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## 1. IDENTIFICATION

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**Product name:** GLUTARALDEHYDE 50%

**Recommended use of the chemical and restrictions on use Identified uses:** Crosslinker. For industrial use only.

### COMPANY IDENTIFICATION

**Swadesh Life Science**

H-103, Sumel 7, Near Soni ni chali  
BRTS, Rakhiyal,  
Ahmedabad, Gujarat, India

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## 2. HAZARDS IDENTIFICATION

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### Hazard classification

GHS classification in accordance with 29 CFR 1910.1200

Acute toxicity - Category 3 - Oral

Acute toxicity - Category 2 - Inhalation

Skin corrosion - Category 1

Serious eye damage - Category 1

Respiratory sensitisation - Category 1

Skin sensitisation - Category 1

Specific target organ toxicity - single exposure - Category 3

### Label elements Hazard pictograms



Signal word: **DANGER!**

### Hazards

Toxic if swallowed.

Causes severe skin burns and eye damage.

May cause an allergic skin reaction.

Fatal if inhaled.

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation.

### Precautionary statements Prevention

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

## MATERIAL SAFETY DATA SHEET

Wash skin thoroughly after handling.  
Do not eat, drink or smoke when using this product.  
Use only outdoors or in a well-ventilated area.  
Contaminated work clothing should not be allowed out of the workplace.  
Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear respiratory protection.

### Response

IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.  
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.  
If skin irritation or rash occurs: Get medical advice/ attention.  
If experiencing respiratory symptoms: Call a POISON CENTER/doctor. Wash contaminated clothing before reuse.

### Storage

Store in a well-ventilated place. Keep container tightly closed.  
Store locked up.

### Disposal

Dispose of contents/ container to an approved waste disposal plant.

### Other hazards

No data available

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

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**Synonyms:** Glutaral; glutaraldehyde; 1,5-pentanedial This product is a substance.

Component	CASRN	Concentration
Glutaraldehyde	111-30-8	50.0%
Water	7732-18-5	<= 50.0 %

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### 4. FIRST AID MEASURES

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#### Description of first aid measures

##### General advice:

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

**Inhalation:** Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

**Skin contact:** Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly. Suitable emergency safety shower facility should be immediately available.

**Eye contact:** Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

**Ingestion:** If the person is fully alert and cooperative, have the person rinse mouth with plenty of water. In cases of ingestion have the person drink 4 to 10 ounces (120-300 mL) of water. Do not induce vomiting. Do not attempt mouth rinse if the person has respiratory distress, altered mental status, or nausea and vomiting. Call a physician and/or transport to emergency facility immediately.

##### Most important symptoms and effects, both acute and delayed:

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

##### Indication of any immediate medical attention and special treatment needed

**Notes to physician:** Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Glutaraldehyde may transiently worsen reversible airways obstruction including asthma or reactive airways disease. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. Probable mucosal damage may contraindicate the use of gastric lavage. Exposure to vapors may result in skin sensitization. In sensitized individuals, reexposure to very small amounts of vapor, mist, or liquid may cause a severe allergic skin reaction. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

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## 5. FIREFIGHTING MEASURES

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**Suitable extinguishing media:** To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

**Unsuitable extinguishing media:** None known.

**Special hazards arising from the substance or mixture**

**Hazardous combustion products:** Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

**Unusual Fire and Explosion Hazards:** This material will not burn until the water has evaporated. Residue can burn.

**Advice for firefighters**

**Fire Fighting Procedures:** Keep people away. Isolate fire and deny unnecessary entry. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

**Special protective equipment for firefighters:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

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## 6. ACCIDENTAL RELEASE MEASURES

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**Personal precautions, protective equipment and emergency procedures:** Evacuate area. Keep upwind of spill. Ventilate area of leak or spill. Only trained and properly protected personnel must be involved in clean-up operations. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

**Environmental precautions:** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. Spills or discharge to natural waterways is likely to kill aquatic organisms.

**Methods and materials for containment and cleaning up:** Avoid making contact with spilled material, glutaraldehyde will be absorbed by most shoes. Always wear the correct protective equipment, consisting of splashproof monogoggles, or both safety glasses with side shields and a wraparound full-face shield, appropriate gloves and protective clothing. A self-contained breathing apparatus or respirator and absorbents may be necessary, depending on the size of the spill and the adequacy of ventilation. Small spills: Wear the correct protective equipment and cover the liquid with absorbent material. Collect and seal the material and the dirt that has absorbed the spilled material in

polyethylene bags and place in a drum for transit to an approved disposal site. Rinse away the remaining spilled material with water to reduce odor, and discharge the rinsate into a municipal or industrial sewer. Large spills: In case of nasal and respiratory irritation, vacate the room immediately. Personnel cleaning up should be trained and equipped with a self-contained breathing apparatus, or an officially approved or certified full-face respirator equipped with an organic vapor cartridge, gloves, and clothing impervious to glutaraldehyde, including rubber boots or shoe protection. Deactivate with sodium bisulfite (2-3 parts (by weight) per part of active substance glutaraldehyde), collect the neutralized liquid and place in a drum for transit to an approved disposal site.

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## 7. HANDLING AND STORAGE

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**Precautions for safe handling:** Do not spray or aerosolize the undiluted form of the product. Full personal protective equipment (including skin covering and full-face SCBA respirator) is required for dilutions or mixtures of the product used in a spray application.

Keep out of reach of children. Do not get in eyes, on skin, on clothing. Do not swallow. Avoid prolonged or repeated contact with skin. Avoid breathing vapor. Keep container closed. Use with adequate ventilation. Wear goggles, protective clothing and butyl or nitrile gloves. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

**Conditions for safe storage:** Do not store in: Aluminum. Carbon steel. Copper. Mild steel. Iron.

**Storage stability Shelf life:** Use within 18 Month

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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### Exposure controls

**Engineering controls:** Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. Local exhaust ventilation may be necessary for some operations.

### Individual protection measures

**Eye/face protection:** Use chemical goggles. If exposure causes eye discomfort, use a fullface respirator.

### Skin protection

**Hand protection:** Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Examples of acceptable glove barrier materials include: Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

**Other protection:** Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Use chemical protective clothing resistant to this material, when there is any possibility of skin contact.

**Respiratory protection:** Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required, use an approved air-purifying or positive-pressure supplied-air respirator depending on the potential airborne concentration. For operations such as spraying/misting and other conditions such as emergencies where the exposure guideline may be greatly exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply.

The following should be effective types of air-purifying respirators: Full-face Organic vapor cartridge with a particulate pre-filter.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Appearance

<b>Physical state</b>	Liquid.
<b>Color</b>	Clear
<b>Odor</b>	Fruity
<b>Odor Threshold</b>	< 1 ppb <i>Literature</i>
<b>pH</b>	3.1 - 4.5 <i>ASTM E70</i>
<b>Melting point/range</b>	Not applicable to liquids
<b>Freezing point</b>	-18 °C ( -0 °F) <i>OECD Test Guideline 102</i>
<b>Boiling point (760 mmHg)</b>	100.7 °C ( 213.3 °F) <i>OECD Test Guideline 103</i>
<b>Flash point</b>	<b>closed cup</b> <i>ASTM D 56</i> (none)
<b>Evaporation Rate (Butyl Acetate = 1)</b>	1.0 <i>Literature</i>
<b>Flammability (solid, gas)</b>	Not applicable to liquids
<b>Lower explosion limit</b>	No test data available
<b>Upper explosion limit</b>	No test data available
<b>Vapor Pressure</b>	0.3 mmHg at 20 °C (68 °F) <i>OECD Test Guideline 104</i> Active ingredient
<b>Relative Vapor Density (air = 1)</b>	1.1 <i>Literature</i>
<b>Relative Density (water = 1)</b>	1.129 at 20 °C (68 °F) <i>OECD 109</i>
<b>Water solubility</b>	100 % at 20 °C (68 °F) <i>Calculated</i> . Soluble
<b>Partition coefficient: noctanol/water</b>	log Pow: -0.333 <i>Measured</i>
<b>Auto-ignition temperature</b>	385 °C (725 °F) at 1,004 hPa <i>92/69/EEC A15</i>
<b>Decomposition temperature</b>	No test data available
<b>Dynamic Viscosity</b>	15.4 cP at 25 °C (77 °F) (Brookfield Viscosity - @ 100 rpm, #0 spindle)
<b>Kinematic Viscosity</b>	20.2 mm <sup>2</sup> /s at 20 °C (68 °F) <i>Literature</i>
<b>Explosive properties</b>	No <i>EEC A14</i>
<b>Oxidizing properties</b>	No
<b>Molecular weight</b>	No test data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** No dangerous reaction known under conditions of normal use.

**Chemical stability:** Thermally stable at typical use temperatures.

**Possibility of hazardous reactions:** Polymerization will not occur.

**Conditions to avoid:** Active ingredient decomposes at elevated temperatures.

**Incompatible materials:** Avoid contact with: Amines. Ammonia. Strong acids. Strong bases. Strong oxidizers. Avoid contact with metals such as: Aluminum. Carbon steel. Copper. Iron. Mild steel.

**Hazardous decomposition products:** Decomposition products depend upon temperature, air supply and the presence of other materials.

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## 11. TOXICOLOGICAL INFORMATION

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*Toxicological information appears in this section when such data is available.*

### **Acute toxicity Acute oral toxicity**

Moderate toxicity if swallowed. Swallowing may result in irritation or burns of the mouth, throat, and gastrointestinal tract. Swallowing may result in gastrointestinal irritation or ulceration. Excessive exposure may cause: Headache. Dizziness. Anesthetic effects. Drowsiness. Unconsciousness. Other central nervous system effects.

LD50, Rat, male and female, 200 mg/kg

### **Acute dermal toxicity**

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

LD50, Rabbit, male and female, > 2,000 mg/kg

### **Acute inhalation toxicity**

Vapor from heated material or mist may cause serious adverse effects, even death. Vapor may cause severe irritation of the upper respiratory tract (nose and throat). Case reports and medical surveys link asthma and respiratory irritation to glutaraldehyde exposure, primarily in medical personnel. Asthma-like symptoms may occur in people prone to respiratory disorders or other allergies. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.

LC50, Rat, female, 4 Hour, dust/mist, 0.28 mg/l

LC50, Rat, male, 4 Hour, dust/mist, 0.35 mg/l



## MATERIAL SAFETY DATA SHEET

### **Skin corrosion/irritation**

Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.

### **Serious eye damage/eye irritation**

May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Vapor may cause eye irritation experienced as mild discomfort and redness.

### **Sensitization**

Skin contact may cause an allergic skin reaction in a small proportion of individuals.

Has caused allergic skin reactions when tested in guinea pigs. Has demonstrated the potential for contact allergy in mice.

May cause allergic respiratory response in a small proportion of individuals.

### **Specific Target Organ Systemic Toxicity (Single Exposure)**

Material is corrosive. Upper respiratory tract irritation or corrosivity may be expected.

### **Specific Target Organ Systemic Toxicity (Repeated Exposure)**

Repeated skin contact may result in absorption of amounts which could cause death. May cause nausea and vomiting.

### **Carcinogenicity**

In a NTP chronic 2-year inhalation study on glutaraldehyde, no carcinogenicity was seen in rats or in mice. An increase in large granular lymphocytes in Fischer rats dosed with glutaraldehyde for two years was random or a secondary carcinogenic effect due to a modifying influence on the occurrence of this common neoplasm in this rat strain.

### **Teratogenicity**

Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

### **Reproductive toxicity**

In animal studies, did not interfere with reproduction.

### **Mutagenicity**

In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were predominantly negative.

### **Aspiration Hazard**

Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.



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## 12. ECOLOGICAL INFORMATION

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### Toxicity Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, Cyprinodon variegatus (sheepshead minnow), 96 Hour, 64 mg/l

### Acute toxicity to aquatic invertebrates

LC50, copepod *Acartia tonsa*, semi-static test, 48 Hour, 6 mg/l

### Acute toxicity to algae/aquatic plants

ErC50, *Desmodesmus subspicatus* (green algae), 72 Hour, 1.2 mg/l

NOEC, *Desmodesmus subspicatus* (green algae), 72 Hour, Growth rate inhibition, 0.05 mg/l

ErC50, *Skeletonema costatum* (marine diatom), Static, 72 Hour, 1.22 mg/l

NOEC, *Skeletonema costatum* (marine diatom), Static, 72 Hour, 0.142 mg/l

### Toxicity to bacteria

EC50, activated sludge, > 50 mg/l, OECD 209 Test

EC50, Bacteria, 16 Hour, 17 - 25 mg/l

### Chronic aquatic toxicity Chronic toxicity to fish

NOEC, Rainbow trout (*Oncorhynchus mykiss*), semi-static test, 62 d, 2 mg/l

### Chronic toxicity to aquatic invertebrates

NOEC, water flea *Daphnia magna*, flow-through test, 21 d, number of offspring, 0.24 mg/l

### Toxicity to Above Ground Organisms

Material is moderately toxic to birds on an acute basis (LD50 between 51 and 500 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

oral LD50, *Anas platyrhynchos* (Mallard duck), 408 - 466 mg/kg

dietary LC50, *Colinus virginianus* (Bobwhite quail), > 5,000 ppm

dietary LC50, *Anas platyrhynchos* (Mallard duck), > 5,000 ppm

### Persistence and degradability

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

**Biodegradation:** 73 % **Exposure time:** 9 d  
**Method:** OECD Test Guideline 301A or Equivalent  
10-day Window: Not applicable  
**Biodegradation:** 73 % **Exposure time:** 28 d  
**Method:** OECD Test Guideline 306 or Equivalent

**Theoretical Oxygen Demand:** 1.92 mg/mg

### Photodegradation

**Test Type:** Half-life (indirect photolysis)  
**Sensitization:** OH radicals  
**Atmospheric half-life:** 2.74 Hour  
**Method:** Estimated.

### Bioaccumulative potential

**Bioaccumulation:** Bioconcentration potential is low ( $BCF < 100$  or  $\text{Log Pow} < 3$ ).  
**Partition coefficient: n-octanol/water(log Pow):** -0.333 Measured

### Mobility in soil

Potential for mobility in soil is high ( $K_{oc}$  between 50 and 150).  
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process. **Partition coefficient (K<sub>oc</sub>):** 120 - 500  
Estimated.

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## 13. DISPOSAL CONSIDERATIONS

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**Disposal methods:** DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.