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COOL ROOF REQUIREMENTS

RE-ROOFING SINGLE-FAMILY RESIDENTIAL BUILDINGS IN CLIMATE ZONE 9

The new 2022 California Energy Code, effective Jan 1, 2023, requires a cool roof when using the prescriptive requirement for reroofing single-family residential buildings. Roofing products with high solar reflectance and thermal emittance are referred to as a "cool roof". Solar Reflectance refers to a material's ability to reflect the sun's solar energy back into the atmosphere. Thermal emittance provides a means of quantifying how much of the absorbed heat is rejected for a given material. Both properties are measured from 0 to 1 and the higher the value, the "cooler" the roof. There are numerous materials in a wide range of colors that meet cool roof requirements such as tile, metal, asphalt, and coating material. To be considered a cool roof, the roofing products must be tested and labeled by the Cool Roof Rating Council (CRRC). If one wishes not to install a cool roof then they must meet the 2022 California Energy Code using the performance method where tradeoffs can be done.

Replacements of the exterior surface of existing roofs, including adding a new surface layer on top of the existing exterior surface, shall comply with cool roof requirements where more than 50% of the roof is being replaced [Per § 150.2(b)1.I]:

- **FOR STEEP-SLOPED ROOFS (≥ 2:12)** [per § 150.2(b)1.I.i]**:**

Roof Slope	Aged Solar Reflectance AND Thermal Emittance		OR Solar Reflectance Index (SRI)
Steep-sloped (≥ 2 :12)	≥ 0.20	≥ 0.75	≥ 16

Exceptions:

1) Buildings with a ceiling assembly U-factor ≤ 0.025 or at least R-38 ceiling insulation; or
2) Buildings with a radiant barrier in the attic, where the radiant barrier is not installed directly above space sheathing, meeting the requirements of Energy Standards Section 150.1(c)2; or
3) Buildings that have no ducts in the attic; or
4) Building with R-2 or greater continuous insulation above or below the roof deck; or
5) Roof area covered by building integrated photovoltaic panels or solar thermal panels; or
6) Roof constructions with a weight of at least 25 lbs/ft^2.

- **FOR LOW-SLOPED ROOFS (< 2:12)** [per § 150.2(b)1.I.ii(a)]**:**

Roof Slope	Aged Solar Reflectance AND Thermal Emittance		OR Solar Reflectance Index (SRI)
Low-sloped (< 2 :12)	≥ 0.63	≥ 0.75	≥ 75

Exceptions:

1) The aged solar reflectance can be met using R-16 roof deck continuous insulation for climate zone 9 per 2022 California Energy Code Table 150.2-B *("Aged Solar Reflectance Insulation Tradeoff Table");* or
2) Roof area covered by building integrated photovoltaic panels or solar thermal panels; or
3) Roof constructions with a weight of at least 25 lbs/ft^2.

To meet the exception of the California Energy Code (CNC) insulation requirements for roof alterations, the existing roof assembly must meet the requirements listed below. Please indicate the assembly that is existing at the residence of the roof alteration. If the assembly is different than listed below, please specify how the roof alteration will meet the requirements of the CNC 150.2z(b)I.ii(b)

Conventionally Framed Roof:

Rafter Spacing	R-Value of Cavity Insulation	Nominal Framing Size	U-Factor
16-inches on center	R-19	2x6	0.056
24-inches on center	R-19	2x6	0.054

Trusses:

Truss Spacing	R-Value of attic insulation	U-Factor
16-inches on center	R-19	0.049
24-inches on center	R-19	0.048

Roofs shall be insulated with R-14 continuous insulation above the roof deck and roof assembly U-Factor = 0.039 (R-11 cavity insulation below the roof deck, wood framing at 24" o.c.). [Per § 150.2(b)I.ii.b & Table 150.2-C *"Insulation Requirements For Roof Alterations"].*

Exceptions:

1) Existing roofs with R-10 or greater continuous insulation above or below the roof deck; or
2) Existing roofs with an assembly U-Factor ≤ 0.056 or insulated with R-19 minimum insulation between the roof rafters and in contact with the roof deck.
3) The R-14 continuous insulation may be reduced to R-4 where the following conditions are met:
   a. Mechanical equipment is located on the roof and will not be temporarily disconnected and lifted as part of the roof replacement and the addition of insulation would not reduce the height from the roof surface to top of the base flashing to less than the manufacturer's installation instructions.
   b. Replaced roofing abuts sidewall or parapet walls and the addition of insulation would not reduce the height from the roof surface to top of the base flashing to less than the manufacturer's installation instructions, provided that the following conditions apply:
      1) The sidewall or parapet walls are finished with an exterior cladding material other than the roof covering membrane material; and
      2) The sidewall or parapet walls have exterior cladding material that must be removed to install the new roof covering membrane to maintain the minimum base flashing height; and
      3) The ratio of the replaced roof area to the linear dimension of affected sidewall or parapet walls is less than 25 sqft/ft; or
4) The R-14 continuous insulation may be reduced where increasing the thickness of the above deck insulation would reduce the flashing around an existing exterior wall opening below what is permitted by the fenestration or door manufacturer's installation instructions or registered design professional's approved flashing design.
5) Tapered insulation with thermal resistance less than prescribed at the drains and other low points may be used provided that the thickness of the insulation is increased at the high points of the roof so that the average thermal resistance equals or exceeds the required value.