

# Thermal Mass

*Thermal mass is a property that enables building materials to absorb, store and later release significant amounts of heat.*

Thermal mass is a concept in building design that describes how the mass of the building provides “inertia” against temperature fluctuations, sometimes known as the thermal flywheel effect. For example, when outside temperatures are fluctuating throughout the day a large thermal mass within the insulated portion of a house can serve to “flatten out” the daily temperature fluctuations, since the thermal mass will absorb thermal energy when the surroundings are higher in temperature than the mass, and give thermal energy back when the surroundings are cooler, without reaching thermal equilibrium. This is distinct from a material’s insulation value, that reduces the building’s thermal conductivity, allowing it to be heated or cooled relatively separate from the outside, or even just retain the occupants thermal energy longer. Scientifically, thermal mass is equivalent to thermal capacitance or heat capacity - the ability of a body to store thermal energy. It is typically referred to by the symbol  $C_{th}$  and measured in units of  $J/^\circ C$  or  $J/K$  (which are equivalent).

Hempcrete has all the characteristics of Thermal Mass with the added benefit of being lighter weight than concrete and other masonry building materials and is able to STORE and RELEASE ENERGY (heat) that gives Hempcrete its superb ability to insulate.

Synthetic light weight insulation materials cannot store heat at all and will allow heat to pass through very quickly with sudden spikes in temperature.

Solid, heavy materials like concrete cannot absorb and emit heat quickly and do not have the ability to buffer moisture.