

Safety Data Sheet: Glyoxal 40%

1. Identification

Product name	Glyoxal 40% aqueous solution
Recommended use	Industrial crosslinking agent and chemical intermediate.
Supplier	Hainan Zhongxin Chemical Co., Ltd. (ZXCHEM)
Shanghai office	Room 1001, Building A, Caohejing Center, No. 1520 Gumei Road, Xuhui District, Shanghai, China
Contact	Tel: +86-21-54265599 sales@zxchem.com.cn
Emergency contact	+86-21-54265599 (office hours, China time, UTC+8)
Scope	Reference safety information for Glyoxal 40%. The reference composition, concentration and supply-grade differences are described in Section 3. This document does not certify the composition or transport status of a specific delivered batch or a different formulation.

2. Hazard identification

GHS / CLP classification	Skin irritation Category 2; eye irritation Category 2; skin sensitization Category 1; germ cell mutagenicity Category 2; specific target organ toxicity, single exposure Category 3 (respiratory system).
Label elements	Warning GHS07 (exclamation mark); GHS08 (health hazard).
Hazard statements	H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H335 May cause respiratory irritation. H341 Suspected of causing genetic defects.
Precautionary statements	P202 Do not handle until all safety precautions have been read and understood. P261 Avoid breathing mist or vapors. P280 Wear protective gloves/protective clothing/eye protection/face protection. P302+P352 IF ON SKIN: Wash with plenty of water. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308+P313 IF exposed or concerned: Get medical advice/attention.
Other hazards	No PBT or vPvB components at $\geq 0.1\%$. No components identified as endocrine disruptors at $\geq 0.1\%$ under REACH Article 57(f), Regulation (EU) 2017/2100 or Regulation (EU) 2018/605.



3. Composition / information on ingredients

Material type	Mixture: approximately 40% glyoxal in water. The following safety disclosure ranges belong to the selected aqueous reference, not a measured ZXCHEM batch recipe.
Glyoxal (ethanedial)	CAS 107-22-2; EC 203-474-9; index 605-016-00-7. $\geq 30\%$ to $< 50\%$. Ingredient classification: Acute Tox. 4 (H332), Skin Irrit. 2 (H315), Eye Irrit. 2 (H319), Skin Sens. 1 (H317), Muta. 2 (H341), STOT SE 3 (H335).
Ethylene glycol	CAS 107-21-1; EC 203-473-3. Selected reference impurity range $\geq 1\%$ to $< 10\%$. Presence and concentration in a supplied batch are not certified by this reference. Ingredient classification: Acute Tox. 4 (H302), STOT RE 2 (H373).
Aqueous carrier	Water. Hazardous ingredients are disclosed above; mixture classification is given in Section 2.

4. First-aid measures

General	Give attending medical personnel this SDS. Obtain medical assistance for exposure or persistent symptoms.
Inhalation	Move the person to fresh air and seek medical attention.
Skin contact	Remove contaminated clothing immediately. Rinse skin thoroughly with water or shower and seek medical attention.
Eye contact	Rinse with plenty of water. Remove contact lenses where possible and obtain urgent ophthalmological advice.
Ingestion	If conscious, give water to drink (no more than two glasses) and seek immediate medical attention.
Symptoms / treatment	Skin, eye and airway irritation; allergic skin response. See Sections 2 and 11. No specific treatment data available.

5. Fire-fighting measures

Extinguishing media	Water, foam, carbon dioxide or dry powder. No specific extinguishing-agent restriction is identified.
Fire hazards	Contains combustible ingredients. Fire can generate carbon oxides and other hazardous gases or vapors.
Firefighter protection	Wear self-contained breathing apparatus and protective clothing. Prevent skin contact. Keep contaminated firewater out of surface water and groundwater.

6. Accidental release measures

Personal precautions	Avoid breathing vapors or aerosols and avoid direct contact. Ventilate and evacuate the affected area. Use Section 8 protection and trained responders.
Environmental precautions	Keep material out of drains and waterways. Cover nearby drains.
Containment and cleanup	Contain and recover liquid spills by pumping or suitable liquid absorbent/neutralizing material. Collect for proper disposal; clean the affected area. See Sections 7, 10 and 13.

7. Handling and storage

Handling	Follow Section 2 precautions. Use ventilation, prevent mist and splash exposure, and wash exposed skin after handling.
Storage	Keep tightly closed at 5-30°C in a cool, dry, well-ventilated area. Protect from freezing, heat and direct sunlight.
Storage class	TRGS 510: Class 10 (combustible liquids). Keep away from incompatible materials listed in Section 10.
Specific use	Industrial formulation and chemical synthesis.

8. Exposure controls / personal protection

Control parameters	Country-specific occupational exposure limits are not included. Apply workplace limits for glyoxal and ethylene glycol in the applicable jurisdiction.
Engineering / hygiene	Provide ventilation to control vapors and aerosols. Wash hands and exposed skin after handling. Do not eat, drink or smoke during use.
Eyes / face	Use approved safety glasses, such as equipment meeting EN 166; use face protection for splash exposure.
Hands	Chemical-resistant nitrile gloves. Reference test: minimum thickness 0.11 mm, breakthrough time 480 minutes for full or splash contact. Confirm suitability with the glove supplier for the actual conditions and mixtures.
Body	Protective clothing appropriate to chemical exposure.
Respiratory	Respiratory protection is required when vapors/aerosols are generated. Recommended filter type: ABEK. Select and maintain approved equipment to the exposure assessment and manufacturer instructions (DIN EN 143 / DIN 14387).
Environment	Prevent entry to drains.

9. Physical and chemical properties

State / color / odor	Liquid; colorless; characteristic odor.
Melting / freezing point	-14°C
Boiling point	104°C at 1,013 hPa
pH	>2 to 3 at 20°C
Density	Approximately 1.27 g/cm ³ at 20°C
Dynamic viscosity	8 mPa.s at 20°C
Water solubility	Soluble at 20°C
Vapor pressure	20.2 hPa at 20°C; 106.7 hPa at 50°C
Partition coefficient	log Pow: -1.15. Bioaccumulation is not expected.
Explosive / oxidizing properties	Not classified as explosive; no oxidizing properties.
Other properties	No data available for flash point, flammability, explosion limits, autoignition temperature, decomposition temperature, kinematic viscosity, relative density or relative vapor density. Particle characteristics do not apply to the liquid form.

10. Stability and reactivity

Reactivity / stability	No general reactivity data available. Chemically stable under standard ambient conditions.
Hazardous reactions	Ammonia, amines and alkaline substances can cause violent polymerization. Exothermic reactions are reported with chlorosulfonic acid, ethyleneimine, sodium hydroxide, nitric acid and concentrated sulfuric acid.
Conditions / incompatibilities	Protect from freezing, excessive heat and contamination. Incompatible with aluminum, copper and mild steel.
Decomposition	Carbon oxides and hazardous vapors can be released in fire; see Section 5.

11. Toxicological information

Mixture acute toxicity	Oral LD50 (rat): >2,000 to <5,000 mg/kg. Inhalation LC50 (rat, 4 h, aerosol): 2.44 mg/L. Calculated inhalation ATE (4 h, vapor): >20 mg/L. Dermal LD50 (rat): >2,000 mg/kg.
Symptoms / local effects	Mouth and gastrointestinal mucosal irritation may follow ingestion. Inhalation may cause cough, shortness of breath and airway damage. Causes skin and serious eye irritation; may cause allergic skin reactions.
Mutagenicity / STOT	Suspected of causing genetic defects. May cause respiratory irritation after a single exposure. Mixture data are unavailable for repeated-exposure STOT, carcinogenicity, reproductive toxicity and aspiration hazard.
Glyoxal component	Oral LD50 (rat): 3,300 mg/kg (OECD 401); inhalation ATE (4 h, vapor): 11.1 mg/L (expert judgment); dermal LD50 (rabbit): 10,000 mg/kg. Positive guinea-pig sensitization (OECD 406). Positive in-vitro mutagenicity tests; negative rat-liver and mouse-bone-marrow in-vivo tests (OECD 486/474). Upper-airway irritation is reported.
Ethylene glycol component	Oral ATE: 500.1 mg/kg (expert judgment). Inhalation LC50 (rat, 6 h, aerosol): >2.5 mg/L; dermal LD50 (mouse): >3,500 mg/kg. Animal testing reports teratogenic/reproductive effects. Prolonged or repeated ingestion can damage kidneys. No irritation or sensitization was seen in the listed rabbit/guinea-pig tests; listed mutagenicity tests were negative.
Endocrine properties	No identified endocrine-disrupting components at $\geq 0.1\%$ under the criteria listed in Section 2. Handle with particular care; other hazardous effects cannot be excluded.

12. Ecological information

Mixture aquatic toxicity	Fish LC50 (Leuciscus idus, 96 h): 460-680 mg/L. Daphnia magna EC50 (48 h): 404 mg/L. Green algae IC50 (72 h): >100 mg/L. Pseudomonas putida EC50 (16 h): 102 mg/L.
Degradation / accumulation	Readily biodegradable: 90-100% (OECD 301A). No mixture data for bioaccumulative potential or soil mobility.
Glyoxal component	Fish LC50 (96 h): 186-272 mg/L; mysid EC50 (48 h): 69.2 mg/L; marine diatom ErC50 (96 h): 313.8 mg/L; activated-sludge EC50 (30 min): >400 mg/L. Chronic fish NOEC (34 d): 112 mg/L; Daphnia magna NOEC (21 d): 3.19 mg/L.
Ethylene glycol component	Fish LC50 (96 h): 72,860 mg/L; Daphnia magna EC50 (48 h): >100 mg/L; algal NOEC (72 h): >100 mg/L. Chronic fish LC50 (28 d): >1,500 mg/L (analogy to triethylene glycol); water-flea NOEC (7 d): 8,590 mg/L.
PBT / vPvB / endocrine	No PBT/vPvB or identified endocrine-disrupting components at $\geq 0.1\%$, under the criteria listed in Section 2.
Other effects	Prevent discharge to the environment.

13. Disposal considerations

Product waste	Dispose of chemical residues through approved waste channels under applicable local and national requirements. Do not discharge to drains or waterways.
Containers	Residual product can remain in packaging. Handle contaminated containers with the same precautions as the product and use approved disposal or recycling channels.

14. Transport information

ADR / RID	Not regulated as dangerous goods. UN number, proper shipping name, transport class and packing group: not applicable. Environmental hazard: no.
IMDG	Not regulated as dangerous goods. UN number, proper shipping name, transport class and packing group: not applicable. Marine pollutant: no.
IATA	Not regulated as dangerous goods. UN number, proper shipping name, transport class and packing group: not applicable. Environmental hazard: no.
Special precautions	No additional mode-specific precaution data available. Use compatible, sealed containers and protect packaging during transport.
Maritime bulk transport	Not applicable to the product as supplied under IMO bulk instruments.

15. Regulatory information

Safety framework	Hazard classification and label elements follow Regulation (EC) No 1272/2008 (CLP). The 16-section safety information is organized under Regulation (EC) No 1907/2006 (REACH).
Restrictions	Formaldehyde is subject to applicable REACH Annex XVII restrictions. Observe workplace maternity protections under Directive 92/85/EEC and young-worker protections under Directive 94/33/EC, or stricter national requirements where applicable.
Chemical safety assessment	No product chemical safety assessment is available. No supplier-specific REACH registration, exemption, UFI or inventory approval is asserted.

16. Other information

H-statement texts (ingredients)	H302 Harmful if swallowed. H332 Harmful if inhaled. H373 May cause damage to organs through prolonged or repeated exposure if swallowed. H315, H317, H319, H335 and H341 are written in Section 2.
Classification procedure	Mixture Skin Irrit. 2, Eye Irrit. 2, Skin Sens. 1, Muta. 2 and STOT SE 3: calculation method. Ingredient classifications in Section 3 are distinct from the mixture label.
Abbreviations	ATE: acute toxicity estimate; LC50/LD50: median lethal concentration/dose; EC50/IC50: median effect/inhibition concentration; NOEC: no observed effect concentration; PBT/vPvB: persistent, bioaccumulative and toxic/very persistent and very bioaccumulative; ADR/RID: road/rail dangerous-goods rules; IMDG: maritime dangerous-goods code; IATA: air-transport association; OECD: Organisation for Economic Co-operation and Development.
Revision	2026.1; prepared 2026-10-07. Customer-document branding and title corrected; technical safety data retained.
Applicability	Classification and component test results are reference information for the identified aqueous grade. Use batch composition and ordered-grade information when assessing a different formulation.
Document scope	Reference safety information for the material and grade described in Sections 1 and 3. Different concentrations, solvents or formulations require the applicable safety information. This is not a batch analytical certificate.

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