[27138-31-4] DIPROPYLENE GLYCOL DIBENZOATE

CAS RN: 27138-31-4

Add a synonym

Synonyms: Benzoflex 9-88; Oxybisopropanol Dibenzoate; Oxydipropyl dibenzoate

Add a PubChem CID

**Description:**

"DGD is the esterification product of two benzoate groups with dipropylene glycol, see structural formula below. Its CAS No. is 27138-31-4. It is marketed by Genovique [Eastman] under the product name Benzoflex 9-88..."

"DGD is a high solvating plasticizer that has been used for many years in a wide variety of applications. Its diverse uses include resilient flooring, adhesives, artificial leather cloth and caulk (Genovique, 2009b)."

"DGD can be used as a replacement for BBP and DBP in vinyl applications. Its gel fusion temperature is identical to BBP and DBP in vinyl plastisol applications allowing it to be as close to a drop-in replacement for BBP and DBP as possible (Genovique, 2009)..."

"significant market experience in sealants, adhesives, coatings and inks as well as in PVC spread coating (plastisols), extrusion and injection moulding. DGD seems to be capable of substituting for both DEHP, DBP and BBP, indication coverage of some general plasticizer features as well as some of the special performance characteristics of DBP and BBP." (Maag et al. 2010)

"Uses as solvator for PVC, used in vinyl flooring, adhesives, plasticizers in elastomers, latex caulks and sealants, castable polyurethanes, and color concentrates for PVC. (Velsicol)

"Dipropylene Glycol Dibenzoate is structurally similar to diethylene glycol dibenzoate and triethylene glycol dibenzoate. They contain the same functional groups – aromatic rings, ester groups ether linkages and hydroxyl groups." (Velsicol)

"DEGD is the esterification product of two benzoate groups with diethylene glycol, see structural formula below. Its CAS No. is 120-55-8. It is marketed by Genovique [Eastman] in a mixture with two other dibenzoates under the product name Benzoflex 2088. The two other dibenzoates are dipropylene glycol dibenzoate (DGD; CAS 27138-31-4) and triethylene glycol dibenzoate (CAS 120-56-9)." (Maag et al. 2010)

"Dipropylene glycol dibenzoate (DGD; CAS No 27138-31-4) is together with diethylene glycol dibenzoate (CAS No 120-55-8) one of the main constituents of dibenzoate plasticizers." (COWI et al., 2009: DBP, BBP, DEHP)

"Benzoates are the esterification products of benzoic acid and selected glycols, usually diols. Preferred glycols are dipropylene glycol dibenzoate and butane diols. One commonly used benzoate is dipropylene glycol dibenzoate, DGD (commercially Benzoflex 9-88)." (pg 151 http://www2.mst.dk/udgiv/publications/2010/978-87-92708-00-7/pdf/978-87-92708-01-4.pdf)

"Purity Profile:

Dipropylene Glycol Dibenzoate: 89.4%
Dipropylene Glycol Monobenzoate: 4.98%
Propylene Glycol Dibenzoate: 2.29%
Propylene Glycol Monobenzoate: 0.28%
Propenyloxy Propyl Benzoate: 2.35%" (Velsicol) [also: DGD MSDS]

**Website (if applicable):** [www.epa.gov/hpv/pubs/summaries/diglybnz/c13057.pdf](http://www.epa.gov/hpv/pubs/summaries/diglybnz/c13057.pdf)
**VOC designation:** Non-volatile (Boiling point: 464 degrees Celsius)

- View products containing this material

### My Project Lists

No project lists available. Lists can be added to existing projects on your account. Visit your dashboard for more information.

- Edit Material Data Record
- Delete Material

Add a hazard

### Direct Hazards:

MULTIPLE

German FEA - Substances Hazardous to Waters - Class 2 - Hazard to Waters $^{+2}$

POSITIVE LIST

US EPA - DfE SCIL - Green Circle - Verified Low Concern

### Potential Residual Hazards:

See Process Chemistry Research tab for details on residuals and other substances used in manufacture.

MULTIPLE

EC - CEPA DSL - Inherently Toxic in the Environment - from 1,2-PROPANEDIOL DIPhenOATE

### Process Chemistry Research Status:

Preliminary literature review drafted

### Process Chemistry - Known or Potential Residuals:

<table>
<thead>
<tr>
<th>Material</th>
<th>Hazard</th>
<th>Type</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[19224-26-1] 1,2-PROPANEDIOL DIBENZOATE</td>
<td></td>
<td>Pollutant/Contaminant Residual + Manufacturing</td>
<td>Frequent (known)</td>
<td>2.29 %</td>
<td></td>
</tr>
<tr>
<td>[32686-95-6] Dipropylene glycol monobenzoate</td>
<td></td>
<td>Pollutant/Contaminant Residual + Manufacturing</td>
<td>Frequent (known)</td>
<td>4.98 %</td>
<td></td>
</tr>
<tr>
<td>[197178-94-2] Propenyloxy Propyl Benzoate</td>
<td></td>
<td>Pollutant/Contaminant Residual + Manufacturing</td>
<td>Frequent (known)</td>
<td>2.35 %</td>
<td></td>
</tr>
<tr>
<td>[37086-84-3] Propylene Glycol monobenzoate</td>
<td></td>
<td>Pollutant/Contaminant Residual + Manufacturing</td>
<td>Frequent</td>
<td>4.98 %</td>
<td></td>
</tr>
</tbody>
</table>
Process Chemistry - Other:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Residual</th>
<th>Manufacturing</th>
<th>Type</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[65-85-0] BENZOIC ACID</td>
<td></td>
<td></td>
<td>Reactant</td>
<td></td>
<td></td>
<td>Unknown</td>
</tr>
</tbody>
</table>

This material is used in the process chemistry of:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Residual</th>
<th>Manufacturing</th>
<th>Type</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[20109-39-1] 1-Propanol, 2-(2-(benzoyloxy)propoxy)-, 1-benzoate</td>
<td></td>
<td></td>
<td>Pollutant/Contaminant</td>
<td>Integral (known)</td>
<td>89.40 %</td>
<td></td>
</tr>
<tr>
<td>[120-55-8] Diethylene glycol dibenzoate</td>
<td></td>
<td></td>
<td>Component</td>
<td>Integral (known)</td>
<td>Unknown</td>
<td></td>
</tr>
</tbody>
</table>

Add GreenScreen Full Assessment

GreenScreen for Safer Chemicals Full Assessment: None available

Highest concern GreenScreen score: LT-P1 (Possible Benchmark 1)

Cradle to Cradle Certified™ List Hazards

What are C2C hazards and what do these colors mean?

What are C2C hazards and what do these colors mean?

What are the C2C Hazards? The Cradle to Cradle Certified Product Standard establishes a Material Health Assessment Methodology which assigns hazard ratings to 24 individual human and environmental health endpoints. Roll your cursor over the abbreviations (C, M, R+D, etc) in the table to see the full name of each endpoint (Carcinogenicity, Mutagenicity, Reproductive Toxicity, etc). Organohalogen and Toxic Metal are classes of chemicals generally associated with significant human and environmental health issues and are specially treated in the C2C Standard.

The hazard rating is a Green-Yellow-Red-Grey color scheme based upon available toxicity and fate information:

- Green: no hazard identified for the endpoint
- Red: hazard identified for the endpoint
- Yellow: borderline
- Grey: no data available for the endpoint

This tab shows the preliminary hazard ratings based upon hazard lists tracked in the Pharos Chemical & Material Library. During full assessment for certification purposes, Grey hazards must be filled by an accredited assessor and other list-based hazards may be overridden.

**Why are these rating colors sometimes different from the GreenScreen or Pharos rating colors?** The C2C hazard rating colors are similar to those used in the GreenScreen system and in Pharos, with some distinctions. Pharos has two additional rating colors - orange and purple - not used in the C2C or GreenScreen systems. Pharos orange, red and purple ratings generally encompass the C2C & GreenScreen red ranges. There are some distinctions between the GreenScreen and C2C thresholds that result in different color assignments that are under consideration for harmonization. See the [Material Health Evaluation Programs Harmonization Opportunities Report](http://www.c2ccertified.org/resources/cradle-to-cradle-certified-resources) for details. For substances that have been fully assessed under the GreenScreen protocol, there may be different colors due to the application of data from studies that provide information beyond that in the hazard lists.

If interested in assessing the chemicals in a product, please also review the link below describing "How to Use These Scores in a C2C Assessment".

**How to Use These Scores in a C2C Assessment**

The top table displays preliminary hazard ratings for individual endpoints based on the hazard lists a given chemical appears on. During the assessment, an accredited Cradle to Cradle Certified Material Health Assessor may override these list-based hazard ratings based on information from other sources. Additionally, a red hazard rating in any one endpoint does not automatically mean that a substance will be x-assessed and targeted for phase-out, as exposure relevant to the endpoint may be deemed non-plausible for the substance depending on the material and product context in which it is being assessed.

The bottom table (Full Hazard List by Endpoint) includes all warnings associated with the substance from each of the authoritative hazard lists used by C2C, as well as additional lists in the Pharos Chemical and Material Library. C2C lists are labeled with their C2C hazard rating (Red, Yellow, or Green), while non-C2C lists are labeled as "not rated".

The ratings for the hazard lists used in this tool are based on Table 9 in the Material Assessment Methodology, Cradle to Cradle Certified Version 3.0 with a few minor adjustments/additions to allow for direct mapping from GreenScreen list translator results for a subset of the covered lists. The v3.0 Material Assessment Methodology document can be found on the C2C Resources page at [http://www.c2ccertified.org/resources/collection-page/cradle-to-cradle-certified-resources](http://www.c2ccertified.org/resources/collection-page/cradle-to-cradle-certified-resources). For information on the relevant adjustments/additions, contact Matteo Kausch at matteo@c2ccertified.org.

**Key**

- R: Red hazard level
- Y: Yellow hazard level

http://pharosproject.net/material/show/2009555
G: Green hazard level
?: On a hazard list that has not been rated by C2C
-: Not listed on any C2C or Pharos hazard lists

<table>
<thead>
<tr>
<th>Acute and Chronic Tox.</th>
<th>Acute Aquatic Tox.</th>
<th>Chronic Aquatic Tox.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMR+DEODI</td>
<td>NIrS+IrESnSnR</td>
<td>Fish Inv. Alg. Any Fish Inv. Alg. Any T PB Climate Organohalogen Toxic Metal Other Mult</td>
</tr>
<tr>
<td>- - - - - - - - - - -</td>
<td>- - - - - - - - - -</td>
<td>G NL NL - R</td>
</tr>
</tbody>
</table>

**Full Hazard List By Endpoint:**

- Carcinogenicity: not listed
- Mutagenicity: not listed
- Reproductive Toxicity (Repro + Dev): not listed
- Endocrine Disruption: not listed
- Oral Toxicity: not listed
- Dermal Toxicity: not listed
- Inhalative Toxicity: not listed
- Oral, Dermal, and/or Inhalative Toxicity: not listed
- Neurotoxicity: not listed
- Skin, Eye, and Respiratory Corrosion/Irritation: not listed
- Skin and Respiratory Sensitization: not listed
- Acute Aquatic Toxicity (Fish): not listed
- Acute Aquatic Toxicity (Invertibrates): not listed
- Acute Aquatic Toxicity (Algae): not listed
- Acute Aquatic Toxicity (Fish, Invertibrates, and/or Algae): not listed
- Chronic Aquatic Toxicity (Fish): not listed
- Chronic Aquatic Toxicity (Invertibrates): not listed
- Chronic Aquatic Toxicity (Algae): not listed
Chronic Aquatic Toxicity (Fish, Invertibrates, and/or Algae) not listed
Terrestrial not listed
Persistence not listed
Bioaccumulation not listed
Climatic Relevance not listed
Organohalogen not listed - This chemical is not on the Pharos list of organohalogenes, but we may have missed a few. Please double-check the chemical structure to confirm there are no carbon-halogen bonds.
Toxic Metal not listed - This chemical is not on the Pharos list of toxic metals, but we may have missed a few. Please double-check the chemical structure to confirm there are no toxic metals.
Other (Human Health) not listed
Multiple Endpoints EC - CEPA DSL - Inherently Toxic in the Environment: Red
EC - CEPA DSL - Inherently Toxic to Humans (iT human): Red
German FEA - Substances Hazardous to Waters - Class 2 - Hazard to Waters: Red

Notes

No notes have been added yet for this material.

Add Notes

Status: Public Display

This material may be used as a component of other materials.

Created 2014-05-19 08:39:39 by jim@healthybuilding.net
Updated 2016-09-30 04:48:07 by jim@healthybuilding.net

Add a compound group

View Changelog

Notes Log

Add a note

None provided
Substance Hazard

This color reflects the highest hazard associated directly with this substance by an authoritative hazard list.

The colors represent the relative level of hazard, ranging from **purple** (highest concern) through **red**, **orange**, and **yellow** to **green** (lowest concern).

**Grey** indicates that the authoritative hazard listing is ambiguous and covers a wide range of possible hazard levels.

**Blue** indicates that the substance is referenced on a restricted substance list (RSL) rather than an authoritative hazard list.

For a full description of authoritative hazard lists used in Pharos and of the derivation of the hazard level indicators, see the complete [Pharos Chemical and Material Library Description](http://pharosproject.net/material/show/2009555).

For the authoritative hazard list that is the source of this hazard color, see the "Hazard" tab on the chemical / material's page.

Residual Hazard

This color reflects the highest hazard associated with residual chemicals that our research indicates may be present with the chemical. These residuals consist of all process chemicals in the following categories:

- Monomers
- Catalysts
- Non-reactive Additives
- Pollutants and Contaminants
- Other known residuals

Hazards are drawn from process chemicals far upstream in the manufacturing process as well as the immediate precursors to this chemical.

The colors represent the relative level of hazard, ranging from **purple** (highest concern) through **red**, **orange**, and **yellow** to **green** (lowest concern).

**Grey** indicates that the authoritative hazard listing is ambiguous and covers a wide range of possible hazard levels.

**Blue** indicates that the substance is referenced on a restricted substance list (RSL) rather than an authoritative hazard list.

For a full description of authoritative hazard lists used in Pharos and of the derivation of the hazard level indicators, see the complete [Pharos Chemical and Material Library Description](http://pharosproject.net/material/show/2009555).
For the source of this hazard, see the "Process Chemistry Research" tab on the chemical's page.

Manufacturing Hazard

This color reflects the highest hazard associated with chemicals that our research categorizes as “frequent” or “integral” to the production of a chemical. The manufacturing score is included to surface potential hazards upstream in the manufacturing process that may or may not be present as residuals. Hazards are drawn from process chemicals far upstream in the manufacturing process as well as the immediate precursors to this chemical.

The colors represent the relative level of hazard, ranging from purple (highest concern) through red, orange, and yellow to green (lowest concern).

Grey indicates that the authoritative hazard listing is ambiguous and covers a wide range of possible hazard levels.

Blue indicates that the substance is referenced on a restricted substance list (RSL) rather than an authoritative hazard list.

For a full description of authoritative hazard lists used in Pharos and of the derivation of the hazard level indicators, see the complete Pharos Chemical and Material Library Description.

For the source of this hazard, see the "Process Chemistry Research" tab on the chemical's page.

GreenScreen

The Pharos scoring system is informed by the GreenScreen® for Safer Chemicals, a benchmarking system to rank the safety of chemicals on a 4 point hazard scale and encourage progress toward safer alternatives. Chemicals that have undergone a full GreenScreen assessment by Licensed GreenScreen Profilers are given a Benchmark score, which is the most authoritative. Chemicals that have been assessed using an automated comparison to hazard lists are given a List Translator score, which is less authoritative. Full GreenScreen assessments trump results from List Translator scoring.

GreenScreen Scores in order from highest concern to lowest concern are:

- Benchmark 1
- LT-1 - List Translator Likely Benchmark 1
- LT-P1 - List Translator Possible Benchmark 1
- LT-UNK - List Translator Benchmark Unknown
- Benchmark U
- Benchmark 2
- Benchmark 3
- Benchmark 4
For more information, see the "GreenScreen" tab on the chemical's page or visit www.greenscreenchemicals.org.