Ground Rules

• Everyone’s line has been muted by default
• Type questions into Chat
• Q&A at end of webinar
What is the CRRC?

501(c)(3) nonprofit

- Evaluates and labels the radiative performance of roofing and exterior wall products
- Provides a public service through ratings, research, and education
- Supports development of policies and programs by providing data
  - CRRC does not advocate for specific requirements
Established in 1998 through stakeholder collaboration
Diverse set of stakeholders have spent the past two years developing the programmatic and technical requirements.
Why is the CRRC interested in walls?

- Roofs and walls are similar
- Third-party rating system is needed
  - Existing wall provisions in codes, standards & programs
  - No ratings to support compliance & enforcement
    - No standardized testing and rating
    - No comprehensive list of product data
- 20 years of experience
- Independent and objective
BENEFITS AND VALUE
What are the benefits?
Rosado et al. (2019) found that “cool walls” save energy in all California climates and U.S. climate zones 1–4.

LEED BD+C: New Construction • v4.1 - LEED v4.1

Heat Island Mitigation with Cool Walls

Pilot credits
SSpc154 I Possible 1 Points

2019 CALIFORNIA GREEN BUILDING STANDARDS CODE
CALGreen.
CALIFORNIA CODE OF REGULATIONS / TITLE 24, PART 11
CAL Green Building Standards Commission

HAWAII STATE
Energy Office
What is a third-party product rating?

- Informs users about product’s ability to reduce heat gain
- Based on standardized measurement data
- Rated on 0 to 1 scale
- Gives assurance of unbiased data
- Supports programs & policies
- Helps consumers ID products
- Published in online directory
CRRC Product Logo and Label helpful for marketing products

<table>
<thead>
<tr>
<th>Wall Rated Product ID #: W000-0000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Reflectance</td>
</tr>
<tr>
<td>Thermal Emittance</td>
</tr>
</tbody>
</table>

The ratings above are subject to CRRC rating program conditions, requirements, and limitations. Visit coolroofs.org for important information and disclaimers about CRRC rating conditions, requirements, and limitations.
WALL RATING PROGRAM DETAILS
Ratings based on product’s surface radiative performance

- Solar Reflectance (SR) and Thermal Emittance (TE)
- Two ratings
  - Initial Rating (when product is new)
  - Aged Rating (after three-year weathering)
What wall products can be rated?

- Any wall product can be rated (with the exception of unique products in which a new test method is needed)
- Data submittal requirements:
  - Product contact information
  - Brand name & model number
  - Product type & color
  - Radiative property measurements (provided by CRRC-approved lab)
- Chemical formulations are **not** needed
- Initial rating will be published once approved
Product Rating Application/Test Results Report (PRA/TRR): Excel Workbook that contains the product information entered by the Wall Licensee and test results entered by lab

Accredited Independent Testing Laboratory (AITL): An accredited test lab approved by the CRRC to test wall products that is completely independent from any manufacturing company
WRP Aged Rating Process (Standard Products)

**Step 1**
AITL sends specimens to approved Test Farm 28 days before the next exposure placement.

**Step 2**
Specimens undergo 3-year field exposure, then are sent back to AITL for aged testing.

**Step 3**
AITL completes aged testing and enters results in retained PRA/TRR. AITL submits PRA/TRR to CRRC via email within 90 days of removal.

**Step 4**
Once reviewed and approved by CRRC staff, aged test results are placed on Rated Wall Products Directory.
WRP Application Status Flow

1. Draft
   - Submit to Test Lab

2. Initial Test Data needed?
   - Yes: Initial Pending Results
   - No: Initial Application Review

3. Initial Application Review
   - Licensee submits payment

4. Payment Received?
   - No: Pending Payment
   - Yes: Initial Approved

5. Pending Payment
   - Yes: Aged Pending Results
   - No: Aged Application Review

6. Aged Test Data needed?
   - Yes: Aged Pending Results
   - No: Aged Application Review

7. Aged Approved

Application Status Responsibility Key:
- Licensee
- Test Lab
- CRRC
Measurements made by CRRC Approved Test Laboratories (AITLs)

- CRRC approved
- No affiliation with manufacturing
- ISO/IEC 17025 accredited
- Required participation in CRRC Biennial Interlaboratory Comparison Study (ILC)
- Existing CRRC-approved AITLs will be allowed to conduct testing if appropriate measurement equipment has been procured
Test methods for radiative performance

- Solar Reflectance
  - ASTM C1549
  - ASTM E903
  - CRRC Test Method #1 (variegated color)
  - CRRC Directional-Hemispherical Solar Reflectance Test Method (410-Solar Reflectometer)

- Thermal Emittance
  - ASTM C1371
  - Slide Method
Three years of weathering will be required

Currently approved Test Farms
- Atlas Weathering Services Group
- Q-Lab Weathering Research Service
Products are listed on the CRRC Rated Wall Products Directory
Rated Wall Products Directory Features

- **Product Type**
  - One-Coat Stucco
  - Three-Coat Stucco
  - Metal
  - Vinyl Siding
  - Insulated Vinyl Siding
  - Polypropylene siding
  - Paint/Architectural Coating
  - Retro-Reflective Material
  - Architectural Fabric
  - Metal Composite Material
  - Polymer Film
  - Fiber Cement Siding
  - Painted Wood Composite
  - Masonry

- **Colors**
  - Red
  - Yellow
  - Blue
  - Bright White
  - Tan
  - Black
  - Metallic
  - Orange
  - Green
  - Purple
  - Off-White
  - Grey
  - Brown
  - Variegated (Multicolor)

- **Solar Reflectance**
  - Filter by minimum initial or 3 year aged values
  - Initial
    - min: -0  max: 1.00
    - 0.00
  - 3 Year Aged
    - min: -0  max: 1.00
    - 0.00

- **Thermal Emittance**
  - Filter by minimum initial or 3 year aged values
  - Initial
    - min: -0  max: 1.00
    - 0.00
  - 3 Year Aged
    - min: -0  max: 1.00
    - 0.00

- **Product Market**
  - End-Users
  - Other Manufacturers
  - Both End-Users and Other Manufacturers
### Rated Wall Product Directory Features

- Sort by feature
- Easily navigate to Roof Directory
- Click “Support” for CRRC contact information

<table>
<thead>
<tr>
<th>PRODUCT TYPE</th>
<th>COLOR</th>
<th>Date Added</th>
<th>CRRC Product ID</th>
<th>Manufacturer</th>
<th>Brand and Model</th>
<th>Product Type</th>
<th>Solar Reflectance Initial Value</th>
<th>Solar Reflectance 3 Year Value</th>
<th>Thermal Emittance Initial Value</th>
<th>Thermal Emittance 3 Year Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinyl Siding</td>
<td>Bright White</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tan, Bright White</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polypropylene siding</td>
<td>Purple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retro-reflective material</td>
<td>Metallic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal Composite Material</td>
<td>Grey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinyl Siding</td>
<td>Purple</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown</td>
<td>0.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Rated Wall Product Directory Features

<table>
<thead>
<tr>
<th>CRRC PROD ID</th>
<th>MANUFACTURER</th>
<th>BRAND AND MODEL</th>
<th>PRODUCT TYPE</th>
<th>COLOR</th>
<th>SOLAR REFLECTANCE</th>
<th>THERMAL EMITTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>W559-2633</td>
<td>Ankunding PLC</td>
<td>Ability Citrus</td>
<td>Vinyl Siding</td>
<td>Bright White, Tan, Bright White</td>
<td>0.01</td>
<td>0.45</td>
</tr>
</tbody>
</table>

### Detailed Information

- **APPLICATION APPROVAL DATE**: N/A
- **MANUFACTURER CONTACT**: Marisa Zita
  
  1-357-974-7094 x93278
  
  [http://www.spinka.net/](http://www.spinka.net/)

- Manufacturer contact and product rating information accessible by clicking the three dots on the right.
Rated Wall Product Directory Features

• Navigate to the CRRC website Homepage by clicking on the CRRC Logo at the top left of the Directory

• Directory accessible from Homepage
Data integrity is critical to credible ratings

- Vetted test methods & standards
- Testing & reporting by accredited independent test labs and trained manufacturer test labs
- Three-year weathering by accredited test farms in three designated U.S. climates
- Strict chain of custody
- Validation testing
Rated Wall Product Test Data

- **CRRC-2 Wall Product Rating Program Manual**
- Existing test data/measurements may not be used for Wall Product Ratings
- Ratings are based on measured SR and TE by an approved CRRC test lab using the proper equipment and settings
- Data integrity is critical to CRRC credibility as third-party ratings organization
REFERENCE
RATING OPTION
Reference Ratings

- Rating option for a product that inherits measured data from another CRRC-rated product
- Example: private labeling
Reference Ratings

• An *Other Manufacturer Authorization Form* must be signed by the Licensed Seller (LS) and the Licensed Other Manufacturer (OM) and submitted to the CRRC

• The LS applying for a Reference Rating must be a CRRC Licensee

• No additional testing is required

• Reference relationships are confidential
COMPOUND RATING OPTIONS
Compound Ratings

- One product rating application which covers multiple product profiles
- Same material formulation
- All products undergo testing, lowest performer undergoes weathering and aged testing
- Additional brands and models listed on Directory

Image Credit: Georgia-Pacific https://www.gpvinylsiding.com/
COLOR FAMILY PROGRAM
When to use Color Families
Colors can be grouped together under single rating

• Is available for architectural coatings (paint) and factory-applied coatings (metal panels)

• All elements in a Color Family Group must belong to the same product line
  – Must have similar chemical composition properties, thus aging similarly

• Manufacturers may submit some product data
  – Requires testing facilities and approval as a CRRC Accredited Manufacturer Test Lab
Color Family Program

• All products tested for Solar Reflectance, Thermal Emittance, and Colorimetry
  – Must fit in color ranges for chosen Color Family
• The *Representative Element (RE)* is the product with the lowest Solar Reflectance
• *Representative Elements* get tested by independent test labs and undergo three-year aging
• Data for *Additional Elements (AE)* can be provided by an Accredited Manufacturer Test Lab, and inherit the aged data from the *Representative Elements*
Color Family Group Example

- Lowest Solar Reflectance
- Receives Initial and Aged Testing from an independent lab
- Undergoes 3-year weathering

Initial Solar Reflectance, Thermal Emittance, and colorimetry data may be submitted by AMTL

Inherit Aged ratings from Representative Element
Paint products are tested on a defined substrate

- Standard substrate is a metal panel with a Solar Reflectance <0.20
- Color Family Additional Elements can be applied to:
  - Standard substrate
  - Leneta Form BK plain black chart
  - Black portion of a Leneta Form 2C opacity chart
- Manufacturers provide prepared panels or supply the substrate to the lab along with instructions on how to properly apply the coating to the substrate
Approved Substrates for Paint
Additional Elements

Leneta Form BK

Leneta Form 2C

Image Credits:
ACCREDITED MANUFACTURER TEST LABS (AMTLs)
Manufacturer test labs can submit test data under certain circumstances

• Can submit test data for Color Family Additional Elements
• Must apply (and be approved) to become Accredited Manufacturer Test Laboratory (AMTL)
• Must be capable of measuring solar reflectance using
  − D&S Portable Reflectometer with AM1.5GV setting and/or extracting 1.5GV output from raw measurement data, or
  − Equivalent mode in Surface Optics 410-Solar / 410-Solar-i
• Be capable of measuring thermal emittance with D&S emissometer
To become an AMTL...

• Submit a completed AMTL Application
• Submit documentation of written test procedures, training records, system for retaining test records, and calibration system
• Participate in CRRC AMTL Training
  – Contact audrey@coolroofs.org for information
• Test set of specimens provided by the CRRC
• Submit signed AMTL Agreement (upon program launch)
• Pay AMTL annual fee (upon program launch)

See CRRC-2 Program Manual for additional information
AMTL Ongoing Responsibilities:

- Payment of AMTL annual renewal fee
- Participation in CRRC biennial Interlaboratory Comparison Study (ILC)
  - Ensures consistency and competency of all accredited test labs
- Responsible Person duties
  - Individual(s) who participated in CRRC training
  - Must perform or supervise all testing that is submitted for CRRC Ratings
  - Must retain at least one Responsible Person and notify CRRC within 10 business days if there are changes
Interested in becoming an AMTL?

• Review the complete AMTL requirements in section 2.2, 2.3, and 2.6 of the CRRC-2 Wall Product Rating Program Manual

• Contact audrey@coolroofs.org with any questions or for information about the next AMTL Training session
HOW TO GET INVOLVED
Wall product manufacturers and sellers

- Manufacturers and sellers must **first** become a Licensee in the Wall Program in order to have products rated
  - Submit Licensee Application
  - Submit Licensee Agreement
  - Pay initial Licensee fee
  - Become an AMTL (optional)
- **Separate from participation in CRRC Roof Program**

See [CRRC-2 Program Manual](#) for additional information
## Licensee Fees

<table>
<thead>
<tr>
<th>Application Submittal Month</th>
<th>Licensee Sales</th>
<th>Accredited Manufacturer Test Lab (AMTL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt;$100M</td>
<td>$35-100M</td>
</tr>
<tr>
<td>January</td>
<td>$9,800</td>
<td>$7,000</td>
</tr>
<tr>
<td>February</td>
<td>$8,983</td>
<td>$6,417</td>
</tr>
<tr>
<td>March</td>
<td>$8,167</td>
<td>$5,833</td>
</tr>
<tr>
<td>April</td>
<td>$7,350</td>
<td>$5,250</td>
</tr>
<tr>
<td>May</td>
<td>$6,533</td>
<td>$4,667</td>
</tr>
<tr>
<td>June</td>
<td>$5,717</td>
<td>$4,083</td>
</tr>
<tr>
<td>July</td>
<td>$4,900</td>
<td>$3,500</td>
</tr>
<tr>
<td>August</td>
<td>$4,083</td>
<td>$2,917</td>
</tr>
<tr>
<td>September</td>
<td>$3,267</td>
<td>$2,333</td>
</tr>
<tr>
<td>October</td>
<td>$2,450</td>
<td>$1,750</td>
</tr>
<tr>
<td>November</td>
<td>$1,633</td>
<td>$1,167</td>
</tr>
<tr>
<td>December</td>
<td>$817</td>
<td>$583</td>
</tr>
</tbody>
</table>
To have products rated:

- Engage a CRRC-approved lab for initial testing
  - *and three-year aged testing*
- Engage a CRRC-approved test farm for product weathering
- Submit product rating application to CRRC
- Pay CRRC product rating fee (and annual renewal fees)
### Wall Rating Program Product Rating Fees

<table>
<thead>
<tr>
<th>Rating Type</th>
<th>Initial Rating</th>
<th>Annual Renewal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Product</td>
<td>$250</td>
<td>$150</td>
</tr>
<tr>
<td>Reference Product (private labeling)</td>
<td>$250</td>
<td>$75</td>
</tr>
<tr>
<td>Compound Rating Product</td>
<td>$450</td>
<td>$225</td>
</tr>
<tr>
<td>Color Family Representative Element</td>
<td>$450</td>
<td>$225</td>
</tr>
<tr>
<td>Color Family Additional Element</td>
<td>$75</td>
<td>$25</td>
</tr>
</tbody>
</table>
Now accepting applications!

- Submit Licensee (and AMTL, if applicable) application now
- No obligation to pay until program launches on January 17, 2022
- Applications at coolroofs.org
Wall Rating Program Committee

- Oversees maintenance and updates to Wall Rating Program
- Upcoming meeting schedule available at coolroofs.org
  - December 8, 2021
  - February 24, 2022
  - May 25, 2022
  - August 26, 2022
  - December 1, 2022
- If interested in attending, contact jeff@coolroofs.org to be added to distribution list
QUESTIONS & ANSWERS

Please type questions into the Chat box