



ICYNENETM
HEALTHIER, QUIETER, MORE ENERGY EFFICIENT*

THE ICYNENE[®] ADVANTAGE

APPLICATION CASE STUDY: ***Working Together to Build a “Green” Dream Home – The New American Home[®] 2006***



Synopsis:

- ✓ Minimized environmental impact by creating less pollution and waste
- ✓ Maximized energy efficiency with an unvented conditioned attic
- ✓ Created additional heating and cooling savings through HVAC rightsizing
- ✓ Increased resilience against wind and storms with an air-sealed attic assembly
- ✓ Reduced the potential for mold and mildew growth with advanced moisture management



Overview:

Each year, the National Association of Home Builders (NAHB) works with industry experts and manufacturers to design and build The New American Home® (TNAH®). Showcased at the annual International Builders' Show® (IBS®), TNAH® highlights the most innovative building techniques, design approaches and products, so they can be replicated in millions of homes across the country.

TNAH® also acts as a real-world laboratory. For the 2006 project, the home modeled and tested the latest energy solutions developed through the Building America Program. Building America is a private/public partnership that combines the knowledge and resources of industry leaders with the U.S. Department of Energy's technical capabilities. Together, they conduct research to develop advanced building energy systems that make homes and communities much more energy efficient.



"With The New American Home® there's a pressure to dazzle the public with the latest features, but our job was to balance those desires with sustainable practices. As a result, The New American Home® 2006 is probably more impressive than any that has preceded it." Christopher Joiner, WCI's Director of Design



With a distinctive, British-Caribbean flair, the home boasts a view of the lake from nearly every room. In addition to having such amenities as an "infinity pool", a spa and a second-storey library, TNAH® 2006 was designed to be environmentally friendly.

Situated on the shore of Windemere's Lake Burden in Orlando, Florida, TNAH® 2006 was built to introduce a new community to the green building philosophy. Green building is a philosophy of design and construction that integrates building products and components more effectively, while creating healthier, more efficient "high performance" structures, homes and communities. The NAHB recognizes that today's homeowners are turning to green building to lower utility costs, increase resale value and improve the environmental quality of the home.

At over 9,500 square feet, TNAH® 2006 is unlike any other in the program's 23-year history. With a distinctive, British-Caribbean flair, the home boasts a view of the lake from nearly every room. In addition to having such amenities as an "infinity pool," a spa, a master suite with a breakfast coffee station and laundry room, and a second-storey library, TNAH® 2006 was designed to be environmentally friendly.

The Challenge: Optimizing Housing Performance by Introducing the "Green" Building Philosophy

Since the program began in 1984, the key objective of TNAH® has been to combine the latest in high-performance home building products with beautiful, comfortable design. By incorporating such elements as energy efficiency and indoor air quality (IAQ) with safety and market value, TNAH® 2006 demonstrated that housing performance is equally as important as aesthetics.



TNAH® 2006 was certified by the Florida Green Building Coalition Inc. for using environmentally sound construction materials and principles, including ICYNENE LD-C-50™ⁱ.



ICYNENE LD-C-50™ was applied to the underside of the roof deck creating a sealed, unvented, and conditioned space for ductwork and air handlers. Photo courtesy of IBACOS, Inc. (www.ibacos.com)

Another goal of this project was to introduce production builders to advanced insulation strategies while focusing on airtightness.ⁱⁱ

In addition, the 2006 show home was set to become the first certified Florida Green Builders Coalition (FGBC) “green” home built through TNAH® program. Certified homes earn their designation through energy and water efficiency, site planning, healthy materials, durability and other green practices.ⁱⁱⁱ

Known for the firm’s expertise in green design, WCI Architecture & Land Planning was selected to meet the challenge: to create a home that was both elegant and functional while remaining environmentally conscious.

The Solution: Build “Green” with ICYNENE LD-C-50™

In collaboration with builder, Hannigan Homes, Inc., the WCI design team identified products and techniques that would contribute to the green certification. Green features embodied in the plan included abundant natural light and ventilation, insulated exterior concrete walls to mediate temperature differentials, and welcoming outdoor living spaces to foster a close relationship with the natural world.

One of the key green building products specified for TNAH® 2006 was ICYNENE LD-C-50™, a 100% water-blown insulation and air barrier material, which was used in the following applications:

- Icynene applied to the underside of the roof assembly to create an unvented conditioned attic
- Icynene applied to the two-storey entrance tower
- Icynene applied to wall transitions

When sprayed in place, Icynene forms a continuous thermal barrier that minimizes air movement, offering a tremendous impact on energy efficiency, moisture management and building durability.

“This is the first designated certified, green-built home in the whole [TNAH®] program, and Icynene was a major part of that,” said Alex Hannigan, President of Hannigan Homes.



Icynene soft foam insulation was carefully installed in the top of the two-storey entrance tower to minimize air movement and to insulate the home. Photo courtesy of IBACOS, Inc. (www.ibacos.com)



Decorative wood strip was applied with no problems because Icynene effortlessly adheres to the cavity. Photo courtesy of IBACOS, Inc. (www.ibacos.com)

The Result: Eco-Friendly Elegance

Clean Comfort

Icynene contains no HFCs or PBDEs and does not emit harmful gases in its cured form. Harmful emissions can compromise indoor air quality and can also diminish an insulation's rated R-value. Icynene is guaranteed to last the life of the building, eliminating the need to re-install additional material in the future and thereby reducing the impact to the environment.

In addition to contributing to a waste management strategy, Icynene helps create a comfortable indoor environment by minimizing the intrusion of outdoor allergens and pollutants.

Energy Efficient

Using Building America's systems-engineering approach, the relationship between building site, envelope, mechanical systems, and other factors were carefully considered. For instance, the shallow depth of the house makes it ideal for cross ventilation if the air conditioning is off, and the deep overhangs and loggias help keep out the direct sun. TNAH® 2006 is conditioned by high-efficiency heat pump units (SEER 15 average) and uses zone control to maintain ideal temperature settings in the home's six zones.

Icynene is a key component of this integrated systems approach. Applied underneath the roof deck, it offers a more hospitable area for ductwork and air handlers by turning the attic into a sealed, unvented, and conditioned space. Icynene's superior thermal performance helps reduce heating and cooling loads on mechanical equipment, contributing to energy conservation and money savings.

TNAH® 2006 is ENERGY STAR® rated through the Building America Program and uses 61% less energy for heating and cooling compared to a similar house in this climate zone (hot/humid).^{iv} Performance testing and monitoring was provided by Building America team member, IBACOS Inc., throughout all phases of the home's design and construction.

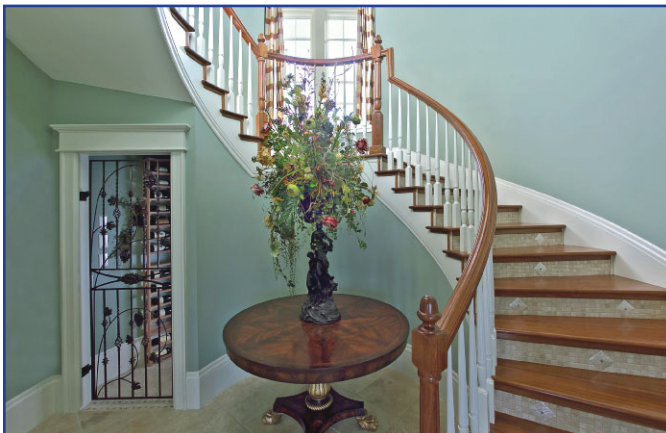


Safe and Sustainable

Because of its hurricane-prone location, TNAH® 2006 was built with concrete block walls to protect against storm damage. Icynene was applied to the underside of the roof deck to create an unvented conditioned attic assembly for added durability.

Traditional vented attics can allow wind, and the laterally-driven rainwater carried with it, to enter through the soffit vent assemblies. A unique material property of Icynene is its ability to create a continuous air-seal. By sealing the soffit vents and making the attic part of the conditioned space, Icynene minimizes moisture intrusion during severe weather conditions, reducing the potential for moisture-related problems (like mold) in the home.

Building science expert, Joe Lstiburek of Building Science Corporation, suggests that, *“This technology [unvented conditioned attic construction] has significant advantages in the Florida climate with respect to rainwater control, energy conservation, moisture and humidity control, wind uplift and fire performance over standard attic roof technology.”*^v



The entryway rises 30 feet, winding a grand spiral staircase with Brazilian cherry handrails to a dramatic octagonal ceiling made of cypress. Eyes instinctively drawn up, you almost don't notice the wine cellar built into the staircase.



“We are proud to have built a home that blends cutting-edge building design with environmental sensibility,” said builder Alex Hannigan

Icynene Puts Sustainable Goals in Reach for Any Green Building Project:

- ✓ Insulates and air-seals in one step to eliminate excess sealing material and accelerate the construction process
- ✓ Optimizes energy efficiency to deliver up to 50% in energy savings for homeowners
- ✓ Provides optimal airtightness and allows for HVAC equipment rightsizing
- ✓ Minimizes dust, allergens and other outdoor pollutants
- ✓ Delivers advanced moisture management to reduce the incidence of mold and mildew



Icynene Insulation

Icynene foam insulation products are sprayed into/onto walls, crawlspaces, underside of roofs, attics and ceilings by Icynene Licensed Dealers. They expand in seconds to create superior insulating and air-sealing results. Every crevice, crack, electrical box, duct and exterior penetration is effortlessly sealed to reduce energy-robbing random air leakage. Icynene products adhere to the construction material and remain flexible so that the integrity of the building envelope seal remains intact over time.

Icynene is ideal for residential, commercial, industrial and institutional indoor applications. The products are:

Healthier: Icynene spray foam products are CHPS (Collaborative for High Performance Schools) EQ 2.2 Section 01350 Compliant, meeting nationally recognized requirements as Low-Emitting Materials (LEM) and Environmentally Preferable Products (EPP). Icynene spray foam products are 100% water-blown and contain no HFCs or PBDEs. Icynene seals out dust, pollen and other allergens from entering the structure. As air barriers, Icynene products minimize the potential for airborne moisture build-up and related problems such as mold and mildew.

Quieter: By air-sealing the building envelope, Icynene effectively minimizes airborne sounds. Icynene is perfect for reducing unwanted noises from home theaters, plumbing runs and playrooms.

More Energy Efficient: Icynene delivers up to 50% more energy savings versus traditional insulation.

Information about Icynene insulation can be obtained by calling Icynene Inc. (800-758-7325), visiting the website Icynene.com, or contacting your local Icynene Licensed Dealer.

Endnotes:

- i Christopher Joiner, WCI's Director of Design, www.wcicomunities.com, Jan. 2006
- ii The New American Home® 2006. Building America Research that Works, Building Technology Program (Brochure), 2006, p. 1
- iii <http://www.floridagreenbuilding.org/>
- iv The New American Home® 2006. Building America Research that Works, Building Technology Program (Brochure), 2006, p. 2
- v Rainwater Management Performance of Newly Constructed Residential Building Enclosures During August and September 2004, p. 39

† The Icynene product installed and addressed in this project example is Icynene's classic formula, ICYNENE LD-C-50™.



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For more information, contact your local Icynene Licensed Dealer

**Visit our website: Icynene.com
or call**

1-800-758-7325

