

Houses That Work: Ventilation Strategies

This workshop will build on the basic concepts of indoor air quality and ventilation presented in the Houses That Work full day workshop. The workshop will start with a brief review of the relevance of proper ventilation in high performance homes. Participants will be shown how to properly size ventilation systems in accordance with the applicable ASHRAE 62.2 Ventilation Standard. The various types of ventilation systems and equipment options will be outlined. Participants will be encouraged to discuss ways builders and HVAC contractors can evaluate ventilation options that are appropriate for their climate zone. Builders and their contractors will take away key ventilation system design parameters and installation methods. Participants will gain a thorough understanding of the cost of ventilation – both installation and operation. Builders will also learn the key benefits of proper ventilation for themselves and their homebuyers when they are applied in high performance homes.

Who Should Attend

- The workshop is targeted to at least the following groups:
- New home builders and remodelers and their site supervision staff
- HVAC contractors
- Designers and architects
- Building Officials and Energy Raters
- Estimators and contract managers of builders
- Building supply and manufacturers' representatives who wish to promote materials applicable to the specifications
- Specific trade contractors such as HVAC, foundation, framers, and insulators
- Utility and housing program officials who promote ENERGY STAR Homes.

Relevance to Attendees

- Learn why ventilation is an important part of all high performance homes and how ventilation fits into the systems approach of building science
- Learn to properly size ventilation and identify cost-effective ventilation system options
- Identify the best, most cost-effective technical details and process changes needed to achieve the new ENERGY STAR V3 requirements
- Energy raters and building officials will better be able to recognize the elements of good ventilation systems
- Identify the benefits of ventilation to the builder and homebuyers and demonstrate the cost effectiveness of ventilation options.

Note:

The workshop will in all cases be adapted to the climate zone and building practices of the local area where it is being presented to ensure it is relevant to participants.

Agenda

Session Segment	Activity Plan	Timing
<p><u>Introduction to EEBA and its Sponsors</u></p> <ul style="list-style-type: none"> • What EEBA does • Relevance of the Houses that Work Program • EEBA publications and education • The EEBA Conference • Introduction of speaker and sponsors 	<p>Facilitator has sponsors and participants introduce themselves and asks participants what prompted their interest in today's session.</p>	10 minutes
<p><u>The Relevance of Ventilation in High Performance Homes</u></p> <p>This segment will review the basics of high performance homes such as air, heat and moisture flow control. A discussion of how proper ventilation is an important part of the total HVAC system to control moisture and indoor air quality.</p> <p>1. The changes in the way we build and use houses that increases the need for ventilation</p> <ul style="list-style-type: none"> • Tighter buildings, more moisture issues, different building materials and higher expectations of homebuyers <p>2. Code requirements, applicable standards and how ventilation fits into energy efficiency and green building programs.</p> <ul style="list-style-type: none"> • Outline of the ASHRAE 62.2 Ventilation Standard. • The role of ventilation in various housing programs such as ENERGY STAR and LEED for Homes. • How local climate and building practices may affect ventilation system options 	<p><u>Small Group Exercise:</u> Participants work together to list industry changes that impact performance.</p> <p><u>Question & Answer:</u> Participants are asked about local climate and code conditions that impact the way they build</p> <p><u>Short Lecture:</u> Facilitator outlines the role of ventilation is codes and green programs.</p>	30 minutes
<p><u>Proper Sizing of Ventilation for Homes</u></p> <p>In this segment participants will be given exercises to learn how to properly size ventilation systems using the ASHRAE 62.2 Ventilation Standard for various types and sizes of homes. The differences between the need for continuous whole house ventilation and intermittent spot ventilation for specific rooms will be highlighted.</p> <p>1. Sizing for whole house continuous ventilation</p> <ul style="list-style-type: none"> • Minimum ventilation requirements and best practice ventilation rates to optimize energy efficiency and indoor air quality • Control options for continuous ventilation 	<p><u>Short Lecture:</u> Facilitator demonstrates the sizing formula for ventilation.</p> <p><u>Individual Exercise:</u> Participants are given a sizing exercise to work on.</p>	20 minutes

<p>2. Requirements for intermittent specific room purpose ventilation</p>		
<p><u>Ventilation System Options – Whole House Ventilation</u> In this segment participants will learn about the various ventilation system options. Advantages of each system will be outlined. The key design and installation parameters to ensure successful application of each option will also be highlighted using a series of group exercises and case studies. Each system option will be discussed in relation to the building practices and climate specifics relevant to where the workshop is being held.</p> <ol style="list-style-type: none"> 1. Exhaust-only ventilation systems <ul style="list-style-type: none"> • Design parameters, equipment and control options • Installation and commissioning requirements • Cost implications 2. Supply-only ventilation systems <ul style="list-style-type: none"> • Design parameters, equipment and control options • Installation and commissioning requirements • Cost implications and integration with heating and cooling systems 3. Balanced ventilation systems <ul style="list-style-type: none"> • Design parameters, equipment and control options • Installation and commissioning requirements • Heat and energy recovery cost implications for specific climate zones 	<p><u>Question & Answer:</u> Participants are shown pictures of different ventilation strategies and asked for their feedback on any experience they have had with the techniques and products shown.</p> <p><u>Small Group Exercise:</u> Participants work together to develop lists of the advantages and challenges with each type of ventilation strategy.</p>	<p>50 minutes</p>
<p><u>Intermittent and Spot Ventilation Systems</u> This segment will cover ventilation requirements for specific purpose needs such as kitchens, bathrooms, laundry areas and attached garages. In each case sizing parameters and equipment options will be outlined.</p> <ol style="list-style-type: none"> 1. Kitchen ventilation requirements <ul style="list-style-type: none"> • Sizing to control cooking pollutants and moisture • Equipment and control options 2. Bathroom ventilation <ul style="list-style-type: none"> • Sizing to control moisture and odors • Equipment and control options 3. Special ventilation needs <ul style="list-style-type: none"> • Laundry rooms, attached garages and shop areas 	<p><u>Short Lecture:</u> Facilitator covers the issues related to ventilation of critical areas.</p> <p><u>Individual Exercise:</u> Participants will size ventilation for specific areas of a house plan.</p>	<p>20 minutes</p>
<p><u>Integrating Ventilation into High Performance Homes</u> This segment provides participants with important</p>	<p><u>Short Lecture:</u> Facilitator will demonstrate the</p>	<p>30 minutes</p>

<p>information about how ventilation systems could affect or interact with other elements of high performance homes. Participants will learn how ventilation impacts heating and cooling loads and how ventilation systems can be integrated with typical HVAC systems. The issue of building pressures and combustion safety will also be outlined and participants will be shown how to evaluate and test for the impact of ventilation on systems on building pressures.</p> <p>1. The impact of ventilation on heating and cooling loads</p> <ul style="list-style-type: none"> • Calculating load changes for different ventilation system options • Control and ducting options for integrating ventilation into HVAC systems <p>2. The impact of ventilation on building pressures and combustion safety</p> <ul style="list-style-type: none"> • Combustion and make-up air requirements • Testing houses for depressurization and back drafting • Strategies for managing house pressures 	<p>impact of proper ventilation on other house systems.</p> <p><u>Question & Answer:</u> Participants are asked for their feedback on any experience they have had with these issues and how they were overcome.</p>	
<p>Commissioning and Maintaining Ventilation Systems This segment will show participants the requirements for proper measuring and balancing of ventilation flows in accordance with program requirements for ENERGY STAR and LEED for Homes. Participants will also discuss maintenance requirements of various system options and how they can empower homebuyers to undertake proper maintenance</p> <p>1. Measuring and balancing ventilation system</p> <ul style="list-style-type: none"> • Tools needed and cost effective techniques <p>2. Cleaning and maintaining ventilation systems</p> <ul style="list-style-type: none"> • Designing systems to facilitate cleaning • Providing homeowner education 	<p><u>Demonstration:</u> The facilitator, with help from selected participants / sponsors, will demonstrate how to measure airflow and maintain selected ventilation systems.</p>	20 minutes
<p>Promoting the Benefits of Proper Ventilation This final segment will help participants learn how to promote the benefits of proper ventilation to homebuyers</p> <p>1. Educating sales staff and educating homebuyers</p> <ul style="list-style-type: none"> • Recognizing the growing interest in healthier indoor air • Using programs such as the ENERGY STAR IAQ Label and LEED for homes to highlight the benefits of proper 	<p><u>Small Group Exercise:</u> Participants will work in groups to identify tools they could use to promote better ventilation to homebuyers.</p>	15 minutes

ventilation		
Summary and End of Workshop	Final Review Question and Answer: Participants are asked to quickly size a ventilation system for a house. Participants are asked: - Which ventilation strategy is best suited for them and why.	15 minutes
End of Workshop		

Training Time and CEUs/Professional Development Credits

3.5 Hours of Educational and Training Time

This Seminar qualifies for CEUs/Professional Development Credits from the following accreditation organizations:



Pricing

The hosting fee for this seminar is \$6500

The registration fee for this seminar is \$65 (online registration) or \$70 (on-site registration)*

* The registration fee includes lunch when two half-day sessions are combined for a full day.

Reading Material and Online Resources

The reading material for the course consists of documents, publications and online resources relating to each educational and training seminar. You are welcome to order, view or print the resources if you



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choose. You can find them by following the links below to the EEBA, Department of Energy and EPA/IAQ websites.

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[Builder's Guide to Cold Climates](#)

[Builder's Guide to Hot-Dry / Mixed-Dry Climates](#)

[Builder's Guide to Hot-Humid Climates](#)

[Builder's Guide to Mixed-Humid Climates](#)

[Online bookstore with EEBA Publications, issue-specific guides, software and tools](#)

Software Resources

[Building Better Homes DVD](#)

Online Resources

[National Residential Efficiency Measures Database](#)

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