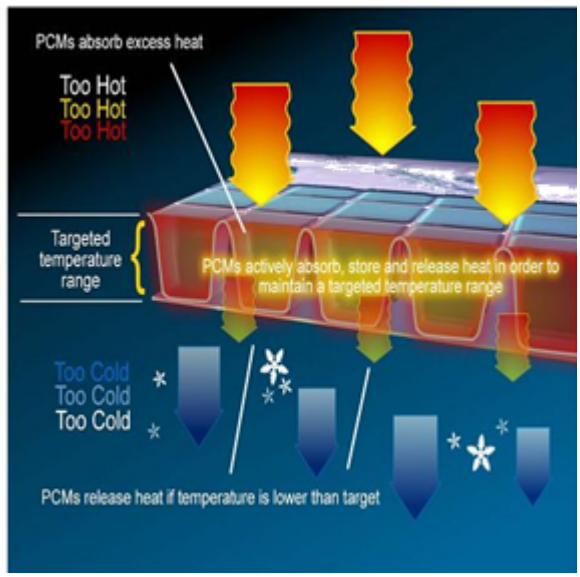
TECHNOLOGY DEVELOPMENT PROJECT FACT SHEET

UT006 Phase Change Material

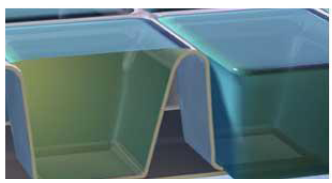
Phase Change Material (PCM) is a solid at room temperature that turns into a liquid by absorbing the outdoor heat that moves through the insulated wall to the inside of the room and then returns to a solid when it cools. It reduces utility bills by moderating temperatures within the room and reduces the inside room temperature fluctuations between day and night.
APS had two buildings erected at the STAR site. Each is 10x10 ft square with a door and one window. One building is the "control" and has normal insulation material placed in the walls and ceiling. The second building has the PCM installed in addition to the insulation. The object of the test is to maintain identical temperatures in each building with thermostat controlled heat pumps and then monitor the temperatures and electric energy usage in each building.

Theoretically, the PCM will be cooled by the air conditioner during the night and return it to its solid phase. During the day, the PCM will absorb heat and become a liquid. Absorbing heat in this way should keep the building cooler and potentially shift the peak use of the air conditioner up to four hours later in the day compared to the air conditioned room in the normally insulated "control" building. At night the cycle begins again.



The experiment is to test the manufacturer's claim of 30% reduction in energy usage and to validate their claim of a shift in electricity peak demand by 4 hours.

The Phase Change Material is being proposed as an energy saving building material with applications to wallboard and ceilings.



STAR PCM test site with a control building built with standard construction methods and the other built with pcm in both the ceiling and walls. The testing will measure energy savings achieved by installing pcms versus standard construction.

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