

Insulated Metal Panels

Proven Performance Meets New Needs

Sometimes the best new idea comes by recognizing a new use for a familiar product or concept. So it is with insulated metal panels (IMPs).

These panels have proved to be sturdy and time-saving building elements. They've been successfully used in roof and wall applications throughout the country for more than 30 years. But the growing interest in improving building performance has brought IMPs to the forefront as a solid solution to the worldwide challenge of making the best use of energy resources.

Thermal Efficiency

The increased recognition and growing popularity of IMPs among architects, general contractors and other influencers in the building industry are based on a better understanding of the panels' capabilities in several areas.

Insulated metal panels were one of the first exterior wall systems to place insulation outside the support system while maintaining or improving thermal performance. In fact, findings by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) that revealed the shortcomings of insulated metal stud cavities, and recognized the need for greater thermal performance, have illuminated IMPs uniqueness as an efficient solution to improved performance. The panels have a proven record of meeting the new performance standards related to improved energy efficiency prescribed by ASHRAE 90.1.

Insulated metal panels are installed outside the metal stud cavity or other structural support system. This minimizes thermal bridging, while efficiently incorporating a water, air and vapor barrier using a single-unit wall assembly that eliminates the need for other materials and construction trade coordination.

A large percentage of IMP products are produced via a state-of-the-art and highly efficient continuous bonding technology. During this manufacturing process, a liquid mix of pre-

formulated chemicals is injected between two metal sheets. These chemicals react and expand to make a rigid cellular polyurethane and polyisocyanurate foam that fills the cavity and fuses with the metal skins. The foam eliminates interior cavities, providing consistent insulation values throughout the panel. The finished product is a complete insulated panel with R-values that range between R-14 and R-48, depending on the core thickness and mean core temperature.

With energy costs currently accounting for about 39% of controllable operating expenses for commercial buildings – and expected to increase -- thermal efficiency of the building envelope has become a key concern among architects and builders. Normally, insulation placed within a building's stud cavity can be as little as 33% effective. In contrast, IMPs can provide as much as 95% thermal efficiency. This high level of performance in the field is backed by test data that show how the panel meets pertinent building standards.

In addition to offering excellent thermal performance, IMPs protect the building's interior and exterior and reduce air flow in and out of the building envelope, which helps improve HVAC performance. Also, this enhancement may potentially contribute up to 10 points for Optimized Energy Performance if the building is aiming for certification under the U.S. Green Building Council's LEED guidelines. IMPs also help the environment by reducing or eliminating field cutting and material waste.

One Multi-powered Unit

The value of IMPs lies in the combined power of all its components. Although individual products have slight variations, all IMPs typically consist of an insulated core, exterior and interior metal skins, double tongue-and-groove joinery, and concealed clips and fasteners.

The panels are ideal for the entirety of an exterior wall or roof system but can also be used in conjunction with other panels for multi-component solutions.

Regardless of climate conditions, IMPs offer long-term benefits such as the high durability and low maintenance offered by metal. The high performance coatings applied to the metal skins protect the panels from exposure to sunlight, wind and harsh weather elements for decades, eliminating repainting and maintaining the aesthetic values.

To help improve the efficiency of buildings groups such as the Metal Construction Association are providing educational materials and resources about IMPs to architects and builders as well as architectural faculty and students in colleges and universities.

“Insulated metal panels have been manufactured for more than 30 years. Yet the knowledge of the benefits and uses of this product are generally limited,” remarked Scott Kriner, Technical Director for MCA. “Knowing how IMPs are produced will help architects and contractors understand their value in all types of projects.”

Architects and building owners who want high performance in their buildings are turning to IMPs because of their proven thermal performance. But they also appreciate the added benefits of a wide range of color and style options to fit all types of designs as well as reduced installation time compared to multi-component assemblies that require multiple trade groups for each component.

(Samples of projects with photos can be supplied to show how IMPs are being used in different markets.)

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(sidebars)

The thermal efficiency of IMPs is verified by their compliance with these important ASTM standards (www.astm.org).

ASTM C-1363-05	Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus (Replaces ASTM C236)
ASTM C 518	Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

Some IMPs contribute to the following LEED-NC points:

Energy & Atmosphere Points

EA Credit 1	Optimize Energy Performance	1 to 10 Points
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Materials & Resources

MR Credit 4.1	Recycled Content: 10%	1 Point
MR Credit 4.2	Recycled Content: 20%	1 Point
MR Credit 5.1	Regional Materials: 10%	1 Point
MR Credit 5.2	Regional Materials: 20%	1 Point

Indoor Environmental Quality

EQ Credit 4.1	Low-Emitting Materials: Adhesives and Sealants	1 Point
EQ Credit 4.2	Low –Emitting Materials: Paints and Coatings	1 Point

Innovation and Design Process

ID Credit 1.x	Innovation in Design: Cradle to Cradle Certification	1 Point
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Other potential credits

Sustainable Sites

SS Credit 7.2	Heat Island Effect: Roof	1 Point
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