

Energy Efficient Envelope Design Generates over \$1,000,000 in Savings



Thermax™ (ci) combined with Weathermate™ Straight Flashing make up exterior continuous insulation



Styrofoam™ Brand Spray Polyurethane Foam (SPF) – CM Series Insulation is used in the cavity to provide additional insulation and increases the air tightness of the enclosure.

Project Snapshot

Building Type: Medical Office Building

Location: Saginaw, Michigan, ASHRAE Climate Zone 5

Square Foot: 21,400 ft²

Exterior Façade: Brick

Dow Solutions:

- *Wall Assembly:* Thermax™ Wall System
- *Exterior Wall:* Thermax™ (ci)
- *Weathermate™* Straight Flashing and Great Stuff Pro™
- *Interior Wall Cavity:* Styrofoam™ Brand Spray Polyurethane Foam (SPF) – CM Series Insulation

Roof Assembly:

- Dow™ Styrofoam™ Brand Spray Polyurethane Foam (SPF) – CM Series Insulation

Interior Foundation & Slab:

- Dow™ Styrofoam™ Brand Insulation (now DuPont™ Styrofoam™ Brand Insulation)
- **Architect:** SSP Associates Inc
- **Builder:** SSP Associates Inc
- **Year Completion:** April, 2012

Hospitals consume 2.5× more energy than the average commercial building⁽¹⁾

Hospitals tend to consume a higher level of energy because they require increased lighting and they have strict climate control regulations. In fact, hospitals use up 2.5 times the energy of the average commercial building. Hospitals and medical offices across the country are investing in energy saving practices to make up for the energy consumption used to serve patients. When a medical office in Saginaw, Michigan decided to build a new facility in the same neighborhood as their existing office, they partnered with Dow's Building Scientist, Gary Parsons, to develop a high performing building designed to maximize energy savings with the potential of achieving net-zero.

Rarely do building scientists get the opportunity to literally compare a conventionally built office structure side by side to a high-performing continuously insulated building. In 2012, the high performance, 21,400 ft² two-story building was completed. Occupants relocated into the new, high-performance building from an office suite building directly across the street offering a unique opportunity to study the energy performance of a comparably sized conventionally constructed structure with the similar usage and occupants.

⁽¹⁾ US Department of Energy

Long Term Building Performance Payback

Conventional building envelope

- Installation Cost
\$16,614
- Annual cost to condition building:
\$52,399
- Initially cheaper, but becomes more expensive over time, due to higher energy costs to maintain the building's temperature.

VS

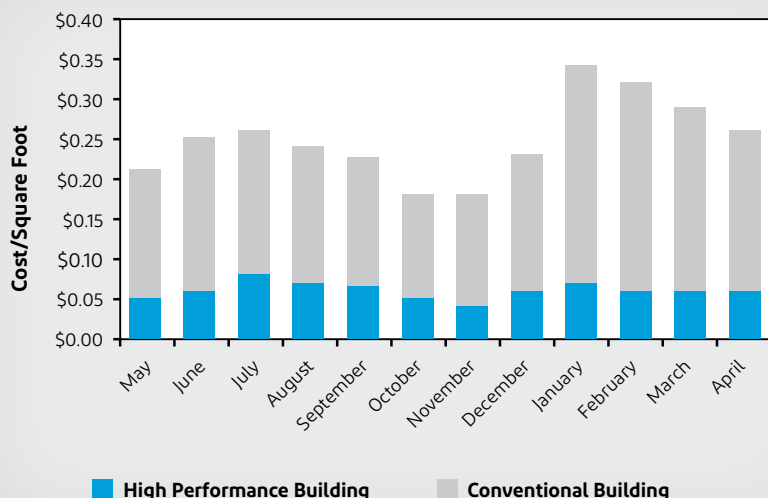
Thermax™ Wall System

- Installation Cost
\$132,299
- Annual cost to condition building:
\$15,842
- Initially more expensive, but becomes the more cost-effective option in as little as **3.1 years** due to lower energy costs.

The Thermax™ Wall System will save the building owner \$1,425,723 in energy savings over the course of the building's estimated lifetime.*



*Assumes 39 years (depreciated life of a commercial building)



The utility cost savings for each building broken down per month in cost per square foot. The high performing building saved 70% on heating and cooling costs.

The high performance building enclosure is wood frame construction with the **Thermax™ Wall System** delivering exterior continuous insulation. **Styrofoam™ Brand Spray Polyurethane Foam (SPF) – CM Series Insulation** was used in the cavity to provide additional insulation and increases the air tightness of the enclosure. **Styrofoam™ Brand Insulation** is installed on the interior of both the foundation stem wall and under the slab floor. The roof assembly is insulated by continuous layer of spray foam which is directly applied to the attic side surface of the ceiling for the main purpose of air sealing the ceiling plane. By contrast, the conventional building envelope consisted of steel stud construction and full wall cavity mineral wool insulation. No continuous exterior insulation was used on the baseline building.

The cost of exterior **Thermax™ (ci)**, **Styrofoam™ Brand Insulation**, and **Styrofoam™ Brand Spray Polyurethane Foam (SPF) – CM Series Insulation** totaled \$132,299. For comparison, the lowest cost to insulate the building with fiber batt insulation would have been approximately \$16,614. The energy savings quickly offset the cost premium by delivering significant energy cost savings.

The residents have inhabited the office space for over a year in which energy usage and costs were monitored in comparison to the previous year's energy costs for the conventional building. The residents reported increased comfort due to even temperature levels and the HVAC system operates at a much lighter load. In fact, the annual energy cost for the conventional building was \$52,399⁽²⁾. By contrast, the energy cost of the high performance building using the **Thermax™ Wall System** was only \$15,842 per year, resulting in a savings of \$36,557 per year or 70% of the cost to condition the building. Based on the annual savings, the payback of the high performance insulation system premium is a short 3.1 years. The energy use was minimized so much the larger, high performance building actually only requires a residential size HVAC system.

To learn more about how to save energy with a high performing building visit www.thermaxwallsystem.com or call a building science expert at 1-866-583-2583.

⁽²⁾ When adjusted to account for size differences of the suite



**For more information visit
building.dupont.com
or call 1-866-583-2583**

NOTICE: No freedom from infringement of any patent owned by DuPont or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where DuPont is represented. The claims made may not have been approved for use in all countries. DuPont assumes no obligation or liability for the information in this document. References to "DuPont" or the "Company" mean the DuPont legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. The buyer assumes all risks as to the use of the material. Buyer's exclusive remedy or any claim (including without limitations, negligence, strict liability, or tort) shall be limited to the refund of the purchase price of the material. Failure to strictly adhere to any recommended procedures shall release DuPont of all liability with respect to the materials or the use thereof. The information herein is not intended for use by non-professional designers, applicators or other persons who do not purchase or utilize this product in the normal course of their business. CAUTION: This product is combustible and shall only be used as specified by the local building code with respect to flame spread classification and to the use of a suitable thermal barrier. For more information, consult (Material) Safety Data Sheet ((M)SDS), call DuPont at 1-866-583-2583, or contact your local building inspector. In an emergency, call 1-989-636-4400.

Thermax™ products should be used only in strict accordance with product application instructions. Thermax™ products, when used in a building containing combustible materials, may contribute to the spread of fire.

DuPont™, the DuPont Oval Logo, and all trademarks and service marks denoted with™, SM or ® are owned by affiliates of DuPont de Nemours, Inc. unless otherwise noted. © 2020 DuPont.

43-D100792-enNA-0220 CDP