



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 all surfaces 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 based. No CFCs, HCFCs, 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 air borne 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 web site www.icynene.com, or contacting your local Icynene Licensed Dealer.

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APPLICATION CASE STUDY : CRAWLSPACE INSULATION RENOVATION

Synopsis:

- ✓ Icynene® lowered heating energy consumption by 29%
- ✓ Icynene® allowed for the elimination of extra heating equipment
- ✓ Icynene® was a major element in the mold remediation program
- ✓ Icynene® provided a more comfortable living space for tenants

The Problem

The Village at Fox Point is a 56 building, 450 unit housing project originally constructed in 1949. The buildings and individual units were heated until the 1980's by steam generated from a central plant and distributed through underground pipes. During this time period, sufficient heat escaped from the steam pipes located in the crawlspaces to prevent the plumbing pipes from freezing during the winter months. When steam was eliminated in the late 1980's and individual heat and cooling units installed, plumbing pipes located in the crawlspace began to freeze and break during the winter months. To correct the situation, heaters were installed in the crawlspaces and operated during the cold months.

Over time, The Village at Fox Point fell into disrepair and became a problem within the Wilmington Delaware community. In 1995, the property was purchased by owners who planned to renovate the complex and create mid-priced rental units.



The Village at Fox Point, Wilmington Delaware.



A close-up of one of the 56 buildings located on the property.

THE ICYNENE® ADVANTAGE : A Closer Look at Air Superiority in Action

The Problem (cont.)

Once the first renovated units became occupied, the new tenants began to complain about “sick building issues”, cold drafts, high heating bills, and began to move out. An inspection of the crawlspaces found that there was no insulation. Of further concern in the crawlspaces was the discovery of mold on the underside of the floorboards.

A program to insulate the crawlspaces with fiberglass was implemented but was quickly found to be impractical and incapable of creating an effective air barrier. The fiberglass insulation program did not correct the tenant complaints of cold drafty floors, high heating bills, or poor indoor air quality that originated from the moldy crawlspace area.

The new owners of the property began searching for an insulation and air barrier solution that would address the issues raised by the tenants, eliminate the need for and costs associated with the winter crawlspace heaters and address the mold situation within the crawlspaces of the buildings.



1) Mold problem underneath the floor prior to remediation and installation of Icynene®



2) Various types of mold and mildew underneath the floors prior to remediation and installation of Icynene®

The Solution

In 2000, Mr. John Husband of Thermal Seal Experts undertook the task of insulating and air sealing the crawlspaces of various units within the complex with The Icynene Insulation System®. The program entailed;

- Installing 3.0 inches of Icynene® insulation directly onto to the underside of the floorboards. This insulation, with its air barrier properties, blocked the warm air of the living space from coming into contact with the cooler crawlspace, thus preventing condensation and the resulting mold while providing the tenants with comfortable floor temperatures. The Icynene® also encapsulated any dormant mold spores, depriving them of the air and moisture required for sustenance.
- Installing 3.0 inches of Icynene® insulation directly onto the concrete walls of the crawlspace and covering the area to 3 feet below the ground line. This procedure minimized any conductive heat transfer in the space and prevented air leakage from the above grade exterior.



After 3.0 inches of Icynene® was applied underneath the floors and on the walls of the crawlspaces



The gaps/cracks were sealed with Icynene® to prevent air leakage and from the above grade exterior.

The Results

In the buildings that had Icynene® installed, the crawlspace heaters were turned off and the temperature remained well above freezing even during the coldest December nights (temperature testing and monitoring conducted by Furlow Associates). There were no frozen plumbing pipes. Eliminating the crawlspace heaters will save the owners \$700,000 over 10 years in equipment, maintenance and operating costs. (Data provided by Furlow Associates and Mr. Bill Bennett, Maintenance Supervisor – Village at Fox Point)

Tenants noticed an immediate improvement in floor temperature and elimination of cold drafts. They also noticed an immediate improvement in their indoor air quality as the musty odors of the crawlspace were blocked from entering the living space located above.

The occupant at 1249 Kynlyn Drive reduced his gas consumption in December 2000 versus December 1999 by 15% due to the installation of Icynene® in his crawlspace. This decrease was achieved even though December 2000 had an average temperature **25% colder** than December 1999. Without Icynene® in the crawlspace, the projected gas consumption for December 2000 would have been 14% higher than December 1999. In equalizing the temperature to the December 1999 level, Icynene® in the crawlspace effectively reduced the gas consumption of 1249 Kynlyn Drive by 29%.

Air leakage through the building envelope had been identified as a major contributor to energy inefficiency. Insulating and air sealing the crawlspaces of one tested building within The Village at Fox Point with Icynene® reduced the air leakage of the entire structure by 56%. (Testing conducted by Energy Services Group)

Based on the success of The Icynene Insulation System® in addressing the concerns of the tenants and owners, Thermal Seal Experts were requested to renovate the remaining buildings within the complex.

The Icynene® Insulation Renovation:

- ✓ **Reduced gas consumption & saved money – a 29% reduction in gas consumption**
- ✓ **Allowed for the elimination of extra heating equipment costs totalling \$700,000**
- ✓ **Was a key element in the mold remediation program**
- ✓ **Improved the indoor air quality for tenants by providing an air barrier between the musty air of the crawlspace and the living space located above.**
- ✓ **Provided tenants with a more comfortable living environment, thereby assisting in the reduction of tenant turnover.**