

ENERGY SAVINGS: AIR SEALING THE RIM JOIST IN A BASEMENT

Case Study:

Renovation was taking place on a 2,400 ft home built in 1977. Choosing cabinetry and carpeting proved to be the easy decisions. When it came to adding insulation to the home, the home owner did some reading and wanted to pay special attention to also ensure an energy efficient home during the improvements. The home owners understood the value of adding insulation, how it would both increase the resale value of the home add energy efficiency and return an immediate cost savings associated with the efficiency of the home. One of the areas of concern was the unfinished basement.

Problem

Often times ONLY fiberglass batts are used as insulation material in residential construction. However, while fiberglass is a thermal barrier, it is not an air barrier. Stopping air infiltration is the best defense against energy loss. In fact, the Department of Energy estimates that up to 40% of energy loss in a home can be contributed to air infiltration. Also, creating an air barrier becomes vitally important around the perimeter of a basement in a rim joist because without it, moist air from inside can filter out through fiberglass creating condensation at a cold rim joist. This condensation or moisture can eventually lead to mold and mildew problems.



Solution

Spray Foam, first, was applied to seal and insulate the basement rim joist of the home. Because of its closed cell properties, spray foam creates both an air and a vapor barrier at the rim joist. After the application of the spray foam, fiberglass "pillows" were added and also sealed with foam to ensure not only an air barrier, but also an added thermal barrier. The home was tested, via blower door test, to verify the energy savings and the reduction of uncontrolled air infiltration. The results of this "case study" showed that a reduction in annual infiltration rate estimated at 11.4% was achieved in the house simply by applying the foam spray foam in the rim joist locations. This reduction in air infiltration translated to an estimated annual cost savings of approximately 19.3% for heating and cooling.

The dramatic decrease in uncontrolled air infiltration that can be achieved with the combination of foam and fiberglass batt "pillows" verified through the use of a "blower door" test, which is an EPA Energy Star recognized diagnostic method for measuring airtightness, and performed by a certified third-party home energy rater accredited by the U.S. Government. In this case study, the home was first tested with standard fiberglass insulation in the rim joist areas. After this initial blower door test was performed, the addition of the two-component spray foam in these rim joist areas at an average thickness of 3" improved results verify the reduction in unwanted air infiltration, which was equivalent to eliminating 36.8 in 2 of holes in the building envelope!

Two-component spray foam may be used in a variety of locations throughout the building enclosure to help stop air infiltration, leading to energy savings.

Compliments of:

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