



THE PERFORMANCE MATERIALS COMPANY

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PERFORMANCE PIGMENTS AND COLOR

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How CoolColors and Eclipse Work

How **Cool Colors™** & **Eclipse™** Work

The electromagnetic radiation from the Sun that strikes the Earth consists of radiation in the wavelengths of about 300 nanometers (nm) to 2500 nanometers. The wavelength region below 400 nanometers is called Ultraviolet (UV). The UV region can cause damage to our bodies and skin, and also causes degradation to paints and polymers. The Visible region, 400 to 700 nanometers, is the area where our eyes are attuned to see light in all its various colors. The final area from 700 to 2500 nanometers is the Infrared (IR) region. These longer wavelengths are invisible to the eye, yet contain about half of the solar energy which strikes the earth (see Figure 1).

We see different colors by selective reflection in the visible region, in other words, we see a red color because the radiation in the red portion of the spectrum is reflected, and all the rest of the radiation in the visible range is more or less absorbed. We can't see in the infrared region of the spectrum, so we really can't determine what's going on there by sight. But, we can feel the effects of its energy in the form of **Heat**.

Touch your asphalt driveway, climb on your shingled roof, or place your hand on your black automobile when it's been out in the sun for a while. **It's quite HOT!** In fact, some dark colored roofing can attain a temperature of **190 degrees Fahrenheit or more**. Why, well it's because these materials absorb a large portion of the infrared radiation from the Sun.

Look at the second chart below (Figure 2). We show a typical black pigment versus one of our **Cool Colors™ & Eclipse™** Black pigments, V-799. Notice the difference in the curves. The typical black pigment absorbs the radiation across the whole solar spectrum, where the V-799 Black reflects in the invisible Infrared portion. The color appears black in the visible portion of the spectrum, but reflects in the invisible Infrared portion. This results in significantly less solar energy being absorbed, which means **less heat build-up**.

Ferro scientists began work on this type of selective reflection and absorption for Military applications many years ago. We are now finding commercial application for this technology in such areas as Cool Roofing, Vinyl siding, Coil and other coatings, automotive applications and many other plastic and coating applications where Solar Heat is a problem. In addition, these pigments

are among the most durable and weatherfast pigments known. For more information and an informative CDROM, call us at Ferro Corporation at 216-641-8580.

Spectrum of Solar Radiation

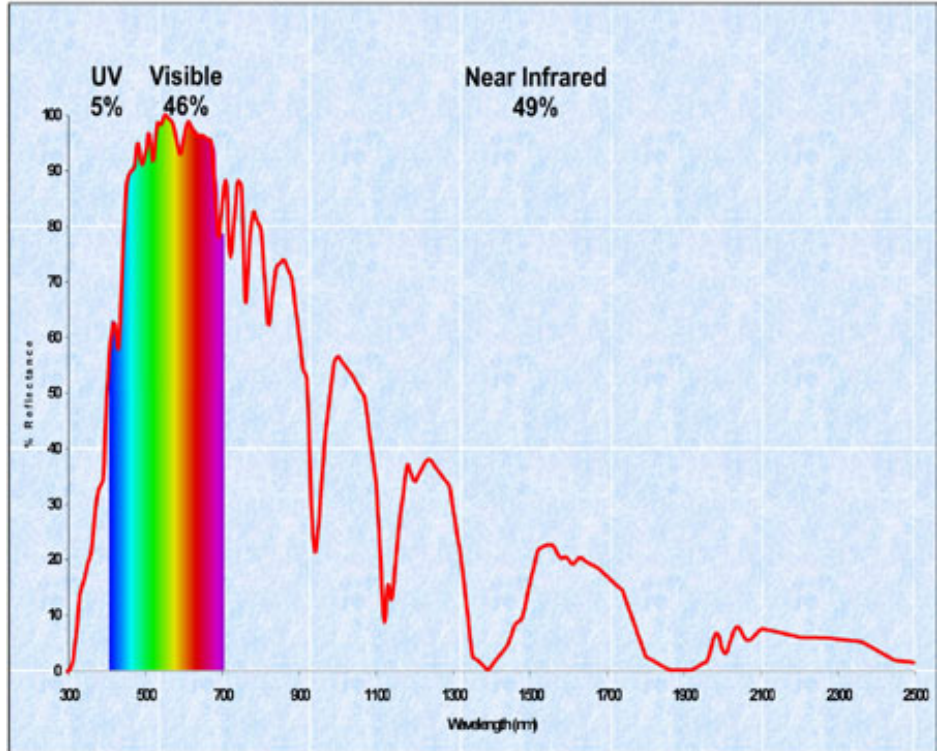


Figure 1

Typical Black v/s *Cool Colors*® & *Eclipse*® Black Pigments

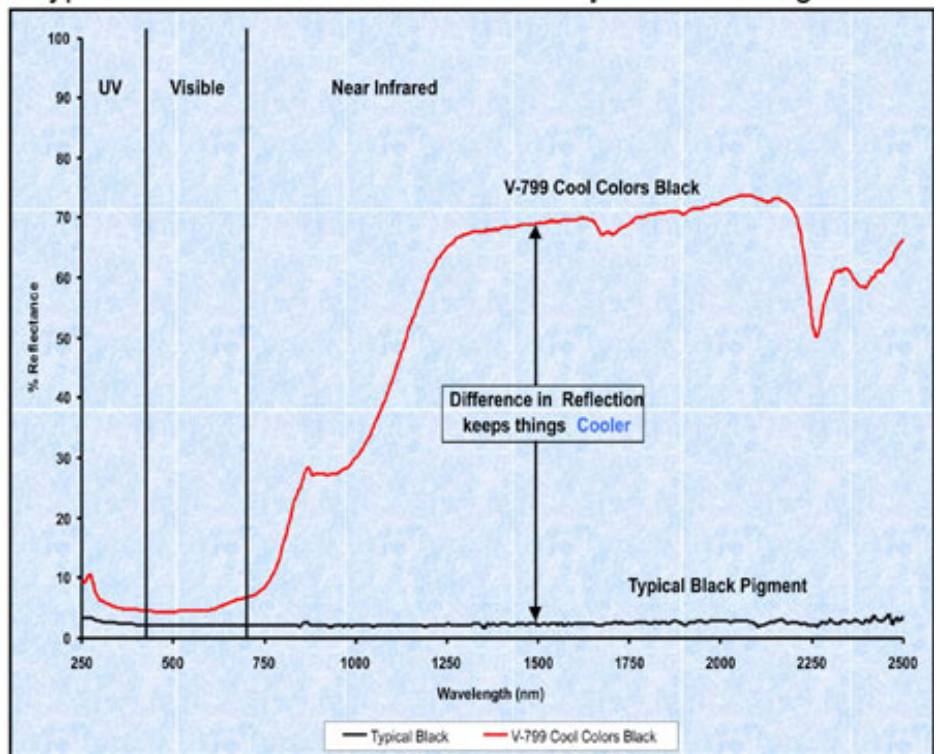


Figure 2

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