UNDERSTANDING THE SOLAR REFLECTANCE INDEX:
A CALCULATED VALUE

What is the Solar Reflectance Index?

The Solar Reflectance Index (SRI) is an indicator of the ability of a roof surface to return solar energy to the atmosphere. Roofing material surfaces with a higher SRI will be cooler than surfaces with a lower SRI under the same solar energy exposure, especially on a sunny day. Using materials with higher SRI values can enhance building occupant comfort and reduce air conditioning use.

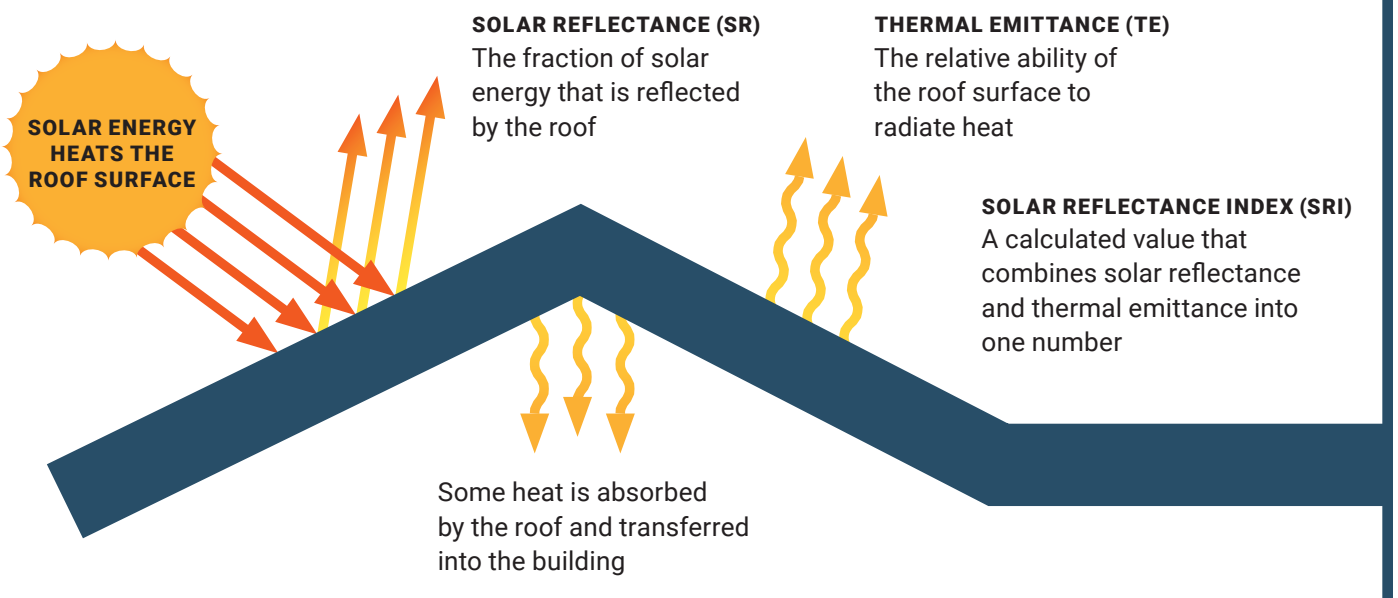
TAKE NOTE!

The Solar Reflectance Index is a calculated value that is **different** from a roof's measured Solar Reflectance.

READ ON TO LEARN MORE.

HOW IS AN SRI VALUE DETERMINED?

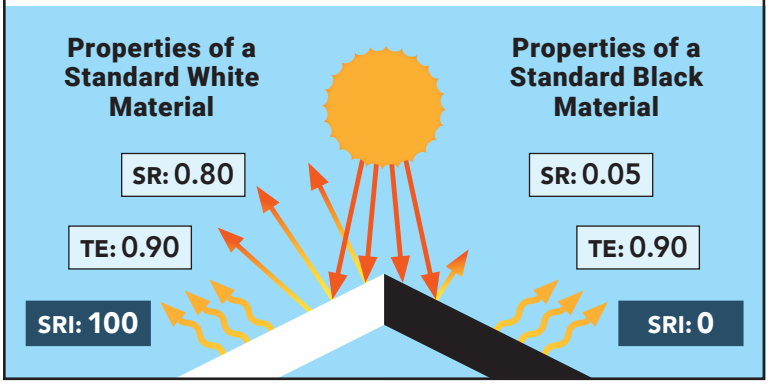
An SRI value is calculated using the roof surface's Solar Reflectance (SR) and Thermal Emittance (TE). The diagram below describes SR and TE, which are measured values that range from 0 to 1, with 1 being the most reflective or emissive.



Determining an SRI Value is a Two-Step Process:

1. The roofing material's SR and TE are used to calculate that material's surface temperature under conditions specified in Standard Practice ASTM E1980 (for more information about ASTM standards, visit astm.org). The CRRC-1 Roof Product Rating Program Manual contains additional requirements.

2. The SRI value for that material is determined using a formula that compares the calculated surface temperature with those of a standard white material and a standard black material under the same specified conditions.



WHAT MAKES THE SRI USEFUL?

SRI VALUES…

- Enable comparison of different roofing products, regardless of the type of roofing material, by providing an indication of the material's relative ability to stay cool in the sun, reducing heat flow into the building.
- Condense two measured values into one whole number.
- Can be used to demonstrate compliance with some building codes even if the measured SR or TE does not comply on its own.

SRI values for most materials fall between 0 and 100, although values outside of that range are possible. After three years of outdoor weathering, approximately 98% of products in the Cool Roof Rating Council (CRRC) Rated Roof Products Directory (coolroofs.org/directory) have an SRI value between 0 and 100.

VARIOUS FACTORS CAN INFLUENCE a material's Solar Reflectance and the resulting calculated SRI value. Below are examples of the three different types of roofing products, along with the range of three-year weathered SRI values found in the CRRC Rated Roof Products Directory for products of each type. SRI values can vary greatly within a material type. Home and building owners, developers, and roofing contractors can consult the CRRC Directory to identify the SRI value for a specific product or browse by color, manufacturer, and more.

TILE (CLAY & CONCRETE)
Three-year weathered SRI range: 4-91

ASPHALT SHINGLES
Three-year weathered SRI range: 14-34

FACTORY-COATED METAL
Three-year weathered SRI range: 20-90

SRI ranges are based on products listed on the CRRC Rated Roof Products Directory (https://coolroofs.org/directory/roof). These examples represent all rated products of a given type at the time of publishing, regardless of material color or other variables.

HOW IS THE SRI APPLIED?

HOME AND BUILDING OWNERS, developers, and roofing contractors can use SRI values to compare the relative potential of different roofing material options to stay cool. In addition, many voluntary programs and building codes and standards reference SRI and/or contain SRI requirements for roofing products.

EXAMPLES INCLUDE:

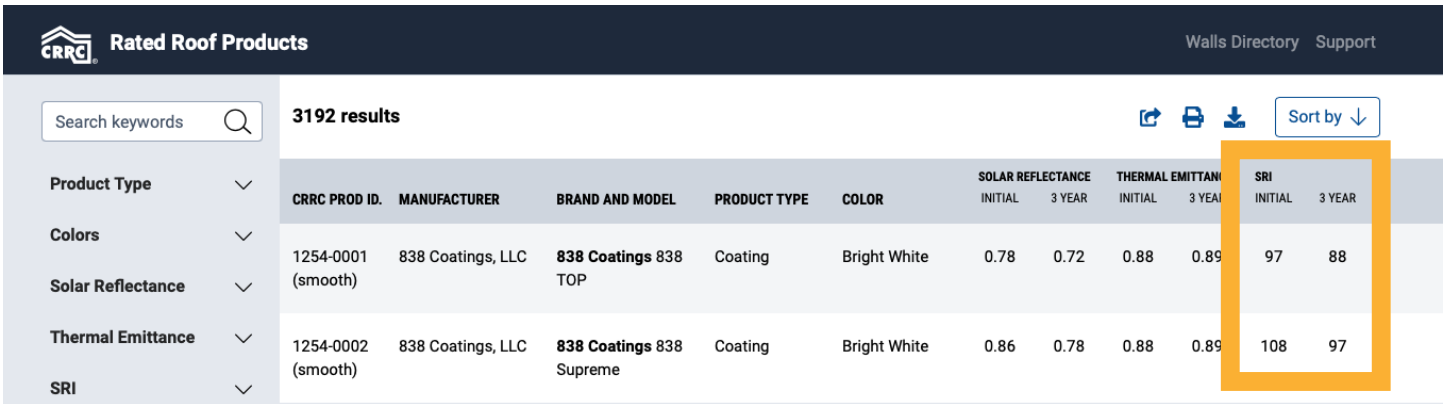
- California's Building Energy Efficiency Standards (CA Title 24, Part 6)
- International Green Construction Code (ASHRAE 189.1/IgCC)
- International Energy Conservation Code (IECC)
- National Green Building Standard (NGBS)
- LEED V4.1

For more information about codes, programs, and standards, visit coolroofs.org/resources/codes-programs-standards-2.

The initial and three-year aged SRI values of products rated by the CRRC are published in the CRRC Rated Roof Products Directory. Lawrence Berkeley National Laboratory's Heat Island Group also provides an SRI Calculator, which applies the ASTM E1980 calculation method and can be used for product research and development.

WHERE CAN SRI DATA BE FOUND?

coolroofs.org/directory/roof



RESOURCES

To learn more about calculating and applying SRI or using it to comply with local codes, programs, and standards, check out the following resources.

- CRRC Rated Roof Products Directory
- Lawrence Berkeley National Laboratory Heat Island Group Technical Resources
- ASTM E1980-11(2019): Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces
- CRRC Codes, Programs, & Standards Information

CRRC COOL ROOF RATING COUNCIL ®

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