

GLUTARALDEHYDE (25%/50% AQUEOUS SOLUTION)

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SECTION 1: IDENTIFICATION

**1.1 GHS Product identifier:**  
GLUTARALDEHYDE (25%/50% AQUEOUS SOLUTION)  
Synonyms: Pentane-1,5-dial; Glutaral; 1,5-Pentanedial, aqueous solution  
**CAS:** 111-30-8

**Other means of identification:**  
Not relevant

**1.2 Recommended use of the chemical and restrictions on use:**  
Relevant uses: High-level disinfectant/sterilant for medical and laboratory instruments, biocide/preservative in industrial water treatment (cooling towers, oilfield, leather tanning), cross-linking agent, fixative. For industrial user only.  
Uses advised against: All uses not specified in this section or in section 7.3. Not for use on living tissue except as part of a registered biocidal/medical product.

**1.3 Supplier's details:**  
**SURAJ CHEMICALS**  
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**1.4 Emergency phone number:**  
Emergency Contact No: +91 - 7092722822, +91 - 9840284032

SECTION 2: HAZARDS IDENTIFICATION

**2.1 Classification of the substance or mixture:**  
**GHS:**  
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), based on the harmonized classification for glutaraldehyde. Note: the lower-strength (25%) grade may fall below some concentration-based classification cut-offs for a given hazard class – refer to the current specification sheet for the exact grade supplied.

|                           |                                                                      |
|---------------------------|----------------------------------------------------------------------|
| Acute Tox. 4 (oral)       | Acute oral toxicity, Category 4, H302                                |
| Acute Tox. 4 (dermal)     | Acute dermal toxicity, Category 4, H312                              |
| Acute Tox. 3 (inhalation) | Acute inhalation toxicity, Category 3, H331                          |
| Skin Corr. 1B             | Skin corrosion, Category 1B, H314                                    |
| Resp. Sens. 1             | Respiratory sensitisation, Category 1, H334                          |
| Skin Sens. 1              | Skin sensitisation, Category 1, H317                                 |
| Aquatic Acute 1           | Hazardous to the aquatic environment, acute hazard, Category 1, H400 |

**2.2 GHS label elements, including precautionary statements:**  
**GHS: Danger**

**Hazard statements:**  
H302 – Harmful if swallowed.  
H312 – Harmful in contact with skin.  
H314 – Causes severe skin burns and eye damage.  
H317 – May cause an allergic skin reaction.  
H331 – Toxic if inhaled.  
H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
H400 – Very toxic to aquatic life.

**Precautionary statements:**  
P260: Do not breathe dust/fume/gas/mist/vapours/spray.  
P261: Avoid breathing vapour/spray.  
P264: Wash hands thoroughly after handling.  
P271: Use only outdoors or in a well-ventilated area.  
P272: Contaminated work clothing should not be allowed out of the workplace.  
P280: Wear protective gloves/protective clothing/eye protection/face protection.  
P284: Wear respiratory protection.  
P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P303+P361+P353: IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water/shower.  
P304+P340: IF INHALED: Remove person to fresh air and keep 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.  
P310: Immediately call a POISON CENTER or doctor/physician.  
P342+P311: If experiencing respiratory symptoms, call a POISON CENTER or doctor/physician.  
P501: Dispose of contents/container in accordance with local/national regulations on hazardous waste.

**2.3 Other hazards which do not result in classification:**  
Strong skin and respiratory sensitiser; repeated exposure may cause progressively more severe allergic reactions. Not a PBT/vPvB substance per current assessment criteria.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

**3.1 Substances:**  
**Chemical description:** Aqueous solution of glutaraldehyde  
In accordance with Annex 4.3.3 of the GHS, the product contains:

| Identification | Chemical Name / Classification                                                                                                                              | Concentration                               |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| CAS: 111-30-8  | Glutaraldehyde — Acute Tox. 4: H302, H312; Acute Tox. 3: H331; Skin Corr. 1B: H314; Resp. Sens. 1: H334; Skin Sens. 1: H317; Aquatic Acute 1: H400 – Danger | 25% or 50% (w/w) as supplied, balance water |
|                |                                                                                                                                                             |                                             |

|                |                        |         |
|----------------|------------------------|---------|
| CAS: 7732-18-5 | Water – Not classified | Balance |
|----------------|------------------------|---------|

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

- 3.2 Mixtures:**  
Supplied as an aqueous solution at the stated nominal concentration; exact assay per batch is given in the certificate of analysis.

SECTION 4: FIRST AID MEASURES

- 4.1 Description of necessary first-aid measures:**  
Request medical assistance immediately, showing the SDS of this product.
- By inhalation:**  
Remove the person affected to fresh air immediately and keep at rest. If breathing is difficult, give oxygen; if not breathing, give artificial respiration. Seek immediate medical attention.
- By skin contact:**  
Remove contaminated clothing immediately. Rinse skin with plenty of water for at least 15 minutes. Seek medical attention – may cause burns and sensitisation.
- By eye contact:**  
Rinse eyes thoroughly with lukewarm water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek immediate medical attention.
- By ingestion/aspiration:**  
Rinse mouth with water. Do NOT induce vomiting (risk of aspiration/further burns). Seek immediate medical attention.
- 4.2 Most important symptoms/effects, acute and delayed:**  
Acute and delayed effects are indicated in sections 2 and 11. Delayed sensitisation reactions (skin/respiratory) may develop with repeated exposure.
- 4.3 Indication of immediate medical attention and special treatment needed, if necessary:**  
Treat symptomatically. No specific antidote known.

SECTION 5: FIRE-FIGHTING MEASURES

- 5.1 Suitable extinguishing media:**  
**Suitable:** Water spray/fog, foam, dry chemical powder, carbon dioxide.  
**Unsuitable:** None known.
- 5.2 Specific hazards arising from the chemical:**  
Aqueous solution; not readily flammable. On heating/combustion may release toxic/irritating fumes including aldehydes and carbon oxides.
- 5.3 Special protective actions for fire-fighters:**  
Wear SCBA and full protective clothing. Cool containers with water spray. Prevent fire-fighting run-off from entering drains/watercourses.
- Additional provisions:**  
None specific.

SECTION 6: ACCIDENTAL RELEASE MEASURES

- 6.1 Personal precautions, protective equipment and emergency procedures:**  
**For non-emergency personnel:**  
Evacuate the area and ventilate well. Avoid breathing vapour. Use PPE per section 8.
- For emergency responders:**  
Wear full protective equipment including respiratory protection with appropriate filter. Keep unprotected persons away.
- 6.2 Environmental precautions:**  
Prevent entry into drains, watercourses and soil – very toxic to aquatic life. Notify authorities if a significant release occurs.
- 6.3 Methods and materials for containment and cleaning up:**  
Contain spillage with inert absorbent material (sand, vermiculite). Collect in suitable labelled containers for disposal. Neutralize residues with a suitable amine-based or bisulfite-based deactivator per manufacturer guidance before final disposal where feasible.
- 6.4 Reference to other sections:**  
See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

- 7.1 Precautions for safe handling:**  
**A. General precautions for safe use:**  
Use only in well-ventilated areas. Avoid breathing vapour/mist. Avoid all contact with skin and eyes. Use closed systems/local exhaust ventilation wherever possible.
- B. Technical recommendations for the prevention of fires and explosions:**  
Not flammable under normal conditions; standard precautions apply.
- C. Technical recommendations on general occupational hygiene:**  
Do not eat, drink or smoke while handling. Wash hands and exposed skin thoroughly after use. Remove and launder contaminated clothing before reuse.
- D. Technical recommendations to prevent environmental risks:**  
Avoid release to drains and watercourses. See section 6.

- 7.2 Conditions for safe storage, including any incompatibilities:**  
**A. Specific storage requirements:**

|               |                                          |
|---------------|------------------------------------------|
| Minimum Temp. | 5°C                                      |
| Maximum Temp. | 30°C                                     |
| Maximum time  | 12 Months (unopened, original packaging) |

- B. General conditions for storage:**  
Store in a cool, dry, well-ventilated place away from direct sunlight and strong oxidizers/alkalis. Keep containers tightly closed.

- 7.3 Specific end use(s):**  
Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

- 8.1 Control parameters:**  
Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948, as amended:

| Identification                  | Occupational Exposure Limit Type            | Value                                                                 |
|---------------------------------|---------------------------------------------|-----------------------------------------------------------------------|
| Glutaraldehyde<br>CAS: 111-30-8 | Time Weighted average concentration (8 hrs) | 0.05 ppm (ceiling/TWA, per published international guidance)          |
|                                 | Short-term exposure limit (ceiling)         | 0.05 ppm (typical ceiling limit per published international guidance) |

- 8.2 Appropriate engineering controls:**

Use local exhaust ventilation/closed systems to keep airborne concentrations below occupational exposure limits, in addition to PPE.

**B. Respiratory protection:**

Full-face respirator with organic vapour cartridge where vapours exceed exposure limits; use SCBA for high concentrations or emergency response.

**C. Specific protection for the hands:**

Chemical-resistant gloves (butyl rubber, nitrile or neoprene – verify breakthrough time with glove manufacturer). Replace at any sign of damage.

**D. Eye and face protection:**

Chemical splash goggles and face shield.

**E. Bodily protection:**

Chemical-resistant apron/coveralls and closed footwear; impervious to the aqueous solution.

**F. Additional emergency measures:**

Emergency shower and eyewash stations must be available in the work area.

**Environmental exposure controls:**

Avoid environmental release of both product and container. See subsection 7.1.D.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

**9.1 Information on basic physical and chemical properties:**

| Appearance                                 |                                                      |
|--------------------------------------------|------------------------------------------------------|
| Physical state at 20°C                     | Liquid (aqueous solution)                            |
| Appearance                                 | Clear, colorless to pale yellow liquid               |
| Color                                      | Colorless to pale yellow                             |
| Odor                                       | Pungent, characteristic aldehyde odor                |
| Odour threshold                            | Typical value – refer to current specification sheet |
| Volatility                                 |                                                      |
| Boiling point at atmospheric pressure      | ~100°C (solution, water-dominated)                   |
| Vapour pressure at 20°C / 50°C             | Typical value – refer to current specification sheet |
| Evaporation rate at 20°C                   | Typical value – refer to current specification sheet |
| Product Description                        |                                                      |
| Density / Relative density at 20°C         | ~1.05 – 1.10 (typical for 25–50% solution)           |
| Dynamic / Kinematic viscosity              | Typical value – refer to current specification sheet |
| Concentration                              | 25% or 50% (w/w) as supplied                         |
| pH                                         | 3.0 – 4.5 (typical, mildly acidic)                   |
| Vapour density at 20°C                     | Typical value – refer to current specification sheet |
| Partition coefficient n-octanol/water 20°C | log Kow ≈ -0.2 (low)                                 |
| Solubility in water at 20°C                | Fully miscible                                       |
| Decomposition temperature                  | Typical value – refer to current specification sheet |
| Melting point/freezing point               | Non-applicable (aqueous solution)                    |
| Flammability                               |                                                      |
| Flash Point                                | Non-applicable (aqueous solution, not flammable)     |
| Flammability (solid, gas)                  | Not applicable (liquid, non-flammable)               |
| Autoignition temperature                   | Not relevant *                                       |
| Lower / Upper flammability limit           | Not relevant *                                       |
| Particle Characteristics                   |                                                      |
| Median equivalent diameter                 | Non-applicable (liquid)                              |

\* Not relevant due to the nature of the product, not providing information on the properties of its hazards.

**9.2 Other information:**

|                         |                                                                                                              |
|-------------------------|--------------------------------------------------------------------------------------------------------------|
| Explosive properties    | Not relevant *                                                                                               |
| Oxidising properties    | Not an oxidizer; not classified                                                                              |
| Corrosive to metals     | Mildly corrosive to some metals over prolonged contact – typical value, refer to current specification sheet |
| Heat of combustion      | Not relevant *                                                                                               |
| Surface tension at 20°C | Typical value – refer to current specification sheet                                                         |
| Refraction index        | Typical value – refer to current specification sheet                                                         |

**SECTION 10: STABILITY AND REACTIVITY**

**10.1 Reactivity:**

Reacts with amines, proteins and other nucleophiles (basis of its biocidal/cross-linking/fixative action). Reacts with strong oxidizers and strong alkalis; polymerizes under alkaline conditions.

**10.2 Chemical stability:**

Stable under recommended storage conditions when stored cool and away from strong alkalis. May slowly polymerize/cloud on prolonged storage or exposure to light/heat.

**10.3 Possibility of hazardous reactions:**

Under the specified conditions, hazardous reactions leading to excessive temperature or pressure are not expected.

**10.4 Conditions to avoid:**

| Shock/Friction | Contact with Air | Increase in Temperature   | Sunlight                 | Humidity                          |
|----------------|------------------|---------------------------|--------------------------|-----------------------------------|
| Not applicable | Not applicable   | Avoid prolonged high heat | Avoid prolonged exposure | Non-applicable (aqueous solution) |

**10.5 Incompatible materials:**

| Amines / Proteins  | Strong Alkalis                          | Strong Oxidizers | Reducing Materials   | Reactive Metals         |
|--------------------|-----------------------------------------|------------------|----------------------|-------------------------|
| Reacts/cross-links | Avoid contact – promotes polymerization | Avoid contact    | Avoid direct contact | Avoid prolonged contact |

**10.6 Hazardous decomposition products:**  
Carbon monoxide, carbon dioxide and irritant aldehyde fumes on thermal decomposition/combustion.

SECTION 11: TOXICOLOGICAL INFORMATION

**11.1 Information on toxicological effects:**  
In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

**A. Ingestion (acute effect):**  
Harmful if swallowed. Causes severe burns to the mouth, throat and gastrointestinal tract.

**B. Inhalation (acute effect):**  
Toxic if inhaled. Vapour is strongly irritating to the respiratory tract and may trigger asthma-like reactions in sensitised individuals.

**C. Contact with skin and eyes (acute effect):**  
Causes severe skin burns. Causes serious eye damage. May cause allergic skin reaction (sensitisation).

**D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):**  
Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met based on available data. IARC: Not classifiable as to carcinogenicity to humans (Group 3) per published international assessments.

**E. Sensitizing effects:**  
Known strong skin and respiratory sensitiser (H317, H334); repeated exposure may provoke occupational asthma/dermatitis in sensitised persons.

**F. Specific target organ toxicity (STOT) – single exposure:**  
Respiratory tract irritation covered under acute inhalation toxicity classification (H331).

**G. Specific target organ toxicity (STOT) – repeated exposure:**  
Classification criteria are not met based on available data; repeated exposure is primarily associated with sensitisation (see E).

**H. Aspiration hazard:**  
Classification criteria are not met based on available data.

Product-specific toxicological information:

| Identification                                    | Acute Toxicity                  | Genus  |
|---------------------------------------------------|---------------------------------|--------|
| Glutaraldehyde (as 50% solution)<br>CAS: 111-30-8 | LD50 oral: 134 mg/kg            | Rat    |
|                                                   | LD50 dermal: 562 mg/kg          | Rabbit |
|                                                   | LC50 inhalation: 0.34 mg/L (4h) | Rat    |

SECTION 12: ECOLOGICAL INFORMATION

Very toxic to aquatic life.

12.1 Toxicity:

| Identification                  | Acute Toxicity      | Species             | Genus      |
|---------------------------------|---------------------|---------------------|------------|
| Glutaraldehyde<br>CAS: 111-30-8 | LC50: 11 mg/L (96h) | Oncorhynchus mykiss | Fish       |
|                                 | EC50: 29 mg/L (48h) | Daphnia magna       | Crustacean |

**12.2 Persistence and degradability:**  
Readily biodegradable under aerobic conditions per published international assessments.

**12.3 Bioaccumulative potential:**  
Low bioaccumulation potential based on log Kow.

12.4 Mobility in soil:

| Koc | Henry | Dry Soil                | Moist Soil                 |
|-----|-------|-------------------------|----------------------------|
| Low | Low   | Non-applicable (liquid) | High (miscible with water) |

**12.5 Results of PBT and vPvB assessment:**  
Not identified as a PBT or vPvB substance per current assessment criteria.

**12.6 Other adverse effects:**  
Not described

SECTION 13: DISPOSAL CONSIDERATIONS

**13.1 Disposal methods:**  
Deactivate/neutralize with a suitable amine- or bisulfite-based deactivating agent per manufacturer guidance prior to disposal, where feasible, then dispose of via a licensed hazardous-waste handler. Do not discharge directly to drains or watercourses. For packaging: rinse per local rules before recycling/disposal, or dispose as hazardous waste if rinsing is not permitted.  
Refer to national and local regulations on hazardous waste management.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):

|                                                          |                                                                                                             |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| 14.1 UN number                                           | UN2922 (50% solution) / Non-regulated or lower packing group for 25% – refer to current specification sheet |
| 14.2 UN proper shipping name                             | CORROSIVE LIQUID, TOXIC, N.O.S. (GLUTARALDEHYDE SOLUTION)                                                   |
| 14.3 Transport hazard class(es)                          | 8 (Subsidiary: 6.1)                                                                                         |
| 14.4 Packing group                                       | II (50% solution, typical)                                                                                  |
| 14.5 Environmental hazard                                | Yes                                                                                                         |
| 14.6 Special precautions for user                        | Physico-chemical properties: see section 9                                                                  |
| 14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code) | Not relevant                                                                                                |

Transport of dangerous goods by sea (IMDG 41-22):

|                                                          |                                                           |
|----------------------------------------------------------|-----------------------------------------------------------|
| 14.1 UN number                                           | UN2922                                                    |
| 14.2 UN proper shipping name                             | CORROSIVE LIQUID, TOXIC, N.O.S. (GLUTARALDEHYDE SOLUTION) |
| 14.3 Transport hazard class(es)                          | 8 (Subsidiary: 6.1)                                       |
| 14.4 Packing group                                       | II                                                        |
| 14.5 Marine pollutant                                    | Yes                                                       |
| 14.6 Special precautions for user                        | EmS Codes: F-A, S-B                                       |
| 14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code) | Not relevant                                              |

Transport of dangerous goods by air (IATA/ICAO 2024):

|                                                          |                                                           |
|----------------------------------------------------------|-----------------------------------------------------------|
| 14.1 UN number                                           | UN2922                                                    |
| 14.2 UN proper shipping name                             | CORROSIVE LIQUID, TOXIC, N.O.S. (GLUTARALDEHYDE SOLUTION) |
| 14.3 Transport hazard class(es)                          | 8 (Subsidiary: 6.1)                                       |
| 14.4 Packing group                                       | II                                                        |
| 14.5 Environmental hazard                                | Yes                                                       |
| 14.6 Special precautions for user                        | Physico-chemical properties: see section 9                |
| 14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code) | Not relevant                                              |

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation:

- Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
- The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
- The Insecticides Act, 1968 (where applicable to biocidal end-use)
- Public Liability Insurance Act, 1991

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

- H302: Harmful if swallowed.
- H312: Harmful in contact with skin.
- H314: Causes severe skin burns and eye damage.
- H317: May cause an allergic skin reaction.
- H331: Toxic if inhaled.
- H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H400: Very toxic to aquatic life.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Personnel handling this product should receive specific training on sensitisation risk, correct PPE use and emergency procedures, in addition to general comprehension of this safety data sheet and the product label.

Principal bibliographical sources:

United Nations GHS (Rev. 8); European Chemicals Agency (ECHA) classification and labelling inventory; publicly available chemical supplier safety data sheets for this CAS number.

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | IARC: International Agency for Research on Cancer | Log-POW: Octanol-water partition coefficient

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET