

Thermal Buffering Effect of A Multi-layer PCM Fibrous System Under Different Heating Temperatures

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Abstract: Phase change material (PCM) has been incorporated into textile for personal thermal management (PTM). For PCM-incorporated textile, the thermal buffering effect lasts for a period while the temperature increased within several degrees. To precisely control the thermal buffering effect within in a small temperature range is necessary while remains to be studied. Recently, we have proposed a multi-layer PCM fibrous system with high PCM loading amount for PTM. In this work, the thermal buffering effect of the multi-layer PCM fibrous system with polyethylene glycol (PEG) as PCM was investigated by using different heating temperature. Besides, morphology and leakage of the multi-layer PCM fibrous system were estimated. As a result, no leakage was found in the multi-layer PCM fibrous system. Higher heating temperature results in the shorter thermal buffering effect and higher temperature increase rate.

Keywords: PCM, multi-layer fabric, thermal buffering effect, temperature increase rate.

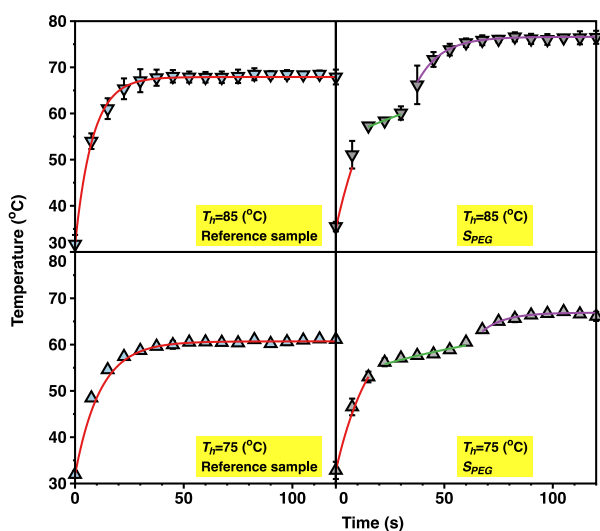


Figure 1 Heating T-history curves with different heating temperatures of reference and multi-layer PCM fabric (Error bar: standard deviation)

ACKNOWLEDGEMENT: The work is supported by the project 'Advanced structures for thermal insulation in extreme conditions' (reg. no. 21-32510M) granted by the Czech Science Foundation (GACR).

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