

# Materials Science and Engineering

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Cunha S***University of Minho, Portugal***Durability of cement mortars with incorporation of phase change materials**

Currently, it is necessary to study and develop constructive solutions with high durability, in order to decrease the environmental negative impacts and maintenance costs of buildings. The development of functional construction materials to increase the energy efficiency of buildings is now an effective way to contribute to a more sustainable development. The high energy consumption throughout the world is one of the main problems of the modern society. Thus, the development of mortars with incorporation of phase change materials (PCM) is a very promising technique for the improvement of social, economic and environmental habitability conditions.

The PCM have the thermal regulation capacity due to their ability to absorb and release energy to the environment, allowing decrease the energy buildings consumption, gas emissions to the atmosphere, environmental negative impacts and increase the energy efficiency of buildings. The durability study depends on the construction materials application. The

exterior solutions have more requirements compared to the interior solutions, since they are more exposed to weather conditions. However, the interior construction solutions must also be extensively studied regarding to their durability, more specifically their behavior at low and high temperatures. Thus, it is important to evaluate the behavior of PCM mortars when submitted to the freeze-thaw cycles (-18°C - 20°C) and high temperatures actions (200°C, 400°C and 600°C). The main results obtained with this study allow to conclude that the incorporation of PCM leads to identical behavior to mortars without PCM.

**Speaker Biography**

Aguiar J has completed his PhD at the age of 30 years from University of Minho, Portugal. He is associate professor at the University of Minho, Portugal. He has over 250 publications that have been cited over 800 times, and his publication H-index is 17.

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