



VISION House® Orlando 2011

Manufacturer: Icynene®
Product: LD-C-50®
Category: Insulation



In designing and planning the VISION House® Orlando as a reworking of the classic farmhouse, the design team had a significant advantage to work with: an exceptionally efficient floor-area to wall and roof area ratio. Why is this important? The more floor area which can be enclosed by a given building enclosure surface area results in less heat loss and heat gain per square foot of living space. It also means that if we want to improve the building enclosure performance to exceptional levels there is less of it to improve; therefore the incremental cost of improvement is reduced.

The classic and simple building form of the VISION House essentially consisted of a two-story rectangular box with a narrow gable at the front and rear, an open two-story, covered front porch, and a small bump-out at the right side serving the mudroom (first floor) and laundry/hobby space (second floor). The living space was enclosed in a very-recognizable Greek-revival form making it extremely efficient with no wasted space. Given that nearly all homes in Orlando are built on slab foundations without basement and crawl spaces, we are left with the question of where to put the HVAC system.

In homes with basements, heating and air-conditioning systems (along with other mechanicals) are typically placed there out of convenience, and so they don't occupy more valuable floor plan area. When basements don't exist, either the equipment is squeezed into the floor plan or placed in the attic, another enclosed volume out of the living space. Here is where we usually encounter another problem: HVAC equipment and ducts tasked with producing and distributing 55 degree conditioned-air while in a space that can range up to 150 degrees or more in the summer. Attics are usually vented to exhaust heat and humidity, which means that any leak from the HVAC equipment escapes to the outside resulting in two bad things: energy losses and conditioned air-losses. The energy losses result in higher cost, reduced efficiency, and reduced capacity. The conditioned air losses are more nefarious. When interior conditioned air is lost, it must be replaced. Because the loss of air will slightly depressurize the house, the air that replaces it is literally sucked in from the outside.

For the VISION House the design team recognized these problems, and applied a solution which mitigates all the potential downsides. Rather than insulate the attic at the floor and vent space, the attic was insulated and sealed at the roof deck, making it part of the conditioned space. The upside for doing this is it provides additional contained space in which to place the HVAC equipment thereby avoiding the problems described above. In order to accomplish this, the insulation choice is critical. The wrong insulation choice could result in inefficiencies or envelope failures.

For this critical insulating task, the design team turned to Icynene® and its LD-C-50®. LD-C-50 is a light density, open celled, 100% water-blown polyurethane spray foam insulation. Generically, a half-pound foam (1/2 lb per cubic foot density) the LD-C-50 product does a few things remarkably well. The product sprays on as a liquid and then expands in seconds to surely and effectively fill all gaps, holes, and voids, assuring a complete "class-I" insulation application. Because the section of attic that the air-handling equipment is located in is not used for storage, LD-C-50 can be left exposed without the need for any additional coverings, saving both time and cost. Since the rest of the thermal enclosure is remarkably air-tight, the sealed attic needed to be too, and this was made possible with Icynene®.