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Different Labeling Programs Varying In Requirements, Meaning

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Labeling a roof as “cool” can be a somewhat confusing process. There are no standard, across the board qualifications and different municipalities may have their own “cool” codes.

In addition, different labeling systems have different requirements. Energy Star, Leadership in Energy and Environmental Design (LEED) and the Cool Roof Rating Council—each has its own standards, or no standards at all. It can all be very overwhelming.

So, what are the qualifications for each labeling system and what does having them mean? In this article we hope clear up some of the misconceptions that you may have regarding these three programs.

Energy Star

Let’s begin with the Energy Star program. This program, originally developed by the Department of Energy and the Environmental Protection Agency, requires a roofing product to meet certain reflectance criteria initially and after three years. Emissivity is not taken into account.

For low-slope roof applications (2:12 or less), Energy Star requires an initial solar reflectance of 0.65 or greater and a three-year aged reflectance of 0.50 or higher. The initial reflectance requirement for a steep-slope roof is 0.25, with an aged reflectance of 0.15. The product warranty for both types of roofs must also be equal in material aspects to that of the manufacturer’s warranty for non-reflective roof materials. If the manufacturer only offers reflective roof products, the warranty must be equal to a warranty for another manufacturer’s comparable non-reflective product.

The method for initial reflectance testing on the two types of applications is similar. Products must be tested using either *ASTM E 903-Standard Test Method for Solar Absorptance, Reflectance and Transmission of Materials Using Integrating Spheres* or *ASTM C 1549-Standard Test Method for*

Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.

To test initial reflectance, a 3" x 3" flat sample of the product needs to be submitted to a laboratory that has appropriate equipment. Samples can be prepared according to the manufacturer's recommendation for the thickness used in the field.

To test the aged reflectance of a roof, three in-place roofs using the same material that was tested initially must be selected. Each of these has to be a minimum of three-years-old and one must be located in a major metropolitan area.

The roof surface should be divided into at least 10 equal sections. Measurements are taken in the center of each area and each measurement must be taken a minimum of three times. The average of all of these measurements will be used to determine if the roof system meets the Energy Star requirements.

Another option for aged testing involves removing three samples from each of the three in-place roofs and test different areas of each according to ASTM E903 or ASTM C1549 standards. The roofs must then be properly repaired to ensure watertight integrity.

It was recently announced that exposed panels on commercial or private weathering farms may be used in lieu of in-place panels. The farms must be accredited to *ISO/IEC 17025:1999 General Requirements for the Competence of Testing and Calibration Laboratories*. This new protocol was an amendment made to the Energy Star program in June 2003. Each exposed panel must be at least 24 sq. in. and mounted so that there is no run off from one panel to the next. The three panels must be of identical formulation as those used for initial testing and be exposed for three years.

This change was due in large part to the efforts of the Cool Metal Roofing Coalition and other interested industry parties. Use of weathering farms will make it easier for painted metal roofing to become Energy Star approved, as well as lowering the cost and effort of the required testing.

LEED

Administered by the U.S. Green Building Council, the LEED program involves a point system whereby a project can be designed using sustainable,

energy-efficient materials to accumulate points. This means the program mainly applies to complete projects rather than individual products.

The LEED 2.1 Version rating system has a total possible 69 points. Points are awarded in six different categories: sustainable sites (14 possible points), water efficiency (5 points), energy atmosphere (17 points), materials and resources (13 points), indoor environmental quality (15 points), and innovation and design process (5 points). Each of these categories has a variety of sections which are assessed a certain number of points that make up the total for that category.

There are four levels of certification based on the project's point totals. A project simply becomes certified with 26-32 points. Thirty-three to 38 points are required for a Silver certification. A project with 39-51 points is a Gold level. To achieve Platinum status, a project must have 52-69 points.

Metal roofing can contribute directly or indirectly toward five points among the categories. While metal roofing significantly helps in the points for recycled content in a building project, the present 2.1 version is restricting metal roofing from gaining a point in the Heat Island Effect category.

The LEED requirement for a cool roof is to “use Energy Star compliant (highly reflective) and high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface”. According to Scott Kriner of the Cool Metal Roofing Coalition, the number of metal roof products that can achieve this emissivity requirement is significantly limited.

This is a problem that needs to be addressed. In response, Kriner said the Cool Metal Roofing Coalition is discussing this issue with the U.S. Green Building Council. Both groups are working to come up with a more fair assessment.

Cool Roof Rating Council

The Cool Roof Rating Council is a non-profit organization dedicated to developing accurate and credible methods for evaluating and labeling the solar reflectance and emittance values of all roofing products.

It has identified testing procedures and labeling protocols with data collected from these tests. CRRC does not establish a standard for whether or not a roof is cool.

To determine initial solar reflectance and thermal emittance, products must be submitted for testing at an independent CRRC Accredited Laboratory by a CRRC Licensed Seller or Licensed Other Manufacturer (a company that is responsible for the key component that determines the radiative properties of the roofing product, but does not bring the final product to market). The lab and seller or other manufacturer (OM) agree upon the proper tests to determine the product's solar reflectance and thermal emittance, test sample requirements, timing and fees. Test reports are completed by the lab and given to the seller or OM.

After the testing is completed, the seller must prepare and submit a product rating application to the CRRC. Several items need to be sent with the application. These include the quality control manager's name and contact information, the submission fee, product test report, field sample collection instructions, and any other pertinent information for the product rating. It is then the responsibility of the seller to label the product and offer it to distributors, contractors or retail outlets.

Three-year aged data will be based on an outdoor exposure program to take place at a commercial weathering farm. The procedure for this phase of the CRRC program is under development. Currently, the label can be issued only with the initial solar reflectance and thermal emittance values. When the aged data becomes available, the labels will need to be updated.

Any product can carry a CRRC label—even a dark-colored, hot material. The label simply indicates that the roof product has been tested in accordance with the CRRC methodology for its reflectivity and emissivity properties. As an added bonus, the information found on the CRRC label may be submitted to Energy Star as part of its initial reflectance criteria.

Hopefully, this information will be helpful to you when seeing each of these labels on roofing products you install or specify. Each one means something different and some areas of the country may require roofing products used there to be tested under one or more of these programs. For more detailed information, check with the individual program you are interested in.

Energy Star:
energystar.gov

LEED:
usgbc.org/LEED

Cool Roof Rating Council:
coolroofs.org