

**A COMPARISON OF RESIDENTIAL  
VENTILATION CODES AND STANDARDS  
REQUIREMENTS IN COLD CLIMATE AREAS OF  
THE UNITED STATES OF AMERICA, CANADA  
AND SELECTED NORTHERN EUROPEAN  
COUNTRIES**

John L. Hockman

*Heating, Refrigeration and Air Conditioning Institute of Canada  
Mississauga, Ontario, Canada*

**Hockman, John, L., Mr.**

**Heating, Refrigeration and Air Conditioning Institute of Canada**

**5045 Orbitor Drive, Building 11, Suite 300**

**Mississauga, Ontario, Canada**

**L4W 4Y4**

**T: 1-204-284-9368, F: 1-204-284-7982, E: [jhockman@mts.net](mailto:jhockman@mts.net)**

**TOPIC:**

**Standards and Codes for Ventilation and Energy**

The Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) has been responsible for the development and delivery of Residential Mechanical Ventilation System Installation and Design training in Canada for many years. It has also developed and delivered similar training in over 12 States in the USA; in both cold and hot climate locations. In order to facilitate a better understanding of the various current and proposed Codes and Standards in the various jurisdictions, a study has been undertaken that compares some of the common factors that are requirements in these Codes and Standards (C/S). The study has included the ventilation requirements that have been in place in three northern European cold climate countries.

The study reviewed each Code/Standard with respect to requirements relating to a common set of ventilation factors and criteria. The main factors include the following:

1. Protection against Depressurization – given the increase in more tightly built homes, how do the differing C/S protect against combustion gas spillage into the dwelling.
2. Ventilation Capacity – what are the requirements for total mechanical air change rates, and high and low airflow capacities?
3. Contaminant Removal – what exhaust requirements are there for specific rooms in the dwelling?
4. Ventilation Air Distribution – are there requirements to distribute outdoor air to specific rooms in the dwelling?

Additional factors such as the requirements for rating and selection of ventilation equipment, equipment installation, sizing and installation of ductwork, ductwork materials, insulation of ductwork, intake and outlet weather hood requirements, controls, etc. have also been reviewed and summarized.

Many of the C/S have similar requirements relating to ventilation rates or ventilation system capacity, but the required ventilation rates and the expected operation time of the system at the specific rate varies from one C/S to another. Many C/S share similar exhaust rate requirements for different rooms, bathrooms and kitchens, where contaminants are most often produced. Outdoor ventilation air distribution requirements are specifically addressed in some C/S; while in others it is virtually ignored, even though most dwellings are being constructed with various techniques to reduce accidental air leakage.

Testing in Canada and some of the Northern States of the USA suggest that ventilation systems, and other exhaust devices, in dwellings have an increasing potential to depressurize dwellings to levels where many combustion venting systems may not function to safely remove combustion gases from the interior dwelling space. Some C/S provide specific prescriptive strategies to avoid the problem, others provide for performance testing, and others remain vague on this subject.

Reviewing the various C/S has provided HRAI with an increased understanding of the critical teaching requirements for industry directed training. These requirements often require the teaching of critical areas of concern that affect mechanical ventilation system design and installation, even though specific C/S do not include requirements in that specific area of concern.