SAFETY DATA SHEET

WANAMINE™ H12MDA
WANHUA CHEMICAL GROUP Co., LTD.

Chemwatch Hazard Alert Code: 3

Version No: 2.4
Safety Data Sheet - Authored according to GB/T16483(2008) and GB/T17519(2013)

Issue Date: 29/09/2017
Print Date: 29/09/2017

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>WANAMINE™ H12MDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Name</td>
<td>4,4'-methylenebis(cyclohexylamine)</td>
</tr>
<tr>
<td>Chemical English Name</td>
<td>4,4'-methylenebis(cyclohexylamine)</td>
</tr>
<tr>
<td>Synonyms</td>
<td>4,4'-Diaminodicyclohexylmethane</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Amines, liquid, corrosive, N.O.S. or Polyamines, liquid, corrosive, N.O.S.</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

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

Relevant identified uses

Be widely used in epoxy, coating and polyamide industry.

Details of the supplier of the safety data sheet

Registered company name

WANHUA CHEMICAL GROUP Co., LTD.

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Emergency telephone numbers

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Other emergency telephone numbers

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SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

SUMMARY OF HAZARD IN AN EMERGENCY SITUATION

Liquid.
Corrosive.
Alkaline. Combustible.
Caustic if swallowed.
Toxic by inhalation.
Causes burns.
Risk of serious damage to eyes.
May cause SENSITISATION by skin contact.
Use appropriate container to avoid environmental contamination.
Avoid release to the environment. Refer to special instructions/Safety data sheets.

Classification [1]

Acute Toxicity (Oral) Category 4, Skin Corrosion/Inflammation Category 1B, Skin Sensitizer Category 1, Serious Eye Damage Category 1, Acute Aquatic Hazard Category 2, Chronic Aquatic Hazard Category 2

Legend:


Label elements

Continued...
### Hazard Statement(s)

- **H302**: Harmful if swallowed.
- **H314**: Causes severe skin burns and eye damage.
- **H317**: May cause an allergic skin reaction.
- **H411**: Toxic to aquatic life with long lasting effects.

### Precautionary Statement(s) Prevention

- **P260**: Do not breathe dust/fume/gas/mist/vapours/spray.
- **P280**: Wear protective gloves/protective clothing/eye protection/face protection.
- **P270**: Do not eat, drink or smoke when using this product.
- **P273**: Avoid release to the environment.
- **P272**: Contaminated work clothing should not be allowed out of the workplace.

### Precautionary Statement(s) Response

- **P301+P330+P331**: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- **P303+P361+P338**: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- **P305+P351+P338**: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- **P306**: Wash contaminated clothing before reuse.
- **P333+P313**: If skin irritation or rash occurs: Get medical advice/attention.
- **P363**: Wash contaminated clothing before reuse.
- **P362+P364**: Take off contaminated clothing and wash it before reuse.
- **P391**: Collect spillage.
- **P301+P312**: IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider if you feel unwell.
- **P304+P340**: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

### Precautionary Statement(s) Storage

- **P405**: Store locked up.

### Precautionary Statement(s) Disposal

- **P501**: Dispose of contents/container in accordance with local regulations.

### Physical and Chemical Hazard

- Liquid.
- Corrosive.
- Alkaline.
- Combustible.
- Toxic smoke/fumes in a fire.

In case of fire and/or explosion, DO NOT BREATHE FUMES.

### Health Hazards

#### Inhaled

Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects; these may be fatal.
Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

Inhalation of amine vapours may cause irritation of the mucous membranes of the nose and throat and lung irritation with respiratory distress and cough. Single exposures to near lethal concentrations and repeated exposures to sublethal concentrations produces tracheitis, bronchitis, pneumonitis and pulmonary oedema. Aliphatic and alicyclic amines are generally well absorbed from the respiratory tract. Systemic effects include headache, nausea, faintness and anxiety. These effects are thought to be transient and are probably related to the pharmacodynamic action of the amines. Histamine release by aliphatic amines may produce bronchoconstriction and wheezing. Inhalation of alkaline corrosives may produce irritation of the respiratory tract with coughing, choking, pain and mucous membrane damage. Pulmonary oedema may develop in more severe cases; this may be immediate or in most cases following a latent period of 5-72 hours. Symptoms may include tightness in the chest, dyspnoea, frothy sputum, cyanosis and dizziness. Findings may include hypotension, a weak and rapid pulse and moist rales.

Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary oedema.

#### 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 alkaline corrosives may produce immediate pain, and circunoral burns. Mucous membrane corrosive damage is characterised by a white appearance and soapy feel; this may then become brown, oedematous and ulcerated. Profuse salivation with an inability to swallow or speak may also result. Even where there is limited or no evidence of chemical burns, both the oesophagus and stomach may experience a burning pain; vomiting and diarrhoea may follow. The vomitus may be thick and may be slimy (mucus) and may eventually contain blood and shreds of mucosa. Epiglottal oedema may result in respiratory distress and asphyxia. Marked hypotension is symptomatic of shock; a weak and rapid pulse, shallow respiration and clammy skin may also be evident. Circulatory collapse may occur and, if uncorrected, may produce renal failure. Severe exposures may result in oesophageal or gastric perforation accompanied by mediastinitis, subternal pain, peritonitis, abdominal rigidity and fever. Although oesophageal, gastric or pyloric stricture may be evident initially, these may occur after weeks or even months and years. Death may be quick and results from asphyxia, circulatory collapse or aspiration of even minute amounts. Death may also be delayed as a result of perforation, pneumonia or the effects of stricture formation.

Aliphatic and alicyclic amines are generally well absorbed from the gut. Corrosive action may cause tissue damage throughout the gastrointestinal tract. Detoxification is thought to occur in the liver, kidney and intestinal mucosa with the enzymes, monoamine oxidase and diamine oxidase (histaminase) having a significant role.

### Environmental Hazards

See Section 12

### Other hazards

Cumulative effects may result following exposure*. Possible respiratory sensitizer*. Sensitisation may give severe responses to very low levels of exposure, in situations where exposure may occur.

### SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

#### Substances

See section below for composition of Mixtures

<table>
<thead>
<tr>
<th>CAS No</th>
<th>% [weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1761-71-3</td>
<td>≥99</td>
<td>4,4'-methylenebis(cyclohexylamine)</td>
</tr>
</tbody>
</table>

### SECTION 4 FIRST AID MEASURES

#### Description of first aid measures

**Eye Contact**

- 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.
  - For amines:
    - If liquid amines come in contact with the eyes, irrigate immediately and continuously with low pressure flowing water, preferably from an eye wash fountain, for 15 to 30 minutes.
    - For more effective flushing of the eyes, use the fingers to spread apart and hold open the eyelids. The eyes should then be “rolled” or moved in all directions.
Seek immediate medical attention, preferably from an ophthalmologist.

If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

For amines:
- In case of major exposure to liquid amine, promptly remove any contaminated clothing, including rings, watches, and shoe, preferably under a safety shower.
- Wash skin for 15 to 30 minutes with plenty of water and soap. Call a physician immediately.
- Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering.
- Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.
- Discard contaminated leather articles such as shoes, belts, and watchbands.
- Note to Physician: Treat any skin burns as thermal burns. After decontamination, consider the use of cold packs and topical antibiotics.

INGESTION:

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)

For amines:
- All employees working in areas where contact with amine catalysts is possible should be thoroughly trained in the administration of appropriate first aid procedures.
- Experience has demonstrated that prompt administration of such aid can minimize the effects of accidental exposure.
- Promptly move the affected person away from the contaminated area to an area of fresh air.
- Keep the affected person calm and warm, but not hot.
- If breathing is difficult, oxygen may be administered by a qualified person.
- If breathing stops, give artificial respiration. Call a physician at once.

EXPRESSIVE ADMISSION:

IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.

For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- In the mean time, qualified first aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
- If the patient is unconscious, 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)

Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
- INDUCE vomiting with fingers down the back of the throat. ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

NOTE: Wear a protective glove when inducing vomiting by mechanical means.

For amines:
- If liquid amine are ingested, have the affected person drink several glasses of water or milk.
- Do not induce vomiting.
- Immediately transport to a medical facility and inform medical personnel about the nature of the exposure. The decision of whether to induce vomiting should be made by an attending physician.

Advise for rescue team (PPE requirement for rescue personnel)

Indication of any immediate medical attention and special treatment needed

For acute or short-term repeated exposures to highly alkaline materials:
- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
- Oxygen is given as indicated.
- The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
- Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue. Alkaline continue to cause damage after exposure.

INGESTION:
- Milk and water are the preferred diluents
- No more than 2 glasses of water should be given to an adult.
- Neutralising agents should never be given since exothermic heat reaction may compound injury.
- Activated charcoal does not absorb alkali.
- Gastric lavage should not be used.

Supportive care involves the following:
- Withhold oral feedings initially.
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:
- Injury should be irrigated for 20-30 minutes.
- Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology]

For amines:
- Certain amines may cause injury to the respiratory tract and lungs if aspirated. Also, such products may cause tissue destruction leading to stricture. If lavage is performed, endotracheal and/or esophagoscopic control is suggested.
Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Laboratory animal studies have shown that a few amines are suspected of causing depletion of certain white blood cells and their precursors in lymphoid tissue. These effects may be due to an immunosuppressive mechanism. Some persons with hyperreactive airways (e.g., asthmatic persons) may experience wheezing attacks (bronchospasm) when exposed to airway irritants.

Lung injury may result following a single massive overexposure to high vapour concentrations or multiple exposures to lower concentrations of any pulmonary irritant material. Health effects of amines, such as skin irritation and transient corneal edema (“blue haze,” “halo effect,” “glaucomia”), are best prevented by means of formal worker education, industrial hygiene monitoring, and exposure control methods. Persons who are highly sensitive to the triggering effect of non-specific irritants should not be assigned to jobs in which such agents are used, handled, or manufactured.

**Medical surveillance programs** should consist of a pre-placement evaluation to determine if workers or applicants have any impairments (e.g., hyperreactive airways or bronchial asthma) that would limit their fitness for work in jobs with potential for exposure to amines. A clinical baseline can be established at the time of this evaluation. Periodic medical evaluations can have significant value in the early detection of disease and in providing an opportunity for health counseling. Medical personnel conducting medical surveillance of individuals potentially exposed to polyurethane amine catalysts should consider the following:

- **Health history**, with emphasis on the respiratory system and history of infections
- **Physical examination**, with emphasis on the respiratory system and the lymphoreticular organs (lymph nodes, spleen, etc.)
- **Lung function tests**, pre- and post-bronchodilator if indicated
- **Total and differential white blood cell count**
- **Serum protein electrophoresis**

Persons who are concurrently exposed to isocyanates also should be kept under medical surveillance. Pre-existing medical conditions generally aggravated by exposure include skin disorders and allergies, chronic respiratory disease (e.g. bronchitis, asthma, emphysema), liver disorders, kidney disease, and eye disease. Broadly speaking, exposure to amines, as characterised by amine catalysts, may cause effects similar to those caused by exposure to ammonia. As such, amines should be considered potentially injurious to any tissue that is directly contacted.

Inhalation of aerosol mists or vapors, especially of heated product, can result in chemical pneumonitis, pulmonary edema, laryngeal edema, and delayed scarring of the airway or other affected organs. There is no specific treatment. Clinical management is based upon supportive treatment, similar to that for thermal burns. Persons with major skin contact should be maintained under medical observation for at least 24 hours due to the possibility of delayed reactions.


**Alliance for Polyurethanes Industry**

### SECTION 5 FIREFIGHTING MEASURES

**Extinguishing media**

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

**Special hazards arising from the substrate or mixture**

**Fire Incompatibility**

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

**Advice for firefighters**

| Fire Fighting | For amines:
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For firefighting, cleaning up large spills, and other emergency operations, workers must wear a self-contained breathing apparatus with full face-piece, operated in a pressure-demand mode.</td>
</tr>
<tr>
<td></td>
<td>Airline and air purifying respirators should not be worn for firefighting or other emergency or upset conditions.</td>
</tr>
<tr>
<td></td>
<td>Respirators should be used in conjunction with a respiratory protection program, which would include suitable fit testing and medical evaluation of the user.</td>
</tr>
<tr>
<td>Fire/Explosion Hazard</td>
<td>Combustible.</td>
</tr>
<tr>
<td></td>
<td>Slight fire hazard when exposed to heat or flame.</td>
</tr>
<tr>
<td></td>
<td>Heating may cause expansion or decomposition leading to violent rupture of containers.</td>
</tr>
<tr>
<td></td>
<td>On combustion, may emit toxic fumes of carbon monoxide (CO).</td>
</tr>
<tr>
<td></td>
<td>May emit acid smoke.</td>
</tr>
<tr>
<td></td>
<td>Mists containing combustible materials may be explosive.</td>
</tr>
<tr>
<td></td>
<td>Combustion products include:</td>
</tr>
<tr>
<td></td>
<td>carbon dioxide (CO₂)</td>
</tr>
<tr>
<td></td>
<td>nitrogen oxides (NOₓ)</td>
</tr>
<tr>
<td></td>
<td>other pyrolysis products typical of burning organic material.</td>
</tr>
<tr>
<td></td>
<td>May emit corrosive fumes.</td>
</tr>
</tbody>
</table>

### SECTION 6 ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**

See section 8

**Measures for Preventing Secondary Contamination**

Refer to section above

**Environmental precautions**

See section 12

**Methods and material for containment and cleaning up**

<table>
<thead>
<tr>
<th>Minor Spills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.</td>
</tr>
<tr>
<td>Check regularly for spills and leaks.</td>
</tr>
<tr>
<td>Clean up all spills immediately.</td>
</tr>
<tr>
<td>Avoid breathing vapours and contact with skin and eyes.</td>
</tr>
<tr>
<td>Control personal contact with the substance, by using protective equipment.</td>
</tr>
<tr>
<td>Contain and absorb spill with sand, earth, inert material or vermiculite.</td>
</tr>
</tbody>
</table>

Continued...
Wipe up. Place in a suitable, labelled container for waste disposal. For amines:
- If possible (i.e., without risk of contact or exposure), stop the leak.
- Contain the spilled material by diking, then neutralize.
- Next, absorb the neutralized product with clay, sawdust, vermiculite, or other inert absorbent and shovel into containers.
- Store the containers outdoors.
- Brooms and mops should be disposed of, along with any remaining absorbent, in accordance with all applicable federal, state, and local regulations and requirements.
- Decontamination of floors and other hard surfaces after the spilled material has been removed may be accomplished by using a 5% solution of acetic acid, followed by very hot water
- Dispose of the material in full accordance with all federal, state, and local laws and regulations governing the disposal of chemical wastes.
- Waste materials from an amine catalyst spill or leak may be "hazardous wastes" that are regulated under various laws.

Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- 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 (see Section 13 for specific agent).
- 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.

Emergency protective equipment should include:
- Self-contained breathing apparatus, with full face-piece, operated in positive pressure or pressure-demand mode.
- Rubber gloves
- Long-sleeve coveralls or impervious full body suit

For release onto land: recommended sorbents listed in order of priority.

### SORBENT TYPE

<table>
<thead>
<tr>
<th>LAND SPILL - SMALL</th>
<th>RANK</th>
<th>APPLICATION</th>
<th>COLLECTION</th>
<th>LIMITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>cross-linked polymer - particulate</td>
<td>1</td>
<td>shovel</td>
<td>shovel</td>
<td>R, W, SS</td>
</tr>
<tr>
<td>cross-linked polymer - pillow</td>
<td>1</td>
<td>throw</td>
<td>pitchfork</td>
<td>R, DGC, RT</td>
</tr>
<tr>
<td>sorbent clay - particulate</td>
<td>2</td>
<td>shovel</td>
<td>shovel</td>
<td>R, I, P</td>
</tr>
<tr>
<td>wood fiber - pillow</td>
<td>3</td>
<td>throw</td>
<td>pitchfork</td>
<td>R, P, DGC, RT</td>
</tr>
<tr>
<td>treated wood fibre - pillow</td>
<td>3</td>
<td>throw</td>
<td>pitchfork</td>
<td>DGC, RT</td>
</tr>
<tr>
<td>foamed glass - pillow</td>
<td>4</td>
<td>throw</td>
<td>pitchfork</td>
<td>R, P, DGC, RT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LAND SPILL - MEDIUM</th>
<th>RANK</th>
<th>APPLICATION</th>
<th>COLLECTION</th>
<th>LIMITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>cross-linked polymer - particulate</td>
<td>1</td>
<td>blower</td>
<td>skiploader</td>
<td>R, W, SS</td>
</tr>
<tr>
<td>cross-linked polymer - pillow</td>
<td>2</td>
<td>throw</td>
<td>skiploader</td>
<td>R, DGC, RT</td>
</tr>
<tr>
<td>sorbent clay - particulate</td>
<td>3</td>
<td>blower</td>
<td>skiploader</td>
<td>R, I, P</td>
</tr>
<tr>
<td>polypropylene - particulate</td>
<td>4</td>
<td>throw</td>
<td>skiploader</td>
<td>DGC, RT</td>
</tr>
<tr>
<td>expanded mineral - particulate</td>
<td>5</td>
<td>blower</td>
<td>skiploader</td>
<td>W, SS, DGC</td>
</tr>
<tr>
<td>polypropylene - mat</td>
<td>6</td>
<td>blower</td>
<td>skiploader</td>
<td>R, I, P</td>
</tr>
</tbody>
</table>

Legend
- DGC: Not effective where ground cover is dense
- R: Not reusable
- I: Not incinerable
- P: Effectiveness reduced when rainy
- RT: Not effective where terrain is rugged
- SS: Not for use within environmentally sensitive sites
- W: Effectiveness reduced when windy

Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control; R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988

**NOTE:**
- Organic absorbents have been known to ignite when contaminated with amines in closed containers. Certain cellulosic materials used for spill cleanup such as wood chips or sawdust have shown reactivity with ethyleneamines and should be avoided.
- DO NOT touch the spill material

For amines:
- First remove all ignition sources from the spill area.
- Have firefighting equipment nearby, and have firefighting personnel fully trained in the proper use of the equipment and in the procedures used in fighting a chemical fire.
- Spills and leaks of polyurethane amine catalysts should be contained by diking, if necessary, and cleaned up only by properly trained and equipped personnel. All others should promptly leave the contaminated area and stay upwind.
- Protective equipment for cleanup crews should include appropriate respiratory protective devices and impervious clothing, footwear, and gloves.
- All work areas should be equipped with safety showers and eyewash fountains in good working order.
- Any material spilled or splashed onto the skin should be quickly washed off.
- Spills or releases may need to be reported to federal, state, and local authorities. This reporting contingency should be a part of a site's emergency response plan.
- Protective equipment should be used during emergency situations whenever there is a likelihood of exposure to liquid amines or to excessive concentrations of amine vapor. "Emergency" may be defined as any occurrence, such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that results in an uncontrolled release of amine liquid or vapor.
- Emergency protective equipment should include:
  - Self-contained breathing apparatus, with full face-piece, operated in positive pressure or pressure-demand mode.
  - Rubber gloves
  - Long-sleeve coveralls or impervious full body suit
SECTION 7 HANDLING AND STORAGE

Precautions for safe 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 storage and handling recommendations contained within this SDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- **DO NOT** allow clothing wet with material to stay in contact with skin

Other information

- 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 storage and handling recommendations contained within this SDS.
- **DO NOT** store near acids, or oxidising agents
- No smoking, naked lights, heat or ignition sources.

Conditions for safe storage, including any incompatibilities

### Suitable container

- Glass container is suitable for laboratory quantities
- 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

- Avoid oxidising agents, acids, acid chlorides, acid anhydrides, chlorofluorocarbons.
- Avoid contact with copper, aluminium and their alloys.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

### OCCUPATIONAL EXPOSURE LIMITS (OEL)

<table>
<thead>
<tr>
<th>INGREDIENT DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
</tr>
</tbody>
</table>

### EMERGENCY LIMITS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>WANAMINE™H12MDA</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

### MATERIAL DATA

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:
Exposure controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:
- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and/or isolation of emission source which keeps a selected hazard “physically” away from the worker and ventilation that strategically “adds” and “removes” air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
- Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection.

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Process controls which involve changing the way a job activity or process is done to reduce the risk.

Within each range the appropriate value depends on:

<table>
<thead>
<tr>
<th>Type of Contaminant:</th>
<th>Air Speed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>solvent, vapours, degreasing etc., evaporating from tank (in still air).</td>
<td>0.25-0.5 m/s (50-100 f/min.)</td>
</tr>
<tr>
<td>aerosols, fumes from pouring operations, intermittent container filling, low speed conveyor transfers, welding, spray drift, plating acid fumes, pickle (released at low velocity into zone of active generation)</td>
<td>0.5-1 m/s (100-200 f/min.)</td>
</tr>
<tr>
<td>direct spray, spray painting in shallow booths, drum filling, conveyor loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)</td>
<td>1-2.5 m/s (200-500 f/min.)</td>
</tr>
<tr>
<td>grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).</td>
<td>2.5-10 m/s (500-2000 f/min.)</td>
</tr>
</tbody>
</table>

Personal protection

For amines:

SPECIAL PRECAUTION:
- Because amines are alkaline materials that can cause rapid and severe tissue damage, wearing of contact lenses while working with amines is strongly discouraged. Wearing such lenses can prolong contact of the eye tissue with the amine, thereby causing more severe damage.
- For amines:
- Because amines are alkaline materials that can cause rapid and severe tissue damage, wearing of contact lenses while working with amines is strongly discouraged. Wearing such lenses can prolong contact of the eye tissue with the amine, thereby causing more severe damage.

CAUTION:
- Ordinary safety glasses or face-shields will not prevent eye irritation from high concentrations of vapour.
- In operations where positive-pressure, air-supplied breathing apparatus is not required, all persons handling liquid amine catalysts or other polyurethane components in open containers should wear chemical workers safety goggles.
- Eyewash fountains should be installed, and kept in good working order, wherever amines are used.
- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses 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 69], [AS/NZS 1336 or national equivalent]

Skin protection

See Hand protection below.

Wear chemical protective gloves, e.g. PVC.
Wear safety footwear or safety gumboots, e.g. Rubber

NOTE:
- The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.
The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
- 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, AS/NZS 2161.1 or national equivalent).
- 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, AS/NZS 2161.10.1 or national equivalent) 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, AS/NZS 2161.10.1 or national equivalent) is recommended.
- Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.

Contaminated gloves should be replaced.

For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended. It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.

Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task.

Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:
- Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.
- Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential.

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

- Leather wear not recommended: Contaminated leather footwear, watch bands, should be destroyed, i.e. burnt, as they cannot be adequately decontaminated.
- For amines: 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.
- Where there is a possibility of exposure to liquid amines skin protection should include: rubber gloves, (neoprene, nitrile, or butyl).
- DO NOT USE latex.

### Body protection
See Other protection below

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

### Thermal hazards
Not Available

## Respiratory protection
Type EK-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

<table>
<thead>
<tr>
<th>Required minimum protection factor</th>
<th>Maximum gas/vapour concentration present in air p.p.m. (by volume)</th>
<th>Half-face Respirator</th>
<th>Full-Face Respirator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>up to 10</strong></td>
<td>1000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>up to 50</strong></td>
<td>1000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>up to 50</strong></td>
<td>5000</td>
<td>Airline *</td>
<td>-</td>
</tr>
<tr>
<td><strong>up to 100</strong></td>
<td>5000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>up to 1000</strong></td>
<td>10000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>100+</strong></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* *Continuous Flow"** - Continuous-flow or positive pressure demand

A(All classes) = Organic vapours, B AUS or B1 = Acid gases, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds (below 65 degC)

Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.

Where engineering controls are not feasible and work practices do not reduce airborne amine concentrations below recommended exposure limits, appropriate respiratory protection should be used. In such cases, air-purifying respirators equipped with cartridges designed to protect against amines are recommended.

### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

#### Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Colorless transparent liquid</td>
</tr>
<tr>
<td><strong>Physical state</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Relative density (Water = 1)</strong></td>
<td>0.96 ( 20 ℃ )</td>
</tr>
</tbody>
</table>

Continued...
Continued...

SECTION 10 STABILITY AND REACTIVITY

Reactivity
See section 7

Chemical stability
▼ Unstable in the presence of incompatible materials.
▼ Product is considered stable.
▼ Hazardous polymerisation will not occur.

Possibility of hazardous reactions
See section 7

Conditions to avoid
See section 7

Incompatible materials
See section 7

Hazardous decomposition products
See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>WANAMINE™ H12MDA</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4,4'-methylenebis(cyclohexylamine)</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal (rabbit) LD50: &gt;1000 mg/kg[^1]</td>
<td>Eye (rabbit): 10μL/24h SEVERE</td>
<td></td>
</tr>
<tr>
<td>Inhalation (mouse) LC50: 0.4 mg/L[^2]</td>
<td>Skin (rabbit): SEVERE Corrosive **</td>
<td></td>
</tr>
<tr>
<td>Oral (rat) LD50: 350 mg/kg[^1]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.
2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of Chemical Substances

The following information refers to contact allergens as a group and may not be specific to this product.

Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compounds. 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 irritant exposure 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 moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may produce respiratory tract irritation. Symptoms of pulmonary irritation may include coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and a burning sensation.

Unlike most organs, the lung can respond to a chemical insult or a chemical agent, by first removing or neutralising the irritant and then repairing the damage (inflammation of the lungs may be a consequence).

The repair process (which initially developed to protect mammalian lungs from foreign matter and antigens) may, however, cause further
damage to the lungs (fibrosis for example) when activated by hazardous chemicals. Often, this results in an impairment of gas exchange, the primary function of the lungs. Therefore prolonged exposure to respiratory irritants may cause sustained breathing difficulties.

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

### SECTION 12 ECOLOGICAL INFORMATION

#### Toxicity

<table>
<thead>
<tr>
<th>ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WANAMINE™ H12MDA</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>4,4’-methylenebis(cyclohexylamine)</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**Legend:**
- Data available but does not fill the criteria for classification
- Data available to make classification
- Data Not Available to make classification

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters. Wastes resulting from use of the product must be disposed of on site or at approved waste sites. Prevent, by any means available, spillage from entering drains or water courses. DO NOT discharge into sewer or waterways.

#### Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4’-methylenebis(cyclohexylamine)</td>
<td>HIGH</td>
<td>HIGH</td>
</tr>
</tbody>
</table>

#### Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4’-methylenebis(cyclohexylamine)</td>
<td>LOW (LogKOW = 3.2649)</td>
</tr>
</tbody>
</table>

#### Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4’-methylenebis(cyclohexylamine)</td>
<td>LOW (KOC = 672.4)</td>
</tr>
</tbody>
</table>

#### Other adverse effects

No data available

### SECTION 13 DISPOSAL CONSIDERATIONS

#### Waste treatment methods

- 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 SDS 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. If it has been contaminated, it may...
be possible to reclaim the product by filtration, distillation or some other means. 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: Neutralisation with suitable dilute acid followed by: burial in a land-fill specifically licensed to accept chemical and/or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material).
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

<table>
<thead>
<tr>
<th>Contaminated packing materials:</th>
<th>Refer to section above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precautions for Transport:</td>
<td>Refer to section above</td>
</tr>
</tbody>
</table>

**SECTION 14 TRANSPORT INFORMATION**

**Labels Required**

- **Marine Pollutant**

**Land transport (UN)**

<table>
<thead>
<tr>
<th>UN number</th>
<th>2735</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport hazard class(es)</th>
<th>Class</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subrisk</td>
<td>Not Applicable</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Packing group</th>
<th>II</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Environmental hazard</th>
<th>Environmentally hazardous</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Special precautions for user</th>
<th>Special provisions</th>
<th>274</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited quantity</td>
<td>1 L</td>
<td></td>
</tr>
</tbody>
</table>

**Air transport (ICAO-IATA / DGR)**

<table>
<thead>
<tr>
<th>UN number</th>
<th>2735</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>Amines, liquid, corrosive, n.o.s. *; Polyamines, liquid, corrosive, n.o.s. *</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport hazard class(es)</th>
<th>ICAO/IATA Class</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICAO / IATA Subrisk</td>
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<td></td>
</tr>
<tr>
<td>ERG Code</td>
<td>8L</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Packing group</th>
<th>II</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Environmental hazard</th>
<th>Environmentally hazardous</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Special precautions for user</th>
<th>Special provisions</th>
<th>A3 A803</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo Only Packing Instructions</td>
<td>855</td>
<td></td>
</tr>
<tr>
<td>Cargo Only Maximum Qty / Pack</td>
<td>30 L</td>
<td></td>
</tr>
<tr>
<td>Passenger and Cargo Packing Instructions</td>
<td>851</td>
<td></td>
</tr>
<tr>
<td>Passenger and Cargo Maximum Qty / Pack</td>
<td>1 L</td>
<td></td>
</tr>
<tr>
<td>Passenger and Cargo Limited Quantity Packing Instructions</td>
<td>Y840</td>
<td></td>
</tr>
<tr>
<td>Passenger and Cargo Limited Maximum Qty / Pack</td>
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</tr>
</tbody>
</table>

**Sea transport (IMDG-Code / GGVSee)**

<table>
<thead>
<tr>
<th>UN number</th>
<th>2735</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.</td>
</tr>
</tbody>
</table>

Continued...
Transport hazard class(es)
IMDG Class 8
IMDG Subrisk Not Applicable

Packing group II

Environmental hazard Marine Pollutant

Special precautions for user
EMS Number F-A, S-B
Special provisions 274
Limited Quantities 1 L

Transport in bulk according to Annex II of MARPOL and the IBC code
Not Applicable

Precautions for Transport
Transportation precautions:
• Documentation covering all dangerous goods carried on the vehicle
• The transport unit must be placarded and marked in accordance with relevant transporting requirements.
• Personal protective equipment must be in sufficient quantities and suitable for use by the driver of the vehicle and where required for escape purposes, any other persons travelling in the vehicle.
• Vehicles transporting dangerous goods need to be equipped with sufficient and adequate fire protection systems and emergency equipment to handle spillages.
• Likely to be incompatible however refer to SDS for further details:
  Class 2.1, 2.2, 2.2 (subrisk 5.1), 2.3, 3, 4.3, 5.2
• If applicable, use appropriate types of segregation devices to isolate incompatible dangerous goods:
• Routes for road vehicles should avoid heavily populated or environmentally sensitive areas, congested crossings or a concentration of people
• Vehicle exhaust or hot engine components must be shielded to ensure cargo temperatures cannot be raised.

Suitable Containers
See section 7

SECTIoN 15 REGULATORY INFORMATION

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

4,4’-METHYLENEBIS(CYCLOHEXYLAMINE)(1761-71-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS

<table>
<thead>
<tr>
<th>National Inventory</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia - AICS</td>
<td>Y</td>
</tr>
<tr>
<td>Canada - DSL</td>
<td>Y</td>
</tr>
<tr>
<td>Canada - NDSL</td>
<td>N (4,4’-methylenebis(cyclohexylamine))</td>
</tr>
<tr>
<td>China - IECSC</td>
<td>Y</td>
</tr>
<tr>
<td>Europe - EINEC / ELINCS / NLP</td>
<td>Y</td>
</tr>
<tr>
<td>Japan - ENCS</td>
<td>N (4,4’-methylenebis(cyclohexylamine))</td>
</tr>
<tr>
<td>Korea - KECI</td>
<td>Y</td>
</tr>
<tr>
<td>New Zealand - NZIoC</td>
<td>Y</td>
</tr>
<tr>
<td>Philippines - PICCS</td>
<td>Y</td>
</tr>
<tr>
<td>USA - TSCA</td>
<td>Y</td>
</tr>
</tbody>
</table>

Legend:
Y = All ingredients are on the inventory
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Other Information
Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations
PC – TWA: Permissible Concentration-Time Weighted Average
PC – STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL: No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value

Continued...
BCF: BioConcentration Factors
BEI: Biological Exposure Index

Disclaimer
The information in the SDS applies only for the specified product and does not include mixtures of this product with other substances and mixtures. The SDS provides product safety information for personnel trained to use this product only.

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