SAFETY DATA SHEET

C.D. PRODUCTS INC
918 N UNION ST
APPLETON, WI 54911
920-739-8685

1.IDENTIFICATION

PFAC I ISOCYNTE FOR 2:1 MIX
C D PRODUCTS INC
918 N UNION ST
APPLETON, WI 54911
920-739-8685

2.HAZARDS IDENTIFICATION

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

Classification of the substance or mixture **:** ACUTE TOXICITY: INHALATION - Category 4

SKIN CORROSION/IRRITATION - Category 2

SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2B

RESPIRATORY SENSITIZATION - Category 1

SKIN SENSITIZATION - Category 1

SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3

GHS label elements

Hazard pictograms **:**

Precautionary statements	:	Wear protective gloves. Wear eye or face protection. In case of inadequate ventilation wear respiratory protection. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. If experiencing respiratory symptoms: Call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention. Store locked up. Dispose of contents and container in accordance with all local, regional, national and international regulations.
Other hazards which do not result in classification	:	Not available.

3.COMPOSITION INFORMATION ON INGREDIENTS

Substance/mixture : Mixture

Ingredient name	%	CAS number
4,4'-Methylenediphenyl diisocyanate	30 - 60	101-68-8
Homopolymer of methylenediphenyl diisocyanate	13 - 30	25686-28-6
2,6-di-tert-butyl-p-cresol	0.1 - 1	128-37-0

Any concentration shown as a range is to protect confidentiality or is due to batch variation. **Occupational exposure limits, if available, are listed in Section 8.**

4.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 : Move exposed person to fresh air. 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: Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. 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. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

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.

Mostmportant symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes eye irritation.

Inhalation : Harmful if inhaled. May cause respiratory irritation. 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. LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.

Skin contact : Causes skin irritation. May cause sensitization 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, but 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.

Indication of immediate medical attention and special treatment needed, if necessary

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

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained

breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

5. FIRE-FIGHTING MEASURES

Flash point : Open cup: 230°C (446°F)

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.

Specific hazards arising from the chemical	:	Hazardous thermal decomposition products
Hazardous thermal decomposition products	:	Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN.
Special protective actions 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.
Remark	:	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.

6. ACCIDENTAL RELEASE MEASURES

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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up : 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. 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. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization 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 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.

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.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Keep container tightly closed in a cool, well-ventilated place. Keep away from moisture. Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Do not reseal contaminated containers. Uncontaminated containers, free of moisture, may be resealed only after placing under a nitrogen blanket. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Unsuitable containers: Do not store in containers made of copper, copper alloys or galvanized surfaces.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Diphenylmethane 4,4' diisocyanate	ACGIH TLV (United States, 3/2012). TWA: 0.005 ppm 8 hours. OSHA PEL (United States, 6/2010). CEIL: 0.02 ppm CEIL: 0.2 mg/m³

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Diisocyanates can only be smelled if the occupational exposure limit has been exceeded considerably.

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.

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.

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.

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.

: 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.

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.

: 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. Recommended: Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C' , Tyvek-Pro 'F' disposable coverall.

: 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.

: 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.

: Not available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	LIQUID
Physical state	LIQUID
Color	LIGHT YELLOW
Odor	N/A

Odor threshold pH	N/A
Melting point/Freezing point	N.A
Boiling/condensation point	>300C DECOMPOSE
Flash point	OPEN CUP 230C
Evaporation rate	N/A
Flammability (solid, gas)	N/A
Lower and upper explosive	N/A
(flammable) limits	N/A
Vapor pressure	N/A
Vapor density	N/A
Relative density	N/A
Partition coefficient: n-	N/A octanol/water
Auto-ignition temperature	>600°C
Decomposition temperature	N/A
Viscosity	N/A

10. STABILKITY AND RECTIVITY

This material is stable under recommended storage conditions

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

Chemical stability

Stable at room temperature.

Possibility of hazardous reactions : Reaction with water (moisture) produces CO2-gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence of solvents. MDI is insoluble with, and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface by liberating carbon dioxide gas.

Conditions to avoid : Avoid high temperatures.

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

Hazardous decomposition products

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

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects Acute toxicity

Product/ingredient name	Test	Endpoint	Species	Result
4,4'-Methylenediphenyl diisocyanate	OECD 403 Acute Inhalation Toxicity OECD 402 Acute Dermal Toxicity	LC50 Inhalation Dusts and mists LD50 Dermal	Rat - Male, Female Rabbit - Male, Female	0.49 mg/l >9400 mg/kg

	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male	>10000 mg/kg
Homopolymer of methylenediphenyl diisocyanate	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	0.49 mg/l
	OECD 425 Acute Oral Toxicity: Up-andDown Procedure	LD50 Oral	Rat - Female	>5000 mg/kg
2,6-di-tert-butyl-p-cresol	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rat - Male, Female	>2000 mg/kg

	-	LD50 Oral	Rat	890 mg/kg
	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male, Female	>2930 mg/kg

Conclusion/Summary :

4,4'-Methylenediphenyl diisocyanate — Irritating to respiratory system.

4,4'-MDI HOMOPOLYMER/ GLY/EO/PO (NCO-ENDED) — Irritating to respiratory system.

Irritation/Corrosion

Product/ingredient name	Test	Species	Result
4,4'-Methylenediphenyl diisocyanate	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Irritant
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes - Non-irritant.
Homopolymer of methylenediphenyl diisocyanate	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes - Non-irritant.
	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Irritant
	OECD 404 Acute Dermal Irritation/Corrosion	Other	Non-corrosive
2,6-di-tert-butyl-p-cresol	No official guidelines	Rabbit	Skin - Non-irritant.
	No official guidelines	Rabbit	Eyes - Non-irritant.

Conclusion/Summary

Skin :

4,4'-Methylenediphenyl diisocyanate — Irritating to skin.

Homopolymer of methylenediphenyl diisocyanate — Irritating to skin.

2,6-di-tert-butyl-p-cresol — Slightly irritating to the skin.

Eyes :

4,4'-Methylenediphenyl diisocyanate — Based on the human occupational exposure data, this substance is considered as irritating to eyes.

		Homopolymer of methylenediphenyl diisocyanate	Irritating to eyes.
		2,6-di-tert-butyl-p-cresol	Slightly irritating to the eyes.
Respiratory	:	4,4'-Methylenediphenyl diisocyanate	No additional information.
		Homopolymer of methylenediphenyl diisocyanate	No additional information.
		2,6-di-tert-butyl-p-cresol	No additional information.

Sensitization

Product/ingredient name	Test	Route of exposure	Species	Result
4,4'-Methylenediphenyl diisocyanate	OECD 429 Skin Sensitization: Local Lymph Node Assay	skin	Mouse	Sensitizing
	OECD 406 Skin Sensitization	skin	Guinea pig	Not sensitizing
	No official guidelines	Respiratory skin	Guinea pig	Sensitizing
Homopolymer of methylenediphenyl diisocyanate	OECD 406 Skin Sensitization		Guinea pig	Sensitizing
	No official guidelines	Respiratory	Guinea pig	Sensitizing
2,6-di-tert-butyl-p-cresol	No official guidelines	skin	Human	Not sensitizing

Mutagenicity

Product/ingredient name	Test	Result
4,4'-Methylenediphenyl diisocyanate	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative
Homopolymer of methylenediphenyl diisocyanate	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative
2,6-di-tert-butyl-p-cresol	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vitro Subject: Mammalian-Animal Metabolic activation: +/-	Negative
	Experiment: In vitro Subject: Mammalian-Animal Metabolic activation: +	Negative

	Experiment: In vivo Subject: Mammalian-Animal	Negative
	Subject: Mammalian-Animal	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative

Conclusion/Summary :

4,4'-Methylenediphenyl diisocyanate — No mutagenic effect.

4,4'-MDI HOMOPOLYMER/ GLY/EO/PO (NCO-ENDED) — No mutagenic effect.

Carcinogenicity

Product/ingredient name	Test	Species	Dose	Exposure	Result/Result type
4,4'-Methylenediphenyl diisocyanate	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	1 mg/m³	2 years; 5 days per week	Positive - Inhalation - NOAEL
Homopolymer of methylenediphenyl diisocyanate	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	1 mg/m³	2 years; 5 days per week	Negative - Inhalation - NOAEL
2,6-di-tert-butyl-p-cresol	No official guidelines	Rat - Male, Female	-	-	Negative - Oral - NOAEL

Carcinogenic class

Product/ingredient name	IARC	OSHA
4,4'-Methylenediphenyl diisocyanate	3	-
2,6-di-tert-butyl-p-cresol	3	-

Reproductive toxicity

Product/ingredient name	Test	Species	Maternal toxicity	Fertility	Developmental effects
2,6-di-tert-butyl-p-cresol	No official guidelines	Rat - Male, Female	Negative	-	-

Conclusion/Summary :

4,4'-Methylenediphenyl diisocyanate — No known significant effects or critical hazards.

4,4'-MDI HOMOPOLYMER/GLY/EO/ PO (NCO-ENDED) — No known significant effects or critical hazards.

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
4,4'-Methylenediphenyl diisocyanate	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	Negative - Inhalation
Homopolymer of methylenediphenyl diisocyanate	OECD 414 Prenatal Developmental Toxicity Study	Rat - Male, Female	Negative - Inhalation
2,6-di-tert-butyl-p-cresol	No official guidelines	Rat	Negative - Oral

Conclusion/Summary :

4,4'-Methylenediphenyl diisocyanate No known significant effects or critical hazards.

4,4'-MDI HOMOPOLYMER/GLY/EO/ No known significant effects or critical hazards.

Product/ingredient name	Category	Route of exposure	Target organs
4,4'-Methylenediphenyl diisocyanate	Category 3	Not applicable.	Respiratory tract irritation
Homopolymer of methylenediphenyl diisocyanate	Category 3	Not applicable.	Respiratory tract irritation

PO (NCO-ENDED)

Specific target organ toxicity (single exposure)

Specific target organ toxicity (repeated exposure) Not available.

Aspiration hazard Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes eye irritation.

Inhalation : Harmful if inhaled. May cause respiratory irritation. 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. LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.

Skin contact : Causes skin irritation. May cause sensitization 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, but ingestion may cause irritation of the gastrointestinal tract.

Symptoms related to the physical, chemical and toxicological characteristics

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.

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	Endpoint	Species	Result
Homopolymer of methylenediphenyl diisocyanate	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Chronic NOEC Inhalation Dusts and mists	Rat - Male, Female	0.2 mg/m³
	OECD 413 Subchronic Inhalation Toxicity: 90-day Study	Sub-chronic NOEC Inhalation Dusts and mists	Rat - Male, Female	<4 mg/m³
2,6-di-tert-butyl-p-cresol	No official guidelines	Chronic NOAEL Oral	Rat - Male, Female	25 mg/kg/d

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 independant 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 : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Inhalation (dusts and mists)	1.362 mg/l

Other information : Not available.

4,4'-Methylenediphenyl diisocyanate	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
Homopolymer of methylenediphenyl diisocyanate	OECD 201 Alga, Growth Inhibition Test	Chronic	NOECr	72 hours Static	Algae	1640	mg/l
	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
2,6-di-tert-butyl-p-cresol	EU EC C.3 Algal Inhibition Test	Acute	EC50	72 hours Static	Algae	>0.4	mg/l
	EU EC 88/302/EC	Acute	EC50	3 hours Static	Bacteria	>10000	mg/l
	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute	EC50	48 hours Static	Daphnia	0.61	mg/l
	EU EC 88/302/EC	Chronic	EC0	3 hours	Bacteria	1000	mg/l

				Static			
	EU EC C.2 Acute Toxicity for Daphnia	Chronic	EC0	48 hours Static	Daphnia	>0.31	mg/l
	EU EC C.1 Acute Toxicity for Fish	Chronic	LC0	96 hours Semi-static	Fish	>0.57	mg/l
	EU EC C.3 Algal Inhibition Test	Chronic	NOEC	72 hours Static	Algae	>0.42	mg/l
	OECD OECD 202: Part II (Daphnia sp., Reproduction Test	Chronic	NOEC	21 days Semi-static	Daphnia	0.316	mg/l

Persistence and degradability

Product/ingredient name	Test	Period	Result
4,4'-Methylenediphenyl diisocyanate	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
Homopolymer of methylenediphenyl diisocyanate	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
2,6-di-tert-butyl-p-cresol	No official guidelines	112 days	5.2 %

	OECD 201 Alga, Growth Inhibition Test	Chronic	NOECr	72 hours Static	Algae	1640	mg/l
Homopolymer of methylenediphenyl diisocyanate	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
2,6-di-tert-butyl-p-cresol	EU EC C.3 Algal Inhibition Test	Acute	EC50	72 hours Static	Algae	>0.4	mg/l
	EU EC 88/302/EC	Acute	EC50	3 hours Static	Bacteria	>10000	mg/l
	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute	EC50	48 hours Static	Daphnia	0.61	mg/l
	EU EC 88/302/EC	Chronic	EC0	3 hours	Bacteria	1000	mg/l

				Static			
	EU EC C.2 Acute Toxicity for Daphnia	Chronic	EC0	48 hours Static	Daphnia	>0.31	mg/l
	EU EC C.1 Acute Toxicity for Fish	Chronic	LC0	96 hours Semi-static	Fish	>0.57	mg/l
	EU EC C.3 Algal Inhibition Test	Chronic	NOEC	72 hours Static	Algae	>0.42	mg/l
	OECD OECD 202: Part II (Daphnia sp., Reproduction Test	Chronic	NOEC	21 days Semi-static	Daphnia	0.316	mg/l

Persistence and degradability

Product/ingredient name	Test	Period	Result
4,4'-Methylenediphenyl diisocyanate	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
Homopolymer of methylenediphenyl diisocyanate	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
2,6-di-tert-butyl-p-cresol	No official guidelines	112 days	5.2 %

12 ECOLOGICAL INFORMATION

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
4,4'-Methylenediphenyl diisocyanate	Fresh water 0.83 days	-	Not readily
Homopolymer of methylenediphenyl diisocyanate	-	-	Not readily
2,6-di-tert-butyl-p-cresol	-	-	Inherent

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
4,4'-Methylenediphenyl diisocyanate	4.51	200	low
Homopolymer of methylenediphenyl diisocyanate	8.56	200	low
2,6-di-tert-butyl-p-cresol	5.1	330 to 1800	high

Mobility in soil

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.

Other adverse effects : No known significant effects or critical hazards.

Other ecological information

BOD5 : Not determined.

COD : Not determined. **TOC** : Not determined.

13. DISPOSAL CONSIDERATIONS

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORTATION CONSIDERATIONS

Proper shipping name

DOT : OTHER REGULATED SUBSTANCES, LIQUID, N.O.S. (Methylene Diphenyl Diisocyanate) **TDG :** Not regulated. **IMDG :** Not regulated.

IATA : Not regulated.

Regulatory information	UN number	Classes	PG*	Label	Additional information
DOT Classification	NA3082	9	II		**Reportable quantity5000 lbs. (2270kg)** Single containers less than 5,000 lbs. are not regulated.
TDG Classification	Not regulated.	-	-		-
IMDG Classification	Not regulated.	-	-		-
IATA Classification	Not regulated.	-	-		-

PG* : Packing group

15 .REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product

United States Regulations

TSCA 8(b) inventory
TSCA 5(a)2 final significant new use rule (SNUR)
TSCA 5(e) substance consent order TSCA 12(b) export notification
SARA 311/312
Clean Air Act Section
112(b) Hazardous Air
Pollutants (HAPs)
: All components are listed or exempted.
: No ingredients listed.
: No ingredients listed.
: No ingredients listed.
: Immediate (acute) health hazard

Product name	Concentration %
: 4,4'-Methylenediphenyl diisocyanate	48.438 - 56.182

information

Clean Air Act - Ozone Depleting Substances (ODS)

: This product does not contain nor is it manufactured with ozone depleting substances.

Product name	Concentration %
: Diphenylmethane 4,4'-diisocyanate	48.438 - 56.182

SARA 313 Form R - Reporting requirements

Ingredient name %	Section 304 CERCLA Hazardous (Lbs)	CERCLA Reportable Quantity	Substance	Product Reportable Quantity (Lbs)
	Listed	5000		9091

CERCLA Hazardous substances

: Diphenylmethane 4,4' 55 diisocyanate

: 4,4'-Methylenediphenyl diisocyanate

State regulations

: This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

PENNSYLVANIA - RTK

: All components are listed or exempted.

California Prop 65

: WHMIS Class D-2A: Material causing other toxic effects (Very toxic).
WHMIS Class D-2B: Material causing other toxic effects (Toxic).

Canadian regulations

CEPA DSL

WHMIS Classes

This product has been classified in accordance with the hazard criteria of the Controlled Products
Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Brazil Regulations
Classification system : Norma ABNT-NBR 14725-2:2012 used
International lists : Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted

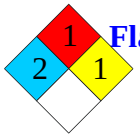
16. OTHER INFORMATION

Hazardous Material Information System (U.S.A.) :

The customer is responsible for determining the PPE code for this material.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

National Fire Protection Association (U.S.A.) :



Flammability
Health
Instability
Special

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Date of printing : 10/31/2014.

Date of issue : 10/31/2014.

Date of previous issue : 07/27/2011

Version : 3

Indicates information that has changed from previously issued version.

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.) Literature reference: PU 193-1 : 'MDI-Based Compositions : Hazards and Safe Handling Procedures.' PU 181-15 : Recommended melting procedures for MDI-based isocyanates.
ISOPA Guidelines for safe Loading/Unloading, Transportation, Storage of TDI and MDI , Ref.03-96 PSC-0005-GUIDL.
SPI PMDI User Guidelines for the Chemical Protective Clothing Selection.
References of methods used in the Physico-Chemical Properties section are reported in Annex V part A to Commission Directive 92/69/EEC of 31 July 1992 adapting to technical progress for the Seventeenth time Council Directive 67/548/EEC.

Notice to reader