ULTRA DURABLE TECHNOLOGIES
Manufacturing Innovative Coatings
(800) 722-2998 ULTRADT.com

SAFETY DATA SHEET

Revision Date 20-Mar-2024

1. IDENTIFICATION

Product identifier

Product Name UDT Polyurea Part B

Other means of identification

Part Number(s) 234050, 234550, 234650

Recommended use of the chemical and restrictions on use

Recommended use For Industrial Use Only

Uses advised against No information available

Details of the supplier of the safety data sheet

Manufacturer Address

ULTRA DURABLE TECHNOLOGIES
355 6th Ave. North
Waite Park, MN 56387
320-258-2266

Emergency telephone number

Emergency Telephone Chemtrec 1-800-424-9300

2. HAZARDS IDENTIFICATION

Danger

Emergency Overview: Danger. May cause allergic skin reaction. May cause skin, eye, and respiratory tract irritation. Harmful by inhalation and if swallowed.

Hazard statements

Causes eye irritation. Causes skin irritation. Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause respiratory irritation. H351 Suspected of causing cancer. May cause damage to organs (Olfactory) through prolonged or repeated exposure (inhalation).

Precautionary Statements

Prevention:
Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in a well-ventilated area. Do not breathe dust/gas/mist/vapors. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. (In case of inadequate ventilation) wear respiratory protection. Contaminated work clothing should not be allowed out of the workplace. Wash with plenty of water and soap thoroughly after handling. Respiratory Protection Standard (29 CFR 1910.134) or regional standards.

Response:
Call a POISON CENTER or doctor/physician if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF exposed or concerned: Call a POISON CENTER or doctor/physician. Get medical advice/attention if you feel unwell. IF ON SKIN (or hair): Wash with plenty of soap and water. If skin irritation or rash occurs: Call a POISON CENTER or doctor/physician. Take off contaminated clothing and wash before reuse. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Call a POISON CENTER or doctor/physician.

Storage:
Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up.

Disposal:
Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Hazard(s) not otherwise classified (HNOC): No specific dangers known if the regulations/notes for storage and handling are considered.

Inhalation: Inhalation of isocyanate 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. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

Skin and Eyes: Avoid contact with skin and eyes. Skin or eye contact may cause irritation.

Ingestion: May cause irritation of the digestive tract with symptoms that include abdominal pain, nausea, vomiting, and diarrhea.

Carcinogenicity: No carcinogenic substances as defined by IARC, NTP and/or OSHA.

See Section 12 for Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances/Mixtures			
Chemical Name	**Identifiers**	**% (by weight)**	**Comments**
P-MDI	9016-87-9	≥25 - ≤50%	
Diphenylmethane-4,4'-diisocyanate (MDI)	101-68-8	≥50 - ≤75%	

See Section 11 for Toxicological Information.

4. FIRST AID MEASURES

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

Skin: Remove contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

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

Ingestion: 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.

Additional Information:

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11: Eye irritation, skin irritation, allergic symptoms

Hazards: Symptoms can appear later.

Hazard Information on Diphenylmethane-4,4'-diisocyanate (MDI): Respiratory sensitization may result in allergic (asthma-like) signs in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma- like reactions that may be produced by product exposures.

Indication of any immediate medical attention and special treatment needed
Note to physician

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

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

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Use water spray, dry powder, carbon dioxide, foam.

Unusual Fire and Explosion Hazards:
Hazards during firefighting: nitrous gases, fumes/smoke, isocyanate, vapor.

Advice for Firefighters: Firefighters should be equipped with self-contained breathing apparatus and turn-out gear. Keep containers cool by spraying with water if exposed to fire. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental Precautions: Do not discharge into drains/surface waters/groundwater.

Containment/Clean-up Measures:
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. Treat spill 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. Dike spillage

7. HANDLING AND STORAGE

Handling: Provide suitable exhaust ventilation at the processing machines. Ensure thorough ventilation of stores and work areas. Avoid aerosol formation. When handling heated products, vapors of the product should be ventilated, and respiratory protection used. Wear respiratory protection when spraying. Danger of bursting when sealed gastight.

Protect against moisture. If bulging of drum occurs, transfer to well-ventilated area, puncture to relieve pressure, open vent and let stand for 48 hours before resealing.
Storage: Keep away from water. Segregate from foods and animal feeds. Segregate from acids and bases.

Suitable materials for containers: Carbon steel (Iron), High density polyethylene (HDPE), Low density polyethylene (LDPE), Stainless steel 1.4301 (V2)

Further information on storage conditions: Formation of CO2 and buildup of pressure possible. Keep container tightly closed and in a well-ventilated place. Empty spaces of containers should be filled with dry inert gas at atmospheric pressure to avoid reaction with moisture.

Storage stability:
Storage temperature: 60 - 80 °F
Protect against moisture and moisture contamination.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Special Note for Exposure Control: Consult local authorities for further acceptable exposure limits.

Exposure Limits/ Guidelines		
Chemical Name	**Result**	**ACGIH/OSHA**
Diphenylmethane-4,4'-diisocyanate (MDI) CAS 101-68-8	STEL	
	TWA	0.005 ppm
	PEL	CLV 0.02 ppm/0.2 mg/m3
P-MDI CAS 9016-87-9	STEL	
	TWA	0.005 ppm
	PEL	CLV 0.02 ppm/0.2 mg/m3

Engineering Measures/Controls: Provide local exhaust ventilation to maintain recommended P.E.L.

Environmental Exposure Controls: Avoid release to the environment. Construct a dike to prevent the spread of spills. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

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

Personal Protective Equipment
Respiratory: When workers are facing concentrations above the occupational exposure limits, they must use appropriate certified respirators. 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 if appropriate precautions and change out schedules are in place. For emergency or non-routine, high exposure situations, including confined space entry, use a 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.

Eye/Face: Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Hands: Chemical resistant protective gloves should be worn to prevent all skin contact., Suitable materials may include, chloroprene rubber (Neoprene), nitrile rubber (Buna N), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, depending upon conditions of use.

Skin/Body: Cover as much of the exposed skin as possible to prevent all skin contact. Suitable materials may include saran-coated material, depending upon conditions of use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on Physical and Chemical Properties			
Physical Form	Liquid.	**Appearance/Description**	Light Brown Liquid
Color	Light brown.	**Odor**	Faint Odor, Aromatic

Boiling Point	200°C	**Bulk Density**	No data
Specific Gravity	Ca. 1.23 g/cm^3 @ 20°C	**UEL**	No data
Water Solubility	Reacts	**LEL**	No data
Flash Point	Approx. 200 °C	**NVW**	No data

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal conditions of use and storage.

Possibility of Hazardous Reactions: 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 polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with subsequent loss in strength.

Conditions to Avoid: Moisture.

Incompatible Materials: Acids, amines, alcohols, water, alkaline, strong bases, substances/products that react with isocyanates.

Hazardous Decomposition Products: carbon monoxide, carbon dioxide, nitrogen oxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapors.

Thermal decomposition: No decomposition if stored and handled as prescribed/indicated.

11. TOXICOLOGICAL INFORMATION

Primary routes of exposure
Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity
Assessment of acute toxicity: Inhalation of vapors may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficulty breathing and reduced pulmonary function. Inhalation exposure 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

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)
LD50 Oral Rat (male/female) > 2,000 mg/kg (Directive 84/449/EEC, B.1)
LC50 rat (male/female) 2.0 mg/l (OECD Guideline 403). An aerosol was tested. LD50 rabbit (male/female) > 9,400 mg/kg

Assessment other acute effects

Assessment of STOT single: Causes temporary irritation of the respiratory tract.
Irritation / corrosion: Assessment of irritating effects: Irritating to eyes, respiratory system, and skin. Skin contact may result in dermatitis, either irritative or allergic.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI) Skin Corrosion/Irritation (Rabbit, Draize Test): Irritating. Eye Corrosion/Irritation (Rabbit, Draize Test): Irritating.

Sensitization
Sensitization after skin contact is possible. The substance may cause sensitization of the respiratory tract. 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. Like 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. 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. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI) Buehler test (guinea pig): Sensitizing
Local Lymph Node Assay (Mouse, LLNA): Sensitizing. Can cause skin sensitization.
Skin Corrosion/Irritation (Guinea Pig): Sensitizing. Note: Studies in animals suggest that dermal exposure may lead to pulmonary sensitization. However, the relevance of this result for humans is unclear.

Chronic Toxicity/Effects

Assessment of repeated dose toxicity: The substance may cause damage to the olfactory epithelium after repeated inhalation. The substance may cause damage to the lung after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure.

Information on Diphenylmethane-4,4'-diisocyanate (MDI):
Experimental/calculated data: rat (Wistar) (male/female) Inhalation 2 years, 6 hr/day 0, 0.2, 1, 6 mg/m3, olfactory epithelium
NOAEL: 0.2 mg/m3
LOAEL: 1 mg/m3
The substance may cause damage to the olfactory epithelium after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure. Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Genetic toxicity
Assessment of mutagenicity: The substance was mutagenic in various bacterial test systems; however, these results could not be confirmed in tests with mammals.
Information on Diphenylmethane-4,4'-diisocyanate (MDI):
Genetic toxicity in vitro: OECD Guideline 471 Ames-test Salmonella typhimurium: with and without metabolic activation, ambiguous.

Information on Diphenylmethane-4,4'-diisocyanate (MDI):
Genetic toxicity in vivo: OECD Guideline 474 Micronucleus assay rat (male) Inhalation negative. No clastogenic effect reported.

Carcinogenicity
Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure.
Experimental/calculated data: OECD Guideline 453 rat Inhalation 0, 0.2, 1, 6 mg/m3. Result: Lung tumors

Reproductive toxicity
Assessment of reproduction toxicity: Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Teratogenicity
Assessment of teratogenicity: The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Development
OECD Guideline 414 rat Inhalation 0, 1, 4, 12 mg/m3 NOAEL Mat.: 4 mg/m3
NOAEL Teratog.: 4 mg/m3
The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Symptoms of Exposure
Eye irritation, skin irritation, allergic symptoms
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. Medical supervision of all employees who handle or come into contact with 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 (FEV, 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.

12. ECOLOGICAL INFORMATION

Toxicity:
Assessment of aquatic toxicity: There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. Based on long-term (chronic) toxicity study data, the product is very likely not harmful to aquatic organisms.

The product may hydrolyze. The test result may be partially due to degradation products. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Toxicity to fish
LC0 (96 h) > 1,000 mg/l, Brachydanio rerio (OECD Guideline 203, static)

Aquatic invertebrates
EC50 (24 h) > 1,000 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

Aquatic plants
EC0 (72 h) 1,640 mg/l (growth rate), Scenedesmus subspicatus (OECD Guideline 201, static)

Microorganisms/Effect on activated sludge Toxicity to microorganisms
OECD Guideline 209 aquatic aerobic bacteria from a domestic water treatment plant/EC50 (3 h): > 100 mg/l

Persistence and degradability
Assessment biodegradation and elimination (H2O): Not readily biodegradable. The product is unstable in water. The elimination data also refer to products of hydrolysis.

Elimination information
0 % BOD of the ThOD (28 d) (OECD Guideline 302 C) (aerobic, activated sludge) Poorly biodegradable.

Assessment of stability in water
In contact with water the substance will hydrolyze slowly.

Information on Stability in Water Hydrolysis
$t^{1/2}$ 20 h (25 °C)

Bioaccumulation Potential
Assessment of bioaccumulation potential: Significant accumulation in organisms is not to be expected. Bioconcentration factor: 200 (28 d), Cyprinus carpio (OECD Guideline 305 E).

Mobility in soil

Assessment of transport between environmental compartments: The substance will not evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is not expected.

13. DISPOSAL CONSIDERATIONS

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

Empty Container Precautions:
Steel drums must be emptied and can be sent to a licensed drum reconditioner for re-use, a scrap metal dealer, or an approved landfill. Do not attempt to refill or clean containers since residue is difficult to remove. Under no circumstances should empty drums be burned or cut open with gas or electric torch as toxic decomposition products may be liberated. Do not reuse empty 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
IATA/ICAO Not classified as a dangerous good under transport regulations

Further information
DOT: This product is regulated if the amount in a single receptacle exceeds the Reportable Quantity (RQ). Please refer to Section 15 of this MSDS for the RQ for this product.

15. REGULATORY INFORMATION

Federal Regulations Registration Status:
TSCA listed

EPCRA 311/312 (Hazard categories): Acute; Chronic EPCRA 313:
CAS Number 9016-87-9
Chemical name: 101-68-8 Diphenylmethane-4,4'-diisocyanate (MDI) P-MDI CERCLA RQ 5000 LBS
CAS Number 9016-87-9; 101- 68-8
Chemical name P-MDI; Diphenylmethane-4,4'-diisocyanate (MDI)

State regulations
State RTK MA, NJ, PA
CAS Number
9016-87-9
101-68-8
26447-40-5
Chemical name P-MDI
Diphenylmethane-4,4'-diisocyanate (MDI) Methylenediphenyl diisocyanate

NFPA Hazard codes:
Health : 2 Fire: 1 Reactivity: 1 Special:

HMIS III rating
Health: 2¤ Flammability: 1 Physical hazard:1

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Preparation Date	01-May-2020
Revision Date	20-Mar-2024
Revision Note	General formatting updates

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Shipping information may vary based upon container size and shipping destination. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage, or release to the environment. The manufacturer assumes no responsibility for injury to the recipient or third persons, or for any damages to any property resulting from misuse of the product.

End of Safety Data Sheet