

# ART – ZOLATONE AIM

## MATERIAL SAFETY DATA SHEET

**MSDS Name:** Catalyst for ZT-9239  
**MSDS Number:** 9239-000C  
**Version Number:** 11  
**MSDS Date:** 8/14/2008  
**Date Printed:** 8/14/2008

### SECTION 1 - Product and Company Information

**Product Name:** Catalyst for Tuff Rider™ Urethane Liner by Zoaltone®  
**CAS Number:** N/A  
**Company Identification:** ART Zolatone AIM  
850 Ladd Rd., Bldg. E  
Walled Lake, MI 48390  
**Contact:** Amy Kramer  
**Telephone:** 800.360.7744  
**Facsimile:** 248.668.2785  
**Chemtrec (24 hours):** 800.424.9300  
**Chemical Family:** Aromatic Isocyanate Prepolymer  
**Chemical Name:** Diphenylmethane Diisocyanate (MDI) Prepolymer  
**Product Class Number:**  
**Product Code Number:** ZT-9239-CATALYST-HP

### SECTION 2 - Hazards Identification

#### Emergency Overview

**WARNING!** **Color:** Dark brown **Form:** liquid **Odor:** musty.

Toxic gases/fumes may be given off during burning or thermal decomposition. Closed container may forcibly rupture under extreme heat or when contents have been contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. Causes eye irritation. May cause lung damage.

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## **SECTION 2 - Hazards Identification**

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### **Potential Health Effects**

**Primary Routes of Entry:** Skin Contact, Inhalation, Eye Contact

**Medical Conditions Aggravated by Exposure:** Asthma, Respiratory disorders, Skin Allergies, Eczema

### **HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE**

#### **Inhalation**

##### **Acute Inhalation**

Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) 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 preexisting, nonspecific bronchial hyperactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

##### **Chronic Inhalation**

As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many nonspecific 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. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent.

#### **Skin**

##### **Acute Skin**

Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove. Contact with MDI can cause discoloration.

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## SECTION 2 - Hazards Identification

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### Chronic Skin

Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction.

### Eye

#### Acute Eye

Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor or aerosol may cause irritation with symptoms of burning and tearing.

#### Chronic Eye

Prolonged vapor contact may cause conjunctivitis.

### Ingestion

#### Acute Ingestion

May cause irritation; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

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

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## SECTION 3 - Composition/Information on Ingredients

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### Hazardous Components

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
30 - 50%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
20 - 30%	Diphenylmethane Diisocyanate (MDI) Mixed Isomers	26447-40-5
10 - 25%	Polyurethane Prepolymer	52747-01-0
10 - 20%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9

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## **SECTION 4 - First Aid Measures**

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### **Eye Contact**

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Get medical attention.

### **Skin Contact**

Immediately remove contaminated clothing and shoes. Wash off with soap and water. Use lukewarm water if possible. Wash contaminated clothing before reuse. For severe exposures, immediately get under a safety shower and begin rinsing. Get medical attention if irritation develops.

### **Inhalation**

Move to an area free from further exposure. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

### **Ingestion**

Do not induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

### **Notes to physician**

Eyes: Stain for evidence of corneal injury. If the cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision.

Skin: This compound is a skin sensitizer. Treat symptomatically for contact dermatitis or thermal burn.

Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound.

Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

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## **SECTION 5 - Fire Fighting Measures**

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**Suitable Extinguishing Media:** dry chemical, carbon dioxide (CO<sub>2</sub>), foam, water spray for large fires.

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## **SECTION 5 - Fire Fighting Measures**

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### **Special Fire Fighting Procedures**

Firefighters should wear NFPA compliant structural firefighting protective equipment, including a self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with the product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

### **Unusual Fire/Explosion Hazards**

Closed containers may forcibly rupture under extreme heat or when contents are contaminated with water (CO<sub>2</sub> formed). Use cold-water spray to cool fire-exposed containers to minimize the risk of rupture. Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between water and hot diisocyanate can be vigorous.

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## **SECTION 6 - Accidental Release Measures**

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### **Spill and Leak Procedures**

Evacuate non-emergency personnel. Isolate the area and prevent access. Remove ignition sources. Notify management. Put on protective equipment. Control the source of the leak. Ventilate. Contain the spill to prevent spread into drains, sewers, water supplies, or soil. Call CHEMTREC at 800-424-9300 for assistance and advice. **Major Spill or Leak (Standing liquid):** Released material may be pumped into closed, but not sealed, metal container for disposal. Process can generate heat. **Minor Spill or Leak (Wet surface):** Cover spill area with suitable absorbent material (Kitty Litter, Oil-Dri®, etc). Saturate absorbent material with neutralization solution and mix. Wait 15 minutes. Collect material in open-head metal containers. Repeat applications of decontamination solution, with scrubbing, followed by absorbent until the surface is decontaminated. Check for residual surface contamination. Swype® test kits have been used for this purpose. Apply lid loosely and allow containers to vent for 72 hours to let carbon dioxide (CO<sub>2</sub>) escape.

### **Additional Spill Procedures/Neutralization**

Neutralization solutions:

- a. Colorimetric Laboratories Inc. (CLI) decontamination solution.
- b. A mixture of 75% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10) and 5% n-propanol.
- c. A mixture of 80% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10).
- d. A mixture of 90% water, 3-8% ammonium hydroxide or concentrated ammonia, and 2% liquid detergent.

ART Zolatone - AIM requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading. Such notification must be immediate and made by the person having knowledge of the release.

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## **SECTION 7 - Handling and Storage**

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### **Storage Temperature:**

**minimum:** 17.78 °C (64 °F)

**maximum:** 30 °C (86 °F)

**Storage Period** 6 Months

### **Handling/Storage Precautions**

Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.

### **Further Info on Storage Conditions**

Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200.

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## **SECTION 8 - Exposure Control / Personal Protection**

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### **4,4'-Diphenylmethane Diisocyanate (MDI) (101-68-8)**

US. ACGIH Threshold Limit Values

Time Weighted Average (TWA): 0.005 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) Ceiling

Limit Value: 0.02 ppm, 0.2 mg/m<sup>3</sup>

### **Industrial Hygiene/Ventilation Measures**

Local exhaust should be used to maintain levels below the TLV whenever MDI is heated, sprayed, or aerosolized. Standard reference sources regarding industrial ventilation (e.g., ACGIH Industrial Ventilation Manual) should be consulted for guidance about adequate ventilation. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA and others have developed sampling and analytical methods.

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## **SECTION 8 - Exposure Control / Personal Protection**

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### **Respiratory Protection**

Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).

### **Hand Protection**

Gloves should be worn. Nitrile rubber showed excellent resistance, Butyl rubber, neoprene and PVC are also effective.

### **Eye Protection**

When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of a splash.

### **Skin and body protection**

Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

### **Medical Surveillance**

All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted.

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## SECTION 8 - Exposure Control / Personal Protection

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### Additional Protective Measures

Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions.

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## SECTION 9 - Physical and Chemical Properties

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<b>Form:</b>	liquid
<b>Color:</b>	Dark brown
<b>Odor:</b>	musty
<b>pH:</b>	Not Applicable
<b>Freezing Point:</b>	< 0 °C (< 32 °F)
<b>Boiling Point/Range:</b>	313.89 °C (597 °F) @ 5 mm Hg
<b>Flash Point:</b>	370.0 °C (698 °F) (Pensky-Martens Closed Cup (ASTM D-93))
<b>Vapor Pressure:</b>	< 0.00001 mmHg @ 25 °C (77 °F)
<b>Specific Gravity:</b>	Estimated based on component(s) 1.23 @ 25 °C (77 °F)
<b>Solubility in Water:</b>	Insoluble - Reacts slowly with water to liberate CO <sub>2</sub> gas
<b>Bulk Density:</b>	10.26 lbs./gal.
<b>Molecular Weight:</b>	350

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## SECTION 10 - Stability and Reactivity

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### Hazardous Reactions

Contact with moisture, other materials that react with isocyanates, or temperatures above 350 F (177 C), may cause polymerization.

### Materials to avoid

Water, Amines, Strong bases, Alcohols, copper alloys.

### Hazardous decomposition products

By Fire and High Heat: hydrogen cyanide; Carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), dense black smoke, Isocyanate, Isocyanic Acid, and other undetermined compounds.

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## SECTION 11 - Toxicological Information

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### Toxicity Note

Toxicity data based on polymeric MDI.

### Acute Oral Toxicity

LD50: > 2,000 mg/kg (rat, Male/Female)

### Acute Inhalation Toxicity

LC50: 490 mg/m<sup>3</sup>, aerosol, 4 h (rat)

### Skin Irritation

rabbit, Slightly irritating

### Repeated Dose Toxicity

90 Days, inhalation: NOAEL: 1 mg/m<sup>3</sup>, (rat, Male/Female, 6 hrs/day 5 days/week) Irritation to lungs and nasal cavity.

2 years, inhalation: NOAEL: 0.2 mg/m<sup>3</sup>, (rat, Male/Female, 6 hrs/day 5 days/week) Irritation to lungs and nasal cavity.

### Mutagenicity

Genetic Toxicity in Vitro:

Bacterial - gene mutation assay: negative (Salmonella typhimurium, Metabolic Activation: with/without)

### Carcinogenicity

rat, Male/Female, inhalation, 2 Years, 6 hrs/day 5 days/week

Exposure to a level of 6 mg/m<sup>3</sup> polymeric MDI was related to the occurrence of lung tumors. This level is significantly over the TLV for MDI.

### Developmental Toxicity/Teratogenicity

rat, female, inhalation, gestation days 6-15, 6 hrs/day, NOAEL (teratogenicity): 12 mg/m<sup>3</sup>, NOAEL (maternal): 4 mg/m<sup>3</sup> No Teratogenic effects observed at doses tested. Fetotoxicity seen only with maternal toxicity.

### Toxicity Data for 4,4'-Diphenylmethane Diisocyanate (MDI) Acute Inhalation Toxicity

LC50: 369 mg/m<sup>3</sup>, 4 hrs (rat, Male/Female) LC50: > 2240 mg/m<sup>3</sup>, aerosol, 1 h (rat)

**Acute dermal toxicity** LD50: > 10,000 mg/kg (rabbit)

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## SECTION 11 - Toxicological Information

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### Skin Irritation

rabbit, Draize Test, Slightly irritating

### Eye Irritation

rabbit, Draize Test, Slightly irritating

### Sensitization

dermal: sensitizer (guinea pig, Maximization Test (GPMT)) inhalation: sensitizer (Guinea pig)

### Repeated Dose Toxicity

90 Days, inhalation: NOAEL: 0.3 mg/m<sup>3</sup>, (rat, Male/Female, 18 hrs/day, 5 days/week) Irritation to lungs and nasal cavity.

### Mutagenicity

Genetic Toxicity in Vitro:

Ames: (Salmonella typhimurium, Metabolic Activation: with/without)

Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing the positive mutagenicity results.

Genetic Toxicity in Vivo:

Micronucleus Assay: negative (mouse).

### Carcinogenicity

rat, Female, inhalation, 2 Years, 17 hrs/day, 5 days/week negative.

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## SECTION 12 - Ecological Information

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### Biodegradation

0 %, Exposure time: 28 Days

### Bioaccumulation

Rainbow trout, Exposure time: 112 d, < 1 BCF Does not bioaccumulate.

### Acute and Prolonged Toxicity to Fish

LC0: > 1,000 mg/l (Zebra fish (Brachydanio rerio), 96 hrs) LC0: > 3,000 mg/l (Killifish (Oryzias latipes), 96 h)

### Acute Toxicity to Aquatic Invertebrates

EC50: > 1,000 mg/l (Water flea (Daphnia magna), 24 hrs)

### Toxicity to Aquatic Plants

NOEC: 1,640 mg/l, End Point: growth (Green algae (Scenedesmus subspicatus), 72 hrs)

### Toxicity to Microorganisms

EC50: > 100 mg/l, (Activated sludge microorganisms, 3 hrs)

### Additional Ecotoxicological Remarks

Ecotoxicity data based on polymeric MDI

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## **SECTION 12 - Ecological Information**

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### **Ecological Data for 4,4'-Diphenylmethane Diisocyanate (MDI)**

#### **Acute and Prolonged Toxicity to Fish**

LC50: > 500 mg/l (Zebra fish (Brachydanio rerio), 24 hrs)

#### **Acute Toxicity to Aquatic Invertebrates**

EC50: > 500 mg/l (Water flea (Daphnia magna), 24 hrs)

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## **SECTION 13 - Disposal Considerations**

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### **Waste Disposal Method**

Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method.

### **Empty Container Precautions**

Empty containers retain product residue; observe all precautions for the product. Do not heat or cut an empty container with an electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If a container is to be disposed, ensure all product residues are removed prior to disposal.

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## **SECTION 14 - Transportation Information**

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### **Land transport (DOT)**

<b>Proper Shipping Name:</b>	Other regulated substances, liquid, n.o.s. (contains 4,4'Diphenylmethane Diisocyanate (MDI))
<b>Hazard Class or Division:</b>	9
<b>UN/NA Number:</b>	NA3082
<b>Packaging Group:</b>	III
<b>Hazard Label(s):</b>	Class 9
<b><u>RSPA/DOT Regulated Components:</u></b>	4,4'-Diphenylmethane Diisocyanate (MDI)
<b>Reportable Quantity:</b>	10,000 lbs.
<b><u>Sea transport (IMDG)</u></b>	Non-Regulated
<b><u>Air transport (ICAO/IATA)</u></b>	Non-Regulated

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## SECTION 14 - Transportation Information

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### Additional Transportation Information

When in individual containers of less than the Product RQ, this material ships as non-regulated.

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## SECTION 15- Regulatory Information

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### United States Federal Regulations

**OSHA Hazcom Standard Rating:** Hazardous

**US. Toxic Substances Control Act:** Listed on the TSCA Inventory.

### **US. EPA CERCLA Hazardous Substances (40 CFR 302):**

#### Components

4,4'-Diphenylmethane Diisocyanate Reportable quantity: 5,000 lbs. (MDI)

**SARA Section 311/312 Hazard Categories:** Acute Health Hazard, Chronic Health Hazard

**US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A): Components** None

**US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required: Components**

4,4'-Diphenylmethane Diisocyanate (MDI), Polymeric Diphenylmethane Diisocyanate (pMDI)

### **US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):**

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

### State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

This product contains a trace (ppm) amount of phenyl isocyanate (CAS # 103-71-9) and monochlorobenzene (CAS # 108-90-7) as impurities.

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## SECTION 15 - Regulatory Information

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### Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
30 - 50%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
20 - 30%	Diphenylmethane Diisocyanate (MDI) Mixed Isomers	6447-40-5
0 - 25%	Polyurethane Prepolymer	52747-01-0
10 - 20%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9

### New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
30 - 50%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
10 - 20%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9

**California Prop. 65:** To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

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## SECTION 16 - Other Information

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**HMIS Rating:**      **Health: 2\***      **Flammability: 1**      **Reactivity: 1**

The information contained in this material Safety Data Sheet is information from our suppliers and other sources. It is believed to be reliable. Due to the changing nature of government information, it is impossible to guarantee the accuracy of the information contained herein. Since the conditions of handling and use are beyond our control, we make no guarantee of results and assume no liability for damages incurred by the use of this material. This data is not to be taken as a warranty or representation for which this company assumes legal responsibility.