

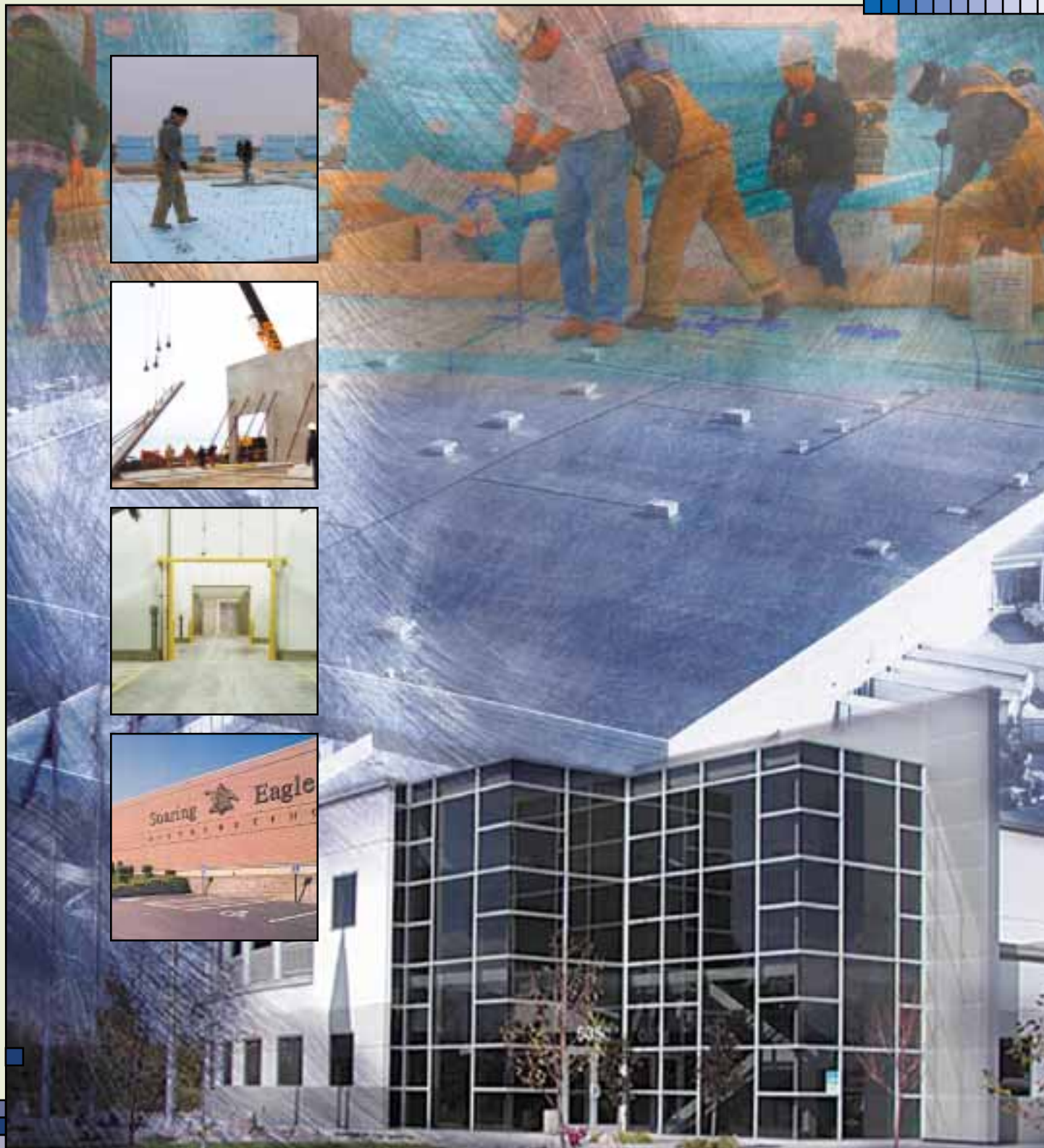


THERMOMASS[®]

BUILDING INSULATION SYSTEMS

By Composite Technologies Corporation

D I S T R I B U T I O N



www.thermomass.com

THERMOMASS®

■■■■■■■■■■ BUILDING INSULATION SYSTEM

THE SYSTEM



Composite Technologies Corporation (CTC) was founded in 1980 by Robert T. Long. His innovative thinking and vision led to the development of the THERMOMASS® Building Insulation System. At the heart of the THERMOMASS® system is a patented continuous fiber composite connector, which is used to structurally tie two layers of concrete together through predrilled, prefabricated, extruded Dow brand insulation products. The non-conductive, chemically resistant, fiber composite connector allows the creation of an uninterrupted envelope of insulation throughout the exterior walls of the building. This creates a highly energy efficient building system that is virtually maintenance-free and has the ability to not only resist mold, but stand up to fire, earthquakes, hurricanes and tornadoes as well.



The continued development of this system represents a dramatic advancement in building technology for many types of temperature and atmosphere controlled facilities throughout the world and offers unsurpassed advantages over block/brick, steel and insulated metal panel construction.

A HISTORY OF SUCCESS



For over 20 years, THERMOMASS® has been the industry leading system for concrete sandwich wall construction. Extensive testing, research and development of innovative technologies keeps CTC at the forefront. With a track record of over 100,000,000-sq. ft. of sandwich walls in the US and around the world in use today, we have more experience than all other building insulation systems combined.

The energy efficiency of the finished building combined with the ease and speed of construction has made our building system the preference of industries ranging from education and correctional facilities to freezers, coolers, distribution centers and retail facilities. They keep returning to the THERMOMASS® Building Insulation System because it provides them with unparalleled construction quality, aesthetic versatility and energy savings.



WHO WE ARE



A FAMILY OF COMPONENTS



The THERMOMASS® Building System is a technologically advanced system that delivers exceptional construction with superior insulation effectiveness.

Connectors

Our family of continuous fiber composite connectors is made from a resilient composite matrix and possesses incredible strength and durability. They are far superior to steel and or plastic connectors in sandwich wall panels because they are non-corrosive, chemically resistant and have low thermal conductivity with unsurpassed structural strength.

Insulation:

Dow brand insulation products are a "closed cell" structure, that means no gaps or voids between cells. The rigid board construction resists all forms of water penetration including water vapor transmission. The high thermal resistance and high compressive strength make it a valuable component in the THERMOMASS® Building System.

Dow insulation used in the THERMOMASS® Building System:

Styrofoam® Brand Extruded Polystyrene

ISOCAST R Polyisocyanurate

ProPEL® Extruded Polypropylene



WHO WE ARE



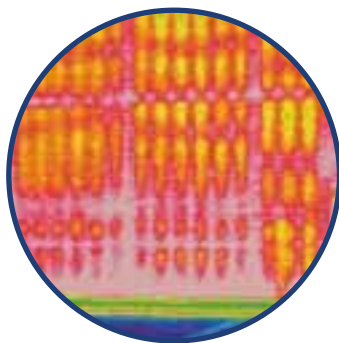
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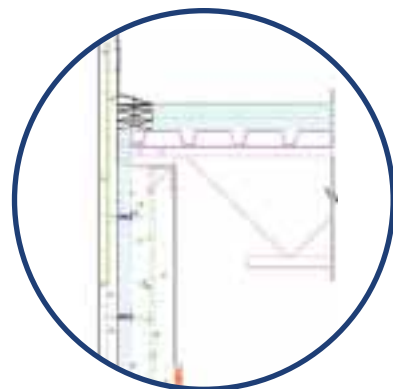
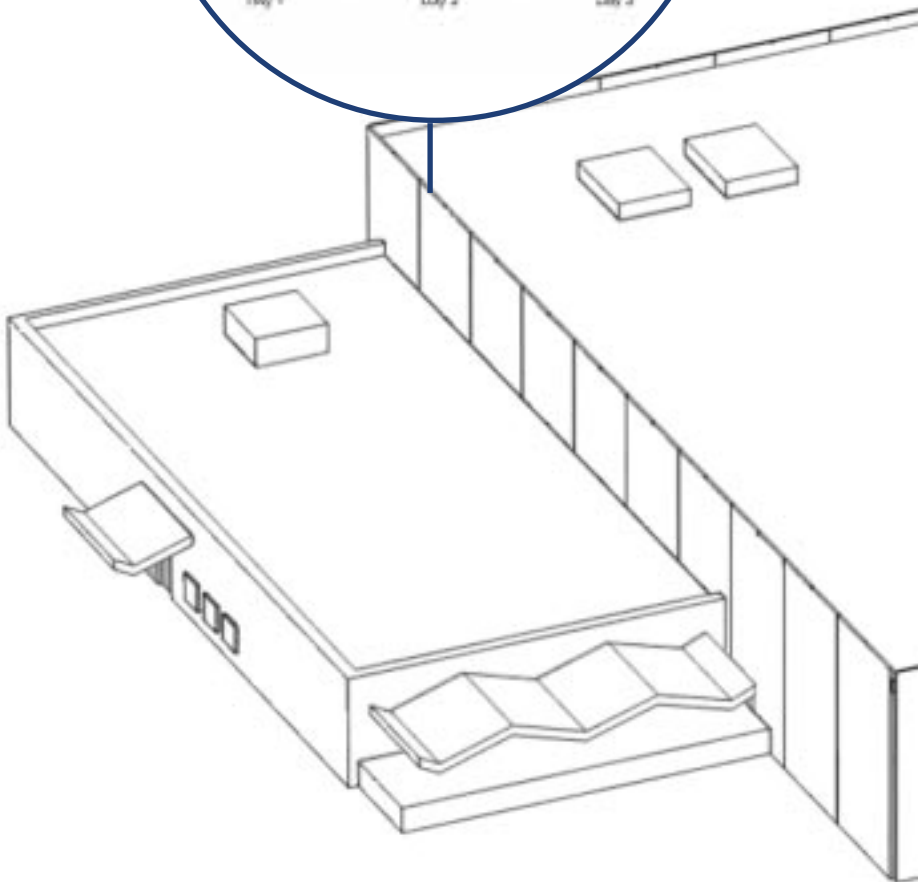
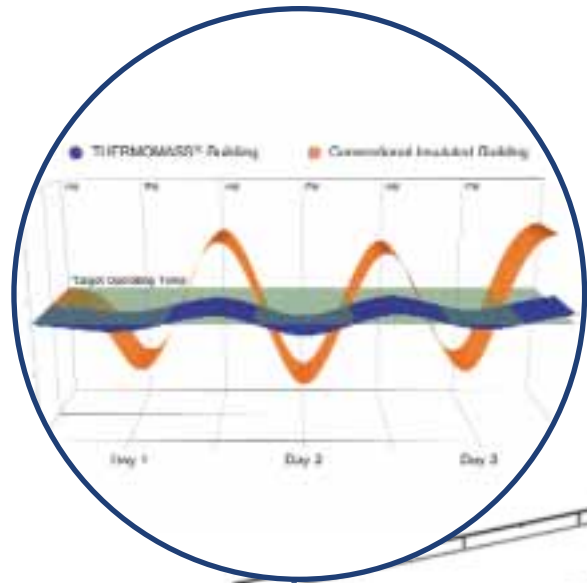
The ability of concrete to store energy and dampen the effect of temperature change on heating and cooling systems is known as the **“Thermal Mass Effect.”** Due to the mass effect created by the THERMOMASS® Building Insulation System the performance R-value of the system can be two to three times greater than that of the material R-value. Resulting in energy cost savings up to or exceeding 50%.



Through the science of thermographic imaging we are able to prove the benefits of the THERMOMASS® system. The blue color in the above image of a THERMOMASS® facility shows zero thermal bridging and no energy loss. Below, is a thermal image of a traditional construction system. The red and yellow colors indicate severe thermal bridging and massive energy loss.

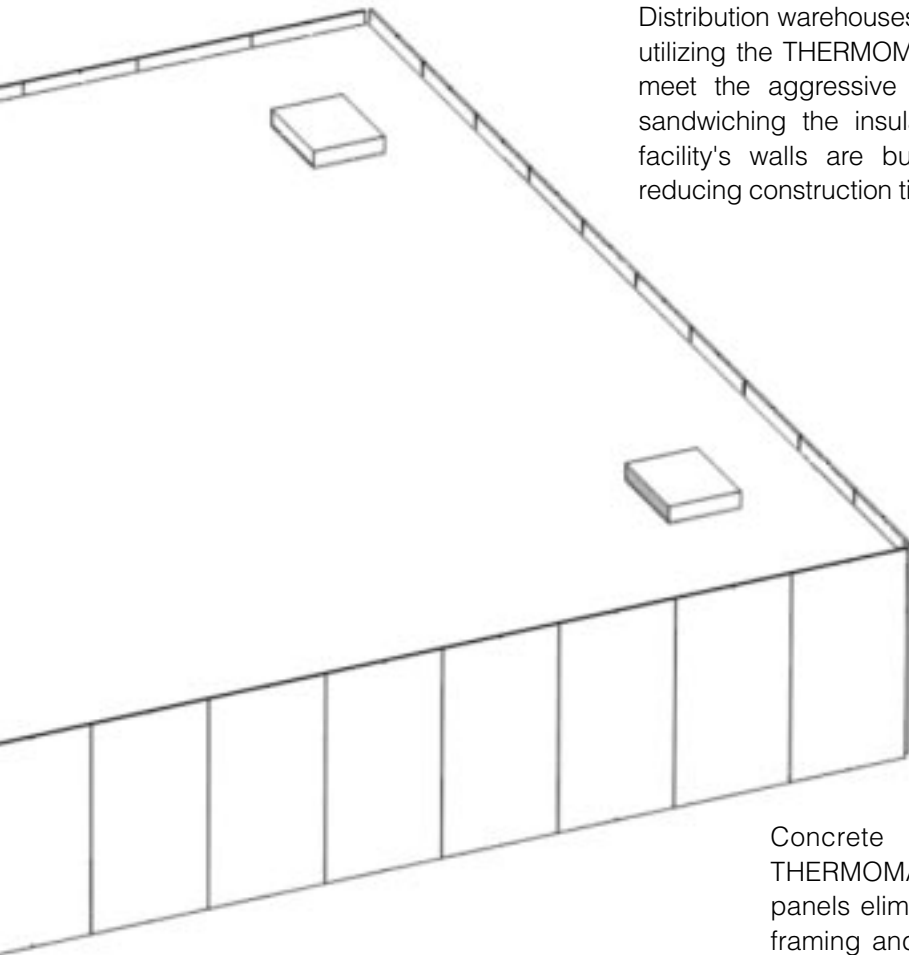


THERMOMASS® uses edge to edge and opening to opening insulation, enabling the exterior and interior wythes of concrete to behave independently. This allows the exterior wythe to expand and contract with exterior temperature change while the interior wythe remains constant. This eliminates the chance of thermal cracking and thermal bowing. Unlike competing systems, THERMOMASS® eliminates thermal short circuits, air infiltration and moisture drive through the exterior walls.





THERMOMASS® insulated walls provide incredible structural integrity and security plus an added measure of fire safety. Our connectors have been tested by a leading United States fire testing agency where a panel constructed with THERMOMASS® fiber composite connectors was subjected to 1093 °C (2000 °F) for four hours with no degradation. The temperature of the surface of the wall opposite the fire rose only 20.8 °C (37.6 °F) during the testing period. The standard for passing this test was 121 °C (250 °F).



Distribution warehouses built with insulated concrete sandwich walls utilizing the THERMOMASS® Building Insulation System are able to meet the aggressive schedule of today's business market. By sandwiching the insulation between two layers of concrete, the facility's walls are built and insulated in one operation—greatly reducing construction time and getting the facility operational sooner.



Concrete sandwich panels insulated with THERMOMASS® are load bearing elements. These panels eliminate the need for perimeter structural steel framing and protective curbing. Instead the insulation, structure and cladding are provided in one assembly. This offers significant design and construction savings by simplifying the building perimeter and area separation wall conditions, freeing up interior space for product movement.

Distribution centers, by definition, are subjected to tremendous abuse on a daily basis due to the volume of product movement through them. THERMOMASS® insulated panels, with their concrete interior, are durable enough to be impervious to damage from forklifts, material handling equipment and traffic flow that would otherwise be inflicted on other types of walls – resulting in a building that is basically maintenance free.



THERMOMASS®

BUILDING INSULATION SYSTEM

A SOUND INVESTMENT



Building a better facility doesn't always cost more. Concrete is low in cost and one of the most durable and flexible construction materials available. Couple that with the added features and benefits of the THERMOMASS® Building Insulation System, and you surely will not "break the bank" on the project. In fact, it's a common misconception that insulated sandwich wall construction is more expensive than other methods such as block, post insulated concrete panels and steel buildings.. To build a high performance distribution center, there is no more economical way than sandwich wall construction and the THERMOMASS® Building Insulation System.

CUSTOM DETAILING



Proven building details are essential to the success of insulating concrete sandwich panels for controlled environments. Without them, you simply cannot guarantee the continuity of the insulation envelope. CTC provides custom details for each facility along with all the technical design assistance necessary to ensure the success of the project. We work closely with architects, engineers, contractors and owners to guarantee the integration of the THERMOMASS® building system.

LOWER HEATING AND COOLING COST



One way that the THERMOMASS® insulation system helps the owner save money is in heating and cooling costs. Because the THERMOMASS® insulated panels have excellent thermal storage properties, facilities using them have a reduced total load requirement. Owners of these buildings have taken advantage of this by purchasing multiple smaller HVAC units, thereby allowing them to stage compressor usage. THERMOMASS® distribution facilities are also able to shift the HVAC load requirements to off peak hours, thus reducing energy costs by as much as 50%.

LEED™ -ING THE WAY IN GREEN BUILDING



The THERMOMASS® Building Insulation System can make a significant contribution toward the construction of a Green Building. Through its highly energy efficient and thermally efficient properties, THERMOMASS® aids architects and engineers in achieving points toward LEED™ certification. LEED™ is a point system used to quantify the use of "green" building materials, designs and products. This rating system contains several sections and subsections in which points are allocated toward LEED™ certification of a building. Builders using the THERMOMASS® system can earn up to 21 points in five of the six sections of LEED™.

DISTRIBUTION





TECHNICAL DESIGN ASSISTANCE

- Determination of system compatibility with your project
- Recommendation of design modifications to assure the integrity of the project
- CAD generated panel layouts that simplify and speed up the construction process
- CAD generated panel and joint design and construction details

CONSTRUCTION ASSISTANCE

- Pre-Construction meetings
- On-site installation training and assistance
- Ongoing project assistance

ANALYSIS SOFTWARE APPLICATION TOOLS

With our State-of-the-art analysis application suite, we can produce studies and testing on the transfer of of moisture, heat migration and humidity levels on panel wall systems. By using these software applications, we can accurately predict reactions to weather from both external and internal climate conditions. Our analysis application suite includes:

- Isothermal analysis
- Mass Performance analysis
- Energy Efficiency and Cost Reduction analysis
- Construction Cost Estimates and Building Life Cycle Payback analysis
- Dewpoint analysis, Moisture and WUFI
- Thermographic analysis
- Finite Element Analysis

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