



CALIFORNIA'S TITLE 24
CHANGES AFFECTING ROOFING IN 2005 & FAQ'S



Effective approximately October 1, 2005 Cool Roofs will be required in California when installing a new roof, reroofing or recoating if the following conditions exist:

- ◆ The roof covers non-residential construction,
- ◆ Slope is less than 2:12
- ◆ It is over conditioned space (air conditioned or heated)

Title 24 is written by the California Energy Commission ("CEC") and is made part of California's building code. It addresses all types of energy requirements for HVAC, lighting, windows and walls as well as roofs. These changes now make a "cool" roof the base line for all non-residential buildings.

To qualify as a Cool Roof the material must meet

- ◆ Minimum 0.70 Reflectance
- ◆ Minimum Thermal Emittance of 0.75
- ◆ And be CRRC labeled with these values

If a coating is used to achieve a cool roof, the coating system must be applied at a rate to achieve a minimum dry mil thickness of 20 dry mills (more for cementitious coatings) and meet the listed minimum physical properties. Regulations for liquid-applied roof coatings may be changing likely in 2006 – until changes are approved current requirements must be followed.

Table 118-C
Minimum Performance Requirements for Liquid Roof Coatings

Physical Property	ASTM Test Procedure	Requirement
Initial percent elongation (break)	D2370	Minimum 60% 0° F. Minimum 200% 73° F.
Initial tensile strength (maximum stress)	D2370	Minimum 100 psi 73° F. Minimum 200 psi 0° F.
Final percent elongation (break) after accelerated weathering 1000 hours	D2370	Minimum 40% 0° F. Minimum 100% 73° F.
Permeance	D1653	Maximum 50 perms
Accelerated weathering 1000 hours	D4798	No cracking or checking ¹
¹ Any cracking or checking visible to the eye fails the test procedure		

If I'm doing a reroof is a cool roof required? Yes as long as the following conditions exist: it's over conditioned space, is non-residential. (Some coastal and mountain areas are exempt.)

Does a roof on a new building have to be a cool roof? If the designer follows the simple prescriptive method it will require a cool roof. If the designer follows a calculated performance method there are some upgrades that could be made to the HVAC, windows, doors and walls to off-set the cool roof requirement.

If I'm recoating the roof does it have to be a cool roof? Same criteria applies when coating the roof.

Are there any non-residential buildings that are exempt? Cool Roofs are **OPTIONAL** for hospitals, prisons, mental institutions, hotels/motels, high-rise residential buildings (4 stores or more), high-sloped (more than 2:12) non-residential roofs, unconditioned buildings and process spaces. However, a cool roof will contribute to an energy credit toward meeting the energy budget.

How will it be enforced? When you pull a permit, the Building Departments will require certification that a cool roof is being installed. New forms are being developed by the CEC to facilitate this requirement.

What if you don't have to pull a permit? The roofing contractor is still bound to follow code and install a cool roof.

Does an Energy Star product qualify as a cool roof? **NO!** Title 24 requires a CRRC label and meets the minimum 0.70 reflectance and 0.75 Thermal Emittance.

If I add insulation do I still need to have a cool roof? Title 24 outlines minimum insulation values. Under some computation methods a cool roof could be waived BUT it's unlikely to be cheaper.

If building has a large unconditioned space but a small airconditioned office does the entire roof require a Cool Roof? Not usually. If unconditioned space is much larger than the conditioned space inside the building it will probably be considered unconditioned and a cool roof will be just an option. When the space heating and/or cooling system for the smaller space starts getting large – that is large enough to have the capacity to condition the entire building, the whole building approaches being a conditioned building.

Will I get a rebate if I install a cool roof? Check with your utility, but it is unlikely that the rebates will continue after the October 2005 effective date.

Who is the CRRC? The Cool Roof Rating Council (CRRC) is an independent and non-biased organization that has established a system for providing Building Code Bodies, Energy Service Providers, Architects & Specifiers, Property Owners and Community Planners with accurate radiative property data on roof surfaces that may improve the energy efficiency of buildings while positively impacting our environment

So as long as the product carries a CRRC it meets the California Cool Roof requirement? Not unless it has 0.70 reflectance and minimum 0.75 emissivity and if a coating it meets the physical properties.

What's on the CRRC label? This data includes initial Solar Reflectance and Initial Thermal Emittance. Weathered Values will be included after the product has been exposed for three years. Because the testing criteria were only established and adopted late 2002 Weathered values are currently listed as "Pending". The manufacturer and the product also have an I.D. number on the labels. Without this label the product would not be in compliance with Title 24. If the manufacturer makes a significant change to the product, albeit an improvement, the product must be retested.

	60 pt.	180 pt.
	Initial	Weathered
	Solar Reflectance 0.00	Pending
	Thermal Emittance 0.00	Pending
	Rated Product ID	XXXXX
	Licensed Manufacturer ID	XXXXX
	Classification	Production Line
<small>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 construction may vary. Manufacturer of product stipulates that these ratings were determined in accordance with the applicable Cool Roof Rating Council procedures.</small>		

Why would there be a CRRC label on non-compliant products? CRRC merely rates the optical properties of a product; they do not set compliance numbers (which can vary by region and by application), nor do they test for the physical properties that the CEC requires for coatings. For new construction, where there can be some off-setting upgrades to other building components for purposes of complying with Title 24, the actual CRRC values will be used to determine if the building meets the overall required energy efficiency. If a product does not have a CRRC label the reflectance will default to .10, which is a very dark roof.

What is the purpose of the Cool Roof? To reduce air conditioning loads, the single largest drive of peak power demand. This reduces the demands on power plants at peak periods of the day—usually between Noon to 6 p.m. with heaviest demand between 4 p.m. to 6 p.m. There are additional benefits outside the scope of complying with Title 24 that include extending the service life of the roof, improved interior comfort, reduction in air pollution.

Are gravel roofs permitted? The short answer is No; but the long answer is gravel roofs are only permitted under a very narrow criteria and only when all of the following occur: 1. The existing roof has a rock or gravel surface, and; 2. The new roof has a rock or gravel surface, and; 3. There is no removal of existing layers of roof coverings of more than fifty percent of the roof or more than 2,000 square feet of roof, whichever is less; and; 4. There is no recoating with a liquid applied coating.; and; 5. There is no installation of a recover board, rigid insulation or other rigid, smooth substrate to separate and protect the new roof recovering from the existing roof .

Does aluminum qualify as a Cool Roof? While technically possible, the criteria to allow an aluminum coating aren't practical.

What about residential roofs? Low-rise residential buildings using concrete or clay tile still require a thermal emittance of 0.75 but only a solar reflectance of 0.40.

Important links: Complete text of Title 24 http://www.energy.ca.gov/title24/2005standards/2004-11-04_400-03-001F.PDF

Collaborative for High Performance Schools: www.chps.net

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