



# POLYONE CORPORATION

## MATERIAL SAFETY DATA SHEET

**P1241B**

Version Number 1.2  
Revision Date 06/11/2007

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### 1. PRODUCT AND COMPANY IDENTIFICATION

**POLYONE CORPORATION**  
**8155 Cobb Center Drive, Kennesaw, GA 30152**

Telephone : Product Stewardship (770) 590-3500 x.3563  
Emergency telephone : **CHEMTREC 1-800-424-9300 (24hrs for spill, leak, fire, exposure or accident).**

Product name : P1241B  
Product code : FO00012891  
Chemical Name : Mixture  
CAS-No. : Mixture  
Product Use : Industrial Applications

### 2. COMPOSITION/INFORMATION ON REGULATED INGREDIENTS

Components	CAS-No.	Weight %
Methylenediphenyl diisocyanate	26447-40-5	1 - 5
4,4'-Methylenediphenyl diisocyanate (MDI)	101-68-8	60 - 100

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

This product is a mixture of polymeric isocyanate and monomeric isocyanates. The health effects of polymeric isocyanates have not been fully investigated. Isocyanates in general are irritating to eyes, skin, and respiratory system. Exposure to moderate levels of isocyanates can result in respiratory or skin sensitization, especially in predisposed persons such as those with respiratory problems, recurrent skin eczema, or skin allergies. Polymeric isocyanates normally have low volatility, but heating, spraying, or other processing, especially in poorly ventilated areas, can increase exposure risk. Sensitized persons should not be exposed to any material containing unreacted isocyanates.

#### POTENTIAL HEALTH EFFECTS

**Routes of Exposure:** : Inhalation, Skin contact, Ingestion

#### Acute exposure

Inhalation : Isocyanates vapor or mist at concentrations above the TLV can irritate the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath, and reduced lung function (breathing obstruction). Persons with a pre-existing, non-specific bronchial hyper-reactivity can respond to concentrations below the TLV with similar symptoms as well as asthma attacks. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in the lungs). These symptoms can be delayed up to several hours after exposure. As a result of previous

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repeated overexposures or a single large dose, certain individuals develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure at levels well below the TLV. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath, or asthma 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 or in severe cases for several years. Overexposure to isocyanates has also been reported to cause lung damage (including decreased lung function), which may be permanent. Sensitization can either be temporary or permanent.

- Ingestion : May be harmful if swallowed. Can result in irritation and corrosive action in the mouth, stomach tissue, and digestive tract. Symptoms can include sore throat, abdominal pain, nausea, vomiting, and diarrhea.
- Eyes : Liquid, aerosol, or vapors of this product are irritating and may cause tearing, reddening, and swelling accompanied by a stinging sensation and/or a feeling like that of fine dust in the eyes. If left untreated, corneal damage can occur, and injury is slow to heal. However, damage may be reversible with time.
- Skin : Isocyanates react with skin protein and moisture in the skin and can cause irritation which may include reddening, swelling, rash, scaling or blistering. Cured material is difficult to remove. Prolonged contact may cause skin sensitization in some cases. Individuals who have skin sensitization can develop these symptoms from contact with liquid or vapors. Animal tests have indicated that respiratory sensitization can result from direct skin contact with isocyanates. This data reinforces the need to prevent direct skin contact with isocyanates.

**Chronic exposure** : Refer to Section 11 for Toxicological Information.

**Medical Conditions Aggravated by Exposure:** : Individuals with chronic respiratory disorders (i.e. asthma, chronic bronchitis, etc.) may be adversely affected by any airborne contaminant.

**4. FIRST AID MEASURES**

- Inhalation : Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. When symptoms persist or in all cases of doubt seek medical advice. Administer oxygen or artificial respiration as needed. Asthmatic type symptoms may develop and may be immediate or delayed up to several hours. Consult physician should this occur.
- Ingestion : Wash mouth with water. Never give anything by mouth to an unconscious person. Seek medical attention if necessary. Do not induce vomiting without medical advice.
- Eyes : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek medical advice. Note to physician. Eyes: Stain

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for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors may produce reversible corneal epithelial edema impairing vision.

Skin : Wash off with soap and plenty of water. Take off all contaminated clothing immediately. Wash contaminated clothing before re-use. If skin irritation persists seek medical attention.

**5. FIRE-FIGHTING MEASURES**

Flash point : Greater than 300 °F (149 °C)

**Flammable Limits**

Upper explosion limit : No data available

Lower explosion limit : No data available

Autoignition temperature : No data available

Suitable extinguishing media : Carbon dioxide blanket, Water spray, Dry powder, Foam.

Special Fire Fighting Procedures : Fullface self-contained breathing apparatus (SCBA) used in positive pressure mode should be worn to prevent inhalation of airborne contaminants. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. At temperatures greater than 400 F (204 C), polymeric isocyanates can polymerize and decompose which can cause pressure build-up in closed containers. Explosive rupture is possible; therefore, use cold water to cool fire-exposed containers.

Unusual Fire/Explosion Hazards : Carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), other hazardous materials, and smoke are all possible.

**6. ACCIDENTAL RELEASE MEASURES**

Personal precautions : Ensure response personnel are properly protected (see section 8 for respiratory or other protection guidelines.) Use caution as floors may be slippery. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Remove all sources of ignition.

Environmental precautions : The product should not be allowed to enter drains, water courses or the soil. Should not be released into the environment.

Methods for cleaning up : Minor spills can be absorbed with sawdust or other absorbents and shoveled into unsealed containers for neutralization. Neutralizing can be performed with a solution of 0.2% to 0.5% liquid detergent and 3% to 8% concentrated ammonium hydroxide in water (5% to 10% sodium carbonate may be substituted.) Use 10 parts neutralizing solution to each part isocyanate. Allow to react for 10 to 15 minutes in a well ventilated area as carbon dioxide will be generated. Containers should be uncovered for 48 hours to allow CO<sub>2</sub> to escape. Decontaminate floors and other surfaces with neutralizing solution. Large spills: evacuate and ventilate spill area; dike spill to prevent entry into water



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system. Wear full protective equipment, including respiratory equipment during clean up. If temporary control of isocyanate vapors is required, use a blanket of protein foam, (available at most fire departments). If spills occur during transportation, call CHEMTREC at 800-424-9300. Large quantities of material may be pumped in closed but not sealed containers for disposal.

**7. HANDLING AND STORAGE**

- Handling : Heat only in areas with appropriate exhaust ventilation. Ensure all equipment is electrically grounded before beginning transfer operations. Ensure employees are properly trained before allowing to handle. Use only with adequate ventilation. Avoid skin contact with product. Do not breathe vapors or mists. If sensitization to this material occurs, all future exposure should be prevented.
- Storage : Store in a cool dry place. Keep containers dry and tightly closed to avoid moisture absorption and contamination. Do not reseal containers if moisture contamination is suspected as moisture contamination may result in CO2 generation and increased pressure inside the container. Keep from freezing. Keep away from feed or food products. Storage Temperature Min/Max 77°F (25°C) minimum 95°F (37°C) maximum. Product quality is negatively affected outside this temperature range.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

- Respiratory protection : Heating or spraying or using the product with inadequate ventilation may result in an airborne exposure potential. Appropriate respiratory protection such as a supplied air respirator in positive pressure or continuous flow mode must be worn. Isocyanates have poor warning properties as the odor threshold is much higher than the permissible exposure limit. Refer to OSHA 29 CFR 1910.134 for respiratory use regulations. MONITORING: Airborne isocyanate concentrations should be measured when the potential for overexposure exists. e. g. when the product is sprayed, aerosolized or heated. Monitoring of airborne isocyanates in the breathing zone of individuals should become part of the overall employee exposure characterization program. Sampling and analytical methods have been developed by NIOSH, Bayer Corporation and others. Bayer Corporation methods can be made available upon request. MEDICAL SURVEILLANCE: Medical supervision of all employees who handle or come in contact with isocyanates is recommended. These should include pre-employment and periodic medical examinations with pulmonary functions tests (FEV, FVC as a minimum). History of adult asthma, respiratory allergies such as hay fever, eczema, history of prior isocyanate sensitization, or lack of smell (anosmia) are possible reasons for medical exclusion from isocyanate areas. Once a person is accurately diagnosed as sensitized to an isocyanate, no further exposure can be permitted.

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- Eye/Face Protection : Safety glasses with side-shields. Wear goggles or face shield during operations that present a splash potential.
- Hand protection : Wear protective gloves when product contact is a possibility. Ensure gloves are resistant to isocyanates. Test gloves or contact glove vendor prior to use. Some gloves that have been found to work include neoprene, nitrile rubber, butyl rubber, and PVA. Note that PVA degrades in water. Use of thin disposable latex gloves should be avoided.
- Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place.
- Additional Protective Measures : Safety showers and eyewash stations should be available. Educate and train employees in safe use of product.
- General Hygiene Considerations : Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
- Engineering measures : Provide appropriate exhaust ventilation at machinery. Adequate ventilation and/or appropriate respiratory protection may also be necessary to minimize employee exposure to processing vapors.

Exposure limit(s)

Components	Value	Exposure time	Exposure type	List:
4,4'-Methylenediphenyl diisocyanate (MDI)	0.005 ppm	Time Weighted Average (TWA):	as MDI	ACGIH
	0.02 ppm 0.2 mg/m3	Ceiling Limit Value:	as MDI	OSHA Z1
	0.005 ppm 0.051 mg/m3	Time Weighted Average (TWA):		MX OEL
	0.02 ppm 0.2 mg/m3	Time Weighted Average (TWA):		MX OEL

**9. PHYSICAL AND CHEMICAL PROPERTIES**

- Form : liquid
- Appearance : amber
- Color : NOT APPLICABLE
- Odour : Weakly aromatic
- Evaporation rate : Not established
- Specific Gravity : Not determined
- Bulk density : Not applicable
- Vapour pressure : Less than 0.00001 mm Hg @ 77 F for MDI
- Melting point/range : Typically 58°F to 68°F (14°C to 20°C)
- Vapour density : 8.5 (MDI) (Air = 1)
- Boiling Point: : Not established
- pH : Not determined
- Water solubility : Reacts with water to

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release CO2 gas

**10. STABILITY AND REACTIVITY**

- Stability : Stable.
- Hazardous Polymerization : May occur. Contact with moisture, other materials which react with isocyanates, or temperatures above 400 F (204 C) may cause polymerization.
- Conditions to avoid : Keep from freezing. Avoid moisture. Keep away from oxidizing agents and open flame.
- Incompatible Materials : Isocyanates will react with materials containing active hydrogen such as water, alcohols, ammonia, amines, alkalis, and acids. The reaction with water (including humid conditions) is accelerated in the presence of alkalis, tertiary amines, and metal compounds. Some reactions can be violent. Iron, zinc, aluminium and their compounds will catalyze product decomposition.
- Hazardous decomposition products : Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), other hazardous materials, and smoke are all possible.

**11. TOXICOLOGICAL INFORMATION**

This mixture has not been evaluated as a whole for health effects. Exposure effects listed are based on existing health data for the individual components which comprise the mixture.

Toxicity Overview

This product contains the following components which in their pure form have the following characteristics:

CAS-No.	Chemical Name	Effect	Target Organ
26447-40-5	Methylenediphenyl diisocyanate	Irritant	Eyes, Skin, Respiratory system.
		sensitizer	Respiratory system, Skin.
101-68-8	4,4'-Methylenediphenyl diisocyanate (MDI)	Systemic effects	Eyes, Respiratory system.
		Irritant	Eyes, Skin, Respiratory system.
		sensitizer	Skin, Respiratory system.
		Toxic	Refer to LC50 / LD50 Data on MSDS..

LC50 / LD50

This product contains the following components which, in their pure form, have the following toxicity data:

CAS-No.	Chemical Name	Route	Value	Species
101-68-8	4,4'-Methylenediphenyl diisocyanate (MDI)	LC50 Oral LD50	178 mg/m3 9,200 mg/kg	rat rat

**Additional Health Hazard Information:**

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**Methylenediphenyl diisocyanate 26447-40-5 Isocyanates in general are irritants to the skin, eyes, and respiratory system. Isocyanates are skin and respiratory sensitizers. Exposure can result in an asthma-like condition or skin rashes. Sensitized individuals should be kept from exposure to unreacted isocyanates.**

**Additional Health Hazard Information:**

**4,4'-Methylenediphenyl diisocyanate (MDI) 101-68-8 Isocyanates in general are irritants to the skin, eyes, and respiratory system. Isocyanates are skin and respiratory sensitizers. Exposure can result in an asthma-like condition or skin rashes. Sensitized individuals should be kept from exposure to unreacted isocyanates.**

**12. ECOLOGICAL INFORMATION**

Persistence and degradability : Not readily biodegradable.

Environmental Toxicity : LC50. 24 hr.(static): Greater than 500mg/liter for Daphnia magna, Limnea Stagnalis, and Zebra fish (Brachndanio rerio) for both polymeric and monomeric MDI

Bioaccumulation Potential : No data available

Additional advice : No data available

**13. DISPOSAL CONSIDERATIONS**

Product : The generator of waste material has the responsibility for proper waste classification, transportation and disposal in accordance with applicable federal, state/provincial and local regulations.

Contaminated packaging : Drums or other used isocyanate containers must be decontaminated before disposal. Ensure disposal personnel are properly protected from exposure. Spray neutralizing solution into the used container at a 10:1 solution:waste ratio. Allow container to stand unsealed for 48 hours in a well ventilated area. Pour out the solution, triple rinse the container, and puncture or otherwise destroy the rinsed container prior to disposal. Do not heat or cut empty container with electric or gas torch, gases may be highly toxic. The generator of waste material has the responsibility for proper waste classification, transportation and disposal in accordance with applicable federal, state/provincial and local regulations.

**14. TRANSPORT INFORMATION**

U.S. DOT Classification : Refer to specific regulation.

ICAO/IATA (air) : Refer to specific regulation.

IMO / IMDG (maritime) : Refer to specific regulation.



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**15. REGULATORY INFORMATION**

US Regulations:

OSHA Status : Classified as hazardous based on components.

TSCA Status : All components of this product are listed on or exempt from the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

Not applicable

California Proposition : Not applicable  
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SARA Title III Section 302 Extremely Hazardous Substance

Unless specific chemicals are identified under this section, this product is Not Applicable under this regulation

SARA Title III Section 313 Toxic Chemicals:

Unless specific chemicals are identified under this section, this product is Not Applicable under this regulation

Chemical Name	CAS-No.	Weight %
METHYLENEBIS(PHENYLISOCYANATE) (MDI)	101-68-8	60.00 - 100.00

Canadian Regulations:

National Pollutant Release Inventory (NPRI)

Chemical Name	CAS-No.	Weight %	NPRI ID#
4,4'-Methylenediphenyl diisocyanate (MDI)	101-68-8	60.00 - 100.00	156

WHMIS Classification : D1A

WHMIS Ingredient Disclosure List

CAS-No.
101-68-8

DSL : All components of this product are on the Canadian Domestic Substances List (DSL) or are exempt.

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National Inventories:

- Australia AICS : Listed
- China IECS : Listed
- Europe EINECS : Listed
- Japan ENCS : Listed
- Korea KECI : Listed
- Philippines PICCS : Listed

**16. OTHER INFORMATION**

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.