SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Identification of the substance: 1-Butanol

Article number: 4431

Registration number (REACH): 01-2119484630-38-xxxx

Index No: 603-004-00-6

EC number: 200-751-6

CAS number: 71-36-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: laboratory chemical, laboratory and analytical use

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone: +49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
E-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet: Department Health, Safety and Environment
E-mail (competent person): sicherheit@carlroth.de

1.4 Emergency telephone number

<table>
<thead>
<tr>
<th>Name</th>
<th>Street</th>
<th>Postal code/city</th>
<th>Telephone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW Poisons Information Centre Childrens Hospital</td>
<td>Hawkesbury Road</td>
<td>2145 Westmead, NSW</td>
<td>131126</td>
<td></td>
</tr>
</tbody>
</table>

Emergency information service: Poison Centre Munich: +49/(0)89 19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

<table>
<thead>
<tr>
<th>Classification acc. to GHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>2.6</td>
</tr>
<tr>
<td>3.1O</td>
</tr>
</tbody>
</table>
### Classification acc. to GHS

<table>
<thead>
<tr>
<th>Section</th>
<th>Hazard class</th>
<th>Hazard class and category</th>
<th>Hazard statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>skin corrosion/irritation</td>
<td>(Skin Irrit. 2)</td>
<td>H315</td>
</tr>
<tr>
<td>3.3</td>
<td>serious eye damage/eye irritation</td>
<td>(Eye Dam. 1)</td>
<td>H318</td>
</tr>
<tr>
<td>3.8R</td>
<td>specific target organ toxicity - single exposure (respiratory tract irritation)</td>
<td>(STOT SE 3)</td>
<td>H335</td>
</tr>
<tr>
<td>3.8D</td>
<td>specific target organ toxicity - single exposure (narcotic effects, drowsiness)</td>
<td>(STOT SE 3)</td>
<td>H336</td>
</tr>
</tbody>
</table>

The most important adverse physicochemical, human health and environmental effects

Narcotic effects.

### 2.2 Label elements

#### Labelling GHS

**Signal word**: Danger

**Pictograms**

GHS02, GHS05, GHS07

**Hazard statements**

- H226: Flammable liquid and vapour
- H302: Harmful if swallowed
- H315: Causes skin irritation
- H318: Causes serious eye damage
- H335: May cause respiratory irritation
- H336: May cause drowsiness or dizziness

#### Precautionary statements

**Precautionary statements - prevention**

- P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

**Precautionary statements - response**

- P302+P352: IF ON SKIN: Wash with plenty of soap and water.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P370+P378: In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction.

**Precautionary statements - storage**

- P403+P233: Store in a well-ventilated place. Keep container tightly closed.
- P403+P235: Store in a well-ventilated place. Keep cool.

### Labelling of packages where the contents do not exceed 125 ml

Signal word: Danger
Symbol(s)

H318 Causes serious eye damage.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other hazards
There is no additional information.

SECTION 3: Composition/information on ingredients

3.1 Substances
Name of substance n-Butanol
Index No 603-004-00-6
Registration number (REACH) 01-2119484630-38-xxxx
EC number 200-751-6
CAS number 71-36-3
Molecular formula C₄H₁₀O
Molar mass 74.12 g/mol

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes
Take off contaminated clothing.

Following inhalation
Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact
Rinse skin with water/shower. In case of skin irritation, consult a physician.

Following eye contact
In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Following ingestion
Rinse mouth. Do not induce vomiting. Aspiration hazard. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

Following inhalation: Cough, Dyspnoea, Irritant effects, Vertigo, Headache, Drowsiness, Dizziness, Narcosis,
Following skin contact: Irritation,
After eye contact: Irritation, Risk of serious damage to eyes, Risk of blindness,
After ingestion: Vomiting, Nausea, Aspiration hazard
4.3 Indication of any immediate medical attention and special treatment needed
none

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Co-ordinate fire-fighting measures to the fire surroundings
water spray, foam, alcohol resistant foam, dry extinguishing powder, carbon dioxide (CO2)

Unsuitable extinguishing media
water jet

5.2 Special hazards arising from the substance or mixture
Combustible. Vapours are heavier than air, spread along floors and form explosive mixtures with air.

Hazardous combustion products
In case of fire may be liberated: carbon monoxide (CO), carbon dioxide (CO2)

5.3 Advice for firefighters
Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray. Avoidance of ignition sources.

6.2 Environmental precautions
Keep away from drains, surface and ground water. Explosive properties.

6.3 Methods and material for containment and cleaning up
Advice on how to contain a spill
Covering of drains.

Advice on how to clean up a spill
Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).

Other information relating to spills and releases
Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections
SECTION 7: Handling and storage

7.1 Precautions for safe handling
Provision of sufficient ventilation. Use extractor hood (laboratory).

• Measures to prevent fire as well as aerosol and dust generation
Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge.

Advice on general occupational hygiene
Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs. When using do not smoke.

7.2 Conditions for safe storage, including any incompatibilities
Store in a well-ventilated place. Keep container tightly closed.

Incompatible substances or mixtures
Observe hints for combined storage.

Consideration of other advice
Ground/bond container and receiving equipment.

• Ventilation requirements
Use local and general ventilation.

• Specific designs for storage rooms or vessels
Recommended storage temperature: 15 – 25 °C.

7.3 Specific end use(s)
No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of agent</th>
<th>CAS No</th>
<th>Notation</th>
<th>Identifier</th>
<th>TWA [ppm]</th>
<th>TWA [mg/m³]</th>
<th>STEL [ppm]</th>
<th>STEL [mg/m³]</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU</td>
<td>n-butyl alcohol (butan-1-ol)</td>
<td>71-36-3</td>
<td>WES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WES</td>
</tr>
</tbody>
</table>

Notation

STEL Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)

TWA Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

Relevant DNELs/DMELs/PNECs and other threshold levels
• human health values

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Protection goal, route of exposure</th>
<th>Used in</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>310 mg/m³</td>
<td>human, inhalatory</td>
<td>worker (industry)</td>
<td>chronic - local effects</td>
</tr>
</tbody>
</table>

• environmental values

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Environmental compartment</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC</td>
<td>0.082 mg/l</td>
<td>freshwater</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.008 mg/l</td>
<td>marine water</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>2,476 mg/l</td>
<td>sewage treatment plant (STP)</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.324 mg/kg</td>
<td>freshwater sediment</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.032 mg/kg</td>
<td>marine sediment</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.017 mg/kg</td>
<td>soil</td>
<td>short-term (single instance)</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection

Use safety goggle with side protection.

Skin protection

• hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 °C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• type of material

NBR (Nitrile rubber)

• material thickness

0.4 mm

• breakthrough times of the glove material

>480 minutes (permeation: level 6)

• other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is
**Respiratory protection**

Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C, colour code: Brown).

**Environmental exposure controls**

Keep away from drains, surface and ground water.

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

**Appearance**

- **Physical state**: liquid (fluid)
- **Colour**: colourless
- **Odour**: like: alcohol
- **Odour threshold**: 0.004 – 48.7 ppm

**Other physical and chemical parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pH (value)</strong></td>
<td>7 (water: 70 g/l, 20 °C)</td>
</tr>
<tr>
<td><strong>Melting point/freezing point</strong></td>
<td>&lt;-90 °C</td>
</tr>
<tr>
<td><strong>Initial boiling point and boiling range</strong></td>
<td>119 °C at 1,013 hPa</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>35 °C at 1,013 hPa</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>not relevant (fluid)</td>
</tr>
<tr>
<td><strong>Explosive limits</strong></td>
<td></td>
</tr>
<tr>
<td>• lower explosion limit (LEL)</td>
<td>1.4 vol%</td>
</tr>
<tr>
<td>• upper explosion limit (UEL)</td>
<td>11.3 vol%</td>
</tr>
<tr>
<td><strong>Explosion limits of dust clouds</strong></td>
<td>not relevant</td>
</tr>
<tr>
<td><strong>Vapour pressure</strong></td>
<td>&lt;10 hPa at 20 °C</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>0.81 g/cm³ at 20 °C</td>
</tr>
<tr>
<td><strong>Vapour density</strong></td>
<td>2.6 at 20 °C (air = 1)</td>
</tr>
<tr>
<td><strong>Bulk density</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>Information on this property is not available.</td>
</tr>
<tr>
<td><strong>Solubility(ies)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Water solubility</strong></td>
<td>66 g/l at 20 °C</td>
</tr>
<tr>
<td><strong>Partition coefficient</strong></td>
<td></td>
</tr>
<tr>
<td><strong>n-octanol/water (log KOW)</strong></td>
<td>1 (pH value: 7, 25 °C) (ECHA)</td>
</tr>
<tr>
<td><strong>Soil organic carbon/water (log KOC)</strong></td>
<td>0.541 (ECHA)</td>
</tr>
</tbody>
</table>
### Section 10: Stability and Reactivity

**10.1 Reactivity**
Risk of ignition. In case of warming: Vapours can form explosive mixtures with air.

**10.2 Chemical stability**
The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**10.3 Possibility of Hazardous Reactions**
Exothermic reaction with: Alkali metals, Aluminium, Alkaline earth metal, Reducing agents, Acid chlorides, inorganic, Strong oxidiser

**10.4 Conditions to Avoid**
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

**10.5 Incompatible Materials**
Rubber articles, different plastics

**10.6 Hazardous Decomposition Products**
Hazardous combustion products: see section 5.

### Section 11: Toxicological Information

**11.1 Information on Toxicological Effects**

**Acute Toxicity**

<table>
<thead>
<tr>
<th>Exposure route</th>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>oral</td>
<td>LD50</td>
<td>2,292 mg/kg</td>
<td>rat</td>
<td>ECHA</td>
</tr>
<tr>
<td>dermal</td>
<td>LD50</td>
<td>3,430 mg/kg</td>
<td>rabbit</td>
<td>ECHA</td>
</tr>
</tbody>
</table>

**Skin Corrosion/Irritation**
Causes skin irritation.

**Serious Eye Damage/eye irritation**
Causes serious eye damage.

**Respiratory or Skin Sensitisation**
Shall not be classified as a respiratory or skin sensitiser.
Summary of evaluation of the CMR properties
Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant

- Specific target organ toxicity - single exposure
  May cause respiratory irritation. May cause drowsiness or dizziness.

- Specific target organ toxicity - repeated exposure
  Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics
- If swallowed
  vomiting, nausea, aspiration hazard

- If in eyes
  Causes serious eye damage, risk of blindness

- If inhaled
  cough, Dyspnoea, Irritation to respiratory tract, headache, vertigo, drowsiness, dizziness, narcosis

- If on skin
  causes skin irritation

Other information
Other adverse effects: Cardiovascular system, Liver and kidney damage

SECTION 12: Ecological information

12.1 Toxicity
acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>1,376 mg/l</td>
<td>fish</td>
<td>ECHA</td>
<td>96 h</td>
</tr>
<tr>
<td>EC50</td>
<td>1,328 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>48 h</td>
</tr>
<tr>
<td>ErC50</td>
<td>225 mg/l</td>
<td>algae</td>
<td>ECHA</td>
<td>96 h</td>
</tr>
</tbody>
</table>

Aquatic toxicity (chronic)

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC50</td>
<td>18 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>21 d</td>
</tr>
<tr>
<td>NOEC</td>
<td>4.1 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>21 d</td>
</tr>
<tr>
<td>growth (EbCx) 90%</td>
<td>8,690 mg/l</td>
<td>microorganisms</td>
<td>ECHA</td>
<td>17 h</td>
</tr>
</tbody>
</table>

12.2 Process of degradability
The substance is readily biodegradable.
Theoretical Oxygen Demand: 2.59 mg/mg
Theoretical Carbon Dioxide: 2.375 mg/mg
12.3 **Bioaccumulative potential**
Does not significantly accumulate in organisms.

n-octanol/water (log KOW) 1 (pH value: 7, 25 °C)

12.4 **Mobility in soil**

Henry's law constant 0.054 Pa·m³/mol

The Organic Carbon normalised adsorption coefficient 0.541

12.5 **Results of PBT and vPvB assessment**
Data are not available.

12.6 **Other adverse effects**
Data are not available.

### SECTION 13: Disposal considerations

**13.1 Waste treatment methods**

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Sewage disposal-relevant information**
Do not empty into drains.

**Waste treatment of containers/packagings**
It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

**13.2 Relevant provisions relating to waste**
The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

**13.3 Remarks**
Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

### SECTION 14: Transport information

**14.1 UN number**
1120

**14.2 UN proper shipping name**
BUTANOLS

**Hazardous ingredients**
1-Butanol

**14.3 Transport hazard class(es)**

1-Butanol ROTISOLV® ≥99,8 %, UV/IR-Grade

14.4 Class: 3 (flammable liquids)
14.5 Packing group: III (substance presenting low danger)
14.6 Environmental hazards: none (non-environmentally hazardous acc. to the dangerous goods regulations)

14.7 Special precautions for user
Provisions for dangerous goods (ADR) should be complied within the premises.

14.8 Transport in bulk according to Annex II of MARPOL and the IBC Code
The cargo is not intended to be carried in bulk.

14.9 Information for each of the UN Model Regulations

**Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)**

- **UN number**: 1120
- **Proper shipping name**: BUTANOLS
- **Particulars in the transport document**: UN1120, BUTANOLS, 3, III, (D/E)
- **Class**: 3
- **Classification code**: F1
- **Packing group**: III
- **Danger label(s)**: 3

**Emergency Action Code**

**2Y**

**International Maritime Dangerous Goods Code (IMDG)**

- **UN number**: 1120
- **Proper shipping name**: BUTANOLS
- **Particulars in the shipper’s declaration**: UN1120, BUTANOLS, 3, III, 35°C c.c.
- **Class**: 3
- **Marine pollutant**: -
- **Packing group**: III
- **Danger label(s)**: 3

**Special provisions (SP)**: 223
1-Butanol ROTISOLV® ≥99.8 %, UV/IR-Grade

article number: 4431

<table>
<thead>
<tr>
<th>Excepted quantities (EQ)</th>
<th>E1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited quantities (LQ)</td>
<td>5 L</td>
</tr>
<tr>
<td>EmS</td>
<td>F-E, S-D</td>
</tr>
<tr>
<td>Stowage category</td>
<td>A</td>
</tr>
</tbody>
</table>

• International Civil Aviation Organization (ICAO-IATA/DGR)
  UN number: 1120
  Proper shipping name: Butanols
  Particulars in the shipper’s declaration: UN1120, Butanols, 3, III
  Class: 3
  Packing group: III
  Danger label(s): 3

Special provisions (SP): A3
Excepted quantities (EQ): E1
Limited quantities (LQ): 10 L

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

National inventories
Substance is listed in the following national inventories:

<table>
<thead>
<tr>
<th>Country</th>
<th>National inventories</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU</td>
<td>AICS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>CA</td>
<td>DSL</td>
<td>substance is listed</td>
</tr>
<tr>
<td>CN</td>
<td>IECSC</td>
<td>substance is listed</td>
</tr>
<tr>
<td>EU</td>
<td>ECSI</td>
<td>substance is listed</td>
</tr>
<tr>
<td>EU</td>
<td>REACH Reg.</td>
<td>substance is listed</td>
</tr>
<tr>
<td>JP</td>
<td>CSCL-ENCS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>JP</td>
<td>ISHA-ENCS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>KR</td>
<td>KECI</td>
<td>substance is listed</td>
</tr>
<tr>
<td>MX</td>
<td>INSQ</td>
<td>substance is listed</td>
</tr>
<tr>
<td>NZ</td>
<td>NZIoC</td>
<td>substance is listed</td>
</tr>
<tr>
<td>PH</td>
<td>PICCS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>TR</td>
<td>CICR</td>
<td>substance is listed</td>
</tr>
<tr>
<td>TW</td>
<td>TCSI</td>
<td>substance is listed</td>
</tr>
</tbody>
</table>
15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Descriptions of used abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADN</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)</td>
</tr>
<tr>
<td>ADR</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)</td>
</tr>
<tr>
<td>CMR</td>
<td>Carcinogenic, Mutagenic or toxic for Reproduction</td>
</tr>
<tr>
<td>DGR</td>
<td>Dangerous Goods Regulations (see IATA/DGR)</td>
</tr>
<tr>
<td>DMEL</td>
<td>Derived Minimal Effect Level</td>
</tr>
<tr>
<td>DNEL</td>
<td>Derived No-Effect Level</td>
</tr>
<tr>
<td>EC50</td>
<td>Effective Concentration 50%. The EC50 corresponds to the concentration of a tested substance causing 50% changes in response (e.g. on growth) during a specified time interval</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
</tr>
<tr>
<td>ELINCS</td>
<td>European List of Notified Chemical Substances</td>
</tr>
<tr>
<td>EmS</td>
<td>Emergency Schedule</td>
</tr>
<tr>
<td>ErC50</td>
<td>= EC50: in this method, that concentration of test substance which results in a 50% reduction in either growth (EbC50) or growth rate (ErC50) relative to the control</td>
</tr>
<tr>
<td>GHS</td>
<td>“Globally Harmonized System of Classification and Labelling of Chemicals” developed by the United Nations</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>IATA/DGR</td>
<td>Dangerous Goods Regulations (DGR) for the air transport (IATA)</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organization</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Dangerous Goods Code</td>
</tr>
<tr>
<td>Index No</td>
<td>the Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal Concentration 50%; the LC50 corresponds to the concentration of a tested substance causing 50% lethality during a specified time interval</td>
</tr>
</tbody>
</table>
Abbr. | Descriptions of used abbreviations
---|---
LD50 | Lethal Dose 50%: the LD50 corresponds to the dose of a tested substance causing 50% lethality during a specified time interval
MARPOL | International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NLP | No-Longer Polymer
NOEC | No Observed Effect Concentration
PBT | Persistent, Bioaccumulative and Toxic
PNEC | Predicted No-Effect Concentration
ppm | parts per million
REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals
RID | Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL | short-term exposure limit
TWA | time-weighted average
vPvB | very Persistent and very Bioaccumulative
WES | Safe Work Australia: Workplace exposure standards for airborne contaminants

Key literature references and sources for data
- UN Recommendations on the Transport of Dangerous Good
- Dangerous Goods Regulations (DGR) for the air transport (IATA)
- International Maritime Dangerous Goods Code (IMDG)

List of relevant phrases (code and full text as stated in chapter 2 and 3)

<table>
<thead>
<tr>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>H226</td>
<td>flammable liquid and vapour</td>
</tr>
<tr>
<td>H302</td>
<td>harmful if swallowed</td>
</tr>
<tr>
<td>H315</td>
<td>causes skin irritation</td>
</tr>
<tr>
<td>H318</td>
<td>causes serious eye damage</td>
</tr>
<tr>
<td>H335</td>
<td>may cause respiratory irritation</td>
</tr>
<tr>
<td>H336</td>
<td>may cause drowsiness or dizziness</td>
</tr>
</tbody>
</table>

Disclaimer
The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.