

RENPIM® 6452 POLYOL US

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	12/15/2017	400001012694	Date of first issue: 12/15/2017

SECTION 1. IDENTIFICATION

Product name : RENPIM® 6452 POLYOL US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : 2795 Slough Avenue
Mississauga, ON L4T 1G2,
Canada
Telephone : +1 905 678 9150
E-mail address of person responsible for the SDS : MSDS@huntsman.com
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Component of a Polyurethane System.

**SECTION 2. HAZARDS IDENTIFICATION****GHS classification in accordance with the Hazardous Products Regulations**

Eye irritation : Category 2A

GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : H319 Causes serious eye irritation.

Precautionary statements : **Prevention:**
P264 Wash skin thoroughly after handling.
P280 Wear eye protection/ face protection.
Response:
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
Storage:
Not available
Disposal:
Not available

Other hazards

None known.

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SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
1,1',1",1'''-ethylenedinitrilotetrapropan-2-ol	102-60-3	30 - 40
Poly(oxy-1,4-butanediyl), .alpha.-hydro-.omega.-hydroxy-	25190-06-1	10 - 20
Methyldiethanolamine	105-59-9	1 - 5

SECTION 4. FIRST AID MEASURES

General advice	: Move out of dangerous area. Show this safety data sheet to the doctor in attendance. Treat symptomatically. Get medical attention if symptoms occur.
If inhaled	: If inhaled, remove to fresh air. Get medical attention if symptoms occur.
In case of eye contact	: Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	: Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	: None known.
Notes to physician	: Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	: High volume water jet
Specific hazards during firefighting	: No information available.
Hazardous combustion	: Carbon oxides

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products	Nitrogen oxides (NO _x) Carbon oxides Nitrogen oxides (NO _x) Metal oxides
Specific extinguishing methods	: No data is available on the product itself.
Further information	: No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for firefighters	: Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	: Use personal protective equipment.
Environmental precautions	: Prevent further leakage or spillage if safe to do so.
Methods and materials for containment and cleaning up	: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	: Normal measures for preventive fire protection.
Advice on safe handling	: Do not breathe vapours/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	: Keep container tightly closed in a dry and well-ventilated place. Keep in properly labelled containers.
Further information on storage stability	: Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

Personal protective equipment

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|--------------------------|--|
| Respiratory protection | : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines |
| Filter type | : Organic vapour type |
| Hand protection | |
| Remarks | : The suitability for a specific workplace should be discussed with the producers of the protective gloves. |
| Eye protection | : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems. |
| Skin and body protection | : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place. |
| Hygiene measures | : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday. |

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- | | |
|--|---|
| Appearance | : liquid |
| Colour | : cloudy |
| Odour | : No data is available on the product itself. |
| Odour 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 | : > 127 °C
Method: estimated, 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. |

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Vapour pressure	: No data is available on the product itself.
Relative vapour density	: No data is available on the product itself.
Relative density	: 1.01 - 1.05
Density	: No data is available on the product itself.
Solubility(ies)	
Water solubility	: completely miscible
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	: No data is available on the product itself.
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	: No hazards to be specially mentioned.
Conditions to avoid	: None known.
Incompatible materials	: None known.
Hazardous decomposition products	: No hazardous decomposition products are known.
Hazardous decomposition products	: carbon dioxide
	carbon monoxide
	Nitrogen oxides
Hazardous decomposition products	: carbon dioxide
	carbon monoxide

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Nitrogen oxides

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

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

Components:

Methyldiethanolamine:
Acute inhalation toxicity : LC50 (Rat, male and female): 6.5 mg/m3
Exposure time: 6 h
Test atmosphere: dust/mist

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:**

Methyldiethanolamine:
Species: Rabbit
Result: Mild skin irritation

Serious eye damage/eye irritation**Components:**

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:
Species: Rabbit
Result: Irritating to eyes.
Assessment: Irritant

Methyldiethanolamine:
Species: Rabbit
Result: Eye irritation

Respiratory or skin sensitisation**Components:**

Poly(oxy-1,4-butanediyl), .alpha.-hydro-.omega.-hydroxy-:
Result: Does not cause skin sensitisation.

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Methyldiethanolamine:
Exposure routes: Skin
Species: Guinea pig
Result: Does not cause skin sensitisation.

Assessment: No data available

Germ cell mutagenicity**Components:**

Methyldiethanolamine:
Genotoxicity in vitro : Concentration: 100 - 10000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Components:

Methyldiethanolamine:
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

No data available

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:**

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:
Effects on fertility : Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422

Components:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:
Effects on foetal development : Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
400 mg/kg body weight
Result: No teratogenic effects

Methyldiethanolamine:

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Species: Rat, male and female
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level:
250 mg/kg body weight
Result: No teratogenic effects

Reproductive toxicity - : No data available
Assessment

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Species: Rat, male and female

NOAEL: 1000 mg/kg/d

Application Route: Ingestion

Exposure time: 1,176 h

Number of exposures: 7 d

Method: Subacute toxicity

Species: Rat, male and female

NOAEL: 300 mg/kg/d

Application Route: Ingestion

Exposure time: 1,176 h

Number of exposures: 7 d

Method: Subacute toxicity

Methyldiethanolamine:

Species: Rat, male and female

NOAEL: 750 mg/kg

Application Route: Skin contact

Exposure time: 2,160 h

Number of exposures: 5 d

Method: Subchronic toxicity

Repeated dose toxicity - : No data available
Assessment

Aspiration toxicity

No data available

Experience with human exposure

General Information: No data available

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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:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 4,600 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: DIN 38412

LC50 (Leuciscus idus (Golden orfe)): 2,700 mg/l
Exposure time: 48 h
Test Type: static test
Method: DIN 38412

Methyldiethanolamine:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 1,000 - 2,200 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38412

Components:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

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Toxicity to daphnia and other aquatic invertebrates : IC0 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Type: static test
Method: Directive 67/548/EEC, Annex V, C.2.

Poly(oxy-1,4-butanediyl), .alpha.-hydro-.omega.-hydroxy-:
Toxicity to daphnia and other aquatic invertebrates : EC50: 316 mg/l
Exposure time: 48 h

Methyldiethanolamine:
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 233 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water

Components:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:
Toxicity to algae : EC50 (Other): 150.67 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.3.

Poly(oxy-1,4-butanediyl), .alpha.-hydro-.omega.-hydroxy-:
Toxicity to algae : EC50 (Other): 83.5 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Methyldiethanolamine:
Toxicity to algae : ErC50 (Desmodesmus subspicatus (green algae)): 176 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: DIN 38412

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

Components:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:
Toxicity to fish (Chronic toxicity) : GLP: yes

Components:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:
Toxicity to daphnia and other 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

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

Components:

Methyldiethanolamine:

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Toxicity to microorganisms : EC50 (Pseudomonas putida): 413.8 mg/l
Exposure time: 17 h
Method: DIN 38 412 Part 8

Toxicity to soil dwelling organisms : No data available

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:**

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Biodegradability : Inoculum: activated sludge
Concentration: 107 mg/l
Result: Inherently biodegradable.
Biodegradation: 36 %
Exposure time: 28 d
Method: OECD Test Guideline 302B

Inoculum: Domestic sewage
Concentration: 30 mg/l
Result: Not readily biodegradable.
Biodegradation: 9 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.D.

Poly(oxy-1,4-butanediyl), .alpha.-hydro-.omega.-hydroxy-:
Biodegradability : Result: Readily biodegradable.

Methyldiethanolamine:
Biodegradability : Inoculum: activated sludge
Concentration: 41 mg/l
Result: Readily biodegradable.
Biodegradation: 96 %
Exposure time: 18 d
Method: OECD Test Guideline 301A

Biochemical Oxygen Demand (BOD) : No data available

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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:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Stability in water : Method: OECD Test Guideline 111
GLP: yes
Remarks: see user defined free text

Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential

Components:

Methyldiethanolamine:

Bioaccumulation : Bioconcentration factor (BCF): 3.16
Remarks: Does not bioaccumulate.

Components:

1,1',1'',1'''-ethylenedinitrilotetrapropan-2-ol:

Partition coefficient: n-octanol/water : log Pow: -2.08 (25 °C)

Methyldiethanolamine:

Partition coefficient: n-octanol/water : log Pow: -1.08 (25 °C)
pH: 9.9 - 10.4

Mobility in soil

Mobility : No data available

Components:

Methyldiethanolamine:

Distribution among environmental compartments : Koc: 1

Stability in soil : No data available

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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 CONSIDERATIONS

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 as unused product.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

TDG

Not regulated as dangerous goods

IATA

Not regulated as dangerous goods

IMDG

Not regulated as dangerous goods

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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	: Not 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.

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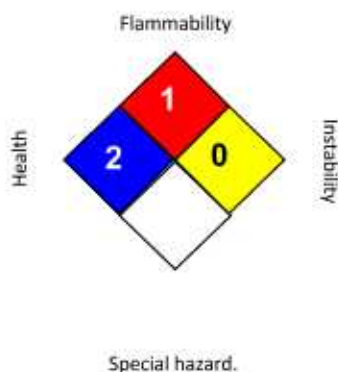
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SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS® IV:

HEALTH	2
FLAMMABILITY	1
PHYSICAL HAZARD	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.

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

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RENPIM® 6452 ISOCYANATE US

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SECTION 1. IDENTIFICATION

Product name : RENPIM® 6452 ISOCYANATE US

Manufacturer or supplier's details

Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : 2795 Slough Avenue
Mississauga, ON L4T 1G2,
Canada
Telephone : +1 905 678 9150

E-mail address of person responsible for the SDS : MSDS@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Component of a Polyurethane System.

SECTION 2. HAZARDS IDENTIFICATION**GHS classification in accordance with the Hazardous Products Regulations**

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)

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H315 + H320 Causes skin and eye irritation.
H317 May cause an allergic skin reaction.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.

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Precautionary statements : **Prevention:**
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves.
P284 Wear respiratory protection.

Response:
P302 + P352 IF ON SKIN: Wash with plenty of water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:
P501 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

Chemical nature : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
4,4'-methylenediphenyl diisocyanate	101-68-8	50 - 60
Methylenediphenyldiisocyanate (mixed isomers)	26447-40-5	20 - 30
Benzene, 1,1'-methylenebis[isocyanato-, homopolymer	39310-05-9	10 - 20

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.

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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 centre immediately.
Keep patient warm and at rest.
Keep respiratory tract clear.
If breathing is difficult, give oxygen.
If breathing is irregular or stopped, administer artificial respiration.
If unconscious, place in recovery position and seek medical advice.
Consult a physician immediately if symptoms such as shortness of breath or asthma are observed.
A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitised persons.
The exposed person may need to be kept under medical surveillance for 48 hours.
LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.

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-Tam™, 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 lens, 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 his back, place him 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 vapour or aerosol at levels above the occupational exposure limit could cause respiratory

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sensitisation.

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 sensitised 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. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Foam
Carbon dioxide (CO₂)
Dry powder
- Unsuitable extinguishing media : Water may be used if no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous.
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
The pressure in sealed containers can increase under the influence of heat.
Exposure to decomposition products may be a hazard to health.
- Hazardous combustion products : Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).
Nitrogen oxides (NO_x)
Hydrogen cyanide (hydrocyanic acid)
- Specific extinguishing methods : Cool containers/tanks with water spray.
- Further information : Standard procedure for chemical fires.

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Due to reaction with water producing CO₂-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed.
 Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
 Prevent fire extinguishing water from contaminating surface water or the ground water system.
 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 fire fighting gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Immediately evacuate personnel to safe areas.
 Use personal protective equipment.
 If specialised 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 and upwind of spill/leak.
 Only qualified personnel equipped with suitable protective equipment may intervene.
 For additional precautions and advice on safe handling, see section 7.
 Never return spills in original containers for re-use.
 Make sure that there is a sufficient amount of neutralizing/absorbent material near the storage area.
 The danger areas must be delimited and identified using relevant 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 ground water system.
 Prevent product from entering drains.
 Prevent further leakage or spillage if safe to do so.
 Local authorities should be advised if significant spillages cannot be contained.
 If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Clean-up methods - small spillage
 Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / 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

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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 vapour.

Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

- 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 : For personal protection see section 8.
 Avoid formation of aerosol.
 Do not breathe vapours or spray mist.
 Do not breathe vapours/dust.
 Do not swallow.
 Do not get in eyes or mouth or on skin.
 Do not get on skin or clothing.
 Avoid exposure - obtain special instructions before use.
 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 sensitisation problems or asthma, allergies, 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.
 Keep 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.

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Materials to avoid : Acids
Amines
Bases
Metals
water

Recommended storage temperature : 2 - 40 °C

Further information on storage stability : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**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/m ³	OSHA Z-1

Personal protective equipment

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this 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.

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.

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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. Chemical splash goggles. 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** : Impervious clothing. Choose body protection according to the amount and concentration of the dangerous substance at the work place. Recommended: Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C' , Tyvek Pro 'F' disposable coverall.
- Protective measures** : Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Ensure that eye flushing systems and safety showers are located close to the working place.
- Hygiene measures** : Handle in accordance with good industrial hygiene and safety practice. 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 AND CHEMICAL PROPERTIES

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Appearance	: liquid
Colour	: amber, clear
Odour	: No data is available on the product itself.
Odour 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	: > 93.33 °C Method: estimated, 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.
Vapour pressure	: No data is available on the product itself.
Relative vapour density	: No data is available on the product itself.
Relative density	: 1.18 - 1.24
Density	: No data is available on the product itself.
Solubility(ies)	
Water solubility	: Water reactive
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	: No data is available on the product itself.

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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 CO₂-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 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 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 : Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke.
Hydrocarbons
Hydrogen cyanide (hydrocyanic acid)
Burning produces noxious and toxic fumes.

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:

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

Methylenediphenyldiisocyanate (mixed isomers):

Acute oral : LD₅₀ (Rat, male and female): > 2,000 mg/kg

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toxicityComponents Assessment: The substance or mixture has no acute oral toxicity

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Acute oral : LD50 (Rat, female): > 5,000 mg/kg
toxicityComponents Method: OECD Test Guideline 425
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity - : Acute toxicity estimate: 1.52 mg/l
Product Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

4,4'-methylenediphenyl diisocyanate:

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9,400 mg/kg
Method: OECD Test Guideline 402

Methylenediphenyldiisocyanate (mixed isomers):

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9,400 mg/kg
Method: OECD Test Guideline 402

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9,400 mg/kg
Method: OECD Test Guideline 402

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

Skin corrosion/irritation**Components:**

4,4'-methylenediphenyl diisocyanate:

Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.

Methylenediphenyldiisocyanate (mixed isomers):

Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.
GLP: yes

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Species: Rabbit
Result: Skin irritation
GLP: yes

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Serious eye damage/eye irritation**Components:**

4,4'-methylenediphenyl diisocyanate:

Species: Rabbit

Result: Mild eye irritation

Methylenediphenyldiisocyanate (mixed isomers):

Species: Rabbit

Result: Mild eye irritation

Method: OECD Test Guideline 405

GLP: yes

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Species: Rabbit

Result: Mild eye irritation

Method: OECD Test Guideline 405

GLP: yes

Respiratory or skin sensitisation**Components:**

4,4'-methylenediphenyl diisocyanate:

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: May cause sensitisation by skin contact.

Exposure routes: Respiratory Tract

Species: Guinea pig

Result: May cause sensitisation by inhalation.

Methylenediphenyldiisocyanate (mixed isomers):

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: May cause sensitisation by skin contact.

Exposure routes: Respiratory Tract

Species: Guinea pig

Result: May cause sensitisation by inhalation.

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: May cause sensitisation by skin contact.

Exposure routes: Respiratory Tract

Species: Guinea pig

Result: May cause sensitisation by inhalation.

Components:

4,4'-methylenediphenyl diisocyanate:

Assessment: May cause sensitisation by inhalation and skin contact.

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Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:
Assessment: May cause sensitisation by inhalation and skin contact.

Germ cell mutagenicity**Components:**

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

Methylenediphenyldiisocyanate (mixed isomers):

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

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Genotoxicity in vitro : Concentration: ca 50 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Components:

4,4'-methylenediphenyl diisocyanate:

Genotoxicity in vivo : Application Route: Inhalation
Exposure time: 3 Weeks
Dose: 118 mg/m3
Method: OECD Test Guideline 474
Result: negative

Methylenediphenyldiisocyanate (mixed isomers):

Genotoxicity in vivo : Application Route: Inhalation
Exposure time: 3 Weeks
Dose: 118 mg/m3
Method: OECD Test Guideline 474
Result: negative

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Genotoxicity in vivo : Application Route: Inhalation
Exposure time: 3 Weeks
Dose: 118 mg/m3
Method: OECD Test Guideline 474
Result: negative

Components:

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Germ cell mutagenicity- : Animal testing did not show any mutagenic effects.
Assessment

Germ cell mutagenicity- : No data available
Assessment

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Carcinogenicity**Product:**

Remarks: Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in a chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m³), there was a significant incidence of a benign tumour of the lung (adenoma) and one malignant tumour (adenocarcinoma). There were no lung tumours at 1 mg/m³ and no effects at 0.2 mg/m³. Overall, the tumour incidence, both benign and malignant, and the number of animals with the tumours were not different from controls. The increased incidence of lung tumours is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumour formation will occur.

Carcinogenicity - : No data available
Assessment

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:**

Methylenediphenyldiisocyanate (mixed isomers):

Effects on fertility : Species: Rat, male and female
Application Route: Inhalation
Method: OECD Test Guideline 414
Result: No effects on fertility and early embryonic development were detected.

Components:

4,4'-methylenediphenyl diisocyanate:

Effects on foetal : Species: Rat, female
development : Application Route: Inhalation
General Toxicity Maternal: No observed adverse effect level: 4 mg/m³
Method: OECD Test Guideline 414
Result: No teratogenic effects

Methylenediphenyldiisocyanate (mixed isomers):

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

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

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

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Result: No teratogenic effects

Components:

Benzene, 1,1'-methylenediphenyl diisocyanate, homopolymer:

Reproductive toxicity - : No evidence of adverse effects on sexual function and fertility,
Assessment or on development, based on animal experiments.**STOT - single exposure****Components:**

4,4'-methylenediphenyl diisocyanate:

Exposure routes: Inhalation

Target Organs: Respiratory Tract

Assessment: May cause respiratory irritation.

Methylenediphenyldiisocyanate (mixed isomers):

Exposure routes: Inhalation

Target Organs: Respiratory Tract

Assessment: May cause respiratory irritation.

Benzene, 1,1'-methylenediphenyl diisocyanate, homopolymer:

Exposure routes: inhalation (dust/mist/fume)

Target Organs: Respiratory Tract

Assessment: May cause respiratory irritation.

STOT - repeated exposure

No data available

Repeated dose toxicity**Components:**

4,4'-methylenediphenyl diisocyanate:

Species: Rat, male and female

NOEC: 0.2 mg/m³

Exposure time: 2 yr

Number of exposures: 5 d

Method: OECD Test Guideline 453

Methylenediphenyldiisocyanate (mixed isomers):

Species: Rat, male and female

NOEC: 0.2 mg/m³

Test atmosphere: dust/mist

Exposure time: 2 yr

Number of exposures: 5 d

Method: OECD Test Guideline 453

Benzene, 1,1'-methylenediphenyl diisocyanate, homopolymer:

Species: Rat, male and female

NOEC: 0.2 mg/m³

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Test atmosphere: dust/mist
Exposure time: 2 yr
Number of exposures: 5 d
Method: OECD Test Guideline 453

Components:

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Repeated dose toxicity - : No adverse effect has been observed in chronic toxicity
Assessment tests.

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:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l

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Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203

Methylenediphenyldiisocyanate (mixed isomers):

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

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

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

Components:**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

Methylenediphenyldiisocyanate (mixed isomers):

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

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

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

Components:**Methylenediphenyldiisocyanate (mixed isomers):**

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

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Toxicity to algae : EC50 (Desmodesmus subspicatus (green algae)): > 1,640 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water

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Method: OECD Test Guideline 201

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

Components:

Benzene, 1,1'-methylenebis(isocyanato-, homopolymer:

Toxicity to fish (Chronic toxicity) : GLP: no

Components:

4,4'-methylenediphenyl diisocyanate:

Toxicity to daphnia and other 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

Methylenediphenyldiisocyanate (mixed isomers):

Toxicity to daphnia and other 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

Benzene, 1,1'-methylenebis(isocyanato-, homopolymer:

Toxicity to daphnia and other 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

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

Components:

Methylenediphenyldiisocyanate (mixed isomers):

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

Benzene, 1,1'-methylenebis(isocyanato-, homopolymer:

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

Components:

4,4'-methylenediphenyl diisocyanate:

Toxicity to soil dwelling organisms : NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg
 Exposure time: 336 h

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Method: OECD Test Guideline 207

Methylenediphenyldiisocyanate (mixed isomers):

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

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

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:

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

Methylenediphenyldiisocyanate (mixed isomers):

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

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

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

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Method: Inherent Biodegradability: Modified MITI Test (II)

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:

Stability in water : Degradation half life(DT50): 20 hrs (25 °C)
 Method: No information available.
 Remarks: Fresh water

Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential**Components:**

4,4'-methylenediphenyl diisocyanate:

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

Methylenediphenyldiisocyanate (mixed isomers):

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

Bioconcentration factor (BCF): 439
 Remarks: Bioaccumulation is unlikely.

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

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

Components:

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4,4'-methylenediphenyl diisocyanate:

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

Methylenediphenyldiisocyanate (mixed isomers):

Partition coefficient: n-octanol/water : log Pow: 4.51 (22 °C)
pH: 7
Method: OECD Test Guideline 117

Benzene, 1,1'-methylenebis[isocyanato-, homopolymer:

Partition coefficient: n-octanol/water : log Pow: 8.56 (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 CONSIDERATIONS

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.

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Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

SECTION 14. TRANSPORT 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.

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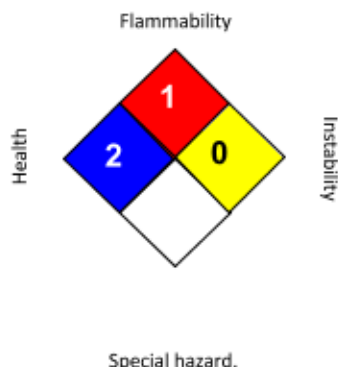
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SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS® IV:

HEALTH	*	2
FLAMMABILITY		1
PHYSICAL HAZARD		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.

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.)

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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

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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.

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

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