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The 3rd workshop on
Energy, Infrastructure and Environment Research

Sustainability for resilience, and resilience for sustainability

Development Of Energy Efficient Roof Tiles

Energy efficient tiles refer to those that can improve thermal performance of a building. In this research, phase change materials (PCMs) are incorporated into tiles' mortar that would increase the thermal mass of the object and subsequently strengthen the barrier between the building indoor and outdoor environments. To protect PCMs from leaking, they are mixed with diatomite which would allow them to trap themselves into diatomite pores as a result of capillary action. The composite consisting of PCM and diatomite is called form-stable PCM (FSPCM). A double-jacketed glass reactor was used to prepare FSPCM composite. Regular mortar materials are mixed with FSPCM composite to prepare the tiles. The corresponding energy savings were calculated by empirical formulas. A comparative study on energy savings has been performed. It is found that the cooling energy can be saved by about 35%.

Professor Bijan Samali is Professor of Structural Engineering and the current Director of Centre for Infrastructure Engineering at the Western Sydney University. He received his Doctorate degree from the George Washington University in Washington DC in 1984 in Dynamics of Structures.

He has published nearly 600 technical papers in engineering journals and conference proceedings and to date has supervised over 40 PhD students successfully and has attracted over $5M in research funding as a Chief Investigator. His main research interests and expertise lie in the general area of Structural Engineering (with emphasis on Structural Vibration Control, Structural Health Monitoring, Wind and Earthquake Engineering, as well as Bridge Rehabilitation and Structural Testing) and materials, particularly concrete structures and pavements, including new and innovative, and green materials for engineering applications. He has over 34 years of academic experience in Australia, and engagement with industry as a specialist consultant for over 37 years.

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