

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878 □□ □□□ REACH □□ (EC) 1907/2006 □□ □□

□□·□□ □□ (CLP) : H226 - □□□ □□ □ □□.
H319 - □□ □□ □□□ □□□.
H335 - □□□ □□□ □□□ □ □□.
H336 - □□ □□ □□□□ □□□ □ □□.
□□ □□ □□(CLP) : P210 - □·□□□ □□·□□□·□□·□□ □□□□□□ □□□□□. □□.
P261 - □□·□·□□·□□□·□□·□□□□ □ □□□ □□□□.
P305+P351+P338 - □□ □□□□: □ □□ □□ □□□□ □□□□. □□□□ □□□ □□□ □□□□□. □□ □□□□.

2.3. □□ □□

□□ □□

□□ 3: □□□□□ □□ □ □□□

3.1. □□□□

□□ □□ : □□□□□□

□□	□□□□	%
BUTAN-2-OL	CAS □□: 78-92-2 EC □□: 201-158-5 EC □□ □□: 603-127-00-5	100

□□ 4: □□□□□□

4.1. □□□□ □□

□□ □□ □□ : □□□□ □□□ □□□□(□□)□ □□□ □□□□.
□□□□ □□ : □□□ □□□ □□ □□□ □□□ □□□□ □□ □□□ □□□ □□□□(□□)□ □□□□ □□□□.
□□□ □□□□ □□ : □□□ □□ □□□□[□□ □□□□□]. □□□ □□ □□□ □□ □□□□.
□□ □□□□ □□ : □ □□ □□ □□□□ □□□□. □□□□ □□□□□□ □□□□□. □□ □□□□. □□ □□□ □□□□: □□□□ □□□/□□□ □□□□.
□□□ □□ : □□□□ □□□ □□□□(□□)□ □□□ □□□□.
Self protection of the first-aid : □□□□ □□□□ □□□ □□ □□ □□□ □□□□ □□□.

4.2. □□ □ □□□ □□ □□□ □□ □ □□

□□/□□ : □□ □□ □□□□ □□□ □ □□.
□□ □ □□/□□ : □□□ □□□ □□□ □ □□.
□□ □□ □ □□/□□ : None under normal conditions.
□ □□ □ □□/□□ : Eye irritation.
□□ □ □□/□□ : None under normal conditions.

4.3. □□□□ □□ □ □□ □□ □□ □□ □□

Treat symptomatically.

□□ 5: □□·□□□ □□□□

5.1. □□□ □□□

□□□ □□□ : Water spray. Dry powder. Foam. Carbon dioxide.
□□□□ □□□ : Do not use a heavy water stream.

5.2. □□□□□□□ □□□ □□ □□□

□□ □□ : □□□ □□ □ □□.
□□ □□ : No direct explosion hazard.

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878 □□ □□□ REACH □□ (EC) 1907/2006 □□ □□

□□ □ □□□ □□□ □□ : Toxic fumes may be released.

5.3. □□□□ □□□□ □ □□□□

□□ □□ : Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection.

□□ □□ □ □□ : Do not attempt to take action without suitable protective equipment. □□□ □□□□□. Complete protective clothing.

□□ 6: □□□□□ □□□□

6.1. □□□ □□□□ □□ □□□ □□□□ □ □□□

□□ □□ : □□□□ □□□□ □□ □□□□ □□□ □□□□ □□□ □□ □□□ □□. □□□ □□ □□□□ □□ □□□□ □□□□□.

□□□ □□ □□ : Wear recommended personal protective equipment.

□□ □□ : Ventilate spillage area. □□, □□□□ □□ □□. □□. □□/□/□□/□□□/□□□□ □ □□□ □□□□. □□ □ □□□ □□□ □□□□.

□□ □□ □□ : Do not attempt to take action without suitable protective equipment. □□ □□□ □□□ □□ 8: "□□□ □ □□□□□"□ □□□□□.

□□ □□ : Evacuate unnecessary personnel. □□□□ □□□□ □□ □□□□ □□□ □□□□.

6.2. □□□ □□□□ □□ □□□ □□□□

□□□□ □□□□ □□□.

6.3. □□ □□ □□ □□

□□□ : Absorb spilled material with sand or earth. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Stop leak without risks if possible.

□□ □□ : Take up liquid spill into absorbent material. □□□ □□□ □□ □□□□□ □□□ □□ □□□ □□.

□ □□ □□□□ : Dispose of materials or solid residues at an authorized site.

6.4. □□ □□ □□

For further information refer to section 13.

□□ 7: □□ □ □□□□

7.1. □□□□□□

□□ □ □□□□□ □□ □□ : □□□□ □□ □□□□□ □□□ □□□□ □□.

□□□□□□ : □, □□□ □□, □□□, □□ □ □ □□ □□□□□□ □□□□□. □□. □□□ □□□□□ □□□□□. □□□ □□□□□ □□ □□□□□. □□□ □□ □□□ □□□□. □□ □ □□□ □□□ □□□ □ □□. Use explosion-proof equipment. □□ □□□□ □□□□□. □□ □□ □□□ □ □□ □□□□ □□□□□. □□/□/ □□/□□□/□□/□□□□ □ □□□ □□□□. □□ □ □□□ □□□ □□□.

□□ □□ : □ □□□ □□□ □□□ □□□, □□□□ □□□□ □□□. Always wash hands after handling the product.

7.2. □□□□ □□□ □□□ □□□ □□ □□

□□□ □□ : □□□ □□□□□ □□□□□.

□□ □□ : □□□ □ □□ □□ □□□□□. □□□□ □□□□□. □□□ □□□ □□□□□. □□□□□ □□ □□□□□.

□□□ : Store always product in container of same material as original container.

□□□

□□ □□(LK) : LK 3 - □□□ □□

7.3. □□ □□ □□

□□ □□

BUTAN-2-OL GC REFERENCE STANDARD

(EU) 2020/878
REACH
(EC) 1907/2006

8:

8.1.

8.2.

Ensure good ventilation of the work station.

Wear recommended personal protective equipment.



Chemical goggles or safety glasses

Skin protection

Wear a mask

Protective gloves

Wear appropriate mask

9:

9.1.

pH

:

: Colourless.

: Clear liquid.

: 74.12 g/mol

: sweet, fruity odour.

: 3.2 ppm

:

: -115 °C

: 98 – 100 °C

:

:

:

: 24 °C (closed cup)

: 405 °C

:

: 5.821 mm²/s

: 4.703 mPa·s at 15 °C

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878 □□ □□□ REACH □□ (EC) 1907/2006 □□ □□

□□□	: □: 125 g/l at 20 °C
	□□□: Miscible
	□□□: Miscible
	□□□: Miscible
Partition coefficient n-octanol/water (Log Kow)	: □□□□
□□□	: 15.3 hPa at 20 °C
50°C□□□ □□□	: □□□□
□□	: 0.808 g/cm³
□□	: □□□□
20°C□□□ □□ □□ □□	: 2.6 (Air= 1)
□□ □□	: □□□□

9.2. □ □□ □□□□

□□ □□ □□	
□□□	: 1.3978 at 20 °C

□□ 10: □□□ □ □□□

10.1. □□□

□□□ □□ □ □□.

10.2. □□□ □□□

Stable under normal conditions.

10.3. □□ □□□ □□□

No dangerous reactions known under normal conditions of use.

10.4. □□□ □ □□

□□□ □□□ □□□ □□□□. □. □□, □□□, □□□□ □□ □□□□□□.

10.5. □□□ □ □□

□□ □□

10.6. □□□ □□□□ □□□□

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

□□ 11: □□□ □□ □□

11.1. □□ (EC) No 1272/2008 □ □□□, □□□ □□□ □□ □□

□□ □□ (□□)	: □□□□ □□
□□ □□ (□□)	: □□□□ □□
□□ □□ (□□)	: □□□□ □□
□□ □□□ □□ □□□	: □□□□ □□
	pH: 7
□□ □ □□ □□ □□□	: □□ □□ □□□ □□□.
	pH: 7
□□□ □□ □□ □□□	: □□□□ □□
□□□□ □□□□	: □□□□ □□
□□□	: □□□□ □□
□□□□	: □□□□ □□
□□ □□□□ □□ (1□ □□)	: □□ □□ □□□□ □□□ □ □□. □□□ □□□ □□□ □ □□.
□□ □□□□ □□ (□□ □□)	: □□□□ □□
□□ □□□	: □□□□ □□

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878 □□ □□□ REACH □□ (EC) 1907/2006 □□ □□

BUTAN-2-OL GC REFERENCE STANDARD (78-92-2)	
□□(□□□)	5.821 mm²/s

11.2. □□ □□ □□

□□ □□

□□ 12: □□□ □□□ □□

12.1. □□

□□□ - □□	: The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
□□ □□□□ □□□	: □□□□ □□
□□ □□□□ □□□	: □□□□ □□

12.2. □□□ □□□□

BUTAN-2-OL GC REFERENCE STANDARD (78-92-2)	
□□□ □□□□	□□ □□ □□

12.3. □□ □□□

□□ □□

12.4. □□ □□□

□□ □□

12.5. PBT □ vPvB □□ □□

□□ □□

12.6. □□□ □□ □□

□□ □□

12.7. □□ □□ □□

□□ □□

□□ 13: □□□ □□□□

13.1. □□□ □□□

□□ □□(□□□)	: Disposal must be done according to official regulations.
□□□ □□□	: Dispose of contents/container in accordance with licensed collector’s sorting instructions.
□□ □□ □□ □□	: Disposal must be done according to official regulations.
□□/□□ □□ □□□□	: Disposal must be done according to official regulations.
□□ □□	: □□ □□□□ □□□ □□□ □□□. Do not re-use empty containers.

□□ 14: □□□ □□□ □□

ADR / IMDG / IATA / ADN / RID □□ □□

14.1. UN □□ □□ ID □□

UN-□□ (ADR)	: UN 1120
UN-□□ (IMDG)	: UN 1120
UN-□□ (IATA)	: UN 1120
UN-□□ (ADN)	: UN 1120
UN-□□ (RID)	: UN 1120

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878 □□ □□□ REACH □□ (EC) 1907/2006 □ □□

14.2. UN □□ □□□

□□ □□□ (ADR)	: □□□
□□ □□□ (IMDG)	: BUTANOLS
□□ □□□ (IATA)	: Butanols
□□ □□□ (ADN)	: □□□
□□ □□□ (RID)	: □□□
□□ □□ □□ (ADR) (ADR)	: UN 1120 □□□, 3, III, (D/E)
Transport document description (IMDG)	: UN 1120 BUTANOLS, 3, III
Transport document description (IATA)	: UN 1120 Butanols, 3, III
Transport document description (ADN)	: UN 1120 □□□, 3, III
Transport document description (RID)	: UN 1120 □□□, 3, III

14.3. □□□□□ □□□ □□

ADR

□□□□□ □□□ □□ (ADR)	: 3
□□ □□ (ADR)	: 3
	:



IMDG

□□□□□ □□□ □□ (IMDG)	: 3
□□ □□ (IMDG)	: 3
	:



IATA

□□□□□ □□□ □□ (IATA)	: 3
□□ □□ (IATA)	: 3
	:



ADN

□□□□□ □□□ □□ (ADN)	: 3
□□ □□ (ADN)	: 3
	:



RID

□□□□□ □□□ □□ (RID)	: 3
□□ □□ (RID)	: 3
	:



14.4. □□□□

□□ □□ (ADR)	: III
□□ □□ (IMDG)	: III
□□ □□ (IATA)	: III

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878 □□ □□□ REACH □□ (EC) 1907/2006 □□ □□

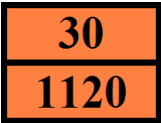
□□ □□(ADN) : III
□□ □□(RID) : III

14.5. □□ □□□□

□□□ □□ : □□□
□□□□□□ : □□□
EmS-No. (□□) : F-E
EmS-No. (□□) : S-D
□ □□ □□□□ : □□ □□ □□ □□

14.6. □□□□ □□ □□ □□□□

□□ □□
□□ □□ (ADR) : F1
□□□(ADR) : 51
□□□(ADR) : E1
□□ □□(ADR) : P001, IBC03, LP01, R001
□□ □□ □□ □□ □□(ADR) : MP19
□□□ □□ □ □□ □□□□ □□ (ADR) : T2
□□□ □□ □ □□ □□□□ □□ □□ (ADR) : TP1
□□ □□(ADR) : LGBF
□□ □□□□ □□ : FL
□□ □□(ADR) : 3
□□ □□ □□ □□ - □□(ADR) : V12
□□ □□ □□ □□ - □□(ADR) : S2
□□ □□ □□(Kemler □□) : 30
Orange plates (□□□□□□) :



□□ □□ □□ (ADR) : D/E
EAC □□ : •2Y

□□ □□

□□ □□ (IMDG) : 223
□□ □□(IMDG) : 5 L
□□□(IMDG) : E1
□□ □□ (IMDG) : P001, LP01
IBC □□ □□(IMDG) : IBC03
□□ □□ (IMDG) : T2
□□ □□ □□ (IMDG) : TP1
□□ □□ (IMDG) : A
□□□ □□□□ (IMDG) : Colourless liquids with a disagreeable odour. Explosive limits: normal-BUTANOL 1.4% to 11.2%. secondary-BUTANOL 1.7% to 9.8%. tertiary-BUTANOL 2.4% to 8%. tertiary-BUTANOL solidifies at about 25°C. normal-BUTANOL is immiscible with water. secondary-BUTANOL is immiscible with water. tertiary-BUTANOL is miscible with water. Irritating to skin, eyes and mucous membranes.

□□ □□

PCA □□ □□(IATA) : E1
PCA □□ □□(IATA) : Y344
PCA □□ □□ □□ □□ □□□(IATA) : 10L
PCA □□ □□(IATA) : 355
PCA □□ □□□(IATA) : 60L
CAO □□ □□(IATA) : 366
CAO □□ □□□(IATA) : 220L
□□ □□(IATA) : A3
ERG □□(IATA) : 3L

□□ □□ □□

□□ □□(ADN) : F1
□□□(ADN) : 5 L
□□□(ADN) : E1

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878 □□ □□ □□ REACH □□ (EC) 1907/2006 □□ □□

□□□□(ADN) : T
□□ □□(ADN) : PP, EX, A
□□(ADN) : VE01
□□ □□/□□□ □□(ADN) : 0

□□ □□
□□ □□(RID) : F1
□□ □□(RID) : 5L
□□□(RID) : E1
□□ □□ (RID) : P001, IBC03, LP01, R001
□□ □□ □□ □□ □□(RID) : MP19
□□□ □□ □ □□ □□□□ □□ (RID) : T2
□□□ □□ □ □□ □□□□ □□ □□ (RID) : TP1
RID □□□ □□ □□(RID) : LGBF
□□ □□(RID) : 3
□□ □□ □□ □□ - □□(RID) : W12
□□ □□□ : CE4
□□□ □□ □□ (RID) : 30

14.7. □□□□□□(IMO) □□ □□ □□ □□

□□□□

□□ 15: □□ □□□□

15.1. □□, □□ □ □□□ □□□□ □□□□ □□ □□ □□ □□/□□

EU □□

REACH □□□ XVII (□□ □□)

EU restriction □□ (REACH Annex XVII)	
□□ □□	□□ □□
3(a)	BUTAN-2-OL GC REFERENCE STANDARD
3(b)	BUTAN-2-OL GC REFERENCE STANDARD
40.	BUTAN-2-OL GC REFERENCE STANDARD

REACH □□□ XIV (□□ □□)

REACH □□□ XIV (□□ □□) □ □□□ □□

REACH □□ □□ □□ (SVHC)

REACH □□ □□ □□□ □□□□ □□

PIC □□ (□□□□□□)

PIC □□□ □□□□ □□ (□□ EU 649/2012)

POP □□ (□□□ □□ □□□□)

POP □□□ □□□□ □□ (□□ EU 2019/1021)

Ozone Regulation (2024/590)

Not listed on the Ozone Depletion list (Regulation EU 2024/590)

□□□□ □□(428/2009)

Not listed on the COUNCIL REGULATION (EC) of dual-use items.

□□ □□□□ □□ (2019/1148)

Not listed on the Explosives Precursors list (EU)

□□ □□□□ □□ (273/2004)

Not listed on the Drug Precursors list (EU)

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878 □□ □□□ REACH □□ (EC) 1907/2006 □□

□□ □□

□□□□□

Ordinance on Flammable Liquids (VbF) : Hazard category 3: Flammable (flash point 23 - 60 °C. Excluding gas oils and petroleum).

□□□	
□□	□□
RG 84	

□□

Employment restrictions : □□ □□ □□□ (MuSchG) □□ □□ □□.
□□ □□□ □□□ (JArbSchG) □□ □□ □□.
WGK : WGK 1, □□ □□ □□ □□ (Classification according to AwSV; ID □□ 40).
□□ □□ □□(12. BImSchV) : Is not listed in the Major Accidents Ordinance (12. BImSchV)

□□□□

SZW-lijst van kankerverwekkende stoffen : □□□ □□□□ □□□□□.
SZW-lijst van mutagene stoffen : □□□ □□□□ □□□□□.
SZW-lijst van reprotoxische stoffen – Borstvoeding : □□□ □□□□ □□□□□.
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid : □□□ □□□□ □□□□□.
SZW-lijst van reprotoxische stoffen – Ontwikkeling : □□□ □□□□ □□□□□.

□□□

Class for fire hazard : □□ II-1
Store unit : 5 liter
□□ □□ □□ □□ : R10 <H226;H319;H335;H336>; □□□ □□ □□ □□ □□□ □□□□ □□□
□□□ □□ □□ : 18□ □□ □□□ □□ □□□ □□□□□

□□□

□□□ □□ □□ : Act of 25 February 2011 on chemical substances and their mixtures (J. o L. No. 63, item 322 as amended; consolidated text J. o L. 2019, item 1225).
Act of 14 December 2012 on waste (J. o L. 2013, item 322 as amended; consolidated text J. o L. 2020, item 797).
The announcement of Marshal of the Sejm of the Republic of Poland dated 19 October 2016 concerning the consolidated text announcement of the decree on the management of packaging and packaging waste (J. o L. 2016, item 1863 as amended).
Decree of the Minister of Environment of 14 December 2014 on the catalogue of waste (J. o L. 2014, item 1923).
Act of 19 August 2011 on the Carriage of Dangerous Goods (J. o L. 2011 No. 227, item 1367 as amended; consolidated text J. o L. 2020, item 154).
Regulation of the Minister of Family, Labour and Social Policy of 12 June 2018 on the highest permissible concentration and intensity of noxious agents for health at work environment (J. o L. item 1286 as amended).
The announcement of Minister of Health dated 9 September 2016 concerning the consolidated text announcement of the decree of the Minister of Health of 30 December 2004 on health and safety at work related to exposure to chemical agents at work (J. o L. of 16 September 2016, item 1488)
Regulation of the Minister of Health of 2 February 2011 on tests and measurements of the noxious agents for health at work environment (J. o L. No. 33, item 166 as amended).
Regulation of the Minister of Environment of 9 December 2003 on particularly hazardous substances to the environment (J. o L. No. 217, item 2141).
ADR Agreement: Government Statement of 13 March 2023 on the entry into force of amendments to Annexes A and B to the Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), signed in Geneva on 30 September 1957 (J. o. L. 2023, item 891)

□□□

Royal Decree 665/1997 : Is not subject to the Royal Decree 665/1997

15.2. □□ □□ □□□ □□

No chemical safety assessment has been carried out

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878□ □□ □□□ REACH □□ (EC) 1907/2006□ □□

□□ 16: □ □□ □□□□

□□ □ □□□□:	
ACGIH	American Conference of Government Industrial Hygienists
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
BLV	□□ □□ □
BOD	Biochemical oxygen demand (BOD)
CAS □□	□□□□ □□ □□ □□(CAS)
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
COD	□□□ □□ □□□
CSA	□□ □□ □□□ □□
DMEL	Derived Minimal Effect level
DNEL	□□ □□□ □□
EC □□	□□ □□□ □□
EC50	Median effective concentration
ED	□□□ □□□□
EN	□□ □□
EWC	European waste catalogue
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
Log Kow	Partition coefficient n-octanol/water (Log Kow)
Log Pow	Partition coefficient n-octanol/water (Log Pow)
MAK	maximum workplace concentration
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
N.O.S.	Not Otherwise Specified
OECD	Organisation for Economic Co-operation and Development
OEL	□□□ □□ □□
OSHA	Occupational Safety & Health Administration
PBT	Persistent Bioaccumulative Toxic
PNEC	□□ □□□ □□
PPE	□□ □□□

BUTAN-2-OL GC REFERENCE STANDARD

□□□□□□□□

□□ (EU) 2020/878□ □□ □□□ REACH □□ (EC) 1907/2006□ □□

□□ □ □□□□□:	
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	□□□□□□□□
STP	Sewage treatment plant
TF	□□□ □□
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit
TWA	Time Weighted Average
COV	Volatile Organic Compounds
vPvB	Very Persistent and Very Bioaccumulative
UFI	□□ □□ □□□

□H□ □ EUH□ □□:	
□ □□□ 2	□□ □ □□□/□ □□□, □□ 2
□□□ □□ 3	□□□ □□, □□ 3
□□ □□□□ □□ (1□ □□) 3	□□□□□□ □□ - 1□ □□, □□ 3, □□ □□
H226	□□□ □□ □ □□.
H319	□□ □□ □□□ □□□.
H335	□□□ □□□ □□□ □ □□.
H336	□□ □□ □□□□ □□□ □ □□.

□□□□□□□□(SDS), EU

□ □□□ □□ □□□ □□□ □□ □□□ □□ □□□ □□, □□ □ □□ □□□ □□□ □□ □□□□ □□ □□□□. □□□□ □□□ □□□ □□□ □□□□ □□□ □□ □□□□ □ □□□.