



**Inhalation:** Remove patient from exposure, keep warm and at rest. Obtain medical attention. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is labored, oxygen should be administered by qualified personnel. Apply artificial respiration if breathing has ceased or shows signs of failing. Remove victim to fresh air and provide oxygen if breathing is difficult. GET PROMPT MEDICAL ATTENTION.

**Skin:** Remove contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation, redness, or a burning sensation develops and persists, obtain medical advice. Contaminated clothing should be thoroughly cleaned before reuse.

**Eyes:** Immediately flush eyes with running water for a minimum of 15 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY.

**Note to Physician:** Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.

## 5. FIRE FIGHTING MEASURES

**Flash Point:** 375°F (190.6°C) (CC)

**Flammability Classification:** 1

**Flammability Limits:**

**Lower Limit:** Not Available

**Upper Limit:** Not Available

**Autoignition Temperature:** 240°C (464°F) (4, 4'-Diphenylmethane Diisocyanate)

**Unusual Fire and Explosion Hazards:** Containers may burst under intense heat. Due to reaction with water, a hazardous buildup of pressure could result if contaminated containers are re-sealed.

**Extinguishing Media:** Carbon dioxide, dry chemical or appropriate foam. If water is used, very large quantities are required. Reaction between water and hot isocyanate may be vigorous. Contain run-off water with temporary barriers.

**Fire Fighting Instructions:** As appropriate for surrounding materials/equipment.

**Fire Fighting Protective Equipment:** Use self-contained breathing apparatus and full protective clothing (Bunker gear).

**Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide, nitrogen oxides and some HON

NFPA 740M Rating: Health: 3 Flammability: 1 Reactivity: Special: --

## 6. ACCIDENTAL RELEASE MEASURES

**General Overview:** Spills, Leaks, or Releases: Clean-up should only be performed by trained personnel. People dealing with major spillages should wear full protective clothing including respiratory protection. Evacuate the area. Prevent further leakage, spillage or entry into drains.

Contain and absorb large spillages onto an inert, non-flammable adsorbent carrier (such as earth or sand). Shovel into opentop drums or plastic bags for further decontamination, if necessary. Wash the spillage area clean with liquid decontaminant.

Test atmosphere for MDI vapor. Neutralize small spillages with decontaminant. Remove and dispose of residues. Notify applicable government authorities if release is reportable. The CERCLA RQ for MDI is 5,000 lbs. (see CERCLA in Section 15).

**Decontamination:** Preparation of Decontamination Solution: Prepare a decontamination solution of 0.2-0.5% liquid detergent and 3-8% concentrated ammonium hydroxide in water (5-10% sodium carbonate may be substituted for the ammonium hydroxide). Follow the precautions in Section 3, and Section 5 in material safety data sheets when preparing and using solution.

**Use of Decontamination Solution:** Allow deactivated material to stand for at least 30 minutes before shoveling into drums. Do not tighten the bungs. Mixing with wet earth is also effective, but slower

## 7. HANDLING AND STORAGE

**Storage:** Keep containers properly sealed and when stored indoors, in a well ventilated area. Keep contents away from moisture. Due to reaction with water, producing CO<sub>2</sub>-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Do not reseal contaminated containers. Uncontaminated containers, free of moisture, may be resealed only after placing under a nitrogen blanket. Ideal storage temperature is 16-38°C (60-100°F). Isocyanates react quickly with bases, secondary or primary amines, acids, and alcohols. They should not be stored near these chemicals. Isocyanates may also react with water to produce a water-insoluble urea and carbon dioxide. Isocyanates should, therefore, be stored in closed containers to prevent water from entering

because the water-isocyanate reaction can generate enough pressure to rupture containers. Stored isocyanates should also be protected from heat and direct sunlight because breakdown of the product may occur in such conditions.

**Other Precautions:** Do not store in containers made of copper, copper alloys or galvanized surfaces.

**Handling:** Avoid personal contact with the product or reaction mixture. Use only with adequate ventilation to ensure that the defined occupational exposure limit is not exceeded. The efficiency of the ventilation must be monitored regularly because of the possibility of blockage. Avoid breathing aerosols, mists and vapors. When the product is sprayed or heated, an approved MSHA/NIOSH positive-pressure, supplied-air respirator may be required.

**Incompatible Materials:** Copper, copper alloys or galvanized surfaces

**Ventilation:** Under normal use, no special ventilation is required. Use local exhaust ventilation where the product is heated, sprayed, or vapor may be generated.

## 8. EXPOSURE CONTROL / PERSONAL PROTECTION

**Respiratory Protection:** Use a NIOSH/MSHA-approved positive pressure air-supplied respirator equipped with a full face piece, or an air-supplied hood, if airborne concentrations exceed or are expected to exceed the TLV. Air purifying (cartridge type) respirators are not approved for protection against Diisocyanate.

**Protective Clothing:** Avoid prolonged or repeated contact with skin. Wear chemical-resistant gloves and other clothing as required to minimize contact. Test data from published literature and/or glove and clothing manufacturers indicate the best protection is provided by nitrile, neoprene and natural rubber gloves.

**Eye Protection:** Avoid contact with eyes. Wear chemical goggles if there is likelihood of contact with eyes. Maintain eye wash fountain and quick-drench facilities in work area.

**Other Protective Clothing or Equipment:** Use explosion-proof ventilation as required to control vapor concentrations. Eye wash fountains and safety showers should be available for emergency use.

**Work/Hygienic Practices:** Wash with soap and water before eating, drinking, smoking or using toilet facilities. Launder contaminated clothing before reuse.

**Engineering Controls:** Use local exhaust ventilation to maintain airborne concentrations below the TLV. Suitable respiratory equipment should be used in cases of insufficient ventilation or where operational procedures demand it. For general guidance on engineering control measures refer to the ACGIH publication "Industrial Ventilation".

**Exposure Guidelines:** Medical supervision of all employees who handle or come in contact with respiratory sensitizers is recommended. Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with this product. Once a person is diagnosed as sensitized, no further exposure to the material that caused the sensitization should be permitted.

### HAZARDOUS INGREDIENTS:

4, 4'-Diphenylmethane Diisocyanate:

ACGIH TLV 0.005 ppm (8-hour, 40 hours/week)

OSHA PEL DEILING 0.02 ppm

NIOSH REL TWA 0.005 ppm (10-hour, 40 hours/week)

NIOSH REL/CEILING 0.02 ppm (10-minute)

NOTE: The Occupational Exposure Limits listed for isocyanates do not apply to previously sensitized individuals.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance/Odor:** Yellow to Amber Liquid, slight odor.

**Physical Sate:** Liquid

**pH:** N/A

**Melting Point:** N/A

**Vapor Pressure (mmHg):** Approx.  $4 \times 10^{-6}$

**Vapor Density (Air=1):** 8.5 approx.

**Boiling Point:** N/A

**Solubility in Water:** (Reacts with water)

**Solubility (Other):** Soluble in most organic solvents

**Specific Gravity (Water=1):** 1.2183

**Evaporation (N-Butyl Acetate=1):** N/A

**VOC's:** 0 g/l

## 10. STABILITY AND REACTIVITY

**Chemical Stability:** Stable at room temperature.

**Conditions to Avoid:** Avoid high temperatures. Avoid freezing.

**Hazardous Polymerization:** Polymerization may occur at elevated temperatures (450°F) and in the presence of alkalis, tertiary amines and metal compounds.

**Incompatibility:** This product will react with any materials containing active hydrogens such as water, alcohol, amines, bases and acids. The reaction with water is very slow under 50°C (122°F) but is accelerated at higher temperatures.

## 11. TOXOLOGICAL INFORMATION

### Toxological:

Oral LD50 (rat) > 5,000 mg/kg

Dermal LD50 (rabbit) > 5,000

mg/kg

Inhalation LD50 (rat) =490 mg/m<sup>3</sup> (respirable aerosol)

### Potential Health Effects:

**Inhalation:** This product is a respiratory irritant and potential respiratory sensitizer. Repeated inhalation of vapor or aerosol at levels above the occupational exposure limit could cause respiratory sensitization. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

**Skin Contact:** Moderate irritant. Repeated and/or prolonged contact may cause skin sensitization. Animal studies have shown that respiratory sensitization can be induced by skin contact with known respiratory sensitizers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.

**Eye Contact:** The aerosol, vapor or liquid will irritate human eyes following contact.

**Ingestion:** Ingestion may cause irritation of the gastrointestinal tract. Based on the oral LD50, this product is considered practically non-toxic by ingestion.

**Chronic Effects:** A study was conducted where groups of rats were exposed for 6 hours/day, 5 days/week for a lifetime to atmospheres of respirable polymeric MDI aerosol. Overall, the tumor incidence, both benign and malignant, and the number of animals with tumors were not different from controls. Only at the top level (6 mg/m<sup>3</sup>), there was a significant incidence of a benign tumor of the lung (adenoma) and one malignant tumor (adenocarcinoma). There were no lung tumors at 1 mg/m<sup>3</sup> and no effects at 0.2 mg/m<sup>3</sup>. The increased incidence of lung tumors is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumor formation will occur. There are reports that chronic exposure may result in permanent decrease in lung function.

**Carcinogenicity:** The ingredients of this product are not classified as carcinogenic by ADGIH or IARC, not regulated as carcinogens by OSHA, and not listed as carcinogens by NW.

**Mutagenicity:** There is no substantial evidence of mutagenic potential.

**Reproductive Effects:** No adverse reproductive effects are anticipated.

**Teratogenicity and Fetotoxicity:** No birth defects were seen in two independent animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. Fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal, respirable concentrations well in excess of the defined occupational limits.

## 12. ECOLOGICAL INFORMATION

It is unlikely that significant environmental exposure in the air or water will arise; based on consideration of the normal industrial use of this product Lava-Liner, Ltd. has not conducted ecological studies on this product. However the following information on similar mixtures was found in a search of scientific literature.

**Persistence and Degradation:** Immiscible with water, but will react with water to produce inert and nonbiodegradable solids.

**Toxicity:** Polymeric MDI.

LCO (Zebra Fish) > 1000g/l

EC50 (Daphnia magna) (24 hour) > 1000 mg/l

EC50 (E. Cali) > 100 mg/l

### 13. DISPOSAL CONSIDERATIONS

The generation of waste should be avoided or minimized wherever possible. Disposal should be in accordance with local, state, provincial or national regulations. This material is not a hazardous waste under RCRA 40 CFR 261. Small quantities should be treated with a decontaminant solution (See Section 6). The treated waste is not a hazardous material under RCRA 40 CFR 261. Chemical waste, even small quantities, should never be poured down drains, sewers or waterways. Empty containers should be decontaminated and either passed to an approved drum recycler or destroyed.

### 14. TRANSPORT INFORMATION

**DOT Proper Shipping Name:**

**DOT Hazard Class/ I.D. No.:**

Package Size: 5-gallon pail containing 45 lbs, 1/2-gallon jugs containing 4.5-5.2 pounds, or 16 oz bottles containing 0.9-

1.05 lbs.

DOT Shipping Name: N/A

DOT Hazard Class: N/A

UNNMFC: UN2489

DOT Class 55

Reportable Quantity: 5,000 pounds

### 15. REGULATORY INFORMATION

**U. S. Regulations:**

**TSCA Inventory:**

All components of this product are listed or exempt under the Toxic Substances Control Act (TSCA) inventory.

**WHMIS CLASSIFICATION:** D1A, D2A, D2B

**OSHA Regulatory Status (29 CFR 1910.1200):** This material is classified as hazardous under OSHA regulations.

**SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:**

This product contains the following chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and 40 CFR 372:

Chemical CAS Number: % Weight

MDI 101-68-8 65%-100%

**California Proposition 65:** This product does not contain ingredients known to the State of California to cause cancer, birth defects, or other reproductive harm.

### 16: OTHER

Some of the information presented and conclusions drawn herein are from sources other than direct test data on the product itself. The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. If the product is used as a component in another product other than that provided by Lava-Liner, Ltd. This MSDS information may not be applicable. This MSDS has been prepared in accordance with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200