Energy Efficient Cool Roofs

Amie Brousseau
California Energy Commission
Outreach and Education Unit

SMUD Residential Cool Roofing for Contractors
Sacramento, CA
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Topics

- Energy efficient roofing products
- 2016 Energy Standards for residential roofs
- Alterations, additions and new construction
Energy Efficient Roofs

**Cool Roof** is a concept for saving energy

- A cool roof will reflect more sunlight and absorb less heat than a standard roof
- The roofing product must meet minimum Solar Reflectance and Thermal Emittance values to be considered a cool roof.
Cool Roof Definitions

*Solar Reflectance (SR)*: ability to reflect solar energy from the sun back into the atmosphere

*Thermal Emittance (TE)*: the ability to release heat that has been absorbed

*Solar Reflectance Index (SRI)*: combines SR three year *aged* value and TE in an equation

*The higher the number, the cooler the roof*
Cool Roof Benefits

• Energy cost savings
• Reduces attic temperature
• Reduces use of air conditioner
• Conditioned space stays cooler
• Improves occupant comfort
• Available in many colors
• Lots of styles and material choices
• Lasts longer than standard roof

Photo Credit: Eagle Roofing
Cool Roof FAQs

- Is it required in my climate zone?
- Do I need a radiant barrier?
- Does it have to be white?
- What is considered a reroof?
- Do I need permits and forms?
2016 Energy Standards

Mandatory Measures

• § 10-113: Cool Roof Rating Council (CRRC) is responsible for certifying cool roof products
  
  www.coolroofs.org

• § 110.8(i): How to determine cool roof efficiency with \textit{aged} Solar Reflectance, Thermal Emittance and SRI calculations
Residential Roof Alterations

What is a roofing alteration?

- Re-roof or roof replacement

When is code trigged for cool roofs?

- More than 50% of existing roof area is replaced

Does the roof slope make a difference?

- Low-sloped $\leq 2:12$
- Steep-sloped $> 2:12$
Residential Re-Roof
Steep-sloped § 150.2(b)1Hi

• Prescriptive requirements in Climate Zones 10–15
  ▪ Minimum 0.20 aged SR and 0.75 TE, or minimum 16 SRI

• Exceptions
  ▪ 1” of air space between roof deck and roofing product
  ▪ Profile ratio 1:5 rise to width for more than half the width
  ▪ 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
Residential Re-Roof
Low-sloped § 150.2(b)1Hii

• Prescriptive requirements in Climate Zones 13 and 15
  ▪ Minimum 0.63 aged SR and 0.75 TE, or minimum 75 SRI

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

<table>
<thead>
<tr>
<th>Aged Solar Reflectance</th>
<th>Roof Deck Insulation R-value</th>
<th>Aged Solar Reflectance</th>
<th>Roof Deck Insulation R-value</th>
</tr>
</thead>
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<tr>
<td>0.62-0.60</td>
<td>2</td>
<td>0.44-0.40</td>
<td>12</td>
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<td>20</td>
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<td>8</td>
<td>0.29-0.25</td>
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</table>
Residential Additions
§ 150.2(a)

- Prescriptive requirements
  - **Steep-sloped** roofs meet minimum 0.20 aged SR and 0.75 TE, or 16 SRI in Climate Zones 10–15
  - **Low-sloped** roofs meet minimum 0.63 SR and 0.75 TE, or 75 SRI in Climate Zones 13 and 15

- Exceptions
  - Additions 300 square feet or less
Residential New Construction
§ 150.1(c)11

- Prescriptive requirements
  - **Steep-sloped** roofs meet minimum 0.20 aged SR and 0.75 TE, or 16 SRI in Climate Zones 10–15
  - **Low-sloped** roofs meet minimum 0.63 SR and 0.75 TE, or 75 SRI in Climate Zones 13 and 15

- Exceptions
  - Building integrated photovoltaic panels and building integrated solar thermal panels
  - Roof constructions that have thermal mass over the roof membrane with a weight of at least 25 lbs./ft²
Blueprint

• Email Newsletter

• Published quarterly

• Clarifications on frequently asked questions

http://www.energy.ca.gov/efficiency/blueprint/
Energy Standards Hotline

- Open Monday through Friday
  8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 4:30 p.m.

- Call
  800-772-3300 (in CA)
  916-654-5106 (outside CA)

- Email
  Title24@energy.ca.gov
Questions