

**SUPRASEC® 2004**

Version 1.1      Revision Date: 02/06/2017      SDS Number: 400001000401      Date of last issue: 01/26/2016  
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**SECTION 1. IDENTIFICATION**

Product name : SUPRASEC® 2004

**Manufacturer or supplier's details**

Company name of supplier : Huntsman Polyurethanes  
Address : P.O. Box 4980  
The Woodlands,  
TX 77387  
United States of America (USA)  
Telephone : Tech Info:(800) 257-5547  
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.  
Industrial use

**SECTION 2. HAZARDS IDENTIFICATION****GHS classification in accordance with 29 CFR 1910.1200**

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.

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H335 May cause respiratory irritation.

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.  
 P285 In case of inadequate ventilation wear respiratory protection.  
**Response:**  
 P302 + P352 IF ON SKIN: Wash with plenty of soap and 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 Take off contaminated clothing and wash 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

**Hazardous components**

Chemical name	CAS-No.	Concentration (% w/w)
4,4'-methylenediphenyl diisocyanate	101-68-8	70 - 90
Diphenylmethane-2,4'- diisocyanate	5873-54-1	20 - 30
1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol	150449-03-9	1 - 5
Homopolymer of methylenediphenyl diisocyanate	25686-28-6	1 - 5

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

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**SECTION 4. FIRST AID MEASURES**

- General advice : Move out of dangerous area.  
Do not leave the victim unattended.  
Consult a physician.  
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.  
LC50 (rat) : ca. 490 mg/m<sup>3</sup> (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<sup>TM</sup>, PEG-400) or corn oil may be more effective than soap and water.
- In case of eye contact : In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.  
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 : Severe allergic skin reactions, bronchospasm and anaphylactic shock

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delayed

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 (CO<sub>2</sub>)  
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<sub>x</sub>)  
Hydrogen cyanide (hydrocyanic acid)

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

Further information : Standard procedure for chemical fires.  
Due to reaction with water producing CO<sub>2</sub>-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.

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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 : Use personal protective equipment.  
Ensure adequate ventilation.  
Immediately evacuate personnel to safe areas.  
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  
Dilute with plenty of water.  
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 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,

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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 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.
- Materials to avoid : Acids  
Amines  
Bases  
Metals  
water

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**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

**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.

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.

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- 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 or drink.  
When using do not smoke.  
Contaminated work clothing should not be allowed out of the workplace.  
Wash hands and face before breaks and immediately after handling the product.  
Wash hands before breaks and at the end of workday.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

- Appearance : liquid
- Colour : No data is available on the product itself.
- 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.

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Boiling point	No data is available on the product itself.
Flash point	: 177 °C Method: 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	: No data is available on the product itself.
Lower explosion 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	: No data is available on the product itself.
Density	: 1.2 g/cm <sup>3</sup> (25 °C)
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	: 5 - 20 mPa.s (25 °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 <sub>2</sub> -gas. Exothermic reaction with materials containing active hydrogen groups.

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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 (CO <sub>2</sub> ), carbon monoxide (CO), oxides of nitrogen (NO <sub>x</sub> ), 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 toxicityComponents	:	LD50 (Rat, male): > 10,000 mg/kg Method: OECD Test Guideline 401
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1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

Acute oral toxicityComponents	:	LD50 (Rat, female): > 5,000 mg/kg Method: OECD Test Guideline 425
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Homopolymer of methylenediphenyl diisocyanate:

Acute oral toxicityComponents	:	LD50 (Rat, female): > 5,000 mg/kg Method: OECD Test Guideline 425
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Acute inhalation toxicity - Product	:	Acute toxicity estimate: 1.45 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
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**Components:**

4,4'-methylenediphenyl diisocyanate:

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

Diphenylmethane-2,4'- diisocyanate:

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

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

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.

Diphenylmethane-2,4'- diisocyanate:

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

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: Skin irritation

Homopolymer of methylenediphenyl diisocyanate:

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: Irritating to skin.**Serious eye damage/eye irritation****Components:**

4,4'-methylenediphenyl diisocyanate:

Species: Rabbit  
Result: Mild eye irritation

Diphenylmethane-2,4'- diisocyanate:

Species: Humans  
Result: Irritation to eyes, reversing within 7 days

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Assessment: Mild eye irritant  
Method: OECD Test Guideline 405  
Remarks: Mild eye irritation

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:  
Species: Rabbit  
Result: Mild eye irritation  
Method: OECD Test Guideline 405

Homopolymer of methylenediphenyl diisocyanate:  
Species: Rabbit  
Result: Mild eye irritation  
Method: OECD Test Guideline 405

**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.

Diphenylmethane-2,4'- diisocyanate:  
Exposure routes: Skin  
Species: Mouse  
Assessment: May cause sensitisation by skin contact.  
Result: Causes sensitisation.

Exposure routes: Respiratory Tract  
Species: Guinea pig  
Assessment: May cause sensitisation by inhalation.  
Result: Causes sensitisation.

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:  
Exposure routes: Respiratory Tract  
Species: Guinea pig  
Result: May cause sensitisation by inhalation.

Exposure routes: Skin  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: May cause sensitisation by skin contact.

Homopolymer of methylenediphenyl diisocyanate:  
Exposure routes: Skin  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: May cause sensitisation by skin contact.

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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.

Diphenylmethane-2,4'- diisocyanate:  
Assessment: Mild eye irritation

**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

Diphenylmethane-2,4'- diisocyanate:  
Genotoxicity in vitro : Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:  
Genotoxicity in vitro : Concentration: ca 5000 ug/plate  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

Homopolymer of methylenediphenyl diisocyanate:  
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/m<sup>3</sup>  
Method: OECD Test Guideline 474  
Result: negative

Diphenylmethane-2,4'- diisocyanate:  
Genotoxicity in vivo : Application Route: Inhalation  
Exposure time: 3 Weeks  
Dose: 118 mg/m<sup>3</sup>  
Method: OECD Test Guideline 474  
Result: negative

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1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

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

Homopolymer of methylenediphenyl diisocyanate:

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

**Carcinogenicity****Components:**

4,4'-methylenediphenyl diisocyanate:

Species: Rat, (male and female)  
Application Route: Inhalation  
Exposure time: 24 month(s)  
Dose: 1 mg/m<sup>3</sup>  
Frequency of Treatment: 5 daily  
Method: OECD Test Guideline 453  
Result: positive  
Target Organs: Lungs

Diphenylmethane-2,4'- diisocyanate:

Species: Rat, (male and female)  
Application Route: Inhalation  
Exposure time: 24 month(s)  
Dose: 1 mg/m<sup>3</sup>  
Frequency of Treatment: 5 daily  
Method: OECD Test Guideline 453  
Result: positive  
Target Organs: Lungs

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

Species: Rat, (male and female)  
Application Route: Inhalation  
Exposure time: 24 month(s)  
Dose: 1 mg/m<sup>3</sup>  
Frequency of Treatment: 5 daily  
Method: OECD Test Guideline 453  
Result: negative

Homopolymer of methylenediphenyl diisocyanate:

Species: Rat, (male and female)  
Application Route: Inhalation  
Exposure time: 24 month(s)  
Dose: 1 mg/m<sup>3</sup>  
Frequency of Treatment: 5 daily  
Method: OECD Test Guideline 453  
Result: negative

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Carcinogenicity - Assessment : No data available

**IARC** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**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.

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

**NTP** No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity****Components:**

Diphenylmethane-2,4'- diisocyanate:

Effects on fertility : Species: Rat, female  
Application Route: Inhalation  
Method: OECD Test Guideline 414  
Result: Animal testing did not show any effects on fertility.

Species: Rat, male and female  
Application Route: Inhalation  
Method: OECD Test Guideline 414  
Result: Animal testing did not show any effects on fertility.

**Components:**

4,4'-methylenediphenyl diisocyanate:

Effects on foetal development : Species: Rat, female  
Application Route: Inhalation  
General Toxicity Maternal: No observed adverse effect level: 4 mg/m<sup>3</sup>  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

Diphenylmethane-2,4'- diisocyanate:

Species: Rat, male and female  
Application Route: Inhalation  
General Toxicity Maternal: No observed adverse effect level: 4 mg/m<sup>3</sup>  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

Species: Rat, male and female  
Application Route: Inhalation

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General Toxicity Maternal: No observed adverse effect level: 4 mg/m<sup>3</sup>  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

Homopolymer of methylenediphenyl diisocyanate:  
Species: Rat, male and female  
Application Route: Inhalation  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

Reproductive toxicity - Assessment : No data available

**STOT - single exposure****Components:**

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

Diphenylmethane-2,4'- diisocyanate:  
Exposure routes: Inhalation  
Target Organs: Respiratory system  
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:  
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.

Homopolymer of methylenediphenyl diisocyanate:  
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:  
Species: Rat, male and female  
: 0.2 mg/m<sup>3</sup>  
Exposure time: 2 yr  
Number of exposures: 5 d

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Method: OECD Test Guideline 453

Diphenylmethane-2,4'- diisocyanate:

Species: Rat, male and female

: 0.2 mg/m<sup>3</sup>

Exposure time: 2 yr

Number of exposures: 5 d

Method: OECD Test Guideline 453

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

Species: Rat, male and female

: 0.2 mg/m<sup>3</sup>

Test atmosphere: dust/mist

Exposure time: 2 yr

Number of exposures: 5 d

Method: OECD Test Guideline 453

Species: Rat, male and female

: 1 mg/m<sup>3</sup>

Test atmosphere: dust/mist

Exposure time: 2,160 h

Number of exposures: 5 d

Method: OECD Test Guideline 413

Homopolymer of methylenediphenyl diisocyanate:

Species: Rat, male and female

: 0.2 mg/m<sup>3</sup>

Test atmosphere: dust/mist

Exposure time: 2 yr

Number of exposures: 5 d

Method: OECD Test Guideline 453

**Components:**

Diphenylmethane-2,4'- diisocyanate:

Repeated dose toxicity - : Mild eye irritation

Assessment

**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

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Ingestion: No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

**Further information****Product:**

Remarks: No data available

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:**

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

Diphenylmethane-2,4'- diisocyanate:

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

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

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

Homopolymer of methylenediphenyl diisocyanate:

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:

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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

**Diphenylmethane-2,4'- 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

**1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:**

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

**Homopolymer of 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

**Components:****1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:**

Toxicity to algae : EC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): > 1,640 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201

**Homopolymer of methylenediphenyl diisocyanate:**

Toxicity to algae : EC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): > 1,640 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:**

Toxicity to daphnia and other : NOEC (Daphnia magna (Water flea)): >= 10 mg/l



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

Diphenylmethane-2,4'- diisocyanate:

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

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

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

Homopolymer of methylenediphenyl diisocyanate:

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)

Diphenylmethane-2,4'- 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)

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1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

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

Homopolymer of 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)

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

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:

Stability in water : Method: No information available.  
GLP: yes  
Remarks: see user defined free text  
  
Method: No information available.  
GLP: no  
Remarks: see user defined free text

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Homopolymer of methylenediphenyl diisocyanate:  
Stability in water : Method: No information available.

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.

Diphenylmethane-2,4'- diisocyanate:  
Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 200  
Remarks: Bioaccumulation is unlikely.

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:  
Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 200  
Remarks: Bioaccumulation is unlikely.

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

**Components:**

4,4'-methylenediphenyl diisocyanate:  
Partition coefficient: n-octanol/water : log Pow: 4.51 (20 °C)  
pH: 7  
Method: OECD Test Guideline 117

Diphenylmethane-2,4'- diisocyanate:  
Partition coefficient: n-octanol/water : log Pow: 4.51 (20 °C)  
pH: 7  
Method: OECD Test Guideline 117

1,3-Butanediol, polymer with 1,1'-methylenebis[isocyanatobenzene], [(1-methyl-1,2-ethanediyl)bis(oxy)]bis[propanol] and 1,2-propanediol:  
Partition coefficient: n-octanol/water : log Pow: 15.98 (20 °C)  
GLP: no

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

**Mobility in soil**

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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 : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances  
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information - Product : 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**

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**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****DOT Classification**

UN/ID/NA number	: NA 3082
Proper shipping name	: OTHER REGULATED SUBSTANCES, LIQUID, N.O.S. (Methylene Diphenyl Diisocyanate)
Class	: 9
Packing group	: III
Labels	: CLASS 9
ERG Code	: 171
Marine pollutant	: no

**SECTION 15. REGULATORY INFORMATION****EPCRA - Emergency Planning and Community Right-to-Know Act****CERCLA Reportable Quantity**

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
4,4'-methylenediphenyl diisocyanate	101-68-8	5000	7119
chlorobenzene	108-90-7	100	*
acetone	67-64-1	5000	*

\*: Calculated RQ exceeds reasonably attainable upper limit.

**SARA 311/312 Hazards** : Acute Health Hazard**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:

4,4'-methylenediphenyl diisocyanate	101-68-8	70 - 90 %
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The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

4,4'-methylenediphenyl diisocyanate	101-68-8	70.2294 %
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**California Prop. 65**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**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 : Not 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**

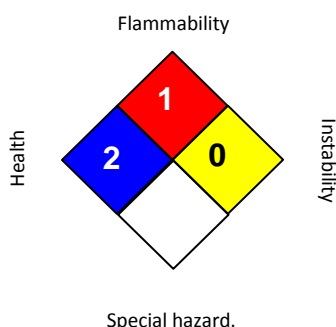
AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

**TSCA - 5(a) Significant New Use Rule List of Chemicals**

No substances are subject to a Significant New Use Rule.

**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

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

**SECTION 16. OTHER INFORMATION****Further information****NFPA:****HMIS® IV:**

<b>HEALTH</b>	*	<b>2</b>
<b>FLAMMABILITY</b>		<b>1</b>
<b>PHYSICAL HAZARD</b>		<b>0</b>

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 %

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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.)

Revision Date : 02/06/2017

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 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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