Experimental study of a novel three-fluids heat exchanger embedded with phase change materials for cooling applications

Boniface Dominick Mselle, Gabriel Zsembinszki, David Vérez, Luisa F. Cabeza*

GREiA Research Group, Universitat de Lleida, Pere de Cabrera s/n, 25001-Lleida, Spain.

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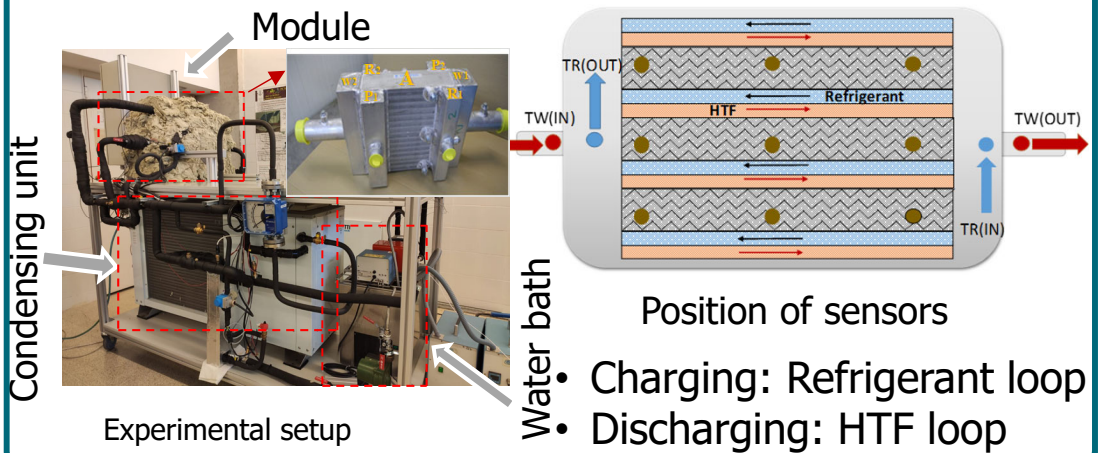
Introduction

- The integration of PCM into refrigeration systems increases the performance of the systems
- The implementation of PCM into the systems resulted to increasing the number of components
- An interesting solution is to modify the evaporator or the condenser to enable both the latent energy storage ability and the heat exchanger functions.

Methods

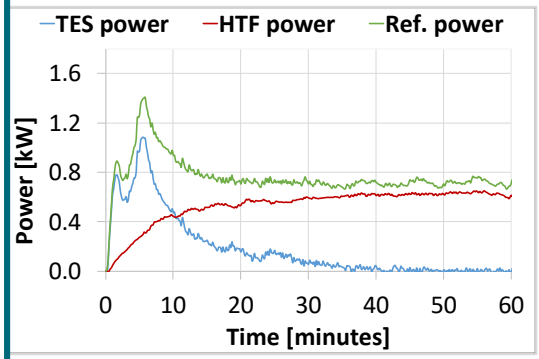


Experimental setup

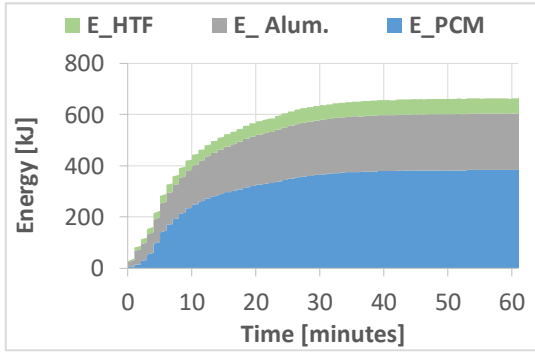
Position of sensors

- Charging: Refrigerant loop
- Discharging: HTF loop

Results



Power delivered



Energy stored

Conclusions

- The PCM charges until a thermal equilibrium is achieved
- More than 54% of total energy was stored in the PCM
- The module is a feasible solution for the integration of PCM into refrigeration systems and similar systems

Acknowledgements

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C/ Pere de Cabrera, s/n,
25001 Lleida
Tel. +34 973 003 704
luisaf.cabeza@udl.cat

www.greia.udl.cat