

MAPEI LIGNOBOND COMPONENT B

Chemwatch Material Safety Data Sheet
Issue Date: Thu 31-Mar-2005

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

MAPEI LIGNOBOND COMPONENT B

SYNONYMS

"Solvent free liquid epoxy urethane amine curing agent Part B"

PROPER SHIPPING NAME

CORROSIVE LIQUID, N.O.S.

PRODUCT USE

INTEGRITY CHECK: Product contains BOTH an acid and a base as ingredients. Part B or Hardener of a 2 pack. epoxy coating system. Requires that the two parts be mixed by hand or mixer before use, in accordance with manufacturers directions. Mix only as much as is required. Do not return the mixed material to the original containers. Application is by brush or hand roller. The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation.

SUPPLIER

Company: Mapei Australia P/L
Address:
12 Parkview Drive
Archerfield
QLD, 4108
AUS
Telephone: +61 7 3276 5000
Fax: +61 7 3276 5076

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

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

POISONS SCHEDULE

S5

RISK

Harmful by inhalation and if swallowed.
Causes burns.
Risk of serious damage to eyes.
May cause SENSITISATION by skin contact.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Possible risk of impaired fertility.
Possible risk of harm to the unborn child.
Skin contact may produce health damage*.
Cumulative effects may result following exposure*.
Limited evidence of a carcinogenic effect*.
Possible respiratory sensitiser*.
* (limited evidence).

continued...

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Section 2 - HAZARDS IDENTIFICATION

SAFETY

Keep container in a well ventilated place.
Avoid exposure - obtain special instructions before use.
Keep container tightly closed.
This material and its container must be disposed of in a safe way.
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).
Use appropriate container to avoid environment contamination.
Avoid release to the environment. Refer to special instructions/Safety data sheets.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
benzyl alcohol	100-51-6	20-25
nonylphenol	25154-52-3	10-20
amines including		
2,4,6-tri(dimethylaminomethyl)phenol	90-72-2	1-5
diethylenetriamine	111-40-0	1-5
triethylenetetramine	112-24-3	<2
bisphenol A	80-05-7	<2
No other ingredient information supplied.		

Section 4 - FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

EYE

If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with 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.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.

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Section 4 - FIRST AID MEASURES

- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

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, without delay.

NOTES TO PHYSICIAN

For acute or short-term repeated exposures to highly alkaline materials:

- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
 - Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
 - Oxygen is given as indicated.
 - The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
 - Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue.
- Alkalis continue to cause damage after exposure.

INGESTION:

- Milk and water are the preferred diluents
- No more than 2 glasses of water should be given to an adult.
- Neutralising agents should never be given since exothermic heat reaction may compound injury.
 - * Catharsis and emesis are absolutely contra-indicated.
 - * Activated charcoal does not absorb alkali.
 - * Gastric lavage should not be used.

Supportive care involves the following:

- Withhold oral feedings initially.
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:

- Injury should be irrigated for 20-30 minutes.
- Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology]. Clinical experience of benzyl alcohol poisoning is generally confined to premature neonates in receipt of preserved intravenous salines.
- Metabolic acidosis, bradycardia, skin breakdown, hypotonia, hepatorenal failure, hypotension and cardiovascular collapse are characteristic.
 - High urine benzoate and hippuric acid as well as elevated serum benzoic acid levels are found.
 - The so-called "gasping syndrome" describes the progressive neurological deterioration of poisoned neonates.
 - Management is essentially supportive.

For acute or short term repeated exposures to phenols/ cresols:

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Section 4 - FIRST AID MEASURES

- Phenol is absorbed rapidly through lungs and skin. [Massive skin contact may result in collapse and death]*
- [Ingestion may result in ulceration of upper respiratory tract; perforation of oesophagus and/or stomach, with attendant complications, may occur. Oesophageal stricture may occur.]*
- An initial excitatory phase may present. Convulsions may appear as long as 18 hours after ingestion. Hypotension and ventricular tachycardia that require vasopressor and antiarrhythmic therapy, respectively, can occur.
- Respiratory arrest, ventricular dysrhythmias, seizures and metabolic acidosis may complicate severe phenol exposures so the initial attention should be directed towards stabilisation of breathing and circulation with ventilation, intubation, intravenous lines, fluids and cardiac monitoring as indicated.
- [Vegetable oils retard absorption; do NOT use paraffin oils or alcohols. Gastric lavage, with endotracheal intubation, should be repeated until phenol odour is no longer detectable; follow with vegetable oil. A saline cathartic should then be given.]* ALTERNATIVELY: Activated charcoal (1g/kg) may be given. A cathartic should be given after oral activated charcoal.
- Severe poisoning may require slow intravenous injection of methylene blue to treat methaemoglobinaemia.
- [Renal failure may require haemodialysis.]*
- Most absorbed phenol is biotransformed by the liver to ethereal and glucuronide sulfates and is eliminated almost completely after 24 hours. [Ellenhorn and Barceloux: Medical Toxicology] *[Union Carbide]

BIOLOGICAL EXPOSURE INDEX - BEI

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

Determinant	Index	Sampling Time	Comments
1. Total phenol in blood	250 mg/gm creatinine	End of shift	B, NS

B: Background levels occur in specimens collected from subjects NOT exposed
NS: Non-specific determinant; also seen in exposure to other materials.

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.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- 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.
- Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of

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Section 5 - FIRE FIGHTING MEASURES

containers.

- On combustion, may emit toxic fumes of carbon monoxide (CO).
 - May emit acrid smoke.
 - Mists containing combustible materials may be explosive., Combustion products include, carbon dioxide (CO₂), aldehydes, nitrogen oxides (NO_x), other pyrolysis products typical of burning organic material.
- May emit corrosive fumes.

FIRE INCOMPATIBILITY

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

HAZCHEM

2X

Personal Protective Equipment

PERSONAL PROTECTION EQUIPMENT

Breathing apparatus.

Gas tight chemical resistant suit.

Limit exposure duration to 1 BA set - 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labelled container for waste disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL

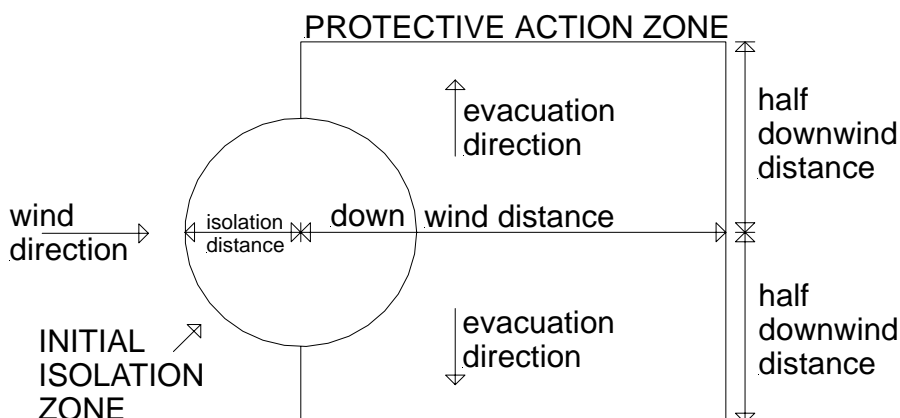
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Section 6 - ACCIDENTAL RELEASE MEASURES



From IERG (Canada/Australia)

Isolation Distance	25 metres
Downwind Protection Distance	250 metres
IERG Number	37

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 154 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

EMERGENCY RESPONSE PLANNING GUIDELINES (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:

benzyl alcohol	200 ppm
nonylphenol	500 mg/m ³

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

benzyl alcohol	100 ppm
nonylphenol	125 mg/m ³

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

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Section 6 - ACCIDENTAL RELEASE MEASURES

benzyl alcohol	12.5 ppm
nonylphenol	20 mg/m ³

The threshold concentration below which most people will experience no appreciable risk of health effects:

benzyl alcohol	4 ppm
nonylphenol	6 mg/m ³

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T)	>= 3.0%
R50 >= 0.25%	Corrosive (C)	>= 5.0%
R51 >= 2.5%		
else >= 10%		

where percentage is percentage of ingredient found in the mixture

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 exposure occurs.
 - Use in a well-ventilated area.
 - Avoid contact with moisture.
 - 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. Launder contaminated clothing before re-use.
 - 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 are maintained.
- DO NOT allow clothing wet with material to stay in contact with skin.

SUITABLE CONTAINER

- Lined metal can, Lined metal pail/ can
 - Plastic pail
 - Polyliner drum
 - Packing as recommended by manufacturer.
 - Check all containers are clearly labelled and free from leaks.
- For low viscosity materials
- Drums and jerricans must be of the non-removable head type.
 - 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) and solids (between 15 C deg. and 40 deg C.):
- Removable head packaging;
 - Cans with friction closures and
 - low pressure tubes and cartridges may be used.
-

Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in

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Section 7 - HANDLING AND STORAGE

contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

STORAGE INCOMPATIBILITY

Avoid strong acids.
Avoid reaction with oxidising agents.

STORAGE REQUIREMENTS

- Store in original containers.
 - Keep containers securely sealed.
 - Store in a cool, dry, well-ventilated area.
 - Store away from incompatible materials and foodstuff containers.
 - Protect containers against physical damage and check regularly for leaks.
 - Observe manufacturer's storing and handling recommendations.
- DO NOT store near acids, or oxidising agents.
Protect containers against physical damage.
Check regularly for spills and leaks.
No smoking, naked lights, heat or ignition sources.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³
Australian Exposure Standards	Diethylene triamine	1	4.2				

No data available for benzyl alcohol as (CAS: 100-51-6)
No data available for nonylphenol as (CAS: 25154-52-3) / (CAS: 84852-15-3)
No data available for 2,4,6-tri(dimethylaminomethyl)phenol as (CAS: 90-72-2)
No data available for triethylenetetramine as (CAS: 112-24-3)
No data available for bisphenol A as (CAS: 80-05-7)
None assigned. Refer to individual constituents.

ODOUR SAFETY FACTOR (OSF)

OSF=25 (2,4,6-tri(dimethylaminomethyl)phenol)

Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities
B	26-550	As "A" for 50-90% of persons being distracted
C	1-26	As "A" for less than 50% of persons being distracted

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

D	0.18-1	10-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As "D" for less than 10% of persons aware of being tested

REPRODUCTIVE HEALTH GUIDELINES

Established occupational exposure limits frequently do not take into consideration reproductive end points that are clearly below the thresholds for other toxic effects. Occupational reproductive guidelines (ORGs) have been suggested as an additional standard. These have been established after a literature search for reproductive no-observed-adverse effect-level (NOAEL) and the lowest-observed-adverse-effect-level (LOAEL). In addition the US EPA's procedures for risk assessment for hazard identification and dose-response assessment as applied by NIOSH were used in the creation of such limits.

Ingredient	ORG	UF	Endpoint	CR	TLV Adeq
triethylenetetramine	2.9 mg/m ³	10	D	NA	-
bisphenol A	0.3 mg/m ³	1000	D	NA	-

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time-weighted average unless specified otherwise.

CR = Cancer Risk/10000; UF = Uncertainty factor:

TLV believed to be adequate to protect reproductive health:

LOD: Limit of detection

Toxic endpoints have also been identified as:

D = Developmental; R = Reproductive; TC = Transplacental carcinogen

Jankovic J., Drake F.: A Screening Method for Occupational Reproductive

American Industrial Hygiene Association Journal 57: 641-649 (1996).

INGREDIENT DATA

BENZYL ALCOHOL:

No exposure limits set by NOHSC or ACGIH.

OEL STEL (Russia): 5 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.

Odour Threshold: 5.5 ppm

NONYLPHENOL:

No exposure limits set by NOHSC or ACGIH.

2,4,6-TRI(DIMETHYLAMINOMETHYL)PHENOL:

No exposure limits set by NOHSC or ACGIH.

CEL TWA: 5 ppm, 54 mg/m³ SKIN

[Rohm & Haas]

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.

DIETHYLENETRIAMINE:

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Not available. Refer to individual constituents.

TRIETHYLENETETRAMINE:

No exposure limits set by NOHSC or ACGIH.

CEL TWA: 1 ppm, 6 mg/m³; STEL: 2 ppm, 12 mg/m³

[compare OEL TWA (Sweden): 1 ppm, 6 mg/m³; STEL: 2 ppm, 12 mg/m³ Sensitiser]

BISPHENOL A:

REL TWA: 5 mg/m³

[Dow Chemical]

MAK value: 5 mg/m³

- measured as the inhalable fraction of the aerosol.

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(P) in List of MAK values: Danger of photo-contact sensitisation.

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.

PERSONAL PROTECTION

EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

- When handling liquid-grade epoxy resins wear chemically protective gloves (e.g nitrile or nitrile-butadiene rubber), boots and aprons.
- DO NOT use cotton or leather (which absorb and concentrate the resin), polyvinyl chloride, rubber or polyethylene gloves (which absorb the resin).
- DO NOT use barrier creams containing emulsified fats and oils as these may absorb the resin; silicone-based barrier creams should be reviewed prior to use. Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

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.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computer-generated selection: benzyl alcohol

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computer-generated selection:

Protective Material CPI *

BUTYL	A
VITON	A

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computer-generated selection:

Protective Material CPI *

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	AK-AUS P	-
1000	50	-	AK-AUS P
5000	50	Airline *	-
5000	100	-	AK-2 P
10000	100	-	AK-3 P
	100+		Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

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

For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection.

Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.

An approved self contained breathing apparatus (SCBA) may be required in some situations.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Provide adequate ventilation in warehouse or closed storage area. 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).	Air Speed: 0.25-0.5 m/s (50-100 f/min.)
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 generation)	0.5-1 m/s (100-200 f/min.)
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.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (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

Transparent combustible mobile liquid with an ammoniacal odour;
partly soluble in water. Mixes with strong epoxy solvents.

PHYSICAL PROPERTIES

Does not mix with water.
Corrosive.

continued...

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Alkaline.

Molecular Weight: Not applicable
Melting Range (°C): Not available
Solubility in water (g/L): Partly miscible
pH (1% solution): Not available
Volatile Component (%vol): Nil @ 38C
Relative Vapour Density (air=1): > 1.0
Lower Explosive Limit (%): Not applicable
Autoignition Temp (°C): Not applicable
State: LIQUID

Boiling Range (°C): Not available
Specific Gravity (water=1): 1.0
pH (as supplied): 11 alkaline
Vapour Pressure (kPa): < 0.01 @ 23 C.
Evaporation Rate: Slow
Flash Point (°C): > 100
Upper Explosive Limit (%): Not applicable
Decomposition Temp (°C):

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

The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Some phenol derivatives can cause damage to the digestive system. If absorbed, profuse sweating, thirst, nausea, vomiting, diarrhoea, cyanosis, restlessness, stupor, low blood pressure, gasping, abdominal pain, anaemia, convulsions, coma and lung swelling can happen followed by pneumonia. There may be respiratory failure and kidney damage. Chemical burns, seizures and irregular heartbeat may result.

Ingestion of amine epoxy-curing agents (hardeners) may cause severe abdominal pain, nausea, vomiting or diarrhoea. The vomitus may contain blood and mucus. If death does not occur within 24 hours there may be an improvement in the patients condition for 2-4 days only to be followed by the sudden onset of abdominal pain, boardlike abdominal rigidity or hypo-tension; this indicates that delayed gastric or oesophageal corrosive damage has occurred.

Amines without benzene rings when swallowed are absorbed throughout the gut. Corrosive action may cause damage throughout the gastrointestinal tract. They are removed through the liver, kidney and intestinal mucosa by enzyme breakdown.

EYE

The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.

If applied to the eyes, this material causes severe eye damage.

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

Some phenol derivatives may produce mild to severe eye irritation with redness, pain and blurred vision. Permanent eye injury may occur; recovery may also be complete or partial.

The liquid produces a high level of eye discomfort and is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible

continued...

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Section 11 - TOXICOLOGICAL INFORMATION

permanent impairment of vision, if not promptly and adequately treated.

SKIN

Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

The material can produce chemical burns following direct contact with the skin.

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. Phenol and its derivatives can cause severe skin irritation if contact is maintained, and can be absorbed to the skin affecting the cardiovascular and central nervous system. Effects include sweating, intense thirst, nausea and vomiting, diarrhoea, cyanosis, restlessness, stupor, low blood pressure, hyperventilation, abdominal pain, anaemia, convulsions, coma, lung swelling followed by pneumonia. Respiratory failure and kidney damage may follow.

The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.

Amine epoxy-curing agents (hardeners) may produce primary skin irritation and sensitisation dermatitis in predisposed individuals. Cutaneous reactions include erythema, intolerable itching and severe facial swelling. Blistering, with weeping of serous fluid, and crusting and scaling may also occur. Individuals exhibiting "amine dermatitis" may experience a dramatic reaction upon re-exposure to minute quantities. Highly sensitive persons may even react to cured resins containing trace amounts of unreacted amine hardener. Minute quantities of air-borne amine may precipitate intense dermatological symptoms in sensitive individuals. Prolonged or repeated exposure may produce tissue necrosis.

INHALED

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

The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.

If phenols are absorbed via the lungs, systemic effects may occur affecting the cardiovascular and nervous systems. Inhalation can result in profuse perspiration, intense thirst, nausea, vomiting, diarrhoea, cyanosis, restlessness, stupor, falling blood pressure, hyperventilation, abdominal pain, anaemia, convulsions, coma, swelling and inflammation of the lung. This is followed by respiratory failure and kidney damage. Phenols also cause loss of sensation and general depression at high concentrations. The toxicities of phenol derivatives vary.

Inhalation of amine vapours may cause irritation of the mucous membrane of the nose and throat, and lung irritation with respiratory distress and cough.

Swelling and inflammation of the respiratory tract is seen in serious cases; with headache, nausea, faintness and anxiety. There may also be wheezing. Acute effects from inhalation of high vapour concentrations may be chest and nasal irritation with coughing, sneezing, headache and even nausea.

CHRONIC HEALTH EFFECTS

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due

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Section 11 - TOXICOLOGICAL INFORMATION

to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucous production. There is some evidence that inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population. Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population. 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. Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility. Results in experiments suggest that this material may cause disorders in the development of the embryo or foetus, even when no signs of poisoning show in the mother. Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis). The material may accumulate in the human body and progressively cause tissue damage. Exposure to alkyl phenolics is associated with reduced sperm count and fertility in males.

TOXICITY AND IRRITATION

Not available. Refer to individual constituents.

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

BENZYL ALCOHOL:

TOXICITY

Oral (rat) LD50: 1230 mg/kg
Inhalation (rat) LCLo: 2000 ppm/4h
Inhalation (rat) LC50: 1000 ppm/8h
Inhalation (rat) LC50: > 4178 mg/m³/4h (aerosol)
Dermal (rabbit) LD50: 2000 mg/kg

IRRITATION

Skin (man): 16 mg/48h-Mild
Skin (rabbit): 10 mg/24h open-Mild
Eye (rabbit): 0.75 mg open SEVERE

NONYLPHENOL:

TOXICITY

Oral (rat) LD50: 1620 mg/kg
Skin (rabbit) LD50: 2140 mg/kg
Eye (rabbit): 0.5 mg (open)-SEVERE

IRRITATION

Skin(rabbit):10mg/24h(open)-SEVERE
Skin (rabbit): 500 mg(open)-mod

2,4,6-TRI(DIMETHYLAMINOMETHYL)PHENOL:

TOXICITY

Oral (rat) LD50: 1200 mg/kg
Oral (rat) LD50: 2500 mg/kg *
Dermal (rabbit) LD50: 1280 mg/kg
Inhalation (rat) LC50: > 0.5 mg/l/1 hr.

IRRITATION

Skin (rabbit): 2 mg/24h - SEVERE
Eye (rabbit): 0.05 mg/24h - SEVERE
[Rohm & Haas, Henkel]*
[Ciba]

DIETHYLENETRIAMINE:

TOXICITY

IRRITATION

continued...

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Oral (rat) LD50: 1080 mg/kg
Dermal (rabbit) LD50: 1090 mg/kg
SEVERE

Skin (rabbit): 500 mg open Moderate
Skin (rabbit): 10 mg/24h - SEVE

TRIETHYLENETETRAMINE: TOXICITY

Oral (rat) LD50: 2500 mg/kg
Dermal (rabbit) LD50: 805 mg/kg
Eye (rabbit): 49 mg SEVERE
Eye (rabbit): 20 mg/24h Moderate
Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

IRRITATION

Skin (rabbit): 490 mg open SEVERE
Skin (rabbit): 5 mg/24 SEVERE

BISPHENOL A: TOXICITY

Oral (rat) LD50: 3250 mg/kg
Inhalation (rat) LC50: 200 ppm
Dermal (rabbit) LD50: 3000 mg/kg

IRRITATION

Skin (rabbit): 250 mg open - Mild
Skin (rabbit): 500 mg/24h - Mild
Eye (rabbit): 0.25 mg/24h-SEVERE

Section 12 - ECOLOGICAL INFORMATION

Prevent, by any means available, spillage from entering drains or water
Refer to data for ingredients, which follows:

BENZYL ALCOHOL:

log Kow : 1.1
Koc : <5
Henry's atm m³ /mol: 3.91E-07
BOD 5 if unstated: 1.55-1.6,33-62%
COD : 96%
ThOD : 2.519
BCF : 4
Toxicity Fish: LC50(96)10-460mg/L
Toxicity invertebrate: cell mult. inhib.350mg/L
Bioaccumulation : not sig
Anaerobic effects : sig degrad
Effects on algae and plankton: inhib degrad. of glucose
Degradation Biological: sig
processes Abiotic: RxnOH*,no photochem

NONYLPHENOL:

The material is classified as an ecotoxin* because the Daphnia EC50 (48 hours) is less than or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment)

Appendix 8, Table 1

Compiler's Guide for the Preparation of International Chemical Safety Cards:
1993 Commission of the European Communities.

BCF : mussel 8-12

Toxicity Fish: LD50(96)7mg/L

2,4,6-TRI(DIMETHYLAMINOMETHYL)PHENOL:

Fish toxicity:

Rainbow trout (salmo gairdneri) TL50: 222 (174-283) mg/l/24hr
Rainbow trout (salmo gairdneri) TL50: 180-240 mg/l/96hr
Rainbow trout (salmo gairdneri) No effect level: 180 mg/l
Mud crab TL50: 750-1000 mg/l/24hr
Mud crab TL50: 750-1000 mg/l/96hr
Mud crab TL50: No effect level: 750 mg/l

continued...

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Section 12 - ECOLOGICAL INFORMATION

Carp TL50: 249 (204-305) mg/l/24hr
Carp TL50: 175 (131-235) mg/l/96hr
Carp No effect level: 140 mg/l
Grass shrimp TL50: 750-1000 mg/l/24

[Air Products & Chemicals]

DIETHYLENETRIAMINE:
log Kow (Prager 1995): -1.27

Harmful to aquatic organisms.

Ecotoxicity:

LC50: 17 mg/l (Daphnia magna)*

LC50: 332 mg/l (Pimephales promelas)*

LC50: 710 mg/l (Artemia salina)*

*[ITW Ramset / Red Head]

log Kow : -2.27

The material will leach into ground water and is not expected to be biodegradable. No significant degree of bioaccumulation is anticipated.

A large spill could be toxic to biomass in a treatment plant or could be toxic to fish.

Evaporated material is expected to photodegrade following reaction with hydroxy radicals; the half-life in air is thought to be less than a day.

BISPHENOL A:

log Kow : 3.32

Kow : 314-1524

Half-life (hr) air : 4

Half-life (hr) H2O surface water : 96

BCF : 42-96

Toxicity Fish: LC50(96)42mg/L

processes Abiotic: violent,fast decomp.in H2O

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible.
 - Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
 - Treat and neutralise at an approved treatment plant.
 - Treatment should involve: Neutralisation with suitable dilute acid followed by: Burial in a licenced land-fill or Incineration in a licenced apparatus (after admixture with suitable combustible material).
 - Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
- Puncture containers to prevent re-use and bury at an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

Shipping Name:

CORROSIVE LIQUID, N.O.S.

Dangerous Goods Class: 8

Subrisk: None

UN/NA Number: 1760

Packing Group: III

Labels Required: corrosive

Additional Shipping Information:

International Transport Regulations:

IMO Dangerous Goods class: 8

IMO Packing group: None

continued...

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IATA Dangerous goods class: 8
Cargo Instructions: 820
Cargo Max: 60 L
Passenger Instructions: 818
Passenger Max: 5 L
Special Provisions: None, None

HAZCHEM

2X

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE

S5

REGULATIONS

benzyl alcohol (CAS: 100-51-6) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)

nonylphenol (CAS: 25154-52-3) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)
Australia High Volume Industrial Chemical List (HVICL)

nonylphenol (CAS: 84852-15-3) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)

2,4,6-tri(dimethylaminomethyl)phenol (CAS: 90-72-2) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)

diethylenetriamine (CAS: 111-40-0) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)
Australian Poisons Schedule

triethylenetetramine (CAS: 112-24-3) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)
Australian Poisons Schedule

bisphenol A (CAS: 80-05-7) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)
Australia High Volume Industrial Chemical List (HVICL)

Section 16 - OTHER INFORMATION

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