COOL CHEMISTRY® Coatings

Coil and extrusion coatings for green building applications

AkzoNobel
Tomorrow's Answers Today

We manufacture a complete line of coil and extrusion coatings that comply with Energy Star guidelines and can contribute to points in LEED, which help make your projects more energy efficient and sustainable.

Coil Coatings

Our industry leading silicone-modified polyester, CERAM-A-STAR® 1050, along with our 70% PVDF product TRINAR®, are available in our COOL CHEMISTRY® Series which contain ceramic infrared reflective pigments. These special pigments are designed to reflect infrared energy while still absorbing visible light energy, thus appearing as the same color yet staying much cooler. When COOL CHEMISTRY® Series paints are used on metal roofing, the result is a sustainable building material that can lower air conditioning costs, reduce peak energy demand, and help to mitigate urban heat island effects.

Extrusion Coatings

We also have a full line of extrusion coatings that are available as COOL CHEMISTRY® colors, and also contain infrared reflective pigments. This pigmentation increases solar reflectivity and helps reduce energy costs associated with cooling, especially when combined with cool metal roofing. Our TRINAR® *ULTRA* coatings offer other eco-friendly characteristics, such as a lower volume of VOC's, and lower amounts of hazardous air pollutants. TRINAR® coatings also are ideally suited for application on louvers and other sun screens, which can be used to create shaded areas either inside or outside a building.

Increased efficiency, reliable performance

All of our products that utilize infrared reflective pigments in our COOL CHEMISTRY® Series of coil and extrusion coatings have the same exceptional performance as the standard versions. For extrusion coatings, this means that our TRINAR® line of spray coatings continue to meet or exceed the stringent AAMA 2605 specification.

For years AkzoNobel has served its customers worldwide by creating the right chemistry with products such as TRINAR® and our CERAM-A-STAR® product lines. With our COOL CHEMISTRY® Series of coatings, we continue to offer the unparalleled durability of TRINAR® and CERAM-A-STAR® in formulations which reduce energy consumption in buildings, thus lowering costs while protecting natural resources and help reduce pollution.










Cool Roof Rating Programs: Energy Star, LEED and CRRC

List of web sites for more information

Energy Star
www.energystar.gov
LEED / U.S. Green Building Council
www.usgbc.org
Cool Metal Roofing Coalition
www.coolmetalroofing.org
Metal Roofing Alliance
www.metalroofing.com
Metal Construction Association
www.metalconstruction.org
California Energy Commission Consumer Energy Center
www.consumerenergycenter.org
Cool Roof Rating Council
www.coolroofs.org
Metal Building Manufacturers Association
www.mbma.com
National Coil Coating Association
www.coilcoating.org
Lawrence Berkeley National Lab
http://eetd.lbl.gov/HeatIsland/CoolRoofs
Oak Ridge National Lab
www.ornl.gov/roofs+walls/index.html
Florida Solar Energy Center
www.fsec.ucf.edu

Introduction to Energy Star

Introduced in 1992, Energy Star is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy, which is designed to identify and promote energy efficient products. The first products that were Energy Star labeled were computers and monitors, but since then the program has been expanded to now include a wide range of products from appliances to building products.

There are more than 15,000 private and public sector organizations that are Energy Star partners, with more joining every month. Energy Star provides the technical information and tools that organizations and consumers need to choose energy-efficient solutions and best management practices. The use of the Energy Star program has helped improve energy efficiency and cost savings across the country, saving businesses, organizations, and consumers about $19 billion in 2008 alone.

Energy Star and Cool Metal Roofing

Energy Star has a labeling program for reflective roofing products, which includes cool metal roofs. This allows manufacturers to use the Energy Star label on reflective roof products that meet the U.S. EPA's specifications for solar reflectance and reliability.

A roofing manufacturer must first apply to become an Energy Star Partner, and then once they are approved they can submit products for certification. Once a product is certified, it is listed on the Energy Star web site.

Energy Star specifications

ROOF SLOPE	INITIAL SOLAR REFLECTANCE	3RD YEAR SOLAR REFLECTANCE
Low Slope (≤ 2:12 inches)	≥ 0.65	≥ 0.50
Steep Slope (> 2:12 inches)	≥ 0.25	≥ 0.15

NOTE: THERMAL EMITTANCE VALUES MUST BE REPORTED AS REQUIRED BY ENERGY STAR, BUT THEY ARE NOT A CONDITION OF CERTIFICATION.

ENERGY STAR PARTNER

Introduction to LEED

The LEED® Green Building Rating System™ was developed by the U.S. Green Building Council (USGBC) to identify and certify buildings that are designed, constructed and operated sustainably. The LEED Rating System is intended to provide a framework for rating new and existing commercial, institutional and residential buildings in regards to energy efficiency. LEED is based on a 100 point scale, where points are awarded for certain aspects of a building's design and construction. Points are awarded in credits within five different categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality.

The current version of this program is LEED 2009, and was released in April of 2009. Cool metal roofing can allow a building project to obtain LEED points, and the requirements are spelled out on the following pages.

Introduction to the Cool Roof Rating Council

The Cool Roof Rating Council was created in 1998 to develop accurate and credible methods for evaluating and labeling the solar reflectance and thermal emittance of roofing products and to disseminate the information to all interested parties.

At the core of the CRRC is its Product Rating Program, in which roofing manufacturers can label various roof products with values of radiative properties evaluated under a strict program administered by the CRRC. Code bodies, architects, building owners and specifiers can rely on the rating information provided in the CRRC Rated Products Directory

The CRRC does not set a minimum definition for "cool", the CRRC simply lists the measured radiative property values on their Directory. This data serves as an impartial source of information and is referenced by other programs, such as LEED.

Prepainted metal roofing compliance: LEED 2009

Sustainable Sites (SS Credit 7.2)

SS Credit 7.2: Heat Island Effect - Roof (1 Point)

Intent:

Reduce heat islands (ambient thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitats.

Requirements:

OPTION 1

Use roofing materials having a Solar Reflectance Index[1] (SRI) equal to or greater than the values in the table below for a minimum of 75% of the roof surface.

Roofing materials having a lower SRI value than those listed below may be used if the weighted rooftop SRI average meets the following criteria:
(Area SRI roof/Total roof area) x (SRI of installed roof/Required SRI) ≥75%

ROOF TYPE	SLOPE	SRI
Low-Sloped Roof	≤ 2:12	78
Steep-Sloped Roof	> 2:12	29

OPTION 2

Install a vegetated roof for at least 50% of the roof area.

OPTION 3

Install high albedo and vegetated roof surfaces that, in combination, meet the following criteria:
(Area of SRI Roof / 0.75) + (Area of vegetated roof / 0.5) ≥Total Roof Area

ROOF TYPE	SLOPE	SRI
Low-Sloped Roof	≤ 2:12	78
Steep-Sloped Roof	> 2:12	29

[1]The Solar Reflectance Index (SRI) is a measure of the constructed surface's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. To calculate the SRI for a given material, obtain the reflectance value and emittance value for the material. SRI is calculated according to ASTM E 1980. Reflectance is measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371.

Potential Technologies & Strategies

Consider installing high-albedo and vegetated roofs to reduce heat absorption. SRI is calculated according to ASTM E 1980. Reflectance is measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371. Default values are available in the LEED 2009 Reference Guides. Product information is available from the Cool Roof Rating Council web site, at www.coolroofs.org and the ENERGY STAR web site, at www.energystar.gov.

To comply with Credit 7.2 in LEED 2009, the following steps must be taken:

- Building owner and design team registers the building project in advance with the USGBC, which provides LEED document templates for subsequent submission of the project details to USGBC for certification.
  - Information on materials, building practice, systems used, etc. included on the letter templates.
  - Specific information with respect to LEED SS-credit 7.2 includes roof surface SRI values.
- Metal roof manufacturer must verify to owner/architect/specifier that roof material and design complies with criteria in Credit 7.2.
- Paint supplier provides to metal roofing manufacturer a certified laboratory test report of measured TSR, TE and calculated SRI on the specified type of paint system and color requested.
- Building owner/architect/spec writer must take into account the percentage of the roof surface area to be covered by metal roofing. Note that Credit 7.2 calls for at least 75% of the area to be covered with a cool roof. If more than 75% of the area is covered (excluding parapets, sky lights, and equipment) a lower effective SRI is permitted by using the calculator in Credit 7.2.

COOL CHEMISTRY® Product Information

Our COOL CHEMISTRY® Series of coatings offers the unparalleled durability of TRINAR® and CERAM-A-STAR® in formulations which reduce energy consumption in buildings, thus lowering energy costs while protecting natural resources and reducing pollution.

End use description

AkzoNobel's COOL CHEMISTRY® Series of coil coatings incorporate solar reflecting pigmentation in TRINAR® (70% PVDF) and the CERAM-A-STAR® (siliconized modified polyesters) family. Both coating systems are designed to contribute color and help protect metal coils that are later fabricated into construction panel products for metal roofing and siding. Years of continuous research and actual outdoor testing ensure the performance of COOL CHEMISTRY® coatings, which are available in a wide array of colors that blend well with collateral construction materials.

Application

COOL CHEMISTRY® Series coatings are intended to be factory applied to metal substrates according to AkzoNobel Product Data Sheets, over primer, by the coil coating method only. This process efficiently and economically applies primer and COOL CHEMISTRY® Series coatings according to exact film thickness specifications across the entire panel width. In this process, coatings are applied to specified metal substrates that have been thoroughly cleaned and chemically pretreated in accordance with manufacturer's instructions to optimize adhesion, forming and weathering characteristics.

COOL CHEMISTRY® Series coatings and primer must be baked and cured in factory ovens at peak metal temperatures ranging from 400°-480°F. Color, gloss, hardness, cure, flexibility and adhesion are only a few of the performance characteristics monitored in the quality control process. The coil coating process is highly efficient with nearly 100% transfer efficiency to the metal coils. This process collects and destroys almost all volatile organic content (VOC's) usually associated to any painting process.

Specified parameters

Refer to AkzoNobel specific product specification pages available from your metal supplier or AkzoNobel. Complete test reports are available upon request.

Test Specifications

Test methods established by ASTM (American Society for Testing and Materials).
For Energy Star® labeled product:
ASTM E903 or C1549 Total Solar Reflectance.
For CRRC® labeled product:
ASTM E903, E1918 or C1549 for Total Solar Reflectance, and ASTM C1371 for Thermal Emittance.

Product composition

COOL CHEMISTRY® Series coatings are made from the highest quality ceramic and select inorganic pigments in a wide range of colors. ISO 9001 certified AkzoNobel manufacturing methods uniformly distribute pigments into a proprietary resins formulation. This combination has been proven under years of harsh 45° S. South Florida exposure, to resist changes in color and general appearance, while preserving film integrity and coating properties.

Maintenance suggestions

Proper maintenance is vital for any coating to achieve maximum installed life performance. Contact AkzoNobel and ask for a copy of our "Care and Maintenance Guide" for recommended methods and procedures. Color matched air-dry coatings for post construction touch-up and scratch repair, as mentioned in the "Care and Maintenance Guide," are available in COOL CHEMISTRY® Series coatings through your panel fabricator.

Costing and warranty

Contact your panel system fabricator for accurate installed cost estimates. Coating system performance warranties are available. Contact AkzoNobel Coatings Marketing and Sales department or your panel system supplier.

AkzoNobel
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www.akzonobel.com/ccna

We're the largest global paints and coatings company and a major producer of speciality chemicals. We supply industries worldwide with quality ingredients for life's essentials. We think about the future, but act in the present. We're passionate about developing sustainable answers for our customers. Based in Amsterdam, the Netherlands, we have 60,000 employees working in more than 80 countries - all committed to excellence and delivering Tomorrow's Answers Today™.

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For more information, please contact:

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ENERGY STAR PARTNER
CRRC COOL ROOF RATING COUNCIL
MCA Metal Construction Association
ISO 9001:2000 CERTIFIED COMPANY
MBMA METAL BUILDING MANUFACTURERS ASSOCIATION
National Coil Coating Association

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