

## **Copper Roofing Systems Prove Cool, Energy-Efficient and Sustainable**

*Roof Assembly and Life Cycle Become Increasingly More Important in Sustainable Design*

Building designers today are striving to incorporate longer-lasting materials, more energy-efficient assemblies and environmentally-conscious technologies in order to reduce environmental footprints and improve overall building sustainability.

The roof assembly has come under particular scrutiny as it is the first line of defense against the elements and, often times, the building envelope's largest exterior surface area. Copper, arguably the most sustainable metal known to man because of its long-life cycle, low life-cycle costs and recyclability, is not only proving to be a valuable roofing material for its durability and ease of maintenance, but energy-efficiency and cost-effectiveness as well.

When "cool" roofing is discussed, two main factors usually define the effectiveness of a particular material: reflectance (the ability to reflect solar energy) and emittance (the infrared radiation energy that is released from the roof). These are typically achieved through paint pigments and reflective coatings in asphalt and other metals. The roof system, however, goes beyond the surface material. To achieve the highest potential building energy efficiency, a correctly assembled, properly ventilated copper roof can prove just as effective as a highly-reflective or emissive-surfaced roof.

In a recent study conducted by the Copper Development Association (CDA) at the Oak Ridge National Laboratory, two different vented copper assemblies were compared to two steel roof assemblies and one asphalt system. The ventilated copper systems take advantage of convective heating/cooling by properly venting the system at the eaves and ridge. As air moves in through the eaves, it heats, rises and is expelled through the ventilation at the roof ridge, controlling heat gain and yielding lower attic temperatures, keeping the building cooler and more energy efficient.

With this particular roof assembly, surface reflectance and emittance no longer holds as much influence on the interior building temperature and energy performance of the building. Copper emerges as the better choice. The result is lower cooling costs for the building owner and reduced electrical energy usage.

"Bottom line, copper has been providing property owners with a sustainable roofing system design for hundreds of years," said Andy Kireta Jr., Vice President of CDA. "The recyclability, long life span, beauty and maintenance-free durability of a properly designed copper roof can meet or exceed the typical installations of other comparable materials and be one of the most environmentally sound assets of your green building."

Based on performance and overall goal, a copper roof is cool where it matters most: energy savings. This is just one more reason why copper remains a design element of choice. Not only does copper's versatility provide various ways to address today's energy concerns, its durability and longevity are essential to long-term cost effectiveness.

To learn more about copper and cool roofing, visit [www.copper.org](http://www.copper.org).