

Enhancement of thermal performance of cool paints with various ceramic fillers

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Many regions around the world often reach or exceed 40 oC during summer. So we often expend substantial amounts of energy to reduce the interior temperature of the building, e.g. air conditioning. One way to reduce energy consumption is to employ energy-saving paints on the building's exterior. In this study, we introduce new cool paints to enable reduction of the building interior temperature in hot climates. Cool paints mixed with different shaped ceramic powders such as pearl, mica, and hollow silica having reflectivity or insulation properties contributes to the reduction of the surface temperature due to high surface reflectivity and/or protection of heat transfer in solar spectra. The surface temperature of the cool paints painted with 0.4mm thickness was reduced about 10 oC compared with conventional paints at same color. The painted samples were characterized by reflective index, thermal image, and cross-section SEM to understand ceramic powder role in efficient thermo-shielding paint.