

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

<b>Product Description:</b>	<b><u>2-Butyne-1,4-diol</u></b>
<b>Cat No. :</b>	<b>A14539</b>
<b>Synonyms</b>	1,4-Dihydroxy-2-butyne
<b>Index No</b>	603-076-00-9
<b>CAS No</b>	110-65-6
<b>EC No</b>	203-788-6
<b>Molecular Formula</b>	C4 H6 O2
<b>REACH registration number</b>	-

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

<b>Recommended Use</b>	Laboratory chemicals
<b>Sector of use</b>	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
<b>Product category</b>	PC21 - Laboratory chemicals
<b>Process categories</b>	PROC15 - Use as a laboratory reagent
<b>Environmental release category</b>	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
<b>Uses advised against</b>	No Information available

### 1.3. Details of the supplier of the safety data sheet

<b>Company</b>	Avocado Research Chemicals Ltd. (Part of Thermo Fisher Scientific) Shore Road, Heysham Lancashire, LA3 2XY, United Kingdom Office Tel: +44 (0) 1524 850506 Office Fax: +44 (0) 1524 850608
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<b>E-mail address</b>	begel.sdsdesk@thermofisher.com
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### 1.4. Emergency telephone number

For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11  
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99  
**CHEMTREC** Tel. No. **US**:001-800-424-9300 / **Europe**:001-703-527-3887

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

**GHS Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567**

**Physical hazards**

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Based on available data, the classification criteria are not met

## **Health hazards**

Acute oral toxicity	Category 3 (H301)
Acute dermal toxicity	Category 3 (H311)
Acute Inhalation Toxicity - Dusts and Mists	Category 3 (H331)
Skin Corrosion/Irritation	Category 1 B (H314)
Serious Eye Damage/Eye Irritation	Category 1 (H318)
Skin Sensitization	Category 1 (H317)
Specific target organ toxicity - (single exposure)	Category 3 (H335)
Specific target organ toxicity - (repeated exposure)	Category 2 (H373)

## **Environmental hazards**

Based on available data, the classification criteria are not met

Full text of Hazard Statements: see section 16

## **2.2. Label elements**



**Signal Word**

**Danger**

## **Hazard Statements**

- H301 + H311 + H331 - Toxic if swallowed, in contact with skin or if inhaled
- H314 - Causes severe skin burns and eye damage
- H317 - May cause an allergic skin reaction
- H335 - May cause respiratory irritation
- H373 - May cause damage to organs through prolonged or repeated exposure

## **Precautionary Statements**

- P280 - Wear protective gloves/protective clothing/eye protection/face protection
- P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
- P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower
- 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 lenses, if present and easy to do. Continue rinsing
- P310 - Immediately call a POISON CENTER or doctor/physician

## **2.3. Other hazards**

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)

- Toxicity to Soil Dwelling Organisms
- Toxic to terrestrial vertebrates
- This product does not contain any known or suspected endocrine disruptors

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## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substances

Component	CAS No	EC No	Weight %	GHS Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567
2-Butyne-1,4-diol	110-65-6	EEC No. 203-788-6	>99.5	Acute Tox. 3 (H331) Acute Tox. 3 (H301) Acute Tox. 3 (H331) Skin Corr. 1B (H314) Eye Dam. 1 (H318) Skin Sens. 1 (H317) STOT RE 2 (H373) STOT SE 3 (H335)
4-Methylene-2-pentyne-1,5-diol	881313-36-6		0.1-0.5	Acute Tox. 4 5H302 Skin Sens. 1 (H317)
Formaldehyde	50-00-0	200-001-8	0.01-0.1	Acute Tox. 3 (H301) Acute Tox. 3 (H311) Acute Tox. 3 (H331) Skin Corr. 1B (H314) Eye Dam. 1 (H318) Skin Sens. 1 (H317) STOT SE 3 (H335) Muta. 2 (H341) Carc. 1B (H350) EUH071

Component	Specific concentration limits (SCL's)	M-Factor	Component notes
2-Butyne-1,4-diol	Skin Corr. 1B :: C>=50% Skin Irrit. 2 :: 25%<=C<50% Eye Irrit. 2 :: 25%<=C<50%	-	-
Formaldehyde	Skin Corr. 1B :: C>=25% Eye Irrit. 2 :: 5%<=C<25% Skin Irrit. 2 :: 5%<=C<25% STOT SE 3 :: C>=5%<25% EUH071 :: C>=25%	-	-

Component	ECHA (RAC) ATE (Oral)	ECHA (RAC) ATE (Dermal)	ECHA (RAC) ATE (Inhalation)
Formaldehyde	oral: ATE = 100 mg/kg bw	-	inhalation: ATE = 100 ppmV (gases)

REACH registration number	-
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Full text of Hazard Statements: see section 16

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

<b>General Advice</b>	Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.
<b>Eye Contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.
<b>Ingestion</b>	Do NOT induce vomiting. Call a physician or poison control center immediately.

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<b>Inhalation</b>	Remove to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required. If not breathing, give artificial respiration.
<b>Self-Protection of the First Aider</b>	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

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

Causes burns by all exposure routes. May cause allergic skin reaction. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

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

**Notes to Physician** Treat symptomatically.

## **SECTION 5: FIREFIGHTING MEASURES**

### **5.1. Extinguishing media**

#### **Suitable Extinguishing Media**

Water spray, carbon dioxide (CO<sub>2</sub>), dry chemical, alcohol-resistant foam.

#### **Extinguishing media which must not be used for safety reasons**

No information available.

### **5.2. Special hazards arising from the substance or mixture**

The product causes burns of eyes, skin and mucous membranes.

#### **Hazardous Combustion Products**

Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>), Thermal decomposition can lead to release of irritating gases and vapors.

### **5.3. Advice for firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

## **SECTION 6: ACCIDENTAL RELEASE MEASURES**

### **6.1. Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment as required. Evacuate personnel to safe areas. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid dust formation.

### **6.2. Environmental precautions**

Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information.

### **6.3. Methods and material for containment and cleaning up**

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Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

## 6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Wear personal protective equipment/face protection. Do not ingest. If swallowed then seek immediate medical assistance. Do not breathe (dust, vapor, mist, gas). Avoid dust formation.

### Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

### 7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

**Technical Rules for Hazardous Substances (TRGS) 510** Class 6.1C  
**Storage Class (LGK) (Germany)**

### 7.3. Specific end use(s)

Use in laboratories

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

#### Exposure limits

List source(s): **UK** - EH40/2005 Work Exposure Limits, Fourth edition. Published 2020. **IRE** - 2021 Code of Practice for the Chemical Agents Regulations, Schedule 1. Published by the Health and Safety Authority **EU** - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC

Component	The United Kingdom	European Union	Ireland
2-Butyne-1,4-diol	STEL: 1.5 mg/m <sup>3</sup> 15 min	TWA: 0.5 mg/m <sup>3</sup> (8h)	TWA: 0.5 mg/m <sup>3</sup> 8 hr. STEL: 1.5 mg/m <sup>3</sup> 15 min
Formaldehyde	STEL: 2 ppm 15 min STEL: 2.5 mg/m <sup>3</sup> 15 min TWA: 2 ppm 8 hr TWA: 2.5 mg/m <sup>3</sup> 8 hr Carc.	TWA: 0.37 mg/m <sup>3</sup> (8h) TWA: 0.62 mg/m <sup>3</sup> (8h) TWA: 0.3 ppm (8h) TWA: 0.5 ppm (8h) Skin STEL: 0.74 mg/m <sup>3</sup> (8h) STEL: 0.6 ppm (8h)	TWA: 0.3 ppm 8 hr. TWA: 0.5 ppm 8 hr. for the healthcare, funeral and embalming sectors until July 11, 2024 TWA: 0.37 mg/m <sup>3</sup> 8 hr. TWA: 0.62 mg/m <sup>3</sup> 8 hr. for the healthcare, funeral and embalming sectors until July 11, 2024 STEL: 0.6 ppm 15 min STEL: 0.738 mg/m <sup>3</sup> 15 min STEL: 0.62 mg/m <sup>3</sup> 15 min

#### Biological limit values

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific

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regulatory bodies

**Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)**

Workers; See table for values

Component	Acute effects local (Dermal)	Acute effects systemic (Dermal)	Chronic effects local (Dermal)	Chronic effects systemic (Dermal)
2-Butyne-1,4-diol 110-65-6 (>99.5)		DNEL = 6.6mg/kg bw/day		DNEL = 0.2mg/kg bw/day
Formaldehyde 50-00-0 (0.01-0.1)			DNEL = 37µg/cm <sup>2</sup>	DNEL = 240mg/kg bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
2-Butyne-1,4-diol 110-65-6 (>99.5)	DNEL = 1mg/m <sup>3</sup>	DNEL = 100mg/m <sup>3</sup>	DNEL = 0.5mg/m <sup>3</sup>	DNEL = 1.25mg/m <sup>3</sup>
Formaldehyde 50-00-0 (0.01-0.1)	DNEL = 0.75mg/m <sup>3</sup>		DNEL = 0.375mg/m <sup>3</sup>	DNEL = 9mg/m <sup>3</sup>

**Predicted No Effect Concentration (PNEC)**

See values below.

Component	Fresh water	Fresh water sediment	Water Intermittent	Microorganisms in sewage treatment	Soil (Agriculture)
2-Butyne-1,4-diol 110-65-6 (>99.5)	PNEC = 0.0155mg/L			PNEC = 134mg/L	PNEC = 0.05mg/kg soil dw
Formaldehyde 50-00-0 (0.01-0.1)	PNEC = 0.44mg/L	PNEC = 2.3mg/kg sediment dw	PNEC = 4.44mg/L	PNEC = 0.19mg/L	PNEC = 0.2mg/kg soil dw

Component	Marine water	Marine water sediment	Marine water intermittent	Food chain	Air
2-Butyne-1,4-diol 110-65-6 (>99.5)	PNEC = 0.00155mg/L				
Formaldehyde 50-00-0 (0.01-0.1)	PNEC = 0.44mg/L	PNEC = 2.3mg/kg sediment dw			

**8.2. Exposure controls**

**Engineering Measures**

Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

**Personal protective equipment**

**Eye Protection** Goggles (European standard - EN 166)

**Hand Protection** Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber Neoprene Natural rubber PVC	See manufacturers recommendations	-	EN 374	(minimum requirement)

**Skin and body protection** Long sleeved clothing.

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Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves.  
(Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

## Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

## Large scale/emergency use

Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

**Recommended Filter type:** Particulates filter conforming to EN 143

## Small scale/Laboratory use

Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Recommended half mask:-** Particle filtering: EN149:2001

When RPE is used a face piece Fit Test should be conducted

## Environmental exposure controls

Prevent product from entering drains.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

Physical State	Solid	
Appearance	Beige	
Odor	No information available	
Odor Threshold	No data available	
Melting Point/Range	54 - 58 °C / 129.2 - 136.4 °F	
Softening Point	No data available	
Boiling Point/Range	238 °C / 460.4 °F	
Flammability (liquid)	Not applicable	Solid
Flammability (solid,gas)	No information available	
Explosion Limits	No data available	
Flash Point	152 °C / 305.6 °F	<b>Method -</b> No information available
Autoignition Temperature	410 °C / 770 °F	
Decomposition Temperature	> 150°C	
pH	6.4	100 g/L aq.sol
Viscosity	Not applicable	Solid
Water Solubility	2960 g/L (20°C)	
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/water)		
Component	<b>log Pow</b>	
2-Butyne-1,4-diol	-0.73	
Formaldehyde	-0.35	
Vapor Pressure	1.33 mbar @ 102 °C	
Density / Specific Gravity	1.200	
Bulk Density	No data available	
Vapor Density	Not applicable	Solid
Particle characteristics	No data available	

### 9.2. Other information

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**Molecular Formula** C4 H6 O2  
**Molecular Weight** 86.09  
**Evaporation Rate** Not applicable - Solid

## SECTION 10: STABILITY AND REACTIVITY

**10.1. Reactivity** None known, based on information available

**10.2. Chemical stability** Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

**Hazardous Polymerization** Hazardous polymerization does not occur.  
**Hazardous Reactions** None under normal processing.

**10.4. Conditions to avoid** Incompatible products. Excess heat.

**10.5. Incompatible materials** Strong oxidizing agents. Strong acids. Strong bases. Finely powdered metals. Acid anhydrides. Acid chlorides.

**10.6. Hazardous decomposition products** Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>). Thermal decomposition can lead to release of irritating gases and vapors.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

#### Product Information

(a) acute toxicity;  
Oral Category 3  
Dermal Category 3  
Inhalation Category 3

#### Toxicology data for the components

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
2-Butyne-1,4-diol	176 mg/kg (Rat female)	659 mg/kg (Rat)	0.69 mg/L/4h (Rat)
Formaldehyde	500 mg/kg (Rat)	LD50 = 270 mg/kg (Rabbit)	0.578 mg/L (Rat) 4 h

Component	ECHA (RAC) ATE (Oral)	ECHA (RAC) ATE (Dermal)	ECHA (RAC) ATE (Inhalation)
Formaldehyde	oral: ATE = 100 mg/kg bw	-	inhalation: ATE = 100 ppmV (gases)

(b) skin corrosion/irritation; Category 1 B

(c) serious eye damage/irritation; Category 1

(d) respiratory or skin sensitization;  
Respiratory Based on available data, the classification criteria are not met

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**Skin** Category 1

Component	Test method	Test species	Study result
Formaldehyde 50-00-0 ( 0.01-0.1 )	Skin sensitization Test method Patch Test	Man guinea pig	Sensitizer Sensitization
	Respiratory sensitization in vitro		

May cause sensitization by skin contact

**(e) germ cell mutagenicity;** Based on available data, the classification criteria are not met  
Not mutagenic in AMES Test

**(f) carcinogenicity;** Based on available data, the classification criteria are not met  
The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	EU	UK	Germany	IARC
Formaldehyde	Carc Cat. 1B	Cat 3		Group 1

**(g) reproductive toxicity;** Based on available data, the classification criteria are not met

**(h) STOT-single exposure;** Category 3  
**Results / Target organs** Respiratory system.

**(i) STOT-repeated exposure;** Category 2  
**Target Organs** Liver, Kidney, spleen.

**(j) aspiration hazard;** Not applicable  
Solid

**Symptoms / effects, both acute and delayed** Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing.

## 11.2. Information on other hazards

**Endocrine Disrupting Properties** Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

**Ecotoxicity effects** Do not empty into drains. Contains a substance which is: Harmful to aquatic organisms. The product contains following substances which are hazardous for the environment.

Component	Freshwater Fish	Water Flea	Freshwater Algae
2-Butyne-1,4-diol	49.3 - 58.3 mg/L LC50 96 h	26.8 mg/L EC50 = 48 h	430 mg/L EC50 = 96 h 480 mg/L EC50 = 72 h
Formaldehyde	Leuciscus idus: LC50 = 15 mg/L 96h	EC50 = 20 mg/L 96h EC50 = 2 mg/L 48h	EC50 (72h) = 4.89 mg/L (Desmodesmus subspicatus)

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Component	Microtox	M-Factor
2-Butyne-1,4-diol	EC50 = 1343 mg/L 48 h EC50 = 2940 mg/L 17 h	

## 12.2. Persistence and degradability

Readily biodegradable

Persistence is unlikely.

Component	Degradability
Formaldehyde 50-00-0 ( 0.01-0.1 )	Readily biodegradable (OECD guideline 301A, 301C and 301D) under aerobic and anaerobic conditions.

**Degradation in sewage treatment plant**

Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

## 12.3. Bioaccumulative potential

Bioaccumulation is unlikely

Component	log Pow	Bioconcentration factor (BCF)
2-Butyne-1,4-diol	-0.73	3.16
Formaldehyde	-0.35	No data available

## 12.4. Mobility in soil

The product is water soluble, and may spread in water systems . Will likely be mobile in the environment due to its water solubility. Highly mobile in soils

## 12.5. Results of PBT and vPvB assessment

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB).

## 12.6. Endocrine disrupting properties

**Endocrine Disruptor Information**

This product does not contain any known or suspected endocrine disruptors

## 12.7. Other adverse effects

**Persistent Organic Pollutant**  
**Ozone Depletion Potential**

This product does not contain any known or suspected substance

This product does not contain any known or suspected substance

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste from Residues/Unused Products**

Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

**Contaminated Packaging**

Dispose of this container to hazardous or special waste collection point.

**European Waste Catalogue (EWC)**

According to the European Waste Catalog, Waste Codes are not product specific, but application specific.

**Other Information**

Do not flush to sewer. Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

## SECTION 14: TRANSPORT INFORMATION

**IMDG/IMO**

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**14.1. UN number** UN2716  
**14.2. UN proper shipping name** 1,4-Butynediol  
**14.3. Transport hazard class(es)** 6.1  
**14.4. Packing group** III

**ADR**

**14.1. UN number** UN2716  
**14.2. UN proper shipping name** 1,4-Butynediol  
**14.3. Transport hazard class(es)** 6.1  
**14.4. Packing group** III

**IATA**

**14.1. UN number** UN2716  
**14.2. UN proper shipping name** 1,4-Butynediol  
**14.3. Transport hazard class(es)** 6.1  
**14.4. Packing group** III

**14.5. Environmental hazards** No hazards identified  
**14.6. Special precautions for user** No special precautions required.  
**14.7. Maritime transport in bulk according to IMO instruments** Not applicable, packaged goods

**SECTION 15: REGULATORY INFORMATION**

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

**International Inventories**

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
2-Butyne-1,4-diol	110-65-6	203-788-6	-	-	X	X	X	X	X
4-Methylene-2-pentyne-1,5-diol	881313-36-6	-	-	-	-	-	-	-	-
Formaldehyde	50-00-0	200-001-8	-	-	X	X	KE-17074	X	X

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	DSL	NDSL	AICS	NZIoC	PICCS
2-Butyne-1,4-diol	110-65-6	X	ACTIVE	X	-	X	X	X
4-Methylene-2-pentyne-1,5-diol	881313-36-6	-	-	-	-	-	-	-
Formaldehyde	50-00-0	X	ACTIVE	X	-	X	X	X

**Legend:** X - Listed '-' - Not Listed      **KECL** - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

**Authorisation/Restrictions according to EU REACH**

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
2-Butyne-1,4-diol	110-65-6	-	Use restricted. See entry 75. (see link for restriction)	-

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			details)	
4-Methylene-2-pentyne-1,5-diol	881313-36-6	-	-	-
Formaldehyde	50-00-0	-	Use restricted. See entry 72. (see link for restriction details) Use restricted. See entry 77. (see link for restriction details) Use restricted. See entry 28. (see link for restriction details) Use restricted. See entry 75. (see link for restriction details)	-

**REACH links**

<https://echa.europa.eu/substances-restricted-under-reach>

**Seveso III Directive (2012/18/EC)**

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
2-Butyne-1,4-diol	110-65-6	Not applicable	Not applicable
4-Methylene-2-pentyne-1,5-diol	881313-36-6	Not applicable	Not applicable
Formaldehyde	50-00-0	5 tonne	50 tonne

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

Component	CAS No	OECD HPV	Restriction of Hazardous Substances (RoHS)	Basel Convention (Hazardous Waste)
2-Butyne-1,4-diol	110-65-6	Listed	Not applicable	Not applicable
4-Methylene-2-pentyne-1,5-diol	881313-36-6	Not applicable	Not applicable	Not applicable
Formaldehyde	50-00-0	Listed	Not applicable	Not applicable

**Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals**

Not applicable

**Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?**

Not applicable

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .

Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

Take note of Dir 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations

**National Regulations**

**UK** - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

**WGK Classification**

See table for values

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
2-Butyne-1,4-diol	WGK 2	Class I : 20 mg/m <sup>3</sup> (Massenkonzentration)
Formaldehyde	WGK 3	Krebserzeugende Stoffe - : 5 mg/m <sup>3</sup> (Massenkonzentration)

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2-Butyne-1,4-diol

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<b>Component</b>	<b>France - INRS (Tables of occupational diseases)</b>
Formaldehyde	Tableaux des maladies professionnelles (TMP) - RG 43

<b>Component</b>	<b>Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81)</b>	<b>Switzerland - Ordinance on Incentive Taxes on Volatile Organic Compounds (OVOC)</b>	<b>Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure</b>
Formaldehyde 50-00-0 ( 0.01-0.1 )		Group I	

## 15.2. Chemical safety assessment

Chemical Safety Assessment/Reports (CSA/CSR) are not required for mixtures

## SECTION 16: OTHER INFORMATION

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

H301 - Toxic if swallowed  
H311 - Toxic in contact with skin  
H331 - Toxic if inhaled  
H314 - Causes severe skin burns and eye damage  
H317 - May cause an allergic skin reaction  
H318 - Causes serious eye damage  
H335 - May cause respiratory irritation  
H373 - May cause damage to organs through prolonged or repeated exposure  
H341 - Suspected of causing genetic defects  
H350 - May cause cancer

### Legend

**CAS** - Chemical Abstracts Service

**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**IECSC** - Chinese Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**ENCS** - Japanese Existing and New Chemical Substances

**AICS** - Australian Inventory of Chemical Substances

**NZIoC** - New Zealand Inventory of Chemicals

**WEL** - Workplace Exposure Limit

**ACGIH** - American Conference of Governmental Industrial Hygienists

**DNEL** - Derived No Effect Level

**RPE** - Respiratory Protective Equipment

**LC50** - Lethal Concentration 50%

**NOEC** - No Observed Effect Concentration

**PBT** - Persistent, Bioaccumulative, Toxic

**TWA** - Time Weighted Average

**IARC** - International Agency for Research on Cancer Predicted No Effect Concentration (PNEC)

**LD50** - Lethal Dose 50%

**EC50** - Effective Concentration 50%

**POW** - Partition coefficient Octanol:Water

**vPvB** - very Persistent, very Bioaccumulative

**ADR** - European Agreement Concerning the International Carriage of Dangerous Goods by Road

**IMO/IMDG** - International Maritime Organization/International Maritime Dangerous Goods Code

**OECD** - Organisation for Economic Co-operation and Development

**BCF** - Bioconcentration factor

**Key literature references and sources for data**

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

**ICAO/IATA** - International Civil Aviation Organization/International Air Transport Association

**MARPOL** - International Convention for the Prevention of Pollution from Ships

**ATE** - Acute Toxicity Estimate

**VOC** - (Volatile Organic Compound)

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

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<b>Physical hazards</b>	On basis of test data
<b>Health Hazards</b>	Calculation method
<b>Environmental hazards</b>	Calculation method

## Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

<b>Prepared By</b>	Health, Safety and Environmental Department
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<b>Revision Summary</b>	.

**This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as amended.**

## Disclaimer

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

**End of Safety Data Sheet**