

The Impacts of Cool Roofs and Solar Reflectance Index (SRI) of Roofing Material in Reducing Building Cooling Energy Use

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Abstract

One simple and effective way to mitigate urban heat islands and their negative impacts on cooling energy consumption is to use high-albedo materials on major urban surfaces such as rooftops, streets, sidewalks and etc, Roofs that have high solar reflectance and high thermal emittance stay cool in the sun. A roof with lower thermal emittance but exceptionally high solar reflectance can also stay cool in the sun. Measured data and computer simulations have demonstrated the impact of roof albedo in saving cooling energy use in buildings. Cool roofs can also lower the citywide ambient air temperature in summer, slowing ozone formation and increasing human comfort. This study based on library research and data analysis; in this paper we summarize the results of Investigations and analyze the impact of roof albedo and emissivity on heating and cooling energy use. Results indicate that raising the solar reflectance of a roof from a typical value of 0.1–0.2 to an achievable 0.6 can reduce cooling-energy use in buildings by more than 20%.

Keywords: *cool roofs, solar reflectance index, roof shapes, cooling energy savings, building energy efficiency standards.*