General Properties

Chemical Structure: Perylene Red
Colour Index Part I: P.R. 149
Colour Index Part II: 71137
CAS Number: 4948-15-6
Physical Form: Powder
Colour Shade: Red

Preparations

Luprofil™ Red 35-8005 C 4
Palamid™ Red 35-8005
Rakusol Red 35-8005
Rakusol Red 35-8007

(Other) preparations can be made on special request.

Colouristical Properties Org.

Hue Grade in PVC 1/3 SD: 26.7
Chroma in PVC 1/3 SD: 60.8
Red. Ratio in PVC 1/3 SD: 8.1

Hue Grade in PVC 1/9 SD: 24.8
Chroma in PVC 1/9 SD: 47.2
Red. Ratio in PVC 1/9 SD: 25.4

Hue Grade in PE-LD 1/3 SD: 25.2
Chroma in PE-LD 1/3 SD: 58.5
Red. Ratio PE-LD 1/3 SD: 6.9

Hue Grade in PE-LD 1/9 SD: 23.1
Chroma in PE-LD 1/9 SD: 45.4
Red. Ratio in PE-LD 1/9 SD: 21.4

Ease of Dispersion: <10

Physical Properties

Density: 1.4 g/cm³
Bulk Density: 0.23 g/cm³
Index of pH: 7
Conductivity: 20 μS/cm
Specific Surface: 76 m²/g

Fastness properties

Heat stability: 300 °C
Light fastness: 8
Weather fastness: 4-5
Migration fastness: 4-5

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>&gt;6 Months</td>
</tr>
<tr>
<td>HCl 10%</td>
<td></td>
<td>&gt;6 Months</td>
</tr>
<tr>
<td>H2SO4</td>
<td>conc.</td>
<td>5 Months</td>
</tr>
<tr>
<td>H2SO4 10%</td>
<td></td>
<td>&gt;6 Months</td>
</tr>
<tr>
<td>HNO3 conc.</td>
<td></td>
<td>Instable</td>
</tr>
<tr>
<td>HNO3 10%</td>
<td></td>
<td>&gt;6 Months</td>
</tr>
<tr>
<td>NaOH conc.</td>
<td></td>
<td>&gt;6 Months</td>
</tr>
<tr>
<td>Na2CO3 sat.</td>
<td></td>
<td>&gt;6 Months</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**

<table>
<thead>
<tr>
<th>Material</th>
<th>Suitable</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC-p</td>
<td></td>
</tr>
<tr>
<td>PVC-u</td>
<td></td>
</tr>
<tr>
<td>PUR</td>
<td></td>
</tr>
<tr>
<td>LD-PE</td>
<td></td>
</tr>
<tr>
<td>HD-PE</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td></td>
</tr>
<tr>
<td>SB</td>
<td></td>
</tr>
<tr>
<td>SAN</td>
<td></td>
</tr>
<tr>
<td>ABS/ASA</td>
<td>UCC</td>
</tr>
<tr>
<td>PMMA</td>
<td>Suitable</td>
</tr>
<tr>
<td>PC</td>
<td>UCC</td>
</tr>
<tr>
<td>PA</td>
<td>UCC</td>
</tr>
<tr>
<td>PETP</td>
<td>UCC</td>
</tr>
<tr>
<td>CA/CAB</td>
<td>Suitable</td>
</tr>
<tr>
<td>UP</td>
<td></td>
</tr>
</tbody>
</table>

**Recommendations for food applications**

<table>
<thead>
<tr>
<th>Material</th>
<th>Suitable</th>
</tr>
</thead>
<tbody>
<tr>
<td>BgVV</td>
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</tr>
<tr>
<td>FDA</td>
<td>UnderApp.</td>
</tr>
<tr>
<td>France</td>
<td></td>
</tr>
</tbody>
</table>

UCC: Under certain conditions

All data is subject to the producer's disclaimer.
Product Specification - PALIOGEN® RED K 3580

**PROPERTIES**
- Pigment type: Perylene red
- Colour Index: Pigment Red 149
- Application: Colourant for plastics
- Physical form: Powder
- Storage: practically unlimited shelf life
- Food packaging: approved according to "Empfehlung IX des BgVV".

**SPECIFICATION**
- Colour tolerances: $dH^* \pm 0.7; \ dC^* \pm 0.7; \ dL^* \pm 0.7; \ dE^* \leq 1.0$;
  $da^* \pm 0.7; \ db^* \pm 0.7$
- 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 - PALIOGEN® RED K 3580
Weather fastness
PALIOGEN® RED K 3580

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

Steps grey scale

<table>
<thead>
<tr>
<th>Hours</th>
<th>1:50</th>
<th>1:10</th>
<th>0.2%</th>
<th>0.05%</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>1000</td>
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<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Particle Size Distribution
PALIOGEN® RED K 3580

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

Susp. Fluid: H2O
Disp. Agent: Tetronic
Mixer Time: 60 s
Median Size: 0.887 µ
CILAS
Reflection Curve
PALIOGEN® RED K 3580

Test medium:
PVC-p

Note: The program stores curve points (see table). The diagram shows approximations.
Heat Stability
PALIOGEN® RED K 3580

Test medium:
PE-HD (Lupolen 6031M)

According to
DIN 53772

Note: The program stores curve points (see table). The diagram shows approximations.
Light fastness
PALIOGEN® RED K 3580

Test medium:
PE-HD (Lupolen 6031M)

According to
DIN 53387, 54004

Steps blue wool scale

<table>
<thead>
<tr>
<th></th>
<th>1:50</th>
<th>1:10</th>
<th>0.2%</th>
<th>0.05%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
<td>7</td>
<td>8</td>
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</tr>
<tr>
<td>2</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>6</td>
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<td>7</td>
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<td></td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

All data is subject to the producer's disclaimer
LUCOLOR 2.0 - BASF Colourants for Plastics (Oct.1998) - Printed: 8/24/99
Name of product: PALIOGEN® Red K 3580
C.I. No. / Name: 71 137 / C.I. Pigment Red 149, Perylene Red
CAS No. / EINECS No.: 4948-15-6 / 225-590-9

Name of product: PALIOGEN® Red K 3911 HD
C.I. No. / Name: 71 155 / C.I. Pigment Red 178, Perylene Red
CAS No. / EINECS No.: 3049-71-6 / 221-264-5

Name of product: PALIOGEN® Red K 4180
C.I. No. / Name: 71 130 / C.I. Pigment Red 179, Perylene Red
CAS No. / EINECS No.: 5521-31-3 / 226-866-1

Name of product: PALIOGEN® Red Violet K 5011
C.I. No. / Name: 71 129 / C.I. Pigment Violet 29, Perylene Red
CAS No. / EINECS No.: 81-33-4 / 201-344-6

Chemical nature
The listed PALIOGEN® types, also known as perylene pigments, are
derivatives of perylenetetracarboxylic anhydride. Originally used as vat dyes,
it is only since 1950 that they have found application as pigments for
colouring plastics and high-grade industrial paints.

Toxicology
Perylene pigments do not exhibit acute oral toxicity in animal trials, nor do
they irritate the skin and mucous membranes. A 28-day (subacute) feeding
trial carried out with a perylene pigment did not show any adverse
toxicological results.

Ecology
Because of their poor solubility in water, perylene pigments are nontoxic to
aquatic organisms and are not an environmental hazard. An 8-week
bioaccumulation study with a perylene pigment on fish showed that the
pigment does not accumulate in the organism.

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
PALIOGEN® 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.

**Halogen content**

 PALIOGEN® pigments do not contain organically combined halogens.

**Food legislation**

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

Europe: Resolution AP (89)
Germany: BgVV Empfehlung IX., 190. Mitteilung vom 1.6.1994
France: Brochure No. 1227. Red K 4180 and Red violet K 5011

are

Italy: Decreto Ministeriale dated 21.3.1973
Spain: Resolución del 4.11.82 de la Subsecretaría de Sanidad
USA: C.I. Pigment Red 179 ist listed in the FDA-Positive List (21.CFR, § 178.3297). The other PALIOGEN® pigments are in approval. Current use only on evidence of "non migration".

**Toys**

According to tests on standard samples (Type 8082), the listed PALIOGEN® 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).

**TA Luft**

Para 3.1.3 - Total dust (Germany)

**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)

**Water hazard class**

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

Further information can be found in our Material Safety Data Sheets and Technical Information Bulletins. The Product Safety Department in our Organic Pigments Division will gladly reply to your queries and can be reached under the following address:
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.