PIER Research for the 2008 Residential Building Standards

Revision to the Residential ACM Calculation for Indoor Air Quality Ventilation

March 28, 2006

Bruce Wilcox

Ken Nittler

Agenda

- Background
- Envelope Air Tightness
- Mechanical Ventilation
- Proposed Model
- Impact with Defaults

Background

- The Residential ACM specifies the rules and algorithms to be used in compliance Calculations
- 2005 ACM assumes Specific Leakage Area (SLA) is 4.4 with sealed ducts
- 2005 ACM assumes occupants open windows to maintain IAQ if natural air change rate is too low
- Hourly window operation depends on house air tightness and weather and IAQ ventilation is rare with default SLA
- Mechanical ventilation included in ACM but rarely used

Change in Air Tightness Assumption

- Current default Specific Leakage Area (SLA) 4.4 (sealed ducts) based on California houses built in 1984-1987
- Typical houses are getting tighter
  - RCQ Study average SLA = 3.2 – 3.5
  - Wilson, 76 2002 homes in Southern California, average SLA = 2.8
- Proposed new default SLA = 3.8 with sealed ducts

2008 Proposal for Mechanical Ventilation

- Based on ASHRAE Standard 62.2
- Default is continuous exhaust fan
- Ventilation Rate is
- 0.01 * conditioned floor area
- + 7.5 * (number of bedrooms + 1)
- 48 CFM in the 1761 Prototype
- Default W/CFM is 0.25

Default IAQ Ventilation Increases Annual TDV 1%