Building America Case Study
Technology Solutions for New and Existing Homes

Insulated Siding Retrofit in Climate Zone 6

New Paltz, New York

PROJECT INFORMATION

Project Name: Insulated Siding Retrofit in Climate Zone 6

Location: New Paltz, NY

Partners: Kinsley Construction

Building America Team: BA-PIRC, www.ba-pirc.org

Building Component: Building envelope component – exterior cladding and water resistive barrier

Application: Retrofit; Single family

Year Tested: 2012-2013

Applicable Climate Zone(s): 4, 5, 6

PERFORMANCE DATA [of the measure alone, not whole house]

Cost of Energy-Efficiency Measure (including labor): $1,618 (higher than standard vinyl siding retrofit)

Projected Energy Savings: 7% space/water heating savings/year

Projected Energy Cost Savings: $170/year

In addition to its thermal benefits and reduction in air infiltration which increase a home's energy efficiency, reduce utility costs, and increase comfort, insulated siding has outstanding impact resistance, is long-lived, and manufactured with recycled materials.

Building America U.S. Department of Energy

In recent years, re-siding a home with insulated siding has ranked as one of the best remodeling projects for the resale of homes, based on a cost to value ratio. (Remodeling Magazine. 2010. "Cost vs. Value Report." Hanley Wood.) In a merger of style with function, insulated siding is successfully capturing the attention of home buyers, by simultaneously improving curb appeal and the energy performance of homes.

In 2011, insulated siding was recognized by the U.S. Environmental Protection Agency's ENERGY STAR for Homes Program as an insulation product that can help meet its mandatory requirement for reducing thermal bridging. Also in 2011, the International Code Council recognized insulated siding as a product that can be used to meet above grade walls' continuous insulation requirements in the 2012 International Energy Conservation Code (IECC).

Though insulated siding has been commercially available since 1997, product developments have increased its recognition as a premium residential cladding that will improve a building's thermal performance. Furthermore, the insulated siding industry has made significant strides to standardize testing of products, develop an industry guide for installers and specifiers, and sponsor a long-term research project to quantify the energy performance benefits of insulated siding on retrofits of existing homes.

Insulated siding is an integrated vinyl siding material whereby contoured expanded polystyrene insulation is permanently adhered to the vinyl siding panel. Tested insulating values of insulated siding range from R-2.0 to R-2.7 and new products are under development as high as R-5.0. Insulated siding is installed in a similar fashion to standard vinyl siding, but care must be taken to assure that the insulation panels butt tightly to one another. Like standard vinyl siding, manufacturers recommend installation on a flat surface over a water resistive barrier with seams taped to help prevent water intrusion.

DESCRIPTION

Pre-Retrofit: Southeast Side of Home

Home constructed in 1969. Aluminum siding. No water resistive barrier. R-11 fiberglass batts in wall cavity. Poorly installed nominal R-22 attic insulation. Below grade walls un-insulated. Single pane wood windows with storms.

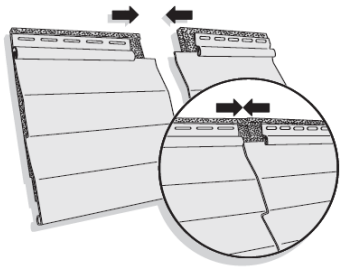
Post-Retrofit: Southeast Side of Home

R-2.7 insulated siding installed over water resistive barrier with seams taped. Air sealing around windows, doors, and penetrations through above grade walls. No other energy upgrades made to isolate impact of siding retrofit.

Air Tightness Improvement: 9.5%

Observed Heating Energy Savings: 8% (normalized for outdoor temperature variation – therms/HDD)

Siding and Trim Profiles for Insulated Siding. Multiple profiles and colors available. Trim pieces for all detailing available in white and coordinated colors.



Full Installation Guide. Install over flat surface and water resistive barrier. Nail loosely with 2” corrosion-resistant nails 16” o.c. Allow ¼” gap between siding and trim pieces above 40°F – slightly more at colder temperatures. To overlap, slip vinyl edge of one panel beneath foam and vinyl of adjoining panel; slide together until foam ends touch.

Lessons Learned

- Challenging to achieve apples-to-apples comparison in field evaluation
- Realized over 9% improvement in measured air tighness of building
- Normalized utility bill data showed 8% reduction in Btu/HDD consumed over one post-retrofit heating season
- Homeowner reported increased comfort and reduced draftiness
- Alternate options to achieve equivalent R-value, e.g., rigid insulation, would carry higher labor costs as well as material costs.
- Cost of insulated siding and trim materials for this project $1,618 higher than standard vinyl siding
- Labor costs equivalent for standard and insulated siding

Looking Ahead

New generations of integrated insulated siding with higher R-values will offer greater opportunity for energy efficiency improvements in existing homes. Future field evaluations would benefit from more discrete pre- and post-retrofit monitoring.

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

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The U.S. Department of Energy’s Building America program is engineering the American home for energy performance, durability, quality, affordability, and comfort.