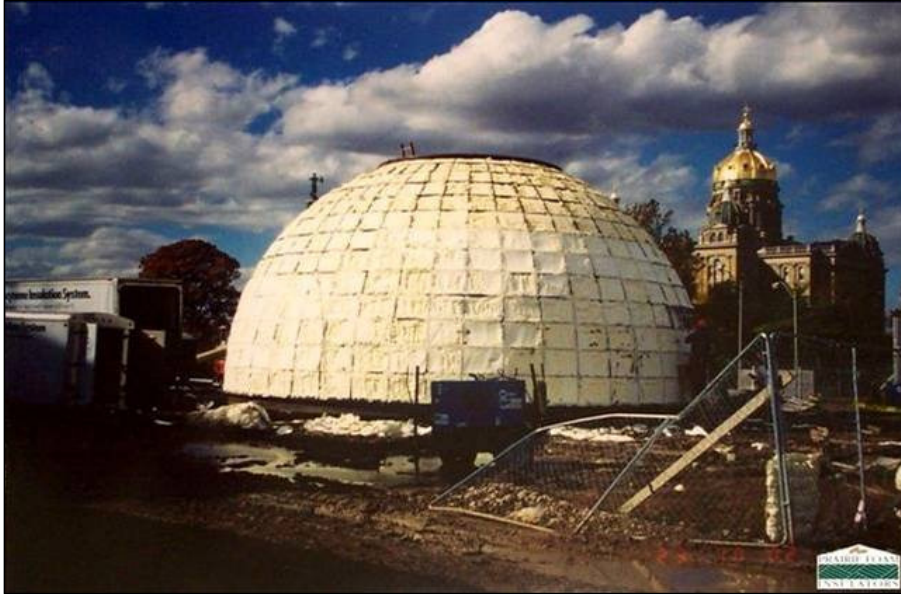

Architects Push the Envelope, Icynene® Seals It.



Creating more energy efficient structures without compromising your design vision.

As an architect, you are a person of vision, continually innovating to create buildings that are not only an aesthetically unique representation of our culture at a given time in history, but also structurally sound, sustainable and healthy. There will certainly be challenges in fulfilling your vision especially when trying to combine complex building designs with conventional construction materials.

In this paper you will find:

A Healthier Building: Air & Moisture Control.....	Page 2
Air Leakage & Vapor Diffusion.....	Page 3
The Benefits of Innovation.....	Page 4
Making a Quieter Building.....	Page 5
Being More Energy Efficient & Green.....	Page 5
LEED & Your Projects.....	Page 6

A Healthier Building: Air & Moisture Control

There are several questions you may want to ask of yourself:

Am I designing for maximum energy efficiency?

Am I choosing innovative building materials?

Am I thinking “GREEN” when it comes to my design and materials?

Am I utilizing building materials that have the most potential in terms of LEED certification?

In this paper, we will help you explore those inner questions and more as we present our vision on creating more energy efficient structures from an Architect’s perspective.

Healthier Buildings

Buildings are a complex, interconnected set of materials and systems woven intricately together. Any product used in constructing the building must be able to work in a positive and mutually beneficial manner with all the other building components. By accounting for the interactions of the various building components, such as the foundation, walls, roofs, doors, insulation and mechanical systems, along with factors like site, climate and occupant behavior, designers can better plan and develop healthy buildings.

Indoor Air Pollution

Icynene® minimizes the infiltration of dust, allergens and pollutants thus contributing to a healthier indoor environment for the building occupants. Though certainly not a cure, allergy sufferers will often find much needed relief.

Air & Moisture Control

Icynene’s portfolio of spray foam products not only act as an effective insulator but an air barrier. By introducing an air barrier in conjunction with proper mechanical ventilation, you have addressed a major source of moisture transport through the building envelope.

The Harmful Effects of Mold

“All molds have the potential to cause health effects. Molds can produce allergens that can trigger allergic reactions or even asthma attacks in people allergic to mold. Others are known to produce potent toxins and/or irritants,” according to the US Environmental Protection Agency (EPA).

According to a 1999 Mayo Clinic Study, nearly all chronic sinus infections (afflicting 37 million Americans) are a result of molds. A 300% increase in the asthma rate over the past 20 years has been linked to molds. (1999 USA Today Cover Story)



Left: mold sample pulled from the walls of a school containing stachybotrys (Black Mold)



Left: water infiltrates through improperly detailed windows

Air Leakage and Vapor Diffusion

Mold Cont'd

Mold seeks MOISTURE, WARMTH, and FOOD, and all three conditions are necessary for it to grow.

A building could experience events such as roof leaks, burst pipes, and bath tub overflows that allow water infiltration into wall cavities. If they are not able to dry out, the conditions for mold growth could quickly occur.

90% of ALL building failures in the United States are related to moisture. -ASHRAE ([American Society of Heating, Refrigerating and Air-Conditioning Engineers](#))

Air Leakage

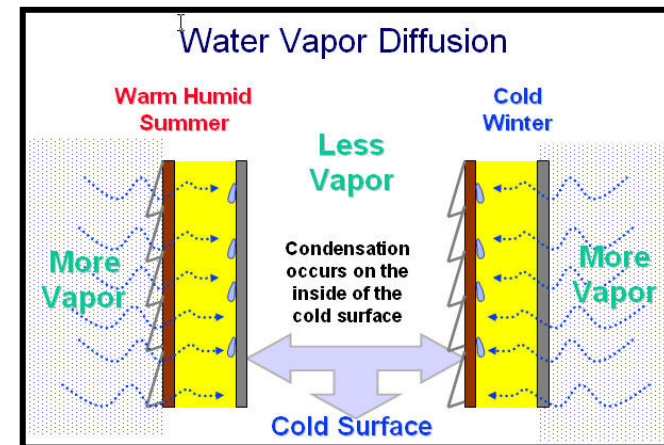
A proper air barrier is needed to keep this airborne moisture from infiltrating a building. Air leakage is a major contributor to moisture infiltration that can lead to harmful mold growth. Not only do Icynene spray foam products provide excellent thermal performance, but by their very nature of being able to expand into cracks and crevices, they provide an effective air barrier thus allowing you to construct a tight healthy building for the occupants for generations to come.

Vapor Diffusion

Vapor diffusion is the process by which water vapor moves through materials caused by a difference in water vapor pressure. In certain climates, some vapor diffusion is important to reduce the potential for moisture build up in a building assembly.

Icynene light density spray foam products provide a vapor permeable air barrier that can move with the building. Being vapor permeable, it allows moisture to diffuse through the insulation and dissipate from the building envelope. This makes Icynene light density spray foam well suited for many applications but particularly for use in walls and unvented attics in hot, humid climates, or anywhere diffusion or drainage is advantageous to the design of the building envelope.

Icynene medium density spray foam has lower vapor permeability and water absorption characteristics than our light density product which reduces the amount of moisture that can diffuse through the insulation. These features are often required for building envelopes in northern climates. Check with a code official regarding local vapor retarder requirements.



Moisture is carried through the air permeable insulation wall system. Moisture related problems can occur including mold/mildew growth, wood/drywall rot and diminished R-value due to wetting, sagging and settling of insulation material over time

The Benefits of Innovation

Durability, Energy Efficiency and the Indoor Environment

It is ultimately your architectural stamp of approval that goes on the building design and you should specify products that help maximize durability and increase energy efficiency while improving the indoor environment.

Two Questions Answered - Two to Go

Earlier in the paper we challenged you to ask yourself some questions. Two of them:

Am I designing for maximum energy efficiency?

Am I choosing innovative building materials?

By embracing innovative products such as Icynene and specifying it in your design plans, you are choosing a product that will greatly increase the energy efficiency of the building while improving the indoor environment for its occupants. An example of the importance of a healthy indoor environment:

18 months after VeriFone employees began working in a building retrofitted to cut indoor pollutants and improve indoor environmental quality, absenteeism rates went down 40% and productivity increased over 5%¹. These are tangible benefits that more than offset the initial investment in innovative products.



¹ Building Optimization March 2009 White Paper by Brandi McManus

Building a Quieter, More Energy Efficient, Green Building

Building a Quieter Building

Icynene is ideal for environments where less is more – less sound that is. Commercial offices, schools and hospitals can benefit from a reduction in airborne sound through Icynene-insulated walls.

More Energy Efficient = Green

As a complete insulation and air barrier, Icynene minimizes air leakage in the building structure, which allows for HVAC equipment rightsizing. This saves dramatically on initial equipment costs and ongoing utility costs which can save up to 50% in energy costs versus traditional insulation options.

Becoming a Leader in Green Design

According to the EPA, within the United States, the building sector accounts for approximately 48% of annual greenhouse gas (GHG) emissions, with 36% of the direct energy related GHG emissions.

It's no wonder why sustainable building products are in high demand. The most cost-effective choices are those made before ground is even broken including insulation solutions. The right insulation can significantly impact the sustainability of homes and buildings.

Icynene delivers high-performance solutions for efficient building envelopes, thermal comfort and a healthy indoor environment – all of which are integral components of green building.

How Else Icynene is Green?

Renewable Content: [ICYNENE LD-R-50™](#) uses castor oil to reduce reliance on petroleum-based polyol, offering a high-performance, eco-conscious option.

Recycled Content: 12.6% recycled plastic is contained in the [MD-R-200™](#) resin.

Simply by specifying Icynene in your design plans, you are stating that you are an environmental steward and leader in environmentally sound design.



LEED and Your Projects

What is LEED?

LEED: “Leadership in Energy and Environmental Design” is a green building program designed to quantify the environmental benefit of various green building strategies in a rating system format, which ultimately includes a certification program that places a certification label on the constructed building.



LEED for Schools

The LEED for Schools Rating System recognizes the unique nature of the design and construction of K-12 schools. It addresses issues such as classroom acoustics, master planning, mold prevention and environmental site assessment. By addressing the uniqueness of school spaces and children’s health issues, LEED for Schools provides a unique, comprehensive tool for schools that wish to build green, with measurable results. LEED for Schools is the recognized third-party standard for high-performance schools that are healthy for students, comfortable for teachers, and cost-effective.

LEED-New Construction and Major Renovation



LEED for New Construction and Major Renovation is a rating system for buildings that was designed to guide and distinguish high performance buildings that have less of an impact on the environment, are healthier for those who work and/or live in the building, and are more profitable than their conventional

counterparts. The LEED for New Construction Rating System can be applied to commercial, institutional and high-rise residential projects, with a focus on office buildings.

Icynene and Your LEED Projects

“Icynene insulation products can play a key role in energy efficient and environmentally responsible design, and are used in many of the industry’s best structures.”



– Derek Satnik, Managing Partner,
Mindscape Innovations

For more information:

[Icynene and LEED NC \(PDF\)](#)

[Icynene and LEED for Schools \(PDF\)](#)

The Final Questions

As you read the preceding pages, we hope you were able to come to conclusions on the final two questions that were posed at the beginning of this paper:

Am I thinking “GREEN” when it comes to my design and materials?

Am I utilizing building materials that have the most potential in terms of LEED certification?

We hope you take these questions into consideration in every aspect of your business whether it's the latest in design innovation or choosing building materials that allow for truly comfortable and sustainable structures.

In addition to health, sustainability, leadership and eco-consciousness, there is one final question that will be just as important to you.

Does Icynene make *my* life easier in terms of design options and architectural vision?

In terms of aesthetics, Icynene spray foam insulation solutions can conform to virtually any shape and allows architects to think of curved and flowing walls and roofs rather than being confined to rectangular boxes. In short, this allows you to focus on what you do best; design. This gives you the freedom as an architect to push the design envelope while Icynene is there to seal it.

Sources:

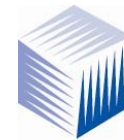
<http://www.epa.gov>

<http://www.ashrae.org>

<http://www.usgbc.org/leed>



For More Information visit our Architects section at Icynene.com



ICYNENE®

Icynene® is a registered trademark of Icynene Inc.