

## Review of 2009 IECC for Attic Accesses

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*Why is it important and what is compliant?*

### **Background**

There are a number of factors that led up to the adoption of the new code requirements for attic accesses. First, it is known that more energy is lost through the attic than any other area of a home. The use of thermal cameras, blower door device and computer modeling revealed the large amount of conductive and convective heat transfer that occurs through attic accesses in both hot and cold weather.

UA calculations were first used in weatherization for calculating the insulating value of an area with uneven levels of insulation. This calculation proved that an attic access without insulation will significantly reduce the insulating value of the total attic. (For a 1,000 ft<sup>2</sup> attic at R-38 with a folding ladder, using the conventional simple averaging reduced the R-value by less than R-1. The UA calculations indicate a real reduction of R-12). This shows the need for the insulating value of the attic access to be consistent with the rest of the attic. Further, since the attic access cover will be moved to enter and exit the attic, it is important that the insulation used is durable and not subject to being compressed. Compressed fiberglass insulation loses significant insulating value.

Loose fill insulation has increasingly been used instead of batt insulation. This insulation can readily fall into the living space when entering and exiting the attic thereby creating a need for a blocking device to keep loose fill insulation in the attic to maintain a consistent insulating value in the area around the attic access.

With the tightening of the thermal envelope everywhere else in the structure, any remaining opening such as the attic access will be a source of increased air leakage. Air leakage through the attic access in the otherwise tightened thermal envelope contributes to or causes other significant problems in the structure such as rainy attics, mold and ice damming.

### **The Code**

The standards for attic hatches and doors address each of the above items. The new standards exist in two separate and distinct sections of the 2009 IECC. Sections 402.2.3 and 402.4.1 of the 2009 IECC contain the specific new requirements.

First, section 402.4.1 has a new requirement for a durable air seal for attic access openings. Since this is a mandatory requirement, it cannot be addressed by a simulated performance alternative.

Section 402.2.3 has the following new prescriptive requirements:

1. Insulation R-Value equivalent to the rest of the attic
2. Wood or Equivalent protective baffle when loose fill insulation is installed
3. Non-Compressible Insulation

Section 401.2 allows for prescriptive requirements of various sections and specifically Section 402.2.3 to be met by section 405, Simulated Performance Alternative. This includes the use of approved compliance software tools such as the 2009 ResCheck software.

## **ResCheck**

The ResCheck program provides an alternative measure for the insulating R-Value requirement of the attic access. This is accomplished with a UA calculation for the entire structure. This alternative reduces the R-Value requirement for the attic access in most cases. This calculation takes into account the fact that there are areas of a structure where it is not feasible to have levels of insulation that meet the required R-Value.

ResCheck is clear in the scope of what it addresses: “REScheck is appropriate for insulation and window trade-off calculations in residential detached one- and two-family buildings and multi-family buildings three stories or less in height above grade, such as apartments, condominiums, and townhouses. REScheck works by performing a simple U-factor x Area (UA) calculation for each building assembly to determine the overall UA of a building. The UA that would result from a building conforming to the code requirements is compared against the UA for your building. If the total heat loss (represented as a UA) through the envelope of your building does not exceed the total heat loss from the same building conforming to the code, the software generates a report that declares your building is compliant with the code.” Source: <http://www.energycodes.gov/rescheck>

If the Rescheck program is used and the insulating values are met for the total structure including the attic access, then it produces a 2009 IECC compliance certificate despite the fact that the only information submitted on the ResCheck checklist pertaining to the attic access is “Attic Access Hatch & Door insulation R-Value of the adjacent assembly”.

ResCheck does not address the requirements listed in 2-3 above for wood or equivalent protective baffle and non-compressible insulation.

The purpose of these other 2009 IECC requirements is clearly stated in the code. For example, “a wood or equivalent baffle or retainer is required to be provided when loose insulation is installed” It goes on to clarify, “the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and, to provide a permanent means of maintaining the installed R-Value of the loose fill insulation.” This is an important health issue for the resident(s) as well as a means to achieve and maintain the proper insulating value in the attic for the long term. This requirement is not included in the ResCheck check list.

The need for non-compressible insulation is also straight forward -“Access shall be provided... that prevents damaging or compressing the insulation.” The insulation on the attic access will be subject to movement, leaning against more rigid objects and/or under the weight of the hatch cover in the normal course of entering and exiting the attic that will compress any non-rigid insulation.

Based on the clarity of purpose from the explanation provided in the code, it is common sense that non compressible insulation and a protective barrier is needed. Nonetheless, a literal reading of the

requirements for ResCheck and the Prescriptive requirements that are in 402.2.3 appear inconsistent. Sections 101.4 and 303.2 provide guidance on resolving the matter.

Section 101.4 titled Applicability states that, “Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.” Following this guidance, having a protective barrier is more restrictive than no barrier and having non-compressible insulation over the attic hatch or door to the attic is more restrictive than any type of insulation. That logic is consistent with the common sense approach above.

Section 303.2 provides further clarity on both of these requirements as it states that, “All materials, systems and equipment shall be installed in accordance with the manufacturer’s installation instructions and the International Building Code.” The manufacturers of batt insulation such as Owens Corning<sup>i</sup> indicate that “To get the marked R-Value, it is essential that this insulation be installed properly.” “Insulation should not be compressed... as this results in a reduction of R-Value.” Relying on the requirement to follow the manufacturer’s installation instructions, it is clear that the use of non-compressible insulation is required and compressible batt insulation should not be used to insulate the attic access. Using batt insulation, the uncompressed R-Value stated on the ResCheck checklist for the attic access will be inaccurate and also non-compliant with section 303.2.

Again referencing Owens Corning and its installation instructions for loose fill insulation, it states that, “Failure by the installer to provide... at least the minimum thickness will result in lower insulation R-Value.”\*\*<sup>ii</sup> Without a protective barrier around the attic access, the loose fill insulation will need to be tapered as it approaches the opening or the insulation will fall freely into the living space. In either case, the loose fill insulation will not meet the thickness required for the stated R-Value. Absent a viable protective barrier or the contractor entering an additional ceiling component, the R-Value stated on the ResCheck checklist for the ceiling will be inaccurate or non-compliant with section 303.2.

Taking the ResCheck compliance certificate as a total solution for the attic access requires that the standards for a wood or equivalent protective barrier, non-compressible insulation, and a durable air seal be ignored. That would be inconsistent with the written code and detrimental to the homeowner.

## **Non-compliant Measures**

A structure with or without a 2009 IECC compliance certificate is often non-compliant for:

1. Batt insulation on the hatch cover
2. No air sealing measure or Gaps in the air sealing measure
3. Air sealing measures that are not durable
4. No Protective Baffle
5. A Protective Baffle made of batt insulation, cardboard or low density foamboard

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<sup>i</sup> Owens-Corning Website ([http://www2.owenscorning.com/literature/pdfs/21149-E%20EcoTouch%20R-21%20High%20Density%20\(for%20x6%20Exterior%20Walls\)%20Data%20Sheet.pdf](http://www2.owenscorning.com/literature/pdfs/21149-E%20EcoTouch%20R-21%20High%20Density%20(for%20x6%20Exterior%20Walls)%20Data%20Sheet.pdf))

<sup>ii</sup> Owens-Corning Website (<http://www2.owenscorning.com/literature/pdfs/22676PROPINKL77ManufacturersFactSheet.pdf>)

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## 2009 IECC Checklist for Attic Accesses\*

1. **Insulation (Choose one)**
  - A. R-Value equivalent to rest of attic
  - B. ResCheck Compliance Certificate
  
2. **Type Insulation- (With or without ResCheck Compliance Certificate)**
  - A. Non-Compressible Insulation (No Batt Insulation)
  
3. **Protective Barrier around the opening (With or without ResCheck Compliance Certificate)**
  - A. Wood or equivalent (dense insulation board)
  - B. No batt insulation, cardboard or low density board
  
4. **Durable Air Seal (With or without ResCheck Compliance Certificate)**
  - A. Continuous air seal measure (No gaps in air sealing)

**\*Note:** This checklist takes into account sections 101.4, 303.2, 401.2, 402.2.3, 402.4.1, and 405 of the 2009 IECC which all or parts pertain to the requirements for all attic accesses from conditioned to unconditioned spaces.