

## The effect of phase change material on thermal energy storage in cement layers

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### Abstract

Due to the increase in weather temperatures during the last decade, the demand for refrigeration and air conditioning have been increased. The building and house wall covering material can be used as heat storage material for economic advantage over conventional cooling devices. The phase change material PCM can be implemented in wall covering material as a thermal storage and to become a part of the building structure. PCM is one of the latent heat material having low temperature range and high energy density of melting-solidification compared to the sensible heat storage. Two laboratory experimental cement samples are tested by using thermocouple junctions at the same external thermal load and outer ambient temperatures. The comparison of transient measured temperatures between treated and non-treated cement samples with PCM have been investigated. The study indicates that the transient measured temperatures in treated sample are lower than in non-treated sample about (7.93% to 9.67%) at the same junction position for the two samples. The results have shown that the use of PCM in covering building has significant advantages for thermal storage component in wall structure.