

## **AESTHETIC AND THERMAL PERFORMANCES OF BLACK CUPRIC OXIDE AND TITANIUM DIOXIDE NANO-PARTICULATE COATINGS**

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**ABSTRACT.** Nano-particulate coatings with high reflectance against solar irradiation can control undesirable thermal heating by sunlight absorption. It can reduce the energy consumption for air conditioning of houses and cars. For the objects covered by these coatings and subjected to human sight, e.g. roofing surfaces, high dazzle of reflected visible light can offend the human eyes and spoil the fine view of covered objects. A new optimization method in designing pigmented coatings which considers both thermal and aesthetic effects by controlling the material, size and concentration of pigment particles is introduced. Our proposed coatings maximize the reflectance of near infrared (NIR) region to care the thermal effects and minimize the visible (VIS) reflected energy to keep the dark tone because of aesthetic appeal. Black cupric oxide and white titanium dioxide are considered as the pigment particles in this study. The optimum characteristics and performances of these two pigments are obtained and compared. The results show that cupric oxide has much better performance for our objective.