NANYANG TECHNOLOGICAL UNIVERSITY

Energy Research Institute @ NTU

Presenter:
Dr. Kishor Zingre

Building Energy Performance in Tropical Climate using Magortherm insulation

OBJECTIVE & SCOPES

➢To demonstrate thermal performance of MagorTherm insulation material under tropical climate conditions.

➢To evaluate energy performance of MagorTherm insulation material Vs a conventional concrete Vs Cool paint Vs Phase-change material under tropical climate.

- To perform experimental measurements and computational simulations using EnergyPlus program
- To perform measurements in real-scale naturally ventilated residential buildings in NTU campus for thermal comfort analysis and air-conditioned pre-built units (PBU) for energy analysis.

NOVETLY

✓First real-scale test-bed study on concrete-based insulation material in tropical Singapore.

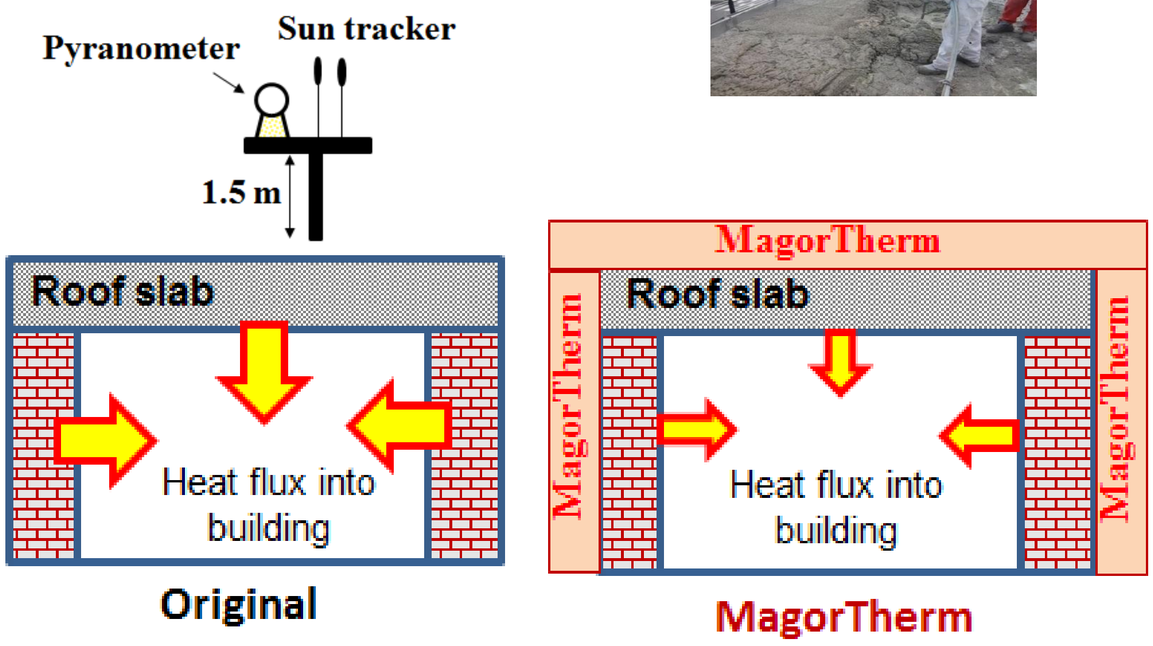
✓First study to compare thermal performance (indoor thermal comfort and energy savings) using insulaton Vs cool paint vs PCM in tropical climate.

KEY OUTCOMES

✓27% savings in annual energy consumption (A/C)

✓3°C enhancement in indoor thermal comfort (N/V)

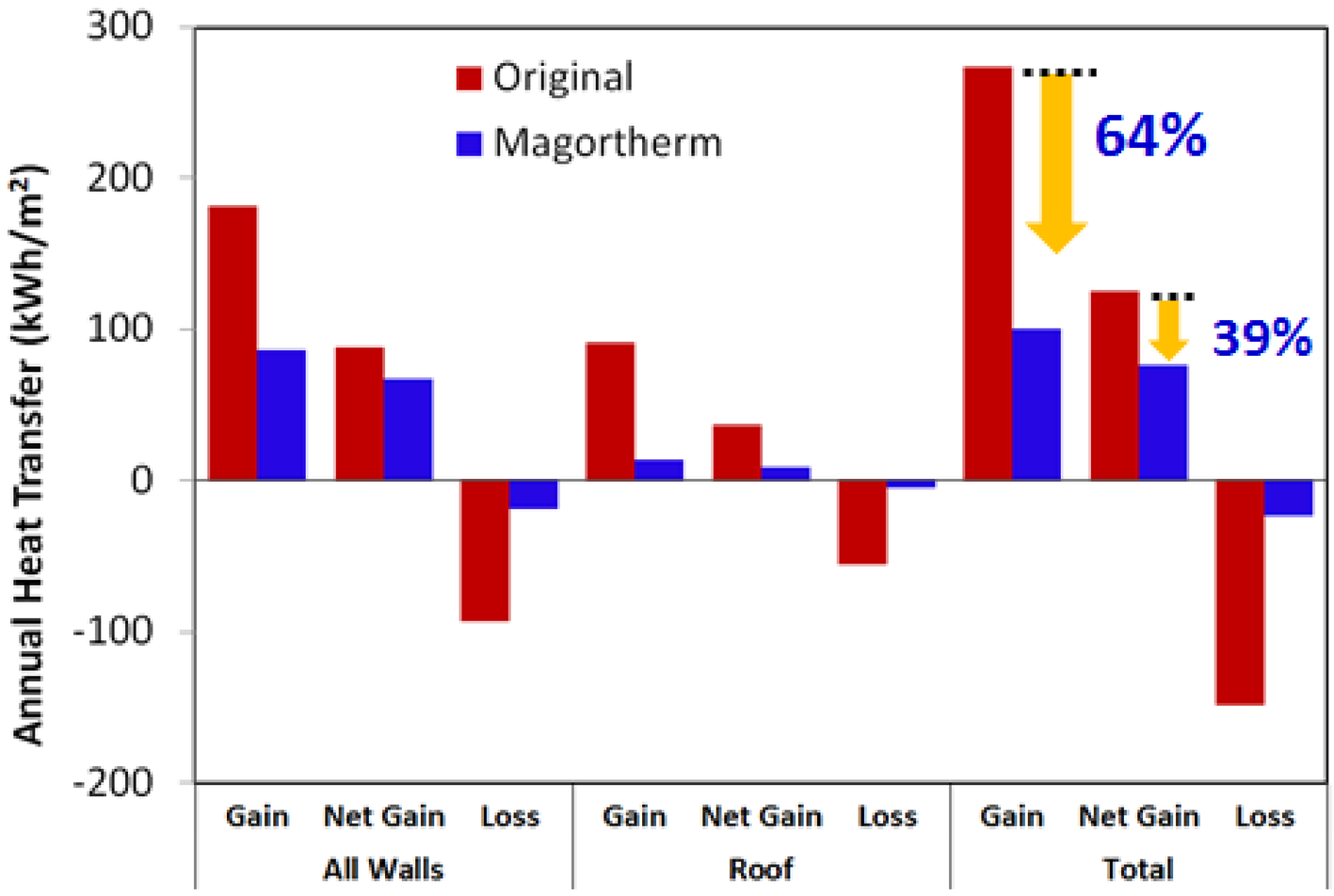
EXPERIMENTAL DESIGN



RESULTS

✓**64%** reduction in annual heat gain (N/V)

✓**39%** reduction in annual "**Net**" heat gain (N/V)



TEST-BED

SIMULATION