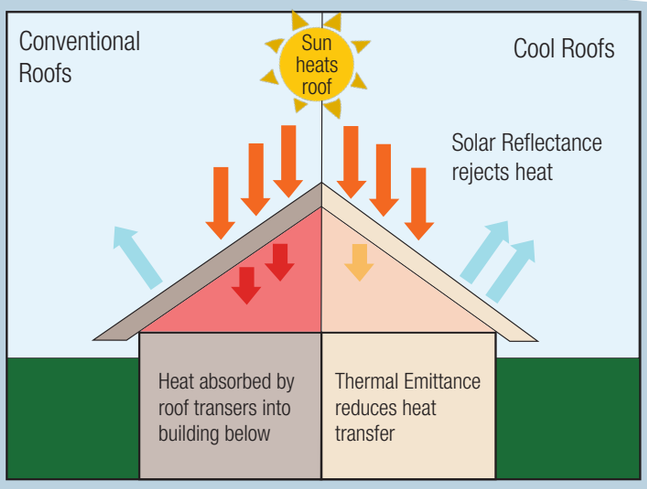
ENERGY EFFICIENT ROOFS

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

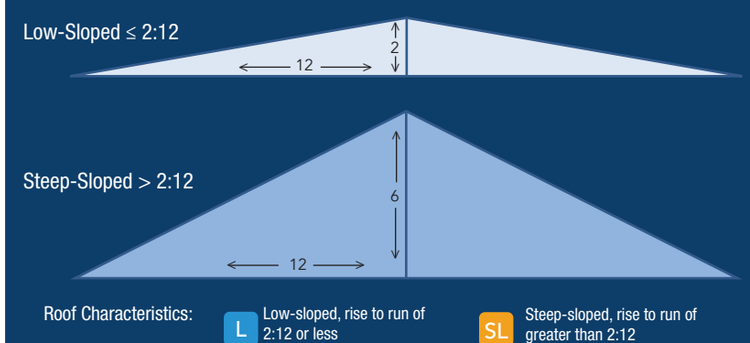
The two approaches for compliance are performance and prescriptive. The performance approach requires using approved computer software where energy tradeoffs are allowed to bring the whole building into compliance with the Energy Standards. The prescriptive approach has predefined efficiency requirements 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 and the slope of the roof per TABLE 150.1-A. These requirements apply only to low-rise residential buildings that are mechanically heated or cooled (conditioned space).

Residential Prescriptive Requirements

LOW-RISE RESIDENTIAL BUILDINGS

	CLIMATE ZONE	AGED SOLAR REFLECTANCE	&	THERMAL EMITTANCE	OR	SRI
L	13 & 15	≥0.63		≥0.75		≥75
SL	10-15	≥0.20		≥0.75		≥16



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 of the roof is replaced.

WHAT ARE THE EXCEPTIONS?*

New Construction § 150.1(c)11:

- Building integrated photovoltaic (PV) or solar thermal panels
- Roof constructions that have thermal mass over the roof membrane with a weight of at least 25 lb/ft²

Additions § 150.2(a):

- Additions 300 square feet or less

Alterations (re-roofs) § 150.2(b)1H:

Steep-sloped:

- 1" air space between roof deck and roofing
- Profile ratio of rise to width is 1:5 for half the width or more
- Existing ducts are sealed and insulated per § 150.1(c)9
- R-38 ceiling insulation
- Radiant barrier in attic per § 150.1(c)2
- No ducts in attic
- R-2 or greater insulation above roof deck

Low-sloped:

- No ducts in attic
- Lower aged solar reflectance can be installed when roof deck insulation is installed per TABLE 150.2-B

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

Asphalt shingle cool roof at Mutual Housing at Spring Lake.