



Roof-Coatings Study: Substrate, Chemistry Not Significant for Reflectance

Source: [The Journal of Architectural Coatings](#)

By: Staff

Roof-substrate type and texture—and coating chemistry—appear to exert little effect on the loss of solar reflectivity of roof coatings over time, a study conducted by the [Reflective Roof Coatings Institute](#) (RRCI) concludes.

The institute this week shared the results of a three-year solar-reflectance field study, which measured the impact of various factors on the loss of solar reflectance of roof coatings over time. The study's objective was to gauge the role of roof substrate type and texture, roof-coating chemistry and roof-coating thickness.

The study's findings were reported at the organization [Mid-Year Technical Meeting](#), in Orlando, Fla.

RRCI said the study indicates that substrate textures and coating chemistry demonstrated a relatively small effect on new and aged [solar reflectance](#) (SR). In addition, neither substrate texture nor substrate chemistry—nor the combination of the two—produce aged SR values less than the current [Energy Star](#) and [California Energy Commission](#) (CEC) accepted minimums.

As a result of the study's conclusions, RRCI has recommended to the [Cool Roof Rating Council](#) (CRRC) that aluminum test panels remain the standard substrate of choice for testing the solar reflectance of field-applied roof coatings over time. In addition, RRCI is recommending that CRRC reduce the testing exposure time for field-applied coatings from a three-year duration to one year of exposure.

Currently, solar-reflectance ratings of cool roofs and cool-roof coatings and listed by the Cool Roof Rating Council (www.coolroofs.org) are based on initial and three-year aged reflectance data.

Jim Leonard of ERSystems Inc. and a past RRCI president, presented the findings of the three-year study; his presentation has been posted on the “members only” section of the RRCI website, where members can log in to review it.

Looking for ‘Real-World’ Answers

Penny Gift of Republic Powdered Metals Inc., the current RRCI president, said the three-year study was carried out to verify whether smooth aluminum is a representative substrate for “real-world” exposure of solar-reflective, field-applied roof coatings. She



noted that Cool Roof Rating Council (CRRC) certification of field-applied roof coatings requires application to a smooth aluminum panel.



The study's objective was to gauge the role of roof substrate type and texture, roof-coating chemistry and roof-coating thickness on coating-surface reflectance over time.

Four coating types were initially selected to be applied to 11 different roofing substrates at three different film thicknesses. The samples were placed for aging in three different climate types (South/West/Midwest) at low slope. Initial solar reflectance and [thermal emittance](#) were measured, followed by solar-reflectance measures at one-half, one, two, and three-year intervals and thermal-emittance measures at year three.

Data was collected and a statistical analysis performed to determine significance of changes that were observed.

The coatings were applied to aluminum, CRS (cold rolled steel), APP granulated, APP smooth, asphalt emulsion, EPDM, PVC, SBS granulated black, SBS granulated green, SBS granulated white, and SPF (spray polyurethane foam). Of the 11 substrates, four are granulated and seven are smooth, six are asphaltic-based, and five are non-asphaltic-based surfaces.