

2-Butanol

19440-1L

Version 1.4

Revision Date 16.12.2022

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Flammable liquids Category 3

H226 Flammable liquid and vapour.

Eye irritation Category 2

H319 Causes serious eye irritation.

Specific target organ toxicity - single exposure Category 3 - Central nervous system

H336 May cause drowsiness or dizziness.

Specific target organ toxicity - single exposure Category 3 - Respiratory system

H335 May cause respiratory irritation.

2.2. Label elements

REGULATION (EC) No 1272/2008

Hazard pictograms



Signal word

: Warning

Hazard statements

: H226 Flammable liquid and vapour.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.

Precautionary statements

: P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ eye protection/ face protection.
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

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P308 + P313

lenses, if present and easy to do.
Continue rinsing.
IF exposed or concerned: Get medical
advice/ attention.

2.3. Other hazards

Vapours may form explosive mixtures with air. Vapours are heavier than air and may spread along floors.

SECTION 3: Composition/information on ingredients

3.1. Substance

Chemical name	CAS-No. Index-No. REACH Registration Number EC-No.	Classification 1272/2008	Concentration	Remarks
butan-2-ol	78-92-2 603-127-00-5 201-158-5	Flam. Liq. 3; H226 Eye Irrit. 2; H319 STOT SE 3; H335 STOT SE 3; H336	100 %	

3.2. Mixture

Not applicable

Occupational Exposure Limit(s), if available, are listed in Section 8.
For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice:

First aider needs to protect himself. Move out of dangerous area. Take off all contaminated clothing immediately.

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Inhalation:

When inhaled remove to fresh air and seek medical aid.

Skin contact:

After contact with skin, wash immediately with plenty of water. Call a physician if irritation develops or persists.

Eye contact:

Rinse thoroughly with plenty of water, also under the eyelids. Protect unharmed eye. Remove contact lenses. Call a physician immediately.

Ingestion:

When swallowed, allow water to be drunk. Do NOT induce vomiting. Call a physician immediately.

4.2. Most important symptoms and effects, both acute and delayed

No data available

4.3. Indication of any immediate medical attention and special treatment needed

No data available

See Section 11 for more detailed information on health effects and symptoms.

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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water spray
Carbon dioxide (CO₂)
Dry powder
Alcohol-resistant foam

Extinguishing media which shall not be used for safety reasons:

High volume water jet

5.2. Special hazards arising from the substance or mixture

Fire may cause evolution of:
carbon oxides (CO, CO₂).
Flammable gases/vapours
Irritant gases/vapours

5.3. Advice for firefighters

In the event of fire, wear self-contained breathing apparatus.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Do not use a solid water stream as it may scatter and spread fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Wear personal protective equipment. Unprotected persons must be kept away. Eliminate all ignition sources if safe to do so. Avoid contact with skin and eyes.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Should not be released into the environment.

6.3. Methods and materials for containment and cleaning up

Soak up with inert absorbent material.
Pick for disposal in tightly closed containers

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6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling:

Exhaust ventilation at the object is necessary. Do not breathe vapour. Avoid contact with skin and eyes.

Advice on protection against fire and explosion:

Container hazardous when empty. Take measures to prevent the build up of electrostatic charge. Vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Keep away from heat and sources of ignition. Keep away from direct sunlight.

Hygiene measures:

General industrial hygiene practice.

Temperature class:

T2

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers:

Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place.

Advice on common storage:

Do not store together with: Oxidizing agents

7.3. Specific end use(s)

no additional data available

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits:

Components	Basis / Value type	Value / Form of exposure	Exceeding Factor	Remarks
butan-2-ol	EH40 OES TWA	308 mg/m3 100 ppm		
butan-2-ol	EH40 OES STEL	462 mg/m3 150 ppm		
butan-2-ol	EH40 WEL STEL	462 mg/m3 150 ppm		
butan-2-ol	EH40 WEL TWA	308 mg/m3 100 ppm		
butan-2-ol	EH40 WEL			Listed

TWA - Time weighted average
STEL - Short term exposure limit

DNEL/ PNEC-Values

Component	End-use/impact	Exposure duration	Value	Exposure routes	Remarks
butan-2-ol	Consumers / Long-term systemic effects		15mg/kg bw/d	Ingestion	
butan-2-ol	Workers / Long-term systemic effects		405mg/kg bw/d	Skin contact	
butan-2-ol	Consumers / Long-term systemic effects		203mg/kg bw/d	Skin contact	
butan-2-ol	Workers / Long-term systemic		212 mg/m3	Inhalation	

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	effects				
butan-2-ol	Consumers / Long-term systemic effects		52 mg/m ³	Inhalation	

Component	Environmental compartment / Value	Remarks
butan-2-ol	Fresh water: 47,1 mg/l	
butan-2-ol	Marine water: 47,1 mg/l	
butan-2-ol	Fresh water sediment: 196,19 mg/kg	
butan-2-ol	Marine sediment: 196,19 mg/kg	
butan-2-ol	Soil: 11,58 mg/kg	

8.2. Exposure controls

Occupational exposure controls

The Personal Protective Equipment must be in accordance with EN standards: respirator EN 136, 140, 149; safety glasses EN 166; protective suit: EN 340, 463, 468, 943-1, 943-2; gloves EN 374, 511; safety shoes EN-ISO 20345.

Ensure that eyewash stations and safety showers are close to the workstation location.

Avoid contact with skin, eyes and clothing.

Take off all contaminated clothing immediately.

Engineering measures

General room ventilation is adequate for storage and handling.

Take measures to prevent the build up of electrostatic charge.

Local exhaust

Personal protective equipment

Respiratory protection:

In the case of vapour formation use a respirator with an approved filter.

Hand protection:

Glove material: Nitrile rubber

Break through time: > 480 min

Glove thickness: 0,4 mm

Camatril® 730

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Gloves must be inspected prior to use.

Replace when worn.

Remarks: Supplementary note: The specifications are based on information and tests from similar substances by analogy.

Due to varying conditions (e.g.temperature or other strains) it must be considered that the usage of a chemical protective glove in practice may be much shorter than the permeation time determined in accordance with EN 374.

Since actual conditions of practical use often deviate from standardised conditions according EN 374 the glove manufacturer recommends to use the chemical protective glove in practice not longer than 50% of the recommended permeation time.

Manufacturer's directions for use should be observed because of great diversity of types .

Suitable gloves tested according EN 374 are supplied e.g. from KCL GmbH, D-36124 Eichenzell, Vertrieb@kcl.de

Eye protection:

Safety goggles

Skin and body protection:

Protective suit

Environmental exposure controls

Handle in accordance with local environmental regulations and good industrial practices.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	colourless
Odour	:	characteristic
molecular weight	:	74,12 g/mol
Melting point/range	:	ca. -89 °C
Boiling point/boiling range	:	ca. 99 °C
Upper explosion limit	:	9,8 %(V)
Lower explosion limit	:	1,7 %(V)

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Flash point	:	24 °C
Auto-ignition temperature	:	390 - 406 °C
Decomposition temperature	:	At normal pressure may be distilled without decomposition.
pH	:	neutral
Auto-ignition temperature	:	not auto-flammable
Viscosity, kinematic	:	No data available
Water solubility	:	125 g/l at 20 °C
Solubility in other solvents	:	Soluble in most organic solvents
Partition coefficient: n-octanol/water	:	log Pow 0,61
Vapour pressure	:	16,5 hPa at 20 °C
Vapour pressure	:	110 hPa at 50 °C
Density	:	0,81 g/cm ³ at 20 °C
Relative vapour density	:	No data available

9.2 Other Information

Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Evaporation rate	:	No data available
Viscosity, dynamic	:	ca. 3,5 - 4,2 mPa.s at 20 °C

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SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal conditions.

10.2. Chemical stability

At normal pressure may be distilled without decomposition.

10.3. Possibility of hazardous reactions

No data available

10.4. Conditions to avoid

Keep away from heat and sources of ignition.

10.5. Incompatible materials

Plastic materials can be attacked.

Strong oxidizing agents

Acids

Halogens

Peroxides

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity:

LD50

Species: Rat

Value: 2.193 mg/kg

Method: OECD Test Guideline 423

Acute dermal toxicity:

LD50

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Species: Rabbit
Value: > 2.000 mg/kg
Method: OECD Test Guideline 402

Acute inhalation toxicity:

LC50
Species: Rat
Value: > 20 mg/l
Exposure time: 4 h

Skin irritation:

Species: Rabbit
Result: non-irritant
Exposure time: 4 h
Method: OECD Test Guideline 404

Eye irritation:

Classification based on Annex VI of regulation 1272/2008/EC.

Respiratory or skin sensitisation:

Maximisation Test
Route of exposure: Dermal
Species: Guinea pig
Result: non-sensitizing
Method: OECD Test Guideline 406

Carcinogenicity:

Note: Not classified due to data which are conclusive although insufficient for classification.

Germ cell mutagenicity:

Test Method: Microbial mutagenesis assay (Ames test)
Metabolic activation: with and without metabolic activation
Result: negative
Method: OECD Test Guideline 471

Test Method: Micronucleus test
Species: Mouse
Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative

Reproductive toxicity:

Remarks: Not classified due to data which are conclusive although insufficient for classification.

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Remarks: Not classified due to data which are conclusive although insufficient for classification.

Aspiration hazard:

Not classified due to data which are conclusive although insufficient for classification.

11.2. Information on other hazards

Endocrine disrupting properties
No data available

Other information:

Solvent removes skin oil from the skin.
Not mutagenic in Ames Test

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish:

LC50

Species: Pimephales promelas (fathead minnow)

Value: 2.993 mg/l

Exposure time: 96 h

Toxicity to aquatic plants:

EC50

Species: Pseudokirchneriella subcapitata (green algae)

Value: 2.039 mg/l

Exposure time: 96 h

Toxicity to Microorganisms:

Cell multiplication inhibition test

Species: Pseudomonas putida

Value: 500 mg/l

Exposure time: 16 h

Method: DIN 38412

Toxicity to aquatic invertebrates:

EC50

Species: Daphnia magna (Water flea)

Value: 308 mg/l

Exposure time: 48 h

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12.2. Persistence and degradability

Biodegradability:

aerobic

Biodegradation: 86 %

Exposure time: 5 d

Result: Readily biodegradable.

12.3. Bioaccumulative potential

Bioconcentration factor (BCF): < 100

Bioaccumulation is unlikely.

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

No data available

12.6. Endocrine disrupting properties

No data available

12.7. Other adverse effects

Biochemical Oxygen Demand (BOD) : Value: 1.870 mg/g

Chemical Oxygen Demand (COD) : Value: 2.470 mg/g

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product:

Dispose according to legal requirements.

Packaging:

Legal requirements are to be considered in regard of reuse or disposal of used packaging materials

Further information:

Provisions relating to waste:

EC Directive 2006/12/EC; 2008/98/EEC

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Regulation No. 1013/2006

For personal protection see section 8.

SECTION 14: Transport information

14.1 UN number

ADR/RID:1120

IMDG:1120

IATA:1120

14.2 UN proper shipping name

ADR/RID:BUTANOLS

IMDG:BUTANOLS

IATA:Butanols

14.3 Transport hazard class(es)

ADR/RID: 3

IMDG: 3

IATA: 3

14.4 Packaging group

ADR/RID: III

IMDG: III

IATA: III

14.5 Environmental hazards

ADR/RID:no

Marine pollutant: no

14.6 Special precautions for user

No data available

14.7 Maritime transport in bulk according to IMO instruments

No data available

SECTION 15: Regulatory information

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

Basis	Value	Remarks
Directive 2012/18/EC SEVESO III Listed in Regulation : P5c: FLAMMABLE LIQUIDS	Quantity: 5.000.000 kg Quantity: 50.000.000 kg	
Substances of very high concern (SVHC)		This product does not contain substances of very high concern according to Regulation (EC) No Article 57 above the respective regulatory 1907/2006 (REACH),

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		concentration limit of ≥ 0.1 % (w/w).
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Poison Control Center

Country	Phone Number
Austria	+4314064343
Belgium	070 245245
Bulgaria	(+35929154233
Croatia	(+3851)23-48-342
Cyprus	+357 2240 5611
Czech Republic	+420224919293; +420224915402
Denmark	82121212
Estonia	16662; (+372)6269390
Finland	9471977
France	+33(0)145425959
Greece	+30 210 779 3777
Hungary	(+36-80)201-199
Iceland	5432222
Ireland	+353(1)8092166
Italy	0382 24444
Germany	Berlin : 030/19240
	Bonn : 0228/19240
	Erfurt : 0361/730730
	Freiburg : 0761/19240
	Göttingen : 0551/19240
	Homburg : 06841/19240
	Mainz : 06131/19240
Munich : 089/19240	
Latvia	+37167042473

Country	Phone Number
Liechtenstein	+41 442515151
Lithuania	+370532362052
Luxembourg	070245245; (+352)80002-5500
Malta	+356 2395 2000
Netherlands	030-2748888
Norway	22591300
Poland	+48 42 25 38 400
Portugal	800250250
Romania	+40 21 318 3606
Slovakia (NTIC)	+421 2 54 774 166
Slovenia	+386 1 400 6051
Spain	+34915620420
Sweden	112 (begär Giftinformation);+46104566786
Switzerland	145
United Kingdom	(+44) 844 892 0111

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Other inventory information

US. Toxic Substances Control Act
On TSCA Inventory

Australia. Inventory of Industrial Chemicals (AIIC), as amended
On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)
All components of this product are on the Canadian DSL

Japan. Kashin-Hou Law List
On the inventory, or in compliance with the inventory

Korea. Existing Chemicals Inventory (KECI)
On the inventory, or in compliance with the inventory

Philippines. Inventory of Chemicals and Chemical Substances (PICCS)
On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances (IECSC)
On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand
On the inventory, or in compliance with the inventory

Taiwan Chemical Substance Inventory (TCSI)
On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Text of H-statements referred to under heading 3

butan-2-ol : H226 Flammable liquid and vapour.
H319 Causes serious eye irritation.

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H335 May cause respiratory irritation.

H336 May cause drowsiness or dizziness.

Further information

All directives and regulations refer to amended versions.

Vertical lines in the left hand margin indicate a relevant amendment from the previous version.

Abbreviations:

EC European Community

CAS Chemical Abstracts Service

DNEL Derived no effect level

PNEC Predicted no effect level

vPvB Very persistent and very bioaccumulative substance

PBT Persistent, bioaccumulative und toxic substance

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user.

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