



# Builder Panel: Ventilation Best Practices in Different Climate Zones

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# 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 ( $<30^{\circ}\text{F}$   $<30\%$  RH)
  - Cool & Humid ( $<60^{\circ}\text{F}$   $>60\%$  RH)
  - Mild
  - Warm & Humid ( $>85^{\circ}\text{F}$   $>60\%$  RH)
  - Hot & Dry ( $>95^{\circ}\text{F}$   $<40\%$  RH)



# Interior Pressure

Pressure	Intake	Exhaust
Positive	Known Source & Filtered	Through Bldg Envelope
Negative	Through Bldg Envelope	Known Exit
Balanced	Known Source & Filtered	Known Exit

# 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

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