

PHASE CHANGE MATERIALS (PCM) IMPREGNATED BIO-POLYURETHANE ROOFING IN BUILDING APPLICATION

TECHNOLOGY DESCRIPTION

This technology is invented to be used as a material incorporated with the function of energy saving and provides thermal comfort to the buildings for the modern building design.

TECHNOLOGY FEATURES

This technology applies latent heat theory by using fatty acids which are formed into an eutatic mixture serves as a thermal energy storage while receiving heat by solar during daytime. The heat is stored in the molten and kept in the building and at the same time prevents heat from entering the inner part of the building. The materials have undergone thermal analysis and morphological and conditioning tests. It uses lighter and moldable materials which is safe and economically valuable. It is suitable to be used in modern housing construction.

ADVANTAGES

- Energy saving
- Provide thermal comfort
- Lighter and moldable material

INDUSTRY OVERVIEW

Prospects: Building developers, Architects, Building material manufacturers

Phase change materials (PCMs) are commonly used in commercial buildings to save energy by actively absorbing and releasing heat. Currently, the PCMs dominate building and construction market followed by heating, ventilation and air-conditioning. According to Real Estate and Housing Developers' Association Malaysia (REDHA), the Malaysian property market recorded a marginal increase of 6.7% at RM 152.37 billion in 2013 compared to RM142.84 billion in 2012. The residential sub-sector continued to dominate the biggest share in the property market activities at 64.6% of the total share, worth at RM5.76 billion (US\$1.9 billion) by the end 2013. In terms of supply, there were 4.72 million of existing residential units with another 696,557 units in the incoming supply and 615,815 units in the planned supply categories. Globally, the PCMs market is estimated to grow from USD460 million in 2013 to USD1,150 million in 2018, at an estimated compound annual growth rate (CAGR) of 20.1%. Europe will remain the largest market in terms of volume and value by 2018 while North America is another market where number of major player exists.

Prof. Dr. Luqman Chuah A.
Institute of Tropical Forestry and Forest Products
chuah@upm.edu.my