Glory Global
CO.,LTD

Material Safety Data Sheet

Product name	RHODIAMINE HMD 72 % (BR)

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product name: RHODIAMINE HMD 72 % (BR)

1.2. CAS-No.: 124-09-4

1.3. Relevant identified uses of the substance or mixture and uses advised against

Identified uses:
- Industrial Manufacturing (all)
- Manufacture of textiles, leather, fur
- Manufacture of bulk, large scale chemicals (including petroleum products)
- Manufacture of fine chemicals
- Formulation
- Manufacture of rubber products
- Manufacture of plastics products, including compounding and conversion
- Use as intermediate or monomer
- Formulation & (re)packing of substances and mixtures
- Use in liquid formulation
- Use in dry formulation
- (for more details please refer to the annex of this SDS)

1.4. Details of the supplier of the safety data sheet

Company	Glory Global CO.,LTD
Address	C-208, 10, Nowon-ro 15-gil, Nowon-gu, Seoul, Korea
Emergency Phone	+82 2 6223 0862

2. Hazards identification

2.1. Classification of the substance or mixture

Hazard classification
HCS 2012 (29 CFR 1910.1200):
Acute toxicity, Category 4
Acute toxicity, Category 4
Skin corrosion, Category 1
Serious eye damage, Category 1
Specific target organ systemic toxicity - single exposure Category 3
H302: Harmful if swallowed.
H312: Harmful in contact with skin.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H335: May cause respiratory irritation. (Respiratory system)

2.2. GHS Label elements, including precautionary statements

Hazardous products which must be listed on the label: CAS-No. 124-09-4
1,6-Diaminohexane

Pictogram:

Signal word: Danger

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.

Precautionary code and statements

Prevention
- P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
- P264 Wash skin thoroughly afterhandling.
- P270 Do not eat, drink or smoke when using this product.
- P271 Use only outdoors or in a well-ventilated area.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response
- P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
- P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P304 + P340 + P310 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.
- P305 + P351 + P338 + P310 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 or doctor/ physician.

Storage
- P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
- P405 Store locked up.

Disposal
- P501 Dispose of contents/ container to an approved waste disposal plant.

2.3, Hazards not otherwise classified (HNOC) or not covered by GHS
- Harmful to aquatic organisms.
- On thermal decomposition (pyrolysis) releases
- toxic gases

NFPA (National Fire Protection Association) - Classification
Health: 3 serious
Flammability: 1 slight
Instability or Reactivity: 0 minimal

3. Composition/information on ingredients

3.1. Substances: Not applicable, this product is a mixture

3.2. Mixture: Chemical nature Aqueous solution

Information on Components and Impurities

Chemical name	CAS-No.	Identification number	GHS Classification	Concentration [%]
1,6-Diaminohexane	124-09-4	KECI Number: KE-18611	Acute toxicity, Category 4 ; H302 Acute toxicity, Category 4 ; H312 Skin corrosion, Category 1 ; H314 Serious eye damage, Category 1 ; H318 Specific target organ toxicity - single exposure, Category 3 ; H335 (Respiratory system)	≥70 - ≤80 %

4. First aid measures

4.1. Description of first aid measures

General advice
- Show this material safety data sheet to the doctor in attendance.
- First responder needs to protect himself.
- Place affected apparel in a sealed bag for subsequent decontamination.

If inhaled
- Move to fresh air.
- Keep at rest.
- Get immediate medical advice/ attention.

In case of skin contact
- Take off contaminated clothing and shoes immediately.
- Wash immediately and thoroughly for a prolonged period (at least 15 minutes).
- Get immediate medical advice/ attention.

In case of eye contact
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- Get immediate medical advice/ attention.

If swallowed
- Do NOT induce vomiting.
- Do not give anything to drink.
- Get immediate medical advice/ attention.

4.2. Most important symptoms and effects, both acute and delayed
- Skin contact may aggravate existing skin disease
- Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis

4.3. Indication of any immediate medical attention and special treatment needed
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
- Water spray

Unsuitable extinguishing media
- Carbon dioxide (CO2)

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting
- On heating there is a risk of a build-up of pressure in hermetically sealed containers or tanks.
- Highly toxic gases are released.

Hazardous combustion products
- Hydrogen cyanide (hydrocyanic acid)
- Ammonia
- Nitrogen oxides (NOx)
- Carbon oxides

5.3. Advice for firefighters
- Special protective equipment for firefighters
- Wear self-contained breathing apparatus for firefighting if necessary.

5.4. Further information
- Cool containers/tanks with water spray.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
- Avoid contact with the skin and the eyes.
- Personal protective equipment
- Self-contained breathing apparatus (EN 133)
- Wear suitable gloves.
- Tightly fitting safety goggles
- Boots
- Respiratory protection

6.2. Environmental precautions
- Dam up.
- The product should not be allowed to enter drains, water courses or the soil.

6.3. Methods and materials for containment and cleaning up
- Collect spillage.
- Keep in properly labelled containers
- Wash off with plenty of water.
- Recover the cleaning water for subsequent disposal.
- Treat recovered material as described in the section "Disposal considerations".

6.4. Reference to other sections
- Refer to protective measures listed in sections 7 and 8
- 13. DISPOSAL CONSIDERATIONS

7. Handling and storage

7.1. Precautions for safe handling
- Vapour extraction at source
- Do not allow contact with air.
- Use only in well-ventilated areas.
- Avoid contact with skin and eyes.
- Do not breathe vapors/dust.

7.2. Conditions for safe storage, including any incompatibilities
- Keep away from open flames, hot surfaces and sources of ignition.
- Keep away from incompatible materials to be indicated by the manufacturer
- Keep under inert gas.
- Keep in a well-ventilated place.
- Keep away from: Acids, Oxidizing materials.

7.3. Specific end use(s)
- no data available

8. Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	Value type	Value	Basis
1,6-Diaminohexane	TWA	0.5 ppm	USA. ACGIH Threshold Limit Values (TLV)

8.2. Exposure controls

Appropriate engineering controls
- Use only in well-ventilated areas.
- Effective exhaust ventilation system
- Avoid splashes.

Personal protective equipment

a) Eye/face protection
- Tightly fitting safety goggles

b) Skin protection
- In case of contact through splashing
- Complete suit protecting against chemicals
- Complete head face and neck protection
- Remove and wash contaminated clothing.

c) Hand Protection
- Where there is a risk of contact with hands, use appropriate gloves
- Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

d) Respiratory protection
- In case of insufficient ventilation, wear suitable respiratory equipment.
- Breathing apparatus with filter.

e) Hygiene measures
- Emergency equipment immediately accessible, with instructions for use.
- Ensure that eyewash stations and safety showers are close to the workstation location.
- Use clean, well-maintained personal protection equipment.
- Wash hands before breaks and immediately after handling the product.
- When using do not eat, drink or smoke.

f) Protective measures
- Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the potential hazards and/or risks that may occur during use.

Environmental exposure controls
- Dam up.
- The product should not be allowed to enter drains, water courses or the soil.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Form: Aqueous solution Physical state: liquid Colour: colourless
Odour	ammoniaca
Odour Threshold	No data available
Molecular weight	116.21 g/mol Anhydrous product
pH	12.1 (1 % (m/v)) Aqueous solution
Melting point/freezing point	Crystallization temperature: 0 °C
Initial boiling point and boiling range	Boiling point/boiling range: 114 °C (1,013 hPa)
Flash point	> 98 °C closed cup Molten form, internal evaluation
Evaporation rate	No data available
Flammability (solid, gas)	The product is not flammable. Method: EU Test Guideline A10 Molten form, internal evaluation
Flammability (liquids)	The product is not flammable. Molten form
Flammability/Explosive limit	No data available
Auto-ignition temperature	315 °C (1,027 hPa) Method: EU Test Guideline A15 Anhydrous product
Vapour pressure	50 hPa (40 °C)
Vapour density	No data available
Density	0.927 g/cm3 (20 °C)
Relative density	No data available
Water solubility	1,090 g/l (20 °C)
Solubility in other solvents	Diethylether : slightly soluble Benzene : slightly soluble Methanol : 950 g/l (20 °C) soluble
Partition coefficient: n-octanol/water	log Pow: 0.02 - 0.035
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	Not explosive Method : EU Test Guideline A14 pure product
Oxidizing properties	Not considered as oxidizing, Structure-activity relationship (SAR)
9.2. Other safety information	No data available

10. Stability and reactivity

10.1. Reactivity	- No data available
10.2. Chemical stability	- Stable under normal conditions.
10.3. Possibility of hazardous reactions	- Reacts slowly with carbon dioxide present in the air.
10.4. Conditions to avoid	- No data available
10.5. Incompatible materials	- Reacts violently with: - Strong acids - Oxidizing agents
10.6. Hazardous decomposition products	- On thermal decomposition (pyrolysis) releases: - highly toxic gases. - Hydrogen cyanide (hydrocyanic acid) - Ammonia gas may be liberated at high temperatures.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity	LD50 : 1,160 mg/kg - Rat , male and female Method: according to a standardised method This product is classified as acute toxicity, category 4 Unpublished internal reports
Skin corrosion/irritation	Causes burns. Method: according to a standardised method Unpublished reports Unpublished internal reports
Serious eye damage/eye irritation	Rabbit Risk of serious damage to eyes. Method: according to a standardised method Unpublished reports
Respiratory or skin sensitisation	Corrosive

Germ cell mutagenicity (Genotoxicity in vitro)	Ames test with and without metabolic activation negative Method: OECD Test Guideline 471 Unpublished internal reports Chromosome aberration test in vitro Strain: Chinese hamster ovary cells with and without metabolic activation negative Method: OECD Test Guideline 473 Published data Gene mutation assays in mammalian cells. Strain: Chinese hamster ovary cells with and without metabolic activation negative Method: OECD Test Guideline 476 Unpublished reports Chromosome aberration test in vivo - Rat male and female Oral Method: OECD Test Guideline 475 negative
Carcinogenicity	No data available
Reproductive toxicity	Two-generation study - Rat, male and female, Oral Fertility NOAEL Parent: 500 mg/kg OECD Test Guideline 416 No toxicity to reproduction, Published data
Specific target organ toxicity - single exposure	Target Organs: Respiratory system The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation according to GHS criteria.
Specific target organ toxicity - repeated exposure	The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.
Aspiration hazard	No data available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. Ecological information

12.1. Toxicity

Toxicity to fish	LC50 - 96 h : 1,825 mg/l - Pimephales promelas (fathead minnow) static test Analytical monitoring: no Method: OECD Test Guideline 203 Unpublished reports Not harmful to fish (LC/LL50 > 100 mg/L)
Toxicity to daphnia and other aquatic invertebrates	EC50 - 48 h : 31.5 mg/l - Daphnia magna (Water flea) static test Analytical monitoring: no Method: according to a standardised method Unpublished reports Harmful to aquatic invertebrates.
Toxicity to algae/aquatic plants	ErC50 - 72 h : > 100 mg/l - Pseudokirchneriella subcapitata (microalgae) static test Analytical monitoring: yes End point: Growth rate Method: OECD Test Guideline 201 Not harmful to algae (EC/EL50 > 100 mg/L) Unpublished internal reports ErC10 - 72 h : 118 mg/l - Pseudokirchneriella subcapitata (microalgae) static test Analytical monitoring: yes End point: Growth rate Method: OECD Test Guideline 201 No adverse chronic effect observed up to and including the threshold of 1 mg/L.
Toxicity to bacteria	EC50 - 3 h : 291 mg/l - activated sludge static test Method: OECD Test Guideline 209 Unpublished internal reports
Chronic aquatic toxicity	No data available

12.2. Persistence and degradability

Biodegradability	Ready biodegradability study: Method: OECD Test Guideline 301 D 82 % - 28 Days The 10 day time window criterion is fulfilled. The substance fulfills the criteria for ultimate aerobic biodegradability and ready biodegradability O2 consumption Inoculum: activated sludge Unpublished internal reports
12.3. Bioaccumulative potential	**Partition coefficient: n-octanol/water** Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected. **Bioconcentration factor (BCF)** No data available.
12.4. Mobility in soil	**Adsorption potential (Koc)** Adsorption Soil Log Koc: 4.23 Method: OECD Test Guideline 106 Unpublished internal reports Adsorption Sediment Log Koc: 3.18 Method: OECD Test Guideline 106 Unpublished internal reports **Known distribution to environmental compartments** Ultimate destination of the product : Water Method: Estimation method / Structure-activity relationship (SAR)
12.5. Results of PBT and vPvB assessment	Not classified as PBT substance. Not classified as vPvB.
12.6. Other adverse effects	- Short-term (acute) aquatic hazard : Harmful to aquatic life. - Long-term (chronic) aquatic hazard : No adverse chronic effect observed up to and including the threshold of 1 mg/L.

13. Disposal considerations

13.1 Product Disposal	- Avoid release to the environment. - Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
13.2. Advice on cleaning and disposal of packaging	- Clean with cold water. - Reuse or recycle following washing. - Dispose of as hazardous waste in compliance with local and national regulations.
13.3. Measure for waste avoidance or recovery	- Do not dispose of the product at a rubbish tip

14. Transport information

14.1, KR DG	- UN number UN: 1783 - Proper shipping name: HEXAMETHYLENEDIAMINE SOLUTION - Transport hazard class 8 / Label(s): 8 - Packing group: II / EmS 1 F-A / EmS 2 S-B - Environmental hazards: NO - Special precautions for user: For personal protection see section 8.
14.2. IMDG	- UN number UN: 1783 - Proper shipping name: HEXAMETHYLENEDIAMINE SOLUTION : IMDG Code segregation group Alkalis (SGG18) - Transport hazard class: 8 / Label(s): 8 - Packing group: II - Environmental hazards: Marine pollutant - NO - Special precautions for user: EmS F-A , S-B / For personal protection see section 8. - Transport in bulk vessels according to IMO instruments: No data available
14.3. IATA	- UN number: UN 1783 - Proper shipping name: HEXAMETHYLENEDIAMINE SOLUTION - Transport hazard class: 8 / Label(s): 8 - Packing group: II - Environmental hazards: NO - Special precautions for user Packing instruction (cargo aircraft): 855 Max net qty/pkg: 30.00 L Packing instruction (passenger aircraft): 851 Max net qty/pkg: 1.00 L

15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Occupational Safety and Health Act	- Harmful Substances Prohibited from Manufacturing: Not applicable - Harmful Substances Required Permission for Manufacture: Not applicable - Controlled Hazardous Substances: Not applicable - Controlled Substances Subject to Environment Monitoring: Not applicable - Controlled Substances Subject to Health Examination: Not applicable - Please refer to Chapter 8 and 13 for the OEL and disposal
AREC (K-REACH) and Chemicals Control Act	- Toxic Substances: Not applicable - Restricted Substances: Not applicable - Prohibited Substances: Not applicable - Toxic Release Inventory: Not applicable - Substances Requiring Preparation for Accidents: Not applicable
Safety Control of Dangerous Substances Act	- Not Applicable to Dangerous Materials

15.2. Notification status

United States TSCA Inventory	- Listed on Inventory
Canadian Domestic Substances List (DSL)	- Listed on Inventory
Australia Inventory of Chemical Substances (AICS)	- Listed on Inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- Listed on Inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- Listed on Inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- Listed on Inventory
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- Listed on Inventory
Taiwan Chemical Substance Inventory (TCSI)	- Listed on Inventory
New Zealand. Inventory of Chemical Substances	- All components are listed on the NZIOC inventory. the HSNO status of the product has Not been assessed.

16. Other information

16.1. Further information	- Always work safely around open hatches on bulk tanks. The low density makes flotation difficult for immersed person.