SCHOOL

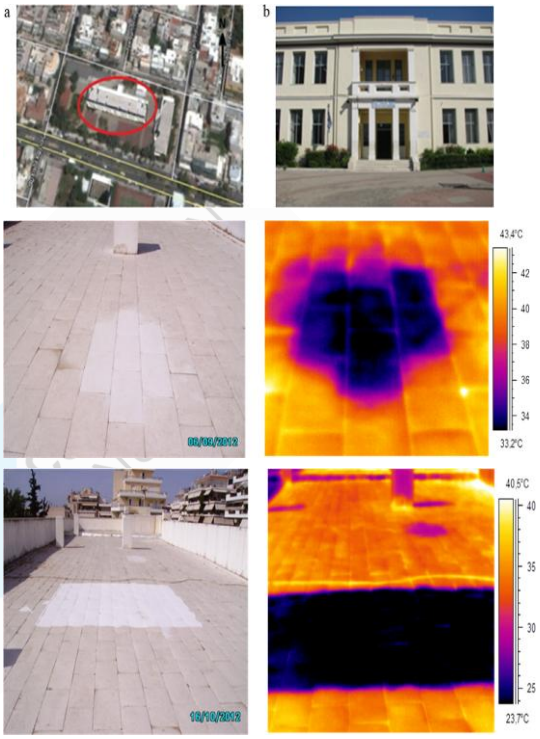
Kaisariani, Athens, Greece **2012**

School buildings

White cool coating

PROJECT DESCRIPTION / NEEDS

The use of cool materials for heat island mitigation has gained a lot of interest during the past few years. Cool materials are characterized by high solar reflectance and infrared emittance values. To maximize cooling energy savings, high albedo roof coatings should maintain the above properties for the service life of the coating, the weatherisation of the cool roofs in two buildings in Athens Greece is analysed. The optical properties of the aged and new cool roofs are measured and compared. The impact of ageing in the two buildings' energy performance is estimated.



APPLICATION / UTILIZATION

The buildings under investigation are two non-insulated schools located in Kaisariani, a densely built urban area near the centre of Athens, Greece. These two buildings are selected due to the fact that cool materials were applied in 2008.
The procedure followed is divided into the following steps:1. Measurement of the roofs' albedo. The two roofs under the ageing conditions. 2. Thermal imaging of the roofs' surfaces in order to detect heat patterns and temperature changes

Main products / systems used:
White cool coating

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CUSTOMER BENEFITS

The analysis show a decrease of almost 25% of the cool roofs' albedo after four years exposure in the outdoor environment. The solar reflectance of the school A roof has changed from 0.5 (existing cool roof) to 0.55 (cleaned cool roof) and finally to 0.74 after the new application of the same cool coating while the albedo of the school B has shown an alteration from 0.54 to 0.71 for the existing and the new cool coating application respectively. In both school roofs the surface temperature has a significant decrease between the part of the existing cool coating and the application of the new part (school A ΔT= 12 K, school B ΔT= 7 K). The application of new cool roof coating can decrease the energy demand for cooling by 72% compared to the aged cool roof.