Heat Recovery
Phase Change Materials

Heating and cooling are energy intensive processes used widely in managing the building's internal climate as well as in numerous industrial processes. EWTCOI researchers are exploring unique and novel ways to reduce energy usage in heating and cooling processes. One such effort is focused on recovery of waste heat through the development of phase change materials **(PCMs)**.

In collaboration with *KOYO Engineering Pte Ltd*, EWTCOI researchers have developed a high latent heat recovery phase change material for air-conditioning systems. In such a system, thermal storage using phase change materials can be used to operate chiller plants at optimised efficiency. Also, by providing on-demand heat storage via phase change materials during peak and off-peak periods, the overall plant energy consumption can be minimised.

EWTCOI can develop phase change materials for different applications in thermal storage.

Key Features & Benefits

- Nano-encapsulated heat recovery material
- Excellent corrosion resistance
- Non–toxic
- Excellent mechanical and chemical stability with high energy density
- Possible to tweak for different temperature heat recovery

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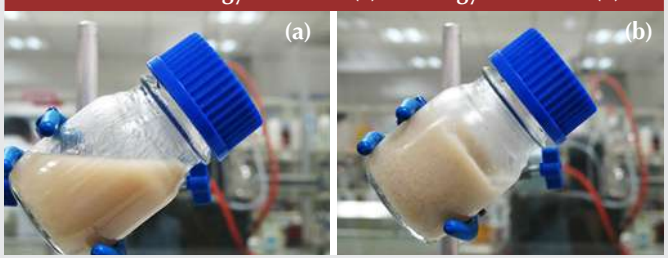
Applications

- Air-conditioning systems
- Equipment and building cooling
- Thermal regulating textiles (cooling wearables)
- Food packaging

PCM Liquid Phase at 25°C

PCM Solid Phase at 8°C

PCM Phases: Energy Released (a) & Energy Absorbed (b)



Thermal Energy Storage System for passive cooling/heating