
- thermostatic anti-scald valves;
- cooling design;
- water heaters certification;
- water heaters sizing for storage capacity and heat output;
- installation procedures for testing, flushing;
- general installation;
- warning labels;
- "Equipment Selection Summary & Application" forms (sample form is included).

The UCG is the result of a co-operative effort by a Task Group which included representatives of all levels of government and industry. Although we do not have enough space to list all of the participants, significant contributions to the development of this document were made by:

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The UCG is available from HRAI at a cost of \$25 plus tax, shipping and handling. Net proceeds from the sale of the guideline will be used to develop a certification training course.

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HRAI will reply to technical inquires for information or clarification of the UCG requirements. The contact person is Gord Arnott (see address, telephone & e-mail above).

MORE VENTILATION HANDOUT STUFF

In addition to the listing of good handout stuff in the last Journal, we have come across the CMHC publication CE9. This is a 4-pager about HRV care and feeding with lots of illustrations and a maintenance chart.

Next issue we'll get back to ventilation issues by clearing the air on when the code actually requires an HRV and when it does not....don't miss it.

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NOTE: Although this column has appeared under the title "HRAI Commentary" in the past, readers should note that HRAI no longer endorses the content. The opinions expressed in this column are those of the writers and do not reflect the views of HRAI, OBOA or any other agency, corporation or individual.

Code Review, Legislation & Technical Committee Report

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Questions Re: Code Review

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