PHOTOCHROMIC PIGMENTS

1. Introduction:
The photochromic pigments change color when exposed to sunlight/UV, and revert to their original color when the sunlight/UV is dimmed or blocked. After absorbing the energy of sunlight/UV, their molecular structure is changed, which causes their absorbed wavelength to be changed allowing a color to appear. It reverts to the original molecular structure and color when the light stimuli is dimmed or blocked.

2. Product Description:
A. Color conversion from colorless to colored when excited by UV light:

![Colorless (no UV) ↔ Colored (under UV)]

Available Colors: #12 Purple, #13 Sky Blue, #14 Blue, #16 Yellow, #17 Orange, #19 Magenta, #22 Gray

3. Available Products & Applicability:

<table>
<thead>
<tr>
<th>Applicability</th>
<th>Microencapsulated Powder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ink/Paint (Solvent)</td>
<td>☺</td>
</tr>
<tr>
<td>Ink/Paint (Aqueous)</td>
<td>☒</td>
</tr>
<tr>
<td>Plastic Injection/Extrusion</td>
<td>☻</td>
</tr>
</tbody>
</table>

☺ Can be used       ☒ Conditional

Photochromic Microencapsulated Powder

A. Product Description

* Photochromic microencapsulated powder contains 2-5 % of photochromic dye and less than 3% of moisture, suitable for solvent/aqueous based ink/paint and plastic injection/extrusion. The average particle size is 3-10 mm.
B. Properties

- Photochromic microencapsulated powder is a pigment, which is heat and solvent resistant. The powder shows brilliant color when exposed to sunlight/UV. Suitable for plastic injection and solvent based ink/paint.

C. Recommended Concentrations:

- For solvent/aqueous based ink/paint: 3% to 30% w/w (For best results, about 25% concentration is required for 20 mm film thickness)

- For plastic injection/extrusion: 0.2% to 1% w/w (For best results, about 0.5% concentration is required for 0.2 cm plastic thickness)

D. General Recommendations:

- Add a heat stabilizer and process at temperatures not higher than 230°C (445 °F) when applied to plastic injection/extrusion.

Miscellaneous:

From colored to colored:

- All the UMC photochromic products, except the photochromic dyes, are in a pigmentary form, which can provide various levels of coverage effects.
- The light fastness of the photochromic products should be thoroughly tested prior to approval for production.
- Light fastness can be improved by adding more photochromic materials.

Storage: Keep sealed in a dark, cool place, away from direct sunlight. Best within two years if stored correctly.
Certifications: EN-71 & RoHS passed. Safe for food grade packaging and toys.

Imported & Distributed by
UNITED MINERAL & CHEMICAL CORPORATION
160 Chubb Ave., Suite 206, Lyndhurst NJ 07071
Tel : 201-507-3300  Fax : 201-507-1506
Website: www.umccorp.com