

# Material Safety Data Sheet

Hazardous Substance, NON-DANGEROUS GOODS



## 1 . Identification of the material and supplier

**Product name** : TUFFLON-P90 Part A

**Other names** : Not available.

**Recommended use** : Component of a Polyurea System

**Supplier name and address** : Liquimix PtyLtd  
ABN: 32 062 887 585  
1/29 Collinsvale St  
Rocklea  
Queensland 4106 Australia

**Telephone** : + 617 3277 6655

**e-mail address for MSDS information** : admin@liquimix.com

**Emergency telephone number** : **Australia: 0418 725 785 (ALL HOURS)**  
**International: +61 418 725 785 (ALL HOURS)**

## 2 . Hazards identification

**Hazard classification** : HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

This material is classified as hazardous according to Australian criteria.

Not classified as Dangerous Goods for the purpose of transport by road, rail, sea or air transport.

Classified as a C2 (COMBUSTIBLE LIQUID) for the purpose of storage and handling, in accordance with the requirements of AS 1940. Refer to State Regulations for storage and transport requirements.

**Risk phrase(s)** : R40- Limited evidence of a carcinogenic effect.  
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.

**Safety phrase(s)** : S23- Do not breathe gas/fumes/vapour/spray.  
S36/37- Wear suitable protective clothing and gloves.  
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**Poison schedule (Australia)** : None Allocated.

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## 3 . Composition/information on ingredients

**Physical state** : Liquid.

**Colour / Appearance**

Ingredient name	CAS number	Concentration (%)
Polypropylene glycol, diphenylmethane diisocyanate polymer isocyanates, reaction product of polyol with methylenediphenyl diisocyanate	39420-98-9	30 - 60 30 - 60
Other ingredients determined not to be hazardous	-	to 100

## 4 . First-aid measures

### Ingestion

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

### Skin contact

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

### Inhalation

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. 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. In the event of any complaints or symptoms, avoid further exposure.

### Medical Attention and Special Treatment

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.

If poisoning occurs, contact a doctor or Poisons Information Centre. Phone Australia 13 1126; New Zealand 0800 764 766.

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### 5 . Fire-fighting measures

#### Extinguishing media

Foam, CO<sub>2</sub> or dry powder.

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.

#### Hazardous combustion products

Decomposition products may include the following materials:

carbon dioxide

carbon monoxide

nitrogen oxides

#### 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.

#### 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.

In a fire or if heated, a pressure increase will occur and the container may burst.

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. Containers may burst if overheated.

### 6 . Accidental release measures

#### Emergency procedures

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 (see Section 8).

Avoid dispersal of spilt 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 clean-up procedures

##### *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).

##### *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.

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### 7 . Handling and storage

#### Precautions for safe handling

Put on appropriate personal protective equipment (see Section 8). 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. 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. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. 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.

#### Precautions for safe storage

Store between the following temperatures: 16 to 38°C (60.8 to 100.4°F). 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) and food and drink. 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.

Classified as a C2 (COMBUSTIBLE LIQUID) for the purpose of storage and handling, in accordance with the requirements of AS 1940. Refer to State Regulations for storage and transport requirements.

### 8 . Exposure controls/personal protection

#### National exposure standards

##### Ingredient name

4,4'-methylenediphenyl diisocyanate

##### Exposure limits

**Safe Work Australia (Australia, 8/2005). Skin sensitiser.**

STEL: 0.07 mg/m<sup>3</sup> 15 minute(s).

TWA: 0.02 mg/m<sup>3</sup> 8 hour(s).

##### Notes:

Exposure standard (TWA): the time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

STEL (Short Term Exposure Limit): the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour work day.

Peak Limitation Notice: a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes.

Skin Absorption Notice: absorption through the skin may be a significant source of exposure. The exposure standard is invalidated if such contact should occur.

Sensitiser Notice: the substance can cause a specific immune response in some people. An affected individual may subsequently react to exposure to minute levels of that substance.

The Exposure Standards listed represent airborne concentrations of individual chemical substances which, according to current knowledge, should neither impair the health of, nor cause undue discomfort to, nearly all workers. They are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These Exposure Standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

#### Biological limit values

No biological limit allocated.

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### 8 . Exposure controls/personal protection

#### Engineering controls

Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

#### Personal protective equipment

##### Eyes

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. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Refer to Australian/New Zealand Standard AS/NZS 1337:1992 for guidance on selection and use of protective eyewear.

##### Hands

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Refer to Australian/New Zealand Standard AS/NZS 2161.1: 2000 for guidance on selection and use of protective gloves.

##### Respiratory

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.

Refer to Australian/New Zealand Standard AS/NZS 1715 and AS/NZS 1716 for guidance on selection and use of respiratory devices.

##### 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.

### 9 . Physical and chemical properties

**Physical state** : Liquid.  
**Colour / Appearance** : Not available.  
**Solubility** : Insoluble in water. Soluble in many organic solvents.

<b>Density</b>	: 1.11 g/cm <sup>3</sup> [25°C]	<b>Vapour density</b>	: Not available.
<b>Specific gravity</b>	: Not available.	<b>Vapour pressure</b>	: Not available.
<b>Boiling point</b>	: Not available.	<b>Flash point</b>	: Closed cup: 210°C Open cup: 210°C [ASTM D 92 (Cleveland open cup)]
<b>Melting point</b>	: Not available.	<b>Flammable limits</b>	: Not available.

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## 9 . Physical and chemical properties

**Viscosity** : Dynamic (room temperature): 575 to 850 mPa·s  
**Auto-ignition temperature** : Not available.  
**pH** : Not available.

(Typical values only - consult specification sheet)

## 10 . Stability and reactivity

**Chemical stability** : Stable at room temperature. 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** : No specific data.

**Materials to avoid** : water, alcohols, amines, bases, and acids

**Hazardous decomposition products** : Combustion products may include: carbon oxides (CO, CO<sub>2</sub>) , nitrogen oxides (NO, NO<sub>2</sub> etc.) , hydrocarbons , HCN .

**Hazardous Reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

## 11 . Toxicological information

### Potential acute health effects

**Ingestion** : Irritating to mouth, throat and stomach.

**Skin contact** : Irritating to skin. May cause sensitisation by skin contact.

**Eye contact** : Irritating to eyes.

**Inhalation** : Harmful by inhalation. Irritating to respiratory system. May cause sensitisation by inhalation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

### Acute toxicity

Product/ingredient name	Exposure	Species	Dose	Result
Isocyanate based on MDI	LD50 Dermal	Rabbit - Male, Female	>9400 mg/kg	-
	LD50 Oral	Rat - Male	>10000 mg/kg	-
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl) phenyl isocyanate	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 - Male	>10000 mg/kg	-
	LC50 Inhalation Dusts and mists	Rat - Male, Female	0.49 mg/L	4 hours

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## 11 . Toxicological information

### Potential chronic health effects

#### Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl) phenyl isocyanate	Positive - Inhalation - NOAEL	Rat - Male, Female	1 mg/m3	2 years; 5 days per week

#### Mutagenicity

Product/ingredient name	Test	Experiment	Result
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl) phenyl isocyanate	EU EC B.13/14 Mutagenicity - Reverse Mutation Testing using Bacteria	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Negative

#### Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl) phenyl isocyanate	Negative - Inhalation	Rat - Male, Female	12 mg/m3 NOAEL	20 days

**Chronic effects** : Harmful: danger of serious damage to health by prolonged exposure through inhalation. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity** : May cause cancer, based on animal data. Limited evidence of a carcinogenic effect. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

### Over-exposure signs/symptoms

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

**Ingestion** : No specific data.

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

**Eyes** : Adverse symptoms may include the following:  
irritation  
watering  
redness

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## 11 . Toxicological information

## 12 . Ecological information

**Environmental effects** : No known significant effects or critical hazards.

### Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl) phenyl isocyanate	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute EC50 >1000 mg/L Fresh water	Daphnia	24 hours Static
	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute EC50 >100 mg/L Fresh water	Bacteria	3 hours Static
	OECD 203 Fish, Acute Toxicity Test	Acute LC50 >1000 mg/L	Fish	96 hours Static
	OECD 211 Daphnia Magna Reproduction Test	Chronic NOEC >10 mg/L Fresh water	Daphnia	21 days Semi- static

**Conclusion/Summary** : Not available.

### Biodegradability

Product/ingredient name	Test	Result	Dose	Inoculum
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl) phenyl isocyanate	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	0 % - Not readily - 28 days	30 mg/L BOD:	-

**Conclusion/Summary** : Not available.

<u>Product/ingredient name</u>	<u>Aquatic half-life</u>	<u>Photolysis</u>	<u>Biodegradability</u>
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	-	-	Not readily

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	4.51	200	high

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## 12 . Ecological information

**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.

## 13 . Disposal considerations

### 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. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. 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.

## 14 . Transport information

### Road and rail transport

Not classified as dangerous goods by the criteria of the Australian Dangerous Goods (ADG) Code for transport by road and rail.

### Marine transport

Not classified as dangerous goods by the criteria of the International Maritime Dangerous Goods (IMDG) Code for transport by sea.

### Air transport

Not classified as dangerous goods by the criteria of the International Air Transport Association (IATA) Code for transport by air.

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## 15 . Regulatory information

### Inventory status

Country	Inventory	Status
Australia	AICS	All components are listed or exempted.
Canada	DSL	All components are listed or exempted.
China	IECSC	All components are listed or exempted.
Europe	EINECS/ELINCS/NLP	All components are listed or exempted.
Japan	ENCS	Listed or exempted in Japan Chemical Substance Control Law.
Korea	KECI	Listed
New Zealand	NZIoC	All components are listed or exempted.
Philippines	PICCS	Not determined.
United States	TSCA	All components are listed or exempted.

**Carcinogen schedule (Australia)** : None Allocated.

**Poison schedule (Australia)** : None Allocated.

## 16 . Other information

✔ Indicates information that has changed from previously issued version.

### Disclaimer

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.

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## 16 . Other information

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

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