



Manufacturers of UTHANE Polyurethane Coatings
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Ref msds 00095A

UT100 U-THANE - PART "A"

Hazardous according to criteria of Worksafe Australia

1. IDENTIFICATION

PRODUCT NAME : UT100 U-Thane - Part "A" - All colors are Lead Free.
AVAILABLE COLORS : 0925 Red, 1010 Bright Red, 1102 Maroon, 1980 Violet, 2614 G/S Blue, 2730 Blue, 3300 Green, 4026 Primrose, 4095 Med. Yellow, 4621 Yellow, 4636 TO Yellow, 5870 Scarlet, 6219 Red Oxide, 7016 White, 7017 High Opacity White, 7500 Black, 8010 Clear Matte, 8030 Clear Satin, 8040 Clear Semigloss, 8050 Clear Semigloss, 8100 Clear Gloss, 8216 Silver, 8238 Silver Satin.
All pigments used are Lead Free.
Range of colors & gloss levels ranging from full gloss to matte.
OTHER NAMES : Not Applicable
USE : Reactive acrylic spray coating to provide a tough, durable air dried or force dried finish with the properties of baked enamels on suitably prepared glass surfaces.

**For industrial use only in spray areas complying with relevant regulations.
This product is one component of a two component system.
All components must be mixed together immediately prior to use.**

COMPANY / UNDERTAKING

BC COATINGS
2 HUME ROAD, SMITHFIELD, N.S.W. 2164
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The following personnel should be contacted depending on the nature of the inquiry.

TECHNICAL MANAGER	PRODUCTION MANAGER
MANAGING DIRECTOR	SALES MANAGER

AUSTRALIAN POISONS INFORMATION CENTRE 24 HOUR SERVICE : 13 11 26

POLICE OR FIRE BRIGADE : 000 (exchange) : 1100

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure.

Always read the Material Safety Data Sheets (MSDS) for any products you use at work.

They contain useful information on hazards and control measures.

Safety Data Sheets are current for a maximum of three years but may be updated more frequently.

Please ensure that you have a current copy.

The information given in this bulletin and by the company's technical staff is provided as a general guide only to facilitate the adoption of appropriate measures in relation to handling, storage and disposal of the product.

Although BC Coatings has taken all reasonable care to ensure that the information is accurate, it accepts no responsibility for any loss or damage however caused that results there from and does not warrant such accuracy whether or not the information originated with BC Coatings.

BC Coatings urges each recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product.

The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety.

Users of the product are requested to contact BC Coatings technical section for detailed information regarding the qualities and characteristics of the product before it is used.

We reserve the right to revise Material Safety Data Sheets periodically as new information becomes available.

UT100 U-THANE - PART "A"**2. HAZARDS IDENTIFICATION****Hazardous according to criteria of Worksafe Australia****CLASSIFICATION AND LABELLING ACCORDING TO NOHSC CODES****CLASSIFICATION / SYMBOL** : FLAMABLE / F**CLASSIFICATION / SYMBOL** : IRRITANT / Xi , HARMFUL / Xn**GOVERNING DIRECTIVE** : National Code of practice for the Labelling of Hazardous Substances.**HAZARDS IDENTIFICATION**

Leaks of gas or spills of liquid can readily form flammable mixtures at temperatures at or above flash point.

SYMBOLS

Xi	Irritant
Xn	Harmful
N	Dangerous for the environment

RISK PHRASES

R11	Highly flammable.
R18	In use, may form flammable/explosive vapor-air mixture.
R20/2122	Harmful by inhalation, in contact with skin and if swallowed.
R33	Danger of cumulative effects.
R36/37/38	Irritating to eyes, respiratory system and skin.
R40	Limited evidence of carcinogenic effect.
R42/43	May cause sensitisation by inhalation and skin contact.
R51/53	Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.
R61	May cause harm to the unborn child.
R62	Possible risk of impaired fertility.
R65	May cause lung damage if swallowed.
R67	Vapors may cause drowsiness and dizziness.

SAFETY ADVICE

S02	Keep out of the reach of children.
S3/7/9	Keep container tightly closed in a cool, well ventilated place.
S16	Keep away from sources of ignition - No smoking.
S20/21	When using, do not eat, drink or smoke.
S23	Do not breathe fumes/vapour/spray
S24/25	Avoid contact with skin and eyes.
S29	Do not empty into drains.
S33	Take precautionary measures against static discharges.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S43B	In case of fire use sand, earth, chemical powder or alcohol type foam
S45	In case of accident or if you feel unwell, seek medical advice immediately. (Show label or MSDS where possible).
S51	Use only in well ventilated areas.
S61	Avoid release into the environment.
S62	If swallowed, do NOT induce vomiting.

UT100 U-THANE - PART "A"**2. HAZARDS IDENTIFICATION - continued****HEALTH EFFECTS - ACUTE EXPOSURE**

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label.

The following acute (short term) health effects may occur immediately or shortly after exposure to this product :

High vapor concentrations are irritating to the eyes, nose, mouth, and throat, mucous membranes and the respiratory tract, may cause sore throat, insomnia coughing, headaches, tiredness, dizziness, a burning sensation to the eyes, blurred vision, mental sluggishness, lethargy, weakness, tremor, nausea and vomiting, unconsciousness, are anaesthetic and may have other central nervous system effects. Very high levels can cause death.

Gastroenteritis, heartburn and intestinal pain, diarrhoea, loss of appetite and anorexia, may also occur.

Acute exposure may also result in narcosis, pulmonary oedema and severe kidney and liver damage.

Kidney damage may be indicated by changes in urine output or appearance, pain upon urination or in the lower back, or general oedema (swelling from fluid retention).

Liver damage may be indicated by loss of appetite, jaundice (yellowish skin and eye colour), fatigue, bleeding or easy bruising and sometimes pain and swelling in the upper right abdomen.

Narcotic effects can occur at levels below the exposure standard.

The onset of respiratory symptoms may be delayed for several hours after exposure.

Exposure to very high concentrations can be fatal.

If a large amount (>1 ml/kg) is ingested and retained can cause gastrointestinal irritation, kidney damage, symptoms of CNS depression and irritation occur and include weakness, dizziness, unconsciousness and convulsions.

Systemic effects from short-term high exposures may include lung, kidney and brain damage.

Tolerance is reported to be acquired over the work week and lost over the weekend.

It is readily absorbed by the skin.

Prolonged, repeated skin contact with low viscosity materials may de-fat the skin resulting in possible irritation and dermatitis.

Breathing air which contains solvents, resulting from its use in spraying applications, may cause delayed lung damage.

Corneal and auditory system damage may occur after prolonged contact.

TARGET ORGANS :

Eyes, skin, respiratory system, central nervous system, mucous membranes, G.I. tract, blood, reproductive system, liver and kidneys, auditory system.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE :

Auditory system, central nervous system (CNS), respiratory system, skin disorders, damaged skin, respiratory system disease, kidney, liver, or blood disorders.

ROUTES OF ENTRY : Ingestion, inhalation, skin contact, eye contact, absorption**SWALLOWED**

Considered an unlikely route of entry in commercial/industrial environments.

The liquid is highly irritating and toxic if swallowed.

Ingestion may result in irritation of the mouth, throat, the gastro-intestinal tract.

May be harmful and cause corrosion and damage of the gastrointestinal tract if swallowed in large quantity.

Tends to break into a foam if the patient vomits.

Ingestion of small quantities can result in headache, weakness, dizziness, drowsiness, pain, nausea, cramps, abdominal pain, vomiting, diarrhoea and central nervous system depression.

Ingestion in large quantities may lead to unconsciousness and is expected to cause central nervous system depression and severe poisoning and may lead to kidney injury.

Small amounts of liquid aspirated into respiratory system during ingestion or from vomiting may cause potentially lethal pulmonary oedema.

If the victim is uncoordinated there is a greater likelihood of vomit entering the lungs and causing subsequent complications.

EYE

The vapour and the liquid are both severe eye irritants if exposure is prolonged.

The liquid is highly irritating to the eyes and is capable of causing temporary discomfort or pain (experienced as excess blinking and tear production) with mild redness of the conjunctiva (similar to wind burn), temporary impairment of vision and other transient eye damage/ulceration.

The liquid is capable of causing corneal damage with loss of sight if not promptly and adequately treated.

At concentrations of 100 - 200 ppm, the vapour may irritate the eyes and respiratory tract.

More marked irritation at higher concentrations.

UT100 U-THANE - PART "A"**2. HAZARDS IDENTIFICATION - continued****HEALTH EFFECTS - ACUTE EXPOSURE (continued)****SKIN**

Will have a degreasing action on the skin.

Frequent or prolonged contact with the skin may cause severe irritation with itching and local redness and may defat and dry the skin, leading to discomfort, irritant contact dermatitis and possible tissue destruction.

Substance is readily absorbed through skin and may cause central nervous system depression.

Toxic effects may result from skin absorption. Absorption by skin may readily exceed vapour inhalation exposure.

Symptoms for skin absorption are the same as for inhalation.

Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.

Capable of causing skin sensitisation and allergic skin reactions. The material may accentuate any pre-existing skin condition.

Bare unprotected skin, abraded or irritated skin, open cuts and etc., should not be exposed to this material.

INHALED

This product is a central nervous system depressant. Central nervous system (CNS) depression may be evident early.

Vapor/mist concentrations above recommended exposure levels are extremely irritating to the eyes, mucous membranes, lungs and the upper respiratory tract.

CNS depression characterised by dizziness and headache.

Symptoms of exposure may include restlessness, headache, vomiting, stupor, low blood pressure and rapid and irregular pulse, eye and throat irritation, weakness of the legs, dizziness and light-headedness.

Acute effects from inhalation of high concentrations of vapour may be dryness of the mouth and throat, nasal irritation (experienced as discomfort and discharge), coughing and sneezing, gastrointestinal disturbances (e.g. nausea, anorexia and flatulence), pulmonary irritation, nausea, vomiting, central nervous system depression (characterized by headache and dizziness, increased reaction time, fatigue, irritability, impaired judgement, lassitude, loss of co-ordination, uncoordinated movements, slurred speech, drowsiness, mental confusion), and if exposure is prolonged in extreme cases, unconsciousness even coma and possible death.

Inhalation hazard is increased at higher temperatures. Toxic effects are increased by consumption of alcohol.

Repeated exposure may cause sensitisation and/or allergic reactions.

Serious poisonings may result in respiratory depression and may be fatal.

Aspiration of liquid into lungs can cause serious (even fatal) pneumonitis.

Significant exposure to this chemical may adversely affect people with chronic disease of the respiratory system, skin and/or eyes.

HEALTH EFFECTS - CHRONIC EXPOSURE

Principal routes of exposure are usually by accidental skin and eye contact contact/absorption and inhalation of vapours especially at higher temperatures.

Chronic (long term) health effects can occur at some time after exposure to chemicals and can last for months or years.

Symptoms of chronic exposure may include weakness, loss of appetite, burning eyes, stomach-ache, nausea, vomiting, sore throat, tiredness, insomnia, heart burn, intestinal pain, slightly enlarged liver, colitis, and dermatitis.

The vapours may cause smarting of the eyes and respiratory tract.

Can be absorbed through the skin with resultant toxic effects.

Capable of causing skin sensitisation and allergic skin reactions. Skin contact may aggravate an existing dermatitis.

Inhalation of material may aggravate asthma and inflammatory or fibrotic pulmonary diseases.

Evidence from animal tests indicate that repeated or prolonged solvent inhalation exposures could result in kidney disorders, nervous system impairment, liver and blood changes. [PATTYS]

Repeated exposure to this product can cause poor memory, difficulty in concentration and other brain effects.

Prolonged or continuous skin contact with the liquid may cause de-fatting with drying, cracking, irritation and dermatitis following.

This chemical has not been adequately evaluated to determine whether brain or other nerve damage could occur with repeated exposure. However, many solvents and other petroleum based chemicals have been shown to cause such damage.

Effects may include reduced memory and concentration, personality changes (withdrawal, irritability), fatigue, sleep disturbances, reduced co-ordination, and/or effects on nerves supplying internal organs (autonomic nerves) and/or nerves to the arms and legs (weakness, "pins and needles").

MIXED EXPOSURES

Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure.

Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

Because more than light alcohol consumption can cause liver damage, drinking alcohol can increase the liver damage caused by liquid hydrocarbons.

UT100 U-THANE - PART "A"**4. FIRST AID MEASURES**

Poison Information Centres in each State capital city can provide additional assistance for scheduled poisons.

SWALLOWED

Harmful if swallowed.

If the victim is convulsing or unconscious, do **NOT** give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body.

IMMEDIATELY call a doctor or Poisons Information Centre and/or transport to an emergency facility or hospital.

DO NOT MAKE AN UNCONSCIOUS PERSON VOMIT.

If the victim is conscious and not convulsing, rinse mouth out with plenty of water and give 1 or 2 glasses of water to drink to dilute the chemical and **IMMEDIATELY** call a doctor or hospital or Poisons Information Centre.

Tends to break into a foam if the patient vomits.

Do **NOT** induce vomiting due to the hazard of solvent aspiration into the lungs which may cause mild to severe pulmonary injury and possibly death.

Be prepared to transport the victim to a hospital if advised by a physician.

Should vomiting occur, place patient's head downwards, head lower than hips, to prevent vomit entering the lungs.

This is especially important as aspiration of this material into the lungs can cause chemical pneumonia, which can be fatal.

Call a doctor and/or transport to an emergency facility or hospital **IMMEDIATELY**.

EYE

If this product comes in contact with the eyes

First check the victim for contact lenses and remove if present.

Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

IMMEDIATELY and continuously irrigate with copious quantities of fresh, low pressure water or normal saline solution for at least 15 minutes while simultaneously calling a hospital or Poisons Information Centre.

Eyelids should be held open.

Ensure irrigation under the eyelids by occasionally lifting upper and lower lids.

Remove clothing, if contaminated, and gently wash skin with water.

Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician.

Seek **IMMEDIATE** medical attention, preferably from an ophthalmologist.

SKIN

If this product comes in contact with the skin

IMMEDIATELY soak contaminated clothing, including footwear, with water.

Remove all contaminated clothing, including footwear, and gently wash the affected areas thoroughly with water, then mild soap and water.

If exposure has been prolonged or severe or if swelling, redness or irritation occur, **IMMEDIATELY** seek medical advice and be prepared to transport the victim to a hospital for treatment.

Launder contaminated clothing before re-use.

Allow contaminated footwear to dry thoroughly before re-using. Discard internally contaminated gloves and shoes.

Can be absorbed through the skin with resultant toxic effects.

INHALED

If fumes or combustion products are inhaled :

IMMEDIATELY remove affected person(s) to fresh air, taking care not to become affected yourself.

Provide proper respiratory protection to rescuers entering an unknown atmosphere.

Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used. if not available, use a level of protection greater than or equal to that advised under Respirator Recommendation.

Remove any contaminated clothing and loosen remaining clothing.

If breathing is normal, allow the patient to assume the most comfortable position and keep warm.

Keep at rest until fully recovered.

If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital.

If breathing is difficult and patient is cyanotic (blue), ensure airways are clear and have a qualified person give oxygen through a face mask.

If breathing has stopped, commence Expired Air Resuscitation (E.A.R.).

In the event of cardiac arrest, commence Cardio-Pulmonary Resuscitation (C.P.R.)

Seek **IMMEDIATE** medical attention.

UT100 U-THANE - PART "A"

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>CHEMICAL ENTITY</u>	<u>CAS No.</u>	<u>EINECS No.</u>	<u>EU No.</u>	<u>PROPORTION (%w/w)</u>
Xylene (Mixed Isomers) * (Aromatic Petroleum Hydrocarbon)	1330-20-7	215-535-7	601-022-00-9	20 - 60 **
Ethyl Benzene ***	100-41-4	202-849-4	601-023-00-4	< 10
Solvent Naphtha (Petroleum) Light Aromatic	64742-95-6	265-199-0	649-356-00-4	< 10 **
Petroleum Hydrocarbon Mixture (Aromatic) (Proprietary Composition)	Not Available	Not Available	Not Available	< 10 **
Methyl Iso-Butyl Ketone	108-10-1	203-550-1	606-004-00-4	10 - 30
1-Methoxy Propyl Acetate-2 (= 2-Methoxy-1-Methylethyl Acetate)	108-65-6	203-603-9	607-195-00-7	< 10 **
Amorphous (Precipitated) Silica (containing no asbestos & < 1% crystalline silica) (Proprietary Composition)	112926-00-8	Not Available	Not Available	0 - < 10 **
Acrylic Polyol, Hydroxy Functional (Proprietary Composition)	Not Available	Not Available	Not Available	10 - 30
Titanium Dioxide Pigment	13463-67-7	Not Available	Not Available	0 - < 60 **
Organic Pigments (Proprietary Range)	Depends on color	Depends on color	Depends on color	0 - < 30 **
Methylenediaminomethylethyl Polycondensate	Non-Hazardous	Not Available	Not Available	0 - < 10 **
Aluminium Flakes	7429-90-5	Not Available	Not Available	0 - < 30 **
Miscellaneous Additives (Proprietary Composition)	Not Available	Not Available	Not Available	< 10 **

* Xylenes may be a common name for any combination of the following:

- 1,2-Dimethylbenzene (ortho Xylene), CAS # 95-47-6
- 1,3-Dimethylbenzene (meta Xylene), CAS # 108-38-3
- 1,4-Dimethylbenzene (para Xylene), CAS # 106-42-3

** Depending on color &/or gloss level.

*** As a component of Xylene

More detailed information available to medical staff in case of an emergency.

All components are registered in accordance with Australian Inventory of Chemical Substances.

4. FIRST AID MEASURES - continued**ADVICE TO DOCTOR**

Principal routes of exposure are skin contact/absorption and inhalation of the vapor/spray mist.

Primary threat to life from ingestion and/or inhalation, is respiratory failure.

Extreme care must be taken to prevent aspiration.

Pulmonary oedema is a possible complication following aspiration.

Onset of symptoms may be delayed several hours after exposure.

There is no specific antidote.

Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

Individuals experiencing breathing difficulties after exposure to vapor generated in aerosol applications should be observed for at least 48 hours in case delayed respiratory complications develop.

Any material aspirated during vomiting may cause lung injury.

Pulmonary oedema is a possible complication following aspiration.

If vomiting occurs, hold patient with head below the hips to prevent pulmonary aspiration.

If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (e.g. gastric lavage after endotracheal intubation).

Skin sensitisation may result from a single acute exposure.

Sensitisation may cause difficulty in breathing similar to asthma.

For acute or short term repeated exposures to xylenes :

1. Gastro-intestinal absorption is significant with ingestions.
For ingestions exceeding 1-2 ml (xylene)/kg, intubation and gastric lavage with cuffed endotracheal tube is recommended.
The use of charcoal and cathartics is equivocal.
2. Pulmonary absorption is rapid with about 60-65% retained at rest.
3. Primary threat to life from ingestion and/or inhalation, is respiratory failure.
4. Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen.
Patients with inadequate tidal volumes or poor arterial blood gases ($pO_2 < 50$ mm Hg or $pO_2 > 50$ mm Hg) should be intubated.
5. Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients.
The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
6. A chest X-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.
7. Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines.
Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice).
[Ellenhorn and Barceloux : Medical Toxicology].

4. FIRST AID MEASURES - continued**MEDICAL TESTING**

For those with frequent or potentially high exposure (half the TLV or greater, or significant skin contact), the following is recommended before beginning work and at regular times after that:

Exam of the eyes by slit lamp.

If symptoms develop or overexposure is suspected, the following may be useful:

Liver and kidney function tests.

Complete blood count to include at least a red cell count, a white cell count, haemoglobin and haematocrit.

Urine concentration of Methylhippuric Acid (at the end of work-shift) as an index of overexposure.

Interview for brain effects, including recent memory, mood (irritability, withdrawal), concentration, headaches, malaise and altered sleep patterns.

Consider cerebellar, autonomic and peripheral nervous system evaluation.

Positive and borderline individuals should be referred for neuropsychological testing.

Comprehensive medical, work and reproductive histories with special emphasis directed to the haematological system and symptoms related to pulmonary and mucous membrane irritation.

A comprehensive physical examination with emphasis given to haematological and pulmonary systems, mucous membranes, skin and eyes.

In addition, the physician should determine the worker's suitability for respirator use.

Workers or job applicants who have medical conditions that would be aggravated by the use of a respirator need to receive counselling on the increased risk of impairment of their health.

In certain cases, to provide sound medical advice to the employer and the employee, the physician must evaluate situations not directly related to components contained in this product.

For example, employees with skin diseases, whether or not they are product related, may be unable to tolerate wearing protective clothing.

In addition, those with chronic respiratory diseases may not tolerate the wearing of respirators.

Additional tests and procedures that will help the physician determine which employees are medically unable to wear respirators must include a pulmonary function test with measurement of the employee's forced vital capacity (FVC), and forced expiratory volume at one second (FEV1).

Ratios of FEV1 to FVC as well as measured FVC and measured FEV1 to their expected values corrected for variations due to age, sex, race, and height must be calculated. Whether a chest X-ray will provide useful information should be considered.

Any evaluation should include a careful history of past and present symptoms with an exam.

Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information.

5. FIRE FIGHTING MEASURES

For Large Spills And Fires IMMEDIATELY Alert Fire Brigade And Tell Them Location And Nature Of Hazard.

FIRE EXTINGUISHING MEDIA

Either allow fire to burn under controlled conditions or extinguish with alcohol stable foam, carbon dioxide (CO₂), or dry chemical. Try to cover liquid spills with foam.

For small fires use alcohol-type or all-purpose-type foam, dry agent (carbon dioxide - CO₂), or dry chemical powder), water fog in large quantities.

For large fires use foam (by manufacturer's recommended techniques) or water fog (or if unavailable fine water spray). Water spray may be ineffective, but should be used in case of larger fires, water spray be used to keep fire exposed containers cooled. Avoid spraying water directly into storage containers due to danger of boilover. Fire-men have to wear self-contained breathing apparatus. This material may produce a floating fire hazard.

FIRE AND EXPLOSION HAZARD

Flammable liquid, can release vapors that form flammable mixtures at temperatures at or above the flash point.

Liquid and vapor are highly flammable.

Severe explosion hazard, in the form of vapour, when exposed to heat, flame and/or oxidisers.

Severe fire hazard when exposed to heat, flame and/or oxidisers.

Burns very rapidly and explosively.

In the case of incomplete combustion, may form toxic materials such as carbon monoxide, carbon dioxide, fumes and smoke.

When burning may form toxic materials such as carbon monoxide (CO), carbon dioxide (CO₂), aluminium oxides, various hydrocarbons, fumes and smoke possible.

Vapor forms and explosive mixture with air.

Leaks of gas or spills of liquid can readily form flammable/explosive mixtures at temperatures at or above flash point when exposed to flame or spark.

Vapors from this product and may travel or be moved a considerable distance along the vapor trail by air currents and be ignited explosively by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations a considerable distance from product handling point.

Do not store or mix with strong oxidants (such as chlorine, bromine and fluorine) since violent reactions occur and may cause fire.

Methyl Isobutyl Ketone can react violently with peroxides, nitrates and perchlorates, reducing agents and potassium tert-butoxide.

Heating may cause expansion or decomposition leading to violent rupture of containers.

Product can accumulate static charges which can cause an incendiary electrical discharge.

Flammable hydrogen gas may be produced by the reaction of the aluminium flake with water, especially at high temperatures.

This product may form a floating fire hazard on water.

FIRE FIGHTING MEASURES

If employees are expected to fight fires, they must be trained and equipped as stated in the appropriate regulations.

Shut off any leak if safe to do so and remove sources of re-ignition.

If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop leak.

Flammable hydrogen gas may be produced by the reaction of the aluminium flake with water, especially at high temperatures.

Thermal decomposition and incomplete combustion may yield carbon monoxide, carbon dioxide, oxides of aluminium, oxides of silicone, fumes and smoke.

If safe to do so, remove containers from the path of the fire and keep cool with water spray.

Water spray may be used to flush spills away from exposures.

Keep storage tanks, pipelines, fire exposed surfaces etc. cool with water spray.

Minimize breathing gases, vapor, fumes or decomposition products.

Firefighters should wear self-contained breathing apparatus with a full face piece and operated in positive pressure mode.

Avoid spraying water directly into storage containers due to danger of boilover.

Water spray may be used to flush spills away from exposures.

Prevent run off from fire control or dilution from entering waterways, sewers or drinking water supply.

UT100 U-THANE - PART "A"**6. ACCIDENTAL RELEASE MEASURES****SPILLS**

There should a written emergency plan developed for each workplace or work operation.

For Large Spills And Fires IMMEDIATELY Alert Fire Brigade And Tell Them Location And Nature Of Hazard.

Pollutant - contain spillage.

Stop liquid at the source if safe to do so.

Clean up spills **IMMEDIATELY**.

Slippery when spilt.

Do not empty into drains.

Keep unauthorized persons away at a safe distance and move upwind until clean up is complete. Consider evacuation.

Shut off all possible sources of ignition ensure adequate ventilation / exhaust ventilation.

No smoking, naked lights, open flames or heat sources.

May be violently or explosively reactive. Use only spark-free and/or explosion proof equipment.

Keep this product out of a confined space, such as a sewer, because of the possibility of an explosion, unless the sewer is designed to prevent the build up of explosive concentrations.

Avoid breathing vapors and contact with skin and eyes.

Wear breathing apparatus, gloves and full protective clothing to prevent skin and eye contamination and inhalation of vapours.

Water spray may be used to flush spills away from exposures.

If a leak or spill has not ignited, use water spray or fog to disperse/absorb the vapors and to protect men attempting to stop leak.

Advise authorities if product has entered or may enter sewers, watercourses, ground water or has contaminated soil or vegetation

MINOR SPILLS

Clean up spills immediately.

Small spills may be absorbed onto any absorbent material such as sand, soil or vermiculite or other absorbent material.

Wipe up.

Collect residues and place in sealed, labelled, flammable waste container.

Follow state or local authority regulations and guidelines for disposal of the waste.

MAJOR SPILLS

Consider evacuation.

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

Warn occupants of down wind areas of fire and explosion hazard.

In the event of a spillage, advise the local environment protection authority or emergency services that the product has entered or may enter sewers, drains, watercourses, or has contaminated soil or vegetation

Avoid breathing vapors and contact with skin and eyes.

Wear breathing apparatus, protective gloves and full protective clothing.

Dyke the area with sand, earth or vermiculite, to prevent spreading and to prevent it entering sewers, drains or natural waterways.

Take measures to minimize the effect on ground water.

Advise authorities product has entered or may enter sewers, watercourses or extensive land areas.

Water spray or fog may be used to disperse /absorb vapor.

Water spray may be used to flush spills away from exposures.

Collect recoverable product (using explosion proof or hand pump) into sealed, labelled, flammable containers for recycling or disposal.

Use only spark-free and/or explosion proof equipment.

Dilute contained spill with water.

Cover remainders with wet, absorbent material (e.g. soil, sand, vermiculite, fire retardant treated sawdust or other inert material).

Collect solid residues and seal in sealed, labelled flammable waste containers for later disposal.

Ventilate area well to evaporate remaining liquid and to dispel vapor.

Clean area with detergent and water - do not allow product to enter drains, sewers or water courses - inform the local authorities or emergency services if this occurs.

Do not re-enter the contaminated area until the Safety Officer (or other responsible person) has verified that the area has been properly cleaned.

After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.

Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

Dispose of at an appropriate licensed waste disposal site or facility in accordance with current applicable laws and regulations and product characteristics at time of disposal.



7. HANDLING and STORAGE

HANDLING

Prior to working with this product, you should be trained on its proper handling and storage.

Observe manufacturer's storing and handling recommendations.

Packing as supplied by manufacturer. (Metal can / Metal drum / Metal safety cans).

Handle containers with care.

Many plastics are unsuitable as storage and handling materials

Methyl Isobutyl Ketone is incompatible with potassium-tert-butoxide.

Where possible, automatically pump liquid product from drums or other storage containers to process containers.

Explosion protection required.

Static ignition hazard can result from handling and use.

To prevent fire or explosion risk from static accumulation and discharge, effectively ground product transfer system and all containers and equipment before transfer or use of material.

Sources of ignition, such as smoking, open flames, or ignition sources are prohibited where this product is used, handled, or stored in a manner that could create a potential fire or explosion hazard.

Use **ONLY** non-sparking tools and equipment, especially when opening and closing containers of this product.

Avoid exposure to temperatures above 50 °C.

Protect containers against physical damage and check regularly for leaks.

Open containers slowly in order to control possible pressure release.

Ensure adequate ventilation (equivalent to outdoors), or exhaust ventilation in the working area to prevent build up of explosive atmosphere.

Exhaust ventilation necessary if product is sprayed.

To prevent fire or explosion risk from static accumulation and discharge, effectively ground and bond product, transfer system and all process equipment, including tanks and drums.

The product is readily absorbed by the skin.

Irritating to eyes, skin and mucous membranes. Avoid prolonged, repeated contact with eyes, skin contact and breathing vapors or mists.

The product is narcotic in high concentrations.

Intense smelling. Keep away from foodstuffs, clothing and odor sensitive materials.

Refer to AS 1940 (Storage and handling of flammable and combustible liquids) and AS 2865 (Safe working in a confined space), for more specific information on these subjects.

STORAGE REQUIREMENT

Store in an upright position.

Store in tightly closed, properly grounded, original metal containers in a cool, dry, well-ventilated, approved flammable liquid storage area away from direct sunlight.

Check all containers are clearly labelled.

Many plastics are unsuitable as storage and handling materials

Keep container dry and securely sealed when not in use.

Protect containers against physical damage and check regularly for spills and leaks.

Do NOT store in pits, depressions, basements or areas where vapors may be trapped.

Drums should be equipped with self-closing valves, pressure vacuum bungs, and flame arresters.

Materials are stable on storage, but should be stored in a cool and well ventilated place away from sources of ignition, strong oxidizing agents (liquid chlorine, bromine, fluorine, concentrated oxygen, sodium hypochlorite), acids, alkalis (since violent reactions occur) and odor sensitive materials.

Avoid exposure to temperatures above 50 °C.

Do NOT pressurise, cut, heat, or weld containers.

Empty product containers may contain product residue.

Do NOT reuse empty containers without commercial cleaning or reconditioning.

This material may produce a floating fire hazard.

PROCESS HAZARD

Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperatures and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources.

Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapors".

UT100 U-THANE - PART "A"**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****EXPOSURE LIMITS :**

No value has been assigned for this specific material by the National Occupational Health & Safety Commission. However, the Threshold Limit Value (TLV-TWA), as published by WORKSAFE [1995], for some of the individual constituents is listed below.

Exposure limits with "skin" notation indicate that vapor and liquid may be absorbed through intact skin.

XYLENE (all isomers)

TLV-TWA : 80 ppm (350 mg/m³) A4 (Under review)

STEL : 150 ppm (655 mg/m³)

IDLH Level : 1000 ppm

Odour Threshold Value : 20 ppm (detection), 40 ppm (recognition)

The odor threshold only serves as a warning of exposure. Not smelling it does not mean you are not being exposed.

Exposure to xylene at or below the recommended TLV-TWA and STEL is thought to minimise the risk of irritant effects and to produce neither significant narcosis or chronic injury.

An earlier skin notation was deleted because percutaneous absorption is gradual and protracted and does not substantially contribute to the dose received by inhalation.

NOTE : This substance has been classified by the ACGIH as A4. NOT classifiable as causing Cancer in humans. (Under review)

Peak concentration limit according to Category II 1, i.e. German MAK-value may be exceeded for no more than 30 minutes by a factor of no more than 2 (i.e. may rise to no more than 200 ml/m³ up to 4 times per shift (half life period < 2 hours).

Odour Threshold Value : 1.1 ppm (detection), 40 ppm (recognition)

The odor threshold only serves as a warning of exposure. Not smelling it does not mean you are not being exposed.

IDLH Level : 1000 ppm

NOTE : Detector tubes for o-xylene, measuring in excess of 10 ppm, are available commercially. (m-xylene and p-xylene give almost the same response).

Xylene vapour is an irritant to the eyes, mucous membranes and skin and causes narcosis at high concentrations.

Exposure to doses sufficiently high to produce intoxication and unconsciousness also produce transient liver and kidney toxicity.

Neurological impairment is NOT evident amongst volunteers inhaling up to 400 ppm, though complaints of ocular and upper respiratory tract irritation occur at 200 ppm for 3 to 5 minutes.

ETHYL BENZENE (As a component of Xylenes)

TLV-TWA : 100 ppm / STEL - 125ppm [ACGIH]

METHYL ISOBUTYL KETONE

TLV-TWA : 50 ppm (205 mg/m³) / STEL - 75ppm (307mg/m³) [WORKSAFE 1991]
(Under review)

Exposure at or below the recommended TLV-TWA should provide sufficient protection against the potential irritant effects, headache and nausea, neurasthenic symptoms and other systemic toxicities (including liver and kidney damage) produced by methyl isobutyl ketone.

Odour Threshold Value : 0.47 - 0.68 ppm / 0.10 ppm (in air)

Unfatigued, odour recognition threshold (100% test panel) is 0.3 - 0.5 ppm. Distinct odour at 15 ppm.

Odour is objectionable and vapours are irritating to eyes at 200 ppm.

The odor threshold only serves as a warning of exposure. Not smelling it does not mean you are not being exposed.

IDLH Level : 3000 ppm

NOTE : Detector tubes for Methyl Isobutyl Ketone, measuring in excess of 50 ppm, are commercially available.

Exposure at or below the recommended TLV-TWA is should provide sufficient protection against the potential irritant effects, headache and nausea, neurasthenic symptoms and other systemic toxicities (including liver and kidney damage) produced by Methyl Isobutyl Ketone.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION - continued**EXPOSURE LIMITS - continued****4-METHYL-2PENTANOL** (0.3% by weight of METHYL ISOBUTYL KETONE)TLV-TWA : 25 ppm (100 mg/m³) [WORKSAFE 1991]**AROMATIC PETROLEUM HYDROCARBONS MIXTURE (RCP 160-185) (HSPA OELS)**

TLV-TWA : 100 ppm, 8 hours (Supplier recommendation)

AMORPHOUS (PRECIPITATED) SILICATLV-TWA : 10 mg/m³ Total Dust, 8 hour**1-METHOXY PROPYL ACETATE-2**TLV-TWA : 50 ppm (275 mg/m³) (eight hours average value)

Peak concentration limit according to Category I, i.e. German MAK-value may be exceeded for short periods (not more than 5 minutes) by a factor of no more than 2 (i.e. may rise to no more than 100 mg/m³) up to eight times per shift.

1-methoxypropylacetate-2 is classified as a pregnancy group C in the German MAK-value.

That means, a risk of damage of the foetus is not expected, if the MAK-value and the German BAT-value (Biological Industrial Material Tolerance Limit) are observed. (Compare also TLV's and Biological Exposure Indices).

ALUMINIUM (Metal Dust)

TLV-TWA : 10 ppm [WORKSAFE 1991]

NOTE

The above TLV's are issued as guidelines only in the control of occupational health hazards and should not be interpreted as the fine line between safe and dangerous conditions.

The above exposure limits are for air levels only.

When skin contact also occurs, you may be overexposed, even though air levels are less than the limits listed above.

Follow applicable regulations. (refer WORKSAFE Australia Exposure Standards)

As with chemical ingestion, inhalation of vapor, prolonged or repeated skin contact should be avoided by good occupational work practice.

All atmospheric contamination should be kept to as low a level as is practically possible.

If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases.

Take this Fact Sheet with you.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and air samples.

You have a legal right to obtain copies of sampling results from your employer.

If you think you are experiencing any work related health problems, see a doctor trained to recognize occupational diseases.

Take this MSDS with you.



8. EXPOSURE CONTROLS / PERSONAL PROTECTION - continued

EXPOSURE LIMITS - continued

TLV-TWA is the time weighted average airborne concentration of the workplace atmosphere for a normal 8 hour work day and a 40 hour work week, to which nearly all workers may be repeatedly exposed day after day without adverse effect.

These TLV's are issued as guidelines only and should not be interpreted as the fine dividing line between safe and dangerous concentrations of chemicals and/or conditions.

They are not a measure of relative toxicity.

All atmospheric contamination should be kept to as low a level as is practically possible.

STEL's are expressed as airborne concentrations of substances, averaged over a period of 15 minutes.

This short term TWA concentration should not be exceeded at any time during a normal 8 hour working day.

Workers should not be exposed at the STEL concentration continuously for longer than 15 minutes, or for more than four such periods per working day.

A minimum of 60 minutes should be allowed between successive exposures at the STEL concentration.

STEL is the concentration to which workers can be exposed continuously for a short period of time without suffering from :

- irritation
- chronic or irreversible tissue damage, or
- narcosis of a sufficient degree to increase the likelihood of accidental injury, impair self-rescue or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded.

Sk NOTICE - absorption through the skin, mucous membranes and eye may be a significant source of exposure.

The exposure standard is invalidated if such contact should occur.

Exposure limits with "skin" notation indicate that vapor and liquid may be absorbed through intact skin.

Absorption by skin may readily exceed vapor inhalation exposure.

Symptoms for skin absorption are the same as for inhalation.

Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.

PEAK LIMITATION - a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes.

IDLH - Immediate Danger to Life and Health.

ODOR THRESHOLD

When considering the odor threshold of a substance, one finds that reported values are widely divergent.

Two major factors which influence odor detection are differences between individuals in the ability to perceive a particular odor and the methodology employed in conducting the odor threshold determination.

In their "Guide to Industrial Respiratory Protection - Appendix C" , NIOSH states:

Amoore and Hautala (33) found that on average, 95% of a population will have a personal odor threshold that lies within the range from about one-sixteenth to sixteen times the reported mean "odor threshold" for a substance.

In further explanation, Amoore and Hautala state:

The ability of members of the population to detect a given odor is strongly influenced by the innate variability of different persons' olfactory powers, their prior experience with that odor, and by the degree of attention they accord the matter.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION - continued**ENGINEERING CONTROLS :**

None required when handling small quantities.

OTHERWISE :

Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure.

The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release.

Isolating operations can also reduce exposure.

Respirators serve as supplemental protection to reduce employee exposures when engineering and work practice controls are not sufficient to achieve the necessary reduction to or below the TWAs.

Use away from all ignition sources.

Ensure sufficient ventilation to maintain concentration below exposure standard in warehouse or closed storage areas.

Where rapid build up of vapors or mists are generated, particularly in enclosed areas, and natural ventilation is inadequate, a flame proof exhaust ventilation system is required.

Refer to AS 1940 - The storage and handling of flammable and combustible liquids and AS 2430 - Explosive gas atmospheres for further information concerning ventilation requirements.

Use with local exhaust ventilation or while wearing organic vapor /acid mist respirator (meeting the requirements of AS1715 & AS1716) or dust respirator/air supplied mask.

The effectiveness of an air purifying respirator is limited. Use it only for a single, short term exposure.

Refer also to protective measures for the other components used with this product.

Keep containers closed when not in use.

Equipment **MUST** be explosion proof.

Use dust containment system to reduce nuisance dust concentration to permissible exposure levels.

NOTE : Vapor is heavier than air and may collect in hollows, pits storage tanks or sumps.

Do **NOT** enter confined spaces where vapor may have collected without using an approved, positive pressure, self-contained breathing apparatus (meeting the requirements of AS1715 and AS1716) and an observer present for assistance.

LOCAL EXHAUST : Face velocity > 20 m/min.

FLAMMABILITY :

Highly flammable liquid.

Can readily form flammable mixture with air.

May form explosive mixtures with air.

Avoid direct sources of heat, naked lights, sparks, all ignition sources and oxidising materials.

Prevent build up of flammable vapors.

Vapor may travel a considerable distance to source of ignition and flash back.

Explosion proof equipment necessary in areas where this product is being used.

Earth and bond all process equipment, including tanks, hoses and drums to avoid static charge build up.

Nearby equipment should be earthed.

Ensure ventilation is adequate to prevent build up of explosive atmosphere.

Refer to AS 1940 - Storage and handling of flammable and combustible liquids and AS 2865 - Safe working in a confined space, for more specific information on these subjects.

UT100 U-THANE - PART "A"**8. EXPOSURE CONTROLS / PERSONAL PROTECTION - continued****PERSONAL PROTECTION****WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT.**

However, for some jobs personal protective equipment may be appropriate.

Eye wash fountains and safety showers should be available for emergency use.

In case of hypersensitivity of the respiratory tract and skin (e.g. asthmatics and those who suffer from chronic bronchitis and chronic skin complaint) it is inadvisable to work with the product.

Use adequate general or local exhaust ventilation to meet TLV requirements.

Skin contact should be avoided by wearing chemically resistant work clothing, boots and gloves.

All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Contact lenses should **NOT** be worn in areas where eye contact with this product can occur.

Observe good personal hygiene.

Keep away from foodstuffs, drinks and tobacco.

Keep working clothes separate.

Take off immediately all contaminated clothing.

Launder contaminated clothing and other protective equipment before storing or re-using, and discard internally contaminated gloves and footwear.

ALWAYS wash hands before eating, drinking, smoking, using the toilet, before breaks and at end of work.

Do **NOT** eat, smoke, or drink where this product is handled, processed, or stored, since the chemical can be swallowed.

Personal protective equipment should not be worn in lunch areas to prevent migration of this product to an area where other employees may be unknowingly exposed.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult your Occupational Health and Safety Adviser.

For detailed advice on Personal Protective Equipment, refer to the following Australian Standards :-

HB 9 (Handbook 9)	Manual of industrial personal protection.
AS 1377	Eye protectors for industrial applications.
AS 1715	Selection, use and maintenance of respiratory protective devices.
AS 1716	Respiratory protective devices.

When exposure is likely, personal protective equipment in combination appropriate to the degree and nature of exposure, should be selected from the following lists :-

SKIN

Prolonged or repeated skin contact should be avoided by using barrier cream and wearing impervious, chemically resistant work clothing (PVC apron and sleeves or full PVC covering), safety boots and protective gloves (polyethylene, Butyl rubber, Neoprene, Polyvinyl Alcohol, PE/EVOH/PE, nitrile or PVC).

Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing for your operation.

Final glove selection should be made by knowledgeable individuals based on the specific circumstances involved.

Protective suit may be required if exposure severe.

All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Do **NOT** use solvents to clean the skin but use skin cleansing cream.

Ensure that there is ready access to an emergency shower.

Wash skin thoroughly with soap and water after contact to remove the chemical.

If gross contamination occurs, **IMMEDIATELY** wash or shower to remove the chemical and remove all contaminated clothing and change into clean clothing.

Clothing wet with product should be soaked with water before removal to prevent the possibility of ignition by static electricity discharges.

Remove contaminated shoes, thoroughly dry before re-use.

At the end of the work shift, wash any areas of the body that may have contacted this product, whether or not known skin contact has occurred.

Launder contaminated clothing and other protective equipment before storing or re-using, and discard internally contaminated gloves and footwear.

Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to this product.



UT100 U-THANE - PART "A"

8. EXPOSURE CONTROLS / PERSONAL PROTECTION - continued

PERSONAL PROTECTION - continued

RESPIRATORY

Avoid breathing vapors.

Engineering controls must be effective to ensure that exposure to this chemical does not occur.

Enclose operations and use local exhaust ventilation to meet TLV requirements.

If local exhaust ventilation or enclosure is not used, respirators should be worn.

Respiratory protection required if airborne concentration exceeds TLV.

Respiratory protection required in insufficiently ventilated working areas and during spraying.

If the possibility of exposures the recommended limits exists, use an approved self-contained breathing apparatus (meeting the requirements of AS1715 and AS1716) with a full facepiece operated in continuous flow or other positive pressure mode.

Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in the appropriate regulations.

IMPROPER USE OF RESPIRATORS IS DANGEROUS.

<u>Breathing Zone Level</u> <u>ppm (volume)</u>	<u>Maximum Protection</u> <u>Factor</u>	<u>Half-Face</u> <u>Respirator</u>	<u>Full-Face</u> <u>Respirator</u>
1,000	10	AB-AUS P-	
1,000	50	-	AB-AUS P-
5,000	50	Airline *	-
5,000	100	-	AB-2 P-
10,000	100	-	AB-3 P-
10,000	100+	-	Airline **

* - Continuous Flow

** - Continuous Flow or Positive Pressure Demand

Use an approved full face-piece respirator with organic vapor canister or supplied-air respiratory protection in confined or enclosed spaces and/or where the potential exists for exposures over 250 ppm.

At concentrations up to 250 ppm, a chemical cartridge respirator with organic vapor/acid mist cartridge is recommended.

Correct respirator fit is essential to obtain adequate protection.

Above this level, a self-contained breathing apparatus (meeting the requirements of AS1715 and AS1716) is recommended.

If vapor causes eye irritation or if an inhalation risk exists an air supplied breathing apparatus with a full face piece operated in the positive pressure mode or with a full face-piece, hood, or helmet in the continuous flow mode (meeting the requirements of AS1715 and AS1716) should be used.

If while wearing a filter, cartridge or canister respirator, you can smell, taste, or otherwise detect this product, or in the case of a full facepiece respirator you experience eye irritation, leave the area IMMEDIATELY.

Check to make sure the respirator to face seal is still good.

If it is, replace the filter, cartridge, or canister.

If the seal is no longer good, you may need a new respirator.

Where the concentration of vapor or mist is unknown or expected to approach or exceed the Worksafe Exposure Standards limit, the following additional equipment is recommended : -

(1) Short elevated exposures, e.g. spillage - goggles and correct respiratory equipment should be worn.

N.B. if the vapor/mist concentration exceeds the exposure limit by more than 10 times, air supplied apparatus should be used.

(2) For prolonged elevated exposures - Full face air supplied or self contained breathing apparatus should be worn.

NOTE : Make sure the correct cartridges are used for the potential air contamination.

The effectiveness of an air purifying respirator is limited.

Use it only for a single, short term exposure.

For emergency and other conditions where the exposure guide line may be greatly exceeded, use an approved, positive pressure, self-contained breathing apparatus and an observer present for assistance.

For further information consult your Occupational Health and Safety Adviser.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION - continued**PERSONAL PROTECTION - continued****RESPIRATORY - continued**

Be sure to consider all potential exposures in your workplace.

You may need a combination of filters, pre-filters, cartridges, or canisters to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.

Exposure to 1,000 ppm is immediately dangerous to life and health.

If the possibility of exposures above 1,000 ppm exists, use an approved self contained breathing apparatus with a full face-piece (meeting the requirements of AS1715 and AS1716) operated in continuous flow or other positive pressure mode.

Where the concentration of vapor or mist is unknown or expected to approach or exceed the Worksafe Exposure Standards limit, the following additional equipment is recommended : -

(1) Short elevated exposures, e.g. spillage - goggles and correct respiratory equipment should be worn.

N.B. if the vapor/mist concentration exceeds the exposure limit by more than 10 times, air supplied apparatus should be used.

(2) For prolonged elevated exposures - Full face air supplied or self contained breathing apparatus should be worn.

NOTE : Make sure the correct cartridges are used for the potential air contamination.

The effectiveness of an air purifying respirator is limited.

Use it only for a single, short term exposure.

For emergency and other conditions where the exposure guide line may be greatly exceeded, use an approved, positive pressure, self-contained breathing apparatus and an observer present for assistance.

For further information consult your Occupational Health and Safety Adviser.

EYES

Eyes should be protected by chemical splash goggles, safety glasses fitted with side shields or full face shield unless full face-piece respiratory protection is worn..

Contact lenses should **NOT** be worn as soft lenses may absorb irritants and all lenses concentrate irritants.

If vapor causes eye irritation or if an inhalation risk exists a full-face, organic vapor respirator (meeting the requirements of AS1715 & AS1716) should be used.

Eye wash fountains (capable of maintaining an appropriate water pressure for an appropriate length of time to remove the product from the eyes) and safety showers should be available for emergency use.

UT100 U-THANE - PART "A"**9. PHYSICAL and CHEMICAL PROPERTIES****PHYSICAL DESCRIPTION / PROPERTIES**

APPEARANCE		: Viscous liquid. Various colors.	
ODOR		: Strong lacquer odor.	
pH VALUE		: Not applicable	
VAPOR PRESSURE	(kPa @ 38°C)	: 5.2	(Xylene)
VAPOR DENSITY		: 3.7	(Air =1) (Xylene)
BOILING POINT	(°C)	: 114.0 - 118.0	(Methyl Isobutyl Ketone)
FREEZING POINT	(°C)	: - 48.0	(Xylene)
SOLUBILITY IN WATER	(% Weight)	: Negligible	
SPECIFIC GRAVITY	(@ 25°C)	: 0.940 - 1.380	(Water =1) (Depending on color &/or gloss)
FLASH POINT	(°C)	: 17.0 - 18.0	TAG CLOSED CUP (Methyl Isobutyl Ketone)
FLASH POINT	(°C)	: 27.0	TAG CLOSED CUP (Xylene)
FLAMMABILITY LIMITS	(% Volume)	: 1.7 LEL / 7.0 UEL	(Xylene)
AUTOIGNITION TEMPERATURE	(°C)	: 458.0	(Methyl Isobutyl Ketone)
VOC CONTENT		: 470 - 565 gm / Litre	(Depending on color &/or gloss)
EVAPORATION RATE		: 0.7	(Butyl Acetate =1) (Xylene)
VISCOSITY	(BS#4 Flow Cup @ 25°C)	: 40 - 160 Seconds	(Depending on color &/or gloss)
% VOLATILES	(by volume)	: 55 - 66 %	(Depending on color &/or gloss)
Octanol/Water Partition Coefficient Log P (oct)		: 3.12 - 3.20.	(Xylene)

OTHER PROPERTIES

- : Flammable, vapors can readily form explosive mixture with air
- Methyl isobutyl ketone reacts vigorously with both reducing and oxidising agents.
- It ignites on contact with potassium tert-butoxide and may form explosive peroxide on exposure to air.

UT100 U-THANE - PART "A"**10. STABILITY and REACTIVITY****REACTIVITY / COMPATIBILITY**

- Hazardous polymerization : Cannot occur
- Stability : Stable under normal conditions
- Conditions to Avoid : Heat, sparks, flame and build up of static electricity.
- Incompatibility (materials to avoid for purpose of transport, handling & storage only)
: Avoid contact with strong alkalis, mineral acids, halogens, amines, alkanolamines, aldehydes, ammonia, strong oxidizers (liquid chlorine, bromine, fluorine, concentrated oxygen, sodium hypochlorite, perchloric acid, chromium trioxide, peroxides, chlorates, perchlorates, nitrates, & permanganates - increased risk of fire), alkali metal hydroxides (hydrolysis can occur), potassium tert-butylate (ignition can occur), rubber, polyethylene and PVC, and most tank linings.
- Reactivity : Methyl isobutyl ketone reacts vigorously with both reducing and oxidising agents. It reacts violently with and ignites on contact with potassium tert-butoxide. May form explosive peroxide on exposure to air.
- Hazardous reactions : Aluminium flake can react with some acid and alkali solutions to form hydrogen gas and heat.
- Hazardous components of mixtures : No unusual.
- Hazardous decomposition products : No hazardous decomposition products when stored and handled correctly. Forms toxic fumes when thermally decomposed. Thermal decomposition is dependent on time and temperature.
- Hazardous combustion products : Carbon monoxide and/or carbon dioxide, oxides of aluminium, oxides of silicone, fumes and smoke in the case of incomplete combustion. Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant.
- Thermal decomposition and incomplete combustion may yield carbon monoxide, carbon dioxide, oxides of aluminium, oxides of silicone, fumes and smoke.

UT100 U-THANE - PART "A"**11. TOXICOLOGICAL INFORMATION****TOXICITY**

Evidence from animal tests is available to indicate that repeated or prolonged exposure to hydrocarbon solvents could result in liver, kidney and central nervous disorders as well as anaemia and leukopenia (lowered white cell count).
Aromatic hydrocarbons, such as those contained in this product, irritate the skin and mucous membranes and are narcotic if inhaled in high concentrations.
Harmful if swallowed, may cause gastric irritation and narcosis.
Do NOT induce vomiting if swallowed
Prolonged, repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis.
Limits shown for guidance only.
Follow applicable regulations (refer WORKSAFE Australia Exposure Standards).
No LD₅₀ data available for this specific product.
Data for principal ingredients only.

XYLENE

Oral	LD ₅₀ (rat)	: 4,300 mg/kg	Considered to be no more than slightly toxic based on single dose level testing at 2,000 mg/kg.
Oral	LDLO (human)	: 50 mg/kg	
Dermal	LD ₅₀ (rabbit)	: >2,000 mg/kg	Considered to be no more than slightly toxic based on single dose level testing at 2,000 mg/kg.
Inhalation	LC ₅₀ (rat)	: 5,000 ppm / 4 hours	
Inhalation	LC ₅₀ (rat)	: 5,320 ppm / 8 hours	
Inhalation	LCLO (human)	: 10,000 ppm / 6hrs	
Inhalation (Lowest Toxic Concentration)	TCLO (human)	: 200 ppm	Irritant (CNS recording changes, hallucinations)
Inhalation	LCLO (human)	: 10,000 ppm / 6hrs	
Eyes	(rabbit)	: 87 mg	- Mild irritant
Eyes	(human)	: 200 ppm	- Moderate irritant
Skin Irritation	(rabbit)	: 500 mg / 24 hr	- Moderate irritant on prolonged or repeated contact. May cause severe irritation on prolonged or repeated contact.
Swallowed			: Do NOT induce vomiting if swallowed

Evidence from animal tests is available to indicate that repeated or prolonged exposure to xylenes could result in liver, kidney and central nervous system disorders as well as anaemia and leukopenia (lowered white cell count).
Aromatic hydrocarbons, such as xylenes, irritate the skin and mucous membranes and are narcotic if inhaled in high concentrations.
Prolonged, repeated skin contact with low viscosity materials may de-fat the skin resulting in possible irritation and dermatitis.

REPRODUCTIVE TOXICOLOGY

Teratogenic studies (rats) : Negative.
No birth defects reported when pregnant rats were exposed to 500 ppm Xylene.
Foetal weights slightly below normal at 500 ppm. No toxic effects on the foetus reported above 250 ppm.

CARCINOGENICITY

: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

No evidence of skin carcinogenic activity in laboratory tests.
No health effects in animals treated with this material in US NTP 2 -year bioassay.

BIOLOGICAL EXPOSURE INDEX - BEI**XYLENE**

These represent the determinants observed in specimens collected from a healthy worker exposed to Xylene at Exposure Standards (ES or TLV)

<u>Determinant</u>	<u>Index</u>	<u>Sampling Time</u>	<u>Comment</u>
Methyl hippuric acid	1.5 gm/gm	End of shift	Acids in urine
creatinine	2.0 mg/min	Last 4 hrs. of shift	

UT100 U-THANE - PART "A"**11. TOXICOLOGICAL INFORMATION - continued****TOXICITY - continued****ETHYL BENZENE** (As a component of Xylenes)

Oral	LD ₅₀	(rat)	: > 2,000 mg/kg
Dermal	LD ₅₀	(rat)	: >2,000 mg/kg
Inhalation	LC ₅₀	(rat)	: > 2 mg / L / 4 hours
Skin Irritation			: May cause moderate skin irritation (but insufficient to classify).
Swallowed			: Do NOT induce vomiting if swallowed
Eye Irritation			: Moderately irritating to eyes (but insufficient to classify).
Respiratory Irritation			: Repeated inhalation of vapours and mists is expected to cause irritation of the respiratory tract.
Sensitization			: Not expected to be a skin sensitiser.
Repeated Dose Toxicity			: Kidney: can cause kidney damage. : Liver: can cause liver damage. Central nervous system: repeated exposure affects the nervous system. Auditory system: prolonged and repeated exposures to high concentrations have resulted in hearing loss in rats. Solvent abuse and noise interaction in the work environment may cause hearing loss.
Mutagenicity			: Not mutagenic.
Carcinogenicity			: Limited evidence of carcinogenic effect.
Reproductive and Developmental Toxicity			: Causes slight foetotoxicity.

AROMATIC PETROLEUM HYDROCARBONS

Oral	LD ₅₀	(rat)	: 2,900 mg/kg
Dermal	LD ₅₀	(rabbit)	: 10,500 mg/kg
Inhalation	LC ₅₀	(rat)	: 12,100 mg/m ³ /8 hours
Eyes		(rabbit)	: Moderate Irritant
Respiratory Irritation			: Repeated inhalation of vapors and mists is expected to cause irritation of the respiratory tract.
Skin			: Harmful
Other			: Harmful if swallowed or by inhalation.

Evidence from animal tests is available to indicate that repeated or prolonged exposure to hydrocarbon solvents could result in liver, kidney and central nervous disorders as well as anaemia and leukopenia (lowered white cell count).

Aromatic hydrocarbons irritate the skin and mucous membranes and are narcotic if inhaled in high concentrations.

Chronic exposure to high concentrations of Benzene have been associated with blood abnormalities and leukaemia in a small percentage of exposed workers.

1-METHOXY PROPYL ACETATE-2

Oral	LD ₅₀	(rat)	: 850 mg/kg
Inhalation	LC ₅₀	(rat)	: 4,345 ppm/6 hours (CCOHS, RTECS)
Eye		(rabbit)	: Moderate Irritant
Skin		(rabbit)	: Moderate Irritant

ALUMINIUM FLAKE

No toxic effects are known by the manufacturer.

UT100 U-THANE - PART "A"**11. TOXICOLOGICAL INFORMATION - continued****TOXICITY - continued****METHYL ISO-BUTYL KETONE**

Oral	LD ₅₀	(rat)	: 2,080 mg/kg (20% methyl isobutyl ketone dissolved in Tergitol 7 surfactant)
Oral	LD ₅₀	(rat)	: 5.7 mL/kg (≈ 4570 mg/kg) (undiluted methyl isobutyl ketone)
Oral	LD ₅₀	(mouse- 24-hour)	: 1,900 mg/kg
Oral	LD ₅₀	(guinea pig)	: 1,600 mg/kg
Oral	LD ₅₀	(Angelaius phoeniceus-(redwinged blackbird)	: 100 mg/kg
Inhalation	LC ₅₀	(rat)	: 2,000 ppm for 4 hours. Moderately toxic.
Inhalation	LC ₅₀	(mouse)	: 23,300 mg/kg
Inhalation	LCLO	(rat)	: 4,000 ppm / 15 minutes.
Inhalation	TCLO	(human)	: 200 ppm - Irritant (CNS recording changes, hallucinations)
Dermal	LD ₅₀	(rabbit)	: > 3,000 mg/kg Considered to be no more than slightly toxic based on single dose level testing at 3 g/kg.
Eyes		(rabbit)	: 40 mg - Severe Irritant
Eyes		(human)	: 200 ppm / 15 minutes - Irritating
Skin		(rabbit)	: 500 mg / 24hr - Mild Irritant
Swallowed			: Harmful if swallowed, may cause gastric irritation and narcosis.
Inhaled			: High vapor concentrations are irritating to the respiratory tract may cause nausea, vomiting, headache, dizziness, are anaesthetic and may have other central nervous system effects.

SAX TOXICITY EVALUATION

:	:
THR	: A poison by intraperitoneal route. Moderately toxic by ingestion. Mildly toxic by inhalation. It is very irritating to the skin, eyes and mucous membranes. A human systemic irritant by inhalation. It is narcotic in high concentrations.

High vapor concentrations are irritating to the respiratory tract may cause nausea, vomiting, headache, dizziness anaesthetic and may have other central nervous system effects.

Workers near a centrifuge were exposed to 500 ppm of methyl isobutyl ketone for 20 - 30 minutes per day.

They complained of weakness, loss of appetite, headache, burning eyes, nausea, vomiting and sore throats

A 90 day continuous exposure experiment involving rats at 100 ppm of methyl isobutyl ketone resulted in kidney damage.

Mutagenicity studied with similar materials in the Ames test, mouse lymphoma, rat bone marrow cytogenetics and dominant lethal assays showed no adverse effects.

In mutagenicity assays, requested by and submitted to EPA under Section 4 of the Toxic Substances Control Act (TSCA), Methyl Iso-Butyl Ketone tested positive in the mouse lymphoma and cell transformation assays.

Results were suggestive but equivocal for unscheduled DNA synthesis.

GENETIC TOXICOLOGY

L51784 mouse lymphoma cell test	: Negative Ames test.
In vivo cytogenetics assay	: Negative.
Unscheduled DNA synthesis in rat hepatocytes	: Negative

SUBCHRONIC TOXICOLOGY

Rats exposed to 1,000 ppm 6 hours/day, 5 days/week for 90 days developed only increased liver weight.

11. TOXICOLOGICAL INFORMATION - continued**TOXICITY - continued****METHYL ISO-BUTYL KETONE - continued****REPRODUCTIVE TOXICOLOGY**

Teratogenic studies (rats) : Negative

Results from inhalation developmental toxicity studies in mice and rats, requested by and submitted to EPA under Section 4 of TSCA, indicate that Methyl Iso-Butyl Ketone is a developmental toxicant.

Exposure to high concentrations of methyl isobutyl ketone in air during pregnancy can cause maternal and foetal toxicity, resulting in decreased foetal weight and delayed skeletal ossification.

In the rat evidence of developmental toxicity (decrease in foetal weight) was seen at concentrations as low as 300 ppm, the lowest dose tested.

In addition to foetal weight reductions, increases in the frequencies of ossification variations were seen at 3,000 ppm in both rats and mice

These results were attributed to maternal and foetal toxicity.

There were no significant increases in malformations in either rats or mice at any dose.

Humans - No information on the developmental/reproductive toxicity of Methyl Iso-Butyl Ketone was found in the secondary sources searched.

NEUROTOXICITY

Neurological effects, observed in humans and animals exposed to high concentrations of Methyl Iso-Butyl Ketone in air appear to be reversible.

Humans - Exposure to high concentrations (>1000 ppm) of methyl isobutyl ketone can produce central nervous system depression and narcosis. Lower doses (80-500 ppm) can cause weakness, headaches, and nausea

Animals - Very high concentrations of Methyl Iso-Butyl Ketone (19,000-20,000 ppm) resulted in rapid anaesthesia of mice, which was reversible if the animals were promptly removed to fresh air.

Most mice not moved to fresh air died from the narcosis and respiratory failure within 30 minutes at 20,000 ppm.

The same effects were reported with rats and guinea pigs at doses of 21,000 and 16,800 ppm, respectively.

Lower doses (4,000 ppm) resulted in loss of co-ordination and prostration in rats exposed for 6 hours in one study; whereas, the same dose and exposure time killed all the animals in another study

CARCINOGENICITY

Humans - No information on the carcinogenicity of Methyl Iso-Butyl Ketone was found in the secondary sources searched.

Animals - No information on the carcinogenicity of Methyl Iso-Butyl Ketone was found in the secondary sources searched.

SUBCHRONIC TOXICOLOGY**HUMAN**

Human studies and animal experiments have indicated that extended or repeated exposure to relatively high concentrations of Methyl Iso-Butyl Ketone can result in central nervous system, gastrointestinal tract, hepatic, and renal toxicity,

Chronic occupational exposure to an atmospheric concentration of 500 ppm methyl isobutyl ketone for 20-30 minutes/day, and 80 ppm for the remainder of the workday resulted in nausea, headache, burning eyes, and weakness in over half of the workers.

Some workers reported somnolence, insomnia and intestinal pain, and 4/19 appeared to have slightly enlarged livers.

This study was continued 5 years later after the Methyl Iso-Butyl Ketone concentrations had been reduced to 100-105 ppm for the 20-30 minutes exposures and 50 ppm for the general exposures.

A few workers still experienced gastrointestinal and neurological problems and slight liver enlargement was found in 2 individuals

ANIMALS

Rats exposed to 1,000 ppm 6 hours/day, 5 days/week for 90 days developed only increased liver weight.

11. TOXICOLOGICAL INFORMATION - continued**TOXICITY - continued****SPECIAL PROPERTIES / EFFECTS**

Effects of this product on human health and the environment depend on how much of the product is present and the length and frequency of exposure.

Effects also depend on the health of a person or the condition of the environment when exposure occurs.

Over-exposure, especially during spraying operations without the necessary precautions entails the risk of concentration-dependent irritating effects on eyes, nose, throat, and respiratory tract and can adversely affect the nervous system.

Effects range from headaches, dizziness, nausea, and numbness in fingers and toes to unconsciousness and death.

Delayed appearance of the complaints and development of hyper-sensitivity (difficult breathing, coughing, asthma) are possible.

Direct, prolonged contact with liquid product irritates the skin. The liquid also irritates the eyes.

Human health effects associated with breathing or otherwise consuming smaller amounts of the product over long periods of time are not known.

Workers have developed nausea, headaches, weakness, and adverse liver effects as a result of repeated exposure to methyl isobutyl ketone.

Laboratory studies show that breathing large amounts of methyl isobutyl ketone during pregnancy causes adverse effects in the developing foetus of animals.

Studies also show that repeat exposure to large amounts of methyl isobutyl ketone in air causes kidney and liver damage in animals.

Vapour at concentrations above the exposure standard has an anaesthetic effect, which may lead to headache, dizziness and loss of consciousness.

This chemical has not been adequately evaluated to determine whether brain or other nerve damage could occur with repeated exposure.

However, many solvents and other petroleum-based chemicals have been shown to cause such damage.

Effects may include reduced memory and concentration, personality changes (withdrawal, irritability), fatigue, sleep disturbances, reduced coordination, and/or effects on nerves supplying internal organs (autonomic nerves) and/or nerves to the arms and legs (weakness, "pins and needles").

UT100 U-THANE - PART "A"**12. ECOLOGICAL INFORMATION**

The product is a colorless liquid at room temperature and is highly flammable.

Do not allow to escape into waters, waste water or soil.

This product may enter the environment from industrial discharges, municipal waste treatment plant discharges, or spills.

It is a liquid at room temperature and is flammable.

Do not allow to escape into waters, waste water or soil.

No environmental impact data available for this specific product. However for some of the components :

BIOLOGICAL EFFECTS**XYLENES**

ECOTOXICITY	:	Harmful effect on aquatic organisms. Hazard for drinking water supplies.
ENVIRONMENT PROTECTION	:	Do not allow to enter waters, waste water, or soil.
BIO-ACCUMULATIVE POTENTIAL	:	An appreciable bioaccumulation potential is to be expected (log P(o/w) >3).
PERSISTENCE / DEGRADABILITY BIOLOGIC DEGRADATION	:	Biodegradable.
OIL / WATER PARTITION COEFFICIENT, P	:	log P (oct) : 1.82
MOBILITY / DISTRIBUTION	:	log P(o/w) : 3.1 - 3.2.

WATER POLLUTION FACTORS

ThOD	:	3.125 g/g.
COD	:	78.0% of ThOD
BOD ₅	:	1.020
BOD ₂₀	:	1.450

0.1 mg/L affects the self purification of surface waters.

ACUTE TOXICITY

Acute Toxicity - Fish	:	LC ₅₀ : 14 mg/l /96 hour (Onchorhynchus mykiss)
	:	LC ₅₀ : 86 mg/l /48 hour (Leuciscus idus)
Acute Toxicity	:	EC ₅₀ : 165 mg/l /24 hour (Daphnia Daphnia magna)

TOXICITY THRESHOLD (cell multiplication inhibition tests)

BACTERIA	:	115	mg/L
ALGAE	:	280	mg/L
GREEN ALGAE	:	21	mg/L
PROTOZOA	:	321- 574	mg/L
96 hr TL _M @ 24.0 °C (algae)	:	320	ppm
48 hr TL _M @ 24.0 °C (daphnia)	:	44	ppm
96 hr LC ₅₀ (bluegill sunfish)	:	100	ppm

ETHYL BENZENE (As a component of Xylenes)**ACUTE TOXICITY**

Fish	:	Toxic	:	1 < LC/EC/IC ₅₀	<= 10 mg/l
Aquatic Invertebrates	:	Toxic	:	1 < LC/EC/IC ₅₀	<= 10 mg/l
Algae	:	Toxic	:	1 < LC/EC/IC ₅₀	<= 10 mg/l
Micro-organisms	:	Expected to be harmful	:	10 < LC/EC/IC ₅₀	<= 100 mg/l

ENVIRONMENT PROTECTION

: Do not allow to enter waters, waste water, or soil.
: If product enters soil, it will be highly mobile and may contaminate groundwater.

BIOACCUMULATION

: Not expected to bio-accumulate significantly.

PERSISTENCE/DEGRADABILITY

: Readily biodegradable.

MOBILITY / DISTRIBUTION

: Floats on water.

Oxidises rapidly by photo-chemical reactions in air.

OTHER ADVERSE EFFECTS

: In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

UT100 U-THANE - PART "A"**12. ECOLOGICAL INFORMATION - continued****BIOLOGICAL EFFECTS - continued****METHYL ISO-BUTYL KETONE**

ECOTOXICITY : Ecological problems are NOT to be expected when the product is handled and used with due care and attention.

This material is practically non-toxic to aquatic organisms.

ENVIRONMENT PROTECTION

: Do not allow to enter waters, waste water, or soil.

BIO-ACCUMULATIVE POTENTIAL

: The non-acclimated extent of bio-oxidation was 69% after 20 days, in fresh water.

BIOLOGIC DEGRADATION

: Biodegradable when oxygen present.

99 % / 7 days. Readily biodegradable.

No appreciable bioaccumulation potential is to be expected (log P(o/w) 1-3)

OCTANOL-WATER CO-EFFICIENT

: log Pow = 1.38

MOBILITY / DISTRIBUTION

: Oil / Water Partition Coefficient, P : log P(o/w): 1.31 (experimental)

WATER POLLUTION FACTORS**ThOD**

: 2.72 g/g

COD (measured)

: 2.46 g O₂ / g .

Is expected to be low due to the low value of the octanol-water coefficient

BOD

: 2.06 gO₂/g

BOD₅ (5 days)

: 79 % from ThOD (using sludge from a waste treatment plant).

BOD₂₀ (20 days)

: Not Available

ACUTE TOXICITY**FISH**

48 hour LC₅₀ (Golden Orfe) : 675 - 750 mg/l

24 hour LC₅₀ (Carassius auratus - Gold fish) : 460 mg/l

96 hour LC₅₀ (Pimephales promelas - fathead minnow) : 505 - 540 mg/l

96 hour LC₅₀ (Salmo gairdneri) : 600 mg/l

96 hour LC₅₀ (Onchorhynchus mykiss) : 600 mg/l

ICIO : 275 mg/l

OTHER ORGANISMS

24 hour LC₅₀ (Daphnia magna - water flea) : 4,280 mg/l

24 hour EC₁₀₀ (Daphnia magna - water flea) : 5,000 mg/l

48 hour EC₅₀ (Daphnia magna - water flea) : 170 mg/l

96 hour EC₅₀ (Selenastrum capricornutum) : 980 mg/l

48 hour EC₅₀ (Scenedesmus subspicatus) : 980 mg/l

7 day IC₅ (Scenedesmus quadricauda) : 725 mg/l

16 hour EC₅ (Pseudomonas putida) : 275 mg/l

72 hour EC₅ (Entosiphon sulcatum) : 275 mg/l

24 hour LC₅₀ (Artemia salina - brine shrimp) : 1,230 mg/l

EC₅₀ (Photobacterium phosphoreum) : 80 mg/l /5 minute

MAXIMUM PERMISSIBLE TOXIC CONCENTRATION:

16 hour EC₅ (Pseudomonas putida) : 447 mg/l

8 day EC₅ (Microcystis aeruginosa) : 136 mg/l



UT100 U-THANE - PART "A"

12. ECOLOGICAL INFORMATION - continued

ECOLOGICAL INFORMATION - continued

ACUTE (SHORT-TERM) ECOLOGICAL EFFECTS

Acute toxic effects may include the death of animals, birds, or fish, and death or low growth rate in plants. Acute effects are seen two to four days after animals or plants come in contact with a toxic chemical substance. This product has high acute toxicity to aquatic life and causes injury to various agricultural and ornamental crops. Insufficient data are available to evaluate or predict the short-term effects of this product to birds or land animals.

CHRONIC (LONG-TERM) ECOLOGICAL EFFECTS

Chronic toxic effects may include shortened lifespan, reproductive problems, lower fertility, and changes in appearance or behavior. Chronic effects can be seen long after first exposure(s) to a toxic chemical. This product has high chronic toxicity to aquatic life. Insufficient data are available to evaluate or predict the long-term effects of this product to plants, birds, or land animals.

WATER SOLUBILITY

This product is moderately soluble in water. Concentrations of between 1 to 1,000 milligrams will mix with a litre of water.

ENVIRONMENT PROTECTION : Do not allow to enter waters, waste water, or soil.

DISTRIBUTION AND PERSISTENCE IN THE ENVIRONMENT

This product is non-persistent in water. The product is expected to be moderately persistent in water, with a half-life of than 2 - 20 days. The half-life of a pollutant is the amount of time it takes for one-half of the chemical to be degraded. About 99.3% of the solvents in this product will eventually end up in the air; about 0.5% will end up in water; about 0.1%, respectively will end up in terrestrial soils and in aquatic sediments.

BIOACCUMULATION IN AQUATIC ORGANISMS

Some substances increase in concentration, or bio-accumulate, in living organisms as they breathe contaminated air, drink contaminated water, or eat contaminated food. These chemicals can become concentrated in the tissues and internal organs of animals and humans. The concentration of this product found in fish tissues is expected to be somewhat higher than the average concentration of this product in the water from which the fish was taken.

ABIOTIC EFFECTS

Smog chamber studies indicate that methyl isobutyl ketone is moderately reactive with nitrogen oxides producing acetone, peroxyacetylnitrate, and methyl nitrate. According to the definition provided in the Federal Register (1992), methyl isobutyl ketone is a volatile organic carbon (VOC) substance. As a VOC (Volatile Organic Compound), methyl isobutyl ketone can contribute to the formation of photochemical smog in the presence of other VOCs.



UT100 U-THANE - PART "A"

13. DISPOSAL CONSIDERATIONS

This product is NOT suitable for disposal by either landfill or via municipal sewers, drains, natural streams or rivers. Consult an expert on disposal of any recovered material and ensure conformity to local disposal regulations. It may be necessary to contain and dispose of this product as a HAZARDOUS WASTE. Contact your state Environmental Program for specific recommendations. Refer to State Land Waste Management Authority for specific recommendations. Advise of flammable/chemical nature. Recycle product where possible. Normally suitable for incineration in appropriate equipment by an approved agent provided local regulations are observed. Recycle containers where possible, or dispose of in an authorised landfill. Do NOT pressurise, cut, heat, or weld containers. Do NOT re-use empty containers without commercial cleaning or reconditioning. Empty product containers may contain product residue.

UT100 U-THANE - PART "A"**14. TRANSPORT INFORMATION**

Classified as a Dangerous Good (Class 3) (FLAMMABLE LIQUID) Dangerous Substance for the purpose of transport.
Refer to relevant regulations for storage and transport requirements.

STORAGE AND TRANSPORT

Classified as a Dangerous Good (Class 3) for transport purposes.

CORRECT SHIPPING NAME	: Paint related material, L.F.P.		
UN No	: 1263	PACKAGING GROUP	: II
CLASS	: 3.1 (Highly Flammable Liquid)	ICAO / IATA-DGR	: 3 1263 II
AS 1940 Class	: PG II	ICAO / IATA-DGR	: 3 1263 II
SUBSIDIARY RISK	: NOT ASSIGNED	HAZCHEM CODE	: •3YE
IMO HAZARD CLASS	: INFLAMMABLE LIQUID/3.1	EPG	: 3C1
POISONS	: S5		

DECLARATION FOR LAND SHIPMENT	: 1263, Paint related material
DECLARATION FOR SEA SHIPMENT	: Paint related material
DECLARATION FOR SHIPMENT BY AIR	: Paint related material
STORAGE TEMPERATURE	(°C) : Ambient
TRANSPORT TEMPERATURE	(°C) : Ambient
LOADING / UNLOADING TEMPERATURE	(°C) : Ambient
STORAGE / TRANSPORTATION PRESSURE (kPa)	: Atmospheric
ELECTROSTATIC ACCUMULATION HAZARD ?	: Yes, use proper grounding procedure.
USUAL SHIPPING CONTAINERS	: Drums, pails.
MATERIALS AND COATINGS SUITABLE	: Carbon Steel / Stainless Steel.
MATERIALS AND COATINGS UNSUITABLE	: Natural Rubber / Butyl Rubber / E P D M / Polystyrene / Polyethylene / Polypropylene / Polyvinyl chloride / Polyvinyl alcohol / Polyacrylonitrile

Class 3 flammable liquids shall **NOT** be loaded in the same vehicle with :-

- Class 1 Explosives
- Class 2.1 Flammable gases (when both in bulk)
- Class 2.3 Poisonous gases
- Class 4.2 Spontaneously combustible substances
- Class 5.1 Oxidizing agents
- Class 5.2 Organic peroxides
- Class 7 Radioactive substances
- Halogens (chlorinated compounds & etc.)
- Foodstuffs and foodstuff empties.

Refer to Australian Code for the Transport of Dangerous Goods By Road and Rail (8th Edition) for transport regulations and state Dangerous Goods regulations for storage requirements.

This material is a Scheduled Poison (S5) and must be stored, maintained and used in accordance with the relevant regulations.

Materials are stable on storage, but should be stored in a cool, well ventilated area away from sources of ignition, oxidizing agents and odor sensitive materials.

Keep containers tightly closed when not in use and check regularly for leaks.

Use non-sparking tools and equipment.

HARMFUL IF INHALED.

CAUSES EYE IRRITATION.

BREATHING OF MIST MAY CAUSE LUNG DAMAGE.

UT100 U-THANE - PART "A"**15. REGULATORY INFORMATION****CLASSIFICATION AND LABELLING ACCORDING TO NOHSC CODES****CLASSIFICATION / SYMBOL** : FLAMABLE / F**CLASSIFICATION / SYMBOL** : IRRITANT / Xi , HARMFUL / Xn**GOVERNING DIRECTIVE** : National Code of practice for the Labelling of Hazardous Substances.**HAZARDS IDENTIFICATION**

Leaks of gas or spills of liquid can readily form flammable mixtures at temperatures at or above flash point.

SYMBOLS

Xi	Irritant
Xn	Harmful
N	Dangerous for the environment

RISK PHRASES

R11	Highly flammable.
R18	In use, may form flammable/explosive vapor-air mixture.
R20/2122	Harmful by inhalation, in contact with skin and if swallowed.
R33	Danger of cumulative effects.
R36/37/38	Irritating to eyes, respiratory system and skin.
R40	Limited evidence of carcinogenic effect.
R42/43	May cause sensitisation by inhalation and skin contact.
R51/53	Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.
R61	May cause harm to the unborn child.
R62	Possible risk of impaired fertility.
R65	May cause lung damage if swallowed.
R67	Vapors may cause drowsiness and dizziness.

SAFETY ADVICE

S02	Keep out of the reach of children.
S3/7/9	Keep container tightly closed in a cool, well ventilated place.
S16	Keep away from sources of ignition - No smoking.
S20/21	When using, do not eat, drink or smoke.
S23	Do not breathe fumes/vapour/spray
S24/25	Avoid contact with skin and eyes.
S29	Do not empty into drains.
S33	Take precautionary measures against static discharges.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S43B	In case of fire use sand, earth, chemical powder or alcohol type foam
S45	In case of accident or if you feel unwell, seek medical advice immediately. (Show label or MSDS where possible).
S51	Use only in well ventilated areas.
S61	Avoid release into the environment.
S62	If swallowed, do NOT induce vomiting.

UT100 U-THANE - PART "A"**16. OTHER INFORMATION****LD₅₀** (Lethal Dose, 50 %)

LD₅₀ is the amount of a material, given all at once, which causes the death of 50 % (one half) of a group of test animals.

The LD₅₀ is one way to measure the short-term poisoning potential (acute toxicity) of a material.

The LD₅₀ can be found for any route of entry or administration but dermal (applied to the skin) and oral (given by mouth) administration methods are the most common.

LC₅₀ (Lethal Concentration, 50 %)

LC values usually refer to the concentration of a chemical in air but in environmental studies it can also mean the concentration of a chemical in water.

For inhalation experiments, the concentration of the chemical in air that kills 50 % of the test animals in a given time (usually four hours) is the LC₅₀ value.

EC₅₀ (half maximal effective concentration)

refers to the concentration of a drug, antibody or toxicant which induces a response halfway between the baseline and maximum after some specified exposure time. It is commonly used as a measure of drug's potency.

IC₅₀ (half maximal inhibitory concentration)

is a measure of the effectiveness of a compound in inhibiting biological or biochemical function.

This quantitative measure indicates how much of a particular drug or other substance (inhibitor) is needed to inhibit a given biological process (or component of a process, i.e. an enzyme, cell, cell receptor or micro-organism) by half.

TL_M (Median Tolerance Limit)

the concentration of toxicant or substance at which 50% of the test organisms survive over the test period.

log Pow / log P(o/w)

in chemistry and the pharmaceutical sciences, a partition- (P) or distribution coefficient (D) is the ratio of concentrations of a compound in the two phases of a mixture of two immiscible solvents at equilibrium. Hence these coefficients are a measure of differential solubility of the compound between these two solvents. The phrase "Partition Coefficient" is now considered obsolete by IUPAC, and the appropriate alternative ("partition constant", "partition ratio" or "distribution ratio") should be used as appropriate.

Normally one of the solvents chosen is water while the second is hydrophobic such as octanol. Hence both the partition and distribution coefficient are measures of how hydrophilic ("water loving") or hydrophobic ("water fearing") a chemical substance is. A partition coefficient can also be used when one or both solvents is a solid though.

THEORETICAL OXYGEN DEMAND (ThOD)

is the calculated amount of oxygen required to oxidize a compound to its final oxidation products.

or

the amount of oxygen that theoretically can be consumed if the test substance is completely oxidized by micro-organisms.

Calculated from the test substance's chemical structure; units mg O₂ per mg of test substance.

CHEMICAL OXYGEN DEMAND (COD) test is commonly used to indirectly measure the amount of organic compounds in water.

Most applications of COD determine the amount of organic pollutants found in surface water (e.g. lakes and rivers), making COD a useful measure of water quality.

It is expressed in milligrams per litre (mg/L), which indicates the mass of oxygen consumed per litre of solution.

Older references may express the units as parts per million (ppm).

BIOCHEMICAL OXYGEN DEMAND (BOD) is a chemical procedure for determining the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period.

It is not a precise quantitative test, although it is widely used as an indication of the organic quality of water.

It is most commonly expressed in milligrams of oxygen consumed per litre of sample during 5 days of incubation at 20 °C and is often used as a robust surrogate of the degree of organic pollution of water.

BOD can be used as a gauge of the effectiveness of wastewater treatment plants.



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UT100 U-THANE - PART "A"

16. OTHER INFORMATION - continued

DATE OF PREPARATION / LAST REVISION : 03/02/11

PRINCIPAL REFERENCES

Supplier's Material Safety Data Sheet

In "Registry of Toxic Effects of Chemical Substances 1995" (Ed. D. Sweet),
(US Dept. of Health & Human Services: Cincinnati 1995)

The components of this chemical is listed on the Australian Inventory of Chemical Substances (AICS).