

Material Safety Data Sheet

Product Name – Wanhua Wannate[®] PM-2010 (MDI)

1. Substance/Preparation and Company Identification

Company Details

Shakun Industries

P-09, Street-12, Sector-3, Reliance Model Economic Township, Dadri Toe, Jhajjar, Haryana - 124105

Chemical Family: Aromatic Isocyanate

Chemical Name: Diphenylmethane Diisocyanate

Synonyms: MDI, PMDI, Polymeric MDI, ISO, Isocyanate, A-Side, A-Component

2. Composition/Information on Ingredients

CAS Number Content (W/W) Chemical Name:

101 – 68 – 8 38.00 % Diphenylmethane – 4, 4'-diisocyanate

26447 – 40 – 5 < 10.00 % MDI Mixed Isomers

9016 – 87 – 9 < 55.00 % Polymeric MDI

3. Hazard Identification

Emergency Overview

CAUTION: Contains diphenylmethane diisocyanate (CAS# 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. Overexposure to isocyanates may cause sensitization in some individuals, resulting in allergic respiratory reactions including wheezing, shortness of breath, and difficult 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 liquefied gases.

Acute Toxicity

Inhalation of MDI vapours 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, and asthma like findings. 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 pains.

Irritation

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

Repeated Dose Toxicity

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. Embryo toxicity was reported at the top dose in the presence of maternal toxicity.

As a result of previous repeated overexposures of a single large dose, certain individuals will develop isocyanates 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 vapour-only exposure.

Medical Conditions Aggravated by Overexposure

The isocyanates component is a respiratory sensitizer. It may cause allergic reaction leading to asthma like spasms of the bronchial tubes and difficulty in breathing. Medical supervision of all employees, who handle isocyanates, is recommended. Contact may aggravate pulmonary disorders. Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. Pre-employment and periodic medical examinations with respiratory function tests (FEV₁, FVC as a minimum) are suggested. An animal study indicated that MDI may induce respiratory hypersensitivity following dermal exposure. 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.

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. 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

Hazards

Symptoms can appear later.

Antidote

Treatment should be supportive and based on the judgment of the physician.

Treatment

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

5. Fire-Fighting Measures

Flash Point (Open Cup): 220 °C

Auto-Ignition: No data available.

Suitable Extinguishing Media

Water, dry extinguishing media, carbon dioxide, or foam.

Hazards during Firefighting

Nitrous gases, fumes/smoke, isocyanates, vapour.

Protective Equipment for Firefighting

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

6. Accidental Release Measures

Clean-Up - Dike spillage

(For small amounts)

Absorb isocyanates with suitable absorbent material (see §40 CFS, section 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 10:1 ratio. Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide.

(For large amounts)

If temporary control of isocyanates vapor is required, a blanket of protein foam or other suitable foam (available from most fire departments) may be placed over a 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 clean-up: wash down spill area with decontamination solution. Allow solution to stand for at least 10 minutes.

7. Handling and Storage

Handling

General Advice

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 carbon dioxide and build-up of pressure are 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.

Storage Compatibility

Storage temperature: 60 – 80 °F.
Protect against moisture.

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 control recommended PEL.

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 Healthy (IDLH), use NIOSH-certified full-face piece pressure demand self-contained breathing apparatus (SCBA) or a full-face piece 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 vapour 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), nitrile rubber (Buna N), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, fluoro-elastomer (Viton).

Eye Protection

Tightly fitting safety goggles (chemical goggles). If splashing hazard exists, wear face shield.

Body Protection

Suitable materials, saran-coated material.

General Safety and Hygiene Measures

Wear protective clothing as necessary to prevent contact. Eyewash 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 dispose of.

9. Physical and Chemical Properties

| | |
|------------------------|--------------------------|
| Form | : Liquid |
| Odor | : Faint Odor, Aromatic |
| Color | : Dark Brown |
| pH Value | : No data available |
| Freezing Point | : 3 °C (1 ATM) |
| Boiling Point | : 200 °C (5 mmHg) |
| Vapour Pressure | : < 0.00001 mmHg (20 °C) |
| Relative Density | : 1.22 (25 °C) |
| Viscosity, Dynamic | : 200 mPa.s (20 °C) |
| Miscibility with Water | : Reactive with Water |

10. Stability and Reactivity

Conditions to Avoid

Avoid moisture.

Substances to Avoid

Water, alcohols, strong bases, substances/products that react with isocyanates.

Decomposition Products

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

Thermal Decomposition

> 260 °C

Corrosion to Metals

No corrosive effect on metal.

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 alkalis. 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 or product with subsequent loss in strength.

11. Toxicological Information

Acute Toxicity

Oral

LD50/Rat 10,000 mg/Kg

Practically non-toxic

Inhalation

LD50/Rat 2.240 mg/L/1 h

Moderately toxic

12. Ecological Information

Environmental Toxicity

Acute and Prolonged Toxicity to Fish

Static

Zebra Fish/LD50 (24 h) > 500 mg/L

Practically non-toxic

Acute Toxicity to Aquatic Invertebrates

Daphnia Magna/EC50 (24 h) > 500 mg/L

Practically non-toxic

13. Disposal Considerations

Waste Disposal of Substance

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

Container Disposal

Steel drums must be emptied and can be sent to a licensed drum re-conditioner 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 re-conditioner to determine if decontamination is required. Decontaminate containers prior to disposal. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

14. Transport 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

ICAO/IATA

Not classified as a dangerous good under transport regulations.

15. Regulatory information

Registration Status

TSCA, US Listed

TSCA 12B 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.

SARA Hazard 311 & 312

Acute, chronic.

SARA Hazard 313

CAS Number Chemical Name (W/W)

101 – 68 – 8 Diisocyanates Compound Category

State Regulations

CAS Number Content (W/W) State

101 – 68 – 8 Diphenylmethane – 4, 4'-diisocyanate (MDI) MA, NJ, PA

16. Other Information

HMIS III rating

Health: 2

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.

IMPORTANT: The descriptions, designs, data, and information contained herein are guidance only because many factors may affect processing or application/use. We recommend that you make tests to determine the suitability of a product for your particular purpose prior to use. No warranties of any kind, either expressed or implied, including warranties of merchantability or fitness for a particular purpose, are made regarding products described or designs, data or information set forth, or that the products, designs, data, or information may be used without infringing the intellectual property rights of others. In no case shall the descriptions, information, data, or designs provided by consider a part of our terms and conditions of sale. Further, you expressly understand and agree that the descriptions, designs, data, and information furnished by Shakun Industries. Hereunder are given gratis and Shakun Industries assumes no obligation or liability for the description, designs, data, and information given or results obtained. All such being given and accepted at your own risk.

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