



Material Safety Data Sheet

Product name

RHODIAMINE HMD 100% (SOLID)

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

- 1.1. Product name RHODIAMINE HMD 100% (SOLID)
- 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)
- 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)
- Combustible dust
Acute toxicity, Category 4
Acute toxicity, Category 4
Skin corrosion, Category 1A
Serious eye damage, Category 1
Specific target organ systemic toxicity – single exposure
Category 3
May form combustible dust concentrations in air.
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

Pictogram



Signal word

Danger

Hazard statement(s)

- May form combustible dust concentrations in air.
- H302 + H312 Harmful if swallowed or 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

- P260 Do not breathe dusts or mists.
- P264 Wash skin thoroughly after handling.
- 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.
- P363 Wash contaminated clothing before reuse.

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.
- H402: Harmful to aquatic life.
- In use, may form flammable/explosive vapor-air mixture.
- On thermal decomposition (pyrolysis) releases:
 - toxic gases

2.3. Hazards not otherwise classified (HNOC) or not covered by GHS

3. Composition/information on ingredients

3.1. Substances

Chemical Name	CAS-No	Concentration [%]
1,6-Hexanediamine	124-09-4	≥ 99

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

3.2. Mixture

Not applicable, this product is a substance.

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

If inhaled

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. Suitable extinguishing media

- Water spray
- Carbon dioxide (CO₂)

5.2. Special hazards arising from the substance or mixture

- Hydrogen cyanide (hydrocyanic acid)
- Ammonia
- Nitrogen oxides (NO_x)
- Carbon oxides

5.3. Advice for firefighters

- Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.
- Cool containers/tanks with water spray.

5.4. Further information

No data available

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

6.2. Environmental precautions

- Dam up.
- The product should not be allowed to enter drains, water courses or the soil.
- Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies

6.3. Methods and materials for containment and cleaning up

- Shovel or sweep up.
 - Avoid dust formation.
 - Non-sparking tools should be used.
 - Pick up and transfer to properly labeled containers.
 - Keep in suitable, closed containers for disposal.
 - Wash off with plenty of water.
 - Recover the cleaning water for subsequent disposal.
- ### 6.4. Reference to other sections
- Refer to protective measures listed in sections 7 and 8

7. Handling and storage

7.1. Precautions for safe handling

- Do not allow contact with air.
- Use only in well-ventilated areas.
- Avoid contact with skin and eyes.
- Do not breathe vapors/dust.
- Vapor extraction at source

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

Ingredients	Value type	Value	Basis
1,6-Hexanediamine	TWA	0.5 ppm	American Conference of Governmental Industrial Hygienists
1,6-Hexanediamine	WEEL	1 ppm	American Industrial Hygiene Association
Particulates not otherwise regulated	PEL	15 mg/m ³	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
Particulates not otherwise regulated	PEL	5 mg/m ³	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants

8.2. Exposure controls

Appropriate engineering controls

- Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures
- Apply technical measures to comply with the occupational exposure limits.
- Avoid dust formation.
- Effective exhaust ventilation system
- dust extractors
- Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Personal protective equipment

a) Eye/face protection

- Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.
- Eye contact should be prevented through the use of:
 - Tightly fitting safety goggles

b) Skin protection

- Choose body protection according to the amount and concentration of the dangerous substance at the work place.
- In case of contact through splashing:
 - Complete suit protecting against chemicals
 - Complete head face and neck protection
 - Remove and wash contaminated apparel.

c) Body Protection

- Where there is a risk of contact with hands, use appropriate gloves
- Gloves must be inspected prior to use.
- Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

d) Respiratory protection

- When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.
- Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by the appropriate local standard(s):
 - Respirator with combination filter for vapor/particulate (EN 141)

e) Control of environmental exposure

- Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Form: Crystalline matter Physical state: solid liquid (> 108 °F (> 42 °C)) Color: white
Odour	ammoniac
Odour Threshold	No test data available
pH	12.1 (1 % (m/v)) Aqueous solution
Melting point / range	102 – 108 °F (39 – 42 °C) Method: OECD Test Guideline 102
Initial boiling point	394 °F (201 °C) (750.06 mmHg (1,000 hPa))
Flash point	185 °F (85 °C) closed cup / Molten form
Evaporation rate	no data available
Flammability (solid, gas)	Not highly flammable. May form combustible dust concentrations in air
Upper/lower flammability or explosive limits	Lower flammability/explosion limit: 0.70 %(V) Upper flammability/explosion limit: 6.30 %(V)
Vapour pressure	0.20 mmHg (0.27 hPa) (68 °F (20 °C))
Vapour density	no data available
Density	0.978 g/cm ³ (68 °F (20 °C)) 0.845 g/cm ³ (108 °F (42 °C)) 0.8157 g/cm ³ (176 °F (80 °C))
Relative density	0.978 (67.1 °F (19.5 °C)) Method: OECD Test Guideline 109
Water solubility	637 g/l (68 °F (20 °C))
Solubility in other solvents	Diethyl ether : slightly soluble Benzene : slightly soluble Methanol : 670 g/l (68 °F (20 °C)) soluble
Partition coefficient: n-octanol/water	log Pow: 0.04 (77 °F (25 °C)) estimated
Auto-ignition temperature	599 °F (315 °C) (770.31 mmHg (1,027 hPa)) Method: EU Test Guideline A15
Decomposition temperature	no data available
Dynamic Viscosity	0.95 mPa.s (176 °F (80 °C)) Molten form
Explosive properties	Not explosive negative Method : EU Test Guideline A14 Thermal sensitivity negative Method : EU Test Guideline A14 Mechanical sensitivity (shock)
Oxidizing properties	Not considered as oxidizing., Structure-activity relationship (SAR)
Surface tension	71.5 mN/m (68 °F (20 °C))
Molecular formula	116.24 g/mol
9.2. Other safety information	No data available

10. Stability and reactivity

10.1. Reactivity	– Not classified as a reactivity hazard.
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	– Avoid dust formation. – Keep away from open flames, hot surfaces and sources of ignition.
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 Oral : 1,160 mg/kg – Rat Published data LD50 Oral : 792 mg/kg – Rat Published data Harmful if swallowed.
Skin corrosion/irritation	Causes burns. Corrosive
Serious eye damage/eye irritation	Risk of serious damage to eyes.

Respiratory or skin sensitisation	Corrosive
Germ cell mutagenicity (Genotoxicity in vitro)	In vitro tests did not show mutagenic effects Published data
Carcinogenicity	no data available
Reproductive toxicity	No toxicity to reproduction Published data
Specific target organ toxicity – single exposure	The substance or mixture is classified as specific target organ toxicant, single exposure category 3 with respiratory tract irritation
Specific target organ toxicity – repeated exposure	The substance or mixture is not classified as specific target organ toxicant, repeated
Aspiration hazard	no data available
Additional Information	RTECS: Not 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) Unpublished reports
Toxicity to daphnia and other aquatic invertebrates	EC50 – 48 h : 19.8 mg/l – Daphnia magna (Water flea) Unpublished reports
Toxicity to algae/aquatic plants	EC50 – 72 h : – Pseudokirchneriella subcapitata (green algae) Method: OECD Test Guideline 201 Growth rate Not harmful to algae (EC50 > 100 mg/L) Unpublished internal reports EC10 – 72 h : 118 mg/l – Pseudokirchneriella subcapitata (green algae) Method: OECD Test Guideline 201 Growth rate No adverse chronic effect observed up to and including the threshold of 1 mg / L. Unpublished internal reports
Toxicity to bacteria	NOEC: 4.2 mg/l – 21 d – Daphnia magna (Water flea) Method: OECD Test Guideline 211 No adverse chronic effect observed up to and including the threshold of 1 mg / L. Published data
Chronic aquatic toxicity	– No adverse chronic effect observed up to and including the threshold of 1 mg / L.

12.2. Persistence and degradability

Biodegradability	Ultimate aerobic biodegradability Readily biodegradable. Unpublished internal reports
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12.3. Bioaccumulative potential

Partition coefficient: n-octanol/water
Not potentially bioaccumulable
Unpublished reports

12.4. Mobility in soil

Adsorption potential (Koc)
Adsorption/Soil
Koc: 3.48 – 4.23
Method: OECD Test Guideline 106
Unpublished internal reports
Known distribution to environmental compartments

12.5. Results of PBT and vPvB assessment

Ultimate destination of the product: Water
– This substance is not considered to be persistent, bioaccumulating, and toxic (PBT).
– This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6. Other adverse effects

– No data available

13. Disposal considerations

13.1 Product Disposal

– Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

14. Transport information

14.1. DOT (US)

Proper shipping name: HEXAMETHYLENEDIAMINE, SOLID
UN number: UN 2280
Class: 8
Packing group: III
ERG No: 153

14.2. TDG	Proper shipping name: HEXAMETHYLENEDIAMINE, SOLID UN number: UN 2280 Class: 8 Packing group: III ERG No: 153
14.3. IMDG	Proper shipping name: HEXAMETHYLENEDIAMINE, SOLID UN number: UN 2280 Class: 8 Packing group: III ERG No: 153
14.4. IATA	Proper shipping name: HEXAMETHYLENEDIAMINE, SOLID UN number: UN 2280 Class: 8 Packing group: III ERG No: 153
14.5. Environmental Hazard	

15. Regulatory information

15.1. Notification status	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
United States TSCA Inventory	– On TSCA Inventory
Canadian Domestic Substances List (DSL)	– All components of this product are on the Canadian DSL.
Australia Inventory of Chemical Substances (AICS)	– On the inventory, or in compliance with the inventory
Japan. CSCL – Inventory of Existing and New Chemical Substances	– On the inventory, or in compliance with the inventory
Korea. Korean Existing Chemicals Inventory (KECI)	– On the inventory, or in compliance with the inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	– On the inventory, or in compliance with the inventory
15.2. Federal Regulations	
SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370)	– Fire Hazard: no – Reactivity Hazard: no – Sudden Release of Pressure Hazard: no – Acute Health Hazard: yes – Chronic Health Hazard: yes
Section 313 Toxic Chemicals (40 CFR 372.65)	– This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)	– No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)	– This material does not contain any components with a SARA 302 RQ.
Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)	– This material does not contain any components with a section 304 EHS RQ.
US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)	– This material does not contain any components with a CERCLA RQ.
15.3. State Regulations	
US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)	– This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

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.
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