



# Safety Data Sheet

Preformed Line Products, Inc.

**Product Name:** RD™ Encapsulant (Part B Hardener)

**Issue Date:** 4/1/15

## 1. Product and Company Identification

**Product Name:** RD™ Encapsulant (Part B Hardener)

**Chemical Family:** Aromatic Isocyanates

**Synonyms:** Diphenylmethane diisocyanate prepolymer

### Company Identification

Preformed Line Products, Inc.  
1700 Woodhurst Lane  
Albemarle, NC 28001  
United States

### 24-hour Emergency Telephone Numbers:

1 800 424 9300 (CHEMTREC)  
1 704 984 4817 (Local)

## 2. Hazards Identification

Contains < 10% Diphenylmethane diisocyanate (MDI) in various isomeric forms - According to Regulation 2012 OSHA Hazard Communication Standard: 29 CFR Part 1910.1200

### Classification of the product

Acute Toxicity	4	(inhalation - mist)
Serious eye damage / eye irritation	2B	
Skin corrosion / irritation	2	
Skin sensitization	1B	
Respiratory sensitization	1	
Carcinogenicity	2	
Specific target organ toxicity		
Single exposure -	3	(irritation to respiratory system)
Repeated exposure -	2	(by inhalation)

### Label elements

Pictogram:

Signal Word: Danger





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## Hazard Statement:

H320	Causes eye irritation.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs (Olfactory organs) through prolonged or repeated exposure (inhalation).

## Precautionary Statements (Prevention):

P280	Wear protective gloves, protective clothing, eye protection, face protection
P271	Use only outdoors or in a well ventilated area.
P260	Do not breathe dust/gas/mist/vapors.
P201	Obtain special instructions before use.
P261	Avoid breathing mist.
P202	Do not handle until all safety precautions have been read and understood.
P284	Wear respiratory protection if ventilation is inadequate.
P272	Contaminated work clothing should not be allowed out of the workplace.
P264	Wash thoroughly with plenty of soap and water after handling.

## Precautionary Statements (Response):

P312	Call a POISON CENTER or physician if you feel unwell.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. If present and easy to remove, remove contact lenses. Continue rinsing.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+311	If exposed or concerned: Call a POISON CENTER or physician.
P314	Get medical advice/attention if you feel unwell.
P303+P352	IF ON SKIN or hair: Wash with plenty of soap and water.
P333+P311	If skin irritation or rash occurs: Call a POISON CENTER or physician.
P362+P364	Take off contaminated clothing and wash before reuse.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P311	If eye irritation persists: Call a POISON CENTER or physician.
P403+P233	Store in a well ventilated place. Keep container tightly closed.
P405	Store locked up.



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## Precautionary Statement (Disposal)

P501 Dispose of contents/containers to hazardous or special waste collection point.

## Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

## Labeling of special preparations (GHS):

CONTAINS ISOCYANATES. 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. ANIMAL TESTS AND OTHER RESEARCH INDICATE THAT SKIN CONTACT WITH MDI MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION.

## According to Regulation 2012 OSHA Hazard Communication Standard: 29 CFR Part 1910.1200

## Emergency overview

DANGER:

CONTAINS ISOCYANATES. 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. AVOID CONTACT WITH SKIN AND EYES. SKIN OR EYE CONTACT MAY CAUSE IRRITATION.



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## 3. Composition information

<u>CAS #</u>	<u>Amount</u>	<u>Component</u>
101-68-8	< 5%	Diphenylmethane-4,4'-diisocyanate (MDI)
26447-40-5	< 5%	Methylenediphenyl diisocyanate
9016-87-9	< 5%	P-MDI
68092-58-0	< 5%	Methylenediphenyl diisocyanate, dipropylene glycol, tripropylene glycol, copolymer

## 4. First-Aid Measures

**General advise:** Remove contaminated clothing. First Aid responders should pay attention to self-protection.

**If inhaled:** Move the affected individual to fresh air and keep the person calm. Assist in breathing if necessary. Seek immediate medical attention.

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

**If in eyes:** Rinse immediately with water for at least 15 minutes. Seek immediate medical assistance.

**If swallowed:** Rinse mouth and then drink plenty of water. Do not induce vomiting. Seek immediate medical attention.

### **Most important symptoms and effects, both acute and delayed**

Symptoms: respiratory irritation, eye irritation, skin irritation, allergic symptoms -see section 2 (labelling) and section 11 (toxicology). 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.



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## 5. Fire-Fighting Measures

Flash point:	> 200 °C	(open cup)
Auto ignition:	> 300 °C	
Lower explosion limit:	0.4 % (V)	
Upper explosion limit:	2.9% (V)	

*Values taken from component data.*

**Suitable extinguishing media:** water fog or fine spray, dry powder, carbon dioxide or alcohol-resistant foam. Direct water steam may spread fire.

**Fire-fighting hazards:** dense smoke, nitrous oxides, isocyanate vapors, hydrogen cyanide, carbon monoxide, carbon dioxide. Containers may rupture from gas generation in a fire situation.

**Fire-fighting PPE:** self-contained breathing apparatus and turn-out gear.

**Additional information:** If exposed to fire, keep containers cool by spraying with water. Move containers if possible. Dispose of fire debris and contaminated extinguishing water in accordance with regulations. Uncontained fire-water runoff may result in environmental damage.

## 6. Accidental Release Measures

**Personal precautions:** Clear area, ensure adequate ventilation. See section 8 for PPE.

**Environmental precaution:** Do not discharge into drains, surface waters or groundwater.

**Cleanup:** Dike spillage, then -

**Small release:** Absorb material with dirt, vermiculite, sand or clay. Collect into an open container, then move container outside. Do not close container pressure tight. Area can be decontaminated with a mixture that is 90/8/2 of water/sodium carbonate or ammonia/detergent.

**Large release:** If necessary, a blanket of foam may be used to contain vapor. Transfer as much material as possible into a closed, but not sealed, container using a pump or vacuum device. Treat residue as a small release.



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## 7. Handling and Storage

### Handling

**General:** Provide adequate exhaust ventilation at the process machines, work areas and stores. In the presence of fumes, vapors or aerosol mist respiratory protection should be used. Moisture contamination will lead to the evolution of carbon dioxide. This can cause a sealed container to burst. If a bulging container occurs, transfer to a well ventilated area, puncture to relieve pressure and ventilate for 48 hours.

### Storage

**General:** Keep container tightly closed and in a well ventilated area. Moisture contamination can lead to carbon dioxide formation and a build up of pressure. Outage of containers should be filled with a dry inert gas at atmospheric pressure to minimize humidity presence inside container.

**Incompatibility:** Segregate from acids and bases.

**Stability:** Protect against moisture. Store at 65-110 °F.

## 8. Exposure Controls and Personal Protection

### Component with occupational exposure limits

Diphenylmethane -4,4'-diisocyanate (MDI)	OSHA PEL CLV 0.02 ppm, 0.2 mg/m <sup>3</sup> ACGIH TWA 0.005 ppm
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P-MDI	OSHA PEL CLV 0.02 ppm, 0.2 mg/m <sup>3</sup> ACGIH TWA 0.005 ppm
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Methylenediphenyl diisocyanate	OSHA PEL CLV 0.02 ppm, 0.2 mg/m <sup>3</sup> ACGIH TWA 0.005 ppm
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**Respiratory protection:** Provide local exhaust ventilation to maintain recommended P.E.L. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For emergency or non-routine high exposure situations, including confined space, use a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus or a full facepiece pressure demand supplied air respirator with escape provisions.



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**Hand protection:** Chemical resistant protective gloves. Preferred materials include butyl rubber, chlorinated polyethylene, polyethylene, ethyl vinyl alcohol laminate. Acceptable materials include chloroprene rubber, nitrile/butadiene rubber, polyvinyl chloride. Consideration must be given to other exposures and conditions of use.

**Eye protection:** Chemical goggles or face shield. Eyewash fountains must be easily accessible.

**Body protection:** Use protective clothing that is chemically resistant to isocyanates. Selection of specific items such as face shield, boots, apron, etc. will be task dependent. Safety showers must be easily accessible.

## 9. Physical and Chemical Properties

Form:	Liquid	
Odor:	Mild organic odor	
Color:	Clear, yellow to amber color	
pH:	Not applicable	
Specific Gravity	0.96	25 °C
Boiling point	> 200 °C	Decomposes
Solubility in water:	Reacts with water	
Solubility in other solvents:	Moderately non-polar	

## 10. Stability and Reactivity

**Conditions to avoid:** Avoid moisture. Avoid elevated temperature.

**Substances to avoid:** water, alcohol, strong bases, any isocyanate-reactive substance

**Hazardous reactions:** Reacts with water with the formation of carbon dioxide and a risk of bursting containers. Reacts with alcohols, acids, alkalis, amines. Reaction may be exothermic. Risk of polymerization. Contact with certain rubbers can cause brittleness with subsequent loss of strength.

**Decomposition products:** carbon monoxide, carbon dioxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapors



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**Chemical Stability:** Stable if stored and handled as prescribed/indicated.

**Thermal decomposition:** None if stored and handled as prescribed/indicated.

**Corrosion to metals:** Not corrosive to metals.

**Oxidizing properties:** Not fire-propagating

## 11. Toxicological Information

*Toxicology values have not been determined on this material. Toxicology values have not been determined on every component. Product contains <10% Diphenylmethane diisocyanate (MDI) in various isomeric forms. Toxicology values for MDI are given below*

**Primary Routes of exposure:** SOLIDS AND LIQUIDS: inhalation, skin contact, eye contact, ingestion.  
GASES: inhalation, skin contact, eye contact.

### Acute Toxicity/Effects

Inhalation of vapors may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult 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.

### Acute toxicity

**Oral:** LD50, rat, >2000 mg/kg (Directive 84/449/EEC, B.1)

**Inhalation:** LC50, rat, 2.0 mg/l (OECD Guideline 403)

**Dermal:** LD50, rabbit, >9400 mg/kg

**Other acute effects:** Specific target organ toxicity - single exposure: Causes temporary irritation of the respiratory tract.





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## **Irritation/corrosion**

**Skin:** result = irritating, rabbit, Draize test

**Eye:** result = irritating, rabbit, Draize test

**Assessment:** Irritating to eyes, respiratory system and skin. Skin contact may result in irritative or allergic dermatitis.

## **Sensitization**

Buehler test: result = sensitizing, guinea pig;

Mouse Local Lymph Node Assay (LLNA): result = sensitizing, mouse

Other: result = sensitizing, guinea pig

**Assessment of sensitization:** Sensitization after skin contact 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. 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. 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.

## **Repeated dose toxicity**

Inhalation 2 yrs, 6 hr/day, 0/0.2/1/6 mg/m<sup>3</sup>, Wistar rat

No observed adverse effect: 0.2 mg/m<sup>3</sup>, lowest observed adverse effect: 1 mg/m<sup>3</sup>

**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. Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.



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## **Genetic toxicity**

Genetic toxicity in vitro: OECD Guideline 471 Ames-test Salmonella typhimurium: with and without metabolic activation ambiguous.

Genetic toxicity in vivo: OECD Guideline 474 Micronucleus assay rat (male) Inhalation negative. No clastogenic effect reported.

**Assessment of mutagenicity:** The substance was mutagenic in various bacterial test systems; however, these results could not be confirmed in tests with mammals.

## **Carcinogenicity**

Experimental/calculated data: OECD Guideline 453 rat Inhalation 0, 0.2, 1, 6 mg/m<sup>3</sup>; result: lung tumors

**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.

## **Reproductive toxicity**

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

## **Teratogenicity**

OECD Guideline 414 rat inhalation 0/1/4/12 mg/m<sup>3</sup>

No observed adverse effect 4 mg/m<sup>3</sup>(Mat.), 4 mg/m<sup>3</sup>(Teratog.)

Did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

**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.

**Symptoms of exposure:** See sections 2 and 11. 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. Preemployment and periodic medical examinations with respiratory



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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:** The product has not been tested. The following has been derived from substances/products of a similar structure or composition. 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 hydrolyse. The test result maybe partially due to degradation products.

### Fish

Acute: Guideline 203 static, *Brachydanio rerio*, LC0 (96 h) > 1000mg/l

### Aquatic invertebrates

Acute: Guideline 202, part 1 static, *Daphnia magna*, EC50 (24 h) > 1000mg/l

Chronic: *Daphnia magna*, 24 h > 500mg/l, practically nontoxic

### Aquatic plants

OECD Guideline 201 static, green algae, EC0 (72 h): 1640 mg/l

### Microorganisms

OECD Guideline 209 aquatic, aerobic bacteria from a domestic water treatment plant, EC50 (3 h) > 100 mg/l

### Degradability/Persistence

**Assessment of biodegradation and elimination (H<sub>2</sub>O):** Poorly biodegradable. The product is unstable in water. The elimination data also refer to products of hydrolysis.



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## Biological / Abiological Degradation

Test method:

Method of analysis:

OECD Guideline 302C (aerobic), activated sludge

Degree of elimination:

BOD of ThOD

Evaluation:

0% (28 d), poorly biodegradable, product unstable in water, the elimination data also refers to products of hydrolysis.

## Hydrolysis

Test Method:

(abiotic)

Half-life

20 h (25C)

## Bioaccumulation

**Assessment of bioaccumulation potential:** Significant accumulation in organisms is not to be expected.

OECD Guideline 305E

carp (28 d) Bio concentration factor 200

## 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 disposal of substance:

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

### Container disposal:

DRUMS: Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, 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.



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## 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

**Additional 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:

Chemical TSCA, US All components released / listed

**EPCRA 311/312 (Hazard categories):** Acute; Chronic

#### EPCRA 313:

<u>CAS Number</u>	<u>Chemical name</u>
101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)
9016-87-9	P-MDI

<u>CERCLA RQ</u>	<u>CAS Number</u>	<u>Component</u>
5000 LBS	101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)
5000 LBS	9016-87-9	P-MDI

**Reportable Quantity for release:** 13,157.9 lb.



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## State Regulations

<u>State RTK</u>	<u>CAS Number</u>	<u>Component</u>
MA, NJ, PA	101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)
MA, NJ, PA	9016-87-9	P-MDI
NJ	26447-40-5	Methylenediphenyl diisocyanate

## **NFPA Hazard codes:**

Health: 2

Flammability: 1

Reactivity: 1

## **16. Other information**

Recommended use: polyurethane component industrial chemicals

Suitable for use in industrial sector: polymers industry, chemical industry, telecom industry