



# SAFETY DATA SHEET

## Quik-Shield A

### Section 1: Identification

#### 1.1 Product name:

Quik-Shield A, QS-A

#### 1.2 Recommended use:

Identified uses: Component of a Polyurethane System

Restrictions on use: For industrial use only.

#### 1.3 Supplier:

SWD Urethane  
539 S. Drew St.  
Mesa AZ 85210  
(800) 828 -1394  
[www.swdurethane.com](http://www.swdurethane.com)

#### 1.4 Emergency telephone number:

Chemtrec  
(800) 424-9300

### Section 2: Hazard Identification

#### 2.1 Classification:

Classified according to US Hazard Communication Standard (HCS 2012) and Canada Hazardous Products Regulations (WHMIS 2015).

Respiratory Sensitization Cat. 1; H334  
Skin Irritation Cat. 2; H315  
Eye Irritation Cat. 2B; H320  
Skin Sensitization Cat. 1; H317  
Acute Toxicity-inhalation Cat. 4; H332  
Specific Target Organ Toxicity Single Exposure Cat. 3; H335  
Specific Target Organ Toxicity Repeated Exposure Cat. 2; H373

#### 2.2 Label elements:



**Signal Word: Danger**

#### Hazard statements:

May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
Causes skin and eye irritation.  
May cause an allergic skin reaction.  
Harmful if inhaled.  
May cause respiratory irritation.  
May cause damage to respiratory tract through prolonged or repeated exposure by inhalation.

#### Precautionary statements:

#### Prevention:

Wash exposed skin thoroughly after handling.  
Wear protective gloves, protective clothing and eye protection or face protection.  
Do not breathe vapors, fume, spray or dust.  
Use only outdoors or in a well-ventilated area.  
Contaminated work clothing should not be allowed out of the workplace.  
In case of inadequate ventilation wear respiratory protection.

#### Response:

IF INHALED: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor.

IF ON SKIN: Wash with polyglycol based skin cleanser, corn oil or plenty of soap and water. If skin irritation or rash occurs: Get medical attention. Take off contaminated clothing and wash it before reuse.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.



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### 2.2 Label elements: (continued)

**Storage:**

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

**Disposal:**

Recycle and or dispose of contents and containers in accordance with local, regional, national and international regulations.

### 2.3 Other hazards:

Contains isocyanates; may react in contact with water and other materials releasing heat and gases (see Section 10).

## Section 3: Composition/Information on Ingredients

<u>Chemical Name</u>	<u>CAS RN®</u>	<u>Wt. %</u>	<u>Substance Classification</u>
Polymethylene polyphenyl isocyanate Common name: Polymeric MDI	9016-87-9	30 - 70	Skin Irrit. 2; H315 Eye Irrit. 2B; H320 Skin Sens. 1; H317 Acute Tox. 4; H332 Resp. Sens. 1; H334 STOT SE 3; H335 STOT RE 2; H373
Methylene diphenyl diisocyanate Common name: MDI	101-68-8	30 - 50	Skin Irrit. 2; H315 Eye Irrit. 2B; H320 Skin Sens. 1; H317 Acute Tox. 4; H332 Resp. Sens. 1; H334 STOT SE 3; H335 STOT RE 2; H373

Concentrations shown as ranges are due to the inherent variation of the polymeric : monomeric form in the steady-state.

## Section 4: First-Aid Measures

### 4.1 Description of first-aid measures:

**Precautions:** Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). First-aid providers should avoid direct contact with this chemical.

**Inhalation:** If breathing is difficult, remove person to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTRE or doctor.

If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately obtain medical attention and transport victim to an emergency care facility.

**Skin Contact:** Take off immediately all contaminated clothing shoes and leather goods (e.g. watchbands, belts). Wash exposed skin with a polyglycol based skin cleanser, corn oil or plenty of water and mild, non-abrasive soap. Completely decontaminate clothing, shoes and leather goods before reuse or discard. If skin irritation or rash occurs: Get medical attention.

**Eye Contact:** Remove source of exposure or move person to fresh air. Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

If product is a solid in the eye: Do not allow victim to rub eye(s). Let the eye(s) water naturally for a few minutes. Have victim look right and left, and then up and down. If particle/dust does not dislodge, rinse cautiously with water until particle is removed. If irritation persists, obtain medical attention. DO NOT attempt to manually remove anything stuck to eye(s).

**Ingestion:** If swallowed, call a POISON CENTER or doctor. Never give anything by mouth if victim is rapidly losing consciousness or is unconscious or convulsing. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration.



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### 4.2 Most important symptoms and effects, acute and delayed:

See Section 11 of this SDS where additional symptoms and important health effects are described.

**Inhalation:** Respiratory tract irritation, difficulty breathing or asthmatic reaction.

High aerosol concentrations could cause inflammation of the lung tissue (chemical pneumonitis), chemical bronchitis with severe asthma-like wheezing, severe coughing spasms and accumulation of fluid in the lungs (pulmonary edema), which could prove fatal.

Symptoms of pulmonary edema may not appear until several hours after exposure and are aggravated by physical exertion.

**Skin Contact:** May cause in tingling, irritation or redness of the skin inflammation, rash, itching and staining. Repeated skin contact with this material may cause an allergic skin reaction.

**Eye Contact:** Irritation and redness of the eye tissue.

**Ingestion:** Swallowing is expected to cause drowsiness and dizziness, weakness, nausea and vomiting. Causes irritation of the tissues of the mouth, throat and digestive tract. Onset of symptoms may be delayed.

### 4.3 Indication of any immediate medical attention and special treatment needed:

Get immediate medical attention if inhaled or if allergy symptoms develop.

## Section 5: Fire-fighting Measures

### 5.1 Extinguishing media:

Carbon dioxide, dry chemical powder, dry sand, alcohol-resistant foam. Alcohol resistant foams are preferred for large fires. Use water spray to cool fire-exposed containers.

**Unsuitable extinguishing media:** High volume water jet. Exercise caution when using water since the reaction between water and hot isocyanates can be vigorous and will generate CO<sub>2</sub> gas.

### 5.2 Special hazards arising from the chemical:

During a fire, products of combustion may include toxic hydrogen cyanide, isocyanate vapor, carbon monoxide, carbon dioxide, nitrogen oxides, dense smoke and irritating or toxic fumes.

Reacts vigorously with water at high temperatures. Closed containers may rupture violently when heated or contaminated with water.

### 5.3 Special protective equipment and precautions for fire-fighters:

As for any fire, evacuate the area and fight the fire from a safe distance. Firefighters must wear full protective equipment including positive pressure self-contained breathing apparatus and chemical protection clothing.

## Section 6: Accidental Release Measures

### 6.1 Personal precautions, protective equipment and emergency procedures:

Wear adequate personal protective equipment, including an appropriate respirator as indicated in Section 8. Isolate spill area, preventing entry by unauthorized persons. Ventilate area of spill. Do not touch or walk through spilled material.

Stop the leak if you can do it without risk.

When cleaning with Decontamination solution, harmful gases may evolve; ensure adequate ventilation or wear a respirator.

### 6.2 Environmental precautions:

Avoid releases to the environment and prevent material from entering confined areas, domestic sewers, natural waterways, or storm water management systems.

### 6.3 Methods and material for containment and cleaning up:

Immediately shut off the leak if it is safe to do so.

Contain the spill with suitable non-combustible absorbent material (e.g. sand, silica gel, acid binder, universal binder).

Use clean non-sparking tools to collect absorbed material.

Shovel into open-top drums or plastic bags for further decontamination, if necessary. Do not seal drums or containers.

Neutralize small spills with Decontamination solution.

Never return spills in original containers for re-use.

Wash area with one of the following Decontamination solutions:

Formulation A: Liquid surfactant 0.2% to 2%; Sodium carbonate 5% to 10%; Water to make up to 100%.

Formulation B: Liquid surfactant 0.2% to 2%; Concentrated ammonia 3% to 8%; Water to make up to 100%.

Formulation C: Ethanol, isopropanol or butanol 50%; Concentrated ammonia 5%; Water to make up to 100%.

Formulation B reacts faster than Formulation A.

Formulation C is especially suitable for cleaning of equipment from unreacted isocyanate and neutralizing under freezing conditions.



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### Section 7: Handling and Storage

#### 7.1 Precautions for safe handling:

Before handling, it is important that engineering controls are operating, protective equipment requirements and personal hygiene measures are being followed.  
 People working with this chemical should be properly trained regarding its hazards and its safe use.  
 Persons allergic to isocyanates, and particularly those suffering from asthma or other respiratory conditions, should not work with isocyanates.  
 Do not breathe vapors, fumes, spray mist or dusts from this material.  
 Avoid contact with skin and eyes.  
 Use only in a well-ventilated area.  
 Wear respiratory protection when handling heated product or if spraying.  
 Wear protective gloves, protective clothing and eye/face protection.  
 Contaminated work clothing must not be allowed out of the workplace.  
 Do not re-seal containers if contamination of containers is suspected.  
 Keep containers closed when not in use. Assume that empty containers contain residues which are hazardous.  
 Keep away from food and drink. Wash hands and exposed skin before eating, drinking or smoking and at the end of the workshift.

Refer to directives and regulations for instructions on the safe handling, employee training, monitoring and enforcement procedures for isocyanates [e.g. US Department of Labor, OSHA Directive # CPL 03-00-017 National Emphasis Program – Occupational Exposure to Isocyanates. Ontario Designated Substances Regulation-Isocyanates].

#### 7.2 Conditions for safe storage:

Store in a dry, well-ventilated area, out of direct sunlight and away from heat, sources of ignition and incompatible materials.  
 Have appropriate fire extinguishers and spill clean-up equipment in or near storage area.  
 Store in a place accessible by authorized persons only.  
 Keep containers tightly closed.  
 Recommended storage temperature: 16 - 38°C (60 – 100°F).  
 Protect from moisture/humidity; MDI and Polymeric MDI react with water producing CO<sub>2</sub> gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed.  
 Do not re-seal contaminated containers.  
 Nitrogen blanketing open containers is recommended to minimize oxidation and keep out moisture.  
 Store product in its original container.  
 Incompatible with copper and copper alloys, brass and bronze and galvanized surfaces.

### Section 8: Exposure Controls / Personal Protection

#### 8.1 Control parameters:

**Occupational Exposure Limits:** Consult local authorities for acceptable exposure limits.

<u>Ingredient</u>	<u>ACGIH® TLV®</u>	<u>U.S. OSHA PEL</u>	<u>Other Exposure Limits</u>
Polymeric MDI	None established	None established	Alberta (Canada) TWA: 0.07 mg/m <sup>3</sup> (0.005 ppm)
Methylene diphenyl diisocyanate (MDI)	0.051 mg/m <sup>3</sup> (0.005 ppm)	0.2 mg/m <sup>3</sup> (0.02 ppm)	NIOSH IDLH: 75 mg/m <sup>3</sup> Ontario (Canada) TWA: 0.005 ppm Ceiling limit: 0.02 ppm Designated substance AIHA ERPG Values: 5 mg/m <sup>3</sup> ERPG-2 55 mg/m <sup>3</sup> ERPG-3

Some jurisdictions have specific regulations for isocyanates. These regulations may include requirements for medical surveillance programs, including pre-employment and pre-placement examinations, periodic medical examinations, clinical tests, health education and record keeping. Obtain detailed information from the appropriate government agency in the relevant jurisdiction.



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### 8.2 Engineering Controls:

Handle product in closed system or area provided with appropriate exhaust ventilation.

Handle in accordance with good industrial hygiene and safety practice. Ensure regular cleaning of equipment, work area and clothing. Curing ovens must be properly ventilated to prevent emissions of isocyanate monomer into the workplace.

Monitor the workplace air for the presence of isocyanate vapor and fume.

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection. Have equipment available for use in emergencies such as spills or fire.

### 8.3 Individual protection measures:

**Eye/Face protection:** Wear chemical safety goggles. Wear a face-shield or full-face respirator when needed to prevent exposure to liquid, mist or fume.

**Skin protection:** Wear chemical protective gloves, suit, and boots to prevent skin exposure. Polyvinyl alcohol or Butyl rubber gloves may be used to minimize dermal exposures to this material and for cleaning and maintenance operations. Evaluate resistance under conditions of use and maintain protective clothing carefully.

**Respiratory protection:** Airborne concentrations of MDI may exceed the occupational exposure limits when the product is sprayed, aerosolized or heated. When airborne concentrations of MDI exceed the exposure limits, approved respiratory protective equipment (RPE) is required. Wear an approved air purifying respirator with organic vapor cartridges and HEPA particulate filter or self-contained breathing apparatus (SCBA) or supplied air respirator.

A respiratory protection program that meets the regulatory requirement, such as OSHA's 29 CFR 1910.134 or Canadian Standards Association (CSA) Standard Z94.4, must be followed whenever workplace conditions warrant a respirator's use.

NIOSH Recommendations for MDI concentrations in air:

**Up to 0.5 mg/m<sup>3</sup>:**

(APF = 10) Any supplied-air respirator

**Up to 1.25 mg/m<sup>3</sup>:**

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

**Up to 2.5 mg/m<sup>3</sup>:**

(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece

**Up to 75 mg/m<sup>3</sup>:**

(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

**Emergency or planned entry into unknown concentrations or IDLH conditions, 75 mg/m<sup>3</sup>:**

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

**Escape:** (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter, or any appropriate escape-type, self-contained breathing apparatus.

**Other protection:** Safety shower, hand-wash station and eye-wash fountain readily available in the immediate work area.

Follow the applicable code for medical surveillance program indicated for isocyanates.

**Environmental exposure controls:** Store finished products in closed containers (e.g. bulk tanks, drums, cans).

All waste products are assumed to be collected and returned for re-processing or incineration.



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### Section 9: Physical and Chemical Properties

#### 9.1 Information on basic physical and chemical properties:

<b>Appearance:</b>	Liquid. Dark brown, viscous.
<b>Odor:</b>	Musty, slightly pungent odor of isocyanates
<b>Odor threshold:</b>	0.39 ppm for MDI (AIHA)
<b>pH:</b>	Not available
<b>Melting point/freezing point:</b>	Not available
<b>Initial boiling point and boiling range:</b>	>204°C (399°F) decomposes
<b>Flash point:</b>	>204°C (399°F)
<b>Flammability:</b>	Product can burn if strongly heated or involved in a fire.
<b>Auto-ignition temperature:</b>	Not available
<b>Upper/lower flammability or explosive limits:</b>	Not available
<b>Evaporation rate:</b>	Not available
<b>Vapor pressure:</b>	<10 <sup>-4</sup> mmHg @ 40°C for MDI
<b>Vapor density:</b>	>8.5 approximate (air = 1) for MDI
<b>Relative density:</b>	1.25 @ 25°C (water = 1)
<b>Solubility:</b>	Insoluble in water; reacts with water
<b>Partition coefficient (n-octanol/water):</b>	Not available; reacts with water
<b>Decomposition temperature:</b>	>300°C (>572°F)
<b>Viscosity:</b>	200 +/- 100 mPa.s @ 25°C (dynamic)

### Section 10: Stability and Reactivity

#### 10.1 Reactivity:

Reacts with water, Amines, Strong bases, Alcohols, Metal compounds (e.g. organotin catalysts).  
Isocyanates are very reactive compounds and are especially highly reactive toward a large number of compounds with active hydrogens, particularly at high temperatures and in the presence of catalysts.

#### 10.2 Chemical stability:

Product decomposes slowly when stored at controlled room temperature and away from incompatible materials.  
Decomposition is accelerated at elevated temperatures.

#### 10.3 Possibility of hazardous reactions:

Contact with water or humidity may cause a slow reaction, forming carbon dioxide which could rupture closed containers.  
MDI may undergo uncontrolled exothermic polymerization upon contact with incompatible materials or if heated above 170°C.  
The resulting pressure build-up could rupture closed containers.

#### 10.4 Conditions to avoid:

Avoid any contact with water, moisture or humidity.  
Avoid heat and freezing temperatures.  
Avoid unintended contact with polyols, the polymerization reaction generates heat.

#### 10.5 Incompatible materials:

Strong bases, Amines, Alcohols, Acids - may react violently with generation of heat.  
Metal compounds (e.g. organotin catalysts) - may polymerize with the generation of heat and pressure.  
Amides, phenols, mercaptans, urethanes, ureas and surface active compounds (surfactants, non-ionic detergents) - may react vigorously or violently with the generation of heat.  
Water - Reacts slowly, forming carbon dioxide which could rupture closed containers. MDI is insoluble with and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface by liberating CO<sub>2</sub> gas.  
May attack and make brittle many plastic and rubber materials.

#### 10.6 Hazardous decomposition products:

By thermal decomposition and combustion, product may generate nitrogen oxide, hydrogen cyanide and isocyanate vapors.



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### Section 11: Toxicological Information

#### 11.1 Likely routes of exposure:

Inhalation of aerosols or vapor. Skin contact. Eye contact. Ingestion.

#### 11.2 Information on acute health effects:

**Inhalation:** Data not available for the mixture.

MDI has a very low vapor pressure and it is difficult to achieve vapor concentrations necessary for inhalation toxicity testing. Mice exposed to MDI aerosols varying from 7 to 59 mg/m<sup>3</sup> for 4 hours demonstrated a decline in respiratory rate which was determined to be due mainly to MDI's action as a pulmonary irritant. The RD<sub>50</sub> (concentration to reduce the respiratory rate by 50%) was 32 mg/m<sup>3</sup>.

Some people may become sensitized to MDI, causing allergy or asthma symptoms or breathing difficulties if inhaled.

Both the aerosol developed for the acute inhalation toxicity tests and the conditions required to achieve it are artificial and not experienced in normal handling and use of MDI. The EU Risk Assessment of MDI (Directive 793/93/EEC, 3rd Priority List) published in 12/2005 notes that considering the physical properties of these aerosols and the high settling velocity of particles generated under real life conditions, there is no potential for exposure to acutely toxic doses (dose = concentration x time). This finding is supported by the industrial exposure data.

**Skin:** Data not available for the mixture. Isocyanates, in general, can cause skin discoloration (staining) and hardening of the skin after repeated exposures. Skin sensitization, resulting in dermatitis, may occur in some individuals. Cured material may be difficult to remove from the skin.

**Ingestion:** Animal studies indicate that ingested MDI and polymer forms of MDI have low toxicity. Swallowing may result in irritation and corrosion of the mouth, throat and digestive tract.

Symptoms may include drowsiness and dizziness, weakness, nausea and vomiting, pain and irritation of the tissues of the mouth, throat and digestive tract. Onset of symptoms may be delayed.

#### Acute Toxicity Data

<u>Ingredient</u>	<u>LD<sub>50</sub> Oral</u>	<u>LD<sub>50</sub> Dermal</u>	<u>LC<sub>50</sub> Inhalation</u>
Polymeric MDI	>10000 mg/kg (rat)	>9400 mg/kg (rabbit)	490 mg/m <sup>3</sup> / 4 hrs. (rat) Aerosol, particle size: 95% less than 4.3 microns mass median aerodynamic diameter (MMAD)
Methylene diphenyl diisocyanate (MDI)	2200 mg/kg (mouse)	>9400 mg/kg (rabbit)	490 mg/m <sup>3</sup> / 4 hrs. (rat) Aerosol, particle size: 95% less than 4.3 microns mass median aerodynamic diameter (MMAD)

**Skin corrosion / irritation:** In a study with similar MDI isomers, and Polymeric MDI caused irritation and edema in rabbits. (test according to OECD guideline 404).

Symptoms may include tingling, irritation or redness of the skin. Repeated skin contact with this material may cause skin sensitization in humans. Further skin contact may result in inflammation, rash, itching and staining.

**Serious eye damage / irritation:** Data not available for the mixture.

MDI, Liquid, vapors and aerosols, can cause eye irritation in humans.

In animal studies, MDI caused moderate conjunctivitis in rabbits but did not meet the criteria for classification as an irritant. (test according to OECD guideline 405).

Human evidence: eye irritation was reported in workers exposed to airborne concentrations of 0.06 to 1.6 µg/m<sup>3</sup> of MDI monomer vapor and aerosol.

Symptoms may include redness, pain, itching, eye watering.

**Aspiration hazard:** Data not available.

#### 11.3 Information on delayed and chronic health effects:

**STOT (Specific Target Organ Toxicity) – Single exposure:** If inhaled MDI is a severe respiratory irritant. Long-term, low-level exposure could cause severe, permanent respiratory impairment. High aerosol concentrations could cause inflammation of the lung tissue (chemical pneumonitis), chemical bronchitis with severe asthma-like wheezing, severe coughing spasms and accumulation of fluid in the lungs (pulmonary edema), which could prove fatal. Symptoms of pulmonary edema may not appear until several hours after exposure and are aggravated by physical exertion.

**STOT (Specific Target Organ Toxicity) – Repeated exposure:** Long-term, low-level inhalation exposure to MDI may cause severe, permanent respiratory impairment.



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### 11.3 Information on delayed and chronic health effects (continued):

**Sensitization - respiratory and/or skin:** May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. Isocyanates are known to cause skin and respiratory sensitization in humans. Animal tests have indicated that respiratory sensitization can result from skin contact with diisocyanates.

Respiratory sensitization can develop in people working with MDI. Sensitized individuals react to very low levels of MDI (as low as 0.0014 ppm) that have no effect on unsensitized people. Symptoms may initially appear to be a cold or mild hay fever; severe asthmatic symptoms can develop and include wheezing, chest tightness, shortness of breath, difficulty breathing and/or coughing. Fever, chills, general feelings of discomfort, headache and fatigue can also occur. Symptoms may occur immediately upon exposure or may be delayed. Sensitized people who continue to work with MDI may develop symptoms sooner after each exposure. The number and severity of symptoms may increase. MDI and other isocyanates may also cause hypersensitivity pneumonitis, another allergic lung disease, which is characterized by symptoms such as shortness of breath, fever, tiredness, non-productive cough, and chills.

**Carcinogenicity:** Data not available for the mixture.

The International Agency for Research on Cancer (IARC) evaluated MDI as not classifiable as to carcinogenicity to humans (Group 3). IARC has determined there is inadequate evidence for the carcinogenicity of MDI (polymer and monomer) in humans. There is limited evidence for the carcinogenicity of a mixture containing MDI monomer and polymeric MDI in experimental animals (IARC monographs on the evaluation of carcinogenic risks to humans. Vol. 71).

This mixture does not contain any component that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH® (American Conference of Governmental Industrial Hygienists, OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

**Reproductive toxicity :** NOAEL for developmental effects in rats, monomeric MDI = 3 mg/m<sup>3</sup>

NOAEC (inhalation of aerosol) for maternal toxicity and fetal toxicity in rats, polymeric MDI = 4 mg/m<sup>3</sup>

NOAEC (inhalation of aerosol) for developmental and teratogenic effects in rats, polymeric MDI = 12 mg/m<sup>3</sup>

**Germ cell mutagenicity:** Not known to be mutagenic. Overall, tests assessing the mutagenic potential of MDI in vitro and in vivo provide no convincing evidence of mutagenic and genotoxic activity (EU Risk Assessment 2005).

**Interactive effects:** Data not available

## Section 12: Ecological Information

### 12.1 Toxicity:

Data for MDI:

LC<sub>50</sub>, fish (96 hour) >1000 mg/L

EC<sub>50</sub> *Daphnia magna* (48 hour) >1000 mg/L.

Data for Polymeric MDI:

LC<sub>50</sub>, Zebra fish (96 hour) >1000 mg/L.

EC<sub>50</sub> *Daphnia magna* (24 hour) >1000 mg/L.

EC<sub>50</sub> *E. coli* >100 mg/L.

### 12.2 Persistence and degradability:

Not readily biodegradable.

### 12.3 Bioaccumulative potential:

Data not available

### 12.4 Mobility in soil:

Data not available

## Section 13: Disposal Considerations

### 13.1 Disposal methods:

Do NOT discharge into any sewers, on the ground or into any body of water.

Store material for disposal as indicated in Section 7 Handling and Storage.

Empty containers retain product residue. Follow label warnings even if container appears to be empty.

The required hazard evaluation of the waste and compliance with the applicable hazardous waste laws are the responsibility of the user.

Recycle or dispose of contents and container in accordance with local, regional, national and international regulations.





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### Section 14: Transport Information

#### 14.1 U.S. Hazardous Materials Regulation (DOT 49CFR):

Not regulated except when shipped in bulk. Bulk containers (>5000 lbs) must be transported as:

**UN Number :** UN3082

#### 14.2 Shipping name:

ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Methylene Diphenyl Diisocyanate) RQ

#### 14.3 Transport hazard class(es):

Class 9

#### 14.4 Packing group:

PG III

#### 14.5 Environmental hazards:

Hazardous substance RQ Methylene Diphenyl Diisocyanate 5000 lb (2270 kg)

#### 14.6 Special precautions for user:

Contains isocyanates. Keep away from moisture and water.

#### 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

Diphenylmethane diisocyanate: Noxious liquid substance IBC Code: Category Y  
Follow IMO regulations for transporting bulk shipments.

### Section 15: Regulatory Information

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

##### USA

**TSCA Status:** Substances are listed on the TSCA inventory and designated as "Active" in U.S. Commerce.

**SARA Title III :** Sec. 313 Methylene diphenyl diisocyanate (MDI), 1% *de minimis*, N120  
CERCLA RQ Methylene diphenyl diisocyanate (MDI) 5000 lbs (2270kg)

**California Prop 65:** This product does not contain any chemicals listed on the Proposition 65 list of chemicals of the Safe Drinking Water and Toxic Enforcement Act.

##### Canada

**NSNR Status:** All substances are listed on the DSL.

**National Pollutant Release Inventory (NPRI):** Polymeric diphenylmethane diisocyanate and Methylenebis(phenylisocyanate) NPRI Part (Threshold Category): 1A, Reportable to NPRI if manufactured, processed, or otherwise used at quantities greater than: 10 tonnes.

**European Inventories:** MDI is listed on EINECS. Polymeric MDI EC list no. 500-079-6.

##### International Inventories:

**Australia:** Substances are present on the Inventory of Chemical Substances (AICS).

**China:** Substances are present on the Chemical Inventory (IECSC).

**Japan:** Substances are present on the inventory Existing and New Chemical Substances (ENCS, ISHL).

**Korea:** Substances are present on the inventory - Existing Chemicals Inventory.

**Mexico:** Substances are present on the inventory (INSQ).

**New Zealand:** Substances are present on the Chemical Inventory (NZIoC).

**Philippines:** Substances are present on the Inventory of Chemicals and Chemical Substances (PICCS).

**Taiwan:** Substances are present on the Chemical Inventory (TCSI).

**Vietnam:** Substances are present on the National Inventory of Chemicals (NCI).



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### Section 16: Other Information

**Revision date:**

February 2, 2022

**Revision summary:**

Not applicable

**References and sources for data:**

CCOHS, Cheminfo Profile for methylene diphenyl diisocyanate and polymethylene polyphenyl isocyanate  
ECHA – European Chemicals Agency  
IARC monographs on the evaluation of carcinogenic risks to humans. Vol. 71  
HSDB® Hazardous Substances Data Bank, US National Library of Medicine  
NIOSH Pocket Guide to Chemical Hazards  
RTECS® Registry of Toxic Effects of Chemical Substances  
EU Risk Assessment for MDI 2005

**Legend to abbreviations:**

ACGIH® – American Conference of Governmental Industrial Hygienists  
AIHA – American Industrial Hygiene Association  
ERPG – Emergency Response Planning Guidelines  
GHS- Globally Harmonized System for Classification and Labeling.  
IDLH – Immediately Dangerous to Life or Health  
LD<sub>50</sub>- Median lethal dose; the dose causing 50 % lethality  
NIOSH-National Institute for Occupational Safety and Health  
OSHA - Occupational Safety and Health Administration  
PEL – Permissible Exposure Limit  
SDS – Safety Data Sheet  
TWA – Time weighted average  
TLV® - Threshold Limit Value  
WHMIS – Workplace Hazardous Materials Information System.

**Supplier Note:**

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.