

## عنوان مقاله:

A Novel Lightweight Phase-changing Cooling Roof Tile

## محل انتشار:

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## خلاصه مقاله:

Roof tiles are the most common roof coverings in Indian buildings, especially in traditional residential buildings. Given the important role of roofing characteristics in building energy efficiency and indoor thermal comfort conditions, innovative solutions to improve the thermal energy performance of this diffused roofing element have become a key research issue. In this perspective, cool roofing applications represent an effective solution to this objective. The present work deals with the analysis of innovative cooling roof tile manufactured using a combination of Metakaolin with different percentages, EPS, sodium silicate and coating material. The experimental work was carried out during day and night. The thermal performance of cool roof tiles were assessed in terms of the open-air temperature compared to the thermal performance of ordinary roofing tile. The report discovered that using revolutionary cool roofs greatly increased thermal comfort during the daytime, and preserved thermal comfort during the night. The innovative cool roof tile is cheaper, easier to implement, and less expensive compared to other roofing technologies. The study revealed that the roof's exterior and interior surface temperature reduced about  $1^{\circ}\text{C}$  and  $1.3^{\circ}\text{C}$ , respectively during day time, while roof's exterior and interior surface temperature maintain atmospheric temperature during night time. The compressive and transverse breaking strength was increasing about 9.1% and 39.6%.

## کلمات کلیدی:

Cooling roof tile, Metakaolin, phase changing material, lightweight, Expanded Polystyrene Sheet

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1224243>

