Cool roofing conference

by Mark S. Graham

In May, the Roof Consultants Institute (RCI) Foundation held "Cool Roofing … Cutting through the Glare," a symposium featuring 19 papers about the pros and cons of the roofing industry's cool roofing phenomenon.

Following is a brief overview of several papers presented at the symposium.

Highlights

In "Cool roofing and the Cool Roof Rating Council: The evolution of a rating system," Peter Turnbull, senior program manager for Pacific Gas and Electric Co., San Francisco, discusses the Cool Roof Rating Council (CRRC). CRRC provides recognized methods for the testing, reporting and labeling of roofing products' surface solar reflectances and thermal-emittance properties. (For additional information, see "Cool Roof Rating Council," May 2003 issue, page 72.)

In "The economics of cool roofing: A local and regional approach," Jim Hoff, vice president of technology and product development for Firestone Building Products Co., Indianapolis, analyzes the net energy cost savings for a reflective roof system versus nonreflective roof system on a hypothetical commercial building with a low-slope roof system in 40 cities throughout the U.S. Hoff shows for some cities, particularly those in northern climates, the use of a reflective roof system actually has negative net energy cost savings. In cities located in heating and cooling climates in the central U.S., reflective roof systems resulted in marginal net energy cost savings. Southern U.S. cities experienced the largest net energy cost savings.

"Solar spectral optical properties of pigments," by Ronnen Levinson, Ph.D., scientist at Lawrence Berkeley National Laboratory, Berkeley, Calif., and "How pigments can save energy: The importance of a pigment's properties outside of the visible," by Robert Blonski, Ph.D., materials scientist for Ferro Corp., Cleveland, discuss the role coatings' pigment formulations can take in enhancing solar reflectance. Interestingly, these papers show cool roof surfacings need not necessarily be white because pigments' properties in the ultraviolet and near-infrared spectral regions beyond the visible light spectrum have large effects on a roof surfacing's solar reflectivity.

Don Portolio, vice president of PRI Asphalt Technologies, Tampa, Fla., presents interim results from a study in "The effect of reflective roof coatings on the durability of roofing systems." The study, being conducted by the Roof Coatings Manufacturers Association, focuses on the effects roof coatings have on asphalt-based and EPDM membrane systems' physical properties after laboratory-accelerated weathering and field exposure. Once the field-exposure portion of this research is concluded in about two years, the research should provide some useful quantitative data.

An analysis of energy savings based on thermal performance of ballasted roof systems compared with conventional, reflective cool roof systems is presented in "Are ballasted roof systems cool?" by Dick Gillenwater, director of research/development for Carlisle SynTec Inc., Carlisle, Pa. Preliminary study results indicate peak membrane surface temperatures for heavily ballasted single-ply membrane roof systems basically are equal to those of white single-ply membrane roof systems.

René Dupuis, Ph.D., principal of Structural Research Inc., Middleton, Wis., presented his paper, "Study of roof system reflectivity and near-surface air temperatures in Chicago, Illinois." The paper provides an overview of a study of in-place roof systems' solar reflectivities; solar reflectivity values for roofing aggregate currently available; and heat island modeling of downtown Chicago compared with a dense, urban, residential area. The research shows increasing roof systems' solar reflectivities from 0.25 to 0.65 may theoretically reduce average summertime daily ambient temperatures by about 3 degrees Celsius (5 degrees Fahrenheit); however, that temperature is reduced to less than 0.5 degrees Celsius (less than 1 degree Fahrenheit) when advection (horizontal air movement such as wind) is considered.

Closing thoughts

RCI Foundation's symposium provided useful information regarding the cool roofing movement that is sweeping through the U.S. roofing industry. If you are involved in or have an interest in cool roofing and were not able to attend the symposium, I encourage you to obtain the symposium proceedings and review the papers in greater detail. The proceedings are available from RCI's Web site, www.rci-online.org.

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