

# CALIFORNIA TITLE 24

## What It Means to Building Owners, Specifiers and Roofing Contractors

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### HIGHLIGHTS:

- Title 24 will become law in October 2005
- All roofs installed after this date must have at least 0.7 reflectance, and 0.75 emittance.
- National Coatings' ACRYSHIELD® products exceed Title 24 reflectance and emittance requirements.
- The high reflectance and emittance values of ACRYSHIELD roof coating products allow for the substitution of lower efficiency building components in other areas of building design.

### JUSTIFICATION:

California's population is growing rapidly, and in the past 20 years has added the entire population of Illinois, Ohio, Pennsylvania, and Michigan. In 1974 the California Warren Alquist Act found that the rapid growth and demand for electricity was in part due to wasteful uneconomical, inefficient and unnecessary uses of power. Thus the serious depletion of energy, and land and water resources potentially threatened the state's environmental quality. The Act emphasized efficiency as part of state mandated codes and more divergent supplies of resources.

The result of this has been a highly effective series of programs that have enabled California to be the lowest user of kilowatt hours (kWh) per capita of all 50 states. Moreover, per capital kilowatt hour usage has been flat for the past 25 years. Title 24 is the next step in California's continuing process for increased energy efficiency.

### TITLE 24:

California's latest revision of Title 24 was adopted November 2003, and takes effect October 2005. The basic principle behind Title 24 is to establish and meet an energy budget for a building. The budget is based on the climate zone location of the building. California is divided into 16 climate zones.

### HOW IT WORKS:

An energy budget is created based on the building type and components (fenestrations, wall construction, roofing, lighting system, A/C). Each component gets a baseline or neutral value. For 2005 the base line, or minimum, already includes a "cool roof" and according to Section 118 of Title 24, the values for a cool roof must be equal to, or greater than, 0.70 reflectance and 0.75 emittance. Section 10-113 identifies the Cool Roof Rating Council (CRRC) as the sole supervisory entity for the rating system. Section 118 of Title 24 also includes non-radiative performance requirements for liquid applied coatings. These requirements are constructed around the ASTM D-6083 acrylic coating specification and are not covered by the CRRC. The energy budget allows the design professional and building owner to choose components that may not meet Title 24 in one construction component, while compensating with more energy efficient components in other areas. However, the budget must be met, or the building permit will not be issued. There are provisions for periodic upgrades in the future to the minimum code standards, thus "raising the bar" to increase building energy efficiency.

The section on roofing does allow for some exceptions. These include exceptions for low rise residential roofing, non-residential buildings with steep slope and hotel/motel guest rooms.

For new construction, the compliance process involves the use of one of three methods. Section 143(a) allows individual components to be listed with their accompanying budget amount. These are summed and the total budget is compared to the requirement. This is called the prescriptive method. A second method, 143(b), allows for “envelope tradeoff”, where one highly efficient component can be substituted to offset the low energy efficiency of another. However, no trade-off can be made against lighting, water heating, or HVAC systems. Roof reflectance can be traded off against other envelope requirements such as insulated windows, window overhangs and roof insulation. It is noteworthy that increased roof reflectance from using coatings is more economical than installing insulated windows.

The third method for compliance is a building performance simulation. Here an energy consultant or engineer makes an energy simulation (performance run) for one year. The proposed building is compared to a “standard building” based on the prescriptive code requirements. The building complies if its energy use is less than that of the “standard building”. The standard design shall have a “cool roof”.

### **REROOFING EXISTING BUILDINGS:**

Reroofing of existing buildings requires a “cool roof” as defined by Title 24 and specified in 143 (a). Budgetary trade-offs in other construction categories generally are not practical since only the roof is being redone.

### **TYPICAL REFLECTANCE AND EMITTANCE PROPERTIES OF ROOFING MATERIALS**

The Cool Roof Rating Council maintains a list of rated products that can be found on their website at <http://www.coolroofs.org/ratedproductsdirectory.html>. A brief list of the most widely used products is below:

<b>Material</b>	<b>Reflectance</b>	<b>Emittance</b>
White ACRYSHIELD® Roof Coating	0.83	0.95
White TPO/PVC Single Ply	0.80	0.85
“White” Asphalt Cap Sheet	0.25	0.80
Aluminized Asphalt Roof Coating	0.50	0.25
Smooth Surface BUR	0.10	0.80
EPDM	0.10	0.80

### **HELPFUL WEBSITE LINKS:**

California Energy Commission – Title 24: <http://www.energy.ca.gov/title24>

Cool Roof Rating Council: <http://www.coolroofs.org>

ASTM International: <http://www.astm.org>



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