



Manufacturers of UTHANE Polyurethane Coatings
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Date Of Issue : 02/07/07

Emergency Telephone No. +612 9634-5560
MATERIAL SAFETY DATA SHEET
UT910 FAST DRY UTHANE HARDENER - PART "B"

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Ref msds 00130b

Hazardous according to criteria of Worksafe Australia

1. IDENTIFICATION

PRODUCT NAME : UT910 FAST DRY UTHANE HARDENER - PART "B"
AVAILABLE COLORS : 8100 CLEAR
OTHER NAMES : Not Applicable
UN NUMBER : 1866
DANGEROUS GOODS CLASS : 3.2 (flammable liquid)
PACKAGING GROUP : II
SUBSIDIARY RISK : Not available
HAZCHEM CODE : 3[Y]E
POISONS SCHEDULE : S6
EPG : 3A2
USE : Chemical curing agent for reactive spraying finishes to provide a tough, durable air dried substrate prior to the application of finish coats.

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

COMPANY / UNDERTAKING

BC COATINGS
2 Hume Road, Smithfield, N.S.W. 2164
Phone +612 9729-2000, FAX +612 9729-2279
Emergency Telephone No. +612 9634-5560

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.

2. COMPOSITION

<u>CHEMICAL ENTITY</u>	<u>CAS No.</u>	<u>Index No.</u>	<u>EINECS No.</u>	<u>PROPORTION (% w/w)</u>
n-Butyl Acetate	123-86-4	607-025-00-1	204-658-1	30 - 60
Ethyl Acetate	141-78-6	607-022-00-5	205-500-4	< 10
Methyl Ethyl Ketone	78-93-3	606-002-00-3	201-159-0	< 10
Aromatic-Aliphatic Polyisocyanate	63368-95-6	N/A	N/A	30 - 60
Free Monomeric Hexamethylene-1,6-Di-Isocyanate	822-06-0	615-011-001-1	212-485-8	< 0.5
Free Monomeric 2,4-/2,6-Di-Isocyanatetoluene	26471-62-5 (584-84-9/91-08-7)	615-006-00-4	247-722-4	< 0.5

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

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

3. HAZARDS IDENTIFICATION**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. Exposure can occur in the workplace or in the environment following releases to air, water, land, or ground water. It enters the body when breathed in with contaminated air or when consumed with contaminated food or water. Can also be absorbed through skin contact.

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

Effects on human health and the environment depend on how much of the product is present and the length and frequency of exposure or the condition of the environment when exposure occurs.

Repeatedly breathing large amounts of solvents, such as when "sniffing" thinner or paint, can cause permanent brain damage. As a result, humans can develop problems with speech, hearing, and vision.

Humans can also experience loss of muscle control, loss of memory and decreased mental ability.

Exposure to this product can also adversely affect the kidneys.

High vapor concentrations are irritating to the eyes and the respiratory tract, may cause coughing, nausea, headaches and dizziness, fatigue, lethargy, anorexia, tremor, are anaesthetic and may have other central nervous system effects.

Exposure to high concentrations can be fatal.

Lower levels may cause trouble concentrating, headaches, and slowed reflexes.

Narcotic effects occur at levels below the exposure standard.

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

Vapor may cause conjunctivitis. Temporary corneal clouding may also result and may last several hours.

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

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

Corneal damage will occur after prolonged contact.

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

NOHSC has indicated that at levels above 0.5%, free organic isocyanates should be regarded as sensitizers.

It is below that level in this preparation, but its presence should be noted for certain hypersensitive individuals.

TARGET ORGANS : Central nervous system, eyes, skin, gastro-intestinal tract, blood, liver and kidneys

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

: Damaged skin, respiratory system disease

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 to mouth, throat and the gastrointestinal tract and may be toxic if swallowed in quantity.

May cause corrosion and damage of the gastrointestinal tract

Tends to break into a foam if the patient vomits.

Ingestion can result in breathing difficulty nausea, cramps, abdominal pain &/or discomfort, vomiting, diarrhoea, central nervous system depression and other effects similar to those following inhalation.

Ingestion of large amounts may lead to kidney injury, central nervous system effects and may result in red blood cell haemolysis

Small amounts of liquid aspirated into respiratory system during ingestion or from vomiting may cause broncho-pneumonia or 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 (experienced as discomfort or pain, excess blinking and tear production) if exposure is prolonged.

The liquid is highly irritating to the eyes and is capable of causing pain and severe conjunctivitis. (marked excess redness and swelling of the conjunctiva).

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

3. HAZARDS IDENTIFICATION - continued**HEALTH EFFECTS - ACUTE EXPOSURE (continued)****SKIN**

Contact with the skin may result in severe irritation and drying of the skin which may lead to dermatitis if contact is prolonged. Prolonged contact may cause more severe irritation, with discomfort or pain, local redness and swelling, and possible tissue destruction.

Brief contact may cause slight irritation with itching and local redness.

Can be readily absorbed through the skin may cause central nervous system depression.

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

Absorption by skin may readily exceed vapour inhalation exposure.

Toxic effects may result from skin absorption.

Capable of causing skin sensitisation and allergic skin reactions.

Prolonged or widespread contact may result in the absorption of potentially harmful amounts of material.

The material may accentuate any pre-existing skin condition.

Open cuts, abraded or irritated skin should not be exposed to this material.

Bare, unprotected skin should not be exposed to this material.

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.

INHALED

Toxic by inhalation.

Toxic effects are increased by consumption of alcohol.

Repeated exposure may cause sensitisation and/or allergic reactions.

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

This product is a central nervous system depressant.

CNS depression characterised by dizziness and headache.

Central nervous system (CNS) depression may be evident early.

Vapor/mist is extremely irritating to mucous membranes, upper respiratory tract and lungs.

Inhalation hazard is increased at higher temperatures.

Acute effects from inhalation of vapor/mist concentrations above recommended exposure levels are extremely irritating to the eyes, nose, mouth and throat, mucous membranes and the upper respiratory tract (with coughing, sneezing, nasal discomfort and discharge), could be anaesthetic and may have other central nervous system effects (characterized by headache, dizziness, increased reaction time, fatigue, loss or co-ordination, impaired judgement, lassitude, irritability), gastrointestinal disturbances (e.g. nausea, anorexia and flatulence), as well as the kidneys, the liver, and the heart.

If exposure to highly concentrated solvent atmosphere is prolonged this may lead to narcosis, unconsciousness, even coma and possible death.

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



3. HAZARDS IDENTIFICATION - continued

HEALTH EFFECTS - ACUTE EXPOSURE (continued)

HEALTH EFFECTS - CHRONIC EXPOSURE

Principal routes of exposure are usually by skin contact/absorption and inhalation of vapour.

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

In view of the general properties of isocyanates, the product should be considered as involving a possible risk of irritation of the eyes, respiratory tract and respiratory sensitisation (asthma) after repeated exposure, or in sensitised persons.

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

Prolonged or repeated skin contact causes severe irritation and may lead to de-fatting with drying, cracking, irritation and dermatitis following.

Skin contact may aggravate an existing dermatitis.

Can be absorbed through the skin with resultant toxic effects.

Capable of causing skin sensitisation and allergic skin reactions.

Repeated exposure can cause headaches, loss of appetite, nausea, and liver and kidney damage, and may cause brain damage.

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.

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").

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.



4. FIRST AID MEASURES

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

SWALLOWED

Harmful if swallowed.

If patient is fully conscious, rinse mouth out with plenty of water.

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.

Do **NOT** give anything by mouth to an unconscious person.

If swallowed, 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.

Tends to break into a foam if the patient vomits.

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.

Do **NOT** make an unconscious person vomit.

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

EYES

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, running water or normal saline solution for at least 15 minutes.

Eyelids should be held open.

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

Remove any contaminated clothing and gently flush area with water until irritation subsides.

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 and then remove.

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 seek **IMMEDIATE** medical advice.

Launder contaminated clothing before re-use or discard.

Thoroughly dry contaminated shoes before re-use.

Discard internally contaminated footwear and gloves.

Can be absorbed through the skin with resultant toxic effects.

INHALED

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.

If fumes or combustion products are inhaled remove affected person(s) to fresh air, taking care not to become affected yourself.

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 or transport to hospital, or doctor, without delay.

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



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.

There is no specific antidote.

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

Onset of symptoms may be delayed several hours after exposure.

Product contains free organic isocyanate which may cause respiratory and skin sensitisation.

Sensitised people can react to very low levels of airborne isocyanates.

Skin sensitisation may result from a single acute exposure.

Sensitisation may cause difficulty in breathing similar to asthma.

Extreme care must be taken to prevent aspiration.

Pulmonary oedema and chemical pneumonitis are possible complications following aspiration.

Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen.

Gastric lavage with a cuffed endotracheal tube to prevent further aspiration should be done.

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

The lungs excrete inhaled solvents, so that hyperventilation improves clearance.

Methyl Ethyl Ketone in combination with Methyl Butyl Ketone and possibly other solvents can damage the nervous system.

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 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.

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 in this product.

For example, employees with skin diseases may be unable to tolerate wearing protective clothing.

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

5. FIRE FIGHTING MEASURES**FOR LARGE SPILLS AND FIRES IMMEDIATELY CALL YOUR FIRE DEPARTMENT.****FIRE AND EXPLOSION HAZARD**

Flammable liquid, can release vapors that form flammable mixtures at temperatures at or above the flash point.
Vapour forms an explosive mixture with air.
Liquid and vapour are highly flammable.
Severe fire hazard when exposed to heat, flame and/or oxidisers.
Burns very rapidly and explosively.
When burning may form toxic materials such as carbon monoxide (CO,) carbon dioxide (CO₂), nitrogen oxides, isocyanates, various hydrocarbons, fumes and smoke and traces of hydrogen cyanide possible.
Severe explosion hazard, in the form of vapour, when exposed to flame or spark.
Vapor / air mixtures may ignite explosively and flashback a considerable distance along the vapor trail to source of ignition.
Do not store or mix with strong oxidants (such as chlorine, bromine and fluorine) since violent reactions occur.
Heating may cause expansion or decomposition leading to violent rupture of containers.
Product can accumulate static charges which can cause an incendiary electrical discharge.
Shut off any leak if safe to do so and remove sources of re-ignition.
If safe to do so, remove containers from the path of the fire and keep cool with water spray.
Firefighters should wear self-contained breathing apparatus with a full face piece and operated in positive pressure mode.

FIRE FIGHTING MEASURES

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 vapours and to protect personnel attempting to stop leak.
If safe to do so, remove containers from the path of the fire and keep cool with water spray.
Keep storage tanks, pipelines, fire exposed surfaces etc. cool with water spray.
Minimize breathing gases, vapour, fumes or decomposition products.
Firefighters should wear self-contained breathing apparatus with a full face piece and operated in positive pressure mode.
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.
This product may form a floating fire hazard on water.
If employees are expected to fight fires, they must be trained and equipped as stated in the appropriate regulations.

FIRE FIGHTING 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.
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.
In case of fire, formation of carbon monoxide, nitrogen oxide, isocyanate vapour, and traces of hydrogen cyanide is possible.
Fire-men have to wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES**SPILLS****FOR LARGE SPILLS AND FIRES IMMEDIATELY CALL YOUR FIRE DEPARTMENT.**

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

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

Stop liquid at the source if safe to do so.

No smoking, naked lights or ignition sources. Increase ventilation.

May be violently or explosively reactive.

Keep solvents 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.

Do not empty into drains.

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

Avoid breathing vapours and contact with skin and eyes. Control personal contact by using protective equipment.

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

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

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.

Collect residues and place in sealed, labelled, flammable waste container for later recycling or disposal.

MAJOR SPILLS

Consider evacuation.

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

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.

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

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

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

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

Pump the liquid to a labelled salvage tank for recycling or later disposal.

Remove mechanically; cover remainders with wet, absorbent material (e.g. sawdust, chemical binder based on calcium silicate hydrate, sand).

After approximately one hour transfer to waste container and do not seal (evolution of CO₂).

Keep damp in a safe ventilated area for several days. Further disposal by incineration.

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.

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).

Explosion protection required.

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 non-sparking tools and equipment especially when opening and closing containers.

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.

Irritating to eyes, skin and mucous membranes.

Avoid prolonged, repeated contact with eyes, skin contact and breathing vapours or mists.

Intense smelling. Keep away from foodstuffs and clothing.

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

Keep container dry and securely sealed when not in use.

Check all containers are clearly labelled and check regularly for leaks.

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

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

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.

Protect containers against physical damage and check regularly for leaks.

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.

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".



8. EXPOSURE CONTROLS

ENGINEERING CONTROLS

None required when handling small quantities.

OTHERWISE :

Unless a less toxic chemical can be substituted for a hazardous substance, engineering controls and work practices 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.

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

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.

It would be useful that all employees who wear respiratory protection be medically screened to determine whether any health conditions exist which could affect the employee's ability to wear a respirator.

To be used effectively, respirators must be individually selected and fitted, conscientiously and properly worn, regularly maintained, and replaced as necessary.

In many workplaces, these conditions are difficult, if not impossible, to satisfy.

However, it must be kept in mind that the burden of proof of infeasibility rests with the employer in those circumstances where respiratory protection is used in lieu of engineering and work practice controls.

Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

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 away from all ignition sources.

No smoking or open lights.

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, if risk of overexposure exists, while wearing organic vapor/acid mist respirator (meeting the requirements of AS1715 & AS1716).

The effectiveness of an air purifying respirator is limited.

Use it only for a single, short term exposure. Correct fit is essential to ensure adequate protection.

Make sure that the correct cartridge is selected for the conditions encountered.

Where rapid build up of vapors or mists are generated, particularly during spraying operations, in warehouses and enclosed storage areas, and natural ventilation is inadequate, a flame proof exhaust ventilation system is required to maintain concentration below exposure standard.

Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.

Keep containers closed when not in use.

Equipment **MUST** be explosion proof.

Periodic inspection and maintenance of process equipment and control equipment such as ventilation systems is an important work practice control.

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

In evaluating the controls present in your workplace, consider:

- (1) how hazardous the substance is,
- (2) how much of the substance is released into the workplace and
- (3) whether harmful skin or eye contact could occur.

Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of this product to potentially exposed workers.

Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects.

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 & AS1716) and an observer present for assistance.



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8. EXPOSURE CONTROLS - continued

ENGINEERING CONTROLS - continued

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.
- Vapour 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.

8. EXPOSURE CONTROLS - continued**EXPOSURE LIMITS**

No value has been assigned for this specific material by the National Occupational Health & Safety Commission (Worksafe Australia [1991]).

However, the Threshold Limit Value (TLV-TWA), as published by WORKSAFE [1991], for some of the individual constituents is listed below.

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

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

n-BUTYL ACETATE

TLV-TWA : 150 ppm (713 mg/m³) A4
STEL : 200 ppm (950 mg/m³)

ES TWA : 150 ppm (713 mg/m³)
STEL : 200 ppm (950 mg/m³)
PEL (PERMISSIBLE EXPOSURE LIMIT) : 710 mg/m³ (150 ppm)

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

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

IDLH Level : 10,000 ppm

Odour Threshold Value : 0.0063 ppm (detection), 0.038 - 12 ppm (recognition)

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

Exposure at or below the recommended TLV-TWA is thought to prevent significant irritation of the eyes and respiratory passages as well as narcotic effects. In the light of the lack of substantive evidence regarding teratogenicity and a review of acute oral data a STEL is considered inappropriate.

ETHYL ACETATE

ES TWA : 200 ppm (720 mg/m³)
TLV-TWA : 400 ppm (1440 mg/m³) (Proposed change)
STEL : Not Available

In the light of the lack of substantive evidence regarding teratogenicity and a review of acute oral data a STEL is considered inappropriate.

PEL (Permissible Exposure Level) (OSHA) : 400 ppm (1400 mg/m³)

ODOUR THRESHOLD VALUE : 6.4 - 50 ppm (detection), 13.3 - 75 ppm (recognition)

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

Exposure at or below the recommended TLV-TWA is thought to prevent significant irritation of the eyes and respiratory passages as well as narcotic effects.

METHYL ETHYL KETONE

TLV-TWA : 150 ppm (445 mg/m³) maximum
STEL : 330 ppm (890 mg/m³)
PEL (Permissible Exposure Level) (OSHA) : 200 ppm averaged over an 8-hour workshift.
NIOSH Recommended airborne exposure limit : 200 ppm averaged over a 10-hour workshift.
ACGIH Recommended airborne exposure limit : 200 ppm averaged over an 8-hour workshift / STEL 300 ppm
ODOUR THRESHOLD VALUE : 2 ppm (approx)

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

Methyl Ethyl Ketone may be a teratogen in humans.

All contact with this chemical should be reduced to the lowest possible level.

8. EXPOSURE CONTROLS - continued**EXPOSURE LIMITS - continued****ISO-CYANATES (as NCO) - ALL** : 0.02 mg/m³ / STEL 0.07 mg/m³ [SENSITIZER]German MAK-value (TRGS 900) hexamethylene-1, 6-diisocyanate
: 0.01 ml/m³ (ppm) corresp. to 0.07 mg/m³ (eight hours average value)

The European Committee of Paint, Printing Inks and Artists' Colours Manufacturer's Association (CEPE) provides the following information on coatings containing isocyanates :

Ready-to-use paints may have an irritant effect on mucous membranes - especially on breathing organs - and cause hypersensitivity reactions.

Inhalation of vapour or spray mist may cause sensitisation.

When handling paints containing isocyanates all precautions required for solvent-containing paints must be followed.

Vapour and spray mist in particular should not be inhaled.

Allergics and asthmatics as well as people prone to respiratory ailments should not work with isocyanate containing paints.

Any existing national regulations for handling of isocyanates and solvents must be observed.

Airborne emissions must be controlled within local and national limits, in accordance with the appropriate legislation.

Peak concentration limit of free monomeric HEXAMETHYLENE-1,6-DIISOCYANATE according to Category II 1, 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 0.02 ml/m³) up to eight times per shift.

Sensitization possible.

EXPOSURE LIMITS NOTE : SENSITIZER

Many iso-cyanate compounds can cause respiratory and skin sensitisation.

Exposure to a sensitizer, once sensitization has occurred, may manifest itself as a skin rash or inflammation or as an asthmatic condition, and, in some individuals, this reaction can be extremely severe.

Sensitized people can react to very low levels of airborne iso-cyanates and should not work with this material. [APMF]

Worker exposure by all routes should be carefully controlled and kept to a minimum when handling/mixing components and during spray application.

This notation indicates that caution should be exercised in the industrial use of this substance.

NOTE

These Exposure Standards are guides to be used in the control of occupational health hazards only 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.

All contact with this chemical should be reduced to the lowest possible level.

Any existing national regulations for handling of isocyanates and solvents must be observed.

Airborne emissions must be controlled within local and national limits, in accordance with the appropriate legislation.

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 - continued

EXPOSURE LIMITS - continued

TLV-TWA is the time weighted average 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 line between safe and dangerous conditions. 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 30 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 250 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 vapour and liquid may be absorbed through intact skin. 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.

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 - 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

Skin contact should be avoided by wearing chemically resistant apron or other work clothing, safety boots and chemical protective gloves if needed to avoid repeated or prolonged skin contact.

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 solvent 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.

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

Avoid breathing vapors.

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.

IMPROPER USE OF RESPIRATORS IS DANGEROUS.

At concentrations up to 100 ppm, a chemical cartridge respirator with organic vapor/acid mist cartridge is recommended.

Above this level, a self-contained breathing apparatus (meeting the requirements of AS1715 and AS1716) with a full facepiece operated in continuous flow or other positive pressure mode is recommended.

If vapor causes eye irritation or if an inhalation risk for higher exposures exists an approved air supplied breathing apparatus (meeting the requirements of AS1715 and AS1716) operated in pressure demand or other positive pressure mode should be used.

Correct respirator fit is essential to obtain adequate protection.

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.

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 (meeting the requirements of AS1715 and AS1716) with a full facepiece operated in continuous flow or other positive pressure mode.

NOTE : Isocyanate vapours will not be adequately absorbed by organic vapor respirators. [NSW D.I.R. 3-1982].

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.

Contact lenses should **NOT** be worn; 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.



9. PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION / PROPERTIES

APPEARANCE		: Pale yellowish liquid. Strong lacquer odor.	
BOILING POINT	(°C)	: 77	(Ethyl Acetate)
VAPOR PRESSURE	(kPa @ 20°C)	: 10.1	(Ethyl Acetate)
VAPOR PRESSURE	(kPa @ 38°C)	: 22.3	(Methyl Ethyl Ketone)
VAPOR PRESSURE	(mBar @ 20 °C)	: < 0.0001	(Resin)
RELATIVE VAPOR DENSITY		: 4.0	(Air = 1) (Butyl Acetate)
SPECIFIC GRAVITY	(@ 25°C)	: 1.065 ± 0.05	(Water = 1)
% VOLATILES	(by volume)	: 61.0 ± 1.0	
EVAPORATION RATE		: 6.2	(Butyl Acetate =1) (Ethyl Acetate)
FLASH POINT	(°C)	: - 7.0	Tag Closed Cup (Methyl Ethyl Ketone)
EXPLOSIVE LIMITS	(% volume)	: 0.47 LEL / 11.5 UEL	(In Air) (Methyl Ethyl Ketone)
AUTOIGNITION TEMPERATURE	(°C)	: 427.0	(Ethyl Acetate)
SOLUBILITY IN WATER		: Insoluble as resin (reacts as described in Ecological Information)	
SOLUBILITY IN WATER		: Negligible	
pH VALUE		: Not applicable	

OTHER PROPERTIES

Can readily form flammable mixture.

Contains free organic isocyanate (0.5% w/w).

Mixed and thinned material require special precautions and use of protective gear for application. [APMF]

Long term storage or storage at higher than normal temperatures will increase free organic isocyanate content to 0.90% maximum.

Reacts with water, may generate a large volume of foam, carbon dioxide gas & heat.

10. STABILITY and REACTIVITY**REACTIVITY / COMPATIBILITY**

- Hazardous polymerization : Cannot occur
- Stability : Stable under ambient 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 water, detergent solutions, strong alkalis, aldehydes, ammonia, mineral acids, strong oxidizers (halogens [liquid chlorine, bromine, fluorine] concentrated oxygen, sodium hypochlorite, perchloric acid, chromium trioxide, peroxides, chlorates, perchlorates, nitrates, & permanganates - increased risk of fire), strong bases, alcohols, alkali metal hydroxides (hydrolysis can occur), amines, metal compounds, polymerization catalysts, detergent solutions, rubber, polyethylene and PVC, and most tank linings.
Steel or aluminium containers are recommended, while copper or tin should be avoided.
- Hazardous reactions : Exothermic reaction with amines and alcohols; reacts slowly with water forming CO₂ ; foaming in confined spaces / closed containers - risk of bursting owing to increase of pressure.
Reacts dangerously with water, may generate a large volume of foam, carbon dioxide gas and heat.
Iso-cyanates will attack and embrittle some plastics and rubbers.
Forms toxic fumes when thermally decomposed.
- Hazardous decomposition products : No hazardous decomposition products when stored and handled correctly.
- Hazardous combustion products : In case of fire, formation of fumes, smoke, carbon monoxide, nitrogen oxide, isocyanate vapour, and traces of hydrogen cyanide is possible.

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

HAZARDOUS COMPONENTS OF MIXTURES

Contains free organic iso-cyanate (~ 0.2% w/w).

Mixed and thinned material require special precautions and use of protective gear for application. [APMF]
Long term storage or storage at higher than normal temperatures will increase free organic iso-cyanate content.
Reacts with water, may generate a large volume of foam, carbon dioxide gas & heat.

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.

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.

n-BUTYL ACETATE

Oral	LD ₅₀	(rat)	: 13,100 mg/kg
Oral	LD ₅₀	(mouse)	: 7,060 mg/kg
Oral	LD ₅₀	(rabbit)	: 3,200 mg/kg
Inspired	LD ₅₀	(mouse)	: 1,230 mg/kg
Dermal	LD ₅₀	(rabbit)	: > 5,000 mg/kg
Inhalation	LC ₅₀	(rat)	: 2,000 ppm/4 hours
Inhalation	TLCO	(human)	: Not Available (CNS recording changes, hallucinations)
Skin (rabbit)			: 500 mg/24 hr, mild to moderate irritant
Eye (rabbit)			: 20-100 mg /24hr, moderate to severe irritant

CHRONIC TOXICOLOGY (SUMMARY)

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

Animal studies suggest that this material is rapidly broken down in the body and eliminated.

(CC Infodisc - A1 (90-3) - CHEMINFO, Canadian Centre for Occupational Health & Safety; 1990)

ETHYL ACETATE

Oral	LD ₅₀	(rat)	: 5,500 mg/kg
Oral	LD ₅₀	(rabbit)	: 4,935 mg/kg
IPR	LD ₅₀	(mouse)	: 709 mg/kg
Dermal	LD ₅₀	(rabbit)	: > 2,000 mg/kg
Inhalation	LC ₅₀	(rat)	: 1,600 ppm/8 hours - Practically non-toxic.
Inhalation	TLCO	(human)	: 400 ppm – olfaction effects; conjunctiva irritation.
Eye		(human)	: Irritant
Eye Irritation		(rabbit)	: Practically non-irritating.
Skin Irritation		(rabbit)	: Irritant.
Other			: Do NOT induce vomiting if swallowed

There is some indication that this chemical may cause allergic response in some individuals.

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

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

CHRONIC TOXICOLOGY (SUMMARY)

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

11. TOXICOLOGICAL INFORMATION - continued**TOXICITY - continued****METHYL ETHYL KETONE**

Oral	LD ₅₀	(rat)	: 2,737 mg/kg. Moderately toxic.
Dermal	LD ₅₀	Range (rabbit)	: 5,000 - 13,000 mg/kg. Practically non-toxic.
Inhalation	LC ₅₀	(rabbit)	: 13,000 mg/kg
Inhalation	LC ₅₀	(rat)	: 23,500 mg/m ³ / 8 hr - > 2,000 ppm for 2 hours. Moderately toxic.
Inhalation		(human)	: Irritating to nose and throat, will cause nausea, vomiting, headache, dizziness.
Skin		(rabbit)	: May cause moderate irritation on prolonged or repeated contact. If allowed to remain, may cause smarting and reddening of the skin. Not readily absorbed.
Eye		(rabbit)	: Can cause strong-moderate irritation.
Eye		(human)	: Burns, causes severe damage. Eye irritation reported in humans exposed to vapour as low as 350 ppm.
Swallowed			: Do NOT induce vomiting if swallowed Harmful if swallowed, may cause gastric irritation and narcosis.

OTHER LONG-TERM EFFECTS

Toxicological data suggest that methyl ethyl ketone interacts with and enhances the neurotoxicity of n-hexane, 2,5-hexanedione and methyl-n-butyl ketone in the body but direct evidence implicating methyl ethyl ketone is lacking. 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"). Methyl ethyl ketone has been shown to be weakly hepatotoxic in experimental animals at very high doses. Negative in "IN VITRO" mutagenicity assays.

AROMATIC POLYISOCYANATE

Toxicological studies of a comparable product

Oral	LD ₅₀	(rat)	: > 5,000 mg/kg
Inhalation	LD ₅₀	(rat)	: > 3,003 mg as aerosol/m ³ , 4 hour of exposure
Eye		(rabbit)	: Moderate reddening,
Skin & mucous membrane compatibility		(rabbit)	: Slight reddening, superficial cauterization / 4 hours

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. Hypersensitive persons may suffer from these effects even at low isocyanate concentrations including concentrations below the TWA-limit. The liquid irritates the eyes and direct, prolonged contact with liquid product irritates the skin. Vapour at concentrations above the exposure standard has an anaesthetic effect, which may lead to headache, dizziness and loss of consciousness. In case of longer contact with skin, tanning and irritating effects are possible. This chemical has not been adequately evaluated to determine whether brain or other nerve damage could occur with repeated exposure. 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"). Hypersensitive persons may suffer from these effects even at low isocyanate concentrations including concentrations below the German control limit (MAK-value).

12. ECOLOGICAL INFORMATION

This product may enter the environment from industrial discharges, municipal waste treatment plant discharges, or spills. It is a colorless liquid at room temperature and is flammable. Do not allow to escape into waters, waste water or soil.

AROMATIC POLYISOCYANATE

The resin reacts with water at the interface forming CO₂ and a solid, insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by water soluble solvents.

ALIPHATIC POLYISOCYANATE

Investigations were carried out using a similar and solvent free product.

Acute bacterial toxicity : EC₅₀ = 100-1000 mg/l
(OECD Guideline for Testing of Chemicals, No. 209)

Acute fish toxicity : LC₀ = 8.8 mg/l
LC₁₀₀ = 25.0 mg/l

Test species : Brachydanio rerio (Zebra barbel) Duration of test : 96 hours

The resin reacts with water at the interface forming CO₂ and a solid, insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by water soluble solvents.

n-BUTYL ACETATE - BIOLOGICAL EFFECTS

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

TL_M : Median Tolerance Limit

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

96 hr L_{C50} (bluegill sunfish) : 100 ppm

Vershueren, K; Handbook of Environmental Data on Organic Chemicals, Van Nostrand Reinhold Co.; 1983

ENVIRONMENTAL IMPACT

OIL / WATER PARTITION COEFFICIENT, P : log P (oct) = 1.82

WATER POLLUTION FACTORS

ThOD	:	2.207
BOD ₅	:	1.020
BOD ₂₀	:	1.450
COD	:	78.0% of ThOD

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

Vershueren, K; Handbook of Environmental Data on Organic Chemicals, Van Nostrand Reinhold Co.; 1983

ETHYL ACETATE - ENVIRONMENTAL IMPACT

OIL / WATER PARTITION COEFFICIENT, P : log P (oct) = 0.66

WATER POLLUTION FACTORS

ThOD	:	1.82
BOD ₅	:	0.293
COD	:	1.54 % of ThOD

Vershueren, K; Handbook of Environmental Data on Organic Chemicals, Van Nostrand Reinhold Co.; 1983



12. 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 behaviour.

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.

DISTRIBUTION AND PERSISTENCE IN THE ENVIRONMENT

This product is non-persistent in water, with a half-life of less than 2 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

According to the definition provided in the Federal Register (1992), some components in this product are volatile organic carbon (VOC) substances.

As a VOC's, these components can contribute to the formation of photochemical smog in the presence of other VOCs.



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Date Of Issue : 02/07/07

MATERIAL SAFETY DATA SHEET
UT910 FAST DRY UTHANE HARDENER - PART "B"

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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.

Do NOT reuse empty containers without commercial cleaning or reconditioning.

Normally suitable for incineration by an approved agent provided local regulations are observed.

Empty containers may be disposed of after neutralizing any product remaining on the walls of the container with a mixture of isopropanol, ammonia and water. Afterwards, remove warning labels.

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

Empty product containers may contain product residue.

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.

SHIPPING NAME	: Resin Solution		
UN No	: 1866	PACKAGING GROUP	: II
CLASS	: 3.2 (Flammable Liquid)	ICAO / IATA-DGR	: 3 1866 II
AS 1940 Class	: PG II		
SUBSIDIARY RISK	: NOT ASSIGNED	HAZCHEM CODE	: 3[Y]E
IMO HAZARD CLASS	: INFLAMMABLE LIQUID/3.2	EPG	: 3A2
DECLARATION FOR LAND SHIPMENT		: 1866, Resin solution	
DECLARATION FOR SEA SHIPMENT		: Resin solution	
DECLARATION FOR SHIPMENT BY AIR		: Resin solution	
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.
- Detergent solutions

Refer to Australian Code for the Transport of Dangerous Goods By Road and Rail (6th Edition) for transport regulations and state Dangerous Goods regulations for storage requirements.

This material is a Scheduled Poison (S6) and must be stored, maintained and used in accordance with the relevant regulations.

15. REGULATORY INFORMATION**CLASSIFICATION AND LABELLING ACCORDING TO NOHSC CODES****CLASSIFICATION / SYMBOL** : FLAMMABLE / F**CLASSIFICATION / SYMBOL** : HARMFUL**GOVERNING DIRECTIVE** : National Code of Practice for the labelling of workplace substances.**LABEL NAME** : RESIN SOLUTION**HAZARDS IDENTIFICATION**

Toxic.

Contains isocyanates.

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

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

RISK PHRASES

R10	Flammable.
R20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
R23	Toxic by inhalation.
R36/37	Irritating to eyes and respiratory system.
R42/43	May cause sensitisation by inhalation and skin contact. Contains isocyanates.

SAFETY ADVICE

S7/9	Keep container tightly closed and in a 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 gas/fumes/vapour/spray
S24/25	Avoid contact with skin and eyes.
S33	Take precautionary measures against static discharges.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S38	If insufficient ventilation, wear suitable respiratory equipment.
S43B	In case of fire use sand, earth, chemical powder or alcohol type foam
S51	Use only in well ventilated areas.

16. OTHER INFORMATION**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)