



ReVISION House™ Orlando 2011

Manufacturer: Honeywell

Product: Enovate® Spray Foam Blowing Agent

Category: Insulation

Honeywell

Renovating existing homes for superior energy efficiency, comfort, and market appeal involves more than meets the eye. Insulation levels, along with air-sealing and moisture management issues, are critical.

When faced with the option of keeping the insulation in its existing location or selecting a new one, we saw a clear opportunity to positively impact the performance of the home. For example, by installing the wall insulation on the exterior of the block walls rather than on the interior as in the original, the thermal mass of the concrete blocks became beneficial in leveling temperature fluctuations and maintaining more consistent conditions.

The attic insulation placement provided an even more interesting challenge. Since the original insulation was placed on the attic floor, and the heating and air-conditioning equipment, along with all the ducts, was above the insulation in the attic space, all the apparatus for creating and distributing conditioned air was located in the hottest space in the home. During warm weather, the attic could register temperatures over 140 degrees and relative humidity of 70%, increasing the stress on the equipment. Under these conditions, conductive and air-leakage losses to the attic could be significant, resulting in huge efficiency losses and comfort problems in the living space below.

To improve this situation we considered two options: replace the HVAC system with a new system located outside the attic in already conditioned space; or condition the attic space by placing the insulated thermal barrier at the roof deck rather than at the attic floor. Both responses could be effective but the ReVISION House™ team was reluctant to relocate the equipment considering the home's already-tight floor plan. We decided on the conditioned-attic approach.

Since sustainability is more than just energy efficiency, the project team wanted to make sure that the products used for the roof deck-applied insulation also responded to other performance criteria. The team chose closed-cell spray polyurethane foam (ccSPF) for its high R-value per inch, and its relative moisture vapor impermeability. Also important was the blowing agent used in applying the foam. Since ccSPF is a two-component foam (one part polyurethane; one part application vehicle), the team wanted to make sure the blowing agent was also environmentally responsible.

The team turned to Honeywell and its Enovate® blowing agent. Non-flammable, and non-ozone depleting, Enovate® replaces the standard (ozone-depleting) HCFC-141b blowing agent, while not diminishing any of the foam's performance attributes.

Applied at a depth of just over 3 inches, the R-6.2 per inch foam gave us about R-20 at the roof deck, along with vapor impermeability and outstanding air-sealing performance. With these improvements, the heating and cooling equipment in the ReVISION House is still located in the attic, which is now a conditioned space, with far fewer conductive losses and virtually no air-leakage to the outside. The end result? Higher efficiency, improved comfort, and better moisture management. For insulation, that's the trifecta.