



ICYNENE™

HEALTHIER, QUIETER, MORE ENERGY EFFICIENT*

THE ICYNENE® ADVANTAGE

APPLICATION CASE STUDY: *The Greening of the Former Birks Building. Taking the "LEED" by Saving Energy - and Our Planet*



Synopsis:

- ✓ Helped save energy to reduce operating costs and mitigate CO₂ emissions
- ✓ Minimized environmental impact by creating less pollution and waste
- ✓ Played a key role in improving building performance through systems engineering
- ✓ Maximized indoor comfort
- ✓ Preserved building integrity with advanced moisture management
- ✓ Complemented the new air management system to create a healthy indoor environment
- ✓ Upgraded the building to help meet Leadership in Energy and Environmental Design (LEED) requirements Silver certification
- ✓ Helped create a model for energy efficiency and sustainability for future commercial and heritage retrofits



Overview:

Located on one of the busiest corners in downtown Winnipeg, Manitoba, the rich and unique façade of the former Birks Building is one of the architectural jewels of the city. Originally built for the YMCA in 1900, the four-storey solid brick edifice later housed Birks Jewelers from 1912 to 1987.

The structure's recently restored exterior boasts rich Italian Renaissance features. A detailed mosaic frieze representing King Solomon and his assembly with the Queen of Sheba wraps across the top of the outer walls. And on the front of the building are seven medallions illustrating the source of the precious and semi-precious stones used by Birks in their trade, such as an elephant depicting ivory and a diver searching for pearls.

After years of vacancy, the 38,000 square-foot building was purchased in 2003 by A.S.H. Management Group Inc. Soon after this acquisition, the new owner announced a from-the-ground-up overhaul of the interior to produce modern office and retail space.

"I just fell in love with the outside of the building and saw all kinds of potential on the inside," said Bob Shaer, A.S.H. Management's principal partner.



The former Birks Building with its new ground floor exterior and the Birks retail store on the ground floor, ca. 1912.

The Challenge: Preserving the Past While Sustaining the Future

According to Natural Resources Canada, buildings in Canada are responsible for 38% of energy use and 30% of greenhouse gas emissions.ⁱ Most of these emissions come from the combustion of fossil fuels to provide heating, cooling and lighting, and to power appliances and electrical equipment. Scientists predict that, left unchecked, emissions of carbon dioxide (CO₂) and other greenhouse gases from human activities will raise global temperatures by 2.5°F to 10°F this century. By transforming the built environment to be more energy-efficient and climate-friendly, the building sector can play a major role in reducing the threat of climate change.ⁱⁱ



Out of the growing concern and demand for less harmful buildings, the U.S. Green Building Council (USGBC) introduced the Leadership in Energy and Environmental Design (LEED) Rating System. LEED Canada is an adaptation of the USGBC’s LEED Rating System, tailored specifically for Canadian climates, construction practices and regulations. The LEED Canada Rating System recognizes environmental leadership in the building industry by certifying healthy, high-quality, energy efficient buildings that have fewer environmental impacts. Through the process of attaining credits for using recommended strategies, a building achieves certification as a green building. The more credits a building achieves, the higher the level of certification awarded.

In the redesign of the former Birks Building in Winnipeg, the goals of the A.S.H. Management Group Inc. were twofold:

1. To obtain LEED certification for green building design: Silver level or better.
2. To design a building that is at least 25% more energy efficient than Canada’s Model National Energy Code Requirements.

These guidelines were balanced with a desire to preserve certain existing elements of this historical treasure.



The structure’s recently restored exterior boasts such rich Italian Renaissance features as a detailed mosaic frieze and seven decorative medallions.



Once the interior was gutted, one of the first steps to creating a healthy, durable and energy-efficient building envelope was to have Icnene soft foam insulation and air barrier installed.

The Solution: Romanesque Revival Incorporates Tighter Building Practices to Achieve LEED-registration with ICYNENE LD-C-50™†

To realize these goals, A.S.H. Management Group Inc. used an integrated design approach based on the belief that modern buildings should be designed and constructed with sustainability in mind. The entire project team – including owner, design consultants, energy consultants and costing experts – were involved in decision making from concept through to occupancy.



The interior of the building was gutted, then re-designed and re-constructed with green in mind. The team found an abundance of opportunities to save energy, reduce operating costs and mitigate CO₂ emissions:

- Installation of the most efficient heating, ventilation and air conditioning systems
- Daylighting optimized by open-concept design and complemented by state of the art lighting
- Installation of new plumbing and low-volume water fixtures to reduce potable water usage
- A “green roof” to combat water run off and urban heating issues
- Installation of Icynene soft foam insulation and air barrier material by Icynene Licensed Dealer, Penta Protective Coatings, in the exterior walls of the building to protect the shell from a major source of energy loss - air leakage

After researching many different insulation systems, lead project architect, Don Courtnage, selected Icynene over other spray foam options because of its superior environmental benefits.

“Designers and builders are responsible for creating better, healthier building environments for occupants; this all comes back to the products that we are selecting and putting into buildings,” said Don Courtnage.



Penta Protective Coatings, Icynene Licensed Dealer in West St. Paul, Manitoba, sprayed Icynene into the exterior walls of the building to protect the shell from a major source of energy loss – air leakage.



Icynene complements the new air quality system installed in the building, by locking out allergens and other pollutants and allowing building occupants to control the quality of the indoor air.

The Result: A Gem for Generations

By using smart products like Icynene, the project team transformed the landmark into a paradigm of energy efficiency and sustainability, in a heritage envelope. The Icynene installation, combined with other work, will serve to extend the life of the building for another century.

Icynene helps buildings achieve LEED points in four of the six categories: Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation and Design Process.



1. Energy and Atmosphere

The most significant factor contributing to CO₂ emissions from buildings is their use of electricity. If half of new commercial buildings were built to use 50% less energy, it would save over 6 million metric tones of CO₂ annually for the life of the buildings – the equivalent of taking more than 1 million cars off the road every year.ⁱⁱⁱ Air-sealing the building shell can save up to 40% of heating and cooling costs^{iv} and can significantly reduce greenhouse gas emissions, which is why the U.S. Department of Energy recommends the use of an effective, continuous air barrier material, as well as insulation.

In the exterior walls of the former Birks Building, Icynene helped control conductive heat transfer and it performed as an effective air barrier material. In fact, third party testing confirms Icynene's performance as an air barrier when applied at only a one inch thickness.^v Filling and sealing crevices that compromise airtightness, Icynene minimized air leakage and helped reduce heating and cooling loads of the mechanical equipment. Over time, it can save building owners as much as 50% on monthly energy bills.

2. Materials and Resources

Under the LEED program, a building can obtain points by minimizing construction waste. Icynene helped contribute to this credit by providing a significant barrier to airflow without the need for any additional sealing material. As an open-celled material, Icynene is easily compacted, dramatically reducing the waste volume in comparison to other insulation materials.

Icynene adheres to and integrates well with other building components to create a healthy, efficient building envelope. In the former Birks Building, it was sprayed between the steel studs directly onto the old masonry walls. This ensured that the historic walls were insulated and properly air-sealed, and also minimized the amount of new material required for the renovation.

3. Indoor Environmental Quality

Icynene uses water-blown technology and contains no ozone-depleting substances, PBDEs or any other brominated compounds. Icynene complements the new air quality system installed in the former Birks Building by reducing the intrusion of outdoor allergens, odors and pollutants and allowing building occupants to control the quality of the indoor air.

As a qualified air barrier, Icynene also helps reduce the movement of airborne moisture through the building envelope. (Up to 99% of the total moisture movement through a building envelope is carried in air.^{vi}) This makes Icynene particularly suited for the building's steel stud components, as it reduces the potential for condensation, corrosion and moisture build-up caused by air leakage. Another advantage is that Icynene contains no HFCs, which are harmful to the environment and can cause corrosion of metals when in contact with them.

Combined with proper mechanical ventilation, Icynene helps maintain the indoor relative humidity between 35% and 50% - a level at which the growth of mildew, dust mites and other allergens can be minimized. By effectively controlling airborne moisture and related problems like mold, Icynene helped



preserve the integrity of this historic structure, ensuring that occupants and passers-by can admire the original details of the former Birks Building for years to come.

4. Innovation and Design Process

Design teams and projects have an opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.



This LEED-registered complex now sets the standard for the office of tomorrow while preserving the dignity of the past.

Icynene’s unique performance characteristics and flexible installation process can contribute to this credit in a number of ways. Areas that are difficult to insulate with traditional materials rarely pose a problem with Icynene. It is also extremely effective at controlling airborne sounds, making Icynene-insulated buildings quieter than those insulated with traditional materials. Icynene permanently adheres to the construction material and remains flexible without shrinking, sagging or settling, so that the integrity of the building envelope seal remains intact over time. As an open-celled material, Icynene is comprised of air pockets rather than synthetic gases, ensuring that it maintains its rated R-value and delivers at peak performance levels for the lifetime of the building.

“We’ve been very happy with the installation of Icynene,” says Courtnage. “The Icynene Dealer, Penta Protective Coatings Ltd., was extremely helpful in ensuring the project went smoothly given the difficulties of a major retrofit such as this.” Courtnage is looking forward to implementing the system in other projects going forward.

The new building now serves as the Winnipeg offices of the Property Registry and reflects the province’s commitment to using environmentally-sound materials to create green buildings.

Upon completion of the project, the former Birks Building made history all over again, becoming the first LEED-registered retrofit project in Canada.



Icynene Puts Sustainable Goals In Reach For Any Green Remodeling Project:

- ✓ Insulates and air-seals in one step to eliminate the need for sealing material and accelerate the remodeling process
- ✓ Optimizes energy efficiency to deliver up to 50% in energy savings for building owners
- ✓ Provides predictable airtightness and allows for HVAC equipment rightsizing
- ✓ By reducing heating and cooling loads, production of CO₂ and other greenhouse gas emissions are significantly reduced
- ✓ Locks out dust, allergens and other outdoor pollutants
- ✓ Minimizes unwanted airborne sounds
- ✓ Expands 100 times its initial volume completely sealing cavities and providing a continuous air barrier
- ✓ Maintains original cured form - does not shrink, sag or settle
- ✓ Minimizes airborne moisture and related problems like mold, condensation and corrosion in steel applications

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.



Endnotes:

- i Natural Resources Canada's Energy Use Data Handbook, 1990 and 1995 to 2001; http://www.cagbc.org/news_events/news.php?id=28&press=1&draw_column=3:3:2
- ii U.S. Green Building Council: <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1617>
- iii U.S. Green Building Council: <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1617>
- iv www.hud.gov
- v Tests conducted by Bodycote Materials Testing Canada in accordance with ASTM E2178-03.
- vi The Energy & Environmental Building Association (EEBA) tested moisture movement through a 4x8 sheet of gypsum board and discovered that as much as 30 quarts of water is carried through the air via a 1 in2 hole. Only 1/3 quart of water moves through the gypsum board via diffusion (movement of fluid from an area of higher concentration to an area of lower concentration).

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



For more information, contact your local Icnene Licensed Dealer

**Visit our website: Icnene.com
or call**

1-800-758-7325

