

SAFETY DATA SHEET

ISSUED DATE: 10th September 2016

Revision Date 19-Dec- 2016

Version 1

Section 1: PRODUCT IDENTIFIER AND CHEMICAL IDENTITY

Product Identifier

Product name AUSTHANE AUSMDI Isocyanate AUE276 Part B
Synonyms Product Code: AUE276
Other means of identification Plastifoam

Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses Part B liquid component of Polyurethane Foam System

Details of the manufacturer/importer

Registered company name Australian Urethane Systems
Address 25 Garling Road Kings Park 2148 NSW Australia
Telephone +61 2 9678 9833
Fax +61 2 9678 9887
Website <http://www.ausurethane.com/>
Email sales@ausurethane.com

Emergency telephone number
Association / Organisation Not Available
Emergency telephone numbers 1800 039 008
Other emergency telephone numbers +800 2436 2255 (International)

CHEMWATCH EMERGENCY RESPONSE

Primary Number 1800 039 008
Alternative Number 1 +612 9186 1132
Alternative Number 2 Not Available

Once connected and if the message is not in your preferred language then please dial 01

Details of Distributor

Fiberglass (A/Asia) Sales Pty. Ltd.
 2 Lincoln Street,
 Minto NSW 2566

For further information, please contact
Contact Point Phone: (02) 9820 1144
Email: info@fiberglass-sales.com.au

Section 2: HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

CHEMWATCH HAZARD RATINGS

	1	2	3	4
Flammability	1			
Toxicity	3			
Body Contact	2			
Reactivity	1			
Chronic	2			

Min Max
 0 = Minimum
 1 = Low
 2 = Moderate
 3 = High
 4 = Extreme

Poisons Schedule S6

Risk Phrases (1)
R23 Toxic by inhalation.
R36/37/38 Irritating to eyes, respiratory system and skin.
R40 Limited evidence of a carcinogenic effect.
R42/43 May cause SENSITISATION by inhalation and skin contact.
R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.

Legend: 1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI



Relevant risk statements are found in section 2

Indication(s) of danger T

SAFETY ADVICE

- S01** Keep locked up.
- S02** Keep out of reach of children.
- S04** Keep away from living quarters.
- S13** Keep away from food, drink and animal feeding stuffs.
- S20** When using do not eat or drink.
- S21** When using do not smoke.
- S23** Do not breathe gas/fumes/vapour/spray.
- S26** In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.
- S281** After contact with skin, wash immediately with detergent and plenty of water.
- S29** Do not empty into drains.
- S35** This material and its container must be disposed of in a safe way.
- S36** Wear suitable protective clothing.
- S37** Wear suitable gloves.
- S38** In case of insufficient ventilation, wear suitable respiratory equipment.
- S39** Wear eye/face protection.
- S40** To clean the floor and all objects contaminated by this material, use water and detergent.
- S41** In case of fire and/or explosion, DO NOT BREATHE FUMES.
- S45** In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).
- S46** If swallowed, seek medical advice immediately and show this container or label.
- S53** Avoid exposure - obtain special instructions before use.
- S56** Dispose of this material and its container at hazardous or special waste collection point.
- S63** In case of accident by inhalation: remove casualty to fresh air and keep at rest.
- S64** If swallowed, rinse mouth with water (only if the person is conscious).

Other hazards

Skin contact may produce health damage*.

Ingestion may produce serious health damage*.

Cumulative effects may result following exposure*.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS**Substance** See section below for composition of Mixtures

<u>CAS No</u>	<u>% Weight-</u>	<u>Chemical Name</u>
9016-87-9	30-60	polymeric diphenylmethane diisocyanate
101-68-8	30-60	4,4'-diphenylmethane diisocyanate (MDI)
Not Available	<10	methylene diphenyl diisocyanate

Section 4: FIRST AID MEASURES**Description of first aid Measures**

- Eye Contact** If this product comes in contact with the eyes:
Wash out immediately with fresh running water.
Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
Seek medical attention without delay; if pain persists or recurs seek medical attention.
Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
- Skin Contact** If skin contact occurs:
Immediately remove all contaminated clothing, including footwear.
Flush skin and hair with running water (and soap if available).
Seek medical attention in event of irritation.
- Inhalation** If fumes or combustion products are inhaled remove from contaminated area.
Lay patient down. Keep warm and rested.
Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
Transport to hospital, or doctor, without delay.

Ingestion

If swallowed do **NOT** induce vomiting.

If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

Observe the patient carefully.

Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.

Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.

Seek medical advice.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

Indication of any immediate medical attention and special treatment needed

For sub-chronic and chronic exposures to isocyanates:

This material may be a potent pulmonary sensitiser which causes bronchospasm even in patients without prior airway hyperreactivity.

Clinical symptoms of exposure involve mucosal irritation of respiratory and gastrointestinal tracts.

Conjunctival irritation, skin inflammation (erythema, pain vesiculation) and gastrointestinal disturbances occur soon after exposure.

Pulmonary symptoms include cough, burning, substernal pain and dyspnoea.

Some cross-sensitivity occurs between different isocyanates.

Noncardiogenic pulmonary oedema and bronchospasm are the most serious consequences of exposure. Markedly symptomatic patients should receive oxygen, ventilatory support and an intravenous line.

Treatment for asthma includes inhaled sympathomimetics (epinephrine [adrenalin], terbutaline) and steroids.

Activated charcoal (1 g/kg) and a cathartic (sorbitol, magnesium citrate) may be useful for ingestion.

Mydriatics, systemic analgesics and topical antibiotics (Sulamyd) may be used for corneal abrasions.

There is no effective therapy for sensitised workers.

[Ellenhorn and Barceloux; Medical Toxicology]

NOTE: Isocyanates cause airway restriction in naive individuals with the degree of response dependant on the concentration and duration of exposure. They induce smooth muscle contraction which leads to bronchoconstrictive episodes. Acute changes in lung function, such as decreased FEV1, may not represent sensitivity. [Karol & Jin, *Frontiers in Molecular Toxicology*, pp 56-61, 1992] Personnel who work with isocyanates, isocyanate prepolymers or polyisocyanates should have a pre-placement medical examination and periodic examinations thereafter, including a pulmonary function test. Anyone with a medical history of chronic respiratory disease, asthmatic or bronchial attacks, indications of allergic responses, recurrent eczema or sensitisation conditions of the skin should not handle or work with isocyanates. Anyone who develops chronic respiratory distress when working with isocyanates should be removed from exposure and examined by a physician. Further exposure must be avoided if a sensitivity to isocyanates or polyisocyanates has developed.

Section 5: FIRE FIGHTING MEASURES

Extinguishing media

Small quantities of water in contact with hot liquid may react violently with generation of a large volume of rapidly expanding hot sticky semi-solid foam.

Presents additional hazard when fire fighting in a confined space.

Cooling with flooding quantities of water reduces this risk.

Water spray or fog may cause frothing and should be used in large quantities.

Foam.

Dry chemical powder.

BCF (where regulations permit).

Carbon dioxide.

Water spray or fog - Large fires only.

Special hazards arising from the substrate or mixture

Fire Incompatibility Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters**Fire Fighting**

Alert Fire Brigade and tell them location and nature of hazard.

Wear breathing apparatus plus protective gloves.

Prevent, by any means available, spillage from entering drains or water course.

Use water delivered as a fine spray to control fire and cool adjacent area.

Avoid spraying water onto liquid pools.

Do not approach containers suspected to be hot.

Cool fire exposed containers with water spray from a protected location.

If safe to do so, remove containers from path of fire.

Fire/Explosion Hazard

Combustible.

Moderate fire hazard when exposed to heat or flame.

When heated to high temperatures decomposes rapidly generating vapour which pressures and may then rupture containers with release of flammable and highly toxic isocyanate vapour.

Burns with acrid black smoke and poisonous fumes.

Combustion yields traces of highly toxic hydrogen cyanide HCN, plus toxic nitrogen oxides NOx and carbon monoxide.

May emit corrosive fumes.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Minor Spills

Remove all ignition sources.
 Clean up all spills immediately.
 Avoid breathing vapours and contact with skin and eyes.
 Control personal contact with the substance, by using protective equipment.
 Contain and absorb spill with sand, earth, inert material or vermiculite.
 Wipe up.
 Place in a suitable, labelled container for waste disposal.
 Liquid Isocyanates and high isocyanate vapour concentrations will penetrate seals on self contained breathing apparatus - SCBA should be used inside encapsulating suit where this exposure may occur.
 For isocyanate spills of less than 40 litres (2 m²):
 Evacuate area from everybody not dealing with the emergency, keep them upwind and prevent further access, remove ignition sources and, if inside building, ventilate area as well as possible.
 Notify supervision and others as necessary.
 Put on personal protective equipment (suitable respiratory protection, face and eye protection, protective suit, gloves and impermeable boots).
 Control source of leakage (where applicable).
 Dike the spill to prevent spreading and to contain additions of decontaminating solution.
 Prevent the material from entering drains.
 Estimate spill pool volume or area.
 Absorb and decontaminate. - Completely cover the spill with wet sand, wet earth, vermiculite or other similar absorbent. - Add neutraliser (for suitable formulations: see below) to the adsorbent materials (equal to that of estimated spill pool volume). Intensify contact between spill, absorbent and neutraliser by carefully mixing with a rake and allow to react for 15 minutes
 Shovel absorbent/decontaminant solution mixture into a steel drum.
 Decontaminate surface. - Pour an equal amount of neutraliser solution over contaminated surface. - Scrub area with a stiff bristle brush, using moderate pressure. - Completely cover decontaminant with vermiculite or other similar absorbent. - After 5 minutes, shovel absorbent/decontamination solution mixture into the same steel drum used above.
 Monitor for residual isocyanate. If surface is decontaminated, proceed to next step. If contamination persists, repeat decontaminate procedure immediately above
 Place loosely covered drum (release of carbon dioxide) outside for at least 72 hours. Label waste-containing drum appropriately. Remove waste materials for incineration.
 Decontaminate and remove personal protective equipment.
 Return to normal operation.
 Conduct accident investigation and consider measures to prevent reoccurrence.

Major Spills

Decontamination:
 Treat isocyanate spills with sufficient amounts of isocyanate decontaminant preparation ("neutralising fluid"). Isocyanates and polyisocyanates are generally not miscible with water. Liquid surfactants are necessary to allow better dispersion of isocyanate and neutralising fluids/ preparations. Alkaline neutralisers react faster than water/surfactant mixtures alone. Typically, such a preparation may consist of:
 Sawdust: 20 parts by weight Kieselguhr 40 parts by weight plus a mixture of {ammonia (s.g. 0.880) 8% v/v non-ionic surfactant 2% v/v water 90% v/v}.
 Let stand for 24 hours
 Three commonly used neutralising fluids each exhibit advantages in different situations.

Formulation A :

liquid surfactant	0.2-2%
sodium carbonate	5-10%
water to	100%

Formulation B

liquid surfactant	0.2-2%
concentrated ammonia	3-8%
water to	100%

Formulation C

ethanol, isopropanol or butanol	50%
concentrated ammonia	5%
water to	100%

After application of any of these formulae, let stand for 24 hours.

Formulation B reacts faster than Formulation A. However, ammonia-based neutralisers should be used only under well-ventilated conditions to avoid overexposure to ammonia or if members of the emergency team wear suitable respiratory protection. Formulation C is especially suitable for cleaning of equipment from unreacted isocyanate and neutralizing under freezing conditions. Regard has to be taken to the flammability of the alcoholic solution.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

Section 7: HANDLING AND STORAGE

Precautions for safe handling

Safe handling Avoid all personal contact, including inhalation.
 Wear protective clothing when risk of exposure occurs.
 Use in a well-ventilated area.
 Prevent concentration in hollows and sumps.
DO NOT enter confined spaces until atmosphere has been checked.
 Avoid smoking, naked lights or ignition sources.
 Avoid contact with incompatible materials.
 When handling, **DO NOT eat, drink or smoke.**
 Keep containers securely sealed when not in use.
 Avoid physical damage to containers.
 Always wash hands with soap and water after handling.
 Work clothes should be laundered separately.
 Use good occupational work practice.
 Observe manufacturer's storage and handling recommendations contained within this SDS.
 Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
DO NOT allow clothing wet with material to stay in contact with skin

Other information for commercial quantities of isocyanates:
 Isocyanates should be stored in adequately bunded areas. Nothing else should be kept within the same bunding. Pre-polymers need not be segregated.
 Drums of isocyanates should be stored under cover, out of direct sunlight, protected from rain, protected from physical damage and well away from moisture, acids and alkalis.
 Where isocyanates are stored at elevated temperatures to prevent solidifying, adequate controls should be installed to prevent the high temperatures and precautions against fire should be taken.
 Where stored in tanks, the more reactive isocyanates should be blanketed with a non-reactive gas such as nitrogen and equipped with absorptive type breather valve (to prevent vapour emissions)..
 Transfer systems for isocyanates in bulk storage should be fully enclosed and use pump or vacuum systems. Warning signs, in appropriate languages, should be posted where necessary.
 Areas in which polyurethane foam products are stored should be supplied with good general ventilation. Residual amounts of unreacted isocyanate may be Remove all ignition sources. present in the finished foam, resulting in hazardous atmospheric concentrations.
 Rotate all stock to prevent ageing. Use on FIFO (First In-First Out) basis
 Store in original containers.
 Keep containers securely sealed.
 No smoking, naked lights or ignition sources.
 Store in a cool, dry, well-ventilated area.
 Store away from incompatible materials and foodstuff containers.
 Protect containers against physical damage and check regularly for leaks.
 Observe manufacturer's storage and handling recommendations contained within this SDS.

Other information Store in original containers.
 Keep containers securely sealed.
 No smoking, naked lights or ignition sources.
 Store in a cool, dry, well-ventilated area.
 Store away from incompatible materials and foodstuff containers.
 Protect containers against physical damage and check regularly for leaks.
 Observe manufacturer's storage and handling recommendations contained within this MSDS.

Conditions for safe storage, including any incompatibilities

Suitable container Metal can or drum
 Packaging as recommended by manufacturer.
 Check all containers are clearly labelled and free from leaks.

Storage incompatibility

Avoid cross contamination between the two liquid parts of product (kit).
 If two part products are mixed or allowed to mix in proportions other than manufacturer's recommendation, polymerisation with gelation and evolution of heat (exotherm) may occur.
 This excess heat may generate toxic vapour
 Avoid reaction with water, alcohols and detergent solutions.
 Isocyanates and thioisocyanates are incompatible with many classes of compounds, reacting exothermically to release toxic gases. Reactions with amines, strong bases, aldehydes, alcohols, alkali metals, ketones, mercaptans, strong oxidisers, hydrides, phenols, and peroxides can cause vigorous releases of heat. Acids and bases initiate polymerisation reactions in these materials.
 Isocyanates easily form adducts with carbodiimides, isothiocyanates, ketenes, or with substrates containing activated CC or CN bonds.
 Some isocyanates react with water to form amines and liberate carbon dioxide. This reaction may also generate large volumes of foam and heat. Foaming in confined spaces may produce pressure in confined spaces or containers. Gas generation may pressurise drums to the point of rupture.
 Do NOT reseal container if contamination is expected
 Open all containers with care Base-catalysed reactions of isocyanates with alcohols should be carried out in inert solvents. Such reactions in the absence of solvents often occur with explosive violence, Isocyanates will attack and embrittle some plastics and rubbers.
 A range of exothermic decomposition energies for isocyanates is given as 20-30 kJ/mol.
 The relationship between energy of decomposition and processing hazards has been the subject of discussion; it is suggested that values of energy released per unit of mass, rather than on a molar basis (J/g) be used in the assessment. For example, in "open vessel processes" (with man-hole size openings, in an industrial setting), substances with exothermic decomposition energies below 500 J/g are unlikely to present a danger, whilst those in "closed vessel processes" (opening is a safety valve or bursting disk) present some danger where the decomposition energy exceeds 150 J/g.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Materialname	TWA	STEL	Peak	Notes
Australia Exposure Standards	polymeric diphenylmethane diisocyanate	Isocyanates, all (as-NCO)	0.02 mg/m ³	0.07 mg/m ³	Not Available	Sen
Australia Exposure Standards	4,4'-diphenylmethane diisocyanate (MDI)	Isocyanates, all (as-NCO)	0.02 mg/m ³	0.07 mg/m ³	Not Available	Sen

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
polymeric diphenylmethane diisocyanate	Polymethylene polyphenyl isocyanate; (Polymeric diphenylmethane diisocyanate)	0.15 mg/m ³	0.26 mg/m ³	22 mg/m ³
4,4'-diphenylmethane diisocyanate (MDI)	Methylene diphenyl diisocyanate; (Diphenylmethane diisocyanate; MDI)	0.45 mg/m ³	Not Available	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	Methylenebis(isocyanato-benzene), 1,1'-; (Diphenyl methane diisocyanate)	40 mg/m ³	40 mg/m ³	240 mg/m ³

Ingredient	Original IDLH Revised	IDLH
polymeric diphenylmethane diisocyanate	Not Available	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	100 mg/m ³	75 mg/m ³
methylene diphenyl diisocyanate	Not Available	Not Available

Exposure controls

Appropriate engineering controls

All processes in which isocyanates are used should be enclosed wherever possible.

Total enclosure, accompanied by good general ventilation, should be used to keep atmospheric concentrations below the relevant exposure standards.

If total enclosure of the process is not feasible, local exhaust ventilation may be necessary. Local exhaust ventilation is essential where lower molecular weight isocyanates (such as TDI or HDI) is used or where isocyanate or polyurethane is sprayed.

Where other isocyanates or pre-polymers are used and aerosol formation cannot occur, local exhaust ventilation may not be necessary if the atmospheric concentration can be kept below the relevant exposure standards.

Where local exhaust ventilation is installed, exhaust vapours should not be vented to the exterior in such a manner as to create a hazard.

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.

Employers may need to use multiple types of controls to prevent employee overexposure.

Spraying of material or material in admixture with other components must be carried out in conditions conforming to local state regulations (AS/NZS 4114,

UNI EN 12215:2010, ANSI/AIHA Z9.3-2007 or national equivalent).

Local exhaust ventilation with full face positive-pressure air supplied breathing apparatus (hood or helmet type) is required.

Spraying should be performed in a spray booth fitted with an effective exhaust system which complies with local environmental legislation.

The spray booth area must be isolated from unprotected personnel whilst spraying is in progress and until all spraying mist has cleared.

NOTE: Isocyanate vapours will not be adequately absorbed by organic vapour respirators. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)

Within each range the appropriate value depends on:

Lower end of the range

- 1: Room air currents minimal or favourable to capture
- 2: Contaminants of low toxicity or of nuisance value only

Upper end of the range

- 1: Disturbing room air currents
- 2: Contaminants of high toxicity

3: Intermittent, low production.

3: High production, heavy use

4: Large hood or large air mass in motion

4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 4-10 m/s (800-2000 f/min.) for extraction of solvents generated by spraying at a point 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Personal protection



Eye and face protection

Safety glasses with side shields.

Chemical goggles.

Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

Skin protection

See Hand protection below

Hands/feet protection

NOTE:

The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

Do NOT wear natural rubber (latex gloves). Isocyanate resistant materials include Teflon, Viton, nitrile rubber and some PVA gloves. Protective gloves and overalls should be worn as specified in the appropriate national standard.

Contaminated garments should be removed promptly and should not be re-used until they have been decontaminated.

NOTE: Natural rubber, neoprene, PVC can be affected by isocyanates

DO NOT use skin cream unless necessary and then use only minimum amount.

Isocyanate vapour may be absorbed into skin cream and this increases hazard.

Avoid contact with moisture.

Body protection

See Other protection below

Other protection

All employees working with isocyanates must be informed of the hazards from exposure to the contaminant and the precautions necessary to prevent damage to their health. They should be made aware of the need to carry out their work so that as little contamination as possible is produced, and of the importance of the proper use of all safeguards against exposure to themselves and their fellow workers. Adequate training, both in the proper execution of the task and in the use of all associated engineering controls, as well as of any personal protective equipment, is essential.

Employees exposed to contamination hazards should be educated in the need for, and proper use of, facilities, clothing and equipment and thereby maintain a high standard of personal cleanliness. Special attention should be given to ensuring that all personnel understand instructions, especially newly recruited employees and those with local-language difficulties, where they are known.

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

Thermal hazards

Not Available

<p>Recommended material(s) GLOVE SELECTION INDEX Glove selection is based on a modified presentation of the: "Forsberg Clothing Performance Index". The effect(s) of the following substance(s) are taken into account in the computer-generated selection: AUSTHANE AUSMDI Isocyanate</p> <p>Material CPI CPI PE/EVAL/PE C * CPI - Chemwatch Performance Index A: Best Selection B: Satisfactory; may degrade after 4 hours continuous immersion</p>	<p>Respiratory protection Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.</p> <p>In certain circumstances, personal protection of the individual employee is necessary. Personal protective devices should be regarded as being supplementary to substitution and engineering control and should not be used in preference to them as they do</p>
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C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
 * Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

nothing to eliminate the hazard.
 However, in some situations, minimising exposure to isocyanates by enclosure and ventilation is not possible, and occupational exposure standards may be exceeded, particularly during on-site mixing of paints, spray-painting, foaming and maintenance of machine and ventilation systems. In these situations, air-line respirators or self-contained breathing apparatus complying with the appropriate national standard must be used.

Organic vapour respirators with particulate pre- filters and powered, air-purifying respirators are NOT suitable.

Personal protective equipment must be appropriately selected, individually fitted and workers trained in their correct use and maintenance. Personal protective equipment must be regularly checked and maintained to ensure that the worker is being protected. Air- line respirators or self-contained breathing apparatus complying with the appropriate national standard should be used during the clean-up of spills and the repair or clean-up of contaminated equipment and similar situations which cause emergency exposures to hazardous atmospheric concentrations of isocyanate.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Pale brown liquid with slightly pungent odour; reacts slowly with water.		
Physical state	Liquid	Relative density (Water = 1)	1.22
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	>600
pH (as supplied)	Not Applicable	Decomposition temperature	>230
Melting point / freezing point (°C)	>5	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	>200	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	>50 (ASTM D-92)	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Flammable.	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Negligible	Gas group	Not Available
Solubility in water (g/L)	Immiscible	pH as a solution (1%)	Not Applicable
Vapour density (Air = 1)	>1	VOC g/L	Not Available

Section 10: STABILITY AND REACTIVITY

Reactivity	See Section 7
Chemical stability	Unstable in the presence of incompatible materials. Product is considered stable. Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

Section 11: TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhaled	Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo.
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual. Ingestion may result in nausea, abdominal irritation, pain and vomiting
Skin Contact	There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons.
Eye	There is some evidence to suggest that this material can cause eye irritation and damage in some persons.

Chronic

There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment. Based on experience with animal studies, exposure to the material may result in toxic effects to the development of the foetus, at levels which do not cause significant toxic effects to the mother.

**AUSTHANE AUSMDI
AUE276**

TOXICITY
Not Available

IRRITATION
Not Available

extracted from RTECS - Register of Toxic Effect of chemical Substances

POLYETHYLENE/POLYPROPYLENE GLYCOL GLYCERYL ETHER

No significant acute toxicological data identified in literature search.

Non-chlorinated triphosphates have varying chemical, physical, toxicological and environmental properties. Blooming has been identified as a source of potential exposure (human and environmental) to triphosphate plasticisers / flame retardants. Blooming is the movement of an ingredient in rubber or plastic to the outer surface after curing. Blooming is quickened by increased temperature, and triphosphates are known to bloom from car interior plastics, TVs and computer monitors. These substances are absorbed to various organs, particularly the liver and kidney but also the brain. Excretion is rapid and mainly in the urine. Animal testing shows that they have low to moderate acute toxicity, and do not significantly irritate the skin and eye. TCEP has caused convulsions, brain lesions and impaired performance in animal testing. These substances have not been found to cause developmental toxicity or birth defects, but may reduce fertility. Data suggests that they do not cause mutations. Animal testing suggests that these substances, in particular TCEP, TDCPP and TDCiPP, can all cause tumours in various organs, including cancers. At high doses, they may also cause immunotoxicity.

For tris(2-chloro-1-methylethyl)phosphate (TCPP) The flame retardant product supplied in the EU, marketed as TCPP, is actually a reaction mixture containing four isomers. The individual isomers in this reaction mixture are not separated or marketed. The individual components are never produced as such. These data are true for TCPP produced by all EU manufacturers. The other isomers in the mixture include bis(1-chloro-2-propyl)-2-chloropropyl phosphate (CAS 76025-08-6); bis(2-chloropropyl)-1-chloro-2-propyl phosphate (CAS 76649-15-5) and tris(2-chloropropyl) phosphate (CAS 6145-73-9). The assumption is made that all isomers have identical properties in respect of risk assessment. The assumption is justified in part by the fact that they exhibit very similar chromatographic properties, even under conditions optimised to separate them. Predicted physicochemical properties differ to only a small extent.

Chlorinated alkyl phosphate esters (particularly TCPP) were identified as possible substitutes for the fire retardant pentabromodiphenyl ether. They appear to be relatively persistent substances, and there is some human health concern. Three substances in this group have been characterised to a degree and serve as a read across reference for TCPP. They include tris(2-chloroethyl)phosphate (TCEP, CAS 115-96-8), tris[2-(chloro-1-chloromethyl)ethyl]phosphate (TDCP, CAS 13674-87-8) and 2,2-bis(chloromethyl)trimethylene bis[bis(2-chloroethyl)phosphate] (V6, CAS 38051-10-4). Other flame retardants in this family, which do not appear as EU HPV (High Production Volume) substances, include tetrakis[2-(chloroethyl)ethylene]diphosphate (CAS 33125-86-9), tris (2,3-dichloro-1-propyl)phosphate (CAS 78-43-3, an isomer of TDCP).

Acute toxicity: The inhalation exposure studies in animals were somewhat equivocal and in general lacking in detailed information. One study yielded an LC50 of > 7 mg/L/4 hr. A limit test yielded an acute LC50 value of >4.6 mg/L/4h. No deaths occurred at this concentration. Toxic signs observed in this study, and in 2 further poorly reported studies, included mild lethargy, matted fur, acute bodyweight depression and convulsions. From the studies, it appears that TCPP is more toxic when administered whole body as aerosol than by nose-only exposure. This suggests that some of the systemic toxicity observed when TCPP is administered whole body may result from dermal or oral uptake, rather than inhalation. Therefore, it is concluded that TCPP is of low toxicity via the inhalation route.

Studies in rats indicated that TCPP is of moderate toxicity via the oral route of exposure, with LD50 values from the better quality studies ranging from 632 mg/kg up to 4200 mg/kg, with the majority of values determined to be <2000 mg/kg. Common clinical and macroscopic signs of toxicity observed on nearly all studies included depression, ataxia, hunched posture, lethargy, laboured respiration, increased salivation, partially closed eyelids, body tremors, pilo-erection, ptosis, haemorrhagic lungs and dark liver and/or kidneys. A NOAEL of 200 mg/kg can be identified for acute oral toxicity. This is taken from a 1996 study, in which no clinical signs of toxicity were observed in animals dosed with 200 mg/kg TCPP. Based on the results of the acute oral studies, TCPP should be classified with R22, harmful if swallowed.

TRIS(2- CHLOROISOPROPYL)PHOSPHATE

In a delayed neurotoxicity study conducted in hens, TCPP showed moderate toxicity. The principle effects were reduced mean body weight and food consumption, feather loss and cessation of laying. There was no evidence of inhibited plasma acetylcholinesterase or brain neurotoxic esterase enzyme levels. Therefore, there is no concern for acute delayed neurotoxicity for TCPP.

Studies in rats and rabbits indicated that TCPP is of low toxicity via the dermal route of exposure with LD50 values of >2000mg/kg.

There is an extensive database in animals, indicating that TCPP is non-irritant in the rabbit eye and skin. The lack of any substantial skin or eye irritation and the lack of irritation observed in the acute inhalation studies suggest that TCPP would be unlikely to produce significant respiratory tract irritation.

Evidence from a guinea pig study as well as from a local lymph node assay, indicates that TCPP does not possess significant skin sensitization potential. No information is available on the respiratory sensitisation potential of TCPP.

Repeat dose toxicity: A study is available in which male and female rats were fed diets containing TCPP for 13 weeks at concentrations corresponding to mean substance intake values of up to 1349 mg/kg/day and 1745 mg/kg/day for males and females respectively. This study indicated the liver and thyroid to be the main target organs affected by TCPP. Effects observed included statistically significant increases in absolute and relative liver weights in males at all doses and females at the two highest doses, periportal hepatocyte swelling in high dose groups and mild thyroid follicular cell hyperplasia in males at all doses and females at the highest dose. Based on the increase in both absolute and relative liver weights, accompanied by mild thyroid follicular cell hyperplasia observed in males of all dose groups, a LOAEL of 52 mg/kg/day is derived and taken forward to risk characterisation. This LOAEL is taken forward in preference to the NOAEL which was identified in a 4-week study in which rats were dosed with TCPP at concentrations of 0, 10, 100 and 1000 mg/kg/day, as it was derived from a study of longer duration. The 4-week study also showed the liver as the target organ, with increased liver weight changes observed in the high dose groups, accompanied by hepatocyte hypertrophy in all high-dose males and one mid-dose male and changes in ALAT activity in high-dose animals.

A two-week study in which rats were fed diets of TCPP at concentrations corresponding to mean substance intake values of up to 1636 mg/kg/day for males and 1517 mg/kg/day for females showed no major clinical signs of toxicity. There was a significant reduction in weight gain and food consumption in high dose males during week 2, but there were no other significant findings.

In a 2-generation reproductive toxicity study in which rats were fed TCPP in the diet over two successive generations, the low-dose of 99 mg/kg for females is considered to be the LOAEL for parental toxicity. This is based on decreased body weight and food consumption seen in mid and high dose parental animals and the effects on uterus weight seen in all dosed animals. For males, a NOAEL of approximately 85 mg/kg is derived for parental toxicity, based on decreased body weights, food consumption and organ weight changes observed at mid and high dose groups.

No data are available on inhalation and dermal repeated dose toxicity.

Genotoxicity: The mutagenic potential of TCPP has been well investigated *in vitro*. Evidence from several bacterial mutagenicity studies shows that TCPP is not a bacterial cell mutagen. TCPP was also shown to be non-mutagenic in fungi. In mammalian cell studies, TCPP did not induce forward mutations at the TK locus in L5178Y mouse lymphoma cells in one study, but in a second study, the result was considered equivocal (in the presence of rat liver S9 fraction). A confirmatory mouse lymphoma was conducted in accordance with the relevant regulatory guidelines. The results of the assay indicate that TCPP shows clastogenic activity *in vitro* in the presence of metabolic activation. The main concern for TCPP is clastogenicity, owing to the clearly positive *in vitro* mouse lymphoma study. *In vivo*, TCPP was not clastogenic in a mouse bone marrow micronucleus test. TCPP did not induce an increase in chromosomal aberrations in a rat bone marrow cytogenetics assay. In order to further investigate the potential for TCPP to induce DNA damage, an *in vivo* Comet assay in the rat liver was conducted. The liver was chosen for comet analysis as TCPP caused an increased mutation frequency in the mouse lymphoma assay in the presence of S9 and also induced liver enlargement in repeat dose studies. Under the conditions of this study, TCPP did not induce DNA damage in the liver of rats treated with either 750 or 1500 mg/kg TCPP. Overall, it is considered that TCPP is not genotoxic *in vivo*.

Carcinogenicity: TCPP is structurally similar to two other chlorinated alkyl phosphate esters, TDCP (tris [2-chloro-1-(chloromethyl)ethyl] phosphate) and TCEP (tris (2-chloroethyl) phosphate). TDCP and TCEP are non-genotoxic carcinogens, *in vivo*, and have agreed classifications of Carc Cat 3 R40. Based on the available repeat dose toxicity data for TCPP, supported by a qualitative read-across from TDCP and TCEP, there is a potential concern for carcinogenicity for TCPP by a nongenotoxic mechanism. No quantitative read-across can be performed since there are no insights into an underlying mode of action for TCEP and TDCP which would make a prediction on a relatively potency of TCPP possible. Therefore, as a reasonable worst case approach, a risk characterisation will be carried out for this end-point.

It is proposed that the effects observed in the 90-day study for TCPP are taken as a starting point for risk characterisation. If these effects were to progress to cancer, they would do so by a non-genotoxic mechanism. Therefore, it is proposed that the LOAEL of 52 mg/kg/day, identified from the 90-day study with TCPP, should be used as a basis for risk characterisation of the carcinogenicity endpoint.

Reproductive toxicity: In a two-generation reproductive toxicity study with TCPP, there were no treatment related effects in pre-coital time, mating index, female fecundity index, male and female fertility index, duration of gestation and post-implantation loss. There was no effect on sperm parameters at necropsy. In females, the length of the longest oestrus cycle and the mean number of cycles per animal were statistically significantly increased in high dose animals of both generations. A decrease in uterus weight was observed in all dosed females in F0 and in high dose females in F1. Effects were also noted on pituitary weights, significant in high dose females of both generations. A LOAEL of 99 mg/kg is derived for effects on fertility. This is based on effects on the effect on uterus weight seen in all dosed females in F0 and high dose females in F1.

Developmental toxicity: From the same study, a LOAEL of 99 mg/kg is derived for developmental toxicity. This is based on a treatment related effect on the number of runts observed in all TCPP-treated groups of the F0 generation. In a separate study, no treatment-related effects on foetal mortality, implantation number, resorption or foetal weight were observed following treatment of pregnant dams with TCPP. Cervical ribs and missing 13th ribs were noted at a low incidence in all treatment groups, but not in the control group. However, as a specific rib count undertaken in the 2-Generation study did not reveal an increase in this effect, it is concluded that this is not toxicologically significant. Weaning rate and rearing condition were unaffected by treatment and there was no evidence of any abnormality Alkyl esters of phosphoric acid exhibit a low to moderate acute toxicity and metabolised. From studies done on mice, they are not likely to cause gene damage or affect reproduction. However, 2-ethylhexanoic acid produced an effect on newborn rats at high doses to the pregnant female.

Acute Toxicity		Carcinogenicity	
Skin Irritation/Corrosion		Reproductivity	
Serious Eye Damage/Irritation		STOT - Single Exposure	
Respiratory or Skin sensitization		STOT - Repeated Exposure	
Mutagenicity		Aspiration Hazard	

Legend:  – Data required to make classification available
 – Data available but does not fill the criteria for classification
 – Data Not Available to make classification

Section 12: ECOLOGICAL INFORMATION

Toxicity

Environmental Fate: Chlorinated trisphosphates have low volatility thus there is low potential for transport into the air. Some trisphosphates may enter the waste water system through disposal of water containing trisphosphates from washed fabrics. These compounds are generally not biodegraded.

Atmospheric Fate: When released in the atmosphere, trisphosphates are degraded by reaction with atmospheric hydroxyl radicals.

Aquatic Fate: Trisphosphates are not biodegraded under aerobic condition. Chlorinated trisphosphates may enter the water system through seepage of landfill leachate that contains degraded polyurethane foam and polyester.

Terrestrial Fate: Trisphosphates have high affinity to organic components of soils and sediments. But due to high water solubility of these compounds, mobility in and from soil media will be high.

Ecotoxicity: Toxicity tests show that chlorinated trisphosphates such as TCEP and TCPP are slightly toxic to aquatic organisms at all trophic level, while TDCPP is moderately toxic to fish.

Moreover, these compounds are found to be slightly toxic to terrestrial species and aquatic green algae but they are non-toxic to sewage bacteria.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient
tris(2- chloroisopropyl)phosphate

Persistence: Water/Soil
HIGH

Persistence: Air
HIGH

Bioaccumulative potential

Ingredient
tris(2-chloroisopropyl)phosphate

Bioaccumulation
LOW (BCF = 8)

Mobility in soil

Ingredient
tris(2- chloroisopropyl)phosphate

Mobility
LOW (KOC = 1278)

Section 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal

Recycle wherever possible or consult manufacturer for recycling options.
Consult State Land Waste Management Authority for disposal.
Material may be disposed of by controlled burning in an approved incinerator or buried in an approved landfill.
Prior to disposal in a landfill the material should be mixed with the other component and reacted to render the material inert.
Extreme caution should be taken when heating the resin/curing agent mix.
Recycle containers where possible, or dispose of in an authorised landfill.

Small quantities < 20 kgs can be disposed of by reaction with PMDI Isocyanate in open top containers. Wear full protective safety equipment as detailed in SECTION 8 of this MSDS and the MSDS for the Isocyanate component. Mix in well ventilated area, in < 3 kg mix quantities. Allow at least 30 minutes cooling time between each mix to allow the reacted foam to cool before the next mix. After reaction into a solid foam, dispose of in solid waste. For larger quantities, normally suitable for incineration by an approved agent. Drain containers to remove ullage material. Rinse the container with dilute detergent / water solution. Dispose of cleaned container appropriately. Collect the rinse solution in an open container and absorb onto an inert absorbent material. Allow water to evaporate and dispose of in solid waste. Do not weld or use a cutting torch on or near drums, even if drained. Uncontaminated empty drums will contain residual material which may decompose to emit toxic or irritating fumes if burned or cut with a steel cutting torch.

Section 14: TRANSPORT INFORMATION

Labels Required

Marine Pollutant NO
HAZCHEM Not Applicable

Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Section 15: REGULATORY INFORMATION

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

POLYETHYLENE/ POLYPROPYLENE GLYCOL GLYCERYL ETHER(9082-00-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)

TRIS(2-CHLOROISOPROPYL)PHOSPHATE(13674-84-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (polyethylene/ polypropylene glycol glyceryl ether; tris(2-chloroisopropyl)phosphate)
China - IECSC	Y
Europe - EINEC / ELINCS /NLP	N (polyethylene/ polypropylene glycol glyceryl ether)
Japan - ENCS	Y
Korea - KECI	Y
New Zealand – NZIoC	Y

Philippines - PICCS	Y
USA - TSCA	Y

Legend:

Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

Section 16: ANY OTHER RELEVANT INFORMATION**Other information****Ingredients with multiple cas numbers**

Name	CAS No
tris(2-chloroisopropyl)phosphate	1244733-77-4, 13674-84-5, 16839-32-0, 98112-32-4

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet