Date: July 10th, 2017

General Information

In the United States, up to 40% of all energy used is consumed by commercial and residential structures. Nearly 40% of that energy is spent on Heating or Cooling the building. According to officials at Oak Ridge National labs, The US Department of Energy and many other third-party testing and accreditation labs, the use of properly formulated and placed PCMs within the structure can reduce the heating and cooling load by between 40% to 60%. The use of PCMs in buildings within the United States then has the potential of saving Quadrillions of BTUs of energy every year, reduce our dependency on foreign energy sources, and significantly reduce our carbon footprint.
PCM is a unique solution whose material benefits stretch across multiple audiences. Building owners benefit because their heating and cooling utility bills are lowered. Building occupants benefit by occupying a more comfortable environment. Public utilities benefit by reducing energy loads and balancing out daytime and nighttime peak energy demands. The general public benefits because with Infinite R materials, pollution emitted into the environment is reduced.
These benefits can be seen immediately after the material is installed. The potential to save quadrillions of BTU's of energy and hundreds of billions of energy dollars can be saved over the next twenty years. With this material, we see a tremendous opportunity to partner with energy suppliers to reduce peak energy loads, which is one of the biggest problems facing power companies today.

SOLEDION, LLC.
6628 El Poste Ct – El Paso TX 79912
1900 Appaloosa Dr. – Suite A7 - Sunland Park, NM 88063
Phone: **915-588-4444 - 915-422-9785**
e-mail: rpeter@soledion.com **/** apeter@soledion.com

ENERGY STORAGE FOR LIFE!

Infinite-R™ for Commercial Applications

Infinite R™ is the highest performing, lowest cost phase change material available for easy building integration and MASSIVE benefits… literally!

Reduced Energy Costs & Demand Charge Costs!

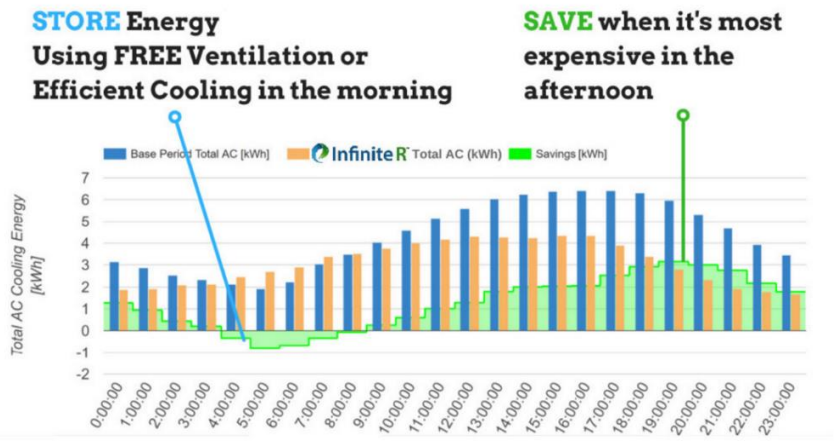
Installing Infinite R™ in strategic locations within your factory, commercial building, agricultural facility, school or any other application has significant benefits.

- Infinite R™ naturally absorbs and releases energy gains and losses to stabilize temperature swings inside your building, and provide huge comfort and energy savings benefits.
- On the coldest days, the building heating system is working a fraction of what it used to. And on the hottest days, the cooling system is either not even turned on or running way below peak load.

All this translates into significant energy savings, better climate control, reduced carbon emissions and huge drops in demand charges.

Infinite R™ is a phase change building material that stores energy when you *don't* need it, releasing it when you *do*.

It works the same as ice inside a cooler, slowly melting or thawing to maintain a target temperature using the process of phase change. It drastically increases the resiliency of buildings and communities, slashes energy costs by as much as half and increases the capacity for a more comfortable world.



SOLEDION, LLC.
6628 El Poste Ct – El Paso TX 79912
1900 Appaloosa Dr. – Suite A7 - Sunland Park, NM 88063
Phone: **915-588-4444 - 915-422-9785**
e-mail: rpeter@soledion.com / apeter@soledion.com

What is Phase Change Material?

Think of your home like a drink cooler…

If you wanted to keep the temperature inside a cooler ideal for drinks, why would you use a heating and cooling system to do this when you could use ICE (aka Phase Change Material)? Yet this is exactly what we do with our buildings.

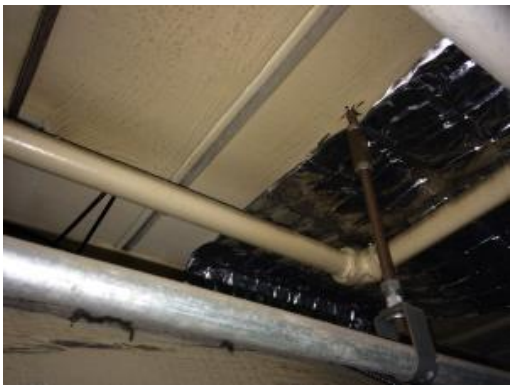
Infinite R™ is a building product that behaves as a Phase Change Material (PCM) designed to freeze and thaw at the exact temperature you want, to keep your living and working spaces closer to target temperature without the use of conventional energy sources.

When your home or space gets hot (from solar gain, occupants, cooking, partying etc), Infinite R™ absorbs unwanted heat as the material inside it's cells begin to melt. Later when the temperatures get cooler, Infinite R™ released that heat as it begins to freeze (at night) – all the while maintaining the space at a comfortable target temperature.

Inside Walls

Under Floors

Above Ceilings and Attic



Garages, Basements

SOLEDION, LLC.
6628 El Poste Ct – El Paso TX 79912
1900 Appaloosa Dr. – Suite A7 - Sunland Park, NM 88063
Phone: **915-588-4444 - 915-422-9785**
e-mail: rpeter@soledion.com **/** apeter@soledion.com

Because of Infinite-R™'s performance, it can be used within the construction of new homes and buildings to **cut energy costs by up to 40% or more.** The use of Infinite-R™ ensures comfort, resilience and energy savings.

The size, complexity and cost of HVAC systems can be reduced because of using PCM Materia

Phase Change Materials (PCMs) have long been considered an essential ingredient to any Net Zero or Passive House project. In fact, it's been shown that the use of phase change materials within a 4″ to 6″ fiberglass wall can out-perform even the most comprehensive wall systems without PCM. Contact us to design Infinite-R™ into your next project in one of the following ways

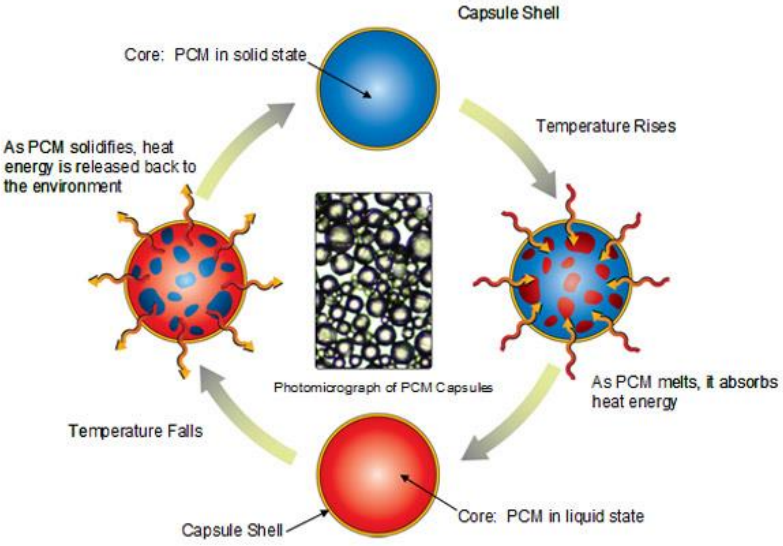
- **Interior & Exterior Walls**
- **Attics**
- **Flooring Systems**
- **Basement Walls & Ceilings**
- **Strategic Storage Areas**

How long will PCMs last?

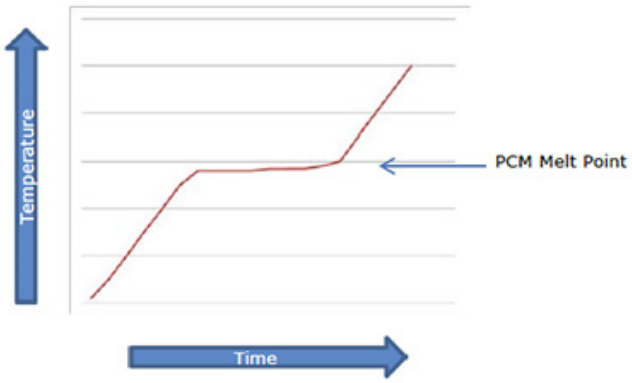
In more than five years of research supported by the U.S. Department of Agriculture, the National Science Foundation and the Department of Defense, the tested phase change materials experienced zero thermal degradation while exposed to over 65,000 thermal cycles.

How do PCMs work?

A phase change material absorbs and releases thermal energy to maintain a regulated temperature.



SOLEDION, LLC.
6628 El Poste Ct – El Paso TX 79912
1900 Appaloosa Dr. – Suite A7 - Sunland Park, NM 88063
Phone: **915-588-4444 - 915-422-9785**
e-mail: rpeter@soledion.com / apeter@soledion.com



When a PCM is in its' solid phase it will absorb heat as the external temperature rises. The temperature of the PCM will mirror the external temperature until the PCM's melt point is reached. When the external temperature reaches the melt point of the PCM, the PCM will begin to melt, i.e. "change phase". During the phase change process, the PCM will absorb large amounts of heat with almost no change in temperature. During this time period, the PCM is providing a cooling effect. The amount of time the PCM will provide a cooling effect is determined by the PCM's enthalpy of melting, also called the latent heat of fusion of melting. The enthalpy varies depending on the PCM material itself. In the case of PCMs, the enthalpy is typically measured in Joules/gram. The higher the number of Joules per gram, the longer the PCM will provide a cooling effect.
The reverse cycle occurs as the external temperature cools. The PCM, now in its' liquid phase, can release the heat it absorbed as the external temperature decreases. During this time period, the PCM solidifies and provides a warming effect.

Why Use PCMs?

Phase change materials are unique in that they provide a completely passive thermal regulation system. In other words, no electricity or power of any kind is necessary to create a real reduction or increase in temperature. In addition, PCMs have the advantage that they can be used over and over again.

What does this mean for you?

It means:

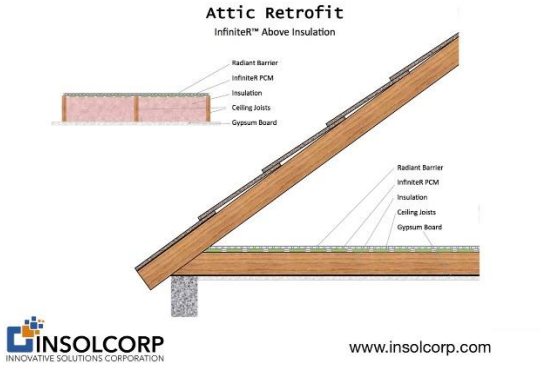
- Substantial energy savings to owners when used in the construction of buildings and structures
- Cooling and heating relief in remote locations without access to electricity
- Heat storage and release in conjunction with solar energy systems
- Construction material that keeps living spaces comfortable and reduces heating and cooling costs
- Thermal energy storage systems that shift a building's cooling and heating needs to cheaper, off-peak hours.

The benefits and uses of PCMs are limited only by the imagination.

SOLEDION, LLC.
6628 El Poste Ct – El Paso TX 79912
1900 Appaloosa Dr. – Suite A7 - Sunland Park, NM 88063
Phone: **915-588-4444 - 915-422-9785**
e-mail: rpeter@soledion.com / apeter@soledion.com

How you should insulate in "HOT CLIMATE"

1. Attic - Installation of Insulation recommended as seen below



If your location is a warm climate where winter months rarely go below freezing temperatures, then the warm climate attic installation is a perfect method of using Infinite R™ as a thermal barrier to combat the harsh high temperatures that are gained within the roof system, eventually penetrating the living space below.

In summer months, the PCM placement helps shield the building from excessive heat gains from high attic temperatures that drive heat into the building from the top down.

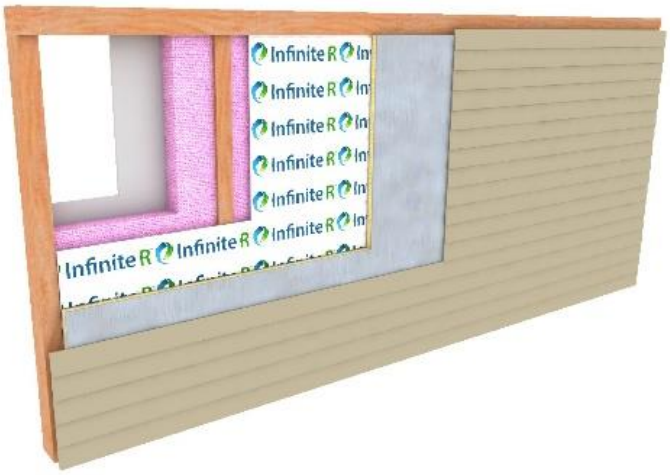
One of the greatest issues with warm/hot climate buildings is the significant temperature swings which take place in the warmer months when the sun is beating down on the roof system. As the rising sun hits the roof system, temperatures spike and the air conditioning system quickly runs into over-drive. Particularly in buildings where ductwork is run through the attic (being super-heated be the high temps along the way).

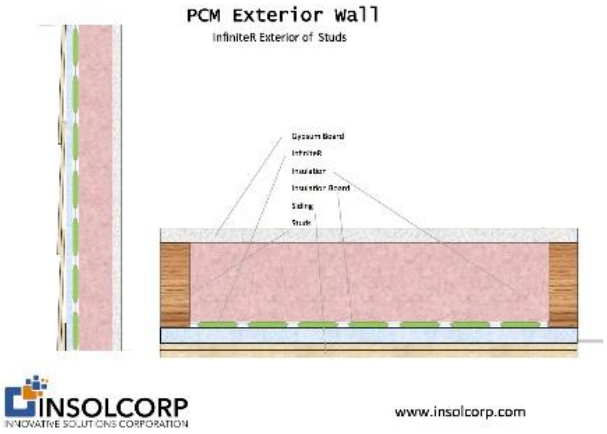
Infinite R™ works as a thermal barrier within the attic system (above the insulation) and stores the very high temperatures in the attic to reduce overall attic temps, and significantly control the impact of high heat gains on the comfort of the spaces below.

Being in this way, the PCM helps the attic and overall building respond as though it is literally living in a much more stable climate with very small temperature swings from day to day.

SOLEDION, LLC.
6628 El Poste Ct – El Paso TX 79912
1900 Appaloosa Dr. – Suite A7 - Sunland Park, NM 88063
Phone: **915-588-4444 - 915-422-9785**
e-mail: rpeter@soledion.com **/** apeter@soledion.com

2. **Exterior Wall – Installation of Insulation recommended as seen below**





There are few better places to install Infinite R™ if your project is in a warm or tropical climate than at the exterior walls.

When placed at the exterior side of a wall assembly, Infinite R acts as like a thermal shield that is constantly helping your building behave as though it lives in a climate that stays constantly within a very narrow temperature range.

For example, if a 78F degree material were used in a climate with overnight lows below 78F then Infinite R™ will freeze overnight, and be ready for a full day of energy storage. As the heat rises outside, the product will increase in temperature steadily until it hits 78F. At this point, the phase change process will begin to take place over many hours, keeping the wall assembly at a comfortably 78F continuously. So, keeping the room at 72F becomes effortless for the air conditioning system which would otherwise be working overtime to combat exterior walls that are leaching and radiating 100 to 150F temperatures into the building.

SOLEDION, LLC.
6628 El Poste Ct – El Paso TX 79912
1900 Appaloosa Dr. – Suite A7 - Sunland Park, NM 88063
Phone: **915-588-4444 - 915-422-9785**
e-mail: rpeter@soledion.com **/** apeter@soledion.com

As the sun goes down, the product releases that heat to the outside where it re-freezes for another day of storage.

In the winter months, the light layer of insulation at the exterior helps Infinite R to access and absorb heat from inside the building where it is stored before leaving the conditioned envelope. The product melts as excess heat within the building rises, and from external loads such as south, eastern and west walls. During the overnight, the product slowly releases it's heat where it can be used to benefit the building or help the heating system experience a climate with a much narrower temperature range.

Since heating and cooling loads are "all about delta-T", this exterior wall detail puts complete control of delta-T in the hands of the building owner instead of the weatherman!

NOTE:

In the following attachment, you will a project case study and test result achieved for a retail store in Phoenix Arizona:

SOLEDION, LLC.
6628 El Poste Ct – El Paso TX 79912
1900 Appaloosa Dr. – Suite A7 - Sunland Park, NM 88063
Phone: **915-588-4444 - 915-422-9785**
e-mail: rpeter@soledion.com **/** apeter@soledion.com