

# OXALIC ACID

GHS Safety Data Sheet

Version No:2.0

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

OXALIC ACID DIHYDRATE

### OTHER NAMES

C2-H6-O6, (COOH)2.2H2O, "ethanedioic acid", "ethandioic acid", "oxalic acid, dihydrate"

### PROPER SHIPPING NAME

CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.(contains oxalic acid dihydrate)

### PRODUCT USE

■ Reducing agent.

As analytical reagent; in calico printing and dyeing; as a general reducing agent; removing paint or varnish, rust or ink stains; manufacture of oxalates; as a condensing agent in organic chemistry. Also used for bleaching straw (hats) and leather; intermediates and dyes; in metal polishes; in indigo dyeing; in purifying methanol; for decolourising pure glycerol; for stabilizing hydrocyanic acid; in ceramics and pigments; in metallurgy as cleanser; in the paper industry; in making glucose from starch.

### SUPPLIER

Company: S D FINE - CHEM LIMITED

Address:

315- 317, T.V.IND.ESTATE,

248 WORLI ROAD,

MUMBAI- 400 030, INDIA

technical@sdfine.com

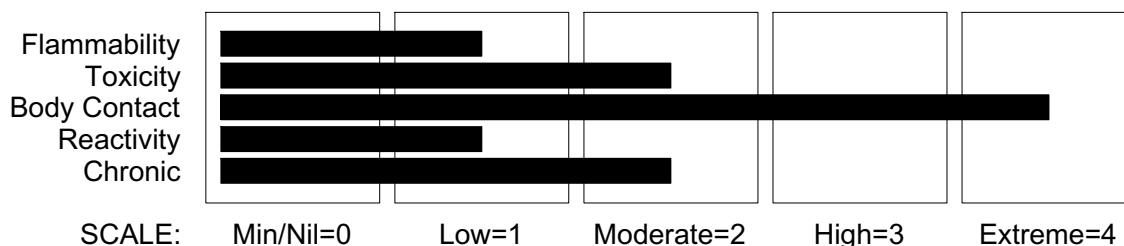
Telephone: 91- 22 24959898

Telephone: 91- 22 24959899

Fax: 91- 22 24937232

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS



### GHS Classification

Acute Toxicity (Dermal) Category 4

Acute Toxicity (Oral) Category 4

Metal Corrosion Category 1

continued...

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## Section 2 - HAZARDS IDENTIFICATION

Reproductive Toxicity Category 2  
Serious Eye Damage Category 1  
Skin Corrosion/Irritation Category 1B



## EMERGENCY OVERVIEW

### HAZARD

#### DANGER

Determined by using GHS criteria:

H302 H312 H361 H361 H290 H314 H318

Harmful if swallowed

Harmful in contact with skin

Suspected of damaging fertility

Suspected of damaging the unborn child

May be corrosive to metals

Causes severe skin burns and eye damage

Causes serious eye damage

## PRECAUTIONARY STATEMENTS

### Prevention

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Keep only in original container.

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

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Wear protective gloves/protective clothing/eye protection/face protection.

Use personal protective equipment as required.

### Response

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

IF ON SKIN: Wash with plenty of soap and water.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF exposed or concerned: Get medical advice/ attention.

Immediately call a POISON CENTER or doctor/physician.

Call a POISON CENTER or doctor/physician if you feel unwell.

Rinse mouth.

Wash contaminated clothing before reuse.

Absorb spillage to prevent material damage.

### Storage

Store locked up.

Store in corrosive resistant container or with a resistant inner liner.

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### Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
oxalic acid dihydrate	6153-56-6	>98

### Section 4 - FIRST AID MEASURES

#### SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

#### EYE

- If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

#### SKIN

- If skin or hair contact occurs:
- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

#### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.
- Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.
- Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
- As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.
- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.

This must definitely be left to a doctor or person authorised by him/her.  
(ICSC13719).

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## Section 4 - FIRST AID MEASURES

### NOTES TO PHYSICIAN

- Effective therapy against burns from oxalic acid involves replacement of calcium.
  - Intravenous oxalic acid is substantially excreted (88% - 90%) in the urine within 36 hours.
- Treatment must be prompt.
- Give immediately by mouth, a dilute solution of any soluble calcium salt; calcium lactate, lime water, finely pulverised chalk or plaster suspended in a large volume of water or milk. Large amounts of calcium are required to inactivate oxalate by precipitating it as the insoluble calcium salt. Do NOT give an emetic drug.
  - Perform gastric lavage carefully or not at all if severe mucosal injury is evident. Dilute lime water (calcium hydroxide) makes a good lavage fluid if used in large quantity.
  - Administer a slow intravenous injection of 10-20 ml of calcium gluconate (10% solution) or of calcium chloride (5% solution). This injection may be repeated frequently to prevent hypocalcaemic tetany. Calcium gluconate (10 m) may also be given intramuscularly every few hours. Calcium compounds are never given subcutaneously; even the intramuscular route is hazardous in infants because of the incidence of sloughing.
  - In severe cases parathyroid extract (100 USP units) should be given intramuscularly.
  - Morphine may be necessary to control pain.
  - Treat shock by cautious intravenous injection of isotonic saline solution. Check for metabolic acidosis and infuse sodium bicarbonate if necessary.
  - Watch for oedema of the glottis late formation of oesophageal stricture.
  - Useful demulcents by mouth include milk of magnesia, bismuth subcarbonate, and mineral oil.
  - Prophylactic and therapeutic measures in anticipation of renal damage.

[GOSSELIN SMITH HODGE: Clinical Toxicology of Commercial Products]

Oxalates are readily metabolized to oxalic acid in the body. Oxalic acid is excreted in the urine at a rate of 8-40 mg/day in healthy normal men and women. About half is excreted as oxalic acid and half as magnesium, calcium or other salts. Ingested oxalic acid is also excreted in the feces. In rats, approximately half of ingested oxalic acid is destroyed by bacterial action and about 25% is excreted unchanged in the feces. In humans, calcium oxalate is deposited in the kidneys as crystals and may be deposited in non-crystalline form, bound to lipid, in the liver and other body tissues.

For acute or short term repeated exposures to strong acids:

- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

#### INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

#### SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

#### EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralising agents or any other additives. Several litres of saline are required.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology].

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## Section 4 - FIRST AID MEASURES

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## Section 5 - FIRE FIGHTING MEASURES

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### EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

### FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### FIRE/EXPLOSION HAZARD

- Combustible.
  - Slight fire hazard when exposed to heat or flame.
  - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
  - Heating may cause expansion or decomposition leading to violent rupture of containers.
  - May emit acrid smoke and corrosive fumes.
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), other pyrolysis products typical of burning organic material.

### FIRE INCOMPATIBILITY

- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

### Personal Protective Equipment

Gas tight chemical resistant suit.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable, labelled container for waste disposal.
- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.

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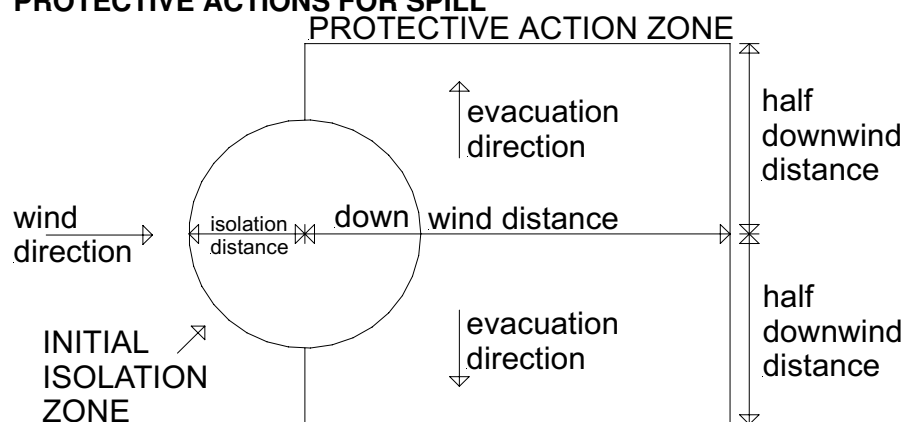
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### Section 6 - ACCIDENTAL RELEASE MEASURES

- Consider evacuation (or protect in place).
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

#### PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

Isolation Distance	25 metres
Downwind Protection Distance	250 metres
IERG Number	36

#### FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".  
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 154 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

**Personal Protective Equipment advice is contained in Section 8 of the MSDS.**

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## Section 7 - HANDLING AND STORAGE

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### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- **WARNING:** To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.

- Do NOT cut, drill, grind or weld such containers
- In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

### SUITABLE CONTAINER

- DO NOT use aluminium or galvanised containers.
- Check regularly for spills and leaks.
- DO NOT use mild steel or galvanised containers.
- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):

- Removable head packaging;
  - Cans with friction closures and
  - low pressure tubes and cartridges
- may be used.

-

Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

### STORAGE INCOMPATIBILITY

- Oxalic acid (and its dihydrate):
  - react violently with strong oxidisers, bromine, furfuryl alcohol, hydrogen peroxide (90%), phosphorous trichloride, silver powders
  - reacts explosively with chlorites and hypochlorites
  - mixture with some silver compounds form explosive salts of silver oxalate
  - is incompatible with caustics and alkalis, urea, alkaline metals and steel
  - attacks polyvinyl alcohol and acetal plastics.
- Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.

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## Section 7 - HANDLING AND STORAGE

- Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.
- Avoid strong bases.
- Segregate from alkalies, oxidising agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

### SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+: May be stored together

O: May be stored together with specific precautions

X: Must not be stored together

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>
Australia Exposure Standards	oxalic acid dihydrate (Oxalic acid)	1	2

### EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m <sup>3</sup> )	Revised IDLH Value (ppm)
oxalic acid dihydrate	500 [Unch]	

### MATERIAL DATA

#### OXALIC ACID DIHYDRATE:

■ There is only scant data regarding the toxicology of industrial exposure to airborne oxalates. There is no data regarding potential systemic toxicity or bioavailability of inhaled oxalates. The TLV-TWA (corresponding to 0.27 ppm on a molecular basis) is comparable to that of sulfuric acid and phosphoric acid and is thought to provide protection against the risk of eye and skin burns and respiratory tract irritation. The recommendation for a STEL is added to prevent irritation of skin and mucous membranes.

### PERSONAL PROTECTION

continued...



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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION



### EYE

- Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure
- Chemical goggles whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted
- Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.
- Alternatively a gas mask may replace splash goggles and face shields.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

### HANDS/FEET

- Elbow length PVC gloves.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

### OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

- selected respiratory . These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
  - Use approved positive flow mask if significant quantities of dust becomes airborne.
  - Try to avoid creating dust conditions.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult your Occupational Health and Safety Advisor.

### ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
  - Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.
  - If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered. Such protection might consist of:
    - (a): particle dust respirators, if necessary, combined with an absorption cartridge;
    - (b): filter respirators with absorption cartridge or canister of the right type;
    - (c): fresh-air hoods or masks
  - Build-up of electrostatic charge on the dust particle, may be prevented by bonding and grounding.
  - Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.
- Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to efficiently remove the contaminant.

Type of Contaminant:	Air Speed:
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated from the extraction point. Other mechanical considerations, producing performance deficits within the

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Colourless, monoclinic tablets, prisms, or granules. Soluble in water, alcohol, ether, glycerol. Insoluble in benzene, chloroform, petroleum ether.

### PHYSICAL PROPERTIES

Mixes with water.

Corrosive.

Acid.

State	DIVIDED SOLID	Molecular Weight	126.1
Melting Range (°C)	101	Viscosity	Not Applicable
Boiling Range (°C)	150 sublimes	Solubility in water (g/L)	Miscible
Flash Point (°C)	Not available.	pH (1% solution)	1.3 (0.1 M sol)
Decomposition Temp (°C)	> 157	pH (as supplied)	Not applicable
Autoignition Temp (°C)	Not available.	Vapour Pressure (kPa)	Not available.
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	1.65
Lower Explosive Limit (%)	Not applicable	Relative Vapour Density (air=1)	Not Applicable
Volatile Component (%vol)	Not available	Evaporation Rate	Not Applicable

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Contact with alkaline material liberates heat.
- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

*For incompatible materials - refer to Section 7 - Handling and Storage.*

## Section 11 - TOXICOLOGICAL INFORMATION

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

- The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion.
- Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
- Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. Swelling of the epiglottis may make it difficult to breathe which may result in suffocation. More severe exposure may result in vomiting blood and thick mucus, shock, abnormally low blood pressure, fluctuating pulse, shallow respiration and clammy skin, inflammation of stomach wall, and rupture of oesophageal tissue. Untreated shock may eventually result in kidney failure. Severe cases may result in perforation of the stomach and abdominal cavity with consequent infection, rigidity and fever. There may be severe narrowing of the oesophageal or pyloric

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## Section 11 - TOXICOLOGICAL INFORMATION

sphincters; this may occur immediately or after a delay of weeks to years. There may be coma and convulsions, followed by death due to infection of the abdominal cavity, kidneys or lungs.

■ Oxalic acid is a minor, normal body constituent occurring in blood at approximately 0.150 mg/100 ml and in kidney, muscle and liver at about 0.050 mg/100 ml dry weight, but higher concentrations are toxic. Ingestion of 5 grams has caused death within hours. It is a systemic poison which affects the central nervous system and kidney function. Low doses (i.e. excess in blood) may cause hypocalcemia (presence in the blood of an abnormally low concentration of calcium).

Oxalic acid occurs naturally in the common weed *Oxalis*, 'sour sobs'.

■ Ingestion of low-molecular organic acid solutions may produce spontaneous haemorrhaging, production of blood clots, gastrointestinal damage and narrowing of the oesophagus and stomach entry.

■ Soluble or solubilised oxalates act as severe corrosive agents within the alimentary tract and may be lethal as a result of severe gastroenteritis and secondary shock. Where gastrointestinal symptoms are absent (as is the case with dilute solutions) systemic effects may dominate resulting in muscle twitching, cramps and depression of respiratory and cardiac functions. Other symptoms of poisoning include vomiting (often bloody with coffee spots), pain, weak and irregular pulse, headache, stiffness, convulsions, stupor and coma. Kidney damage occurs, causing a reduction in frequency of urination, and also protein and blood in the urine.

### EYE

■ The material can produce severe chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.

■ If applied to the eyes, this material causes severe eye damage.

■ Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely. Severe burns produce long-lasting and possibly irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply opaque resulting in blindness.

■ Solutions of low-molecular weight organic acids cause pain and injury to the eyes.

### SKIN

■ The material can produce severe chemical burns following direct contact with the skin.

■ Skin contact with the material may be harmful; systemic effects may result following absorption.

■ Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.

■ Solutions of 5% to 10% oxalic acid are irritating to the skin after prolonged contact; early gangrene may occur after hand immersion in oxalate solutions.

■ Oxalate ion is an irritant and may cause dermatitis. Following contact skin lesions may develop. Epithelial cracking and slow-healing ulceration may follow. They fingers may appear cyanotic.

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

■ Solution of material in moisture on the skin, or perspiration, may increase irritant effects.

### INHALED

■ The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.

■ Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness. Swelling of the lungs can occur, either immediately or after a delay; symptoms of this include chest tightness, shortness of breath, frothy phlegm and cyanosis. Lack of oxygen can cause death hours after onset.

■ Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.

■ Inhalation of oxalic acid dusts or vapours can cause ulceration of the mucous membranes of the nose and throat, epistaxis (nosebleed), headache and nervousness. The airborne dust behaves as a strong acid producing severe local burns of the mucous membranes.

■ Inhalation of soluble oxalates produces irritation of the respiratory tract. Systemic effects may include protein in the urine (albuminuria), ulceration of the mucous membranes, headaches, nervousness, cough, vomiting, emaciation, back pain (due to kidney injury) and weakness.

Inhalation of soluble oxalates over a long period of time might result in weight loss and respiratory tract

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# OXALIC ACID

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### Section 11 - TOXICOLOGICAL INFORMATION

inflammation.

■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

#### CHRONIC HEALTH EFFECTS

■ Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Chronic exposure may inflame the skin or conjunctiva. Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Based on experience with animal studies, exposure to the material may result in toxic effects to the development of the foetus, at levels which do not cause significant toxic effects to the mother. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Based on experience with similar materials, there is a possibility that exposure to the material may reduce fertility in humans at levels which do not cause other toxic effects. Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Prime symptom is breathlessness; lung shadows show on X-ray. Chronic exposure to oxalates may result in circulatory failure or nervous system irregularities may follow prolonged calcium metabolism due to oxalation. Prolonged and severe exposure can cause chronic cough, albuminuria, vomiting, pain in the back and gradual emaciation and weakness. Prolonged or repeated overexposure may result in delayed liver and/or kidney damage. Certain rare individuals are subject to oxalosis (deposition of oxalates in the kidneys) and are unusually reactive to any exposure.

Rats administered oxalic acid at 2.5 and 5% in the diet for 70 days developed depressed thyroid function and weight loss. A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company. In a multigeneration study in mice, toxic effects in pups were seen only at maternally toxic doses. Oxalic acid is negative for genotoxicity in reverse mutation assays.

#### TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

##### TOXICITY

Oral (Rat) LD50: 7500 mg/kg \*  
Oral (rat) TDLo: 1400 mg/kg\*\*

##### IRRITATION

Eye (rabbit): 250 mg/24 h - SEVERE \*  
Skin (rabbit): 500 mg/24 h - Mild

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin

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### Section 11 - TOXICOLOGICAL INFORMATION

redness, swelling, the production of vesicles, scaling and thickening of the skin.

\* Supreme Resources MSDS

### Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:

#### OXALIC ACID DIHYDRATE:

■ For oxalic acid and oxalate salts

Environmental fate:

If released to soil, oxalic acid under environmental conditions (pH 5-9) will be in the form of the oxalate ion (pKa1 and pKa2 of 1.25 and 4.28, respectively) and is expected to leach in soil. Photolysis is expected to be an important fate process; the daytime persistence of oxalic acid and oxalates on soil surfaces is not expected to exceed a few hours. Based upon screening biodegradation tests, biodegradation in soil is expected to be important. No experimental data are available to determine whether the oxalate ion will adsorb to sediment or soil more strongly than its estimated Koc value indicates. If released to water, oxalic acid/oxalates will not volatilise, adsorb to sediment, bioconcentrate in aquatic organisms, oxidise or hydrolyse. Oxalic acid, however, may act as a leaching agent for those metals that form soluble oxalate complexes, including Al and Fe. This may result in the release of metals which may otherwise be strongly adsorbed to soils.

Based on an average experimental water solubility of 220,000 mg/L at 25 deg C and a regression derived equation, the BCF for oxalic acid can be estimated to be approximately 0.6 and therefore should not be expected to bioconcentrate in aquatic organisms. The predominant aquatic fate processes are expected to be photolysis in surface waters and aerobic and anaerobic biodegradation. If released to the atmosphere, removal from air via wet deposition, dry deposition, and photolysis is likely to occur. Exposure of the general population to oxalic acid/oxalates is expected to occur through consumption of foods in which it is naturally contained, inhalation of contaminated air, and consumption of contaminated groundwater.

Oxalic acid is a metabolite of ethylene glycol, which in turn is a metabolite of ethylene oxide. In assessing the aggregate exposure to oxalic acid, the residues of ethylene glycol and ethylene oxide must be considered. Food uses of ethylene oxide are thought result in insignificant exposure to drinking water resources. Ethylene oxide does not persist in the environment because it is reactive and degrades by biotic and abiotic processes. Ethylene glycol also breaks down rapidly in air, soils and water and is not expected to bioaccumulate in the environment or foodstuffs. Therefore these metabolites are not expected to contribute significantly to aggregate exposure.

■ Prevent, by any means available, spillage from entering drains or water courses.

■ DO NOT discharge into sewer or waterways.

#### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
oxalic acid dihydrate	LOW		LOW	HIGH

#### GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / Cas No / RTECS No	EHS	TRN	A1a	A1b	A1	A2	B1	B2	C1	C2	C3	D1	D2	D3	E1	E2	E3
- CAS:6153- 56- 6 /	226 6	282 5	5	2	(2)	NR	1	NI	0	0	(1)	1	1			FE	2

Legend:

continued...

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## Section 12 - ECOLOGICAL INFORMATION

EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships) NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation, A2=Biodegradation, B1=Acute aquatic toxicity LC/EC50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acute mammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation & corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities,

For column A2: R=Readily biodegradable, NR=Not readily biodegradable.

For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lung injury, N=Neurotoxic, I=Immunotoxic.

For column E1: NT=Not tainting (tested), T=Tainting test positive.

For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances.

The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard.

(GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

## Section 13 - DISPOSAL CONSIDERATIONS

- Containers may still present a chemical hazard/ danger when empty.

- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.

- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction

- Reuse

- Recycling

- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

- DO NOT allow wash water from cleaning or process equipment to enter drains.

- It may be necessary to collect all wash water for treatment before disposal.

- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.

- Where in doubt contact the responsible authority.

Recycle wherever possible.

- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.

- Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurring in water; Neutralisation with soda-lime or soda-ash followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)

- Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.

## Section 14 - TRANSPORTATION INFORMATION

continued...

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## Section 14 - TRANSPORTATION INFORMATION



Labels Required: CORROSIVE

### HAZCHEM:

☐ 2X

### Land Transport UNDG:

Class or division:	8	Subsidiary risk:	None
UN No.:	3261	UN packing group:	III
Shipping Name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (contains oxalic acid dihydrate)			

### Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	None
UN/ID Number:	3261	Packing Group:	III
Special provisions:	A3		
Shipping Name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. *(CONTAINS OXALIC ACID DIHYDRATE)			

### Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	None
UN Number:	3261	Packing Group:	III
EMS Number:	F- A, S- B	Special provisions:	274 944
Limited Quantities:	1 kg		
Shipping Name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.(contains oxalic acid dihydrate)			

GESAMP hazard profiles for this material can be found in section 12 of the MSDS.

## Section 15 - REGULATORY INFORMATION

### REGULATIONS

**oxalic acid dihydrate (CAS: 6153-56-6) is found on the following regulatory lists;**

"Australia Inventory of Chemical Substances (AICS)", "OECD Representative List of High Production Volume (HPV) Chemicals"

## Section 16 - OTHER INFORMATION

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## Section 16 - OTHER INFORMATION

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The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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