Builder Panel: Ventilation Best Practices in Different Climate Zones

EEBA Excellence in Building Conference 2014
Greg Cobb, iEngineer
Overview

- Introductions
- Fresh Air Ventilation Primer
- Panel Discussion / Q&A
Introductions

- CR Herro – Meritage Homes
- Luis Imery – Imery & Co.
- Ted Clifton – TC Legend Homes / Zero Energy Plans
- Steve Brown – Carl Franklin Homes
Ventilation Requirements

- Codes: 2012 IRC/IECC
- Programs: Energy Star 3.0/3.1
- Standards: ASHRAE 62.2
  - 2010 Formula:
    - Conditioned sq.ft. x 0.01, plus
    - (Bedrooms + 1) x 7.5
    - Includes assumed infiltration rate credit
  - 2013 Update
    - Conditioned sq.ft. x 0.03, plus
    - (Bedrooms + 1) x 7.5
    - Reduce by measured infiltration rate
Outdoor Conditions

- What is in Outdoor Air?
  - BTUs (or lack thereof)
  - Moisture
  - Dust/Pollen/Allergens
  - Odors

- Common Conditions:
  - Cold & Dry (<30°F <30% RH)
  - Cool & Humid (<60°F >60% RH)
  - Mild
  - Warm & Humid (>85°F >60% RH)
  - Hot & Dry (>95°F <40% RH)
## Interior Pressure

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Intake</th>
<th>Exhaust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Known Source &amp; Filtered</td>
<td>Through Bldg Envelope</td>
</tr>
<tr>
<td>Negative</td>
<td>Through Bldg Envelope</td>
<td>Known Exit</td>
</tr>
<tr>
<td>Balanced</td>
<td>Known Source &amp; Filtered</td>
<td>Known Exit</td>
</tr>
</tbody>
</table>
Ventilation Methods

- Positive Pressure
  - Inline Fan / Powered Ventilator w/ Dehumidification
  - HVAC Blower w/ Intake Duct to Return
- Negative Pressure
  - Exhaust Fan
- Balanced
  - HRV / ERV
- Combinations
Intake/Termination Locations

- Intake
  - Roof
  - Wall
  - Eave/Porch

- Termination
  - Return Can/Plenum
  - Supply Can
  - Conditioned Space
Controls

- ASHRAE 62.2
- HVAC Blower/Fan/Damper Control
- Sensors
- Temperature Lock-out
- Humidity Lock-out
- Dehumidification
- Synchronize/Piggyback w/ Heating/Cooling Call
- Stand Alone vs. Incorporated w/in Thermostat
Preventable Problems

- High Moisture, Window Condensation, Mold
- Dust / Ghosting
- Combustion Appliance Backdrafting
- Drawing in Garage Gases
- Hot / Cold Spots
- Drafts
- Fan Noise
- Increase Heat Load & Equipment Sizing
- Compromising Envelope Performance
- Excessive Energy Consumption
Predictions

- New Products:
  - Heat Pump Ventilators
- Sensors
  - Occupancy
  - Target Contaminants
- Added Intelligence
  - Controls
  - Standards
Builder Panel / Q&A

- CR Herro – Meritage Homes
- Luis Imery – Imery & Co.
- Ted Clifton – TC Legend Homes / Zero Energy Plans
- Steve Brown – Carl Franklin Homes