

SAFETY DATA SHEET

according to Regulation (EC) No. 453/2010 Version 2 Revision Date 10.12.2018

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

1.1 Product identifiers

Product name : Butan-2-ol

Product Number : 5248

Brand : Better Equipped

Index-No. : 603-127-00-5

REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration or the annual tonnage does not require a registration.

CAS-No. : 78-92-2

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

Identified uses : Laboratory chemicals, Manufacture of substances

Identified uses : Scientific research and development

1.3 Details of the supplier of the safety data sheet

Company : Better Equipped,
Wrenbury Business Park,
Wrenbury Road,
Wrenbury,
Nantwich, Cheshire,
CW5 8EB, UK

Telephone +44 (0) 800 9707142

Fax +44 (0) 800 066 4443

E-mail address sales@betterequipped.co.uk

1.4 Emergency telephone number

Emergency Phone # +44 (0)1270 781238

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Flammable liquids (Category 3), H226

Eye irritation (Category 2), H319

Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

Warning

Hazard statement(s)	
H226	Flammable liquid and vapour.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
Precautionary statement(s)	
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280	Wear eye protection/ face protection.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P403 + P235	Store in a well-ventilated place. Keep cool.
Supplemental Hazard Statements	none

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	sec-Butyl alcohol
Formula	:	C ₄ H ₁₀ O
Molecular weight	:	74.12 g/mol
CAS-No.	:	78-92-2
EC-No.	:	201-158-5
Index-No.	:	603-127-00-5

Hazardous ingredients according to Regulation (EC) No 1272/2008

Component	Classification	Concentration
Butan-2-ol		
CAS-No.	78-92-2	Flam. Liq. 3; Eye Irrit. 2; STOT SE 3; H226, H319, H336, H335
EC-No.	201-158-5	
Index-No.	603-127-00-5	
		<= 100 %

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

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Remove contaminated clothing. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Suitable extinguishing media

High volume water jet

5.2 Special hazards arising from the substance or mixture

Carbon oxides, flammable liquid and vapour

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

- 6.1.1 For non-emergency personnel

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

- 6.1.2 For emergency responders

- 6.1.1 For non-emergency personnel

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

7.1.2 Advice on general occupational hygiene:

- No smoking.

- Do not eat or drink.
- Wash hands after use.
- Remove contaminated clothing.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	ValueForm of exposure	Control parameters	Basis
Butan-2-ol	78-92-2	STEL	150 ppm 462 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits
		TWA	100 ppm 308 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits

8.1.2 Information on currently recommended monitoring procedures

For currently recommended monitoring procedures, see HSE series 'Methods for the Determination of Hazardous Substances' (MDHS)

8.1.3 The relevant DNELs and PNECs for the substance/s for the exposure scenarios:

DNEL's. The derived no- or minimum effect level (DN(M)EL) is the level of exposure above which a human should not be exposed to a substance. Please note that when more than one summary is provided, DN(M)EL values may refer to constituents of the substance and not to the substance as a whole.

Data for WORKERS

INHALATION Exposure	Threshold	Most sensitive study
Systemic Effects		
Long-term:	(DNEL) 600 mg/m ³	repeated dose toxicity
Acute /short term:	Low hazard (no threshold derived)	
Local Effects		
Long-term:	Low hazard (no threshold derived)	
Acute /short term:	Low hazard (no threshold derived)	
DERMAL Exposure	Threshold	Most sensitive study

Systemic Effects		
Long-term:	(DNEL) 405 mg/kg bw/day	repeated dose toxicity
Acute /short term:	Low hazard (no threshold derived)	
Local Effects		
Long-term:	No hazard identified	
Acute /short term:	No hazard identified	
EYE Exposure		
Medium hazard (no threshold derived)		

Data for the GENERAL POPULATION

INHALATION Exposure	Threshold	Most sensitive study
Systemic Effects		
Long-term:	(DNEL) 213 mg/m ³	repeated dose toxicity
Acute /short term:	Low hazard (no threshold derived)	
Local Effects		
Long-term:	Low hazard (no threshold derived)	
Acute /short term:	Low hazard (no threshold derived)	
DERMAL Exposure	Threshold	Most sensitive study
Systemic Effects		
Long-term:	(DNEL) 203 mg/kg bw/day	repeated dose toxicity
Acute /short term:	Low hazard (no threshold derived)	
Local Effects		
Long-term:	No hazard identified	
Acute /short term:	No hazard identified	
ORAL Exposure	Threshold	Most sensitive study
Systemic Effects		

Long-term:	(DNEL) 15 mg/kg bw/day	repeated dose toxicity
Acute /short term:	Low hazard (no threshold derived)	
EYE Exposure		
Medium hazard (no threshold derived)		

PNEC's. The Predicted No-Effect Concentration (PNEC) value is the concentration of a substance below which adverse effects in the environment are not expected to occur. Please note that when more than one summary is provided, PNEC values may refer to constituents of the substance and not to the substance as a whole.

Hazard for Aquatic Organisms	
Freshwater	47.1 mg/L (1)
Intermittent releases (freshwater)	47.1 mg/L (1)
Marine water	47.1 mg/L (1)
Intermittent releases (marine water)	-
Sewage treatment plant (STP)	761 mg/L (1)
Sediment (freshwater)	196.19 mg/kg sediment dw (1)
Sediment (marine water)	196.19 mg/kg sediment dw (1)
Hazard for Air	
Air	No hazard identified (1)
Hazard for Terrestrial Organism	
Soil	11.58 mg/kg soil dw (1)
Hazard for Predators	
Secondary poisoning	1 g/kg food (1)

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Use Local exhaust ventilation (LEV).

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of

contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.4 mm

Break through time: 480 min

Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact

Material: Nature latex/chloroprene

Minimum layer thickness: 0.6 mm

Break through time: 30 min

Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties**

a) Appearance	Form: liquid
b) Odour	No data available
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	Melting point/range: -115 °C - lit.
f) Initial boiling point and boiling range	98 °C - lit.
g) Flash point	27 °C - closed cup
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	Upper explosion limit: 9.8 %(V) Lower explosion limit: 1.7 %(V)
k) Vapour pressure	15.3 hPa at 20 °C 24.4 hPa at 25 °C
l) Vapour density	2.56 - (Air = 1.0)
m) Relative density	0.808 g/mL at 25 °C
n) Water solubility	soluble
o) Partition coefficient: n-octanol/water	log Pow: 0.146
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

Surface tension	23 mN/m at 20 °C
Relative vapour density	2.56 - (Air = 1.0)

SECTION 10: Stability and reactivity**10.1 Reactivity**

None based on the data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

None under normal processing. Vapours may form explosive mixtures with air.

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

acids, Acid chlorides, Acid anhydrides, Oxidizing agents, Halogens, Peroxides

10.6 Hazardous decomposition products

Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11: Toxicological information**11.1 Information on toxicological effects****Acute toxicity**

LD50 Oral - Rat - male and female - 2,193 mg/kg
(OECD Test Guideline 423)

LD50 Dermal - Rat - male and female - > 2,000 mg/kg
(OECD Test Guideline 402)

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

Maximisation Test (GPMT) - Guinea pig

Result: Does not cause skin sensitisation.
(OECD Test Guideline 406)

Germ cell mutagenicity

Ames test

S. typhimurium

Result: negative

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

Reproductive toxicity - Rat - Inhalation

Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Musculoskeletal system.

Developmental Toxicity - Rat - Inhalation

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: EO1750000

Nausea, Dizziness, Headache, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information
12.1 Toxicity
Toxicity to fish

LC50 - Pimephales promelas (fathead minnow) - 3,670 mg/l - 96 h static test

LC50 - Leuciscus idus melanotus - 3,520 - 3,540 mg/l - 48 h

Toxicity to daphnia and other aquatic invertebrates

EC50 - Daphnia magna (Water flea) - 4,227 mg/l - 48 h

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 5 d
Result: 86 % - Readily biodegradable

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations
13.1 Waste treatment methods
Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Unused product may be returned and reused, in addition to disposal.

Contaminated packaging

Dispose of as unused product.

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

IMDG Marine pollutant: no

IATA: no

14.6 Special precautions for user

No data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
N/A

SECTION 15: Regulatory information

This safety datasheet complies with the requirements of Regulation (EC) No. 453/2010.

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

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

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

Revisions made since previous version of data sheet:

The following sections of this data sheet have been updated:

1.1, 1.2, 3.1, 4.1, 5.1, 5.2, 6.1, 7.1, 8.1, 8.2, 10.3, 13.1, 14.7, 15.1, 16

We strongly recommend reading the entire data sheet for this chemical in preparation ahead of use.

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Better Equipped and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product.
