

### SECTION 1: Identification

#### 1.1. Identification

Product form : Substance  
Substance name : 1,4 Butanediol  
CAS-No. : 110-63-4  
Formula : C<sub>4</sub>H<sub>10</sub>O<sub>2</sub>  
Synonyms : 1,4-BD / 1,4-butanediol / 1,4-butylene glycol / 1,4-dihydroxybutane / 1,4-tetramethylene glycol / 4G / agrisynth B1D / BDO / butaani-1,4-dioli / butane-1,4-diol / butanediol / butanediol-1,4 / butylène glycol-1,4 / butylène-1,4 glycol / DIOL 1,4 B / DIOL 14 B / SUCOL B / tetramethylene 1,4-diol / tetramethylene glycol / tetramethylene-1,4-glycol  
BIG no : 10673

#### 1.2. Recommended use and restrictions on use

Use of the substance/mixture : Chemical intermediate  
Solvent  
Wetting agent  
Monomer

#### 1.3. Supplier

<u>Atlanta Branch Office</u>	<u>Ocoee Branch Office</u>	<u>Spartanburg Branch Office</u>
Whitaker Oil Company	Whitaker Oil Company	Whitaker Chemicals LLC
1557 Marietta Road NW	280 Enterprise Street	405 John Dodd Road
Atlanta, GA 30318	Ocoee, FL 34761	Spartanburg, SC 29303
404-355-8220 (t)	407-656.0088 (t)	864-578-6968 (t)
404-355-2436 (f)	407-877-8335 (f)	864-578-6864 (f)

**WEBSITE:** www.whitakeroil.com      **EMAIL:** SDS@whitakeroil.com

#### 1.4. Emergency telephone number

Emergency number : **CHEMTREC** 800-424-9300

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Acute toxicity (oral) Category 4 H302 Harmful if swallowed  
Specific target organ toxicity (single exposure) Category 3 H336 May cause drowsiness or dizziness

Full text of H statements : see section 16

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) : Warning  
Hazard statements (GHS-US) : H302 - Harmful if swallowed  
H336 - May cause drowsiness or dizziness  
Precautionary statements (GHS-US) : P261 - Avoid breathing dust, fume, gas, mist, spray, vapors  
P264 - Wash Skin thoroughly after handling  
P270 - Do not eat, drink or smoke when using this product  
P271 - Use only outdoors or in a well-ventilated area  
P301+P312 - If swallowed: Call a POISON CENTER or doctor/physician if you feel unwell  
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing  
P312 - Call a POISON CENTER or doctor/physician if you feel unwell

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P330 - Rinse mouth  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed  
P405 - Store locked up  
P501 - Dispose of contents/container in accordance with local, regional, national, and/or international regulations.

### 2.3. Other hazards which do not result in classification

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substances

Substance type : Mono-constituent

Name	Product identifier	%	GHS-US classification
1,4 Butanediol (Main constituent)	(CAS-No.) 110-63-4	>=99.5	Acute Tox. 4 (Oral), H302 STOT SE 3, H336

Full text of hazard classes and H-statements : see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

First-aid measures after inhalation : Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact : Rinse with water. Soap may be used. Take victim to a doctor if irritation persists.

First-aid measures after eye contact : Rinse with water. Remove contact lenses, if present and easy to do. Continue rinsing. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion : Rinse mouth with water. Call Poison Control Center. Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital.

### 4.2. Most important symptoms and effects (acute and delayed)

Potential Adverse human health effects and symptoms : Harmful if swallowed. Practically non-toxic in contact with skin (LD50 skin > 2000 mg/kg). Not irritant to skin. Practically non-toxic by inhalation (LC50 inh, rat > 5 mg/l/4h). May cause drowsiness or dizziness. Not irritant to eyes.

Symptoms/effects : May cause drowsiness or dizziness.

Symptoms/effects after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Dizziness. Narcosis.

Symptoms/effects after skin contact : No effects known.

Symptoms/effects after eye contact : No effects known.

Symptoms/effects after ingestion : No effects known.

Chronic symptoms : No effects known.

### 4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Quick-acting ABC powder extinguisher. Quick-acting BC powder extinguisher. Quick-acting class B foam extinguisher. Quick-acting CO2 extinguisher. Class B foam (alcohol-resistant). Water spray if puddle cannot expand.

Unsuitable extinguishing media : Water (quick-acting extinguisher, reel); risk of puddle expansion. Water; risk of puddle expansion.

### 5.2. Specific hazards arising from the chemical

Fire hazard : DIRECT FIRE HAZARD: Combustible. INDIRECT FIRE HAZARD: Temperature above flashpoint: higher fire/explosion hazard.

Reactivity : Reacts violently with (strong) oxidizers.

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### 5.3. Special protective equipment and precautions for fire-fighters

- Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: seal off low-lying areas. Exposure to fire/heat: have neighborhood close doors and windows.
- Firefighting instructions : Cool tanks/drums with water spray/remove them into safety.
- Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

## SECTION 6: Accidental release measures

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

#### 6.1.1. For non-emergency personnel

- Protective equipment : Gloves. Protective clothing.
- Emergency procedures : Mark the danger area. No naked flames. Wash contaminated clothes.

#### 6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

### 6.2. Environmental precautions

Avoid release to the environment.

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

- For containment : Contain released product, pump into suitable containers. Plug the leak, cut off the supply.
- Methods for cleaning up : Take up liquid spill into inert absorbent material, e.g.: sand, saw dust, kieselguhr. Take up liquid spill into inert absorbent material, e.g.: sand, earth, vermiculite or powdered limestone. Scoop absorbed substance into closing containers. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.
- Other information : Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

For further information refer to section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- Precautions for safe handling : Use earthed equipment. Keep away from naked flames/heat. In finely divided state: use spark-/explosionproof appliances. Finely divided: keep away from ignition sources/sparks. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Thoroughly clean/dry the installation before use.
- Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

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

- Storage conditions : Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool.
- Storage temperature : 20 - 80 °C
- Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources.
- Information on mixed storage : KEEP SUBSTANCE AWAY FROM: oxidizing agents.
- Storage area : Store in a dry area. Ventilation at floor level. Provide the tank with earthing. Keep out of direct sunlight. May be stored under nitrogen. Meet the legal requirements.
- Special rules on packaging : SPECIAL REQUIREMENTS: closing. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.
- Packaging materials : SUITABLE MATERIAL: stainless steel. carbon steel. tin. zinc. HDPE. LDPE (Low Density Poly Ethylene).

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

No additional information available

### 8.2. Appropriate engineering controls

- Appropriate engineering controls : Ensure good ventilation of the work station.
- Environmental exposure controls : Avoid release to the environment.

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### 8.3. Individual protection measures/Personal protective equipment

#### Materials for protective clothing:

GIVE GOOD RESISTANCE: butyl rubber

#### Hand protection:

Gloves

#### Eye protection:

Eye protection not required in normal conditions

#### Skin and body protection:

Protective clothing

#### Respiratory protection:

Full face mask with filter type A at conc. in air > exposure limit

## SECTION 9: Physical and chemical properties

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

Physical state	: Liquid
Appearance	: Liquid.
Color	: Colorless
Odor	: Almost odorless
Odor threshold	: No data available
pH	: 7 - 8 (50 %)
Melting point	: 20 °C (1013.25 hPa)
Freezing point	: No data available
Boiling point	: 230 °C (1013 hPa)
Critical temperature	: 380 °C
Critical pressure	: 41200 hPa
Flash point	: > 115 °C (Closed cup, 1013 hPa)
Relative evaporation rate (butyl acetate=1)	: < 1
Flammability (solid, gas)	: Not applicable.
Vapor pressure	: < 0.1 hPa (20 °C)
Relative vapor density at 20 °C	: 3.1
Relative density	: 1.02 (20 °C)
Relative density of saturated gas/air mixture	: 1
Specific gravity / density	: 1.02 g/cm <sup>3</sup> at 20 °C
Molecular mass	: 90.12 g/mol
Solubility	: Miscible with water. Soluble in ethanol. Soluble in acetone. Water: 25 °C, miscible Ethanol: complete Acetone: complete
Log Pow	: -0.88 (Experimental value, OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method, 25 °C)
Auto-ignition temperature	: 385 °C (1013 hPa)
Decomposition temperature	: < 200 °C
Viscosity, kinematic	: 83.2 mm <sup>2</sup> /s (20 °C, Calculated)
Viscosity, dynamic	: 84.9 mPa.s (20 °C)
Explosion limits	: 1.95 - 18.3 vol % LEL: 1.95 vol % UEL: 18.3 vol %
Explosive properties	: No data available
Oxidizing properties	: No data available

### 9.2. Other information

VOC content : 0 %

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Other properties : Gas/vapour heavier than air at 20°C. Hygroscopic. Slightly volatile.

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

Reacts violently with (strong) oxidizers.

#### 10.2. Chemical stability

Hygroscopic.

#### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

#### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

#### 10.5. Incompatible materials

No additional information available

#### 10.6. Hazardous decomposition products

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

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed.

1,4 Butanediol (110-63-4)	
LD50 oral rat	1500 mg/kg body weight (Equivalent or similar to OECD 401, Rat, Male/female, Experimental value)
LD50 dermal rat	> 5000 mg/kg (Other, 24 h, Rat, Male/female, Experimental value)
LC50 inhalation rat (mg/l)	> 5.1 mg/l (OECD 403: Acute Inhalation Toxicity, 4 h, Rat, Male/female, Experimental value)
ATE US (oral)	1525 mg/kg body weight

Skin corrosion/irritation : Not classified  
pH: 7 - 8 (50 %)

Serious eye damage/irritation : Not classified  
pH: 7 - 8 (50 %)

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity – single exposure : May cause drowsiness or dizziness.

Specific target organ toxicity – repeated exposure : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Harmful if swallowed. Practically non-toxic in contact with skin (LD50 skin > 2000 mg/kg). Not irritant to skin. Practically non-toxic by inhalation (LC50 inh, rat > 5 mg/l/4h). May cause drowsiness or dizziness. Not irritant to eyes.

Symptoms/effects : May cause drowsiness or dizziness.

Symptoms/effects after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Dizziness. Narcosis.

Symptoms/effects after skin contact : No effects known.

Symptoms/effects after eye contact : No effects known.

Symptoms/effects after ingestion : No effects known.

Chronic symptoms : No effects known.

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008.

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- Ecology - air : Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014). Photolysis in the air. Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).
- Ecology - water : Slightly harmful to crustacea. Not harmful to fishes. Not harmful to activated sludge. Slightly harmful to algae.

1,4 Butanediol (110-63-4)	
LC50 fish 1	> 30000 mg/l (Equivalent or similar to OECD 203, 96 h, Pimephales promelas, Static system, Fresh water, Experimental value)
EC50 Daphnia 1	813 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Static system, Fresh water, Experimental value)

### 12.2. Persistence and degradability

1,4 Butanediol (110-63-4)	
Persistence and degradability	Readily biodegradable in water.
ThOD	1.95 g O <sub>2</sub> /g substance

### 12.3. Bioaccumulative potential

1,4 Butanediol (110-63-4)	
BCF fish 1	3.16 (BCFBAF v3.00, Calculated value)
Log Pow	-0.88 (Experimental value, OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method, 25 °C)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

### 12.4. Mobility in soil

1,4 Butanediol (110-63-4)	
Surface tension	0.045 N/m (20 °C)
Ecology - soil	Highly mobile in soil.

### 12.5. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Disposal methods

- Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
- Product/Packaging disposal recommendations : Do not discharge into surface water. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle by distillation. Remove to an authorized waste incinerator for solvents with energy recovery. May be discharged to wastewater treatment installation.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

- Other information : No supplementary information available.

### Transportation of Dangerous Goods

### Transport by sea

### Air transport

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### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

##### 1,4 Butanediol (110-63-4)

SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard
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#### 15.2. International regulations

##### CANADA

No additional information available

##### EU-Regulations

No additional information available

##### National regulations

No additional information available

#### 15.3. US State regulations

No additional information available

### SECTION 16: Other information

Revision date : 04/11/2018

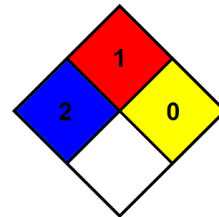
Full text of H-phrases:

H302	Harmful if swallowed
H336	May cause drowsiness or dizziness

NFPA health hazard : 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

NFPA fire hazard : 1 - Materials that must be preheated before ignition can occur.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



SDS US (GHS HazCom 2012)

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