1,4 Butanediol
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Date of issue: 04/11/2018  Revision date: 04/11/2018  Supersedes: 04/07/2016  Version: 1.2

SECTION 1: Identification

1.1. Identification

Product form: Substance
Substance name: 1,4 Butanediol
CAS-No.: 110-63-4
Formula: C₄H₁₀O₂
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 / butylene glycol-1,4 / butylene-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

<table>
<thead>
<tr>
<th>Atlanta Branch Office</th>
<th>Ocoee Branch Office</th>
<th>Spartanburg Branch Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whitaker Oil Company</td>
<td>Whitaker Oil Company</td>
<td>Whitaker Chemicals LLC</td>
</tr>
<tr>
<td>1557 Marietta Road NW</td>
<td>280 Enterprise Street</td>
<td>405 John Dodd Road</td>
</tr>
<tr>
<td>Atlanta, GA 30318</td>
<td>Ocoee, FL 34761</td>
<td>Spartanburg, SC 29303</td>
</tr>
<tr>
<td>404-355-8220 (t)</td>
<td>407-656.0088 (t)</td>
<td>864-578-6988 (t)</td>
</tr>
<tr>
<td>404-355-2436 (t)</td>
<td>407-877-8335 (t)</td>
<td>864-578-8684 (t)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4 Butanediol (Main constituent)</td>
<td>(CAS-No.) 110-63-4</td>
<td>&gt;=99.5</td>
<td>Acute Tox. 4 (Oral), H302 STOT SE 3, H336</td>
</tr>
</tbody>
</table>

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 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


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.
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.


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.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling


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.
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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Liquid.</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Almost odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>7 - 8 (50 %)</td>
</tr>
<tr>
<td>Melting point</td>
<td>20 °C (1013.25 hPa)</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>230 °C (1013 hPa)</td>
</tr>
<tr>
<td>Critical temperature</td>
<td>&gt; 380 °C</td>
</tr>
<tr>
<td>Critical pressure</td>
<td>41200 hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 115 °C (Closed cup, 1013 hPa)</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>&lt; 0.1 hPa (20 °C)</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>3.1</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.02 (20 °C)</td>
</tr>
<tr>
<td>Relative density of saturated gas/air mixture</td>
<td>1</td>
</tr>
<tr>
<td>Specific gravity / density</td>
<td>1.02 g/cm³ at 20 °C</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>90.12 g/mol</td>
</tr>
<tr>
<td>Log Pow</td>
<td>-0.88 (Experimental value, OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method, 25 °C)</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>385 °C (1013 hPa)</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&lt; 200 °C</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>83.2 mm²/s (20 °C, Calculated)</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>84.9 mPa.s (20 °C)</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>1.95 - 18.3 vol %</td>
</tr>
<tr>
<td>LEL: 1.95 vol %</td>
<td></td>
</tr>
<tr>
<td>UEL: 18.3 vol %</td>
<td></td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>1500 mg/kg body weight (Equivalent or similar to OECD 401, Rat, Male/female, Experimental value)</td>
</tr>
<tr>
<td>LD50 dermal rat</td>
<td>&gt; 5000 mg/kg (Other, 24 h, Rat, Male/female, Experimental value)</td>
</tr>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
<td>&gt; 5.1 mg/l (OECD 403: Acute Inhalation Toxicity, 4 h, Rat, Male/female, Experimental value)</td>
</tr>
<tr>
<td>ATE US (oral)</td>
<td>1525 mg/kg body weight</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Not classified  
\[\text{pH: 7 - 8 (50 \%)}\]

Serious eye damage/irritation: Not classified  
\[\text{pH: 7 - 8 (50 \%)}\]

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.
Ecology - air


Ecology - water


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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>&gt; 30000 mg/l (Equivalent or similar to OECD 203, 96 h, Pimephales promelas, Static system, Fresh water, Experimental value)</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>813 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Static system, Fresh water, Experimental value)</td>
</tr>
</tbody>
</table>

#### 12.2. Persistence and degradability

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

- Persistence and degradability: Readily biodegradable in water.
- ThOD: 1.95 g O₂ /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 |

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:

<table>
<thead>
<tr>
<th>H302</th>
<th>Harmful if swallowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>H336</td>
<td>May cause drowsiness or dizziness</td>
</tr>
</tbody>
</table>

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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