

## DO ALL COOL ROOFS LOOK THE SAME?

No. There are numerous materials including tile, metal, asphalt, and coatings that meet the cool roof requirements. Cool roofs are also available in a wide range of colors including dark and vibrant shades.

### A COOL ROOF CAN:

- Look good
- Keep the building cooler
- Increase occupant comfort
- Lower energy costs
- Last longer than conventional roofs
- Reduce roof and attic temperatures
- Reduce the need for air conditioning
- Decrease energy use on hot days
- Help reduce air pollution and greenhouse gas emissions
- Comply with building energy standards and green energy programs



## COOL ROOF LABELING REQUIREMENTS

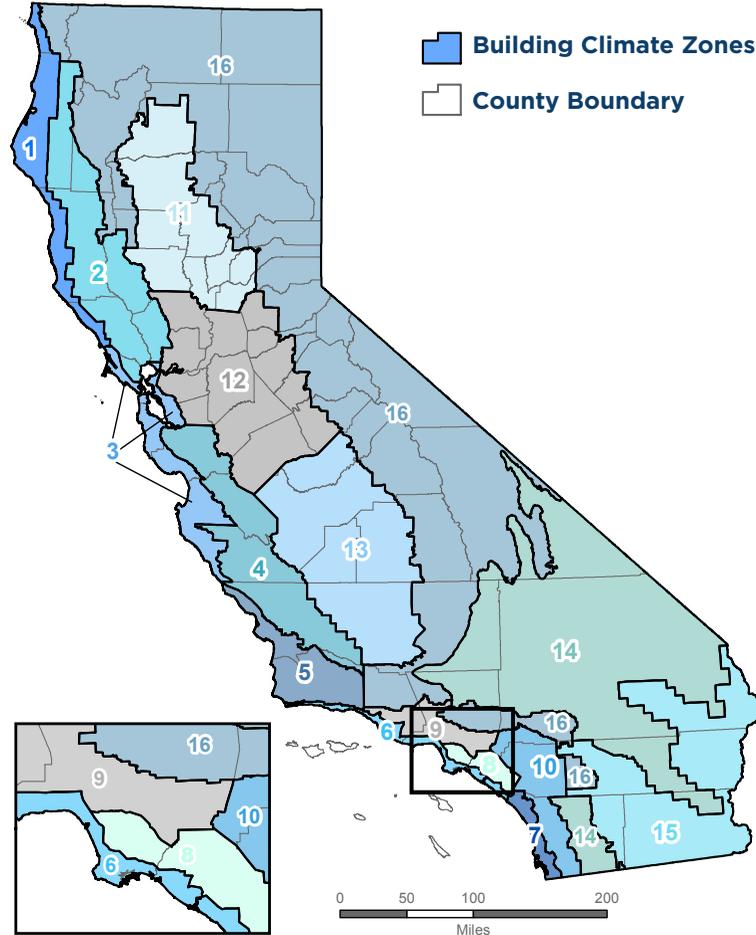
The Energy Commission recognizes the Cool Roof Rating Council (CRRC) for rating the solar reflectance and thermal emittance values of roofing products. Only the aged solar reflectance and emittance values listed within the CRRC Rated Products Directory may be used to meet the cool roof requirements in the Energy Standards. All rated roofing products will have a CRRC label, with the efficiency values listed.

	Solar Reflectance	Initial 0.00	Weathered Pending
	Thermal Emittance	0.00	Pending
	Rated Project ID Number	----	
	Licensed Seller ID Number	----	
	Classification	Production Line	

Cool Roof Rating Council ratings are determined for a fixed set of conditions, and may not be appropriate for determining seasonal energy performance. The actual effect of solar reflectance and thermal emittance on building performance may vary.  
Manufacturers of product stipulates that these ratings were determined in accordance with the applicable Cool Roof Rating Council procedures.

Sample Cool Roof Rating Council Label

## Building Climate Zones California, 2017

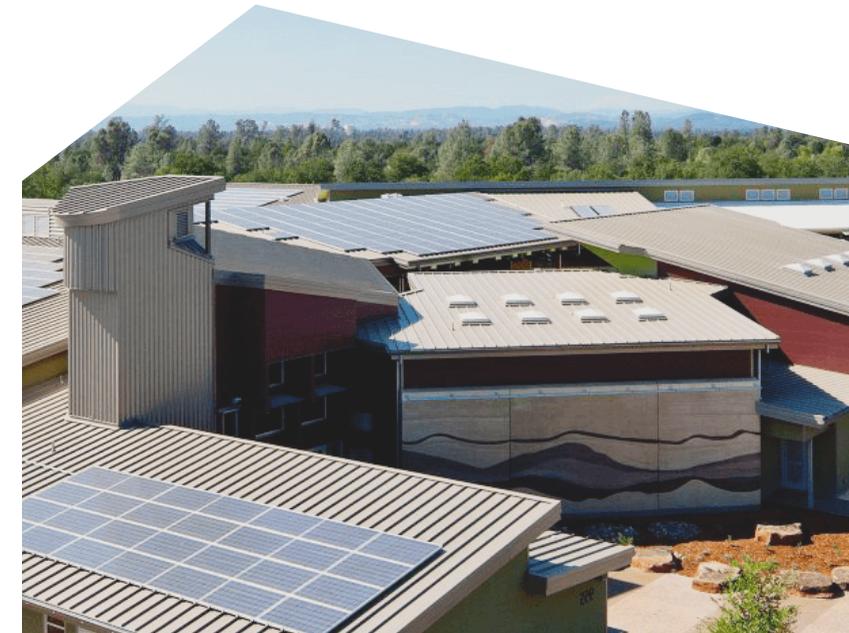


## ENERGY EFFICIENT

# COOL ROOFS

*Nonresidential Buildings, High-Rise  
Residential, Hotels and Motels*

2019 Building Energy Efficiency Standards



Metal cool roof at Redding School of the Arts. Photo courtesy of Kodiak Roofing.

## VISIT THE ENERGY COMMISSION ONLINE

For more information on the Energy Standards and other programs

[www.energy.ca.gov](http://www.energy.ca.gov)

Energy Standards Online Resource Center

[www.energy.ca.gov/title24/orc](http://www.energy.ca.gov/title24/orc)

Contact the Energy Standards Hotline

(800) 772-3300 within CA  
(916) 654-5106 outside CA  
[title24@energy.ca.gov](mailto:title24@energy.ca.gov)

Other Online Resources

Cool Roof Rating Council  
[www.coolroofs.org](http://www.coolroofs.org)



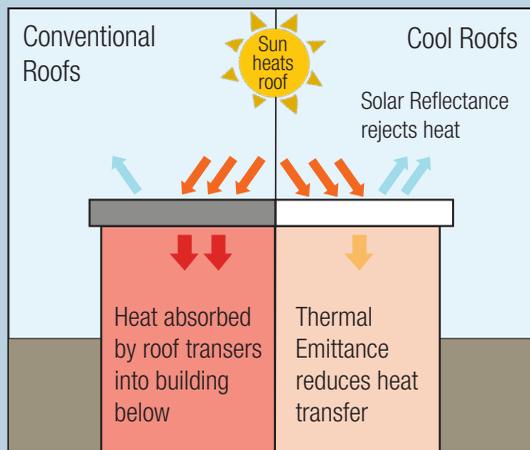
CEC-400-2019-014-BR

## ENERGY EFFICIENT ROOFS

Energy efficient roofs are also known as cool roofs. These roofs are designed to reflect more sunlight and absorb less heat than a standard roof. Energy efficient roofing products have high solar reflectance and thermal emittance properties. These properties help lower roof and attic temperatures on hot, sunny days to reduce the need for air conditioning. Both properties are measured from 0 to 1, and the higher the value the cooler the roof.

**Solar reflectance (SR)** refers to a material's ability to reflect the sun's solar energy back into the atmosphere.

**Thermal emittance (TE)** refers to how much of the absorbed heat is released.



Solar Reflectance and Thermal Emittance

## WHAT IS THE SOLAR REFLECTANCE INDEX?

The solar reflectance index (SRI) is an alternative to meeting the minimum requirements for thermal emittance and aged solar reflectance in the prescriptive approach. A SRI calculation allows for tradeoffs between thermal emittance and aged solar reflectance values. The Energy Commission's solar reflectance index calculator must be used to determine the SRI value. The calculator is available on the Energy Commission's website.

## 2016 ENERGY STANDARDS

The two approaches for compliance are performance and prescriptive. The performance approach requires using approved computer software where energy tradeoffs are allowed to bring the whole building into compliance with the Energy Standards. The prescriptive approach has predefined efficiency requirements for each building component that must be met in order to comply.

The prescriptive requirements listed below are the minimum efficiency requirements for roofing products. The values depend on the climate zone, building type, and the slope of the roof per TABLE 140.3-B and TABLE 140.3-C. These requirements apply only to nonresidential, high-rise residential, hotel and motel buildings that are mechanically heated or cooled (conditioned space).

### Nonresidential Prescriptive Requirements

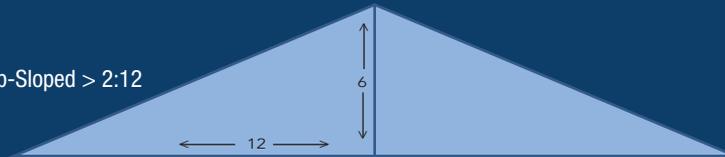
NONRESIDENTIAL BUILDINGS				
	CLIMATE ZONE	AGED SOLAR REFLECTANCE &	THERMAL EMITTANCE	OR SRI
<b>L</b>	1-16	≥0.63	≥0.75	≥75
<b>SL</b>	1-16	≥0.20	≥0.75	≥16
HIGH-RISE RESIDENTIAL, HOTELS AND MOTELS				
	CLIMATE ZONE	AGED SOLAR REFLECTANCE &	THERMAL EMITTANCE	OR SRI
<b>L</b>	9*,10,11,13,14,15	≥0.55	≥0.75	≥64
<b>SL</b>	2-15	≥0.20	≥0.75	≥16

\*DOES NOT APPLY TO ALTERATIONS

Low-Sloped ≤ 2:12



Steep-Sloped > 2:12



Roof Characteristics:

**L** Low-sloped, rise to run of 2:12 or less

**SL** Steep-sloped, rise to run of greater than 2:12

## WHAT TRIGGERS THE ENERGY EFFICIENT ROOF REQUIREMENTS?

The prescriptive approach requires that roofs meet minimum aged SR and TE efficiencies or the minimum SRI for new construction, additions, and alterations where more than fifty percent or 2,000 square feet, whichever is less, of the roof is replaced, recovered, or recoated.

## WHAT ARE THE EXCEPTIONS?\*

### All Building, Project, and Roof Slope Types

- Roof area covered by integrated photovoltaic (PV) panels or solar thermal panels
- Roof constructions that have thermal mass with a weight of at least 25 lb/ft<sup>2</sup> over the roof membrane

### New Construction § 140.3(a) 1A and Additions § 141.0(a):

#### Low-sloped:

- Wood-framed roofs in climate zones 3 and 5 with a roof assembly U-factor of 0.034 or lower
- An aged solar reflectance less than 0.63 is allowed when meeting the roof/ceiling U-factor in TABLE 140.3

### Alterations (re-roof) § 141.0(b)2B:

#### Low-sloped:

- An aged solar reflectance less than 0.63 is allowed when meeting the roof/ceiling U-factor in TABLE 141.0-B

\*If building meets any of these exceptions, it is exempt



Cool roof coating at Palladio at Broadstone