

### SECTION 1: IDENTIFICATION

#### Product Identifier

**Product Form:** Mixture

**Product Name:** HELMICOL 3451

#### Intended Use of the Product

**Use of the Substance/Mixture:** Used in adhesives.

#### Name, Address, and Telephone of the Responsible Party

##### **Company**

Helmitin Inc.

99 Shorncliffe Rd

Toronto, Ontario, M8Z 5K7

877.823.2624

11110 Airport Road

Olive Branch, MS 38654

Phone: 877.823.2624

www.helmitin.com

#### Emergency Telephone Number

**Emergency Number** : CANUTEC 613-996-6666 / CHEMTREC 1-800-424-9300

### SECTION 2: HAZARDS IDENTIFICATION

#### Classification of the Substance or Mixture

##### **Classification (GHS-US)**

Acute toxicity (Inhalation):	Category 4
Skin irritation:	Category 2
Eye irritation:	Category 2B
Respiratory sensitisation:	Category 1
Skin sensitisation:	Category 1
Specific target organ toxicity - single exposure:	Category 3 (Respiratory system)
Specific target organ toxicity - repeated exposure (Inhalation):	Category 1 (Respiratory Tract)

Full text of H-phrases: see section 16

#### Label Elements

##### **GHS-US Labeling**

##### **Hazard Pictograms (GHS-US)**



##### **Signal Word (GHS-US)**

: Danger

##### **Hazard Statements (GHS-US)**

: Causes skin and eye irritation.  
May cause an allergic skin reaction.  
Harmful if inhaled  
May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
Causes damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.

##### **Precautionary Statements (GHS-US)**

: Do not breath dust, mist, gas or vapors or spray.  
Wash skin and face thouroughly after handling.

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Do not eat, drink or smoke when using this product.  
Use only outdoors in a well ventilated area.  
Contaminated work clothing must not be allowed out of the workplace.  
Wear protective gloves.  
In case of inadequate ventilation wear respiratory protection. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134) or regional standards. For additional details, see section 8 of the SDS.  
IF ON SKIN: Wash with plenty of soap and water.  
IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
Call a doctor or emergency medical facility (i.e. 911) if you feel unwell.  
If skin irritation or rash occurs: Get medical attention.  
If eye irritation persists: Get medical attention.  
If experiencing respiratory symptoms: Call a doctor or emergency medical facility (i.e. 911).  
Take off contaminated clothing and wash before reuse.  
Store in a well-ventilated place. Keep container tightly closed.  
Store locked up.  
Dispose of contents and container in accordance with existing federal, state, and local environmental control laws.

### Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Flammable vapors can accumulate in head space of closed systems.

**Unknown Acute Toxicity (GHS-US)** Not available

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### Mixture

Name	Product Identifier	% (w/w)
Diphenylmethanediisocyanate-prepolymer	(CAS No) 103837-45-2	60 – 80
4,4'-Diphenylmethane Diisocyanate (MDI)	(CAS No) 101-68-8	10 – 30
2,4'-Diphenylmethane Diisocyanate (MDI)	(CAS No) 5873-54-1	5 – 10

## SECTION 4: FIRST AID MEASURES

### Description of First Aid Measures

**General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

**Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

**Skin Contact:** Remove contaminated clothing. Rinse affected area with water for at least 5 minutes. Wash contaminated clothing before reuse. Obtain medical attention if irritation persists.

**Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

**Ingestion:** Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

### Most Important Symptoms and Effects Both Acute and Delayed

**Acute:** 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 hyperreactivity 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.

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Causes skin 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.

Causes eye 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.

May cause irritation of the digestive tract. Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

**Delayed:** Symptoms affecting the respiratory tract can also occur several hours after overexposure.

### 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

If direct skin contact with isocyanates occurs, immediately remove contaminated clothing and shoes. Wipe off the isocyanate product from the skin using dry towels or other similar absorbent fabric. If readily available, apply a polyglycol-based cleanser (e.g. SKC, Inc. (SKC) D-TAM™ Skin Cleanser) or corn oil. Wash with soap and warm water and pat dry. If a polyglycol-based cleanser is not available, wash with soap and warm water for 15 minutes. If available, use a wipe test pad to verify decontamination is complete (e.g. SKC SWYPE™). Get medical attention if irritation develops. Discard or wash contaminated clothing before reuse.

### Inhalation

Move to an area free from further exposure. Extreme asthmatic reactions that may occur in sensitized persons can be life threatening. 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.

### 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 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 as 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.

## SECTION 5: FIRE-FIGHTING MEASURES

### Extinguishing Media

**Suitable Extinguishing Media:** Dry chemical, Carbon dioxide (CO<sub>2</sub>), Foam, water spray for large fires.

**Unsuitable Extinguishing Media:** High volume water jet

#### Fire Fighting Procedure

Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with 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.

#### Hazardous Decomposition Products

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

#### Unusual Fire/Explosion Hazards

Closed container 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.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### Spill and Leak Procedures

Implement site emergency response plan. Evacuate non-emergency personnel. The magnitude of the evacuation depends upon the quantity released, site conditions, and the ambient temperature. Isolate the area and prevent access of unauthorized personnel. Notify management. Call CHEMTREC at 1-800-424-9300 for assistance and advice.

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Wear necessary personal protective equipment (PPE) as specified in the SDS or the site emergency response plan. Ventilate and remove ignition sources. Control the source of the leak. Contain the released material by damming, diking, retaining, or diverting into an appropriate containment area. Absorb or pump off as much of the spilled material as possible. When using absorbent, completely cover the spill area with suitable absorbent material (e.g., vermiculite, kitty litter, Oil-Dri®, etc...). Allow for the absorbent material to absorb the spilled liquid. Shovel the absorbent material into an approved metal container (i.e., 55-gallon salvage drum). Do not fill the container more than 2/3 full to allow for expansion, and do not tighten the lid on the container. Repeat application of absorbent material until all liquid has been removed from the surface. For spills involving a solid product, remove mechanically (sweep up, vacuum, shovel etc.) and collect and place into an approved metal container.

Decontaminate the spill surface area using a neutralization solution (see list of solutions on the SDS); scrubbing the surface with a broom or brush helps the decontamination solution to penetrate into porous surfaces. Wait at least 15 minutes after first application of the neutralization solution. Cover the area with absorbent material and shovel this into an approved metal container. Residual surface contamination can be checked using a wipe test pad to verify decontamination is complete (e.g. SKC Surface Swype™). If the wipe test pad demonstrates that isocyanate remains on the surface (red color on pad), repeat applications of neutralization solution, with scrubbing, followed by absorbent until the surface is decontaminated (no color change on wipe pad). Apply lid loosely to metal waste container (do not tighten the lid because carbon dioxide gas and heat can be generated from the neutralization process). With the lid still loosely in place, move the container to an isolated, well-ventilated area to allow release of carbon dioxide. After 72 hours, seal the container, and properly dispose of the waste material and any contaminated equipment (i.e., broom or brush) in accordance with existing federal, state and local regulations.

### Additional Spill Procedures/Neutralization

Products or product mixtures that have been shown to be effective neutralization solutions for decontaminating surfaces, tools, or equipment that have been in contact with an isocyanate include, but are not limited to:

- SKC, Inc. (SKC): 1-800-752-8472
  - o Isocyanate Decontamination Solution
- Spartan Chemical Company: 1-800-537-8990
  - o Spartan® ShineLine Emulsifier Plus (stripping solution)
  - o Spartan® SC-200 Heavy Duty Cleaner
- ZEP Commercial Heavy Duty Floor Stripper
- A mixture of 90% water, 10% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10)
- A mixture of 75% water, 20% non-ionic surfactant, and 5% n-propanol
- A mixture of 80% water, 10% non-ionic surfactant, 5% isopropanol, 5% ammonium hydroxide (household ammonia)

Note: Always wear proper PPE when cleaning up an isocyanate spill or when decontaminating surfaces, tools, or equipment using a neutralization solution. It may take two or more applications of the neutralization solution to decontaminate the surface. Residual surface contamination can be checked using a surface wipe method such as the SKC Swype™ pad.

## SECTION 7: HANDLING AND STORAGE

### Precautions for Safe Handling/Storage

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. Note: The use of aprotic polar solvents (e.g., dimethyl sulfoxide (DMSO), n-methyl-pyrrolidone (NMP), dimethylacetamide (DMAC)) in combination with polymeric MDI / MDI may result in the formation of low concentrations of primary aromatic amines such as 4,4'-methylenedianiline (MDA).

### Storage Period:

6 Months: after receipt of material by customer

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**Storage Temperature** 5 °C (41 °F)

### Temperature

#### Minimum:

**Maximum:** 50 °C (122 °F)

### 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.

### Substances to Avoid

Water, Amines, Strong bases, Alcohols, Copper alloys

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

The recommendations in this section should not be a substitute for a personal protective equipment (PPE) assessment performed by the employer as required by 29 CFR 1910 Subpart I.

### Exposure Limits

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

US. ACGIH Threshold Limit Values, as amended

Time weighted average 0.005 ppm

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

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

Any component which is listed in section 3 and is not listed in this section does not have a known ACGIH TLV, OSHA PEL or supplier recommended occupational exposure limit.

### 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,

### 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 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

Ensure gloves remain in good condition during use and replace if any deterioration is observed. 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 splash.

### Skin 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

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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.

### 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.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### Information on Basic Physical and Chemical Properties

Physical State	: Liquid
Appearance	: Yellow
Odor	: Slight, Aromatic
Odor Threshold	: Not available
pH	: Not available
Evaporation Rate	: Not available
Melting Point	: Not available
Freezing Point	: Not available
Boiling Point	: Not available
Flash Point	: 200°C (392°F)
Auto-ignition Temperature	: Not available
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not available
Lower Flammable Limit	: Not available
Upper Flammable Limit	: Not available
Vapor Pressure	: Not available
Relative Vapor Density at 20 °C	: Not available
Relative Density	: 1.09 g/mL (Concentrate) @ 20°C (68°F)
Specific Gravity	: Not available
Solubility	: Not soluble in water
Partition Coefficient: N-Octanol/Water	: Not available
Viscosity	: 1,800 - 3,500 cP @ 25 °C (77 °F)
Explosion Data – Sensitivity to Mechanical Impact	: Not available
Explosion Data – Sensitivity to Static Discharge	: Not available
VOC Content (SCAQMD Rule 1168)	: < 12 g /L (< 0.1 lb/gal)
VHAP Content	: Not available

## SECTION 10: STABILITY AND REACTIVITY

### Hazardous Reactions

Contact with moisture, other materials that react with isocyanates, or temperatures above 350 F (177 C), may cause polymerization, Moisture (water and high humidity) or high heat (temperatures greater than 350 F (177C)) can cause pressure build-up with possible explosive rupture.

### Materials to Avoid

Water, Amines, Strong bases, Alcohols, Copper alloys

### Hazardous Decomposition Products

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

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### SECTION 11: TOXICOLOGICAL INFORMATION

#### Information on Toxicological Effects - Product

Likely Routes of	Skin Contact
Exposure:	Inhalation
	Eye Contact

#### Health Effects and Symptoms Acute:

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 hyperreactivity 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.

Causes skin 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.

Causes eye 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.

May cause irritation of the digestive tract. Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

**Chronic:** As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to isocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to isocyanates 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 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. Sensitization can be permanent. Chronic overexposure to isocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent. Prolonged contact with skin 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. This data reinforces the need to prevent direct skin contact with isocyanates.

Prolonged vapor contact with the eyes may cause conjunctivitis.

**Delayed:** Symptoms affecting the respiratory tract can also occur several hours after overexposure.

#### Toxicity Data

Toxicity data based on polymeric MDI (a mixture of monomers and higher molecular weight oligomers).

#### Acute Oral Toxicity

LD50: > 2,000 mg/kg (rat, male/female)

#### Acute Inhalation Toxicity

LC50: 0.49 mg/l, 490 mg/m<sup>3</sup>, 4 h, aerosol (rat)

The test atmosphere generated in the animal study is not representative of workplace environments, how the substance is placed on the market, and how it can reasonably be expected to be used. Therefore the test result cannot be directly applied for the purpose of assessing hazard. Based on expert judgment and the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

#### Acute Dermal Toxicity

LD50: > 9,400 mg/kg (rabbit, male/female) (OECD Test Guideline 402)

#### 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)

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Irritation to lungs and nasal cavity.

2 years, inhalation: NOAEL: 0.2, (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

LOAEL: 6mg/l

Polymeric MDI has been classified as IARC Group 3 ("Not classifiable as to its carcinogenicity to humans") (1999) indicating there is inadequate evidence available to describe the carcinogenic potential. Epidemiological studies found no association between isocyanates and cancer. In chronic exposure studies in rodents, pMDI produced tumors only at the highest exposure level of 6 mg/m<sup>3</sup>. This exposure level is significantly above the TLV for MDI (0.051 mg/m<sup>3</sup>). Based on the weight of the evidence, a determination of not classified for carcinogenicity is justified.

### 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: Diphenylmethanediisocyanate-prepolymer

#### Toxicity Note

See data above for polymeric MDI.

#### Acute Oral Toxicity

LD50: > 7,616 mg/kg (rat) (OECD Test Guideline 401)

#### Acute Inhalation Toxicity

LC50: 0.368 mg/l, 4 h, dust/mist (rat, male) (OECD Test Guideline 403)

The test atmosphere generated in the animal study is not representative of workplace environments, how the substance is placed on the market, and how it can reasonably be expected to be used. Therefore the test result cannot be directly applied for the purpose of assessing hazard. Based on expert judgment and the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

#### Acute Dermal Toxicity

LD50: > 9,400 mg/kg (rabbit, male/female) (OECD Test Guideline 402)

Studies of a comparable product.

#### Skin Irritation

rabbit, Draize Test, Slightly irritating

Human, irritating

#### Eye Irritation

rabbit, Draize, Moderately irritating

Human, irritating

#### Sensitization

Skin sensitization (local lymph node assay (LLNA)):: positive (Mouse, OECD Test Guideline 429)

Respiratory sensitization: positive (Guinea pig)

#### Repeated Dose Toxicity



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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.

(Human)

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: (Mouse)

negative

Micronucleus test: negative (rat, male, Inhalative (exposure period: 3x1h/day over 3 weeks))

negative

### Carcinogenicity

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

### Other Relevant Toxicity Information

May cause irritation of respiratory tract.

### Toxicity Note

See data above for polymeric MDI.

### Carcinogenicity:

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

## SECTION 12: ECOLOGICAL INFORMATION

### Ecological Data

Ecotoxicity data based on polymeric MDI (a mixture of monomers and higher molecular weight oligomers).

### Biodegradation

0 %, Exposure time: 28 d, i.e. not degradable

### Bioaccumulation

Oncorhynchus mykiss (rainbow trout), Exposure time: 112 d, < 1 BCF

Does not bioaccumulate.

### Acute and Prolonged Toxicity to Fish

LC0: > 1,000 mg/l (Danio rerio (zebra fish), 96 h)

LC0: > 3,000 mg/l (Oryzias latipes (Orange-red killifish), 96 h)

### Acute Toxicity to Aquatic Invertebrates

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

### Toxicity to Aquatic Plants

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

### Toxicity to Microorganisms

EC50: > 100 mg/l, (activated sludge, 3 h)

### Ecological Data for Diphenylmethanediisocyanate-prepolymer

#### Additional Ecotoxicological Remarks

See data above for polymeric MDI.

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

#### Acute and Prolonged Toxicity to Fish

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

### Acute Toxicity to Aquatic Invertebrates

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

### Ecological Data for 2,4'-Diphenylmethane Diisocyanate (MDI)

#### Additional Ecotoxicological Remarks

See data above for polymeric MDI.

## SECTION 13: DISPOSAL CONSIDERATIONS

### Waste Disposal Method

Waste disposal should be in accordance with existing federal, state and local environmental control laws. Contact and follow the guidance of a licensed disposal facility to properly dispose of unused product or chemical waste.

### Empty Container Precautions

Containers that are empty as defined by RCRA (40 CFR part 261.7), may retain product residue; observe all precautions for product. Do not grind, torch cut, weld or heat an empty container that once held an isocyanate-containing product; highly toxic vapors or gases are formed.

### Other Containers

For all other packaging (e.g., 1-gallon pails), these containers are non-returnable and should not be reused for any other purpose. Remove any remaining product and store in an appropriate waste container for proper disposal. Consult federal, state and local regulations, as well as a licensed waste disposal facility to determine proper disposition of these empty containers.

## SECTION 14: TRANSPORT INFORMATION

**In Accordance with DOT** Not regulated for transport

**In Accordance with IMDG** Not regulated for transport

**In Accordance with IATA** Not regulated for transport

**In Accordance with TDG** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### US State Regulations

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

No substances are subject to TSCA 12(b) export notification requirements.

**US. EPA CERCLA Hazardous Substances (40 CFR 302)** Reportable quantity: 5000 lbs

**Components:** 4,4'-

Diphenylmethane Diisocyanate  
(MDI)

**SARA Section 311/312 Hazard Categories:** Refer to hazard classification information in Section 2.

**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)

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

Under RCRA, it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

### 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 SDS 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.

**Massachusetts, New Jersey or Pennsylvania Components**

**CAS-No.**

**Right to Know Substance Lists:**

**Concentration**

# HELMICOL 3451

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

60 - 80%	Diphenylmethanediisocyanate-prepolymer	103837-45-2
10 - 30%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
5 - 10%	2,4'-Diphenylmethane Diisocyanate (MDI)	5873-54-1

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

**Components**

**CAS-No.**

10 - 30%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
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**Proposition 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.

**CFATS (Chemical Facility Anti-Terrorism Standards) Chemicals**

To the best of our knowledge, this product does not contain Appendix A Chemicals of Interest (COI), at or above the Screening Threshold Quantity (STQ), as defined by the Department of Homeland Security Chemical Facility Anti-terrorism Standard (CFATS, 6 CFR Part 27).

Based on information provided by our suppliers, this product is considered "DRC Conflict Free" as defined by the SEC Conflict Minerals Final Rule (Release No. 34-67716; File No. S7-40-10; Date: 2012-08-22).

**Canadian Regulations**

**DSL Status**

All components of this product are on the Canadian DSL.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

### SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

**Revision Date** : 12/14/2020

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*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.*

North America GHS US 2012 & WHMIS 2015