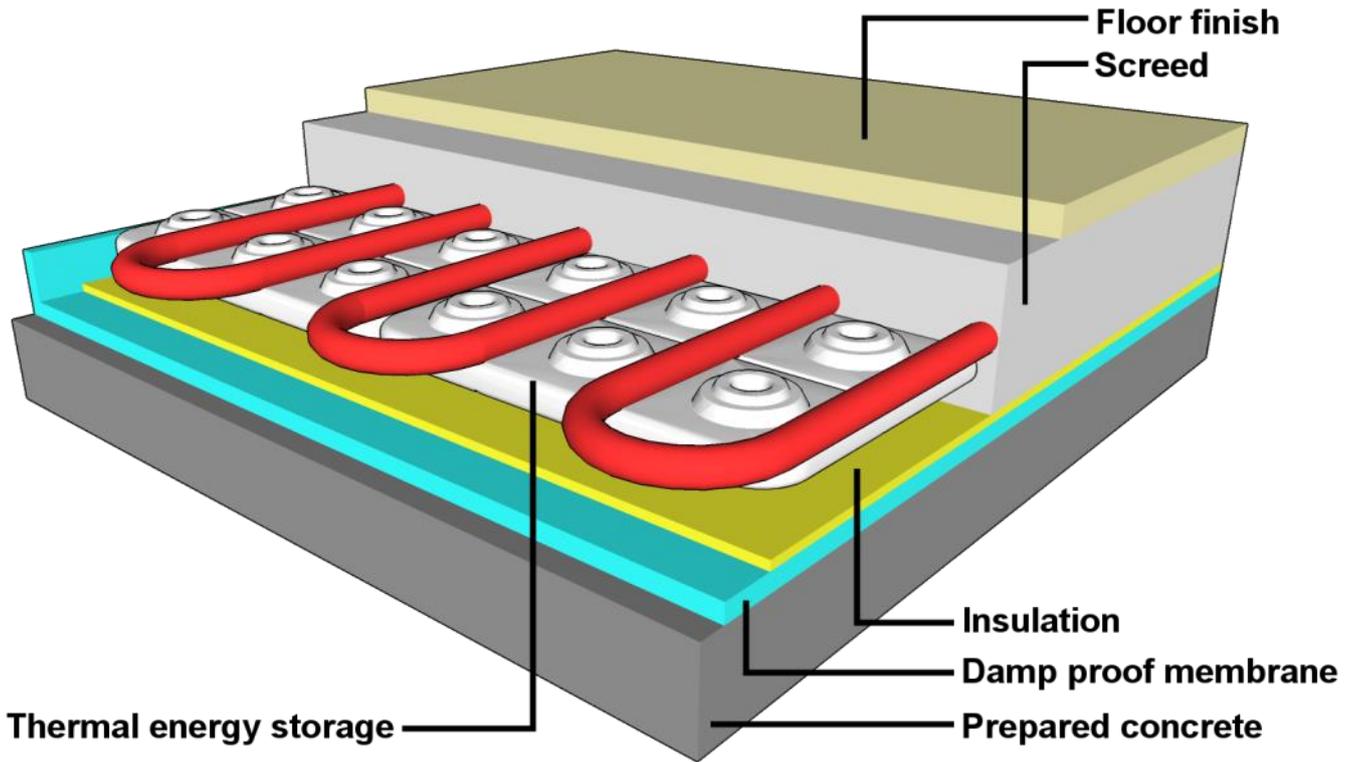
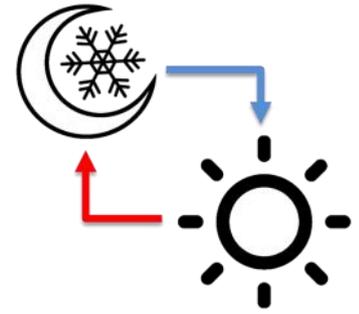


## ThinICE Applications

By introducing eutectic products into a radiant heating system, it is possible to capture excess heating during the day time and maintain that heat into the cold of night. 27°C (81°F) phase change material (PCM) is sealed inside HDPE modules. This material captures energy by melting and releases it when it freezes. All conventional floor finishes are rated to handle these temperatures.



Each module features a number of grooves which are optimally spaced out for runs of underfloor heat pipes, this close contact with the PCM ensures the best heat transfer possible. They allow for pipe lengths to be easily held in place during the installation process requiring no specialist skills. Once installed, the thermal mass of a building may be increased by as much as 10~15 times. Thanks to there being no moving parts, PCM TES is effectively maintenance free and once installed it simply becomes part of the building.

For the best results, this can be paired with a ground source heat pump (GSHP) or other renewable heating systems so that the entire PCM TES can be charged with free energy and then discharged nightly.

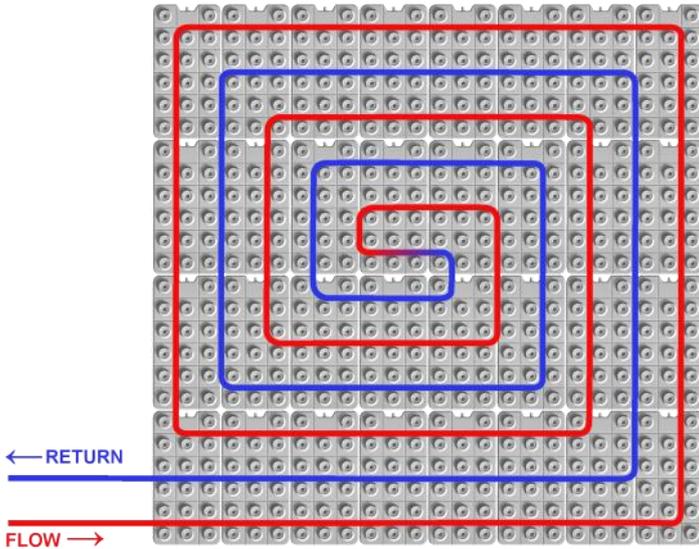
## Installation

At normal conditions the PCM will be in solid form, making the modules very robust. Rows of modules can be laid directly on top of the insulation layer replacing conventional castellated panels. This creates a grid which allows the heating pipe to be laid easily, holding the heat pipe in place throughout the screeding process to ensure that the finished underfloor heating system will distribute heat evenly.

**Maintenance Free**

**No Moving Parts**

**Full Standby Capacity**



## ThinICE modules

An individual PCM module is known as a ThinICE. They are filled with 1.6 litres of PCM solution which is then triple sealed for maximum security. It is possible to install these modules in the ceiling and other locations as a means of thermal energy storage.



## System Sizing

Eight PCM modules can be installed per m<sup>2</sup>. This allows for up to 0.995 kWh/m<sup>2</sup> TES.

For installers, it is important that the heating system has the appropriate power. This can be easily estimated using the below:

$$Q_{ins} = \frac{995.5 \text{ Wh/m}^2}{t} + \frac{Q_{peak} \times K}{A}$$

Where:

- $Q_{ins}$  = heating system power (W/m<sup>2</sup>)
- $t$  = charging period available (hrs)
- $Q_{peak}$  = peak heat load (W)
- $K$  = diversity factor (usually 0.6)
- $A$  = area of underfloor heating (m<sup>2</sup>)

## Example

An underfloor heating system is planned for an 25m<sup>2</sup> room. There is an anticipated peak heat load of 1400W and there is a 10 hour charging period available. Using the above, we know that approximately 200 PCM modules could be installed. The heating system power can also be estimated:

$$Q_{ins} = \frac{995.5}{10} + \frac{1400 \times 0.6}{25} \approx 133\text{W/m}^2$$

It is possible to fill these modules with any of our S-range PCMs, not only S27. Consult our sales team for any custom applications.

## Increased Thermal Mass

