



ICYNENETM
HEALTHIER, QUIETER, MORE ENERGY EFFICIENT*

THE ICYNENE[®] ADVANTAGE

**APPLICATION CASE STUDY:
COMMERCIAL BUILDING INSULATION
– Multiple Savings with ICYNENE LD-C-50^{TM†}**



Synopsis:

- ✓ Icynene lowered energy costs by 43%
- ✓ Icynene reduced the HVAC equipment size by 10 tons
- ✓ Icynene reduced construction time





The Challenge:

American Outdoor Adventures was constructing a 20,000 sq. ft. freestanding structure in Albany, Georgia that would operate primarily as retail space with some offices located on the first and second floor. Within the structure, there would be 15,200 sq. ft. area that would require heating and cooling. The owner, Mr. Shingler, originally planned to construct the building with a 4 inch standard vinyl backed roof and R-19 fiberglass in the exterior wall assemblies.

Based on the original insulation specifications, the electric heat pump system was sized at 35 tons for the main sales floor area. Based on the data provided by Georgia Power Co. the average utility bill for this building was estimated to be \$1,600 per month.

Mr. Shingler then decided to evaluate methods of improving the energy efficiency of his building and reduce his utility expenses as well as, the capital cost of the air conditioning system.

The Solution – Insulate with Icynene:

The local Icynene Licensed Dealer, Barnes Spray Foam Insulation, was contacted to review the project and asked to design an insulation system that would reduce the utility bills and HVAC size. The Shinglers had seen Icynene in use on the television program, *This Old House* and were hoping that the product's benefits as seen in a residential construction project would also be applicable for their store.

Barnes Spray Foam recommendations:

- Approximately 4 inches of Icynene be applied into the steel stud exterior wall cavity and interior side of the metal roof deck.
- Reduce the HVAC equipment for the main sales floor area (15,200 sq. ft.) from 35 tons to 25 tons, as recommended by the HVAC consultant to Barnes Spray Foam.

Why Icynene?:

1. Insulating the building requires control of both conductive heat flow and convection heat flow (air movement). Icynene foam insulation is both a conductive insulation and air barrier. The expanding characteristics of this spray applied foam insulation ensures that all penetrations in the building envelope are effectively sealed.
2. The tenacious adhesion characteristics of Icynene will guarantee that the insulation in the steel stud wall cavities will stay in place without settling or sagging. There will be no gravity effect over time and the hollow area within the interior of the steel stud will be filled with Icynene insulation.
3. External temperature changes will cause expansion and contraction in the metal roof deck. The flexible and soft characteristics of the Icynene applied to the underside of the roof deck will allow it to move with the expansion and contraction of the roof deck and eliminates any concerns of de-lamination.



Icynene applied directly to the roof deck. (1) Icynene sprayed side, (2) unsprayed side.



Icynene installed into the exterior wall cavities, prior to the installation of drywall. (1) Icynene sprayed area, (2) unsprayed area, note the gaps where air can freely pass through the wall. Daylight highlights these gaps.

- As an air barrier, Icynene would block out any air borne noise from entering the store, thereby providing a more peaceful and controlled shopping environment.

The Results:

- Mr. Shingler sought out a second opinion on the HVAC downsizing attributable to the use of Icynene. The mechanical engineering firm Driggers and Associates Inc. was retained to independently verify the proper sizing of the HVAC equipment if Icynene was used. In the final report, Drigger and Associates concluded that:

“Icynene, when sprayed on, eliminates the infiltration of outside air through various seals and metal laps, and eliminates the “fin” effect of roof purlin at insulation. The fin effect will reduce the “R” value at and near the purlin. The combination of the two above items, in my estimation, reduced the initial tonnage from 35 ton to 25 tons in the main sales floor.”

- Georgia Power estimated that the utility bill for this building would be approximately \$1600 per month. This would include the cost of running the electric heat pump and lights. In the warmer months with more daylight hours, the majority of electricity would be used for the air conditioning units. In the cooler months with less daylight hours, the electricity would be required for heating and the exterior 1000 watt lights. Actual power usage has been:

Time Period	Days	KWH	Cost
Aug. 22, 2001 – Sept. 18, 2001	28	5,240	\$ 604.19
Sept. 19, 2001 – Oct. 18, 2001	30	13,360	\$ 939.90
Oct. 19, 2001 – Nov. 14, 2001	27	14,000	\$ 881.67
Nov.15, 2001 – Dec. 16, 2001	32	17,520	\$ 995.57
Dec. 17, 2001 – Jan. 21, 2002	36	20,440	\$ 1,100.83



3. Mr. John Reese, who is the owner of LRA & Associates (the company hired by Mr. Shingler to build the store) indicated that the installation of Icynene was 1-2 days quicker than if they had installed the standard 4 inch vinyl backed insulation on the roof deck and fiberglass in the exterior walls.

Icynene in a Commercial Application:

- ✓ Saved money with lower energy costs – 43% in the first 5 months.
- ✓ Reduced the HVAC equipment required from 35 tons to 25 tons
- ✓ Reduced the time required for insulation installation from 9 days to 7 days

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.

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



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