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## Maximizing the usage of pcm materials in buildings

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**Abstract:** The fundamentals of how PCM materials works need more consideration. It has been reported that using PCM materials may reduce the cooling/heating loads in buildings. PCM can only affect the fluctuation of the load and not the magnitude of the load. Thus PCM materials should be considered as an energy management tool only. For PCM to operate effectively the cycle of charging and discharging of PCM material should be completed over the period of the day, i.e. PCM must be melted and solidified over the 24 hrs of the day. Using the appropriate amount of the PCM will maximize its usage. Fewer amounts will show more fluctuation in the load and larger amount will be a waste without benefit. The appropriate amount for an application is found to be function of PCM properties,  $k$ ,  $C_p$ , density and melting temperature. For PCM to complete the whole cycle in a day period melting temperature need to be near the average between the indoor and outdoor design temperature of the conditioned space. In this investigations a one dimensional model were investigated and solved numerically using finite difference technique. The effect of the amount of PCM material on load fluctuation is calculated and presented . Packing capsulated PCM material of linearly varying melting temperatures is found to maximize the effectiveness of the technique.