



Material Safety Data Sheet

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BOTH NUMBERS ARE AVAILABLE DAYS, NIGHTS, WEEKENDS, & HOLIDAYS

SECTION 1 – PRODUCT INFORMATION

BL1 ISO

Chemical family: aromatic isocyanates

Synonyms: MDI PREPOLYMER

SECTION 2 – INGREDIENTS

CAS Number Content (W/W) Chemical name

101-68-8 48.0 % Diphenylmethane-4,4'-diisocyanate (MDI)

Molecular Formula: > 40.0 % Isocyanate Prepolymer

Chemical Family: 26447-40-5 < 5.0 % MDI Mixed Isomers

SECTION 3 – HAZARDS IDENTIFICATION

Emergency overview

CAUTION: CONTAINS DIPHENYLMETHANE DIISOCYANATE (CAS No. 101-68-8). INHALATION OF MDI MISTS OR VAPORS MAY CAUSE RESPIRATORY IRRITATION, BREATHLESSNESS, CHEST DISCOMFORT AND REDUCED PULMONARY FUNCTION. OVEREXPOSURE WELL ABOVE THE PEL MAY RESULT IN BRONCHITIS, BRONCHIAL SPASMS AND PULMONARY EDEMA. LONG-TERM EXPOSURE TO ISOCYANATES HAS BEEN REPORTED TO CAUSE LUNG DAMAGE, INCLUDING REDUCED LUNG FUNCTION WHICH MAY BE PERMANENT. ACUTE OR CHRONIC OVEREXPOSURE TO ISOCYANATES MAY CAUSE SENSITIZATION IN SOME INDIVIDUALS, RESULTING IN ALLERGIC RESPIRATORY REACTIONS INCLUDING WHEEZING, SHORTNESS OF BREATH AND DIFFICULTY BREATHING.

Potential health effects

Primary routes of exposure

Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquified gases.

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SECTION 3 – HAZARDS IDENTIFICATION (continued)

Acute toxicity:*Information on: MDI*

Inhalation of MDI vapors may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult breathing and reduced pulmonary function. Airborne overexposure well above the PEL may result additionally in eye irritation, headache, chemical bronchitis, asthma-like findings or pulmonary edema. Isocyanates have also been reported to cause hypersensitivity pneumonitis, which is characterized by flu-like symptoms, the onset of which may be delayed. Gastrointestinal symptoms include nausea, vomiting and abdominal pain.

Irritation:*Information on: Diisocyanates*

Eye contact with isocyanates may result in conjunctival irritation and mild corneal opacity. Skin contact may result in dermatitis, either irritative or allergic.

Repeated dose toxicity:*Information on: MDI*

Results from a lifetime inhalation study in rats indicate that MDI aerosol was carcinogenic at 6 mg/m³, the highest dose tested. This is well above the recommended TLV of 5 ppb (0.05 mg/m³). Only irritation was noted at the lower concentration of 0.2 and 1 mg/m³. No birth defects or teratogenic effects were reported in a teratology study with rats exposed to 1, 4, and 12 mg/m³ polymeric MDI for 6 hr/day on days 6-15 of gestation. Embryotoxicity and fetotoxicity was reported at the top dose in the presence of maternal toxicity.

Information on: Isocyanates

As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the PEL/TLV. These symptoms, which include chest tightness, wheezing, cough, shortness of breath, or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including a decrease in lung function, which may be permanent. Sensitization may be either temporary or permanent. Prolonged contact can cause reddening, swelling, rash, scaling, or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material, or even as a result of vapor-only exposure.

Medical conditions aggravated by overexposure:

The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing.

Persons with history of respiratory disease or hypersensitivity should not be exposed to this product.

An animal study indicated that MDI may induce respiratory hypersensitivity following dermal exposure.

Medical supervision of all employees who handle or come into contact with isocyanates is recommended.

Pre-employment and periodic medical examinations with respiratory function tests (FEV₁, FVC as a minimum) are suggested.

Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended.

Contact may aggravate pulmonary disorders.

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SECTION 4 – FIRST AID MEASURES

General advice:

Remove contaminated clothing.

If inhaled:

Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

If on skin:

Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

If in eyes:

In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.

If swallowed:

Rinse mouth and then drink plenty of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.

Note to physician

Antidote: Specific antidotes or neutralizers to isocyanates do not exist.

Treatment: Treatment should be supportive and based on the judgment of the physician in response to the reaction of the patient.

SECTION 5 – FIRE FIGHTING MEASURES

Flash point: > 210 °C (closed cup)

Auto ignition: No data available.

Suitable extinguishing media:

Water, dry extinguishing media, carbon dioxide, foam

Hazards during fire-fighting:

Nitrous gases, fumes/smoke, isocyanate, vapor

Protective equipment for fire-fighting:

Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal precautions:

Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions:

Do not discharge into drains/surface waters/groundwater.

Cleanup:

Dike spillage.

For small amounts: Absorb isocyanate with suitable absorbent material (see § 40 CFR, sections 260, 264 and 265 for further information). Shovel into open container. Do not make container pressure tight. Move container to a well-ventilated area (outside). Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 8 % concentrated ammonia, 2 % detergent. Add at a 10 to 1 ratio. Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide.

For large amounts: If temporary control of isocyanate vapor is required, a blanket of protein foam or other suitable foam (available from most fire departments) may be placed over the spill. Transfer as much liquid as possible via pump or vacuum device into closed but not sealed containers for disposal.

For residues: The following measures should be taken for final cleanup: Wash down spill area with

decontamination solution. Allow solution to stand for at least 10 minutes.

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SECTION 7 – STORAGE AND HANDLING

HANDLING

General advice:

Mix thoroughly before use. If bulging of drum occurs, transfer to well ventilated area, puncture to relieve pressure, open vent and let stand for 48 hours before resealing.

Protection against fire and explosion:

No explosion proofing necessary.

STORAGE

General advice:

Formation of CO₂ and build up of pressure possible. Keep container tightly closed and in a well-ventilated place. Outage of containers should be filled with dry inert gas at atmospheric pressure to avoid reaction with moisture. Keep container in a well-ventilated place.

Storage incompatibility:

General: Segregate from bases.

Storage stability:

Storage temperature: 80 - 95 °F

Protect against moisture.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Diphenylmethane-4,4'- OSHA CLV 0.02 ppm 0.2 mg/m³ ;
diisocyanate (MDI) ACGIH TWA value 0.005 ppm ;

Advice on system design:

Provide local exhaust ventilation to maintain recommended P.E.L.

Personal protective equipment

Respiratory protection:

For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions. When atmospheric levels may exceed the occupational exposure limit (PEL or TLV) NIOSH-certified air-purifying respirators equipped with an organic vapor sorbent and particulate filter can be used as long as appropriate precautions and change out schedules are in place.

Hand protection:

Chemical resistant protective gloves, Suitable materials, chloroprene rubber (Neoprene), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, fluoroelastomer (Viton), nitrile rubber (Buna N)

Eye protection:

Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Suitable materials, saran-coated material

General safety and hygiene measures:

Wear protective clothing as necessary to prevent contact. Eye wash fountains and safety showers must be easily accessible. Observe the appropriate PEL value. Wash soiled clothing immediately. Contaminated equipment or clothing should be cleaned after each use or disposed of. Wash soiled clothing immediately.

Contaminated equipment or clothing should be cleaned after each use or disposed of.

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SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Form: liquid

Odor: faint odour, aromatic

Color: light yellow

pH value: Not applicable

Freezing point: No data available.

Boiling point: > 200 °C (5 mmHg)

Vapor pressure: 0.00001 mmHg (20 °C)

Bulk density: 9.8 lb/USg (25 °C)

Viscosity, dynamic: 525 mPa.s (25 °C)

Solubility in water: Reacts with water.

Miscibility with water: Reacts with water.

SECTION 10 – STABILITY AND REACTIVITY

Conditions to avoid:

Avoid moisture.

Substances to avoid:

water, alcohols, strong bases, Substances/products that react with isocyanates.

Hazardous reactions:

The product is chemically stable.

Reacts with water, with formation of carbon dioxide. Risk of bursting. Reacts with alcohols. Reacts with acids. Reacts with alkalies. Reacts with amines. Risk of exothermic reaction. Risk of violent reaction. Risk of polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with subsequent loss in strength.

Decomposition products:

Hazardous decomposition products: carbon monoxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapors

Thermal decomposition:

No data available.

Corrosion to metals:

No corrosive effect on metal.

SECTION 11 – TOXICOLOGICAL INFORMATION

No data available.

SECTION 12 – ECOLOGICAL INFORMATION

No data available.

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SECTION 13 – DISPOSAL CONSIDERATION

Waste disposal of substance:

Incinerate or dispose of in a licensed facility.
Do not discharge substance/product into sewer system.

Container disposal:

Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, a scrap metal dealer or an approved landfill. Refer to 40 CFR § 261.7 (residues of hazardous waste in empty containers). Check with reconditioner to determine if decontamination is required. Decontaminate containers prior to disposal. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

SECTION 14 – TRANSPORTATION INFORMATION

Land transport

USDOT

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Not classified as a dangerous good under transport regulations

Air transport

IATA/ICAO

Not classified as a dangerous good under transport regulations

SECTION 15 – REGULATORY INFORMATION

Federal Regulations
Registration status:

TSCA, US released / listed
TSCA 12B released / listed

OSHA hazard category: ACGIH TLV established, Highly toxic - inhalation, Chronic target organ effects reported, Skin and/or eye irritant, Acute target organ effects reported, Sensitizer, OSHA PEL established

CERCLA RQ	CAS Number	Chemical name
5,000 LBS	101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)

SARA hazard categories (EPCRA 311/312): Acute, Chronic

SARA 313:

CAS Number	Chemical name
	Diisocyanates

State regulations
State RTK

CAS Number	Chemical name	State RTK
101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)	MA, NJ, PA

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SECTION 16 – OTHER INFORMATION

Recommended use: polyurethane component, industrial chemicals
Suitable for use in industrial sector: Polymers industry, chemical industry

HMIS III rating

Health: 2^a Flammability: 1 Physical hazard: 1

HMIS uses a numbering scale ranging from 0 to 4 to indicate the degree of hazard. A value of zero means that the substance possesses essentially no hazard; a rating of four indicates high hazard.

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