

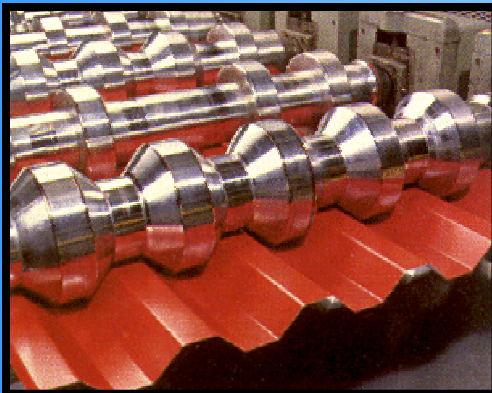
# Development of Cool Colored Roofing Materials

## Project Advisory Committee Meeting

Collaboration of Ferro, Industrial Partners, LBNL & ORNL

Sponsored by: California Energy Commission

March 03, 2005



Reflective Pigments  
Designed to Keep  
Things **COOLER**



Typical Applications

- Cool Roofing
- Building Exteriors
- Automotive
- Plastic substrates
- Coil Coatings & Extrusions



**Cool Colors<sup>™</sup> & Eclipse<sup>™</sup>**  
**IR Heat & Energy Saving Pigments**



***What's been  
the response  
to  
"Cool Roofing" in the  
Marketplace?***

# Cool Colors<sup>TM</sup> & Eclipse<sup>TM</sup> IR Heat & Energy Saving Pigments



## March 2003 Google Search

Advanced Search Preferences Language Tools Search Tips

Google<sup>TM</sup>

Web - Images - Groups - Directory - News

Searched the web for **Cool Roof**.

Results 1 - 10 of about 718,000. Search took 0.07 seconds.

Category: [Business](#) > [Industries](#) > ... > [Membrane Roofing](#)

**Cool Savings Program - Cool Roofs**  
... As of March 1, 2003, the **Cool Savings with Cool Roofs Program** is no longer accepting new applications for **cool roof** rebates. ... Links to **Cool Roof** Information. ... [www.consumerenergycenter.org/coolroof/](http://www.consumerenergycenter.org/coolroof/) - 9k - [Cached](#) - [Similar pages](#)

Sponsored Links

**Cool Roof Installations**  
California & Nevada Roofing Repairs, Maintenance & Cool Roofs  
[www.dinyari.com](http://www.dinyari.com)

# Cool Colors<sup>™</sup> & Eclipse<sup>™</sup> IR Heat & Energy Saving Pigments



## October 2004 Google Search

Web Images Groups News Froogle more »

Google<sup>™</sup> Cool Roof Search Advanced Search Preferences

Over 1 M Hits

Web Results 1 - 10 of about 1,030,000 for Cool Roof. (0.66 seconds)

Cool Roof Rating Council  
The **Cool Roof** Rating Council provides radiative property data on **roof** surfaces to improve the energy efficiency of buildings while positively impacting the ...  
[www.coolroofs.org/](http://www.coolroofs.org/) - 9k - [Cached](#) - [Similar pages](#)

Cool Roofing Materials Data Base  
**Cool Roofing** Materials Database. Lawrence Berkeley National Laboratory. Environmental Energy Technologies Division. Energy-efficient ...  
[eetd.lbl.gov/coolroof/](http://eetd.lbl.gov/coolroof/) - 5k - [Cached](#) - [Similar pages](#)

Sponsored Links

Roof Coatings, Elastic.  
Roofs, Walls, Decks Stops Leak Fast Rubber Paint and Acrylic Premium.  
<http://www.amesresearch.com>

Cool Roof Installations  
California & Nevada Roofing Repairs, Maintenance & **Cool** Roofs

# Cool Colors™ & Eclipse™ IR Heat & Energy Saving Pigments



Less than 6 months later – 2.4 M Hits

Google [Web](#) [Images](#) [Groups](#) [News](#) [Froogle](#) [Local](#) <sup>New!</sup> [more »](#)


[Advanced Search](#)  
[Preferences](#)

**February, 2005**

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**Web** Results 1 - 10 of about 2,440,000 for [Cool Roof](#). (0.18 seconds)

Product search results for [Cool Roof](#)

 [Photo: Cool Tin Roof](#) - \$20.00 - [ShutterPoint Photography](#)  
[Custom UVS Heat Shield](#) - \$49.95 - [Autogeek.net](#)  
[Power Cool Plus - Electric Roof Mount Attic Ventilator](#) - \$150.00 - [michaelholigan](#)

[Cool Roof Rating Council](#)  
The **Cool Roof** Rating Council provides radiative property data on **roof** surfaces to improve the energy efficiency of buildings while positively impacting the ...  
[www.coolroofs.org/](#) - 9k - Feb 23, 2005 - [Cached](#) - [Similar pages](#)

[Cool Roofing Materials Data Base](#)

Sponsored Links

[Green Products](#)  
Providing environmentally friendly and efficient roofing products.  
[www.greenproducts.net](#)

[Reflect 90% of Sun's Heat](#)  
Energy Seal Reflective **Roof** Coating  
Energy Star Labeled Roofing Product  
[www.energy-seal.com](#)

# **Cool Colors<sup>TM</sup> & Eclipse<sup>TM</sup>** **IR Heat & Energy Saving Pigments**



## **History and Development**

- **Work began in 1999**
- **Immediate interest from metal roofing industry**
- **Ferro approached ORNL & LBNL with concept**
- **PAC formation**
- **Testing of Cool-Colored metal roofing products**
- **Promotion into other market segments**

# **Cool Colors<sup>TM</sup> & Eclipse<sup>TM</sup>** **IR Heat & Energy Saving Pigments**



## **Areas of interest**

- **Metal Roofs and Sidewalls (Coil Coatings)**
- **EPDM, Single Ply, and Tile Roofing**
- **Asphalt Shingles (Largest Roofing Market sector)**
- **Decking (Wood, Concrete and Plastic Composite)**
- **Concrete (Roof tile, Swimming Pool Deck, Flat Tile)**
- **Vinyl Siding for homes**
- **Window frames (profiles)**
- **Automotive parts**
- **Cedar Shakes**

**Cool Colors™ & Eclipse™**  
**IR Heat & Energy Saving Pigments**



***What are some  
positive aspects  
of the technology?***



# Cool Colors<sup>TM</sup> & Eclipse<sup>TM</sup> IR Heat & Energy Saving Pigments



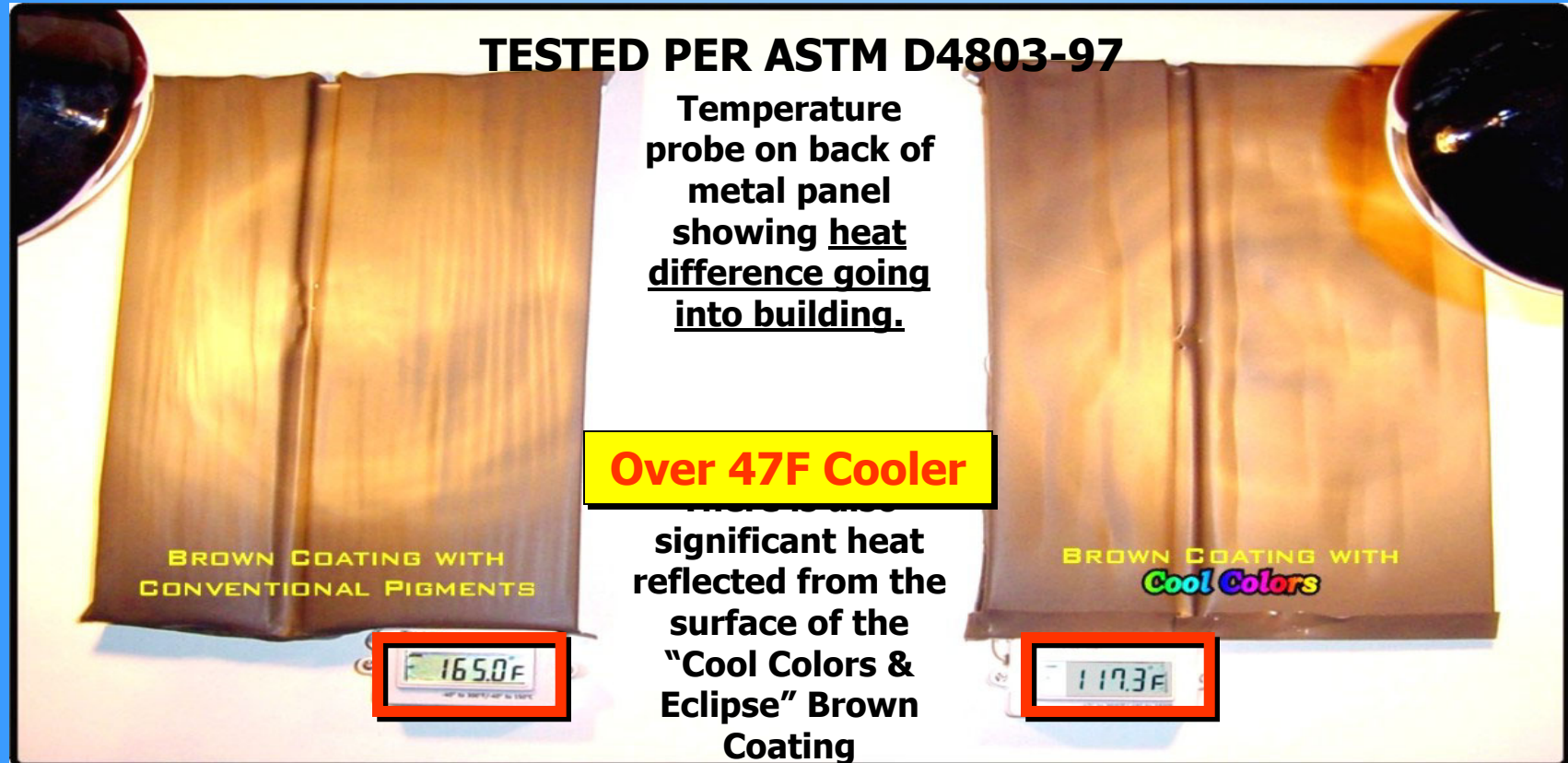
**Higher Reflectance in the IR Region  
Provides Lower Surface & Absorption Temps**

**TESTED PER ASTM D4803-97**

Temperature probe on back of metal panel showing heat difference going into building.

**Over 47F Cooler**

significant heat reflected from the surface of the "Cool Colors & Eclipse" Brown Coating



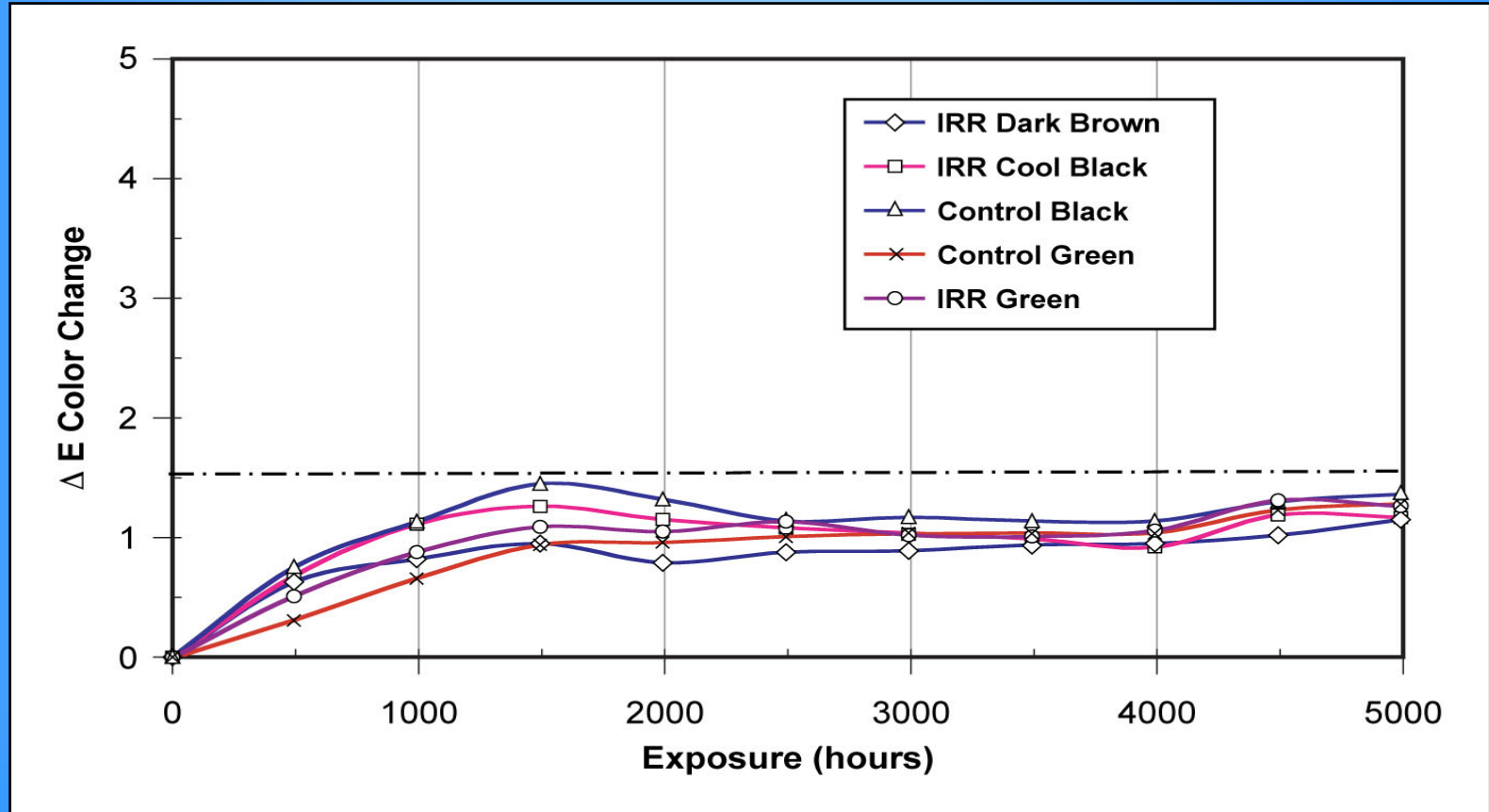
# Cool Colors™ & Eclipse™

## IR Heat & Energy Saving Pigments



## Durability – Fade Resistance

Xenon-arc exposure for 5000 hours



# **Cool Colors<sup>™</sup> & Eclipse<sup>™</sup>**

## **IR Heat & Energy Saving Pigments**



## **What Needs to be done**

- **Large Scale demonstrations showing \$ and KWH savings**
- **Software to estimate the Cooling Energy Savings**
- **Value of technology to lessen Peak Energy Demand**
- **Monitor Color and Reflectivity change over time**
- **Work with labs on reflectivity improvement**
- **Monitor thermal performance over time**
- **Develop predictive software for Cool Coating Design**