### General Properties

- **Chemical Structure**: Pyrazolone Yellow
- **Colour Index Part I**: S.Y. 93
- **Colour Index Part II**: 48160
- **CAS Number**: 4702-90-3
- **Physical Form**: Powder
- **Colour Shade**: Yellow

### Preparations

(Other) preparations can be made on special request.

### Colouristical Properties Org.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hue Grade in PVC 1/3 SD</td>
<td>95.9</td>
</tr>
<tr>
<td>Chroma in PVC 1/3 SD</td>
<td>73.4</td>
</tr>
<tr>
<td>Red. Ratio in PVC-u 1/3 SD</td>
<td>7.2</td>
</tr>
</tbody>
</table>

### Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.3 g/cm³</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>0.5 g/cm³</td>
</tr>
<tr>
<td>Index of pH</td>
<td>5</td>
</tr>
<tr>
<td>Conductivity</td>
<td>15 µS/cm</td>
</tr>
<tr>
<td>Specific Surface</td>
<td>2 m²/g</td>
</tr>
</tbody>
</table>

### Fastness properties

- **Heat stability**: 300 °C
- **Light fastness**: 8
- **Weather fastness**: -
- **Migration fastness**: -
- **Infl. on warping of PE-HD**: -

### Fastness to chemicals:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCl conc.</td>
<td>Months</td>
</tr>
<tr>
<td>HCl 10%</td>
<td>Months</td>
</tr>
<tr>
<td>H₂SO₄ conc.</td>
<td>Months</td>
</tr>
<tr>
<td>H₂SO₄ 10%</td>
<td>Months</td>
</tr>
<tr>
<td>HNO₃ conc.</td>
<td>Months</td>
</tr>
<tr>
<td>HNO₃ 10%</td>
<td>Months</td>
</tr>
<tr>
<td>NaOH conc.</td>
<td>Months</td>
</tr>
<tr>
<td>Na₂CO₃ sat.</td>
<td>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

- PVC-p: Not suitable
- PVC-u: Suitable
- PUR: Not suitable
- LD-PE: Not suitable
<table>
<thead>
<tr>
<th>Polymer</th>
<th>Suitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD-PE</td>
<td>Not suitable</td>
</tr>
<tr>
<td>PP</td>
<td>Not suitable</td>
</tr>
<tr>
<td>PS</td>
<td>Suitable</td>
</tr>
<tr>
<td>SB</td>
<td>UCC</td>
</tr>
<tr>
<td>SAN</td>
<td>Suitable</td>
</tr>
<tr>
<td>ABS/ASA</td>
<td>UCC</td>
</tr>
<tr>
<td>PMMA</td>
<td>Suitable</td>
</tr>
<tr>
<td>PC</td>
<td>Suitable</td>
</tr>
<tr>
<td>PA</td>
<td>Not suitable</td>
</tr>
<tr>
<td>PETP</td>
<td>UCC</td>
</tr>
<tr>
<td>CA/CAB</td>
<td>UCC</td>
</tr>
<tr>
<td>UP</td>
<td>Suitable</td>
</tr>
</tbody>
</table>

**Recommendations for food applications**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Suitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>BgVV</td>
<td>Suitable</td>
</tr>
<tr>
<td>FDA</td>
<td>UCC</td>
</tr>
<tr>
<td>France</td>
<td>Suitable</td>
</tr>
</tbody>
</table>

UCC: Under certain conditions
Product Specification - THERMOPLAST® YELLOW 104

**PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigment type</td>
<td>Pyrazolone Yellow</td>
</tr>
<tr>
<td>Colour Index</td>
<td>S.Y. 93</td>
</tr>
<tr>
<td>Application</td>
<td>Colourant for plastics</td>
</tr>
<tr>
<td>Physical form</td>
<td>Powder</td>
</tr>
<tr>
<td>Storage</td>
<td>practically unlimited shelf life</td>
</tr>
<tr>
<td>Food packaging</td>
<td>approved according to &quot;Empfehlung IX des BgVV&quot;.</td>
</tr>
</tbody>
</table>

**SPECIFICATION**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour tolerances</td>
<td>dH* ± 0.7; dC* ± 0.7;</td>
</tr>
<tr>
<td>Strength equivalence</td>
<td>100 ± 5%</td>
</tr>
<tr>
<td>Test method</td>
<td>Solvents (Regulation 11.3.4.1)</td>
</tr>
</tbody>
</table>

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.
Heat Stability
THERMOPLAST® YELLOW 104

Test medium:
Standard PS
According to DIN 53772

Note: The program stores curve points (see table). The diagram shows approximations.
Reflection Curve
THERMOPLAST® YELLOW 104

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

THERMOPLAST® YELLOW 104

Test medium:
Standard PS
According to DIN 53387, 54001

012345
1:20 1:100 0.02%

0 500 1000 2000 3000

Steps grey scale

All data is subject to the producer's disclaimer
LUCOLOR 2.0 - BASF Colourants for Plastics (Oct.1998) - Printed: 8/26/99
Light fastness
THERMOPLAST® YELLOW 104

Steps blue wool scale

Test medium:
Standard PS
According to DIN 53387, 54004
Name of product  | THERMOPLAST® F Yellow 084  
C.I. No. / Name  | 59 075 / C.I. Solvent Green 5  
CAS No. / EINECS No.  | 2744-50-5 / 220-379-8  

Name of product  | THERMOPLAST® Yellow 104  
C.I. No. / Name  | 48 160 / Solvent Yellow 93  
CAS No. / EINECS No.  | 4702-90-3 / 225-184-1  

Name of product  | THERMOPLAST® Red 454  
C.I. No. / Name  | -*/) / C.I. Solvent Red 195  
CAS No. / EINECS No.  | -*/) / -*)  

Name of product  | THERMOPLAST® Blue 684  
C.I. No. / Name  | 60 725 / C.I. Solvent Violet 13  
CAS No. / EINECS No.  | 81-48-1 / 201-353-5  

Name of product  | THERMOPLAST® Black X70  
C.I. No. / Name  | Mixture  
CAS No. / EINECS No.  | Mixture  

*) The Colour Index, CAS Nos. and EINECS Nos. are not yet available.

Chemical nature
These dyes are free of extenders and soluble in plastics. They belong to different classes of chemical compounds. THERMOPLAST® F Yellow 084 is the isobutyl ester of perylene-3,9-dicarboxylic acid. Yellow 104, known as pyrazolone yellow, consists of two pyrazolone rings connected by a methine bridge. Red 454 is a monoazo compound and Blue 684 is a substituted 1-hydroxy-4-aminoanthraquinone. Black X70 is a mixture of compounds.

Toxicology
In experiments on animals, THERMOPLAST® dyes did not display acute toxicity. 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, dyes are not environmentally hazardous. The dyes are insoluble in water. They can be removed from waste water by mechanical 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)
**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)

**Heavy metal content**
THERMOPLAST® dyes 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
- Arsenic < 20 mg/kg
- Barium < 50 mg/kg
- Lead < 20 mg/kg
- Cadmium < 30 mg/kg
- Chromium < 50 mg/kg
- Selenium < 20 mg/kg
- Mercury < 20 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**
All types listed do not contain any chemically combined halogen.

**Food legislation**
According to tests on standard samples (Type 8081) the listed THERMOPLAST® dyes 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; F Yellow 084 and Red 454 are not listed in the French Positive List
- Italy: Decreto Ministeriale dated 21.3.1973
- USA: Not listed on the FDA List (21.CFR, § 178.3297). Current use only on evidence of "non migration".

**Toys**
According to tests on standard samples (Type 8082), the listed THERMOPLAST® dyes 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). THERMOPLAST® Red 454 is not listed in Japan (MITI).

**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).

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:

BASF AG  
EFO/FS - J 550  
D-67056 Ludwigshafen, Germany

Dr Oberliner  
Mrs Paymal  
Mr Schwanse

Tel. ++49 (0)621-60-99232  
Tel. ++49 (0)621-60-40681  
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.