

# THE ICYNENE® ADVANTAGE

*A Closer Look at Air Superiority in Action*



Vol. 12, Issue 01

## APPLICATION CASE STUDY: THE NEW AMERICAN HOME® - PART 1

### Synopsis:

- ✓ **Delivered energy efficient construction of three high profile homes at the International Builders' Show to meet Building America's energy efficiency guideline of HERS 90.**
- ✓ **Introduced advanced insulation and air tightness solutions.**
- ✓ **Reduced heating and cooling equipment requirements by 30%.**

### The Challenge

The New American Home® 2003 (TNAH) project at the National Association of Home Builders (NAHB) International Builders' Show is a living demonstration of the construction innovations that are enabling builders and architects to create Healthier, Quieter, More Energy Efficient® homes.

As the centerpiece display home for the International Builders' Show, a key goal of The New American Home® 2003 was to surpass other homes in the delivery of superior energy efficiency, without increasing construction costs. The challenge therefore was to build three different townhouse units designed for three distinct lifestyles, while maximizing the buildings' thermal performance and air tightness.

Located on the outskirts of Las Vegas, the units range from 2,775 to 3,151 square feet. Under the scorching Nevada sun, these units would normally experience high cooling loads on the HVAC equipment. The design and construction team at TNAH needed strategies that could ensure the homes were energy efficient, comfortable and affordable.



*An artist's rendering of The New American Home® complex, located on the outskirts of Las Vegas, Nevada.*



*Street view of the townhouse trio, each customized for distinctive lifestyles – the family, the empty nester and the single professional woman.*

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## The Solution – Insulate with Icynene®

Amland Development, the builder of TNAH, with the assistance of IBACOS, a nationally recognized building science and engineering firm, evaluated and tested methods of maximizing the energy efficiency. Using a systems engineering approach, IBACOS determined that high-performance insulation techniques would be required to tighten the building envelope, improve energy efficiency performance and enable the builder to install smaller, less expensive heating and cooling systems.

The IBACOS recommendation included:

- R-20 (5.5 inches) of The Icynene Insulation System®, which is both an insulation and air barrier, sprayed into all exterior walls, floors, cathedralized ceilings and roof deck, thus creating a continuous barrier and a tightly sealed building envelope. Using Icynene® required only one simple application that was completed in 5 days.
- Using the unvented attic technique, the space was completely sealed with Icynene®. The soffit areas, attic walls and underside of the roof deck were coated with this soft foam insulation. When an attic is insulated using this technique, the temperature adjusts to within 10°F of the ambient interior temperature of the house. By insulating the roof rafter assembly, the attic space was converted from unconditioned to conditioned space.
- The HVAC equipment was placed in the attic, which, as a conditioned space, is protected from outdoor temperatures and allows the equipment to operate more efficiently. Because the attic is heated or cooled by air that would normally escape from the house, it does not increase the load on the heating and cooling system.



Icynene® is sprayed directly into the exterior wall. The foam softly expands to fill all of the cracks and crevices. Any excess foam is easily trimmed in preparation for drywall.



Icynene was sprayed on the underside of the roof deck to seal the building and convert the attic from unconditioned to conditioned space, thereby increasing the efficiency of the heating and cooling system.



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



The elimination of random air leakage allows Icynene® homes to maintain the same heating and cooling performance with smaller, less expensive HVAC equipment.

## The Results

Data supplied by IBACOS showed:

- These homes will use 49% less energy for heating and 52% less energy for cooling than the Model Energy Code.
- Each home required a smaller HVAC system, reduced from 7 tons to 5 tons [one 12 SEER (2-ton) unit and one 13 SEER (3-ton) unit].
- The goal of superior airtightness was achieved.
- Improved construction productivity.

Chet Nichols, of Amland Development, enthusiastically added that Icynene® surpassed his goal of making the homes more energy efficient, and reducing HVAC requirements. "If that is not enough", he continued, "Icynene® provided superior sound control, which is an important feature in a town-house environment."

IBACOS will continue to extensively monitor the three homes' performance while occupied for a period of one year to confirm the ongoing savings and homeowner comfort. Look for TNAH – Part two follow-up case study to be released early in 2004.

## Icynene® in a Multi-Unit Project Application:

- ✓ Improved construction productivity with Icynene® installed in one application, in 5 days.
- ✓ Saved money with lower energy costs.
- ✓ Reduced the size of HVAC equipment required from 7 tons to 5 tons.
- ✓ Increased energy efficiency – 49% less energy for heating and 52% less energy for cooling than the Model Energy Code.
- ✓ Achieved a HERS rating of 90 for superior airtightness.

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## The Icynene Insulation System®

Icynene® is a low-density soft foam insulation, which is sprayed into/onto walls, crawlspaces, attics and ceilings by Icynene Licensed Dealers. Sprayed as a liquid, it expands to 100 times its volume in seconds to create a superior insulation and air barrier. Every crevice, crack, electrical box, duct and exterior penetration is effortlessly sealed to reduce energy-robbing random air leakage. The Icynene Insulation System® adheres to the construction material and remains 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 product is:

**Healthier:** Water is the only blowing agent. No CFCs, HCFCs, HFAs, formaldehyde or volatile organic chemicals. Seals out dust, pollen and other allergens from entering the structure. Air sealing minimizes the potential for condensation, molds, mildews.

**Quieter:** Air sealing blocks out airborne noise from entering the structure. Minimizes noise in plumbing run walls.

**More Energy Efficient:** Up to 50% energy savings versus traditional insulation.

Information about The Icynene Insulation System® can be obtained by calling Icynene Inc. (800-758-7325), visiting the website [www.icynene.com](http://www.icynene.com), or contacting your local Icynene Licensed Dealer.

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