



## INTERNATIONAL DIOL COMPANY

### Safety Data Sheet

According to Regulation (EC) No. 1272/2008, Regulation (EC) 1907/2006

#### 1. Identification of the substance/mixture and of the responsible company

1.1. Product Identifier: gamma butyrolactone (GBL) CAS NO: 96-48-0

DIHYDRO-2(3H)-FURANONE; GAMMABUTALACTONE;  
1,4-BUTANOLIDE; 4-BUTANOLIDE; BUTYRIC ACID LACTONE; GAMMABUTYROLACTONE;  
4-BUTYROLACTONE; GAMMA-BUTYRYL LACTONE; 4-DEOXYTETRONIC  
ACID; 4-HYDROXYBUTANOIC ACID LACTONE; GAMMA-HYDROXYBUTYRIC ACID  
LACTONE; 2-OXOTETRAHYDROFURAN; TETRAHYDRO-2-FURANONE;  
4-HYDROXYBUTYRIC ACID LACTONE; GAMMA BL; BLO; C4H6O2

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

Identified uses: chemical intermediate for chemical synthesis, solvent in cleaning formulations.

Uses advised against: cosmetics, personal care products, other chemical uses other than as a solvent or reactive chemical product

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

**International Diol Company**  
**PO Box 12021**  
**Jubail Industrial City - 31961**  
**Kingdom Of Saudi Arabia.**

**Website:** [www.sipchem.com/en/affiliates2.htm](http://www.sipchem.com/en/affiliates2.htm)

1.4. Emergency telephone number: 00966-359 9985 (24 hours)

#### 2. Hazards Identification

Gamma Butyrolactone CAS 96-48-0 Purity: >99%

Trace Impurities: butanediol, acidic materials, acetals and aldehydes

2.1 Classification of the substance or mixture:

Classification of Labeling in accordance with the CLP Regulations:

Index No	International Chemical Identification	EC No	CAS No	Classification		Labeling			Specific Conc. Limits, M-factors	Notes	
				Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram Signal Word Code(s)	Hazard Statement Code(s)	Suppl. Hazard statement Code(s)			
	γ butyrolactone	202-509-5	96-48-0	Xn, Xi; R22-36	Acute Tox. 4; Eye Dam. 1; STOT SE 3;	GHS07 GHS08	H302, H336	H318,		100	

**Classification according to Regulation 1272/2008/EC (CLP)**

**Basis for Classification** This substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation, GHS)

**Gamma Butyrolactone (96-48-0)****Symbol(s):****Signal Word:** Danger**Hazard(s):****H302:** Harmful if swallowed**H433:** Harmful to terrestrial vertebrates**Prevention:****P264:** Wash ... thoroughly after handling.**P270:** Do not eat, drink or smoke when using this product.**Response:****P301+P312:** IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.**P330:** Rinse mouth.**Disposal:****P501:** Dispose of contents/container to all governmental regulations. Incineration is a preferred method.**SAFETY DATA SHEET****Emergency overview: DANGER**

Harmful if ingested or inhaled. Avoid skin contact.

**Potential chronic health effects:****CARCINOGENIC EFFECTS:** No carcinogenic effects reported**MUTAGENIC EFFECTS:** See Section 11.**REPRODUCTION TOXICITY:** See Section 11.

2.1. Label: See table above.

2.2. Other hazards: None known.

**3. Composition/information on ingredients**

Formula	C <sub>4</sub> H <sub>6</sub> O <sub>2</sub>
CAS-No.	98-48-0
EC-No.	202-509-5
Mol Wt.	86.1 g/mol

**4. First Aid Measures**

## 4.1. Description of first aid measures

**Eye Contact:** Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

**Skin Contact:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

**Inhalation:** Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Ingestion:** Wash out mouth and water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

4.2. Most important symptoms and effects, both acute and delayed:

At high levels CNS disorders, headache, dizziness, unconsciousness. Potential damage to liver and kidneys.

4.3. Indication of immediate medical attention and special treatment needed:

Treat symptomatically and supportively

## 5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Water spray (fog), dry chemical, CO<sub>2</sub>, foams

Unsuitable extinguishing media: Do not use a water jet.

5.2. Special hazards arising from the substance or mixture:

Vapors are heavier than air and may spread along floor surfaces.

5.3. Advice for fire fighters:

Special protective equipment for fire fighters: Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Prevent mixing with alkali and amines materials.

Further information: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving a personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. Do not allow fire extinguishing water to contaminate surface or groundwater systems.

## 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures:

Advice for non-emergency personnel: Evacuate the danger zone; follow emergency precautions. Secure emergency assistance immediately. Avoid contact with the material; do not mists. If possible, provide additional ventilation.

Advice for emergency responders: Do not take action without proper training and emergency equipment. See Section 8 for additional information. Evacuate surrounding areas. Eliminate all ignition sources including flares and all open flames. Avoid all contact with spilled material. Maintain adequate ventilation and wear appropriate respiratory protection.

6.2. Environmental precautions:

Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3. Methods and materials for containment:

Stop leak or spill if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, surface waters, basements or confined areas. Wash spillage into effluent treatment plant. Contain and collect spillage using appropriate personal protective equipment. Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products or if a risk assessment indicates this is necessary. Collect and contain spillage with non-combustible, absorbent material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in a container for disposal according to local regulations. Use spark-

proof tools and explosion proof equipment if flammable gasses, liquids or vapors are present in the spill area. Contaminated absorbent material may pose the same hazard(s) as the spilled product.

#### 6.4. Reference to other sections:

See disposal instruction 13 and exposure controls Section 8.

## 7. Handling and storage

### 7.1. Precautions for safe handling:

Observe all label precautions. Use appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on protection against fire and explosion: Keep away from flames and sources of ignition – including static.

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

Store in accordance with local regulations. Store in a segregated and approved area. Store in original or bulk storage container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials, amines and alkalis. It is recommended to keep product locked while in storage.

Bulk storage should be in approved vessels, preferably stainless steel that is grounded and vented. Keep use containers tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Do not store in mild steel containers.

### 7.3. Specific end uses:

No other additional special end uses are anticipated.

## 8. Exposure controls/personal protection

### 8.1. Control parameters:

Personal, workplace or environmental monitoring may be necessary to ensure exposures are below recommended and legal limits.

Exposure limits:

**ACGIH, NIOSH, OSHA (US), Mexico, and EU** have not developed exposure limits for gamma butyrolactone. Use recommended safe handling practices to minimize unnecessary exposure.

#### **Exposure Limits for Chemicals which may be generated during processing**

No information available. No known components of this product have exposure limits.

### 8.2. Exposure controls:

Engineering measures: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures:

**Hygiene measures:** Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Discard contaminated clothing or wash thoroughly before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection:** Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to product dusts, liquid splashes or mists. Goggles should be worn where eye contact is possible.

**Hand protection:** Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is required.

**Glove material:** nitrile, butyl rubber or PVC  
**Glove thickness:** 0.7 mm or thicker  
**Break through time:** > 240 minutes

**Other protective equipment:** Flame retardant antistatic protective clothing may be required if used in areas where flammables are processed.

**Respiratory protection:** A properly fitted air purifying respirator or air supply respirator should be worn if a risk assessment indicates that respiratory protection is necessary. Respirator selection must be based upon known or measured levels of exposure.

**Environmental exposure controls:** Ventilation and engineering controls to protect workers and ventilate work area to at or below recommended employee exposure levels. Technical measures are preferred over use of personal protective equipment. Environmental controls, such as scrubber or thermal oxidizer may be required to prevent process releases to the atmosphere. Do not empty or flush into drains.

## 9. Physical and chemical properties

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

<b>Physical State:</b> Liquid	<b>Appearance:</b> clear
<b>Color:</b> colorless to light yellow	<b>Physical Form:</b> liquid
<b>Odor:</b> faint odor	<b>Odor Threshold:</b> Not available
<b>Texture:</b> oily, viscous	<b>pH:</b> 4 10% solution (20 °C)
<b>Melting Point:</b> Not available	<b>Boiling Point:</b> 204-206 °C
<b>Evaporation Rate:</b> <1 (0.03) butyl acetate=1	<b>Flash Point:</b> 93.3 °C CC
<b>LEL:</b> 0.3 %	<b>OSHA Flammability Class:</b> IIIB
<b>UEL:</b> 16 %	<b>Autoignition:</b> 455 °C
<b>Vapor Pressure:</b> 0.16 mmHg 20 °C	<b>Vapor Density (air = 1):</b> 3
<b>Density:</b> Not available	<b>Specific Gravity (water = 1):</b> 1.017
<b>Water Solubility:</b> soluble	<b>Coeff. Water/Oil Dist:</b> Not available
<b>Viscosity:</b> Not available	<b>Volatility:</b> 100%
<b>Molecular Weight:</b> 86.10	<b>Molecular Formula:</b> C-H2-C-H2-C-H2-C-O-O

#### Solvent Solubility

**Soluble:** alcohols, ethers, benzene, organic solvents

## 10. Stability and reactivity

- 10.1. Reactivity:  
No hazardous reactivity.
- 10.2. Chemical stability:  
Stable at normal temperatures and pressure
- 10.3. Possibility of hazardous reactions:  
Avoid contact with heat, acids or amines.
- 10.4. Conditions to avoid:  
Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials
- 10.5. Incompatible materials:  
Acids, oxidizing materials, metal oxides, metal salts,
- 10.6. Hazardous decomposition products:  
Thermal decomposition will yield oxides of carbon.

## 11. Toxicological information

- 11.1. Information on toxicological effects:

<u>Acute oral toxicity LD50 rat:</u>	1540 mg/kg (RTECS)
<u>Dermal LD50 rabbit:</u>	>2000 mg/kg (RTECS)
<u>Acute inhalation toxicity:</u>	>300 ppm 8 hours Rat (RTECS)
	>5100 mf/m <sup>3</sup> 4 hours Rat (RTECS)
<u>Skin irritation:</u>	Irritant, Rabbit (RTECS)
<u>Eye irritation (rabbit):</u>	Sever eye irritant (RTECS)
<u>Sensitization (guinea pig):</u>	No information available
<u>Genotoxicity and Reproductive Effects:</u>	<b>RTECS Tumorigenic</b>

The components of this material have been reviewed, and RTECS publishes the following endpoints:  
BUTYROLACTONE (96-48-0) 191 gm/kg Oral Mouse TDLo (2 year(s)); 134930 mg/kg Oral Mouse TDLo (103 week); 50 gm/kg Skin Mouse TDLo 42 week)

### **RTECS Mutagenic**

The components of this material have been reviewed, and RTECS publishes the following endpoints:  
BUTYROLACTONE (96-48-0) 20 uL/disc Bacillus subtilis; 2990000 ug/L/12 hour hamster (+/-S9); 4940 mg/L hamster; 2580 mg/L hamster; 25 mg/L hamster

### **RTECS Reproductive Effects**

The components of this material have been reviewed, and RTECS publishes the following endpoints:  
BUTYROLACTONE (96-48-0) 25 gm/kg Oral Rat TDLo (20 day(s)); 500 mg/kg Oral Rat TDLo (pregnant 6-15 day(s))

Specific target organ toxicity - single exposure:

Anesthetic effect on the central nervous system characterized by a loss of sensitization. Preliminary excitement is the initial effect followed by relaxation, stupor, or sleep., Nausea, Dizziness, Headache

Specific target organ toxicity - repeated exposure:

Anesthetic effects on the central nervous system. Liver - Irregularities - Based on Human Evidence

Aspiration hazard:

No information available

## 11.2. Additional information:

After uptake of large quantities:

Potential systemic effects:

Skin: May aggravate existing skin disorders and allergies.

Ingestion: May cause nausea and vomiting. Central nervous system effects may include excitation, euphoria, headache, dizziness, drowsiness, dullness, blurred vision, fatigue, tremors, convulsions, unconsciousness, severe narcosis, coma, respiratory arrest, and death, a result of collapse of the sympathetic and parasympathetic nervous system. May also affect renal function and cause renal damage. Animal studies also noted constriction of pupils and total loss of reflexes.

Further data:

Handle using good occupational and environmental health practices.

## 12. Ecological information

## 12.1. Toxicity

Toxicity to daphnia and other aquatic invertebrates: > 500mg/L (48hr, *Daphnia magna*) IUCLID

Toxicity to algae 79 mg/L (96hr, *Desmodesmus subspicatus*) IUCLID

## 12.2. Persistence and degradability:

Expected to be readily biodegradable

## 12.3. Bio accumulative potential:

Bioaccumulation not expected.

Mobility in soil:

No information available.

## 12.4. Results of PBT and vPvB assessment:

Assessment not available.

## 12.5. Other adverse effects:

No additional environmental adverse environmental effects are known.

Additional ecological information: Do not allow product to enter surface waters, wastewater or soil.

## 13. Disposal considerations

Waste treatment methods: The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## 14. Transport Information

The transport regulations are cited according to international and/or harmonized transport regulations. Possible national deviations and country specific requirements are not considered.

<b>US DOT Information:</b>	No Classification assigned.
<b>TDG Information:</b>	No Classification assigned.
<b>ADR Information:</b>	No Classification assigned.
<b>RID Information:</b>	No Classification assigned.
<b>IATA Information:</b>	No Classification assigned.
<b>ICAO Information:</b>	No Classification assigned.
<b>IMDG Information:</b>	No Classification assigned.



## 15. Regulatory information

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

#### U.S. Federal Regulations

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: No Chronic Health: No Fire: No Pressure: No Reactive: No

#### U.S. State Regulations

None of this product's components are listed on the state lists from CA, MA, MN, NJ or PA.

Not listed under California Proposition 65

#### Germany Water Classification :

BUTYROLACTONE (96-48-0)

ID Number 1286, hazard class 1 - low hazard to waters

Symbol(s) Xn Harmful Xi Irritant Risk Phrases

R22 Harmful if swallowed.

R36 Irritating to eyes.

Safety Phrases

S2 Keep out of the reach of children.

S13 Keep away from food, drink and animal feed stuffs.

S24 Avoid contact with skin.

S25 Avoid contact with eyes.

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36 Wear suitable protective clothing.

S46 If swallowed, seek medical advice immediately and show this container or label.

#### Regulatory Inventory Status

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
G Butyrolactone	96-48-0	Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes

### Globally Harmonized System of Classification and Labeling (GHS)

The listed component(s) of this material have been checked for country-specific published classifications according to the Globally Harmonized System of Classification and Labelling (GHS). The results of the queries are displayed below. Additional interpretations or reference information may be available for individual countries.

**Australia GHS Classifications** No published information available. This material may be hazardous according to published criteria for classification

**European Union GHS Classifications** No published information available. This material may be hazardous according to published criteria for classification

**Indonesia GHS Classifications** No published information available. This material may be hazardous according to published criteria for classification

#### Japan GHS Classifications

Classifications below published under Japan's Chemicals Classification Program according to the Globally Harmonized System of Classification and Labeling of

Chemicals (GHS) BUTYROLACTONE (96-48-0)

Acute toxicity Oral Category 4

H302 Harmful if swallowed Approval: 22A4075

Serious Eye Damage/Eye Irritation Category 2A

H319 Causes serious eye irritation Approval: 22A4075

Specific target organ toxicity - Single exposure Category 2

H371 May cause damage to organs, central nervous system Approval: 22A4075

Specific target organ toxicity - Single exposure Category 3

H336 May cause drowsiness or dizziness Approval: 22A4075

#### Japan GHS Labeling Information

Labeling information below according to classifications published by Japan's Chemicals Classification Program according to the Globally Harmonized System of Classification and Labeling of Chemicals

(GHS) BUTYROLACTONE (96-48-0)

Symbol(s)



Signal Word: Warning

Hazard(s)

H302 Harmful if swallowed

H319 Causes serious eye irritation

H371 May cause damage to organs

H336 May cause drowsiness or dizziness

Prevention

P271 Use only outdoors or in a well-ventilated area

P280 Wear protective gloves/protective clothing/eye protection/face protection

P260 Do not breathe dust/fume/gas/mist/vapours/spray  
P264 Wash thoroughly after handling  
P270 Do not eat, drink or smoke when using this product

#### Response

P308+P313 IF exposed or concerned: Get medical advice/attention  
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position 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  
P337+P313 If eye irritation persists: Get medical advice/attention  
P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell  
P330 Rinse mouth

#### Storage

P403+P233 Store in a well-ventilated place. Keep container tightly closed  
P405 Store locked up

#### Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulations

**Korea GHS Classifications (SV)** No published information available. This material may be hazardous according to published criteria for classification

#### New Zealand GHS Classifications

Classifications below according to the Environmental Risk Management Authority's (ERMA) Hazardous Substances and New Organisms (HSNO) Act, as amended.

BUTYROLACTONE (96-48-0) Approval: HSR003413

Acute toxicity Oral Category 4

H302 Harmful if swallowed

Serious Eye Damage/Eye Irritation Category 2

H319 Causes serious eye irritation

Hazardous to aquatic environment - acute hazard Category 3

H402 Harmful to aquatic life

Terrestrial Vertebrate Ecotoxicity Category 3

H433 Harmful to terrestrial vertebrates

#### New Zealand GHS Labeling Information

Labeling information below according to classifications published by New Zealand's Environmental Risk Management Authority's (ERMA) Hazardous Substances and New Organisms (HSNO) Act, as amended.

BUTYROLACTON

E (96-48-0)

Symbol(s)



Signal Word: Warning

**Hazard(s)**

H302 Harmful if swallowed  
H319 Causes serious eye irritation  
H402 Harmful to aquatic life  
H433 Harmful to terrestrial vertebrates

**Prevention**

P280 Wear protective gloves/protective clothing/eye protection/face protection  
P264 Wash thoroughly after handling  
P270 Do not eat, drink or smoke when using this product  
P273 Avoid release to the environment

**Response**

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P337+P313 If eye irritation persists: Get medical advice/attention  
P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell  
P330 Rinse mouth

**Disposal**

P501 Dispose of contents/container in accordance with local/regional/national/international regulations

**South Africa GHS Classifications** No published information available. This material may be hazardous according to published criteria for classification

**Taiwan GHS Classifications** No published information available. This material may be hazardous according to published criteria for classification

**Classification**

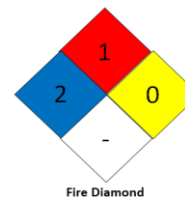
Acute toxicity, Category 3 Acute toxicity, Category 4  
Eye damage/irritation, Category 2A  
Specific target organ systemic toxicity following single exposure, Category 3  
Hazardous to the aquatic environment - acute hazard, Category 3

**Signal Word**

DANGER

**Hazard Statement(s)**

Toxic if inhaled Harmful if swallowed Causes serious eye irritation May cause drowsiness and dizziness Harmful to aquatic life



Sipchem has not conducted a chemical safety assessment for this product.

## 16. Other information

### 16.1. Training Advice:

Provide safety information, instruction and training to operators handling gamma butyrolactone.

The information and recommendations herein are taken from data contained in independent, industry recognized references. Although reasonable care has been taken in the preparation of the information herein, Sipchem and International Diol Company make no guarantee, warranty (express or implied) or other representation and assume no responsibility as to the accuracy or suitability of such information for application of the information, since conditions of its use are beyond control of these companies. Sipchem and International Diol Company shall not bear any liability whatsoever for any loss or damage incurred in connection with the use of this substance.