



Better Homes through Assured Indoor Air Quality

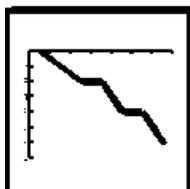
Builder Guide



DESCRIPTION

Indoor air quality (IAQ) is a critical determinant of the comfort and quality of a home. Sources of indoor pollution include human activities such as cooking, smoking, and showering, as well as furnishings and construction materials that give off gases over time, such as carpets and adhesives. In some areas of the country, radon -- a colorless, odorless gas that can cause cancer over prolonged exposure -- can infiltrate from the soil, through the foundation and into the home. Good tight construction practices, (envelope and duct systems) also block other sources of indoor air pollution including dust, molds and other allergens from outdoors; gases from stored hazardous materials; pests from attics, crawl spaces and basements; as well as carbon monoxide from garages. If pollutants are not exhausted from the home and replaced with fresh outdoor air, indoor air quality problems may occur.

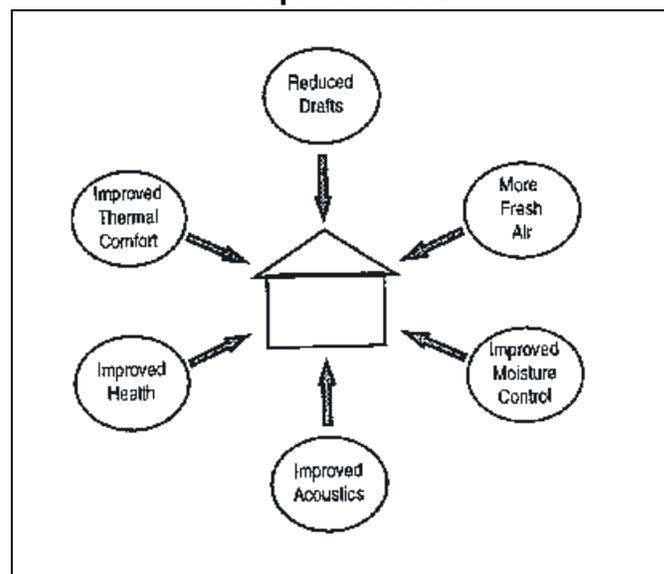
Poor indoor air quality can cause health problems such as headaches, asthma, allergic reactions, and respiratory problems. In addition, poor construction practices may also result in excessive moisture levels that can cause expensive structural damage.



BENEFITS

An effective integrated design approach improves both the energy efficiency **and** indoor air quality of your homes. Your homes can not only cost your customers less to own, but they can be more comfortable and healthier to live in.

Benefits of Building for Improved IAQ



Good indoor air quality means a more comfortable home.

Eliminating unwanted drafts, consistent temperature control, improved humidity control, more effective elimination of odors, and a quieter living environment are all benefits your customers can expect from an integrated approach to indoor air quality. Energy-efficient homes can more effectively assure that important indoor air quality standards are met, such as the standards for relative humidity (30-80% summer; 30-50% winter).

Good indoor air quality means a healthier home.

A well designed indoor environment includes adequate amounts of fresh outside air, filtration to reduce exposure to allergens, safer building materials to reduce Volatile Organic Compounds (VOC's), better humidity control to eliminate mold and mildew growth, and proper construction techniques to prevent radon from entering the home.

Good indoor air quality means a home that is less expensive to operate.

Proper attention to sealing envelope penetrations limits uncontrolled infiltration, improves energy efficiency and reduces homeowner energy costs. Lower energy costs are a key selling point for an ENERGY STAR labeled home, and are even more attractive when combined with good indoor air quality.

Good indoor air quality leads to increased home sales.

Active ventilation systems can help assure your home meets ASHRAE standards for ventilation. Not only does this improve home comfort, but it can increase your home buyers peace of mind concerning negative health effects from poor indoor air quality. Satisfied customers build your reputation for excellence and are more willing to tell their friends about their positive experiences.



INTEGRATION

Good indoor air quality is the result of an integrated approach to building system design.

Materials selection.

Many energy efficient homes feature construction materials made without volatile organic compounds (VOC's), such as formaldehyde, to limit sources of indoor air pollution and further reduce the chance that poor indoor air quality could become a problem. For more information about materials selection and low-VOC products, see the "Healthy House" books by John Bower, listed in the "Resources" section at right.

Envelope construction.

Builders will need to develop subcontractors or in-house crews who know how to effectively seal building envelopes.

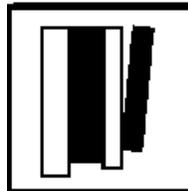
Heating and Cooling system design.

Builders need to coordinate with their HVAC subcontractors to right-size their mechanical systems (see "Right Sized HVAC Systems" fact sheet) and install tightly sealed ducts (see "Duct Sealing" and "Aerosol Duct Sealing" fact sheets.) Right sized

systems provide better temperature control, more continuous operation, and longer equipment life while removing excess humidity more effectively to minimize mold buildup. Tightly sealed ducts stop pollutants from mixing with conditioned air, while improving system efficiency.

Ventilation system design.

Active ventilation systems are growing in popularity as homes are built more air-tight (see "Active Ventilation" fact sheet). You will need to work with the architect to specify this type of ventilation, as well as your HVAC subcontractor to ensure that it is installed properly.



RESOURCES

- For more information on the ENERGY STAR Labeled Homes program, call 1-888-STAR-YES; or access the ENERGY STAR labeled homes web page on the Internet at: <http://www.energystar.gov/homes>
- ASHRAE Standard 62-1989 *Ventilation for Acceptable Indoor Air Quality*, 1989.
- ASHRAE Standard 55-1992 *Thermal Environment and Conditions for Human Occupancy*, 1992.
- The Healthy House*, John Bower, Carol Publishing, 1993
- Healthy House Building: A Design and Construction Guide*, John Bower, Indiana: Health House Institute, 1993
- IAQ INFO: The Indoor Air Quality Information Clearinghouse*, 1-800-438-4318.
- The Inside Story: A Guide to Indoor Air Quality*, U.S. EPA, 1988, (EPA/400/1-88/004).
- Active Ventilation To Improve Indoor Air Quality* (fact sheet in this series).