**General Properties**

- **Chemical Structure**: Cu-phthalocyanine halogenised
- **Colour Index Part I**: P.G. 36
- **Colour Index Part II**: 74265
- **CAS Number**: 14302-13-7
- **Physical Form**: Powder
- **Colour Shade**: Green

**Preparations**

(Other) preparations can be made on special request.

**Colouristical Properties Org.**

<table>
<thead>
<tr>
<th>Hue Grade in PVC 1/3 SD</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chroma in PVC 1/3 SD</td>
<td>58.4</td>
</tr>
<tr>
<td>Red. Ratio in PVC 1/3 SD</td>
<td>2.8</td>
</tr>
<tr>
<td>Hue Grade in PVC 1/9 SD</td>
<td>167</td>
</tr>
<tr>
<td>Chroma in PVC 1/9 SD</td>
<td>49.6</td>
</tr>
<tr>
<td>Red. Ratio in PVC 1/9 SD</td>
<td>7.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hue Grade in PE-LD 1/3 SD</th>
<th>162</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chroma in PE-LD 1/3 SD</td>
<td>59.5</td>
</tr>
<tr>
<td>Red. Ratio PE-LD 1/3 SD</td>
<td>3.2</td>
</tr>
<tr>
<td>Hue Grade in PE-LD 1/9 SD</td>
<td>164</td>
</tr>
<tr>
<td>Chroma in PE-LD 1/9 SD</td>
<td>49.4</td>
</tr>
<tr>
<td>Red. Ratio in PE-LD 1/9 SD</td>
<td>8.9</td>
</tr>
</tbody>
</table>

**Ease of Dispersion**: <10

**Physical Properties**

<table>
<thead>
<tr>
<th>Density</th>
<th>2.1 g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk Density</td>
<td>0.4 g/cm³</td>
</tr>
<tr>
<td>Index of pH</td>
<td>5-8</td>
</tr>
<tr>
<td>Conductivity</td>
<td>200 µS/cm</td>
</tr>
<tr>
<td>Specific Surface</td>
<td>62 m²/g</td>
</tr>
</tbody>
</table>

**Fastness properties**

- **Heat stability**: 300 °C
- **Light fastness**: 8
- **Weather fastness**: 5
- **Migration fastness**: 5
- **Infl. on warping of PE-HD**: Distinct
- **Fastness to chemicals**: HCl conc. >6 Months

All data is subject to the producer's disclaimer

LUCOLOR 2.0 - BASF Colourants for Plastics (Oct.1998) - Printed: 8/24/99
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Stability</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCl 10%</td>
<td>&gt;6</td>
<td></td>
</tr>
<tr>
<td>H2SO4 conc.</td>
<td>&gt;6</td>
<td></td>
</tr>
<tr>
<td>H2SO4 10%</td>
<td>&gt;6</td>
<td></td>
</tr>
<tr>
<td>HNO3 conc.</td>
<td>Instable</td>
<td></td>
</tr>
<tr>
<td>HNO3 10%</td>
<td>&gt;6</td>
<td></td>
</tr>
<tr>
<td>NaOH conc.</td>
<td>&gt;6</td>
<td></td>
</tr>
<tr>
<td>Na2CO3 sat.</td>
<td>&gt;6</td>
<td></td>
</tr>
</tbody>
</table>

Criteria for the fastness to chemicals was a possible colour change of the coloured plastic material during the storage in the test medium.

**Recommendations for applications**

- PVC-p: Suitable
- PVC-u: Suitable
- PUR: Suitable
- LD-PE: Suitable
- HD-PE: Suitable
- PP: Suitable
- PS: Suitable
- SB: Suitable
- SAN: Suitable
- ABS/ASA: UCC
- PMMA: Suitable
- PC: UCC
- PA: UCC
- PETP: Suitable
- CA/CAB: Suitable
- UP: Suitable

UCC: Under certain conditions

**Recommendations for food applications**

- BgVV: Suitable
- FDA: Not suitable
- France: Not suitable

UCC: Under certain conditions
Product Specification - HELIOGEN® GREEN K 9360

PROPERTIES
Pigment type: Cu phthalocyanine halogen.
Colour Index: Pigment Green 36
Application: Colourant for plastics
Physical form: Powder
Storage: practically unlimited shelf life
Food packaging: approved according to "Empfehlung IX des BgVV".

SPECIFICATION
Colour tolerances: dH* ± 0.7; dC* ± 0.7; dL* ± 0.7; dE* <= 1.0;
da* ± 0.7; db* ± 0.7
Strength equivalence: 100 ± 5%
Test method: BASF test method 11.3.1

Please note:
The above data will be warranted by us. These data, however, as well as
the properties of any product samples do not imply any legally binding
assurance of certain properties or of suitability for a specific purpose so that any
liability for damages cannot be derived therefrom.
Reflection Curve
HELIOGEN® GREEN K 9360

Note: The program stores curve points (see table). The diagram shows approximations.

Test medium: PVC-p

Wavelength nm

0 20 40 60 80 100

0 20 40 60 80 100

0 20 40 60 80 100

0 20 40 60 80 100

All data is subject to the producer's disclaimer
LUCOLOR 2.0 - BASF Colourants for Plastics (Oct.1998) - Printed: 8/24/99
Particle Size Distribution
HELIOGEN® GREEN K 9360

Note: The program stores curve points (see table). The diagram shows approximations.
Heat Stability

HELIOKEN® GREEN K 9360

Test medium:
PE-HD (Lupolen 6031M)

According to
DIN 53772

Note: The program stores curve points (see table). The diagram shows approximations.

All data is subject to the producer's disclaimer
LUCOLOR 2.0 - BASF Colourants for Plastics (Oct.1998) - Printed: 8/24/99
Weather fastness
HELIOKEN® GREEN K 9360

Test medium:
PE-HD (Lupolen 6031M)
According to DIN 53387, 54001

Hours
0
500
1000
2000
3000

Steps grey scale
0
1
2
3
4
5

1:50
1:10
0.2%
0.05%
Light fastness
HELIOGEN® GREEN K 9360

Test medium:
PE-HD (Lupolen 6031M)

According to
DIN 53387, 54004
Name of product: **HELIOGEN® Green K 8730**

C.I. No. / Name: 74 260 / C.I. Pigment Green 7, copper phthalocyanine, chlorinated

CAS No. / EINECS No.: 1328-53-5 / 215-524-7

Name of product: **HELIOGEN® Green K 9360**

C.I. No. / Name: 74 265 / C.I. Pigment Green 36, copper phthalocyanine, halogenated

CAS No. / EINECS No.: 14302-13-7 / 238-238-4

**Chemical nature**

The listed **HELIOGEN®** pigments are phthalocyanines. The pigments based on C.I. Pigment Green 7 contain appr. 15 chlorine atoms per molecule. The yellowish green types based on C.I. Pigment Green 36 are additionally substituted by bromine besides chlorine.

**Toxicology**

In experiments on animals, **HELIOGEN®** pigments did not display acute toxicity. Feeding tests on rats to determine the chronic toxicity revealed no toxicological finding whatever. No acute irritant effect was shown in tests to determine the acute irritation of the skin and mucous membranes. In experiments on animals, the pigments did not display skin sensitizing effects.

**Ecology**

Because they are chemically inert and practically insoluble in water, **HELIOGEN®** pigments are not environmentally hazardous. They can be removed from waste water by mechanical means. The high stability of the copper complex means that the pigment does not decompose to release ionic copper by hydrolysis, photolysis, or aerobic or anaerobic decomposition. When disposing of the halogen-containing Green pigments in an incineration plant, depending on the pigment an emission of hydrogen chloride and bromide may occur, which must be removed from the flue gas by appropriate means.

**Labelling**

The above listed products are not dangerous substances in the sense of the German Ordinance on Dangerous Substances or of corresponding EU regulations.

**Classification as dangerous goods**

The products are not classified as hazardous under transport regulations.

**TA Luft**

Para 3.1.3 - Total dust (Germany)

**Water hazard class**

WGK 1 (slightly water hazardous according to German legislation - KBwS - group classification organic colours)

**Heavy metal content**

**HELIOGEN®** pigments do not contain any lead, cadmium, chromium(VI) and mercury compounds in their formulations. The sum of the total contents of these elements, according to tests on standard samples, is less than 100 mg/kg. It is thus below the limit in the EU packaging directives and the
American CONEG model.

<table>
<thead>
<tr>
<th>Metal</th>
<th>Limit (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>Arsenic</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>Lead</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>Cadmium</td>
<td>&lt; 30</td>
</tr>
<tr>
<td>Chromium</td>
<td>&lt; 50</td>
</tr>
<tr>
<td>Selenium</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>Mercury</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>Zinc</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>Prim. aromatic amines</td>
<td>&lt; 100</td>
</tr>
</tbody>
</table>

The metal levels quoted are based on the detection limit of the analytical determination method used (X-ray fluorescence spectroscopy). The actual levels may lie well below these values.

Copper and halogen content

<table>
<thead>
<tr>
<th>Product</th>
<th>Copper content</th>
<th>Halogen content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total (%)</td>
<td>soluble * (ppm)</td>
</tr>
<tr>
<td>K 8730</td>
<td>5.6</td>
<td>50 - 100</td>
</tr>
<tr>
<td>K 9360</td>
<td>4</td>
<td>30 - 90</td>
</tr>
</tbody>
</table>

*) half concentrated hydrochloric acid (ionic copper contents)

Food legislation

According to tests on standard samples (Type 8081) the listed HELIOGEN® pigments conform to the demands on purity in the following food legislation (see also "Heavy metal content"):

Europe: Resolution AP (89)
Germany: BgVV Empfehlung IX., 190. Mitteilung vom 1.6.1994
France: Brochure No. 1227. K 9360 is not listed in the French Positive List.
Italy: Decreto Ministeriale dated 21.3.1973
Spain: Resolución del 4.11.82 de la Subsecretaría de Sanidad
USA: K 8730 is listed on the FDA List (21 CFR, § 178.3297). K 9360: Use only on evidence of "non migration".

Toys

According to tests on standard samples (Type 8082), the listed HELIOGEN® pigments conform to the demands on purity in the European standard on toys, i.e. EN 71, Part 3.

Registration status

The components of the products are listed in the chemical inventories of the following countries: EU (EINECS), USA (TSCA), Canada (DSL), Japan (MITI), Australia (AICS), Korea (ECL), Philippines (PICCS, Final Version 1995), and Switzerland (BAGT No. 612200, Class free).

Other legislation on chemicals

The products do not fall under the provisions of the agreement on chemical weapons and do not contain any substances that are mentioned in the German Ordinance on the Prohibition of Certain Chemicals (ChemVerbotsV). They are produced without using substances that destroy ozone (Montreal Agreement - Ozone Depleting Substances).

MAK value

The general threshold value for dust, i.e. 6 mg/m³, must be observed. (Proposal of the MAK commission for the alveolar passing dust fraction, i.e. 1.5 mg/m³, is not yet valid) (Germany)

Further information can be found in our Material Safety Data Sheets, Technical Information Bulletins and in the Product Safety Info No. 8 "Copper phthalocyanine (HELIOGEN® pigments)" and No. 9 "Organic
pigments containing chlorine in the heat of discussion”. The Product Safety Department in our Organic Pigments Division will gladly reply to your queries and can be reached under the following address:

BASF AG
EFO/FS - J 550
D-67056 Ludwigshafen, Germany
Fax: ++49 (0)621-60-40673

Dr Oberliner  Tel. ++49 (0)621-60-99232
Mrs Paymal  Tel. ++49 (0)621-60-40681
Mr Schwanse  Tel. ++49 (0)621-60-71503

The information submitted in this publication is based on our current knowledge and experience. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.