



# **The Truth About** Air Infiltration

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**Insulation Help for Homebuilders and Design Professionals**

Not knowing the difference between proper insulation and air barriers can cost you



## **Higher energy efficiency requirements**

*for all buildings seem inevitable. Today's homebuyers are becoming more and more sophisticated and are responding to the challenges of climate change. Accurate information helps control cost for builders. Here are the facts:*

- Insulation of any type is no substitute for proper sealing and prevention of air infiltration.
- Achieving the highest possible R-value and eliminating air infiltration are separate issues. Both must be done to make a home more energy efficient.

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- The energy performance of a home reaches its highest potential when the home is thought of as a combination of separate but integrated systems that include insulation, moisture control, ventilation, and air sealing. Combined, these make up the full thermal performance of the home. All materials used in building construction combine to deliver the overall performance.
  - In 16 C.F.R. Part 460, the Federal Trade Commission (FTC) established a definition of R-value to provide a way for consumers to compare various products that perform the same function. R-values for insulation products were never intended to measure the complete thermal performance of a home. What is R-value? R-value is the measure of how well insulation resists the flow of heat or cold. Higher R-values mean greater ability to slow the movement of heat energy.



*The U.S. Department of Energy says that*

“air sealing alone can’t replace the need for proper insulation throughout your home...”

*Compare cost and effectiveness of products that claim to offer both thermal and air infiltration protection in a single spray application with products such as fiber glass and mineral wool insulation that, when properly installed and used with a suitable air barrier material applied to joints, seams, and penetrations, provides optimal thermal protection. Every home is a combination of systems.*



## Thermal Envelope and System Integration

To meet code requirements and to provide energy efficiency, building products and construction techniques that contribute to a structure's thermal envelope must work together to maximize protection and performance. The following materials and methods mean nothing when thought of as separate and independent, but must function as part of a home's thermal envelope (the outermost shell of a building that keeps heat out in summer and in during winter):

- Insulation;
- Exterior cladding;
- External air barrier;
- Framing;
- Windows and doors; and
- Air sealing penetrations

## Address Air Infiltration

Leaks and drafts (air infiltration) can happen in a variety of places. Air barriers block air movement through building cavities which, as a result, the U.S. Department of Energy says on its website under Insulation and Air Sealing, can save up to 30 percent on heating and air conditioning costs. In two consumer's guides for Air Sealing and Insulation and Air Sealing, the U.S. DOE says on its website that "air sealing alone can't replace the need for proper insulation throughout your home, which is needed to reduce heat flow," and that "any air sealing efforts will complement your insulation efforts and vice versa."



*Where to guard against air infiltration.*



*Where proper insulation works to keep homes warm in winter and cool in summer.*

## **Address Insulation**

Insulation provides resistance to the flow of heat. The more resistance insulation provides, the lower the heating and air conditioning costs for homeowners. Savings vary. Builders must provide fact sheets on R-value when selling a home. The FTC has said in 44 Fed. Reg. at 50221 (August, 1979) that the “R-value of an insulation material is the only existing measurement that enables the consumer to compare the thermal performance of competing insulation.”

## **Add it Up**

The entire home should be treated as a combination of systems. Air sealing and insulation should be addressed separately. Walls are different from attics. Compare costs. Compare performance. Compare fiber glass and rock and slag wool insulation used with an air barrier for joints, seams, and penetrations with products that claim to perform both functions—insulate and seal—in a single spray application.

**Insulation of any kind is no substitute for addressing air infiltration.**

## **Environment and Sustainability**

Fiber glass and rock and slag wool insulation contain recycled material. Fiber glass insulation is made from sand and recycled glass. Rock and slag wool insulation uses blast furnace slag, a waste byproduct of steel production. These products are naturally fire retardant and do not require the addition of fire-retardant materials.

# What is R-value?

R-value is the measure of how well insulation resists the flow of heat or cold.

Higher R-values mean greater insulating power.

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