Identificación de Pigmentos de Efecto

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• To understand the color reaction of interference pigments, you have to understand the geometries of illumination and observation.

• You start on the surface of your test panel. This is the base for a semicircle drawn from 0° to 180°.

• You combine this semicircle with optical laws, in particular: angle of incident = angle of reflection
To understand the color reaction of interference pigments, you have to understand the geometries.
Geometries

Panel 0° - 180°,
90° normal (0° optical),
45° illumination,
135° specular,

120° = 15° aspecular
    = 15° cis,
150° = -15° aspecular
    = 15° trans,
110° = 25° aspecular
    = 25° cis.
In case of interference pigments, you can exchange the geometries.
Zeiss GK 311/M:
independent illumination and measuring.
Datacolor MultiFX10:  
Rack with illuminators and observers
Typical description of an interference pigment:
Interference line 25°/140° - 45°/120° - 70°95°
Aspecular line 45°/120°, 45°/110°, 45°/90°, 45°/60°, 45°/25°
Easy to characterize

Examples of different interference pigments:
Left chart: Pearlgreen and Pearlred
Right chart: Viola Fantasy, standalone and mixture
More information

Left chart: aspecular geometries
Right chart: Additional interference geometries
Conventional assessment of panel at a window:
Tipping panel up and down, color information is very poor.
Conventional assessment of panel in a light booth:
Tipping panel up and down, color information is very poor.
New assessment of panel: Moving panel parallel up and down.
Same color, different results: measuring at aspecular geometries holds the risk of unacceptable results.
Same color, different methods of application
Left chart: Honda Pearl
Right chart: Xirallic Crystal Silver
Mostly used are the aspecular geometries at 25°, 45° and 75° or 110° aspecular.
Indeed, you do not „see“ the two different yellow pigments.
Measurement & identification

Two additional geometries help to identify interference pigments. Each interference pigment has its own characteristic.
You can distinguish mixtures with and without interference pigment: Latter show „interference“ and aspecular data in one line.
Conventional data (left) show no significant differences. Additional interference data give you a better idea of color differences (right).
Measurement & identification

Left chart: ChromaFlair pigment - shifting from orange via green to violet (no aluminium)
Right chart: aluminium pigment shifting up and down the specular line.
### Discussion

#### Illumination Specular Viewing aspecular

<table>
<thead>
<tr>
<th>Illumination</th>
<th>Specular</th>
<th>Viewing</th>
<th>aspecular</th>
</tr>
</thead>
<tbody>
<tr>
<td>75°</td>
<td>105°</td>
<td>90°</td>
<td>+15° (cis)</td>
</tr>
<tr>
<td>75°</td>
<td>105°</td>
<td>120°</td>
<td>-15° (trans)</td>
</tr>
<tr>
<td>45°</td>
<td>135°</td>
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<td>25°</td>
<td>155°</td>
<td>140°</td>
<td>+15° (cis)</td>
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<tr>
<td>25°</td>
<td>155°</td>
<td>170°</td>
<td>-15° (trans)</td>
</tr>
</tbody>
</table>
Conclusion

- For a correct visual and instrumental assessment, you need additional illuminations.
- Ideal angles of illumination are 75° (steep), 45° (classical) and 25° (flat) with constant aspecular angle of 15°.
- To get information about the color system, you need still the conventional geometries at a fixed angle of illumination at 45° and different aspecular angles.
El fin. Muchas gracias!