



**ICYNENE**<sup>™</sup>

HEALTHIER, QUIETER, MORE ENERGY EFFICIENT<sup>™</sup>

# THE ICYNENE<sup>®</sup> ADVANTAGE

## APPLICATION CASE STUDY:

### *The New American Home<sup>®</sup> – Townhouse Trio Scores Points for Energy Efficiency*



#### **Synopsis:**

- ✓ Introduced advanced insulation and air tightness solutions
- ✓ Reduced heating and cooling system requirements by 40%
- ✓ Delivered superior air tightness to meet Building America's energy efficiency guideline of HERS 90 (4 points above the minimum requirement for Energy Star designation)

*(Note: all references to the HERS index in this case study reflect the original rating system. HERS changes have taken effect January 2007. These changes are outlined in the footnote on pg. 2)*



**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 nestor and the single professional woman.

**HERS Update:**

Prior to January 2007, the HERS index was based on the 1993 Model Energy Code where the “code” home score was 80. Every 5% reduction in total energy consumption achieved 1 point with 100 being the best possible score. To meet Energy Star requirements, a home needed to be 30% more efficient than the model energy code (equivalent of HERS 86). Under the new system (in effect January 2007), the HERS index is based on the 2004 International Energy Conservation Code where the “code” home score is 100. For every 1% reduction in total energy consumption, the HERS index is lowered by 1 point. Under this system, a zero-energy home would score 0. To meet new Energy Star requirements, a home in a cold climate needs a HERS index no higher than 80 (20% more efficient than the reference home). In moderate or hot climates, an index no higher than 85 is required. Visit [Energystar.gov](http://Energystar.gov) for complete details.



## The Solution – Insulate with ICYNENE LD-C-50™†:

Amland Development, the builder of TNAH®, with the assistance of Building America, a private/public partnership sponsored by the U.S. Department of Energy that conducts research to find energy-efficient solutions for housing, evaluated and tested methods of maximizing the energy efficiency. Using a systems engineering approach, it was 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 Building America recommendation included:

- R-20 (5.5 inches) of Icynene, 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 only required one simple application that was completed in 5 days.
- The soffit areas, attic walls and underside of the roof deck were sealed with Icynene, creating an unvented conditioned attic assembly. With this approach, the attic becomes part of the conditioned space and the attic temperature adjusts to within 10°F of the ambient interior temperature of the house.
- The HVAC equipment was placed in the attic, which, as a conditioned space, is protected from the outdoor conditions 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 Building America showed:

- The home will use 49% less energy for heating and 52% less energy for cooling than the 1993 Model Energy Code
- The 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 air tightness 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 townhouse environment.”

## 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 1993 Model Energy Code.
- ✓ Achieved a HERS rating of 90 for superior airtightness.



**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](http://Icynene.com), or contacting your local Icynene Licensed Dealer.

† The Icynene product installed and addressed in this project example is Icynene’s classic formula, ICYNENE LD-C-50<sup>™</sup>.



For more information, contact your local Icynene Licensed Dealer

**Visit our website: [Icynene.com](http://Icynene.com)  
or call**

**1-800-758-7325**

