



Safety Data Sheet

1. Product Identification

Trade name: Hardener DL
SDS Number ; A-112E-E2S
Manufacturer's name: Murakami Screen (Singapore) Pte. Ltd.
Address ; 35 Loyang Drive, Singapore
Phone number; (+65)6546-0355
FAX number; (+65)6546-0365
Recommended use of chemical and restrictions on use:
Material for screen printing. Not intended for other applications

2. Hazard identification

GHS classification:

Physical hazards;

Explosives	Not applicable
Flammable gases	Not applicable
Flammable aerosols	Not applicable
Oxidizing gases	Not applicable
Gases under pressure	Not applicable
Flammable liquids	Category 3
Flammable solids	Not applicable
Self-reactive substances and mixtures	Classification not possible
Pyrophoric liquids	Classification not possible
Pyrophoric solids	Not applicable
Self-heating substances and mixtures	Classification not possible
Substances and mixtures, which in contact with water, emit flammable gases	Not applicable
Oxidizing liquids	Not applicable
Oxidizing solids	Not applicable
Organic peroxides	Not applicable
Corrosive metals	Classification not possible

Health hazards;

Acute toxicity (Oral)	Category 5
Acute toxicity (Dermal)	Classification not possible
Acute toxicity (Inhalation: Gases)	Not applicable
Acute toxicity (Inhalation: Vapours)	Classification not possible
Acute toxicity (Inhalation: Dusts and Mists)	Category 4
Skin corrosion/irritation	Category 1
Eye damage/eye irritation	Classification not possible
Respiratory sensitization	Category 1
Skin sensitization	Category 1
Germ cell mutagenicity	Not classified
Carcinogenicity	Classification not possible
Reproductive toxicity	Classification not possible
Specific target organ toxicity (Single exposure)	Category 1 (nerve, visual organs)
Specific target organ toxicity (Repeated exposure)	Classification not possible

Aspiration hazard	Classification not possible
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Environmental hazards;

- Hazardous to the aquatic environment (Acute toxicity) Category 2
- Hazardous to the aquatic environment (Chronic toxicity) Category 3
- Hazardous to the ozone layer Classification not possible

Pictogram and Symbol:



Health Hazard Corrosion Flame Exclamation mark

Signal Word:

- Danger
- H226 Flammable liquid and vapour
 - H303 May be harmful if swallowed
 - H314 Causes severe skin burns and eye damage
 - H317 May cause an allergic skin reaction
 - H332 Harmful if inhaled
 - H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
 - H370 Causes damage to organs (nerve, visual organs)
 - H401 Toxic to aquatic life
 - H412 Harmful to aquatic life with long lasting effects

Precautionary statements:

- Prevention ;**
- P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
 - P233 Keep container tightly closed.
 - P240 Ground/bond container and receiving equipment.
 - P241 Use explosion-proof electrical/ventilating/lighting/.../equipment.
 - P242 Use only non-sparking tools.
 - P243 Take precautionary measures against static discharge.
 - P260 Do not breathe mist/vapours.
 - P264 Wash hands thoroughly after handling.
 - P270 Do not eat, drink or smoke when using this product.
 - P271 Use only outdoors or in a well-ventilated area.
 - P272 Contaminated work clothing should not be allowed out of the workplace.
 - P273 Avoid release to the environment.
 - P280 Wear protective gloves/protective clothing/eye protection/face protection.

- Response;**
- P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
 - P302+P352 IF ON SKIN: Wash with plenty of water.
 - P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
 - P304+P340 +P310 IF INHALED: Remove person fresh air and keep comfortable for breathing and
 - P312 Call a POISON CENTER/doctor if you feel unwell.
 - P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
 - P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER/doctor/....
 - P362+P364 Take off contaminated clothing and wash it before reuse.
 - P370+P378 In case of fire: Use water to extinction.

- Storage;**
- P403+P235 Store in a well-ventilated place. Keep cool.
 - P405 Store locked up.

- Disposal;**
- P501 Dispose of contents / container in accordance with local / regional / national / international regulations.



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3. Composition/information on ingredients

Substance or Mixture: Mixture

Ingredients and concentration ranges:

Chemical name		Water	Methyl alcohol	Glutaraldehyde
wt%		80≤<90wt%	5≤<15wt%	1≤<10 wt%
CAS No.		7732-18-5	67-56-1	111-30-8
Global Inventories	TSCA (USA)	Listed	Listed	Listed
	ENCS (Japan)	-	Listed	Listed
	EC No. (EU)	Listed	Listed	Listed
	IECSC (China)	Listed	Listed	Listed

4. First aid measures

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

Get medical advice / attention if you feel unwell.

Get medical advice / attention if experiencing respiratory symptoms.

Cover body with blanket to warm and keep at rest.

Skin Contact: Remove / Take off all contaminated clothing immediately.

Wash with plenty of soap and water.

Get immediate medical advice / attention, if skin irritation or rash occurs.

Eye Contact: Remove contact lenses, if present and easy to do. Continue rinsing.

Rinse with clean water for at least 15 minutes and then seek medical attention if necessary.

When rinsing, open your eyelids with fingers to insure saturation of water.

Seek medical attention if the problem persists.

Ingestion: Rinse mouth. Do not induce vomiting.

Get immediate medical advice / attention.

If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

Protection for personnel administering first aid:

Wear appropriate protective equipment if necessary.

5. Firefighting measures

Extinguishing media:

Suitable extinguishing media; Fire-extinguishing powder, fire-fighting foam, carbon dioxide, sand, water spray

Unsuitable extinguishing media; Straight stream water

Specific hazards arising from the product:

When exposed to high temperatures, this product may generate dangerous decompositions such as carbon monoxide and carbon dioxide.

Specific extinguishing measures: Cut off the combustion source to the origin of fire and extinguish by using the appropriate fire extinguishing media.

Take appropriate measures to disallow substances that may affect the environment from being dispersed by the drainage.

Remove all containers possible to a safe place promptly.

If not possible to remove, cool down the area. Work from windward and use respiratory equipment if necessary.

Special protective equipment and precautions:

Wear appropriate protective wear (heat-proof) including air respirators.



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6. Accidental release measures

Personal precautions, protective equipment and emergency procedures :

- Avoid breathing mist / vapors.
- Wear protective equipment (boots, gloves, and glasses) to prevent contact with skin.
- Remove ignition sources in the area and work from windward.
- Clean up immediately when it spills on the floor or any surface. (The floor surface becomes slippery).
- Prohibit entry other than related personnel.
- Ventilate released area.
- Do not touch and/or walk in the spills.
- The worker wears an appropriate protective equipment, and avoids eyes, the skin contacts, and inhalations. (refer to Item 8)
- Prepare fire extinguishing equipment in case of ignition.

Environmental precautions :

- Avoid releasing to the environment.
- Collect spillage.
- If the pollution of water pipes or waterways occur, contact relevant organizations.
- Clean the area and avoid entry into plumbing system.

Methods and materials for recovery and neutralization:

- Collect into open container by absorbing with cloths, rags, sand or etc. and then rinse with plenty of water.
- Contain the flow path with blankets or sand bags and collect into an appropriate container for large spills.
- Prevent the inflow into drains, sewer, basement, or enclosed areas.
- Wear appropriate protective equipment throughout the process.

7. Handling and storage

- Handling:**
- Keep the concentration below the allowed limit.
 - Seal container after use.
 - Avoid improper handling like tipping over, dropping, strong impact to or dragging the container.
 - Wash hands thoroughly and rinse mouth after handling.
 - Do not eat, drink or smoke when using this product.
 - Do not carry contaminated gloves and protective equipment into rest / break areas.
 - Wear proper protective equipment to avoid inhalation and contact with eyes and skin.
- Storage:**
- Store in a well-ventilated area.
 - Keep container tightly closed.
 - Store in a dark light-safe area.

8. Exposure controls/personal protection

- Management density :**
- 200ppm /Methyl alcohol
 - 0.03ppm /Glutaraldehyde
- Exposure limit values :**
- ACGIH(2010);** 200ppm(TWA), 400ppm (STEL) /Methyl alcohol
 - ACGIH(2009);** 0.05ppm (STEL)/Glutaraldehyde
- Engineering measures:** It is desirable to install a local exhaust system as necessary.
- Personal protective equipment:** Wear following protective equipment as necessary and accordingly.
- Inspect equipment on a regular basis by using a protective equipment maintenance chart.
- Respiratory protection ;** Wearing organic vapor gas mask is preferred.
- Eye protection ;** Wearing protective glasses is preferred.
- Hand protection ;** Wearing gloves that organic solvents or chemicals do not penetrate is preferred.
- Skin protection ;** Wearing protective clothing (long sleeve uniform) that organic solvent or the chemical do not infiltrate easily is preferred.



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9. Physical and chemical properties

Appearance (physical state, color, etc.):

Physical state;	Aqueous solution
Color;	colorless
Odour;	Mild
pH;	3.0 - 4.0
Melting point/freezing point:	Approx 0°C
Initial boiling point and boilinr range:	Approx 91.5°C
Flash point:	Approx 47.5°C
Relative density:	Approx 1mg/cm3
Solubility:	dispersible, soluble

10. Stability and reactivity

Reactivity:	Decomposes upon heating and produces carbon dioxide and carbon monoxide.
Chemical stability:	Stable under normal conditions.
Conditions to avoid:	Sunlight, heat, open flame, high temperature, sparks, static electricity, other sources of ignition.
Incompatible materials:	Incompatible with acid, alkali, amines and is prohibited to mix with.
Hazardous decomposition products:	Carbon monoxide (CO), carbon dioxide (CO2) gas might be generated by combustion. Vapor from organic solvents.

11. Toxicological information

Acute toxicity(Oral):

Information on product;	No information available, Category 5 based on the calculation.
Information on ingredients;	
Glutaraldehyde	Category 3.
Methyl alcohol	Category 4.

Acute toxicity (Transdermal):

Information on product;	No information available, Classification not possible based on the calculation.
Information on ingredients;	No information available.

Acute toxicity(Inhalation):

Information on product;	No information available, Category 4 based on the calculation.
Information on ingredients;	
Glutaraldehyde	Category 2.

Skin corrosion/irritation :

Information on product;	No information available, Category 1 based on the calculation.
Information on ingredients;	
Glutaraldehyde	Category 1

Serious eye damage/irritation :

Information on product;	No information available, Classification not possible based on the calculation.
Information on ingredients;	No information available.

Respiratory sensitization :

Information on product;	No information available, Category 1 based on the calculation.
Information on ingredients;	
Glutaraldehyde	Category 1

Skin sensitization :

Information on product;	No information available, Category 1 based on the calculation.
Information on ingredients;	
Glutaraldehyde	Category 1



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Germ cell mutagenicity :

Information on product; No information available, Not classified based on the calculation.
Information on ingredients; No information available.

Carcinogenicity :

Information on product; No information available, Classification not possible based on the calculation.
Information on ingredients; No information available.

Reproductive toxicity :

Information on product; No information available, Classification not possible based on the calculation.
Information on ingredients; No information available.

STOT-single exposure :

Information on product; No information available, Category 1 (nerve, visual organs) based on the calculation.
Information on ingredients;
Methyl alcohol Category 1(nerve, visual organs)

STOT-repeated exposure :

Information on product; No information available, Classification not possible based on the calculation.
Information on ingredients; No information available.

Aspiration hazard :

Information on product; No information available, Classification not possible based on the calculation.
Information on ingredients; No information available.

12. Ecological information

Acute aquatic toxicity :

Information on product; No information available, Category 2 based on the calculation.
Information on ingredients;
Glutaraldehyde Category 1

Chronic aquatic toxicity :

Information on product; No information available, Category 3 based on the calculation.
Information on ingredients;
Glutaraldehyde Category 2

Persistence and degradability :

Information on product; No information available.
Information on ingredients; No information available.

Bioaccumulative potential :

Information on product; No information available.
Information on ingredients; No information available.

Mobility in soil :

Information on product; No information available.
Information on ingredients; No information available.

Other adverse effects :

Information on product; The product is not allowed to run into drain or waterways.
Information on ingredients; No information available.

13. Disposal considerations

Dispose of contents / container in accordance with local / regional / national / international regulations.

<To be continued>



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14. Transport information

Avoid direct sunlight during transportation. Confirm the container has no damage, corrosion, leakage before transportation. Take measures to prevent the load from tipping, falling and damages.

Verify the container has no leaks when transporting and take preventative measure when loading so that the cargo does not tip, fall or get damaged during transit.

UN classification:

UN number;	1993
UN proper shipping name;	FLAMMABLE LIQUID, N.O.S.
Transport hazard class(es);	3
Packing group;	III
Environmental hazards (Marine pollutant):	Not applicable.
Land transport ADR / RID:	Transport in accordance with ADR/RID
Maritime transport IMDG:	Transport in accordance with IMDG
Air transport ICAO and IATA:	Transport in accordance with ICAO/IATA

15. Regulatory information

The product must be used, stored, and transported in accordance with local / regional / national / international

16. Other information

Handling of described contents:

The information contained herein is given in good faith and accurate to the best of our knowledge. No warranty is given, expressed, or implied.

The product must not be used for any purposes other than those specified under heading 1 without first obtaining written handling instructions.

It is at all times the responsibility of the user to take all necessary measures to comply with legal requirements and local regulations.

The information given on this safety data sheet must be regarded as a description of the safety requirements relating to our product and not a guarantee of its properties.

Moreover, it is likely to be revised based on a revision of the law and a new finding.

This product is developed for general industry. Please use it after confirming safety in your company for special applications.

Reference citations:

Regulation (EC) No. 1272/2008

Raw material company submitting SDS

The Chemical Daily Co.,Ltd. "2011 version 15911 chemical products" (2011)