Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Chem-Fix Cartridge Part B - Hardener used in elastomer systems

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use: Elastomers

1.3 Details of the supplier of the safety data sheet

Address: Unit A7, The Palisades, 39 Kelly Road, Jet Park, Boksburg, Gauteng, South Africa
Tel: +27 011 552 8073
Email: info@chemtrust-solutions.com

1.4 Emergency telephone number

+27 82 262 4267 / +27 82 326 8277

Section 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition: UVCB

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Acute Tox. 4, H332
Skin Irrit. 2, H315
Eye Irrit. 2, H319
Resp. Sens. 1, H334
Skin Sens. 1, H317
Carc. 2, H351
STOT SE 3, H335
STOT RE 2, H373

Classification according to Directive 67/548/EEC [DSD]

Carc. Cat. 3; R40
Xn; R20, R48/20
Xi; R36/37/38
R42/43

See Section 16 for the full text of the R phrases or H statements declared above.
See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms:

Signal word: Danger

Hazard statements:
Harmful if inhaled.
Causes serious eye irritation.
Causes skin irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
Suspected of causing cancer.
May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure if inhaled. (respiratory tract)

Precautionary statements:

General: Not Applicable
Prevention: Do not breathe dust. Do not breathe vapour or spray. In case of inadequate ventilation wear respiratory protection. Wear protective gloves/protective clothing/ eye protection/face protection.
Response IF INHALED:Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF ON SKIN:Wash with plenty of soap and water. IF IN EYES:Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or if you feel unwell:Call a POISON CENTER or physician.
Storage: Not applicable
Disposal: Not applicable
Supplemental label elements: Not applicable

Special packaging requirements

Containers to be fitted: with child-resistant fastenings Not applicable
Tactile warning of danger: Yes, applicable.

2.3 Other hazards

Risk of absorption through the skin of xylene

Section 3: Composition/information on ingredients

3.1 Substances

Product/Ingredient name	Identifiers	%	Classification 67/548/EEC	Classification Regulation (EC) No 1272/2008 (CLP)	Type

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1, 3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis (oxy)]dipropanol and propane-1,2-diol	CAS: Not available. EC: 500-313-7 RRN: 01-2119486870-28	60-100	Carc. Cat. 3; R40 Xn; R20, R48/20 Xi; R36/37/38 R42/43	Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373	[*]
1,3-Butanediol, polymer with 1,1'-methylenebis [isocyanatobenzene] , [(1-methyl-1, 2-ethanediyl) bis(oxy)] bis[propanol] and 1, 2-propanediol	CAS: 150449-03-9 EC: 500-312-1	30-60	Carc. Cat. 3; R40 Xn; R20, R48/20 Xi; R36/37/38 R42/43	Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373	[A]
			See Section 16 for the full text of the R-phrases declared above.	**See Section 16 for the full text of the H-statements declared above.**	

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type
[*] Substance
[A] Constituent
[B] Impurity
[C] Stabilising additive

Section 4: First aid measures

4.1 Description of first aid measures

Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is laboured, oxygen should be administered by qualified personnel.

Skin contact: After contact with skin, wash immediately with plenty of warm soapy water: Get medical attention if irritation develops. Wash clothing before reuse. Clean shoes thoroughly before reuse. An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-TamTM, PEG-400) or corn oil may be more effective than soap and water.

Ingestion: Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Provided the patient is conscious, wash out mouth with water. Get medical attention if symptoms appear.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye Contact: Irritating to eyes.

Inhalation: LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.
This product is a respiratory irritant and potential respiratory sensitiser: 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.

Skin contact: Irritating to skin. May cause sensitisation by skin contact. Animal studies have shown that respiratory sensitisation can be induced by skin contact with known respiratory sensitisers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.

Ingestion: Low oral toxicity. Ingestion may cause irritation of the gastrointestinal tract.

Over-exposure signs/symptoms

Eye Contact: Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation: Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma

Skin contact: Adverse symptoms may include the following:
irritation
redness

Ingestion: No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments Symptomatic treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

Section 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: Foam, CO2 or 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. Prevent washings from entering water courses, keep fire exposed containers cool by spraying with water.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture: No specific hazard.

Hazardous thermal decomposition products Decomposition products may include the following materials:
Carbon Dioxide
Carbon Monoxide
Nitrogen Oxides

5.3 Advice for firefighters

Special precautions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. PVC boots, gloves, safety helmet and protective clothing should be worn.

Additional information: Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Containers may burst if overheated.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency Personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental Precautions Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

6.3 Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor

Large spill: 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: Absorb spillages onto sand, earth or any suitable adsorbent material. Leave to react for at least 30 minutes. Do not absorb onto sawdust or other combustible materials. Shovel into open-top drums for further decontamination. Wash the spillage area with water. Test atmosphere for MDI vapour. Neutralise small spillages with decontaminant. Remove and dispose of residues. The compositions of liquid decontaminants are given in Section 16. See also brochure PU 193-1 (see section 16).

6.4 Reference to other Sections: See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

Section 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitisation problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10), food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Storage hazard class: Storage class 12, Liquids, not dangerous

7.3 Specific end use(s)

Recommendations: Not available

Industrial sector specific Solutions Not available

Indication for fire/explosion-protection not applicable

Storage:
Demands for spaces of storage and vessels: Store in a dry, well ventilated place away from heat and direct sunlight at temperature not above 50 °C and not below 0 °C .

Store separately from oxidizing agents and strongly alkaline and acidic materials.

Store only in containers of origin. (or containers which are similar)
Observe the label precautions. Store in a dry, well-ventilated place not above 50°C, protected against heat and direct sunlight.

Storage Class: not applicable

Section 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
4,4'-Methylenediphenyl diisocyanate	EH40/2005 WELs (United Kingdom (UK), 12/2011). Skin sensitiser. STEL: 0.07 mg/m³, (as NCO) 15 minutes. TWA: 0.02 mg/m³, (as NCO) 8 hours

Recommended monitoring Procedures: Medical supervision of all employees who handle or come in contact with respiratory sensitisers is recommended. Personnel with a history of asthma-type conditions, bronchitis or skin sensitisation conditions should not work with MDI based products. The Occupational Exposure Limits listed do not apply to previously sensitised individuals. Sensitised individuals should be removed from any further exposure.

Derived effect levels

Product/ingredient name	Type	Exposure	Value	Population	Effects
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis(4-isocyanatobenzene)	DNEL	Short term Dermal	50 mg/kg bw/day	Workers	Systemic

homopolymer, [(methylethylene)bis (oxy)]dipropanol and propane-1, 2-diol					
	DNEL	Short term inhalation	0.1mg/m³	Workers	Systemic
	DNEL	Short term dermal	28.7 mg/cm³	Workers	Local
	DNEL	Short term inhalation	0.1 mg/m³	Workers	Local
	DNEL	Long term inhalation	0.05 mg/m³	Workers	Systemic
	DNEL	Long term inhalation	0.05 mg/m³	Workers	Local
	DNEL	Short term dermal	25 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term inhalation	0.05 mg/m³	Consumers	Systemic
	DNEL	Short term oral	20 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term dermal	17.2 mg/ cm²	Consumers	Local
	DNEL	Short term inhalation	0.05 mg/m³	Consumers	Local
	DNEL	Long term inhalation	0.025 mg/ m³	Consumers	Systemic
	DNEL	Long term inhalation	0.025 mg/ m³	Consumers	Local

Predicted effect concentrations

Product/Ingredient name	Type	Compartment Detail	Value	Method Detail
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis(4-isocyanatobenzene) homopolymer, [(methylethylene)bis (oxy)]dipropanol and propane-1, 2-diol	PNEC	Fresh water	1mg/l	Assessment Factors
	PNEC	Marine	0.1mg/l	Assessment Factors
	PNEC	Soil	1 mg/kg	Assessment Factors
	PNEC	Sewage Treatment plant	1mg/l	Assessment Factors

8.2 Exposure controls

Appropriate engineering Controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective occupational exposure limits. MDI

can only be smelled if the occupational exposure limit has been exceeded considerably.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face 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.

Skin protection

Hand protection: 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 then 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.
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 gloves approved to relevant standards e.g. EN 374 (Europe), F739 (US).
Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material and dexterity. Always seek advice from glove suppliers. Additional information can be found for instance at www.gisbau.de.

Body protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Body: Recommended: Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C' , Tyvek-Pro 'F' disposable coverall.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection: In case of inadequate ventilation wear respiratory protection. 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.

Environmental exposure Controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical State	**Liquid**
Colour	**Not available**
Odour	**Not available**
Odour Threshold	**Not available**
pH	**Not available**
Melting point/Freezing point	**-5 °C**
Initial boiling point and boiling range	**Not available**
Flash point	**Closed cup>230 °C**
Evaporation rate	**Not available**
Flammability	**Not available**
Burning time	**Not available**
Burning rate	**Not available**
Upper/lower flammability or explosive limits	**Not available**
Vapour pressure	**0.00000066 kPa [room temperature]**
Vapour density	**Not available**
Relative density	**Not available**

Section 10: Stability and reactivity

10.1 Reactivity: No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability: Stable at room temperature.

10.3 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.
None know

10.4 Conditions to avoid: No specific data.

10.5 Incompatible materials: Water, alcohols, amines, bases, and acids.

10.6 Hazardous decomposition products Combustion products may include: carbon oxides (CO, CO_2) , nitrogen oxides (NO, NO_2 etc.) , hydrocarbons , HCN.

Section 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Endpoint	Species	Result	Exposure
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	LC50 Inhalation Dusts and mists	Rat - Male, Female	0.49 mg/l	4 hours
	LD50 Dermal	Rabbit - Male, Female	>9400 mg/kg	-
	LD50 Oral	Rat - Female	>5000 mg/kg	-

Conclusion/Summary : No additional information.

Irritation/Corrosion

Product/ingredient name	Test	Species	Route of exposure	Result
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes	Non-irritant.
	OECD 404 Acute Dermal Irritation/ Corrosion	Rabbit	Skin	Irritant

Conclusion/Summary

Skin : 4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1,2-diol — Irritating to skin.

Eyes : 4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [— Based on the human occupational exposure data, this substance is considered as irritating to eyes.

Sensitiser

Product/ingredient name	Test	Route of exposure	Species	Result
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	OECD 406 Skin Sensitization	skin	Guinea pig	Sensitising
	No official guidelines	Respiratory	Guinea pig	Sensitising

Conclusion/Summary

Skin : No additional information.

Respiratory : No additional information.

Mutagenicity

Product/ingredient name	Test	Result
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	OECD 471 Bacterial Reverse Mutation Test	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Negative

Conclusion/Summary : No additional information.

Carcinogenicity

Product/ingredient name	Test	Species	Exposure	Result	Route of exposure	Target organs
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat	2 years; 5 days per week	Negative	Inhalation	-

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	OECD 414 Prenatal Developmental Toxicity Study	Rat - Male, Female	12 mg/m³ NOAEL

Conclusion/Summary : No additional information.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene) bis(oxy)]dipropanol and propane-1,2-diol	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene) bis(oxy)]dipropanol and propane-1,2-diol	Category 2	Inhalation	respiratory tract

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Inhalation : LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.
This product is a respiratory irritant and potential respiratory sensitiser: 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.

Ingestion : Low oral toxicity. Ingestion may cause irritation of the gastrointestinal tract.

Skin contact	:	Irritating to skin. May cause sensitisation by skin contact. Animal studies have shown that respiratory sensitisation can be induced by skin contact with known respiratory sensitisers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.
Eye contact	:	Irritating to eyes.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	:	Adverse symptoms may include the following: respiratory tract irritation coughing wheezing and breathing difficulties asthma
Ingestion	:	No specific data.
Skin contact	:	Adverse symptoms may include the following: irritation redness

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Test	Result type		Result	Target organs
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	NOEC	Dusts and mists	0.2 mg/m³	-
	OECD 413 Subchronic Inhalation Toxicity: 90-day Study	NOEC	Gas.	1 mg/m³	-

Conclusion/Summary : No additional information.

General : May cause damage to organs through prolonged or repeated exposure if inhaled. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in 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.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No birth defects were seen in two independent animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. Fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal, respirable concentrations, which are well in excess of defined occupational exposure limits.

Fertility effects : Not available.

Other information : Not available.

Section 12: Ecological information

12.1 Toxicity

Product/ingredient name	Test	Endpoint	Exposure	Species	Result
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	OECD 201 Alga, Growth Inhibition Test	Acute EC50	72 hours Static	Algae	>1640 mg/l
	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute EC50	3 hours Static	Bacteria	>100 mg/l
	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute EC50	24 hours Static	Daphnia	>1000 mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute LC50	96 hours Static	Fish	>1000 mg/l
	OECD 211 Daphnia Magna Reproduction Test	Chronic NOEC	21 days Semi-static	Daphnia	>=10 mg/l

Conclusion/Summary : No additional information.

12.2 Persistence and degradability

Product/ingredient name	Test	Period	Result
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %

Conclusion/Summary : 4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1,2-diol Not biodegradable

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, 1,1'-methylenebis (4-isocyanatobenzene) homopolymer, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	6.17	200	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : By considering the production and use of the substance, it is unlikely that significant environmental exposure in the air or water will arise. Immiscible with water, but will react with water to produce inert and non-biodegradable solids. Conversion to soluble products, including diamino- diphenylmethane (MDA), is very low under the optimal laboratory conditions of good dispersion and low concentration. In air, the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related diisocyanates.

12.5 Results of PBT and vPvB assessment

PBT : PBT: No.
P: No. B: No. T: No.

vPvB : vPvB: No.
vP: No. vB: No.

12.6 Other adverse effects: No other adverse effects or critical hazards.

12.7 Other ecological information

Section 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal: The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste: Yes

European waste catalogue (EWC)

Waste code	Waste designation
08 05 01* 16 03 058	Waste isocyanates Organic wastes containing dangerous substances

Packaging

Methods of disposal: The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions: This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14: Transport information

	14.1 UN Number	14.2 UN proper shipping name
ARD/RID	Not regulated	
AND	Not regulated	
IMDG	Not regulated	
IATA	Not regulated	

	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards	14.6 Special precautions for user	Additional information
ARD/RID			No	**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	
ADN			No	**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	
IMDG			No	**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	
IATA			No	**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	

14.7 Transport in bulk According to Annex II of Marpo; 73/78 and the IBC Code Not applicable

Section 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
EU Regulation (EC) No. 1907/2006 (REACH)
This product is compliant with the REACH Regulation EC 1907/2006.
Huntsman has pre-registered and is registering all of the substances that it manufactures in or imports into the European Economic Area (EEA) that are subject to Title II of the REACH Regulation.

Annex XIV - List of substances subject to authorisation
Substances of very high concern
None of the components are listed.
Annex XIV

Annex XVII – on the manufacture: placing on the market and use of certain dangerous substances, mixtures and article Not applicable

Other EU Regulations
Europe inventory: All components are listed or exempted
Black list chemicals: Not listed
Priority list chemicals: Not listed
Integrated pollution Prevention and control List: Listed
Integrated pollution Prevention and control List (IPPC)-water: Listed

Product/ingredient name	Carcinogenic effects	Mutagenic effects	Developmental effects	Fertility effects
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with butane-1,3-diol, 2,4'-diisocyanatodiphenylmethane, [(methylethylene)bis(oxy)] dipropanol and propane-1, 2-diol	Carc. 2, H351	-	-	-

National regulations

References	:	The provision of Safety Data Sheets comes under Regulation 6 of CHIP (CHIP is the recognised abbreviation for the Chemicals Hazard Information and Packaging Regulations). This is an addition to the Health and Safety at Work Act 1974.
Australia inventory (AICS)	:	All components are listed or exempted.
Canada inventory	:	At least one component is not listed.
China inventory (IECSC)	:	All components are listed or exempted.
Japan inventory	:	Listed or exempted in Japan Chemical Substance Control Law.
Korea inventory (KECI)	:	All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC)	:	All components are listed or exempted.
Philippines inventory (PICCS)	:	At least one component is not listed.
United States inventory (TSCA 8b)	:	All components are listed or exempted.
Chemical Weapons Convention List Schedule I Chemicals	:	Not listed
Chemical Weapons Convention List Schedule II Chemicals	:	Not listed
Chemical Weapons Convention List Schedule III Chemicals	:	Not listed
15.2 Chemical Safety Assessment	:	Complete.

Section 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms	:	ATE = Acute Toxicity Estimate CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008] DNEL = Derived No Effect Level EUH statement = CLP-specific Hazard statement PNEC = Predicted No Effect Concentration RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Acute Tox. 4, H332	Expert judgment
Skin Irrit. 2, H315	Expert judgment
Eye Irrit. 2, H319	Expert judgment
Resp. Sens. 1, H334	Expert judgment
Skin Sens. 1, H317	Expert judgment
Carc. 2, H351	Expert judgment
STOT SE 3, H335	Expert judgment
STOT RE 2, H373	Expert judgment

Full text of abbreviated H statements :

H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure if inhaled.

Full text of classifications [CLP/GHS] :

Acute Tox. 4, H332	ACUTE TOXICITY: INHALATION - Category 4
Carc. 2, H351	CARCINOGENICITY - Category 2
Eye Irrit. 2, H319	SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
Resp. Sens. 1, H334	RESPIRATORY SENSITIZATION - Category 1
Skin Irrit. 2, H315	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1, H317	SKIN SENSITIZATION - Category 1
STOT RE 2, H373	SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE): INHALATION [respiratory tract] - Category 2
STOT SE 3, H335	SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3

Full text of abbreviated R phrases :

R40- Limited evidence of a carcinogenic effect.
R23- Toxic by inhalation.
R20- Harmful by inhalation.
R48/20- Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R36/37/38- Irritating to eyes, respiratory system and skin.
R42/43- May cause sensitisation by inhalation and skin contact.

Full text of classifications [DSD/DPD] :

Carc. Cat. 3 - Carcinogen category 3
T - Toxic
Xn - Harmful
Xi - Irritant

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