



CITY OF PERRIS

DEVELOPMENT SERVICES DEPARTMENT

135 NORTH "D" STREET, PERRIS, CA 92570
TEL (951) 943-5003

ROOF OVERLAYS FOR LOW RISE RESIDENTIAL BUILDINGS

Question:

When does a re-roof have to comply with the California State Energy Title 24 "Cool Roof" requirements?

Answer:

Roof surface replacements, or overlays, shall meet the applicable requirements of Section 152(b) 1H of the 2008 Building Energy Efficiency Standards when more than 50% of the roof or more than 1,000 square feet of roof area, whichever is less, is being replaced.

The 2008 Building Energy Efficiency Standards Section 152(b) 1H states the following criteria for roof surface replacements and alternatives:

- i. For roofs greater than 2:12 slope with roofing product density of less than 5 pounds per sq. ft. in climate zones 10 thru 15, shall have a minimum aged solar reflectance of 0.20 and a minimum thermal emittance of 0.75 or a minimum SRI of 16
- ii. For roofs greater than 2:12 slope with roofing product density of 5 pounds per sq. ft. or more in climates zones 1 thru 16, shall have a minimum aged solar reflectance of 0.15 and a minimum thermal emittance of 0.75 or a minimum SRI of 10

Alternatives to Section 152(b) 1H i and ii:

- a. Insulation with a thermal resistance of at least 0.85 hr per sq. ft. / Btu or at least a ¾ inch air space is added to the roof deck over an attic; or
- b. Existing ducts in the attic are insulated (R-6) and sealed according to Section 151(f)10; or
- c. In climate zones 10, 12 and 13 with 1 sq. ft. of free ventilation area to attic ventilation for every 150 sq. ft. of attic area, and where at least 30 percent of the free ventilation area is within 2 feet vertical distance of the roof ridge; or
- d. Buildings with at least R-30 ceiling insulation; or
- e. Buildings with a radiant barrier in the attic, complying with Section 151(f) 2; or
- f. Buildings that have no ducts in the attic; or
- g. In climate zones 10, 11, 13 and 14, R-3 or greater roof deck insulation above the vented attic.

Section 101 of the 2008 Building Energy Efficiency Standards defines Roof and Roofing Product as follows:

Roof is the outside of a building or structure including the structural supports, decking and top layer that is exposed to the outside with a slope less than 60 degrees in the horizontal.

Roofing Product is the top layer(s) of the roof that is exposed to the outside, which has properties including but not limited to reflectance, emittance and mass.

Prescriptive Certificate of Compliance: Residential Reroof		CF-1R-ALT Re-Roof	
Project Address:		Climate Zone	Project #

ROOFING PRODUCTS (COOL ROOFS) §151(f) 12

When the area of exterior roof surface to be replaced exceeds 50% of the existing roof area, or 1,000 ft², whichever is less, the new roofing area must meet the roofing product "Cool Roof" requirements of § 152(b)1Hii, or 1Hii, or 152(b)1Hiii.

Check applicable **alternative** or **exception** below if the roof alteration is exempt from the roofing product "Cool Roof" requirements:

- Cool roofs **not** required in Climates Zones 1-12, 14 and 16 with a low sloped roof pitch (less or 2:12 pitch).
- Cool roofs **not** required in Climates Zones 1-9 and 16 with a steep-sloped roof (greater pitch than 2:12) and product weight less than 5/1lb/ft².

Alternatives to §152 (b) 1Hi and §152(b) Hii, Steep-slope roof (pitch > 2:12)

- Insulation with a thermal resistance of at least 0.85 hr·ft²·°F/Btu or at least a ¾ inch air space is added to the roof deck over an attic; or
- Existing ducts in the attic are insulated and sealed according to §151(f)10; or
- In climate zones 10, 12 and 13, with 1 ft¹ of free ventilation area of attic ventilation for every 150ft² of attic floor area, and where at least 30 percent of the free ventilation area is within 2 feet vertical distance of the roof ridge; or
- Building has at least R-30 ceiling insulation; or
- Building has radiant barrier in the attic meeting the requirements of §1519f)2; or
- Building has no ducts in the attic; or
- In climate zones 10, 11, 13 and 14, R-3 or greater roof deck insulation above vented attic.

Exception to §152(b)1Hii, Low -slope roof (pitch ≥ 2:12)

- Building has no ducts in the attic.

Other Exceptions

- Roofing area is covered by building integrated; photovoltaic panels and thermal panels are exempt from Cool Roof criteria.
- Roof constructions that have thermal mass over the roof membrane with at least 25lb/ft² are exempt from the Cool Roof criteria.

NOTE: If any of the alternatives or exception is checked the Aged Solar Reflectance and Thermal Emittance requirements for roofing products in § 118(i) are not applicable. Do not fill table below.

CRRC Product ID Number ¹	Roof Slope		Product Weight		Product Type ²	Aged Solar Reflectance ^{3,4}		Thermal Emittance	SRI ⁵
	< 2:12	> 2:12	< 5lb/ft ²	≥ 5lb/ft ²					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>			

Note: If no CRRC-1 label is available, this compliance method cannot be used, use the Performance Approach to show compliance.

1. The CRRC Product ID Number can be obtained from the Cool Roof Rating Council's Rated Product Directory at www.coolroofs.org/products/search.php
2. Indicate the type of product is being used for the roof, asphalt roof, metal proof, etc.
3. If the Aged Reflectance is not available in the Cool Roof Rating Council's Rated Product Directory then use the Initial Reflectance value from the same directory and use the equation $(0.2+0.7(p_{initial}-0.2))$ to obtain a calculated aged value. Where p is the Initial Solar Reflectance.
4. Check box if the Aged Reflectance is a calculated value using the equation above.
5. Calculate the SRI value by using the SRI-Worksheet at <http://www.energy.ca.gov/title24/> and enter the resulting value in the SRI Column above and attach a copy of the SRI-Worksheet to the CF-1R.

To apply **Liquid Field Applied Coatings**, the coatings must be applied across the entire roof surface and meet the dry mil thickness or coverage recommended by the coatings manufacturer and meet minimum performance requirements listed in §118(i). Select the applicable coating:

<input type="checkbox"/> Aluminum-Pigmented Asphalt Roof Coating	<input type="checkbox"/> Cement-Based Roof Coating	<input type="checkbox"/> Other
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NOTE: When a Cool Roof is required, the installing contractor shall complete and submit the CF-6R-ENV-01 for final inspection.

Declaration Statement

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is accurate and complete.
- I certify that the energy features and performance specifications identified on this Certificate conform to the requirements of Title 24, parts 1 and 6 of the California Code of Regulations.

Name:	Signature:
Company:	Date:
Address:	License:
City/State/Zip:	Phone:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300.



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RE-ROOF WORK SHEET / CERTIFICATION

SITE ADDRESS: _____

PART-1 EXISTING ROOF SLOPE _____

ROOF SLOPE	FLAT	2-2 ¹ / ₂ : 12	3-3 ¹ / ₂ : 12	4-4 ¹ / ₂ : 12	5-5 ¹ / ₂ : 12	6-6 ¹ / ₂ : 12	7-7 ¹ / ₂ : 12

EXISTING ROOF (check one covering type & deck type each)

EXISTING ROOF COVERING							ROOF DECK TYPE	
ASPHALT COMPOSITION SHINGLES	HOT MOP	WOOD SHAKE SHINGLE	CLAY TILE	CEMENT TILE	MEMBRANE	METAL	SOLID	SPACED SHEATHING

PART-2 NEW ROOF (check one)

ADDITIONAL; LAYER TO EXISTING COVER	TEAR-OFF, REPLACE SAME AS EXISTING	TEAR-OFF, RE-SHEET, INSTALL NEW COMPOSITION ASPHALT SHINGLES	NEW CLAY/CEMENT TILE
GO TO PART-3	GO TO PART-6	GO TO PART-6	GO TO PART-4

PART-3 Where the existing roof has two or more layers of roof coverings; all existing layers shall be removed, prior to the installation of a new roof covering.

PART-4 **Tile Manufacturer:** _____ **ICC Report** _____

If the tile weight exceeds 6.5 lbs psf or, the combined weight of the new tile + solid plywood decking (1.5psf @1/2") exceeds 6.5lbs. psf, **GO TO PART-5**, Otherwise **GO TO PART-6**

PART-5 THIS PART MUST BE PREPARED BY A CALIFORNIA STATE REGISTERED ENGINEER
 1. Structural Calculations required for the existing roof framing.
 2. Framing plan and connection details for strengthening if required.

PART-6 Owner/Application Certification

I certify the information provided on this form is accurate and complete

Name: _____ **Signature:** _____ **Date:** _____

SOLAR REFLECTANCE INDEX CALCULATION WORKSHEET

CEC-CF1R-ENV-04-E (Revised 01/20)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		CF1R-ENV-04-E
Solar Reflectance Index Calculation Worksheet - For Non-HERS Registered Projects		(Page 1 of 2)
Project Name:	Date Prepared:	

A. Product Information		
01	CRRC Product ID Number	
02	Manufacturer	
03	Brand	
04	Model	
05	Product Type	
06	Roof Pitch	

B. SRI Calculations		
01	Aged Reflectance Listed with CRRC	
02	CRRC Listed Aged Solar Reflectance	
03	Initial Solar Reflectance	
04	Calculated Aged Solar Reflectance	
05	Thermal Emittance	

C. Results		
01	Solar Reflective Index	

SOLAR REFLECTANCE INDEX CALCULATION WORKSHEET

CEC-CF1R-ENV-04-E (Revised 01/20)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		CF1R-ENV-04-E
Solar Reflectance Index Calculation Worksheet - For Non-HERS Registered Projects		(Page 2 of 2)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). That the energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a registered copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company:	Date Signed:
Address:	License:
City/State/Zip:	Phone:

Registration Number:

Registration Date/Time:

HERS Provider:

CA Building Energy Efficiency Standards - 2019 Residential Compliance

January 2020

CF1R-ENV-04-E User Instructions

Calculate the SRI value by using the Solar Reflectance Index (SRI) Calculation Worksheet found on the California Energy Commission website at: http://energy.ca.gov/title24/2013standards/documents/solar_reflectance/.

A. Product Information

- 1-5. CRRC Product ID Number, Manufacturer, Brand, Model and Product Type should be based on product information from the Cool Roof Rating Council's website. The product directory is located at <http://www.coolroofs.org/products/search.php> and may be browsed either by viewing all products or by using the search function to find a specific product. Keep in mind that inclusion in the directory does not guarantee that a product will meet the energy requirements.
6. Roof Pitch: Designate the roof slope as either "less than or equal to 2:12" ($\leq 2:12$) or "greater than 2:12" ($> 2:12$). A ratio of 2:12 is approximately 9.5 degree slope. The SRI requirement is based partly on the slope of the roof.

B. SRI Calculations

1. Aged Reflectance Listed with CRRC?: Indicate whether or not your product's 3-year Aged Solar Reflectance is listed on the CRRC website by selecting either "yes" or "no" from the drop-down list. Depending on your selection, the boxes that you will not need should become blacked out.
2. CRRC Listed Aged Solar Reflectance: If you selected "yes" to box 1, input the CRRC listed 3-year Aged Solar Reflectance.
3. Initial Solar Reflectance: If you selected "no" to box 1, input the CRRC listed Initial Solar Reflectance value as a decimal between 0 and 1.
4. Calculated Aged Solar Reflectance: No input required. The calculator will calculate the Aged Solar Reflectance using the Initial Solar Reflectance once you hit enter or click outside the box.
5. Thermal Emittance: Input the value for Thermal Emittance obtained from the CRRC. This value can be either the Initial Thermal Emittance or the 3-year aged value. Note that it also must be a decimal between 0 and 1.

C. Results

1. Solar Reflectance Index: If you have entered values for both Solar Reflectance and Thermal Emittance, once you press enter or click outside the box, the calculator will calculate the final SRI value. It may take a few moments to obtain a value for the SRI depending on the values you inputted for Reflectance and Emittance. Transfer the proposed SRI value to the "SRI (Optional)" column of the appropriate CF1R-NCB, -ADD, or -ALT certificate of compliance.