MSDS Number: **G4404** * * * * * *Effective Date:* ***09/23/09*** * * * * * *Supercedes:* ***11/09/07***

MSDS **Material Safety Data Sheet**

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

From: **Mallinckrodt Baker, Inc.**
222 Red School Lane
Phillipsburg, NJ 08865

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

GLUTARALDEHYDE 5 - 25 % AQUEOUS SOLUTIONS

1. Product Identification

Synonyms: Glutaraldehyde, 5-25% Aqueous solutions; glutaric dialdehyde 25% solution; Glutaraldehyde 25% EM Grade
CAS No.: 111-30-8
Molecular Weight: 100.12
Chemical Formula: OCH(CH2)3CHO in H2O
Product Codes:
J.T. Baker: 2127, M752, M760
Mallinckrodt: 2471

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Glutaraldehyde	111-30-8	5 - 25%	Yes

Water	7732-18-5	75 - 95%	No

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3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES EYE BURNS. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES SEVERE SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. CAUSES IRRITATION TO RESPIRATORY TRACT.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. Heating the solution may result in more severe irritant effects.
Ingestion:
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. May cause chemical burns of the mouth, throat, esophagus and stomach with discomfort or pain in the chest and abdomen. Aspiration into the lungs may occur during swallowing or vomiting, resulting in lung damage.
Skin Contact:
Causes irritation to skin. Symptoms include redness, itching, and pain. Prolonged contact may cause skin burns. May be absorbed through the skin with possible systemic effects.
Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Chronic Exposure:

Chronic exposure may cause skin effects.
Aggravation of Pre-existing Conditions:
Some individuals may develop an allergic skin reaction from exposure. Persons with pre-existing skin or respiratory disorders may be more susceptible to the effects of the substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:
If swallowed, immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person. Seek medical attention immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Probable mucosal damage may contraindicate the use of gastric lavage. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferablyfrom an ophthalmologist. Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) 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 beta-2 agonist and oral or parenteral corticosteroids. Inhalation of 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.
If burn is present, treat as any thermal burn, after decontamination.

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5. Fire Fighting Measures

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

Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! Very low concentrations (5 ppm or less of glutaraldehyde) can be degraded in a biological wastewater treatment system. Thus, small spills can be flushed with large quantities of water. Large quantities or 'slugs' can be harmful to the treatment system. Thus, large spills should be collected for disposal. It may also be possible to decontaminate spilled material by careful application of aqueous sodium hydroxide or sodium bisulfite. Depending on conditions, considerable heat and fumes can be liberated by the decontamination reaction.

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7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Store at or below room temperature whenever possible in order to minimize decomposition. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-ACGIH Threshold Limit Value (TLV):
0.05 ppm Ceiling, A4 - Not Classifiable as a Human Carcinogen
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee

exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, and engineering controls are not feasible, a full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. This compound possibly exists in both particulate and vapor phase. A particulate (NlOSH type N95 or better) prefilter should be used for the particulate.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene is a recommended material for personal protective equipment. Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to this substance.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

This product in its undiluted form must not be used in a spray or aerosol application. If dilutions or mixtures of this product are used in a spray application, full personal protective equipment is strongly recommended to prevent exposure.

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9. Physical and Chemical Properties

Based on 25% Solution:

Appearance:

Colorless to yellowish liquid.

Odor:

Sharp, fruity, medicinal.

Solubility:

Soluble in water.

Specific Gravity:

1.06 - 1.12 @ 20C

pH:

3.1 - 4.5

% Volatiles by volume @ 21C (70F):

No information found.
Boiling Point:
101C (214F)
Melting Point:
-10C (14F)
Vapor Density (Air=1):
0.8
Vapor Pressure (mm Hg):
0.20 @ 20C (68F) (based on glutaraldehyde)
Evaporation Rate (BuAc=1):
0.9

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10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. May discolor on exposure to air. Polymerization may occur at high temperatures or in alkaline solutions (above pH 9), but it is not hazardous.
Hazardous Decomposition Products:
Hazarous decomposition products depend upon temperature, air supply, and the presence of other materials.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Oxidizers, alkalis.
Conditions to Avoid:
Heat, incompatibles.

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11. Toxicological Information

Toxicological Data:
Peroral rat male LD50: 1639 - 1990 mg/kg.
Has caused allergic skin reactions when tested in guinea pigs., Has caused allergic skin reactions when tested in mice.

Reproductive Toxicity:
In animal studies, did not interfere with reproduction. Did not cause birth defects in laboratory animals., Has been toxic to the fetus in lab animals at doses toxic to the mother.
Carcinogenicity:
In a NTP chronic 2-year inhalation study on glutaraldehyde, no carcinogenicity was seen in rats or in mice.

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  --------\Cancer Lists\-------------------------------------------------------
-
                                          ---NTP Carcinogen---
  Ingredient                              Known    Anticipated    IARC
Category
  ------------------------------------   -----    -----------    ------------
-
  Glutaraldehyde (111-30-8)                No          No             None
  Water (7732-18-5)                        No          No             None
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12. Ecological Information

Environmental Fate:
Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Inhibitory concentration (IC50) in OECD Activated Sludge Respiration Inhibition Test (OECD Test No. 209) is >50 mg/L.
Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Potential for mobility in soil is high (Koc between 50 and 150).
Soil organic carbon/water partition coefficient (Koc) is estimated to be: 120 -500.
Henry's Law Constant (H) is estimated to be: 3.3E-08 atm-m3/mole.
The hydrolysis half-life is pH9 - 46 days 25C
Environmental Toxicity:
Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

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  --------\Chemical Inventory Status - Part 1\-------------------------------
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  Ingredient                                          TSCA  EC   Japan
Australia
  ----------------------------------------------  ----  ---  -----  --------
-
  Glutaraldehyde (111-30-8)                          Yes  Yes   Yes      Yes
  Water (7732-18-5)                                  Yes  Yes   Yes      Yes

  --------\Chemical Inventory Status - Part 2\-------------------------------
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                                                              --Canada--
  Ingredient                                          Korea  DSL   NDSL  Phil.
  ----------------------------------------------  -----  ---   ----  -----
  Glutaraldehyde (111-30-8)                          Yes   Yes   No     Yes
  Water (7732-18-5)                                  Yes   Yes   No     Yes

  --------\Federal, State & International Regulations - Part 1\--------------
--
                                              -SARA 302-    ------SARA 313----
--
  Ingredient                                  RQ    TPQ     List  Chemical
Catg.
  ----------------------------------------  ---   -----   ----  ------------
--
  Glutaraldehyde (111-30-8)                   No    No      No         No
  Water (7732-18-5)                           No    No      No         No

  --------\Federal, State & International Regulations - Part 2\--------------
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                                                          -RCRA-    -TSCA-
  Ingredient                                  CERCLA     261.33     8(d)
  ----------------------------------------  ------     ------    ------
  Glutaraldehyde (111-30-8)                   No         No         Yes
  Water (7732-18-5)                           No         No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: Yes  Fire: No  Pressure: No
Reactivity: No          (Mixture / Liquid)
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Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **3** Flammability: **1** Reactivity: **0**

Label Hazard Warning:

DANGER! CORROSIVE. CAUSES EYE BURNS. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES SEVERE SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. CAUSES IRRITATION TO RESPIRATORY TRACT.

Label Precautions:

Avoid breathing vapor.
Do not get in eyes, on skin, or on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:

In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately. In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. If swallowed, immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person. Seek medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

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