

UNCONTROLLED

2 PACK URETHANE ACRYLIC UA20 - PART B

ChemWatch Material Safety Data Sheet
Issue Date: Fri 24-Oct-2003

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

2 PACK URETHANE ACRYLIC UA20 - PART B

SYNONYMS

Cobblestone Paving

PROPER SHIPPING NAME

RESIN SOLUTION

PRODUCT USE

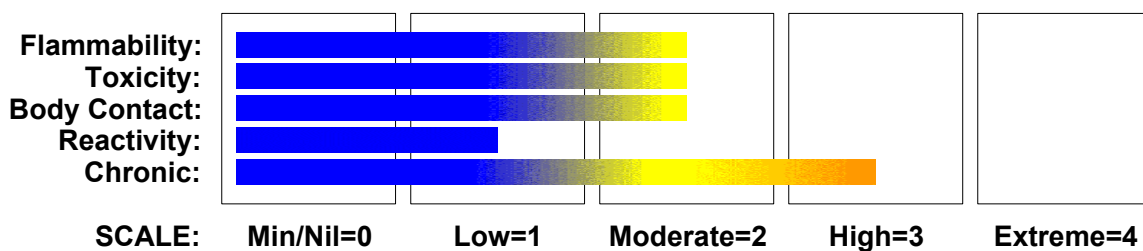
Part B of a 2 part coating.

SUPPLIER

Company: Cobblestone Paving Australia P/L
Address:
PO Box 2057
Burleigh Mdc, Gold Coast
QLD, 4220
AUS

Company: Cobblestone Paving Australia P/L
Address:
45 Alex Fisher Drive
Burleigh Gardens
QLD, 4220
AUS
Telephone: +61 7 5593 7766
Fax: 07 5593 7777

HAZARD RATINGS



Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE. DANGEROUS GOODS.

According to the Criteria of NOHSC, and the ADG Code.

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Section 2 - HAZARDS IDENTIFICATION ...

POISONS SCHEDULE

None

RISK

Flammable.
Harmful by inhalation and in contact with skin.
Irritating to eyes and skin.
May cause harm to the unborn child.
HARMFUL-May cause lung damage if swallowed.
Ingestion may produce health damage*.
Cumulative effects may result following exposure*.
May produce discomfort of the respiratory system*.
Limited evidence of a carcinogenic effect*.
Possible respiratory and skin sensitiser*.
Vapours potentially cause drowsiness and dizziness*.
* (limited evidence)

SAFETY

Keep away from sources of ignition. No smoking.
Keep container in a well ventilated place.
Avoid exposure - obtain special instructions before use.
Do not empty into drains.
Keep container tightly closed.
Take off immediately all contaminated clothing.
In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.
If you feel unwell contact Doctor or Poisons Information Centre. (Show the label if possible).

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME | CAS RN | % |
|---|------------|-------|
| hexamethylene diisocyanate polymer | 28182-81-2 | 75 |
| xylene | 1330-20-7 | 10-30 |
| propylene glycol monomethyl ether acetate, alpha-isomer | 108-65-6 | 10-30 |
| hexamethylene diisocyanate | 822-06-0 | <0.3 |

NOTE: Manufacturer has supplied full ingredient information to allow CHEMWATCH assessment.

Section 4 - FIRST AID MEASURES

SWALLOWED

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down)

continued...

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Section 4 - FIRST AID MEASURES ...

position, if possible) to maintain open airway and prevent aspiration.

- Observe the patient carefully.
 - Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
 - Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
 - Seek medical advice.
- Avoid giving milk or oils.
Avoid giving alcohol.

EYE

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

NOTES TO PHYSICIAN

Treat symptomatically.

Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically. Mechanical means should be used if it is considered necessary to evacuate the stomach contents; these include gastric lavage after endotracheal intubation. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

For sub-chronic and chronic exposures to isocyanates:

- This material may be a potent pulmonary sensitiser which causes bronchospasm even in patients without prior airway hyperreactivity.
- Clinical symptoms of exposure involve mucosal irritation of respiratory and gastrointestinal tracts.
- Conjunctival irritation, skin inflammation (erythema, pain vesiculation) and gastrointestinal disturbances occur soon after exposure.
- Pulmonary symptoms include cough, burning, substernal pain and dyspnoea.
- Some cross-sensitivity occurs between different isocyanates.
- Noncardiogenic pulmonary edema and bronchospasm are the most serious consequences of exposure. Markedly symptomatic patients should receive oxygen, ventilatory support and an intravenous line.
- Treatment for asthma includes inhaled sympathomimetics (epinephrine [adrenalin], terbutaline) and steroids.
- Activated charcoal (1 g/kg) and a cathartic (sorbitol, magnesium citrate) may

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Section 4 - FIRST AID MEASURES ...

be useful for ingestion.

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

- There is no effective therapy for sensitised workers.

[Ellenhorn and Barceloux; Medical Toxicology]

NOTE: Isocyanates cause airway restriction in naive individuals with the degree of response dependant on the concentration and duration of exposure. They induce smooth muscle contraction which leads to bronchoconstrictive episodes. Acute changes in lung function, such as decreased FEV₁, may not represent sensitivity.

[Karol & Jin, Frontiers in Molecular Toxicology, pp 56-61, 1992].

For acute or short term repeated exposures to xylene:

- Gastro-intestinal absorption is significant with ingestions. For ingestions exceeding 1-2 ml (xylene)/kg, intubation and lavage with cuffed endotracheal tube is recommended. The use of charcoal and cathartics is equivocal.

- Pulmonary absorption is rapid with about 60-65% retained at rest.

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

- 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 (pO₂ < 50 mm Hg or pCO₂ > 50 mm Hg) should be intubated.

- 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.

- A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.

- 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.

BIOLOGICAL EXPOSURE INDEX - BEI

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

| Determinant | Index | Sampling Time | Comments |
|--------------------------------|----------------------|---------------------|----------|
| Methylhippu-ric acids in urine | 1.5 gm/gm creatinine | End of shift | |
| | 2 mg/min | Last 4 hrs of shift | |

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.

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Section 5 - FIRE FIGHTING MEASURES ...

- If safe, switch off electrical equipment until vapour fire hazard removed.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

FIRE/EXPLOSION HAZARD

- Hot organic vapours or mist are capable of sudden spontaneous combustion when mixed with air even at temperatures below their published autoignition temperatures.
- The temperature of ignition decreases with increasing vapour volume and vapour/air contact times and is influenced by pressure change.
- Ignition may occur under elevated-temperature process conditions especially in processes performed under vacuum subjected to sudden ingress of air or in processes performed at elevated pressure, where sudden escape of vapours or mists to the atmosphere occurs.
- Liquid and vapour are flammable.
- Moderate fire hazard when exposed to heat or flame.
- Vapour forms an explosive mixture with air.
- Moderate explosion hazard when exposed to heat or flame.
- Vapour may travel a considerable distance to source of ignition.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
Combustion products include.
carbon dioxide (CO₂).
isocyanates.
and minor amounts of.
hydrogen cyanide.
nitrogen oxides (NO_x).
other pyrolysis products typical of burning organic material.
Flooding quantities of water only.
- Combustible.
- Moderate fire hazard when exposed to heat or flame.
- When heated to high temperatures decomposes rapidly generating vapour which pressures and may then rupture containers with release of flammable and highly toxic isocyanate vapour.
- Burns with acrid black smoke and poisonous fumes.
- Combustion yields traces of highly toxic hydrogen cyanide HCN, plus toxic nitrogen oxides NO_x and carbon monoxide.
- Small quantities of water in contact with hot liquid may react violently with generation of a large volume of rapidly expanding hot sticky semi-solid foam.
- Presents additional hazard when fire fighting in a confined space.
- Cooling with flooding quantities of water reduces this risk.

FIRE INCOMPATIBILITY

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

HAZCHEM

3[Y]

Personal Protective Equipment

Glasses:
Chemical goggles.

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Section 5 - FIRE FIGHTING MEASURES ...

Gloves:

1.PE/EVAL/PE 2.PVA 3.VITON

Respirator:

Type A-P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

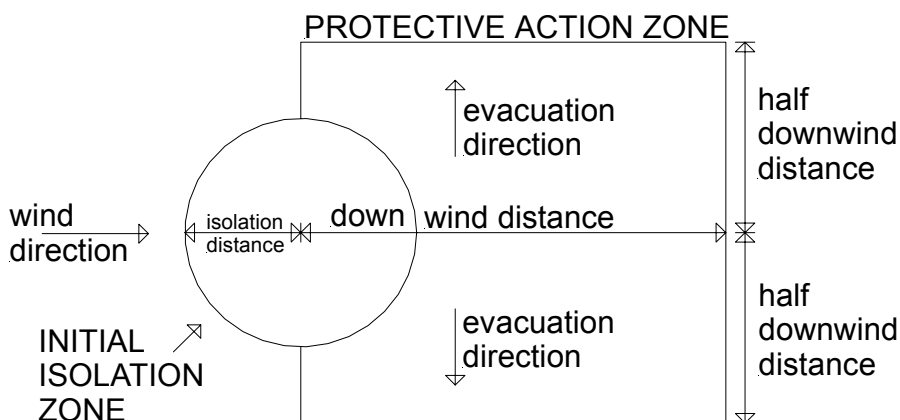
MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb small quantities with vermiculite or other absorbent material.
- Wipe up.
- Collect residues in a flammable waste container.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse / absorb vapour.
- Contain spill with sand, earth or vermiculite.
- Use only spark-free shovels and explosion proof equipment.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL



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Section 6 - ACCIDENTAL RELEASE MEASURES ...

| | |
|------------------------------|------------|
| From IERG (Canada/Australia) | |
| Isolation Distance | 25 metres |
| Downwind Protection Distance | 300 metres |
| IERG Number | 14 |

FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 127 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

EMERGENCY RESPONSE PLANNING GUIDLINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

other than mild, transient adverse effects without perceiving a clearly defined odour is:

American Industrial Hygiene Association (AIHA)

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of overexposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.

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Section 7 - HANDLING AND STORAGE ...

- DO NOT enter confined spaces until atmosphere has been checked.
 - Avoid smoking, naked lights or ignition sources.
 - Avoid generation of static electricity.
 - DO NOT use plastic buckets.
 - Earth all lines and equipment.
 - Use spark-free tools when handling.
 - Avoid contact with incompatible materials.
 - When handling, DO NOT eat, drink or smoke.
 - Keep containers securely sealed when not in use.
 - Avoid physical damage to containers.
 - Always wash hands with soap and water after handling.
 - Work clothes should be laundered separately.
 - Use good occupational work practice.
 - Observe manufacturer's storing and handling recommendations.
 - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
- DO NOT allow clothing wet with material to stay in contact with skin

SUITABLE CONTAINER

Packing as supplied by manufacturer. Plastic containers may only be used if approved for flammable liquid. Check that containers are clearly labelled and free from leaks.

- For low viscosity materials (i) : Drums and jerry cans must be of the non-removable head type. (ii) : Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C)
- For manufactured product having a viscosity of at least 250 cSt. (23 deg. C)
- Manufactured product that requires stirring before use and having a viscosity of at least 20 cSt (25 deg. C)
- (i) : Removable head packaging;
- (ii) : Cans with friction closures and
- (iii) : low pressure tubes and cartridges may be used.
- Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages
- In addition, where inner packagings are glass and contain liquids of packing group I there must be sufficient inert absorbent to absorb any spillage, unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

STORAGE INCOMPATIBILITY

Avoid reaction with water, alcohols, strong bases, alkalis, metal compounds and detergent solutions. Reacts with water, may generate a large volume of foam, carbon dioxide gas (CO₂) and heat. Foaming in confined space may produce pressure. Isocyanates will attack and embrittle some plastics and rubbers. Avoid cross contamination between the two liquid parts of product (kit). If two part products are mixed or allowed to mix in proportions other than manufacturer's recommendation, polymerisation with gelation and evolution of heat (exotherm) may occur. This excess heat may generate toxic vapour.

- Avoid contamination with water, alkalies and detergent solutions.
 - Material reacts with water and generates gas, pressurises containers with even drum rupture resulting.
 - DO NOT reseal container if contamination is suspected.
 - Open all containers with care.
- Avoid reaction with oxidising agents

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Section 7 - HANDLING AND STORAGE ...

STORAGE REQUIREMENTS

- Store in original containers in approved flammable liquid storage area.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- No smoking, naked lights, heat or ignition sources.
- Keep containers securely sealed.
- Store away from incompatible materials in a cool, dry, well-ventilated area.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

#3300

EXPOSURE STANDARDS FOR MIXTURE

"Worst Case" computer-aided prediction of vapour components/concentrations:

Composite Exposure Standard for Mixture (TWA) (mg/m³): 875 mg/m³

If the breathing zone concentration of ANY of the components listed below is exceeded, "Worst Case" considerations deem the individual to be overexposed.

Component Breathing Zone ppm Breathing Zone mg/m³ Mixture Conc: (%)

| Component | Breathing zone (ppm) | Breathing Zone (mg/m ³) | Mixture Conc (%) |
|-----------------------------------|----------------------|-------------------------------------|------------------|
| propylene glycol monomethyl ether | | 525.0000 | 15.0 |
| hexamethylene diisocyanate | 0.00 | 0.0000 | 0.0 |
| xylene | 80.00 | 350.0000 | 10.0 |

INGREDIENT DATA

HEXAMETHYLENE DIISOCYANATE POLYMER:

No exposure limits set by NOHSC or ACGIH

XYLENE:

TLV TWA: 100 ppm A4;BEI [ACGIH]

TLV STEL: 150 ppm A4;BEI [ACGIH]

PEL TWA: 100 ppm, 435 mg/m³ [OSHA Z1]

TLV TWA: 100 ppm, 434 mg/m³; STEL: 150 ppm, 651 mg/m³ A4

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

ES TWA: 80 ppm, 350 mg/m³; STEL: 150 ppm, 655 mg/m³ (Under review)

OES TWA: 100 ppm, 441 mg/m³; STEL: 150 ppm, 662 mg/m³ skin

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.

IDLH Level: 900 ppm

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

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)

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION ...

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 produces transient liver and kidney toxicity. Neurologic 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. 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.

PROPYLENE GLYCOL MONOMETHYL ETHER ACETATE, ALPHA-ISOMER:

ES TWA: 50 ppm; STEL: 150 ppm

PROPOSED CHANGE

ES TWA 50 ppm; STEL: 100 ppm

Saturated vapour concentration: 4868 ppm at 20 C.

material with less than 5% beta isomer

WEEL TWA: 100 ppm, 541 mg/m³ [AIHA]

MAK value: 50 ppm; 270 mg/m³

MAK Category I Peak Limitation: For local irritants Allows excursions of twice the MAK value for 5 minutes at a time, 8 times per shift.

MAK Group C: There is no reason to fear risk of damage to the developing embryo when MAK and BAT values are observed.

MAK values, and categories and groups are those recommended within the Federal Republic of Germany

A two-week inhalation study found nasal effects to the nasal mucosa in animals at concentrations up to 3000 ppm. Differences in the teratogenic potential of the alpha (commercial grade) and beta isomers of PGMEA may be explained by the formation of different metabolites. The beta-isomer is thought to be oxidised to methoxypropionic acid, a homologue to methoxyacetic acid which is a known teratogen. The alpha- form is conjugated and excreted.

PGMEA mixture (containing 2% to 5% beta isomer) is a mild skin and eye irritant, produces mild central nervous system effects in animals at 3000 ppm and produces mild CNS impairment and upper respiratory tract and eye irritation in humans at 1000 ppm. In rats exposed to 3000 ppm PGMEA produced slight foetotoxic effects (delayed sternabral ossification) - no effects on foetal development were seen in rabbits exposed at 3000 ppm.

HEXAMETHYLENE DIISOCYANATE:

TLV TWA: 0.005 ppm [ACGIH]

TLV TWA: 0.005 ppm [ACGIH]

isocyanates, all as NCO (Mol.Wt: 42.00)

ES TWA: 0.02 mg/m³; STEL: 0.07 mg/m³ sensitiser

MEL TWA: 0.02 mg/m³; STEL: 0.07 mg/m³ sensitiser

Some jurisdictions require that health surveillance be conducted on occupationally exposed workers. This should emphasise:

- demography, occupational and medical history and health advice
- completion of a standardised respiratory questionnaire
- physical examination of the respiratory system and skin
- standardised respiratory function tests such as FEV1, FVC and FEV1/FVC

TLV TWA: 0.005 ppm, 0.034 mg/m³

MAK value: 0.005 ppm, 0.035 mg/m³

MAK Category I Peak Limitation: For local irritants Allows excursions of twice the MAK value for 5 minutes at a time, 8 times per shift.

Designated S in List of MAK values: Danger of sensitization.

MAK Group IIc: Substances with MAK Values but no pregnancy risk group

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION ...

classification. These are substances which have been investigated but for which no information regarding possible damage to the foetus/embryo was found. Mention calls attention to the absence of adequate data.

MAK values, and categories and groups are those recommended within the Federal Republic of Germany

The toxicological action of HDI is similar to that of toluene diisocyanate and the TLV-TWA is analogous. In light of reported asthmatic/ respiratory sensitisation-like responses in HDI exposed workers, individuals who may be hypersusceptible or otherwise unusually responsive may not be adequately protected at this limit.

PERSONAL PROTECTION

EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

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

OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

ENGINEERING CONTROLS

For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required. Ventilation equipment should be explosion-resistant.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:
solvent, vapours, degreasing etc.,
evaporating from tank (in still air).
aerosols, fumes from pouring
operations, intermittent container
filling, low speed conveyer transfers,
welding, spray drift, plating acid
fumes, pickling (released at low
velocity into zone of active

Air Speed:
0.25-0.5 m/s (50-100 f/min.)

0.5-1 m/s (100-200 f/min.)

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION ...

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

Within each range the appropriate value depends on:

Lower end of the range

- 1: Room air currents minimal or favourable to capture
- 2: Contaminants of low toxicity or of nuisance value only.
- 3: Intermittent, low production.
- 4: Large hood or large air mass in motion

Upper end of the range

- 1: Disturbing room air currents
- 2: Contaminants of high toxicity
- 3: High production, heavy use
- 4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Pale yellow, slightly viscous, flammable liquid with a solvent odour; reacts with water

PHYSICAL PROPERTIES

Liquid.

Molecular Weight: Not Applicable
Melting Range (°C): Not Available
Solubility in water (g/L): Reacts
pH (1% solution): Not Applicable
Volatile Component (%vol): Not Available
Relative Vapour Density (air=1): Not Available
Lower Explosive Limit (%): 1.7
Autoignition Temp (°C): 425
State: Liquid

Boiling Range (°C): 138
Specific Gravity (water=1): 1.067
pH (as supplied): Not Applicable
Vapour Pressure (kPa): 0.667 @ 20 C
Evaporation Rate: Not Available
Flash Point (°C): >28 Closed Cup
Upper Explosive Limit (%): 7.6
Decomposition Temp (°C): Not Available

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Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual; animal experiments indicate that ingestion of less than 150 gram may be fatal.

Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed. Ingestion may result in nausea, pain and vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis.

Central nervous system (CNS) depression may include nonspecific discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in respiratory depression and may be fatal.

EYE

Evidence exists, or practical experience predicts, that the material may cause severe eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Eye contact may cause significant inflammation with pain. Corneal injury may occur; permanent impairment of vision may result unless treatment is prompt and adequate. Repeated or prolonged exposure to irritants may cause inflammation characterised by a temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

SKIN

Limited evidence exists that exposure to the material may produce irreversible damage (other than carcinogenesis, mutagenesis and teratogenesis) following a single exposure by skin contact.

The material produces moderate skin irritation; evidence exists, or practical experience predicts, that the material either

- produces moderate inflammation of the skin in a substantial number of individuals following direct contact, and/or
- produces significant, but moderate, inflammation when applied to the healthy intact skin of animals (for up to four hours), such inflammation being present twenty-four hours or more after the end of the exposure period.

Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis.

continued...

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Section 11 - TOXICOLOGICAL INFORMATION ...

At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Toxic effects may result from skin absorption.

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.

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis.

Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

INHALED

Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.

Limited evidence exists that exposure to the material may produce irreversible damage (other than carcinogenesis, mutagenesis and teratogenesis) following a single exposure by inhalation.

Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, drowsiness, reduced alertness, loss of reflexes, lack of coordination and vertigo.

Xylene is a central nervous system depressant. Central nervous system (CNS) depression may include nonspecific discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in respiratory depression and may be fatal.

CHRONIC HEALTH EFFECTS

Persons with a history of asthma or other respiratory problems or are known to be sensitised, should not be engaged in any work involving the handling of isocyanates. [CCTRADE-Bayer, APMF]. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment. Practical evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a substantial number of individuals at a greater frequency than would be expected from the response of a normal population. Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching. Significant symptoms of exposure may persist for extended periods, even after exposure ceases. Symptoms can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes and passive smoking. Practical experience shows that skin contact with the material is capable either of inducing a sensitisation reaction in a substantial number of individuals, and/or of producing a positive response in experimental animals. There is some evidence that human exposure to the material may result in developmental toxicity. This evidence is based on animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects. Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis). Respiratory sensitisation may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping. Sensitisation may give severe responses to very low levels of exposure, in situations where exposure may occur.

continued...

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Section 11 - TOXICOLOGICAL INFORMATION ...

2 Pack Urethane Acrylic UA20 - Part B

None assigned. Refer to individual constituents.
unless otherwise specified data extracted from RTECS - Register of Toxic Effects
of Chemical Substances

HEXAMETHYLENE DIISOCYANATE POLYMER:

| | |
|--|----------------------------------|
| TOXICITY | IRRITATION |
| Inhalation (rat) LC50: 18500 mg/m ³ /1h | Skin (rabbit): 500 mg - moderate |
| | Eye (rabbit): 100 mg - moderate |
| Oral (rat) LD50: > 10000 mg/kg* | |
| Dermal (rabbit) LD50: > 5000 mg/kg* | [* BAYER] |

XYLENE:

| | |
|---|------------|
| TOXICITY | IRRITATION |
| Oral (human) LDLo: 50 mg/kg | |
| Skin (rabbit): 500 mg/24h moderate | irritant |
| Eye (human): 200 ppm irrita | |
| Eye (rabbit): 87 mg mild | |
| Eye (rabbit): 5 mg/24h SEVERE | |
| Reproductive effector in rats | |
| The substance is classified by IARC as Group 3: | |
| NOT classifiable as to its carcinogenicity to humans. | |
| Evidence of carcinogenicity may be inadequate or limited in animal testing. | |

PROPYLENE GLYCOL MONOMETHYL ETHER ACETATE, ALPHA-ISOMER:

| | |
|---|--------------|
| TOXICITY | IRRITATION |
| Oral (rat) LD50: 8532 mg/kg | Nil reported |
| Dermal (rabbit) LD50: >5000 mg/kg* | * [CCINFO] |
| Inhalation (rat) LC50: 4345 ppm/6h | |
| A BASF report (in ECETOC) showed that inhalation exposure to 545 ppm PGMEA (beta isomer) was associated with a teratogenic response in rabbits; but exposure to 145 ppm and 36 ppm had no adverse effects. | |
| The beta isomer of PGMEA comprises only 10% of the commercial material, the remaining 90% is alpha isomer. Hazard appears low but emphasizes the need for care in handling this chemical. [I.C.] | |

HEXAMETHYLENE DIISOCYANATE:

| | |
|---|--------------|
| TOXICITY | IRRITATION |
| Oral (rat) LD50: 738 mg/kg | Nil reported |
| Inhalation (rat) LC50: 60 mg/m ³ /4h | |
| Oral (mouse) LD50: 350 mg/kg | |
| Inhalation (mouse) LC50: 30 mg/m ³ | |
| Intravenous (mouse) LD50: 5.6 mg/kg | |
| Dermal (rabbit) LD50: 593 mg/kg | |

Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.

Section 13 - DISPOSAL CONSIDERATIONS

Puncture containers to prevent re-use and bury at an authorised landfill.

continued...

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Section 14 - TRANSPORTATION INFORMATION

Shipping Name:
RESIN SOLUTION
Dangerous Goods Class: 3
UN/NA Number: 1866
ADR Number: 30
Packing Group: III
Labels Required: flammable liquid
Additional Shipping Information:
International Transport Regulations:
IMO: 3

HAZCHEM

3[Y]

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE

None

REGULATIONS

No data available for hexamethylene diisocyanate polymer (CAS: 28182-81-2).
No data available for propylene glycol monomethyl ether acetate, alpha-isomer (CAS: 108-65-6).
No data available for hexamethylene diisocyanate polymer (CAS: 53200-31-0). applies to the following ingredients:
No data available for hexamethylene diisocyanate polymer (CAS: 28182-81-2).
No data available for propylene glycol monomethyl ether acetate, alpha-isomer (CAS: 84540-57-8). applies to the following ingredients:
No data available for propylene glycol monomethyl ether acetate, alpha-isomer (CAS: 108-65-6).

No data available for hexamethylene diisocyanate (CAS: 822-06-0).

Section 16 - OTHER INFORMATION

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