

Safety Data Sheet
according to Globally Harmonized System (GHS)


Printing date 2019-06-18

Revision: 2019-01-14

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

- **Product identifier**
- **Trade name:** 1,4-Butanediol (1,4-BDO); BDOH
- **Synonyms:**
BDOH; Butane-1,4-diol, BDO, BD, 1,4-Butylene Glycol, 1,4-Dihydroxybutane, Tetramethylene glycol, Butylene glycol, 1,4-Butanediol, Tetramethylene 1,4-diol, Butanediol, 1,4-Tetramethyl glycol, Diol 14B, Sucol B
- **CAS Number:**
110-63-4
- **Relevant identified uses of the substance or mixture and uses advised against :**
- **Identified/Recommended uses:**
Raw Material for:
Manufacturing of Poly-butylene Terephthalate (PBT), Polyurethane (PU), Tetrahydrofuran (THF), Polytetra-methylene-ether-glycol (PTMEG), γ -butyrolactone (GBL), Poly-ester plasticizers, PU chain extender, carrier solvent in printing ink, key component of hot melt adhesive, and cleaning agent.
- **Uses advised against:**
Any use in cosmetic products
Soluble coatings on children's toys
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Dairen Chemical Corporation
9th Fl., No. 301, SongJiang Rd.
Taipei City, 10483, TAIWAN
Tel: +886-2-7743-1500 Fax: +886-2-2509-9619
www.dcc.com.tw
- **Further information obtainable from:** Respective plant's environmental, health, and safety (EHS) Dept.
- **Emergency telephone number:** +886-2-7743-1500 (08:30-17:30; GMT+8)

2 Hazards identification

- **Classification of the substance or mixture:**
Acute Tox. 4 H302 Harmful if swallowed.
STOT SE 3 H336 May cause drowsiness or dizziness.
- **Label elements:**
- **Hazard pictograms:**

GHS07
- **Signal word:** Warning
- **Hazard-determining components of labelling:**
butane-1,4-diol
- **Hazard statements:**
Harmful if swallowed.
May cause drowsiness or dizziness.
- **Precautionary statements:**
Avoid breathing dust/fume/gas/mist/vapours/spray.
IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

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Dispose of contents/container in accordance with local/regional/national/international regulations.

3 Composition/information on ingredients

- **Chemical characterisation: Substances**
- **CAS No. Description**
110-63-4 butane-1,4-diol >99.85%

4 First aid measures

- **Description of first aid measures**
- **General information:**
Personal protection for the First Aider.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:**
Generally the product does not irritate the skin.
Rinse cautiously with water for several minutes.
If skin irritation continues, consult a doctor.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:**
Rinse out mouth and then drink plenty of water.
Do not induce vomiting; call for medical help immediately.
Call for a doctor immediately.
- **Most important symptoms and effects, both acute and delayed:**
Dizziness
Nausea
Headache
Vomiting
Blurred vision
CNS disorders
Paralysis symptoms
- **Indication of any immediate medical attention and special treatment needed**
Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5 Firefighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Use fire extinguishing methods suitable to surrounding conditions.
- **Special hazards arising from the substance or mixture**
Vapours are heavier than air and may spread along floors.
Forms explosive mixtures with air at elevated temperatures.
Development of hazardous combustion gases or vapours possible in the event of fire.
- **Advice for firefighters**
- **Protective equipment:**
Wear protective fire fighting clothing (including fire fighting helmet, coat, trousers, boots, and gloves).
If necessary, wear fully protective suit and air respirator.
- **Additional information**
Avoid contact with skin, eye, and clothing.
Do not inhale explosion gases or combustion gases.

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Cool endangered receptacles with water spray.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

If possible, stop flow of product.

Ensure adequate ventilation

Do not breathe dust/fume/gas/mist/vapours/spray.

Use respiratory protective device against the effects of fumes/dust/aerosol.

- **Environmental precautions:**

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

- **Methods and material for containment and cleaning up:**

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Allow to solidify. Pick up mechanically.

For large liquid spills (>1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal.

Dispose contaminated material as waste according to item 13.

- **Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage

- **Handling:**

- **Precautions for safe handling**

Use personal protective equipment as required.

Wear protective gloves/protective clothing/eye protection/face protection.

Use local exhaust ventilation if dust and aerosol are formed during handling.

- **Information about fire - and explosion protection:**

Normal measures for preventive fire protection.

The product is not flammable.

- **Storage:**

- **Requirements to be met by storerooms and receptacles:**

Store in cool, dry place in tightly closed receptacles.

- **Further information about storage conditions:** Protect from heat and direct sunlight.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:**

Use engineering controls to maintain airborne level below exposure limit requirements or guidelines.

If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

- **Control parameters**

- **Ingredients with limit values that require monitoring at the workplace:** Not required.

- **Exposure controls**

- **Personal protective equipment:**

- **General protective and hygienic measures:**

The usual precautionary measures are to be adhered to when handling chemicals.

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Keep away from foodstuffs, beverages and feed.
 Avoid contact with the eyes and skin.
 Do not inhale gases / fumes / aerosols.
 Be sure to clean skin thoroughly after work and before breaks.
 Ensure that washing facilities are available at the work place.

· **Respiratory protection:**

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.
 Required when vapours/aerosols are generated.
 Short term filter device:
 Filter A/P2

· **Protection of hands:**



Protective gloves

The selected protective gloves have to satisfy the specifications of standard EN 374 or its equivalent.
 Replace gloves immediately when torn or any change in appearance (dimension, colour, flexibility etc) is noticed.
 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**

Nitrile rubber, NBR
 Recommended thickness of the material: ≥ 0.11 mm
 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**

Break through time: > 480 min
 The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**



Safety glasses with side shields conforming to EN166, ANSI 87.1-2010, or equivalent.

· **Body protection:**

Protective work clothing
 The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

Form:	Fluid
Colour:	Colourless
Odour:	Nearly odourless

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· Odour threshold:	Not determined.
· pH-value at 20 °C:	~7
· Change in condition	
Melting point/freezing point:	20 °C
Initial boiling point and boiling range:	230 °C
· Flash point:	115 °C (Closed Cup)
· Flammability (solid, gas):	Not applicable.
· Ignition temperature:	385 °C
· Decomposition temperature:	Not determined.
· Auto-ignition temperature:	Not determined.
· Explosive properties:	Product does not present an explosion hazard.
· Explosion limits:	
Lower:	Not determined.
Upper:	Not determined.
· Vapour pressure at 25 °C:	1.4 hPa
· Density at 20 °C:	1.02 g/cm ³
· Relative density	Not determined.
· Vapour density at 20 °C	3.1 g/cm ³
· Evaporation rate	Not determined.
· Solubility in / Miscibility with water:	Fully miscible.
· Partition coefficient: n-octanol/water at 25 °C:	-0.88 log POW (Literature value)
· Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
· Solvent content:	
Organic solvents:	0.0 %
VOC (EC)	0,00 %
· Other information	No further relevant information available.

10 Stability and reactivity

- **Reactivity:** When properly handled and stored, no dangerous reaction is known.
- **Chemical stability:** This product is stable under prescribed use and storage.
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **Possibility of hazardous reactions:**

Violent reaction possible with:
Strong oxidizing agents
Reducing agents
Acid anhydrides
Acid chlorides
- **Conditions to avoid:**
Strong heating.
Protect from heat. Keep ignition sources away.
- **Incompatible materials:**
Strong oxidizing agents

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Nitrating agents

Strong acids

Hazardous decomposition products:Carbon monoxide (CO) and carbon dioxide (CO₂)

Tetrahydrofurane (THF)

Decomposition products depend upon temperature, air supply and the presence of other materials.

11 Toxicological information**Information on toxicological effects****Acute toxicity** Harmful if swallowed.**LD/LC50 values relevant for classification:****110-63-4 butane-1,4-diol**

Oral | LD50 | 1525 mg/kg (rat)

Skin corrosion/irritation:

Not classified based on available data.

Rabbit: not irritating (OECD Test Guideline 404)

Serious eye damage/eye irritation:

Not classified based on available data.

Rabbit: not irritating (OECD Test Guideline 405)

Draize Score: 0

Respiratory or skin sensitization:

Not classified based on available data.

Guinea Pigs - Not sensitizing to the skin (OECD Guideline N/A; maximisation test)

Germ Cell Mutagenicity:

Not classified based on available data.

In-vitro genotoxicity (non-mammalian cells): negative (OECD 473)

Carcinogenicity: Not classified based on available data.**Reproductive Toxicity:**

Not classified based on available data.

Rat - Negative (OECD 422)

In animal studies, did not interfere with fertility.

Specific Target Organ Toxicity - Single Exposure (STOT SE):

May cause drowsiness or dizziness.

Affected Organs: :

Central nervous system

High concentration may cause central nervous system depression resulting in headaches, dizziness, and nausea.

Specific Target Organ Toxicity - Repeated Exposure (STOT RE):

Not classified based on available data.

Aspiration Hazard:

Not classified based on available data.

Based on physical properties, not likely to be an aspiration hazard.

Primary irritant effect:**Skin corrosion/irritation** No irritating effect.**Serious eye damage/irritation** No irritating effect.**Respiratory or skin sensitisation** No sensitising effects known.**12 Ecological information****Toxicity****Aquatic toxicity:**

Not classified based on available data.

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LC50 (96hr, freshwater fish): >30000 mg/L (OECD 203)
EC50 (Daphnia Magna, 24hr): >1000 mg/L (OECD 202)
ErC50 (alga, 72hr): >500 mg/L (OECD DIN 38412 Part 9)

· Persistence and degradability

Easily biodegradable
Degradation : 97% (10d, OECD 302B)

· Bioaccumulative potential

Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Bioconcentration Factor (BCF) : 3.16
Partition coefficient, n-octanol/water (log Pow) : -0.88

· Mobility in soil

Potential for mobility in soil is very high (Koc between 0 and 50).
Henry's Law Constant (H) : 1.12E-010 atm-m³/mole
Partition coefficient, soil organic carbon/water (Koc) : 0.411

· Additional 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.

· Other adverse effects No further relevant information available.

13 Disposal considerations**· Waste treatment methods****· Recommendation**

After prior treatment product has to be disposed of in an incinerator for hazardous waste adhering to the regulations pertaining to the disposal of particularly hazardous waste.

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

Any disposal method should also comply with national, regional, provincial, and local laws.

· Uncleaned packaging:**· Recommendation:**

Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

Disposal must be made according to official regulations.

· Recommended cleansing agents: Water, if necessary together with cleansing agents.

14 Transport information

· Dangerous Goods classification Status: Not classified as a dangerous good with respect to transport regulations (IMDG, IATA, ADN, ADR, US DOT).

· UN-Number

· ADR, ADN, IMDG, IATA None (Not a Dangerous Good)

· UN proper shipping name

· ADR, ADN, IMDG, IATA None (Not a Dangerous Good)

· Transport hazard class(es)

· ADR, ADN, IMDG, IATA None (Not a Dangerous Good)

· Class None (Not a Dangerous Good)

· Packing group

· ADR, IMDG, IATA None (Not a Dangerous Good)

· Environmental hazards:

· Marine pollutant: No

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- **Special precautions for user** Not applicable.
- **UN "Model Regulation":** None (Not a Dangerous Good)

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Status of global inventories:**
All component(s) within this product is listed or exempted from the following country's chemical inventory:
USA – TSCA
Australia – AICS
Canada – DSL
China – IECSC
EU – EINECS/NLP
Japan – ENCS
Korea – KECI
New Zealand – NZIoC
Philippines – PICCS
Taiwan – TCSI
Mexico - INSQ

16 Other information

- **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
Acute Tox. 4: Acute toxicity – Category 4
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
- **Sources**
Most toxicological and eco-toxicological data are obtained from European Chemical Agency (ECHA)'s public dissemination website.
<https://echa.europa.eu/registration-dossier/-/registered-dossier/15496>
- **General Disclaimers:**
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