ChromaFlair® Light-Interference Pigments

Seeing color in a whole new light

ChromaFlair pigments are multi-layer flakes that give paints, coatings, plastics, textiles, and packaging the ability to change color when viewed from different angles, and are suitable wherever color is valued as a differentiator.

Each flake exhibits a variety of colors depending on the angle at which it is viewed and the angle of incident light. The pigment’s dramatic color effect is visible in a wide variety of lighting conditions and works with both high- and low-gloss applications. They are easily incorporated into paints and plastics used in automotive, consumer electronics, sports equipment, apparel, and packaging markets.

Applications

ChromaFlair pigments are suitable for coatings and plastics used on:

- Automobiles
- Architectural Finishes
- Sports Equipment
- Apparel
- Consumer Electronics
The Science of Color

Viavi uses Color by Physics® technology to create ChromaFlair pigments. A multi-layer interference film, manufactured by the deposition of ultra-thin layers using physical vapor deposition (PVD), is ground into micron-sized flakes, as shown in Figure 1. Unlike ordinary pearlescent pigments, ChromaFlair flakes include a center aluminum core layer that is opaque and highly specular (mirror-like). The aluminum layer is surrounded by a glass-like layer. Changing the thickness of this glass-like layer produces different colors, and allows all standard colors to be made from the same three ingredients. To maintain the tight color tolerance required by the automotive industry, layer thicknesses must be controlled to within a few atoms; this is achieved using a proprietary Viavi manufacturing process.

ChromaFlair pigments can be mixed with traditional organic and inorganic pigments to create styled colors to meet a wide variety of design needs. Mix with aluminum pigments to lighten colors and create pastel effects; darker colors tend to intensify the color-shift effect. As shown in Figure 3, mixing with transparent pigments decreases the range of visible colors.

Similar to natural structures such as soap bubbles, butterfly wings, and sea shells, the color of ChromaFlair pigment is the result of a thin-film interference whereby white light is separated into its components through selective constructive and destructive interference. This phenomenon is also called structural color: the raw materials are essentially colorless by themselves but, when ordered in the proper sequence, they work together to create color. Through the use of thin-film interference, vacuum-coating technology, and three colorless materials, Viavi is able to create a full spectrum of highly-chromatic colors.

Figure 1. Cross-sectional drawing of a ChromaFlair pigment flake
Figure 2. Color gamut of ChromaFlair Green/Purple 190 L, demonstrating the high degree of gonio-apparency
Figure 3. Schematic showing ChromaFlair Green/Purple 190 styled with phthalocyanine green
**ChromaFlair Pigment Colors**

ChromaFlair pigment names reflect the color seen at approximately 0° and 45° respectively. The number represents the pigment’s approximate hue at a normal viewing angle.

Available colors include:

- Gold/Silver 080WR
- Red/Gold 000WR
- Blue/Red 280WR
- Green/Purple 190WR
- Silver/Green 060WR

**ChromaFlair WR Series**

ChromaFlair WR Series pigments are suitable for waterborne paints and coatings. Sol-gel encapsulation technology provides long shelf stability and prevents oxidation of the aluminum layer.

Available colors include:

- Gold/Silver 080WR
- Red/Gold 000WR
- Blue/Red 280WR
- Green/Purple 190WR
- Silver/Green 060WR
### Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Particle Size D50 (µm)</th>
<th>D99 (µm)</th>
<th>Percent Solids (w/%)</th>
<th>Wet Specific Gravity (g/cc)</th>
<th>Dry Specific Gravity (g/cc)</th>
<th>Specific Surface Area (m²/g)</th>
<th>Heat Stability (°C)</th>
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### Regulatory Information

ChromaFlair pigments are made with raw materials listed on most chemical inventories internationally. Please consult the Safety Data Sheet or contact customer service for additional regulatory information.

### Ordering Information

For more information on this or other products and their availability, please contact your local Viavi account manager or Viavi directly at worldwide +1 800 254 3684 or via e-mail at chromaflair@viavisolutions.com.