Safety Data Sheet

OR 80SLM Part A

Section 1 – Identification

Oak Ridge Foam & Coating Systems, Inc
575 Commercial Ave
Green Lake, WI 54941
920-294-6800

Emergency Telephone: (800) 424-9300 Chemtrec
800-625-9577 (Oak Ridge Foam & Coating Systems, Inc)
BOTH NUMBERS ARE AVAILABLE DAYS, NIGHTS, WEEKENDS, & HOLIDAYS

GHS product identifier: **OR 80SLM, Part A**
Other means of identification: Not available.
Product type: Liquid.

Relevant identified uses of the substance or mixture and uses advised against
Product use: Component of a Polyurethane System

Supplier's details: Oak Ridge Foam & Coating Systems, Inc
575 Commercial Avenue
Green Lake, WI 54941

Email address of person responsible for this SDS: info@oakridgepoly.com

Emergency telephone number (24h/7 day): Chemtrec: (800) 424-9300 or (703) 527-3887

Section 2 – Hazards Identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:

Acute Toxicity: Inhalation	4
Skin corrosion	2
Eye irritation	2A
Respiratory Sensitization	1
Skin Sensitization	1
Specific Target Organ Toxicity	
- Single Exposure	3 (Respiratory System)

GHS Label Elements
Hazard pictograms:

Signal word: Danger

Hazard Statements:
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
Harmful if inhaled.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause respiratory irritation.

Precautionary Statements:

Prevention:
Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/ eye protection/ face protection.
Wear respiratory protection.

Response:
Wash with plenty of water.
Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
Take off contaminated clothing and wash it before reuse.

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

Disposal:
Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards None known.

Section 3 – Composition/Information on Ingredients

Substance/Mixture: Mixture

Hazardous Components

Weight Percent	Components	CAS-No.
60-100%	4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha-hydro-omega-hydroxypoly(oxy-1,2-ethanediyl)	9048-57-1
30-40%	4,4'-methylenediphenyl diisocyanate	101-68-8
1-5%	4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6
1-5%	Propylene carbonate	108-32-7

Section 4 – First Aid Measures

General advice:
Move out of the dangerous area.
Do not leave the victim unattended.
Get medical attention immediately if symptoms occur.
Show this safety data sheet to the doctor in attendance.

If inhaled:
If breathed in, move person into fresh air.
Call a physician or poison control center immediately.
Keep patient warm and at rest.
Keep respiratory tract clear.
If breathing is difficult, give oxygen.
If breathing is irregular or has stopped, administer artificial respiration immediately.
If unconscious, place in recovery position and seek medical advice.
Consult a physician immediately if symptoms such as shortness of breath or asthma is observed.
A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitized persons.
The exposed person may need to be kept under medical surveillance for 48 hours.

In case of skin contact:
In case of contact, immediately flush skin with soap and plenty of water.
Take off contaminated clothing and shoes immediately.
Wash contaminated clothing before reuse.
Thoroughly clean shoes before reuse.
Call a physician if irritation develops or persists.
An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-TamTM, PEG-400) or corn oil may be more effective than soap and water.

In case of eye contact:
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
If easy to do, remove contact lenses, if worn.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed:
Gently wipe or rinse the inside of the mouth with water.
DO NOT induce vomiting unless directed to do so by a physician or poison control center.
Keep respiratory tract clear.
Keep at rest.
If a person vomits when lying on their back, place them in the recovery position.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

Most important symptoms and effects, both acute and delayed:
Severe allergic skin reactions, bronchospasm and anaphylactic shock.
This product is a respiratory irritant and potential respiratory sensitizer: repeated inhalation of vapor or aerosol at levels above the occupational exposure limit could cause respiratory sensitization.
Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in

breathing.
The onset of the respiratory symptoms may be delayed for several hours after exposure.
A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
First Aid responders should pay attention to self-protection and use the recommended protective clothing

Notes to physician: Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.

The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

Section 5 – Fire Fighting Measures

Suitable extinguishing media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Foam
Carbon dioxide (CO_2)
Dry powder

Unsuitable extinguishing media: Water may be used if no other option is available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous.

Specific hazards during firefighting: Do not allow runoff from firefighting efforts to enter drains or watercourses.
Pressure in sealed containers can increase under the influence of heat.
Exposure to decomposition products may be a hazard to health.

Hazardous combustion products: Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN. In the event of extreme heat (>500° C), aniline is suspected of being formed.

Specific extinguishing methods: Cool containers/tanks with water spray.

Further information: Standard procedure for chemical fires.
Due to reaction with water producing CO_2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed.
Collect contaminated fire extinguishing water separately; do not discharge it into drains.
Prevent fire extinguishing water from contaminating surface water or groundwater systems.

	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters:	Wear an approved positive pressure self-contained breathing apparatus in addition to standard firefighting gear.

Section 6 – Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:	Immediately evacuate personnel to safe areas. Use personal protective equipment. If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. Ensure adequate ventilation. Keep people away from the spill or leak and ensure they remain upwind. Only qualified personnel equipped with suitable protective equipment may intervene. For additional precautions and advice on safe handling, see section 7. Never return spills or unused product back into the original containers for re-use. Make sure that there is a sufficient amount of neutralizing/ absorbent material near the storage area. The dangerous areas should be marked and identified with the appropriate warning and safety signs. Treat recovered material as described in the section "Disposal considerations". For disposal considerations see section 13.
Environmental precautions:	Do not allow uncontrolled discharge of product into the environment. Do not allow material to contaminate groundwater systems. Prevent product from entering drains. If it's safe, stop any further leakage or spillage If large spillages can't be contained, local authorities should be notified. If the product contaminates rivers, lakes or drains inform respective Authorities immediately.
Methods and materials for containment and cleaning up:	**Clean-up methods - small spillage** Contain the spill and absorb it using non-combustible materials (e.g., sand, earth, diatomaceous earth, or vermiculite). Transfer the waste to a suitable container for disposal in accordance with local or national regulations (see Section 13). Clean contaminated surface thoroughly. Sweep up or vacuum up spillage and collect in suitable container for disposal. Neutralize small spillages with decontaminant. The compositions of liquid decontaminants are given in Section 16. Remove and dispose of residues. **Clean-up methods - large spillage**

If the product is in its solid form:
Spilled MDI flakes should be picked up carefully.
The area should be vacuum cleaned to remove remaining dust particles completely.

If the product is in its liquid form:
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Leave to react for at least 30 minutes.
Shovel into open-top drums for further decontamination.
Wash the spillage area with water.
Test atmosphere for MDI vapor.
Keep in suitable, closed containers for disposal.

Section 7 – Storage and Handling

Technical measures:	Ensure that eyewash stations and safety showers are close to the workstation location.
Local/Total ventilation:	Use only with adequate ventilation.
Advice on protection against fire and explosion:	Normal measures for preventive fire protection.
Advice on safe handling:	Refer to Section 8 for personal protective equipment Avoid formation of aerosol. Avoid inhaling vapors or spray mist. Do not breathe vapors/dust. Do not swallow. Avoid contact with eyes, mouth, skin, and clothing. Obtain special instructions before use to prevent exposure. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Keep container closed when not in use. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems, asthma, allergies, and chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Conditions for safe storage:	Keep containers tightly closed in a dry, cool and well-ventilated place. Store in properly labelled containers. Observe label precautions. Protect from moisture. Electrical installations / working materials must comply with the technological safety standards. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Materials to avoid:	Acids Amines Bases Metals Water

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters/ Permissible concentration	Basis
4,4'-methylenediphenyl diisocyanate	101-68-8	TWA	0.005 ppm	ACGIH
		C	0.02 ppm 0.2 mg/m3	OSHA Z-1

LC50 (rat): ca. 490 mg/m³ (4 hours): using experimentally produced respirable aerosol having aerodynamic diameter <5microns.

Personal protective equipment

Respiratory protection: Use a properly fitted air-purifying or air-supplied respirator that meets approved standards if a risk assessment determines it is necessary.. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
In emergency, non-routine, or unknown exposure situations—including confined space entry—a NIOSH-certified full facepiece pressure-demand self-contained breathing apparatus (SCBA), or a full facepiece pressure-demand supplied-air respirator (SAR) with auxiliary self-contained air supply, should be used.

Hand protection remarks: The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin.

Use chemical resistant gloves classified under Standard EN374: protective gloves against chemicals and microorganisms. Examples of glove materials that might provide suitable protection include: Butyl rubber, Chlorinated polyethylene, Polyethylene, Ethyl vinyl alcohol copolymers laminated (“EVAL”), Polychloroprene (Neoprene*), Nitrile/butadiene rubber (“nitrile” or “NBR”), Polyvinyl chloride (“PVC” or “vinyl”), Fluoroelastomer (Viton*).

When prolonged or frequently repeated contact may occur, a glove with protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN374) is recommended.
When only brief contact is expected, a glove with protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN374) is recommended. Contaminated gloves should be decontaminated and disposed of.

Notice: The selection of a specific glove for a particular application and

	duration of use in a workplace should also take into account all requisite workplace factors such as, but not limited to: other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/specifications provided by the glove supplier.
Eye protection:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Wear chemical splash goggles to protect your eyes from exposure. Always wear eye protection when the potential for inadvertent eye contact with the product cannot be excluded. Please follow all applicable local/national requirements when selecting protective measures for a specific workplace. Ensure that eyewash stations and safety showers are close to the workstation location.
Skin and body protection:	Wear impervious clothing suitable for the level and concentration of the hazardous substance in the workplace. **Recommended:** A full-body overall (preferably heavy cotton) or a disposable coverall such as Tyvek Pro Tech 'C' or Tyvek Pro 'F'.
Protective measures:	Personal protective equipment should include suitable protective gloves, safety goggles, and protective clothing. The specific type of equipment must be chosen based on the concentration and quantity of the hazardous substance present at the workplace. Ensure that eye wash stations and safety showers are readily accessible near the work area.
Hygiene measures:	Handle in accordance with good industrial hygiene and safety practices. Wash face, hands and any exposed skin thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Wash hands before breaks and at the end of workday.

Section 9 – Physical Properties

Appearance:	liquid
Color:	clear
Odor:	No data is available on the product itself.
Odor Threshold:	No data is available on the product itself.
pH:	No data is available on the product itself.
Freezing point:	No data is available on the product itself.
Melting point:	No data is available on the product itself.
Boiling point:	No data is available on the product itself.
Flash point:	> 110 °C Method: Seta closed cup, closed cup
Evaporation rate:	No data is available on the product itself.
Flammability (solid, gas):	No data is available on the product itself.
Flammability (liquids):	No data is available on the product itself.

Upper explosion limit / Upper flammability limit:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit:	No data is available on the product itself.
Vapor pressure:	No data is available on the product itself.
Relative vapor density:	No data is available on the product itself.
Relative density:	1.1
Density:	No data is available on the product itself.
Solubility(ies)	
Water solubility:	No data is available on the product itself.
Solubility in other solvents:	No data is available on the product itself.
Partition coefficient: n-octanol/water:	No data is available on the product itself**.**
Auto-ignition temperature:	No data is available on the product itself.
Thermal decomposition:	No data is available on the product itself.
Self-Accelerating: decomposition temperature (SADT)	No data is available on the product itself.
Viscosity	
Viscosity, dynamic:	1,141 mPa.s (20 °C)
Explosive properties:	No data is available on the product itself.
Oxidizing properties:	No data is available on the product itself.
Particle size:	No data is available on the product itself.

Section 10 – Stability and Reactivity

Reactivity:	No dangerous reaction known under conditions of normal use.
Chemical stability:	Stable under normal conditions.
Possibility of hazardous reactions:	Reaction with water (moisture) produces CO_2-gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence of solvents. MDI is insoluble in water, heavier than water, and sinks to the bottom, reacting slowly at the interface. A solid, water-insoluble layer of polyurea forms at the interface, releasing carbon dioxide gas.
Conditions to avoid:	Extremes of temperature and direct sunlight. Exposure to air or moisture over prolonged periods.
Incompatible materials:	Acids Amines Bases Metals Water
Hazardous decomposition products:	Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN. In the event of extreme heat (>500° C), aniline is suspected of being formed.

Section 11 – Toxicological Information

Information on likely routes of exposure:	No data is available on the product itself.

Acute toxicity

Components:

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with. alpha -hydro- omega. -hydroxypoly(oxy-1,2-ethanediyl):

Acute oral:	LD50 (Rat, male): > 10,000 mg/kg
Toxicity Components	Method: OECD Test Guideline 401

4,4'-methylenediphenyl diisocyanate:

Acute oral:	LD50 (Rat, male): > 10,000 mg/kg
Toxicity Components	Method: OECD Test Guideline 401

4,4'-Methylenediphenyl diisocyanate, oligomers:

Acute oral:	LD50 (Rat, female): > 5,000 mg/kg
Toxicity Components	Method: OECD Test Guideline 425

Propylene carbonate:

Acute oral:	LD50 (Rat, male and female): 33,520 mg/kg
toxicity Components	

Acute inhalation toxicity -

Product:	Acute toxicity estimate: 1.46 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method

Acute dermal toxicity –

Product:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method

Acute toxicity (other routes of administration):	No data available

Skin corrosion/irritation

Components:

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):
Species: Rabbit
Assessment: Irritant
Method: OECD Test Guideline 404
Result: Irritating to skin.

4,4'-methylenediphenyl diisocyanate:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.

4,4'-Methylenediphenyl diisocyanate, oligomers:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.

Propylene carbonate:
Species: Rabbit
Assessment: No skin irritation

Method: OECD Test Guideline 404
Result: No skin irritation

Serious eye damage/eye irritation

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):
Species: Rabbit
Result: slight irritation
Assessment: Mild eye irritant

4,4'-methylenediphenyl diisocyanate:
Species: Rabbit
Result: Mild eye irritation

4,4'-Methylenediphenyl diisocyanate, oligomers:
Species: Rabbit
Result: Mild eye irritation
Method: OECD Test Guideline 405

Propylene carbonate:
Species: Rabbit
Result: Eye irritation
Assessment: Irritating to eyes.
Method: OPPTS 870.2400

Respiratory or skin sensitization

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with .alpha -hydro-.omega.-hydroxypoly(oxy-1,2-ethanediyl):
Exposure routes: Skin
Species: Mouse
Result: May cause sensitization by skin contact.

Exposure routes: Respiratory Tract
Species: Guinea pig
Result: May cause sensitization by inhalation.

4,4'-methylenediphenyl diisocyanate:
Exposure routes: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: May cause sensitization by skin contact.

Exposure routes: Respiratory Tract
Species: Guinea pig
Result: May cause sensitization by inhalation.

4,4'-Methylenediphenyl diisocyanate, oligomers:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitization by skin contact.

Exposure routes: Respiratory Tract
Species: Guinea pig

Result: May cause sensitization by inhalation.

Propylene carbonate:
Exposure routes: Skin
Species: Humans
Result: Does not cause skin sensitization.

Components:
4,4'-methylenediphenyl diisocyanate:
Assessment: May cause sensitization by inhalation and skin contact.

Germ cell mutagenicity

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):
Genotoxicity in vitro: Concentration: 200 ug/plate
Metabolic activation: with and without metabolic activation
Method: Directive 67/548/EEC, Annex, B.13/14
Result: negative

4,4'-methylenediphenyl diisocyanate:
Genotoxicity in vitro: Concentration: 200 ug/plate
Metabolic activation: with and without metabolic activation
Method: Directive 67/548/EEC, Annex, B.13/14
Result: negative

4,4'-Methylenediphenyl diisocyanate, oligomers:
Genotoxicity in vitro: Concentration: ca 50 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Propylene carbonate:
Genotoxicity in vitro: Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):
Genotoxicity in vivo: Application Route: Inhalation
Exposure time: 3 Weeks
Dose: 118 mg/m^3
Method: OECD Test Guideline 474
Result: negative

4,4'-methylenediphenyl diisocyanate:
Genotoxicity in vivo: Application Route: Inhalation
Exposure time: 3 Weeks
Dose: 118 mg/m^3
Method: OECD Test Guideline 474

Result: negative

4,4'-Methylenediphenyl diisocyanate, oligomers:
Genotoxicity in vivo: Application Route: Inhalation
Exposure time: 3 Weeks
Dose: 118 mg/m^3
Method: OECD Test Guideline 474
Result: negative

Propylene carbonate:
Genotoxicity in vivo: Application Route: Intraperitoneal injection
Dose: 1666 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Product:
Remarks: Rats were exposed to a respirable aerosol of polymeric MDI for two years, resulting in chronic pulmonary irritation at high concentrations. A significant incidence of benign lung tumors (adenomas) and one malignant tumor (adenocarcinoma) occurred only at the highest exposure level (6 mg/m³). No lung tumors were observed at 1 mg/m³, and there were no effects at 0.2 mg/m³. Overall, the incidence of both benign and malignant tumors, as well as the number of animals with tumors, was similar to that in the control group. The increased incidence of lung tumors was linked to prolonged respiratory irritation and the accumulation of yellow material in the lungs throughout the study. In the absence of prolonged exposure to high concentrations causing chronic irritation and lung damage, tumor formation is highly unlikely.

Carcinogenicity –
Assessment: No data available

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Reproductive toxicity

Components:
Propylene carbonate:
Effects on fertility: Species: Rat
Application Route: Oral
Method: OECD Test Guideline 414
Result: negative

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro-omega-hydroxypoly(oxy-1,2-ethanediyl):
Effects on foetal development: Species: Rat, male and female
Application Route: Inhalation
Method: OECD Test Guideline 414
Result: No teratogenic effects

4,4'-methylenediphenyl diisocyanate: Species: Rat, female
Application Route: Inhalation
General Toxicity Maternal: No observed adverse effect level: 4 mg/m³
Method: OECD Test Guideline 414

Result: No teratogenic effects

4,4'-Methylenediphenyl diisocyanate, oligomers: Species: Rat, male and female
Application Route: Inhalation
Method: OECD Test Guideline 414
Result: No teratogenic effects

Propylene carbonate: Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 1,000 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Reproductive toxicity – Assessment: No data available

STOT - single exposure

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

4,4'-methylenediphenyl diisocyanate:
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

4,4'-Methylenediphenyl diisocyanate, oligomers:
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

STOT - repeated exposure
No data available

Repeated dose toxicity

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):
Species: Rat (both male and female)
NOEC: 0.2 mg/m^3
Exposure time: 2 yr.
Number of exposures: 5 d
Method: OECD Test Guideline 453

4,4'-methylenediphenyl diisocyanate:
Species: Rat (both male and female)
NOEC: 0.2 mg/m3
Exposure time: 2 yr.
Number of exposures: 5 d
Method: OECD Test Guideline 453

4,4'-Methylenediphenyl diisocyanate, oligomers:
Species: Rat (both male and female)
NOEC: 0.2 mg/m^3
Test atmosphere: dust/mist
Exposure time: 2 yr.
Number of exposures: 5 d
Method: OECD Test Guideline 453

Repeated dose toxicity –
Assessment: No data available

Aspiration toxicity
No data available

Experience with human exposure
General Information: No data available
Inhalation: No data available
Skin contact: No data available
Eye contact: No data available
Ingestion: No data available

Toxicology, Metabolism, Distribution
No data available

Neurological effects
No data available

Further information
Ingestion: No data available

Other health hazards
No data available

Section 12 – Ecological Information

Ecotoxicity

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega - hydroxypoly(oxy-1,2-ethanediyl):
Toxicity to fish: LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203

4,4'-methylenediphenyl diisocyanate:
Toxicity to fish: LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203

4,4'-Methylenediphenyl diisocyanate, oligomers:
Toxicity to fish: LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water

Method: OECD Test Guideline 203

Propylene carbonate:
Toxicity to fish: LC50 (Cyprinus carpio (Carp)): > 1,000 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.
Remarks: No-observed-effect level

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega - hydroxypoly(oxy-1,2-ethanediyl):
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
Exposure time: 24 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

4,4'-methylenediphenyl diisocyanate:
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
Exposure time: 24 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

4,4'-Methylenediphenyl diisocyanate, oligomers:
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
Exposure time: 24 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Propylene carbonate:
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202
Remarks: No-observed-effect level

Components:
4,4'-Methylenediphenyl diisocyanate, oligomers:
Toxicity to algae: EC50 (Desmodesmus subspicatus (green algae)): > 1,640 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Propylene carbonate:
Toxicity to algae: ErC50 (Selenastrum capricornutum (green algae)): > 929 mg/l
Exposure time: 72 h

Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

ErC50 (Desmodesmus subspicatus (green algae)): > 900 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity): No data available

Toxicity to fish (Chronic toxicity): No data available

Components:

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):

Toxicity to daphnia and another aquatic invertebrates (Chronic toxicity): NOEC (Daphnia magna (Water flea)): >= 10 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

4,4'-methylenediphenyl diisocyanate:

Toxicity to daphnia and another aquatic invertebrates (Chronic toxicity): NOEC (Daphnia magna (Water flea)): >= 10 mg/l
Exposure time: 21 d

Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

4,4'-Methylenediphenyl diisocyanate, oligomers:

Toxicity to daphnia and another aquatic invertebrates (Chronic toxicity): NOEC (Brachydanio rerio (zebrafish)): >= 10 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity): No data available

Components:

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):

Toxicity to microorganisms: EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

4,4'-Methylenediphenyl diisocyanate, oligomers:

Toxicity to microorganisms: EC50 (activated sludge): > 100 mg/l

Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

Propylene carbonate:
Toxicity to microorganisms: EC50 (Pseudomonas putida): 25,619 mg/l
Exposure time: 16 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38 412 Part 8

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega - hydroxypoly(oxy-1,2-ethanediyl):
Toxicity to soil dwelling organisms: NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg
Exposure time: 336 h
Method: OECD Test Guideline 207

4,4'-methylenediphenyl diisocyanate:
Toxicity to soil dwelling organisms: NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg
Exposure time: 336 h
Method: OECD Test Guideline 207

4,4'-Methylenediphenyl diisocyanate, oligomers:
Toxicity to soil dwelling organisms: EC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg
Exposure time: 336 h
Method: OECD Test Guideline 207

Plant toxicity: No data available

Sediment toxicity: No data available

Toxicity to terrestrial organisms: No data available

Ecotoxicology Assessment
Acute aquatic toxicity: No data available

Chronic aquatic toxicity: No data available

Toxicity Data on Soil: No data available

Other organisms relevant to the environment: No data available

Persistence and degradability

Components:
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega - hydroxypoly(oxy-1,2-ethanediyl):
Biodegradability: Inoculum: Domestic sewage
Concentration: 30 mg/l
Result: Not biodegradable
Biodegradation: 0 %
Exposure time: 28 d
Method: Inherent Biodegradability: Modified MITI Test (II)

4,4'-methylenediphenyl diisocyanate:

Biodegradability:	Inoculum: Domestic sewage Concentration: 30 mg/l Result: Not biodegradable Biodegradation: 0 % Exposure time: 28 d

Method: Inherent Biodegradability: Modified MITI Test (II)

4,4'-Methylenediphenyl diisocyanate, oligomers:

Biodegradability:	Inoculum: Domestic sewage Concentration: 30 mg/l Result: Not biodegradable Biodegradation: 0 % Exposure time: 28 d Method: Inherent Biodegradability: Modified MITI Test (II)

Propylene carbonate:

Biodegradability:	Concentration: 20 mg/l Result: Readily biodegradable. Biodegradation: 83.5 % Exposure time: 29 d Method: OECD Test Guideline 301B

Biochemical Oxygen Demand (BOD):	No data available
Chemical Oxygen Demand (COD):	No data available
BOD/COD:	No data available
ThOD:	No data available
BOD/ThOD:	No data available
Dissolved organic carbon (DOC):	No data available
Physico-chemical removability:	No data available

Components:

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):

Stability in water:	Degradation half-life (DT50): 6 d Remarks: Fresh water

4,4'-methylenediphenyl diisocyanate:

Stability in water:	Degradation half-life (DT50): 20 hrs. (25 °C) Remarks: Fresh water
Photodegradation:	No data available
Impact on Sewage Treatment:	No data available

Bio accumulative potential

Components:

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):

Bioaccumulation: Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Remarks: Bioaccumulation is unlikely.

4,4'-methylenediphenyl diisocyanate:

Bioaccumulation: Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Remarks: Bioaccumulation is unlikely.

4,4'-Methylenediphenyl diisocyanate, oligomers:

Bioaccumulation: Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Remarks: Bioaccumulation is unlikely.

Components:

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with alpha -hydro- omega -hydroxypoly(oxy-1,2-ethanediyl):

Partition coefficient:
n-octanol/water: log Pow: 4.51 (20 °C)
pH: 7
Method: OECD Test Guideline 117

4,4'-methylenediphenyl diisocyanate:

Partition coefficient:
n-octanol/water: log Pow: 4.51 (20 °C)
pH: 7
Method: OECD Test Guideline 117

4,4'-Methylenediphenyl diisocyanate, oligomers:

Partition coefficient:
n-octanol/water: log Pow: 8.56 (20 °C)

Propylene carbonate:

Partition coefficient:
n-octanol/water: log Pow: -0.5 (20 °C)

Mobility in soil

Mobility: No data available

Distribution among environmental compartments: No data available

Stability in soil: No data available

Other adverse effects

Environmental fate and pathways: No data available

Results of PBT and vPvB assessment: No data available

Endocrine disrupting potential: No data available

Adsorbed organic bound halogens (AOX): No data available

Hazardous to the ozone layer

Ozone-Depletion Potential	Not applicable
Additional ecological information:	No data available
Global warming potential (GWP):	No data available

Section 13 – Disposal Consideration

Disposal methods

Waste from residues:	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging:	Empty remaining contents. Dispose of any unused product. Do not re-use empty containers.

Section 14 – Transportation Information

International Regulations

TDG
Not regulated as dangerous goods

IATA
Not regulated as dangerous goods

IMDG
Not regulated as dangerous goods

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

TDG
Not regulated as dangerous goods

Section 15 – Regulatory Information

The components of this product are reported in the following inventories:

CH INV:	The formulation contains substances listed on the Swiss Inventory, On the inventory, or in compliance with the inventory.
DSL:	All components of this product are on the Canadian DSL
AICS:	On the inventory, or in compliance with the inventory
NZIoC:	Not in compliance with the inventory
ENCS:	On the inventory, or in compliance with the inventory
KECI:	On the inventory, or in compliance with the inventory
PICCS:	On the inventory, or in compliance with the inventory
IECSC:	On the inventory, or in compliance with the inventory
TCSI:	On the inventory, or in compliance with the inventory
TSCA:	On the inventory, or in compliance with the inventory

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

Canada. CEPA 1999 Significant New Activity (SNAc) List
No substances are subject to a Significant New Activity Notification.

Section 16 – Other Information

Hazardous Material Information System (USA)
Health = 2
Flammability = 1
Physical hazards = 0

HMIS ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

National Fire Protection Association (USA)
Health = 2
Flammability = 1
Instability = 0
Special = 0

Liquid decontaminants (percentages by weight or volume):
Decontaminant 1: *- sodium carbonate: 5 - 10 % *- liquid detergent: 0.2 - 2 % *- water: to make up to 100 %
Decontaminant 2: *- concentrated ammonia solution: 3 - 8 % *- liquid detergent: 0.2 - 2 % *- water: to make up to
100 %
Decontaminant 1 reacts slower with diisocyanates but is more environmentally friendly than decontaminant 2.
Decontaminant 2 contains ammonia. Ammonia presents health hazards. (See supplier safety information.)

ACGIH:	USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA:	8-hour, time-weighted average
OSHA Z-1 / C:	Ceiling

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behavior of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behavior should be determined by the user and made known to handlers, processors and end users.