

# Material Safety Data Sheet

Glyoxal, 40 wt% solution in water

## Section 1 - Chemical Product

**MSDS Name:** Glyoxal, 40 wt% solution in water **Synonyms:**  
Biformal; Diformal; Ethandial; Glyoxylaldehyde.

## Section 2 - Composition, Information on Ingredients

| CAS#      | Chemical Name | Percent | EINECS/ELINCS |
|-----------|---------------|---------|---------------|
| 7732-18-5 | Water         | 60      | 231-791-2     |
| 107-22-2  | Glyoxal       | 40      | 203-474-9     |

## Section 3 - Hazards Identification

### EMERGENCY OVERVIEW

Appearance: almost colorless liquid.

**Warning!** Harmful if inhaled. Possible risks of irreversible effects. May cause

allergic skin reaction. Causes eye and skin irritation. May cause respiratory tract irritation.

**Target Organs:** Respiratory system, eyes, skin.

### Potential Health Effects

**Eye:** Causes eye irritation.

**Skin:** Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May be harmful if absorbed through the skin. In a human maximization test for contact allergens, glyoxal rated 5 on a scale of 1 to 5. The induction concentration was 10% glyoxal and the challenge concentration was 2% glyoxal. Glyoxal is considered to be a strong human contact sensitizer.

**Ingestion:** May cause irritation of the digestive tract. May be harmful if swallowed.

**Inhalation:** Harmful if inhaled. May cause respiratory tract irritation. Squamous cell metaplasia was observed in the rat larynx after 29 days of exposure (6 hours/day, 5 days/week) to 2 and 10 mg/m<sup>3</sup> of a 40% glyoxal aerosol.

**Chronic:** Prolonged or repeated skin contact may cause dermatitis. Exposure to high concentrations may cause central nervous system depression. Possible risk of irreversible effects. There is insufficient data to classify glyoxal as a human or animal carcinogen. Glyoxal was found to promote stomach carcinoma in animals in one study and to be a direct-acting mutagen in bacterial and mammalian cell assays in extensive testing. NIOSH has noted the similarity of its mutagenic profile to formaldehyde, acetaldehyde, and malonaldehyde and has advised concern regarding its carcinogenic

## Section 4 - First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin:** Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

**Ingestion:** Do not induce vomiting. Get medical aid.

**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

**Extinguishing Media:** Use water spray, dry chemical, carbon dioxide, or appropriate foam.

**Flash Point:** > 104 deg C (> 219.20 deg F)

**Autoignition Temperature:** 285 deg C ( 545.00 deg F)

**Explosion Limits, Lower:** Not available.

**Upper:** Not available.

**NFPA Rating:** (estimated) Health: 2; Flammability: 1; Instability: 1

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation. Do not let this chemical enter the environment.

## Section 7 - Handling and Storage

**Handling:** Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood.

**Storage:** Store in a tightly closed container. Store in a dry area. Store at around 20 癩.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be

equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

### Exposure Limits

| Chemical Name | ACGIH   | NIOSH       | OSHA - Final PELs |
|---------------|---|-------------|-------------------|
| Water         | none listed   | none listed | none listed       |
| Glyoxal       | 0.1 mg/m <sup>3</sup> TWA<br>(inhalable fraction and vapor) | none listed | none listed       |

**OSHA Vacated PELs:** Water: No OSHA Vacated PELs are listed for this chemical.

Glyoxal: No OSHA Vacated PELs are listed for this chemical.

### Personal Protective Equipment

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear - almost colorless

**Odor:** mild odor - characteristic odor

**pH:** 2 - 3.5 (400 g/L aq.sol.)

**Vapor Pressure:** 20.2 hPa @ 20 deg C

**Vapor Density:** Not available.

**Evaporation Rate:** Not available.

**Viscosity:** 8 mPa @ 20 deg C

**Boiling Point:** 104 deg C @ 760 mmHg

**Freezing/Melting Point:** -14 deg C

**Decomposition Temperature:** Not available.

**Solubility:** Miscible.

**Specific Gravity/Density:** 1.265

**Molecular Formula:** C<sub>2</sub>H<sub>2</sub>O<sub>2</sub>

**Molecular Weight:** 58.04

## Section 10 - Stability and Reactivity

**Chemical Stability:** Moisture sensitive. May polymerize. Heat sensitive

**Conditions to Avoid:** Incompatible materials, exposure to moist air or water, heat.

**Incompatibilities with Other Materials:** strong oxidizing agents, strong bases

**Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide.

**Hazardous Polymerization:** May occur.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS# 7732-18-5:**

**CAS# 107-22-2:**

**LD50/LC50:**

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 107-22-2:

Dermal, guinea pig: LD50 = 6600 mg/kg;

Draize test, rabbit, eye: 20 mg Severe;

Draize test, rabbit, eye: 100 uL/24H Moderate;

Draize test, rabbit, eye: 100 uL Mild;

Draize test, rabbit, skin: 500 uL/4H Mild;

Draize test, rabbit, skin: 10 mg/24H;

Inhalation, rat: LC50 = 2410 mg/m<sup>3</sup>/4H;

Oral, mouse: LD50 = 400 mg/kg;

Oral, mouse: LD50 = 1280 mg/kg;

Oral, rabbit: LD50 = >3175 mg/kg;

Oral, rat: LD50 = 200 mg/kg;

Oral, rat: LD50 = 200 mg/kg;

Oral, rat: LD50 = 4290

**Carcinogenicity:**

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 107-22-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** No information found

**Teratogenicity:** No information found

**Reproductive Effects:** No information found

**Mutagenicity:** See actual entry in RTECS for complete information.

**Neurotoxicity:** No information found

**Other Studies:**

## Section 12 - Ecological Information

**Ecotoxicity:** No data available. Fish toxicity: Brachidanio rerio LC50: 760 mg/l (48 h) Daphnia toxicity: Daphnia magna EC50: 430 mg/l (24 h) Bacteria toxicity: Pseudomonas putida EC50: 134 mg/l (16 h)

**Environmental:** Biodegradability: >80% (Method OECD 302 B, 28 d) DOC = 176.8 mgC/l COD = 342 mgO<sub>2</sub>/g

**Physical:** No information available.

**Other:** Do not empty into drains.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

## Section 14 - Transport Information

|                       | US DOT  | Canada TDG    |
|-----------------------|---------|---------------|
| <b>Shipping Name:</b> | GLYOXAL | Not Regulated |
| <b>Hazard Class:</b>  | None    |               |
| <b>UN Number:</b>     | None    |               |
| <b>Packing Group:</b> |         |               |

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 107-22-2 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

#### CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

#### SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

#### SARA Codes

CAS # 107-22-2: immediate.

**Section 313** No chemicals are reportable under Section 313.

#### Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

#### Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

#### OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

### STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 107-22-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

### California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

## **European/International Regulations**

### **European Labeling in Accordance with EC Directives**

#### **Hazard Symbols:**

XN

#### **Risk Phrases:**

R 36/38 Irritating to eyes and skin.

R 43 May cause sensitization by skin contact.

R 20 Harmful by inhalation.

R 68 Possible risk of irreversible effects.

#### **Safety Phrases:**

S 36/37 Wear suitable protective clothing and gloves.

### **WGK (Water Danger/Protection)**

CAS# 7732-18-5: No information available.

CAS# 107-22-2: 1

### **Canada - DSL/NDSL**

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 107-22-2 is listed on Canada's DSL List.

### **Canada - WHMIS**

This product has a WHMIS classification of D2B, D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

### **Canadian Ingredient Disclosure List**

CAS# 107-22-2 is listed on the Canadian Ingredient Disclosure List.