Diamond Vogel
INDUSTRIAL COATINGS

TECHNICAL BULLETIN

Cool Colors

Background

Sunlight reaching the earth's surface is composed of wavelengths from 300-2500 nanometers (nm). Only a small band (see Fig 1) of these is visible and thus responsible for color. An object that reflects the visible range appears white while black surfaces absorb these wavelengths.

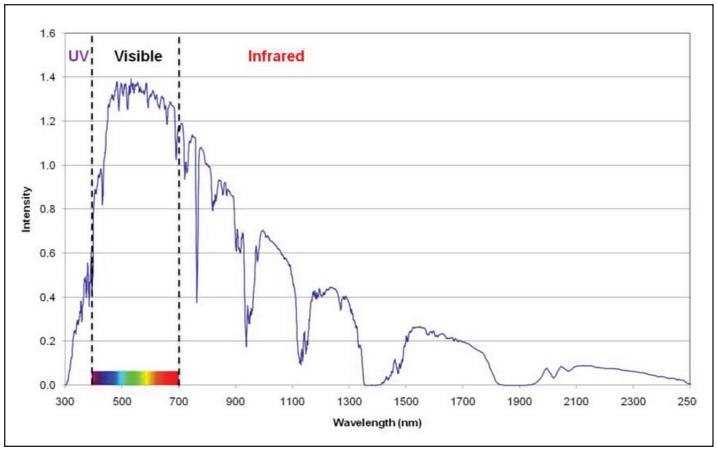

FIG. 1: The Spectra of Sunlight

Light and Heat

Both ultraviolet (UV) and infrared (IR) light are invisible and have no affect on color. IR rays create heat in a similar way as rubbing your hands together does. IR energy causes molecules to vibrate back and forth. The more IR energy an object absorbs, the greater the heat buildup. UV light can cause chemical changes in an absorbing coating but does not contributes to heat buildup. Reflecting IR rays is thus critical in minimizing the heat buildup of a coated surface.

IR Reflective Colors

Two objects can be identical in visible color yet have very different reflective characteristics in the IR band. Most conventional pigments allow infrared radiation to be absorbed causing a buildup of heat. However not every color (such as the bright and vivid organic pigment colors) can be modified with IR reflective pigments. This special group of inorganic pigments exhibit higher IR reflectivity, allowing for less surface heat. The amount of temperature reduction will vary widely by color. Diamond Vogel is currently incorporating IR reflective pigments to produce cool powder coatings when requested.

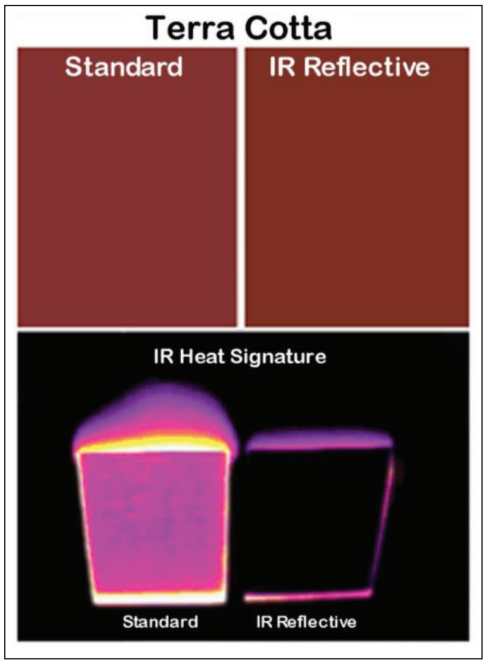

FIG. 2: Heat signature panels with standard and IR reflective pigments

Applications

Many enclosures will profit from a cool coating. These coatings save energy by reducing the heat load on structures. Examples of applications that would benefit include:

- Equipment sheds, instrument enclosures, exterior mounted air handlers, or electrical transformers

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