

### MATERIAL SAFETY DATA SHEET CHEM-FIX HAND MIX PART B

#### 1. PRODUCT AND COMPANY IDENTIFICATION / NAME

**Product name:** Chem-Fix Hand Mix Part B  
**Chemical product name:** Resin Blend  
**Application:** Conveyor Belt Repair Kit  
**Supplier:** Rice Engineering  
 Unit A7  
 The Palisades  
 39 Kelly Road, Jet Park,  
 Boksburg, 1459  
 South Africa  
 Tel: +27 (82) 326 8277

#### Recommended use of the chemical and restrictions on use

Recommended use : Component of a Polyurethane System.  
 Recommended use : For industrial use only.

#### 2. HAZARDOUS IDENTIFICATION

##### GHS Classification

Acute toxicity (Inhalation) : Category 4  
 Skin sorrosion / irritation : Category 2  
 Serious eye damage/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

Hazardous pictograms



Signal word

: Danger

Hazardous 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.

Precautionary statements

##### Prevention:

P261 Avoid breathing dust / fumes / gas / mist / vapours / spray.  
 P264 Wash skin thoroughly after handling.  
 P271 Use only outdoors or in a well-ventiated area.  
 P272 Contaminated work clothing should not be allowed out of the workplace.

## Precautionary statements

### Prevention:

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 CENTRE / 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 + 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 which do not result in classification

None known.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance / Mixture

: Mixture

#### Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
4,4'-methylenediphenyl diisocyanate	101-68-8	>=50 - <70
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	>=20 - <30
4,4'-methylenediphenyl diisocyanate, oligomers	25686-28-6	>=10 - <20
o-(p-isocyanatobenzyl)phenyl isocyanate	5873-54-1	>=1 - <10

### 4. FIRST AID MEASURES

General advice

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

If inhaled

: If breathed in, move person into fresh air.  
Call a physician or poison control 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/m<sup>3</sup> (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns

In case of skin contact	<p>: 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 TM, PEG-400) or corn oil may be more effective than soap and water.</p>
In case of eye contact	<p>: Rinse immediately with plenty of water, also under 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.</p>
If swallowed	<p>: 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. Take victim immediately to hospital. If symptoms persist, call a physician.</p>
Most important symptoms and effects, both acute and delayed.	<p>: 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 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.</p>
Protection of first-aiders	<p>: 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.</p>
Notes to physician	<p>: Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.</p> <p>The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.</p>

## 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 : Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN. In the event of extreme heat (>500 degrees C), aniline is suspected of being formed.  
  
No hazardous combustion products are known.
- Specific extinguishing methods : Cool containers / tanks with water spray. 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. 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.

## 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 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.

## 7. HANDLING AND STORAGE

Technical measures	: Ensure that eyewash stations and safety showers are close to the workstation location.
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, 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	: For incompatible materials please refer to Section 10 of this SDS.

## 8. EXPOSURE CONTROL / PERSONAL PROTECTION

### Components with workplace control parameters

Engineering measures : No data is available on the product itself.

### 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. In emergency, non-routine and unknown exposure situations, including confined space entries, a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied air respirator (SAR) with auxiliary self-contained air supply, should be used.

Hand protection  
Remarks

: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin.  
Use chemical resistant gloves classified under Standard EN374: protective gloves against chemicals and microorganisms. Examples of glove materials that might provide suitable protection include: Butyl rubber, Chlorinated polyethylene, Ethyl vinyl alcohol copolymers laminated ("EVAL"), Polychloroprene (Neoprene\*), Nitrile/butadiene rubber ("nitrile or NBR"), Polyvinyl chloride ("PVC or "vinyl"), Fluoroelastomer (Viton\*).

When prolonged or frequently repeated contact may occur, a glove with protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN374) is recommended.

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

Notice: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all requisite workplace factors such as, but not limited to: other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/specifications provided by the glove supplier.

Eye protection

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. 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 the amount of 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.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Colour	: light yellow
Odour	: No data is available on the product itself.
Odour Theshold	: 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. No information available.
Flash point	: 210 °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 / 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	: No data available.
Density	: 1,22 g/cm <sup>3</sup> (25°C)

Solubility(ies)	:	No data is available on the product itself.
Water solubility	:	
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	:	
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	:	110 - 190 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.

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



## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Components:

4,4'-methylenediphenyl diisocyanate:

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

4,4'-methylenediphenyl diisocyanate oligomers:

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

Acute inhalation toxicity -  
Product

: Assessment: The substance / mixture is not toxic on inhalation as defined by dangerous goods regulations.

#### Components:

4,4'-methylenediphenyl diisocyanate:

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

o-(p-isocyanatobenzyl)phenyl isocyanate:

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

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

Assessment: irritant

Method: OECD Test Guideline 404

Result: Irritating to skin.

4,4'-methylenediphenyl diisocyanate oligomers:

Species: Rabbit

Assessment: irritant

Method: OECD Test Guideline 404

Result: Irritating to skin.

o-(p-isocyanatobenzyl)phenyl isocyanate:

Species: Rabbit

Assessment: irritant

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

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

Result: Irritation to eyes, reversing within 7 days

4,4'-methylenediphenyl diisocyanate oligomers:

Species: Rabbit

Method: OECD Test Guideline 405

Result: Mild eye irritation

o-(p-isocyanatobenzyl)phenyl isocyanate:

Species: Humans

Assessment: Mild eye irritant

Method: OECD Test Guideline 405

Result: Irritation to eyes, reversing within 7 days

Remarks: Mild eye irritation.

## 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.

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

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.

4,4'-methylenediphenyl diisocyanate oligomers:

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.

o-(p-isocyanatobenzyl)phenyl isocyanate:  
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.

#### Components:

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

o-(p-isocyanatobenzyl)phenyl isocyanate:  
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

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

o-(p-isocyanatobenzyl)phenyl isocyanate:  
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

##### Components:

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

4,4'-methylenediphenyl diisocyanate oligomers:  
Genotoxicity in vitro : Application Route: Inhalation  
Exposure time: 3 weeks  
Dose: 118 mg/m<sup>3</sup>  
Method: OECD Test Guideline 474  
Result: negative

o-(p-isocyanatobenzyl)phenyl isocyanate:  
Genotoxicity in vitro : Application Route: Inhalation  
Exposure time: 3 weeks  
Dose: 118 mg/m<sup>3</sup>  
Method: OECD Test Guideline 474  
Result: negative

## 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/m<sup>3</sup>), 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/m<sup>3</sup> and no effects at 0.2 mg/m<sup>3</sup>. 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-  
Assessment : No data available

## Reproductive toxicity

### Components:

o-(p-isocyanatobenzyl)phenyl isocyanate:

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.

4,4'-methylenediphenyl diisocyanate oligomers:

Species: Rat, male and female  
Application Route: Inhalation  
Method: OECD Test Guideline 414  
Result: No teratogenic effects.

o-(p-isocyanatobenzyl)phenyl isocyanate:

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.

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.

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 system

Assessment: May cause respiratory irritation.

4,4'-methylenediphenyl diisocyanate oligomers:

Exposure routes: Inhalation

Target organs: Respiratory tract

Assessment: May cause respiratory irritation.

o-(p-isocyanatobenzyl)phenyl isocyanate:

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.

## 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

Method: OECD Test Guideline 453

4,4'-methylenediphenyl diisocyanate oligomers:

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

o-(p-isocyanatobenzyl)phenyl isocyanate:

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

### Components:

o-(p-isocyanatobenzyl)phenyl isocyanate:

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
Ingestion:	No data available

### Toxicology, Metabolism, Distribution

No data available

### Neurological effects

No data available

### Further information

Ingestion:	No data available
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## 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
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4,4'-methylenediphenyl diisocyanate oligomers:

Toxicity to fish	LC50 (Brachydanio rerio (zebrafish)): > 1 000 mg/l Exposure time: 96 h Test type: static test Test substance: Fresh water Method: OECD Test Guideline 203
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o-(p-isocyanatobenzyl)phenyl isocyanate:

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
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#### 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
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4,4'-methylenediphenyl diisocyanate oligomers:

Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): > 1 000 mg/l Exposure time: 24 h Test type: static test Test substance: Fresh water Method: OECD Test Guideline 202
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o-(p-isocyanatobenzyl)phenyl isocyanate:

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

4,4'-methylenediphenyl diisocyanate oligomers:

Toxicity to algae / aquatic plants 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

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 aquatic invertebrates (Chronic toxicity) NOEC:  $\geq 10$  mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Test type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 211

4,4'-methylenediphenyl diisocyanate oligomers:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) NOEC:  $\geq 10$  mg/l  
Exposure time: 21 d  
Species: Brachydanio rerio (zebrafish)  
Test type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 211

o-(p-isocyanatobenzyl)phenyl isocyanate:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) NOEC:  $\geq 10$  mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Test type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) No data available

### Components

4,4'-methylenediphenyl diisocyanate oligomers:

Toxicity to microorganisms EC50 (activated sludge):  $\geq 100$  mg/l  
Exposure time: 3 h  
Test type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 209

o-(p-isocyanatobenzyl)phenyl isocyanate:

Toxicity to microorganisms : EC50 (activated sludge):  $\geq 100$  mg/l  
Exposure time: 3 h  
Test type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 209

### Components

4,4'-methylenediphenyl diisocyanate:

Toxicity to soil dwelling organisms : NOEC:  $\geq 1000$  mg/kg  
Exposure time: 336 h  
Species: Eisenia fetida (earthworms)  
Method: OECD Test Guideline 207

4,4'-methylenediphenyl diisocyanate oligomers:

Toxicity to soil dwelling organisms : NOEC:  $\geq 1000$  mg/kg  
Exposure time: 336 h  
Species: Eisenia fetida (earthworms)  
Method: OECD Test Guideline 207

o-(p-isocyanatobenzyl)phenyl isocyanate:

Toxicity to soil dwelling organisms : NOEC:  $\geq 1000$  mg/kg  
Exposure time: 336 h  
Species: Eisenia fetida (earthworms)  
Method: OECD Test Guideline 207

Plant toxicity : No data available  
Sediment toxicity : No data available  
Toxicity to terrestrial Organisms : No data available  
Ecotoxicology Assessment : No data available  
Acute aquatic toxicity : No data available

### Components

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

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

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)



## Persistence and degradability

### Components

4,4'-methylenediphenyl diisocyanate oligomers:

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

o-(p-isocyanatobenzyl)phenyl isocyanate:

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)  
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.

4,4'-methylenediphenyl diisocyanate oligomers:

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

o-(p-isocyanatobenzyl)phenyl isocyanate:

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

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: 6,17  
GLP: no

4,4'-methylenediphenyl diisocyanate oligomers:

Partition coefficient: n-octanol/water : log Pow: 8,56 (20°C)

o-(p-isocyanatobenzyl)phenyl isocyanate:

Partition coefficient: n-octanol/water : log Pow: 4,51 (20°C)  
pH: 7  
Method: OECD Test Guideline 117

### 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

Ozone-Depletion Potential : No data available

Additional ecological information : No data available

Global warming potential (GWP) : No data available

## 13. DISPOSAL CONSIDERATIONS

### Disposal methods

Waste from residues : Do not dispose of waste in 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.

## 14. TRANSPORT INFORMATION

### International Regulations

#### 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.

## 15. REGULATORY INFORMATION

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

#### Labelling

Symbols (s)	:	Xn	Xi
Risk phrase (s)	:	R40	Limited evidence of a carcinogenic effect.
	:	R20	Harmful by inhalation.
	:	R36/37/38	Irritating to eyes, respiratory system and skin.
	:	R42/43	May cause sensitization by inhalation and skin contact.
	:	R48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation.
Risk phrase (s)	:	S23	Do not breathe gas/fumes/vapour/spray.
	:	S38	In case of insufficient ventilation, wear suitable respiratory equipment.
	:	S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
	:	S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.

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

CH INV	:	The formulation contains substances listed on the Swiss Inventory.
DSL	:	This product contains one or several components listed in the Canadian NDSL.
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
TCSA	:	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).

## 16. OTHER INFORMATION

### Further information

Other information : 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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