



Precast Solutions & Innovations  
Thermo Efficient, High Performance  
Insulated Wall Panels



**MID-STATES**  
CONCRETE INDUSTRIES

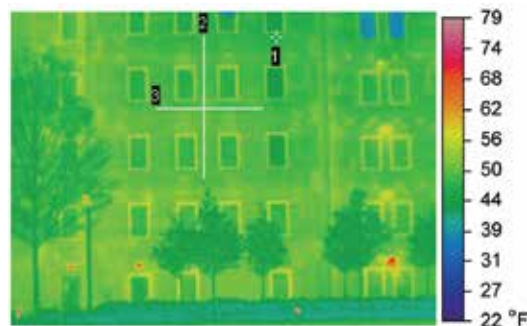


## High Performance Insulated CarbonCast® Wall Panels

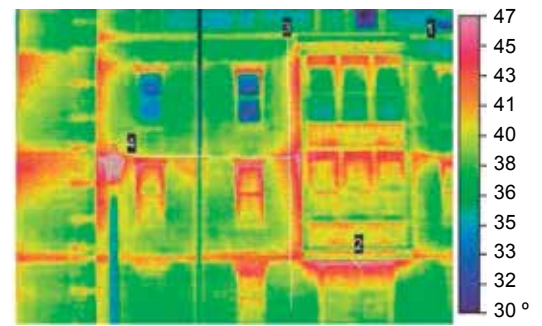
# Unprecedented Thermal Efficiency

The U.S. Department of Energy estimates that 42 percent of the energy consumed in a building is ultimately lost through the building envelope, or the barrier between the building interior and the outside environment. The building envelope is critical in regulating internal building temperatures and determining how much energy is required to heat or cool a structure for occupant comfort. A significant portion of that envelope is the exterior wall and heat transfer through envelope components, such as walls, wastes energy.

Mid-States CarbonCast® technology provides high performance insulated wall panels that not only deliver all of the benefits of factory precasting, but provide an unprecedented thermal efficiency by mitigating heat transfer and energy loss. CarbonCast precast insulated wall panels are engineered to minimize the opportunities for heat to flow from the interior surface through the wall to the building's exterior.



**Thermal Imaging: Precast Wall System**  
 University Commons at GSU built with thermally efficient precast concrete mass wall system. Calculations by infrared imaging found the system to be an R-13.77. (Note: bright spots are exhaust fans or security lighting.)



**Thermal Imaging: Cavity Wall System**  
 A dormitory built with cavity wall construction in the Atlanta market. Calculations by infrared imaging found the system to be an R-7.09. (Note: multiple areas of thermal transfer.)

## How CarbonCast Precast Insulated Wall Panels Work

CarbonCast Enclosure Systems use advanced technology to improve precast concrete by integrating ultra-strong, noncorrosive C-GRID® into the wall panels during fabrication. By taking the place of steel reinforcement C-GRID provides a multitude of benefits that makes factory-made precast concrete an even more intelligent choice for commercial building envelopes.

CarbonCast high performance insulated wall panels are composed of two concrete wythes separated by continuous insulation (ci), and connected by C-GRID shear trusses. With low thermal conductivity, high-strength C-GRID helps deliver a panel with insulation values up to R-37—and above ASHRAE 90.1 (2007) requirements—depending on the thickness and type of foam insulation. Extensive research has unequivocally proven the outstanding load-bearing performance of CarbonCast high performance insulated wall panels. The C-GRID shear trusses and patented pilasters render a panel with full structurally composite action and improved durability.

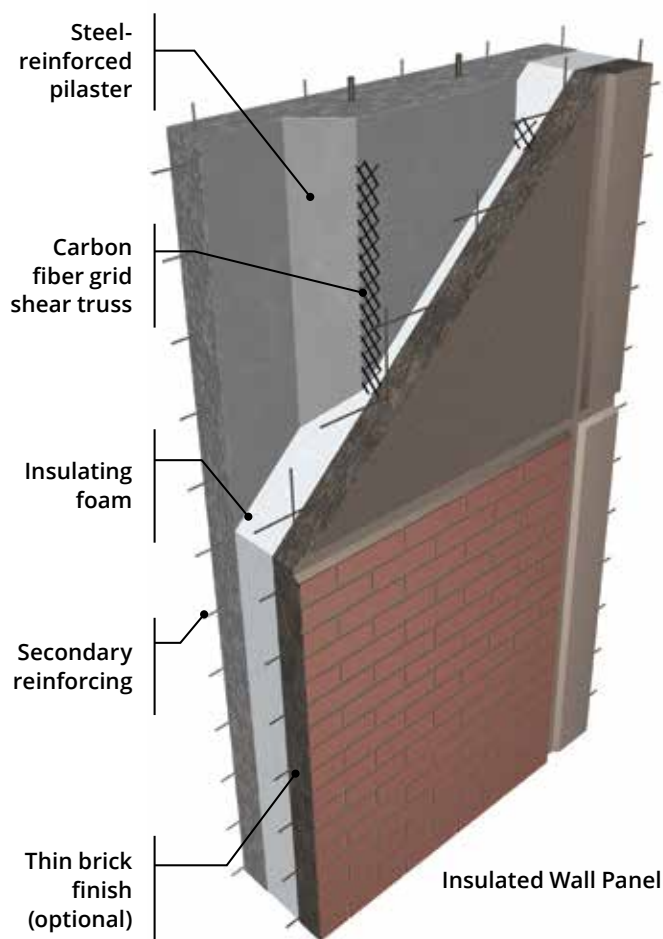
### The role of wythe connectors

In insulated precast concrete wall panels, wythe connectors act as a mechanical connection between the inner and outer layers of concrete. Because they form a connection through the insulation, there is an opportunity for thermal bridging to occur as well. Traditional wythe connection options such as solid zones of concrete or metal connectors—while providing a reliable mechanical connection—permit heat transfer between the wall because of the materials inherent conductivity. What is important is designing a performance specification on the overall wall system rather than just the connector alone. A specification based on the overall wall system is one of the best ways of ensuring that the enclosure will meet the owner's standards.

### The role of insulation

Insulation helps to prevent the flow of heat across the exterior envelope. The use of continuous insulation further stems the flow by eliminating the presence of building materials that could facilitate thermal transfer. Continuous insulation is defined in ASHRAE 90.1 as “insulation that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building envelope.” The thermal performance of edge-to-edge insulated precast sandwich wall panels with no or minimal thermal bridges and no solid zones maintains the R-values for continuous insulation as defined in ASHRAE 90.1, thereby lowering energy costs for the owner and occupant.

– Courtesy of AltusGroup





Beyond Thermo Efficiency

## Additional Benefits of High Performance Insulated CarbonCast Wall Panels

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CarbonCast Enclosure Systems use advanced technology to improve precast concrete by integrating ultra-strong, non-corrosive C-GRID into the wall panels during fabrication. This provides a real advantage over a steel reinforcement and makes CarbonCast precast wall panels an even more intelligent choice for your commercial building envelopes.



### Aesthetic Versatility

The aesthetic versatility of precast is virtually unlimited. Design projections, reveals, bullnoses and other articulations, as well as finishes ranging from thin brick, terra cotta and dozens of other options are available.

### Competitively Priced

Depending on the design, CarbonCast panels are priced competitively with other curtainwall systems such as brick-veneer, masonry, stud walls or concrete. After factoring in reductions to superstructure requirements and potential HVAC system and operating savings, CarbonCast enclosure systems can help pay for themselves immediately.

### Structurally Superior

CarbonCast load bearing panels can eliminate the need for perimeter columns and add to usable floor space.

### Dry and Mold Free

Unlike brick and block insulated cavity walls, or brick with steel studs, concrete does not allow water to penetrate. CarbonCast panels have no voids or cavities where air or water can combine to support mold and mildew growth.

### Long Service Life

Precast panels provide long service life due to the durability and low maintenance of concrete panels.

### Safety

CarbonCast precast panels add protection against high winds and wind blown debris. In addition, the inherent fire resistance of concrete provides additional safety.

### Pre-Finished Interior

CarbonCast high performance insulated wall panels can have trowled interior wythes to eliminate the cost and time to install drywall or other surfaces. They are ready for paint or wall covering and are ultra-durable.

### Acoustically Ideal

Very little sound is transmitted through the walls providing an acoustical environment free of exterior noise.

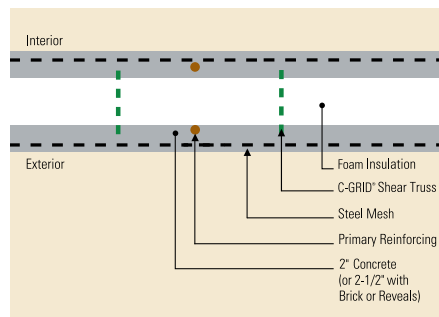
### LEED Certification Enhancement

With C-GRID used as a reinforcing material, CarbonCast technology amplifies many of the qualities that enable precast to contribute to LEED certification.

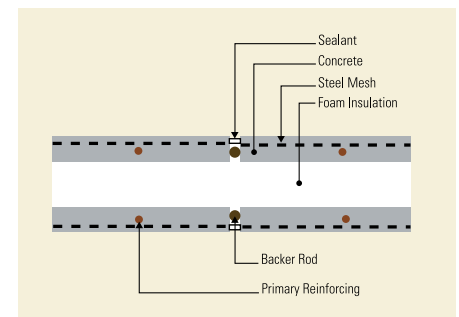
### Environmentally Friendly

More environmentally friendly than standard non-composite wall panels, CarbonCast panels:

- Reduce the amount of cement and other materials
- Reduce overall footprint
- Reduce weight, enabling more panels to be shipped per truck, less structure required to support the panels, and reduced energy for installation



High Performance Insulated Wall Panel Section



High Performance Insulated Wall Panel with Butt Joint

# Commercial and Institutional Uses for CarbonCast High Performance Insulated Wall Panels

From energy savings to aesthetics, Mid-Sates CarbonCast panels provide a cost-competitive innovative solution for your next architectural building project. Precast concrete gives architects and building owners a virtually unlimited array of design and finish options. Precast concrete provides designers outstanding flexibility in terms of form, finish and texture.

In addition to eliminating any potential for staining or spalling, C-GRID reinforcement in the wall panel surface can provide superior crack control compared to steel mesh. Overall, CarbonCast delivers long-term peace of mind.

Schools and Education Facilities



Multi-Family Structures



Office Buildings



Healthcare Facilities



Data Centers



Retail & Commercial Buildings







*CarbonCast® technology is made available through the AltusGroup, of which Mid-States Concrete Industries is a proud member.*



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