

# WHAT YOU NEED TO KNOW ABOUT INDOOR AIR QUALITY (IAQ) AND VENTILATION

A question and answer format designed to help you guide your decision

## **1. What is meant by “Indoor Air Quality”?**

“Good indoor air quality can be defined as the absence of any substance in the air that is a health hazard or a source of discomfort to the occupants of a building, or a threat to the building structure.”\*

\* from *Indoor Air Quality* NHA 6069, published by Canada Mortgage and Housing Corporation, 1988.

## **2. Should everyone be concerned with the quality of the indoor environment?**

Yes. Construction practices used today to reduce energy consumption and moisture damage to buildings have reduced natural air leakage. Without ventilation, normal activities such as laundry, cooking and showers can cause excessive moisture generation resulting in high humidity, occupant discomfort, bacterial or fungus growth and lingering odours.

## **3. What then are the total adverse effects of poor IAQ?**

Both the health and welfare of the occupants will suffer. The structure of the building may also be damaged.

## **4. How may I recognise possible threats to household members due to poor IAQ?**

Some household members may have headaches, or irritations of the nose, throat, lungs, eyes or skin.

## **5. What are some of the major pollutants?**

- Aldehydes
- Carbon dioxide
- Carbon monoxide
- Combustion by-products
- Dirt particles
- Excessive levels of radon gas
- Excessive moisture
- Pollen
- Tobacco smoke

## **6. Can a prolonged exposure to poor IAQ have a lasting or long-term effect upon those exposed?**

Long-term physical weakness may result from, but not be limited to, those pollutants mentioned in the answer to question #5.

## **7. In what way will poor IAQ adversely affect the structure of a house?**

Both visible and hidden damage to the structure may be caused by prolonged build-up of moisture levels in the walls and attic.

## **8. How does this happen?**

Interior damage to the structure is caused by moisture migration due to air and vapour pressure differentials between the inside and the outside of the structure.

## **9. What is the cause of condensation forming on the windows?**

Condensation is caused by warm moist air in contact with colder glass.

## **10. What are some methods of improving and controlling air quality?**

- Removing the source of the problem
- Ventilation
- Air cleaning (filtration)
- Air conditioning
- Dehumidification
- Humidification
- Local exhaust fans

## **11. What equipment is used?**

- Ventilators
- Air conditioners
- Dehumidifiers
- Electronic/media air cleaners
- Humidifiers

## **12. What is ventilation?**

It's a device that exhausts contaminated indoor air from a building or delivers a fixed quantity of outdoor air into a building.

## **13. Is there an industry position in Canada regarding IAQ and ventilation?**

The Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) recognises ventilation as a primary solution to acceptable indoor air quality.

## **14. What considerations are important in ventilation?**

There are three: amount, balance and distribution.

## **15. How do I know what is a proper amount of ventilation**

Minimum ventilation quantities [cubic feet/minute (cfm) or Litre's/second (L/s) are specified in the National Building Code. Also, the Canadian Standard Association (CSA) National Standard CSA F-326-M1989 (Residential Mechanical Ventilation Requirements) establishes current ventilation rates consistent with current construction practices.

## **16. How is balanced ventilation achieved?**

By having equal amount of supply (intake) and exhaust air.

## **17. Why is balanced ventilation important?**

It maintains indoor air pressure at an acceptable range which reduces problems due to moisture (see Questions #7 - #10).

## **18. What about distribution?**

Proper distribution provides ventilation to every room in the house

- Homes which have a convection system (e.g. hot water radiators or electrical baseboards) will require the installation of a ventilation duct system.
- Residences with a forced air system can use existing ducting with minor modifications.

## **19. Is there an operating cost associated with ventilation?**

Yes, fan motors consume electrical energy, outside air must be heated in the winter, and if the house is air conditioned, cooled in the summer.

## **20. Can the operating costs be reduced?**

Yes, a Heat Recovery Ventilator (HRV) is an all-season solution that transfers heat from the exhaust air to the intake air in the winter. In the summer the heat transfer is reversed to save on cooling costs.

## **21. Is any maintenance required?**

Yes, filters must be cleaned periodically. The installer should leave the manufacturer's maintenance instructions with the homeowner.

## **22. What system is right for me?**

This can be determined by a qualified mechanical contractor. Many contractors across Canada have been certified as having successfully completed the HRAI Residential Mechanical Ventilation course. When selecting a contractor, be sure that company technicians are properly qualified, certified and insured. Consider selecting contractors who are members of the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) which requires its members to carry relevant trade, fuel safety and municipal licenses as well as workers compensation. HRAI "Members in Good Standing" are companies that have provided all the necessary documentation. A company's membership in HRAI not only tells you that the company is properly licensed but that they are also committed to continuous improvement through education and training.

## **23. What about installation costs?**

Installation costs can be determined by your contractor. These costs vary with the size of the home and the complexity of the installation.

## **24. Does the installation of a ventilation system increase the market value of a home?**

Yes, it does. It indicates to the buyer that the health and comfort of the occupants, as well as the home's structural concerns, have been addressed.