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

1.4 Emergency telephone number

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

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

<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>2.6</td>
<td>flammable liquid</td>
<td>(Flam. Liq. 3)</td>
<td>H226</td>
</tr>
<tr>
<td>3.1O</td>
<td>acute toxicity (oral)</td>
<td>(Acute Tox. 4)</td>
<td>H302</td>
</tr>
<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>
</tbody>
</table>
The most important adverse physicochemical, human health and environmental effects
Narcotic effects.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008 (CLP)

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, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 Do not breathe mist/vapours.
P280 Wear protective gloves/eye protection.

Precautionary statements - response
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Labelling of packages where the contents do not exceed 125 ml
Signal word: Danger

Symbol(s)

H318 Causes serious eye damage.
Wear protective gloves/eye protection.

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

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>n-Butanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index No</td>
<td>603-004-00-6</td>
</tr>
<tr>
<td>Registration number (REACH)</td>
<td>01-2119484630-38-xxxx</td>
</tr>
<tr>
<td>EC number</td>
<td>200-751-6</td>
</tr>
<tr>
<td>CAS number</td>
<td>71-36-3</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>C₄H₁₀O</td>
</tr>
<tr>
<td>Molar mass</td>
<td>74,12 g/mol</td>
</tr>
</tbody>
</table>

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)
Data are not available.

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>
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 recommended.

Respiratory protection
Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapo-ours 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**
- **pH (value)**: 7 (water: 70 g/l, 20 °C)
- **Melting point/freezing point**: < -90 °C
- **Initial boiling point and boiling range**: 119 °C at 1.013 hPa
- **Flash point**: 35 °C at 1.013 hPa
- **Evaporation rate**: no data available
- **Flammability (solid, gas)**: not relevant (fluid)

**Explosive limits**
- lower explosion limit (LEL): 1,4 vol%
- **upper explosion limit (UEL)**: 11,3 vol%

**Explosion limits of dust clouds**: not relevant

**Vapour pressure**: <10 hPa at 20 °C

**Density**: 0,81 g/cm³ at 20 °C

**Vapour density**: 2,6 at 20 °C (air = 1)

**Bulk density**: Not applicable

**Relative density**: Information on this property is not available.

**Solubility(ies)**
- **Water solubility**: 66 g/l at 20 °C

**Partition coefficient**
- n-octanol/water (log KOW): 1 (pH value: 7, 25 °C) (ECHA)
- Soil organic carbon/water (log KOC): 0,541 (ECHA)
- Auto-ignition temperature: 355 °C at 1.019 hPa - ECHA
- **Decomposition temperature**: no data available

**Viscosity**
- **kinematic viscosity**: 3,638 mm²/s at 20 °C
1-Butanol ROTISOLV® ≥99,8 %, UV/IR-Grade

article number: 4431

• dynamic viscosity
  2,947 mPa s at 20 °C
Explosive properties
  Shall not be classified as explosive
Oxidising properties
  none

9.2 Other information
Surface tension
  69.9 mN/m (20 °C, 1 g/l)
Refractive index
  1.399 (20 °C)
Temperature class (EU, acc. to ATEX)
  T2 (Maximum permissible surface temperature on the equipment: 300°C)

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

Safety data sheet
according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

article number: 4431

- **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
1-Butanol ROTISOLV® ≥99.8 %, UV/IR-Grade

article number: 4431

<table>
<thead>
<tr>
<th>Process</th>
<th>Degradation rate</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>biotic/abiotic</td>
<td>98 %</td>
<td>28 d</td>
</tr>
<tr>
<td>oxygen depletion</td>
<td>68 %</td>
<td>5 d</td>
</tr>
</tbody>
</table>

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)
14.4 Packing group
III (substance presenting low danger)

14.5 Environmental hazards
none (non-environmentally hazardous acc. to the dangerous goods regulations)

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

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

14.8 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

• 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
Excepted quantities (EQ): E1
1-Butanol ROTISOLV® ≥99,8 %, UV/IR-Grade

**SECTION 15: Regulatory information**

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

**Relevant provisions of the European Union (EU)**

- **Regulation 649/2012/EU concerning the export and import of hazardous chemicals (PIC)**
  Not listed.

- **Regulation 1005/2009/EC on substances that deplete the ozone layer (ODS)**
  Not listed.

  Not listed.

- **Restrictions according to REACH, Annex XVII**

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Wt%</th>
<th>Type of registration</th>
<th>Conditions of restriction</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Butanol</td>
<td></td>
<td>100</td>
<td>1907/2006/EC annex XVII</td>
<td>R3</td>
<td>3</td>
</tr>
<tr>
<td>1-Butanol</td>
<td></td>
<td>100</td>
<td>1907/2006/EC annex XVII</td>
<td>R40</td>
<td>40</td>
</tr>
</tbody>
</table>

**Legend**

- **R3**
  - Shall not be used in:
    - ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays,
    - tricks and jokes,
    - games for one or more participants, or any article intended to be used as such, even with ornamental aspects,
  - Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they:
    - can be used as fuel in decorative oil lamps for supply to the general public, and,
    - present an aspiration hazard and are labelled with R65 or H304,
  - Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to...
1. Shall not be used, as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following:
   - metallic glitter intended mainly for decoration,
   - artificial snow and frost,
   - ‘whooppee’ cushions,
   - silly string aerosols,
   - imitation excrement,
   - horns for parties,
   - decorative flakes and foams,
   - artificial cobwebs,
   - stink bombs.

2. Without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances, suppliers shall ensure before the placing on the market that the packaging of aerosol dispensers referred to above is marked visibly, legibly and indelibly with:
   ‘For professional users only’.

3. By way of derogation, paragraphs 1 and 2 shall not apply to the aerosol dispensers referred to Article 8 (1a) of Council Directive 75/324/EEC (2).

4. The aerosol dispensers referred to in paragraphs 1 and 2 shall not be placed on the market unless they conform to the requirements indicated.

• Restrictions according to REACH, Title VIII

None.

• List of substances subject to authorisation (REACH, Annex XIV)/SVHC - candidate list

Not listed

• Seveso Directive

<table>
<thead>
<tr>
<th>2012/18/EU (Seveso III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>P5c</td>
</tr>
</tbody>
</table>

Notation

51) Flammable liquids, categories 2 or 3 not covered by PSa and PSb

• Directive 75/324/EEC relating to aerosol dispensers

Filling batch


| VOC content | 100 % 810 g/l |
1-Butanol ROTISOLV® ≥99.8 %, UV/IR-Grade

article number: 4431

**Directive on industrial emissions (VOCs, 2010/75/EU)**

<table>
<thead>
<tr>
<th>VOC content</th>
<th>100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC content</td>
<td>810 g/l</td>
</tr>
</tbody>
</table>

**Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) - Annex II**

not listed

**Regulation 166/2006/EC concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)**

not listed

**Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD)**

not listed

**Regulation 98/2013/EU on the marketing and use of explosives precursors**

not listed

**Regulation 111/2005/EC laying down rules for the monitoring of trade between the Community and third countries in drug precursors**

not listed

**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>
<tr>
<td>US</td>
<td>TSCA</td>
<td>substance is listed</td>
</tr>
</tbody>
</table>

**Legend**

- **AICS**: Australian Inventory of Chemical Substances
- **CICR**: Chemical Inventory and Control Regulation
- **CSCL-ENCS**: List of Existing and New Chemical Substances (CSCL-ENCS)
- **DSL**: Domestic Substances List (DSL)
- **ECSI**: EC Substance Inventory (EINECS, ELINCS, NLP)
- **IECSC**: Inventory of Existing Chemical Substances Produced or Imported in China
- **INSQ**: National Inventory of Chemical Substances
- **ISHA-ENCS**: Inventory of Existing and New Chemical Substances (ISHA-ENCS)
- **KECI**: Korea Existing Chemicals Inventory

Malta (en)
1-Butanol ROTISOLV® ≥99.8 %, UV/IR-Grade

article number: 4431

### 15.2 Chemical Safety Assessment

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

### SECTION 16: Other information

#### 16.1 Indication of changes (revised safety data sheet)

<table>
<thead>
<tr>
<th>Section</th>
<th>Former entry (text/value)</th>
<th>Actual entry (text/value)</th>
<th>Safety-relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Remarks: For full text of Hazard- and EU Hazard-statements: see SECTION 16.</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>2.2</td>
<td>Pictograms: change in the listing (table)</td>
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<tr>
<td>2.2</td>
<td>Precautionary statements - prevention: change in the listing (table)</td>
<td></td>
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<tr>
<td>2.2</td>
<td>Precautionary statements - response: change in the listing (table)</td>
<td></td>
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<tr>
<td>2.2</td>
<td>Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>8.1</td>
<td>Occupational exposure limit values (Workplace Exposure Limits): not relevant</td>
<td>Occupational exposure limit values (Workplace Exposure Limits): Data are not available.</td>
<td>yes</td>
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<td>8.1</td>
<td>• environmental values: change in the listing (table)</td>
<td></td>
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<tr>
<td>14.3</td>
<td>Transport hazard class(es)</td>
<td>Transport hazard class(es): class 3 hazard - flammable liquids</td>
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<tr>
<td>14.8</td>
<td>Particulars in the shipper’s declaration: UN1120, BUTANOLS, (butyl alcohol (except tert-butyl alcohol)), 3, III, 35°C c.c.</td>
<td>Particulars in the shipper’s declaration: UN1120, BUTANOLS, 3, III, 35°C c.c.</td>
<td>yes</td>
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<tr>
<td>14.8</td>
<td>Marine pollutant: -</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>14.8</td>
<td>• International Civil Aviation Organization (ICAO-IATA/DGR)</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>14.8</td>
<td>UN number: 1120</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>14.8</td>
<td>Proper shipping name: Butanols</td>
<td></td>
<td>yes</td>
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<tr>
<td>14.8</td>
<td>Particulars in the shipper’s declaration: UN1120, Butanols, 3, III</td>
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<tr>
<td>14.8</td>
<td>Class: 3</td>
<td></td>
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</tr>
<tr>
<td>14.8</td>
<td>Packing group: III</td>
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<td>yes</td>
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</tbody>
</table>
### Safety data sheet

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

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

**article number: 4431**

<table>
<thead>
<tr>
<th>Section</th>
<th>Former entry (text/value)</th>
<th>Actual entry (text/value)</th>
<th>Safety-relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.8</td>
<td>Danger label(s): 3</td>
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<tr>
<td>14.8</td>
<td>Danger label(s): change in the listing (table)</td>
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<tr>
<td>14.8</td>
<td>Special provisions (SP): A3</td>
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<td>yes</td>
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<tr>
<td>14.8</td>
<td>Excepted quantities (EQ): E1</td>
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<tr>
<td>14.8</td>
<td>Limited quantities (LQ): 10 L</td>
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<td>yes</td>
</tr>
</tbody>
</table>

### 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>CLP</td>
<td>Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures</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 (EcC50) or growth rate (ErC50) relative to the control</td>
</tr>
<tr>
<td>GHS</td>
<td>&quot;Globally Harmonized System of Classification and Labelling of Chemicals&quot; 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>
<tr>
<td>LD50</td>
<td>Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval</td>
</tr>
<tr>
<td>MARPOL</td>
<td>International Convention for the Prevention of Pollution from Ships (abbr. of &quot;Marine Pollutant&quot;)</td>
</tr>
</tbody>
</table>
### Key literature references and sources for data
- Regulation (EC) No. 1272/2008 (CLP, EU GHS)
- 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.