

## 1 Identification of the substance/preparation and of the company/undertaking

- **Product details**
- **Trade name:** n Butanol

## 2 Composition/information on ingredients

- **Chemical characterization:**
- **CAS No. Description**  
71-36-3 butan-1-ol
- **Identification number(s)**
- **EINECS Number:** 200-751-6
- **Index number:** 603-004-00-6

## 3 Hazards identification

- **Hazard description:**



Xn Harmful

- **Information concerning particular hazards for human and environment:**

R 10 Flammable.  
R 22 Harmful if swallowed.  
R 37/38 Irritating to respiratory system and skin.  
R 41 Risk of serious damage to eyes.  
R 67 Vapours may cause drowsiness and dizziness.

## 4 First aid measures

- **General information:**  
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing:** Call for a doctor immediately.

## 5 Fire-fighting measures

- **Suitable extinguishing agents:**  
CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **For safety reasons unsuitable extinguishing agents:** Water with full jet

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· **Protective equipment:** *No special measures required.*

## 6 Accidental release measures

- **Person-related safety precautions:** *Wear protective equipment. Keep unprotected persons away.*
- **Measures for environmental protection:** *Do not allow to enter sewers/ surface or ground water.*
- **Measures for cleaning/collecting:**
  - Dilute with plenty of water.*
  - Dispose contaminated material as waste according to item 13.*
  - Ensure adequate ventilation.*

## 7 Handling and storage

- **Handling:**
  - **Information for safe handling:** *No special requirement*
  - **Information about fire - and explosion protection:**
    - Keep ignition sources away - Do not smoke.*
    - Protect against electrostatic charges.*
- **Storage:**
  - **Requirements to be met by storerooms and receptacles:** *No special requirements.*
  - **Information about storage in one common storage facility:** *Not required.*
  - **Further information about storage conditions:** *Keep container tightly sealed.*

## 8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** *No further data; see item 7.*

· **Ingredients with limit values that require monitoring at the workplace:**

### 71-36-3 butan-1-ol

PEL (USA)	300 mg/m <sup>3</sup> , 100 ppm
REL (USA)	Short-term value: C 150 mg/m <sup>3</sup> , C 50 ppm
	Skin
TLV (USA)	61 mg/m <sup>3</sup> , 20 ppm
WEL (Great Britain)	Short-term value: 154 mg/m <sup>3</sup> , 50 ppm
	Sk

- **Additional information:** *The lists valid during the making were used as basis.*
- **Personal protective equipment:**
- **General protective and hygienic measures:**
  - Keep away from foodstuffs, beverages and feed.*
  - Immediately remove all soiled and contaminated clothing*
  - Wash hands before breaks and at the end of work.*
  - Avoid contact with the skin.*
  - Avoid contact with the eyes and skin.*
- **Respiratory protection:**
  - In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.*

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· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.  
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**



Tightly sealed goggles

## 9 Physical and chemical properties

· **General Information**

<b>Form:</b>	Fluid
<b>Colour:</b>	Colourless
<b>Odour:</b>	Alcohol-like

· **Change in condition**

**Melting point/Melting range:** -89°C  
**Boiling point/Boiling range:** 116-118°C

· **Flash point:** 35°C

· **Ignition temperature:** 340°C

· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapour mixtures are possible.

· **Explosion limits:**

<b>Lower:</b>	1.5 Vol %
<b>Upper:</b>	9.4 Vol %

· **Vapour pressure at 20°C:** 6.7 hPa

· **Density at 20°C:** 0.81 g/cm<sup>3</sup>

· **Solubility in / Miscibility with water at 20°C:** 77 g/l

· **pH-value (70 g/l) at 20°C:** 7

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- **Viscosity:**  
     *Dynamic at 20°C:*                    2.95 mPas

## 10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Dangerous reactions** No dangerous reactions known.
- **Dangerous decomposition products:** No dangerous decomposition products known.

## 11 Toxicological information

- **Acute toxicity:**
- **LD/LC50 values relevant for classification:**

Oral	LD50	790 mg/kg (rat)
Dermal	LD50	3400 mg/kg (rabbit)
Inhalative	LC50/4 h	8000 mg/l (rat)

- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Strong irritant with the danger of severe eye injury.
- **Sensitization:** No sensitizing effects known.

## 12 Ecological information

- **General notes:**  
     Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water  
     Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

## 13 Disposal considerations

- **Product:**
- **Recommendation**  
     Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

## 14 Transport information

- **Land transport ADR/RID (cross-border)**



- **ADR/RID class:**                    3 Flammable liquids.
- **Danger code (Kemler):** 30
- **UN-Number:**                    1120

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- **Packaging group:** III
- **Hazard label:** 3
- **Description of goods:** 1120 BUTANOLS

· **Maritime transport IMDG:**



- **IMDG Class:** 3
- **UN Number:** 1120
- **Label:** 3
- **Packaging group:** III
- **EMS Number:** F-E,S-D
- **Marine pollutant:** No
- **Proper shipping name:** BUTANOLS

· **Air transport ICAO-TI and IATA-DGR:**



- **ICAO/IATA Class:** 3
- **UN/ID Number:** 1120
- **Label:** 3
- **Packaging group:** III
- **Proper shipping name:** BUTANOLS

## 15 Regulatory information

· **Labelling according to EU guidelines:**

The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.

· **Code letter and hazard designation of product:**



Xn Harmful

· **Risk phrases:**

- 10 Flammable.
- 22 Harmful if swallowed.
- 37/38 Irritating to respiratory system and skin.
- 41 Risk of serious damage to eyes.
- 67 Vapours may cause drowsiness and dizziness.

· **Safety phrases:**

- 2 Keep out of the reach of children.
- 7/9 Keep container tightly closed and in a well-ventilated place.
- 13 Keep away from food, drink and animal feedingstuffs.

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26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

## 16 Other information

*This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.*

· **Department issuing MSDS:** Product safety department

· **Contact:**

**Mr. Menon**

*ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)*

*RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)*

*IMDG: International Maritime Code for Dangerous Goods*

*IATA: International Air Transport Association*

*IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)*

*ICAO: International Civil Aviation Organization*

*ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)*

*EINECS: European Inventory of Existing Commercial Chemical Substances*

*CAS: Chemical Abstracts Service (division of the American Chemical Society)*

*GefStoffV: Gefahrstoffverordnung (Ordinance on Hazardous Substances, Germany)*

*LC50: Lethal concentration, 50 percent*

*LD50: Lethal dose, 50 percent*