General Properties

Chemical Structure: Cu-phthalocyanine beta
Colour Index Part I: P.B. 15:3
Colour Index Part II: 74160
CAS Number: 147-14-8
Physical Form: Powder
Colour Shade: Blue

Preparations

Eupolen® Blue 70-8001
Lufen™ Blue 70-8105 C 4
Luprofil™ Blue 70-8105 C 4
Palamid™ Blue 70-8105

(Other) preparations can be made on special request.

Colouristical Properties Org.

Hue Grade in PVC 1/3 SD: 240
Chroma in PVC 1/3 SD: 48
Red. Ratio in PVC 1/3 SD: 10.9

Hue Grade in PVC 1/9 SD: 233
Chroma in PVC 1/9 SD: 41.5
Red. Ratio in PVC 1/9 SD: 36.5

Hue Grade in PE-LD 1/3 SD: 241
Chroma in PE-LD 1/3 SD: 46.8
Red. Ratio PE-LD 1/3 SD: 9.2

Hue Grade in PE-LD 1/9 SD: 233
Chroma in PE-LD 1/9 SD: 40.4
Red. Ratio in PE-LD 1/9 SD: 30.9

Ease of Dispersion: <10

Physical Properties

Density: 1.6 g/cm³
Bulk Density: 0.2 g/cm³
Index of pH: 5-8
Conductivity: 200 µS/cm
Specific Surface: 65 m²/g

Fastness properties

Heat stability: 280 °C
Light fastness: 8
Weather fastness:
Migration fastness: 5

All data is subject to the producer’s disclaimer
Infl. on warping of PE-HD

Distinct

Fastness to chemicals:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCl</td>
<td>Conc.</td>
<td>Instable</td>
</tr>
<tr>
<td>HCl 10%</td>
<td>&gt;6 Months</td>
<td></td>
</tr>
<tr>
<td>H2SO4 conc.</td>
<td>&gt;6 Months</td>
<td></td>
</tr>
<tr>
<td>H2SO4 10%</td>
<td>&gt;6 Months</td>
<td></td>
</tr>
<tr>
<td>HNO3 conc.</td>
<td>Instable</td>
<td></td>
</tr>
<tr>
<td>HNO3 10%</td>
<td>&gt;6 Months</td>
<td></td>
</tr>
<tr>
<td>NaOH conc.</td>
<td>&gt;6 Months</td>
<td></td>
</tr>
<tr>
<td>Na2CO3 sat.</td>
<td>&gt;6 Months</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     Suitable
- PETP   Suitable
- CA/CAB Suitable
- UP     Suitable

UCC: Under certain conditions

Recommendations for food applications

- BgVV  Suitable
- FDA   Suitable
- France Suitable

UCC: Under certain conditions
Product Specification - HELIOGEN® BLUE K 7090

PROPERTIES
Pigment type: Cu phthalocyanine beta
Colour Index: Pigment Blue 15:3
Application: Colourant for plastics
Physical form: Powder
Storage: practically unlimited shelf life
Food packaging: approved according to "Empfehlung IX des BgVV".

SPECIFICATION
Colour tolerances: \( \Delta H^* \pm 0.7; \Delta C^* \pm 0.7; \Delta L^* \pm 0.7; \Delta E^* \leq 1.0; \)
\( \Delta a^* \pm 0.7; \Delta b^* \pm 0.7 \)
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.
Microscopy - HELIOGEN® BLUE K 7090
Reflection Curve
HELIOGEN® BLUE K 7090

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

Test medium:
PVC-p
Note: The program stores curve points (see table). The diagram shows approximations.
Heat Stability
HELIOKEN® BLUE K 7090

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
HELIOGEN® BLUE K 7090

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

Steps grey scale

Hours

0 1 2 3 4 5

0 500 1000 2000 3000

1:50 1:10 0.2% 0.05%
Light fastness
HELIOGEN® BLUE K 7090

Test medium:
PE-HD (Lupolen 6031M)

According to
DIN 53387, 54004
Name of product: HELIOGEN® Blue K 6850
C.I. No. / Name: 74 160 / C.I. Pigment Blue 15, copper phthalocyanine, alpha form, unstable
CAS No.: 147-14-8
EINECS No.: 205-685-1

Name of product: HELIOGEN® Blue K 6902 / 6911
C.I. No. / Name: 74 160 / C.I. Pigment Blue 15:1, copper phthalocyanine, alpha form, stable
CAS No.: 147-14-8
EINECS No.: 205-685-1

Name of product: HELIOGEN® Blue K 7090
C.I. No. / Name: 74 160 / C.I. Pigment Blue 15:3, copper phthalocyanine, beta form, modified
CAS No.: 147-14-8
EINECS No.: 205-685-1

Chemical nature: The listed HELIOGEN® pigments are phthalocyanines with a central divalent copper atom. Copper phthalocyanine pigments occur in various crystal modifications, of which the alpha form (reddish blue) and beta form (greenish blue) are the most technically significant. The alpha form can be stabilized by partial chlorination (0.5 chlorine atom per molecule).

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.

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.

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.

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.
Antimony < 20 mg/kg  Chromium < 50 mg/kg
Arsenic < 20 mg/kg  Selenium < 20 mg/kg
Lead < 20 mg/kg  Mercury < 20 mg/kg
Cadmium < 30 mg/kg  Zinc < 20 mg/kg
Prim. aromatic amines < 100 mg/kg

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 content  HELIOGEN® Blue K 6840 and K 7090 contain appr. 11 % and K 6902 and K 6911 D contain appr. 10,5 % chemically combined copper.

Halogen content  Only the stabilized alpha HELIOGEN® types K 6902 and K 6911 D contain organically combined chlorine (approx. 3 %). All the other types listed do not contain any chemically combined halogen.

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
Italy: Decreto Ministeriale dated 21.3.1973
Spain: Resolución del 4.11.82 de la Subsecretaría de Sanidad

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)

TA Luft  Para 3.1.3 - Total dust (Germany)

Water hazard class  WGK 0 (generally non water hazardous according to KBwS classification, 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  Dr Oberlinner  Tel. ++49 (0)621-60-99232
EFO/FS - J 550  Mrs Paymal  Tel. ++49 (0)621-60-40681
D-67056 Ludwigshafen, Germany  Mr Schwanse  Tel. ++49 (0)621-60-71503
Fax: ++49 (0)621-60-40673

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.