



 Up-to-the-minute Green
Metal Roofing Resource!

PAC Green Info: Energy Star

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ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy aimed at saving energy and protecting the environment through energy efficient products and practices. ENERGY STAR-rated products meet strict energy efficiency guidelines set by the EPA and US Department of Energy. The Energy Star program was established in 1992 as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Over the last 15 years, the program has continued to expand to rate a multitude of residential and commercial products. Most familiar to homeowners who recognize the Energy Star logo on home appliances and computers, this label can now be used for cool roofing materials as well.

The cost annually to air condition buildings in the United States is \$40 billion – just over 15% of all electricity generated. To reduce the amount of energy required to keep a building cool, Energy Star has introduced a Roof Products Component to initiate energy savings in one of the biggest offenders of heat loss and heat gain – the roof. According to the EPA, a Cool Roof is one that is a reflective roof product that lowers roof surface temperature by up to 100°F, thereby decreasing the amount of heat transferred into a building's interior. ENERGY STAR qualified roof products save money and energy by reducing the amount of air conditioning needed to keep a building comfortable. In highly urbanized areas, Cool Roofs also reduce the “heat island effect”, in which cities can be 2 to 8 degrees warmer than surrounding countryside.

Another benefit of a Cool Roof is the reduction in air pollution. Generating energy to condition buildings requires the burning of fossil fuels, which directly results in smog, acid rain and climate change. The use of a Cool Roof system drastically cuts the energy requirements and correspondingly, air pollutants.

The criteria for an Energy Star® labeled roof are:

For steep slope applications (greater than 2:12 pitch): initial minimum solar reflectance of 0.25, and 3-year aged minimum solar reflectance of 0.15.

For low slope applications (2:12 or less pitch): initial minimum solar reflectance of 0.65 and 3-year aged minimum solar reflectance of 0.50.

Initial solar reflectance can be measured using ASTM E903 – *Standard Test Method for Solar Absorptance, Reflectance, and Transmission of Materials Using Integrating Spheres* or C1549 – *Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer*. For variegated roof products, CRRC Test Method #1 can be used. (<http://www.coolroofs.org/productratingprogram.html>)

The aged solar reflectance can be measured using ASTM E1918 – *Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field* or ASTM E903 or ASTM C1549.

Version 2.0, which became effective on January 1, 2008 requires that manufacturers of cool roof products also report the measured thermal emittance value for the product. The thermal emittance can be measured using ASTM method C1371-04a – *Standard Test Method for Determination of Emittance of Materials Near Room Temperature using Portable Emisometers* or E408-71 (1996)e1- *Standard Test Method for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques*. Although no minimum emittance criterion is required in the new program, EPA announced that it will collect the emittance data and monitor the situation to determine if a criterion based on climate zone could be developed for future versions of the Roof Products program.

A directory of Energy Star labeled roofing products can be found at http://www.energystar.gov/ia/products/prod_lists/roofs_prod_list.pdf.