GREY ETCH PRIMER

Chemwatch Independent Material Safety Data Sheet
Issue Date: 15-Nov-2011
A317LP

CHEMWATCH 4770-26
Version No:2.0

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
GREY ETCH PRIMER

SYNONYMS
"DY-MARK HI-PERFORMANCE ANTI CORROSIVE ETCH PRIMER AEROSOL GREY"

PROPER SHIPPING NAME
AEROSOLS

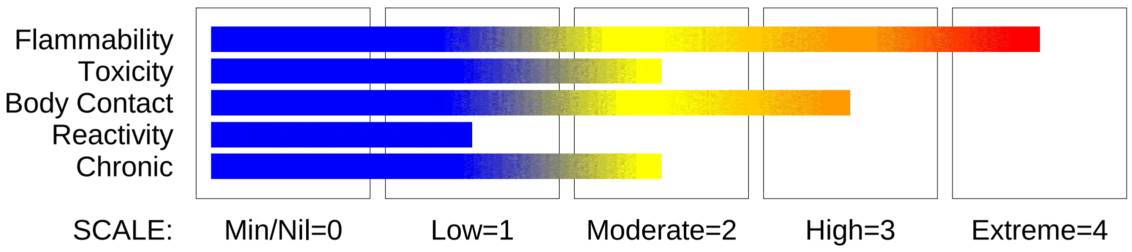
PRODUCT USE
■ Application is by spray atomisation from a hand held aerosol pack.
Used according to manufacturer's directions.

SUPPLIER
Company: Dy- Mark Pty Ltd
Address:
89 Formation Street
Wacol
QLD, 4076
Australia
Telephone: +61 7 3271 2222
Emergency Tel:**0403 186 708**
Fax: +61 7 3271 2751
Email: info@dymark.com.au

Section 2 - HAZARDS IDENTIFICATION

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

CHEMWATCH HAZARD RATINGS



RISK

Risk Codes	Risk Phrases
R12	• Extremely flammable.
R20/21/22	• Harmful by inhalation, in contact with skin and if swallowed.
R37/38	• Irritating to respiratory system and skin.
R41	• Risk of serious damage to eyes.
R43	• May cause SENSITISATION by skin contact.
R44	• Risk of explosion if heated under confinement.
R51/53	• Toxic to aquatic organisms, may cause long- term adverse

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	effects in the aquatic environment.
R67	• Vapours may cause drowsiness and dizziness.

SAFETY

Safety Codes	Safety Phrases
S16	• Keep away from sources of ignition. No smoking.
S23	• Do not breathe gas/fumes/vapour/spray.
S24	• Avoid contact with skin.
S25	• Avoid contact with eyes.
S36	• Wear suitable protective clothing.
S37	• Wear suitable gloves.
S39	• Wear eye/face protection.
S51	• Use only in well ventilated areas.
S09	• Keep container in a well ventilated place.
S53	• Avoid exposure - obtain special instructions before use.
S29	• Do not empty into drains.
S401	• To clean the floor and all objects contaminated by this material, use water and detergent.
S07	• Keep container tightly closed.
S35	• This material and its container must be disposed of in a safe way.
S13	• Keep away from food, drink and animal feeding stuffs.
S26	• In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.
S46	• If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre. (show this container or label).
S57	• Use appropriate container to avoid environmental contamination.
S61	• Avoid release to the environment. Refer to special instructions/Safety data sheets.
S60	• This material and its container must be disposed of as hazardous waste.
S63	• In case of accident by inhalation: remove casualty to fresh air and keep at rest.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
xylene	1330-20-7	10-30
n- butanol	71-36-3	10-30
isopropanol	67-63-0	10-30
bisphenol A/ epichlorohydrin resin, liquid	25068-38-6	1-10
zinc phosphate	7779-90-0	1-10
dimethyl ether	115-10-6	30-60
phosphoric acid	7664-38-2	1-10
pigment and filler		1-10

Section 4 - FIRST AID MEASURES

SWALLOWED

■ - Avoid giving milk or oils.
- Avoid giving alcohol.
- Not considered a normal route of entry.
- If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

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EYE

■ If aerosols come in contact with the eyes:
- Immediately hold the eyelids apart and flush the eye continuously for at least 15 minutes 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.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

■ If solids or aerosol mists are deposited upon the skin:
- Flush skin and hair with running water (and soap if available).
- Remove any adhering solids with industrial skin cleansing cream.
- DO NOT use solvents.
- Seek medical attention in the event of irritation.

INHALED

■ If aerosols, fumes or combustion products are inhaled:
- Remove to fresh air.
- 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.
- If breathing is shallow or has stopped, ensure clear airway and apply resuscitation, 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.
for lower alkyl ethers:

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- A low-stimulus environment must be maintained.
- Monitor and treat, where necessary, for shock.
- Anticipate and treat, where necessary, for seizures.
- DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive-pressure ventilation using a bag-valve mask might be of use.
- Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Hypotension without signs of hypovolaemia may require vasopressors.
- Treat seizures with diazepam.
- Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

- Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases

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(ABGs), chest radiographs and electrocardiograph.
- Ethers may produce anion gap acidosis. Hyperventilation and bicarbonate therapy might be indicated.
- Haemodialysis might be considered in patients with impaired renal function.
- Consult a toxicologist as necessary.

BRONSTEIN, A.C. and CURRANCE, P.L.
EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994.

For acute or short term repeated exposures to isopropanol:
- Rapid onset respiratory depression and hypotension indicates serious ingestions that require careful cardiac and respiratory monitoring together with immediate intravenous access.
- Rapid absorption precludes the usefulness of emesis or lavage 2 hours post-ingestion. Activated charcoal and cathartics are not clinically useful. Ipecac is most useful when given 30 mins. post-ingestion.
- There are no antidotes.
- Management is supportive. Treat hypotension with fluids followed by vasopressors.
- Watch closely, within the first few hours for respiratory depression; follow arterial blood gases and tidal volumes.
- Ice water lavage and serial haemoglobin levels are indicated for those patients with evidence of gastrointestinal bleeding.

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 ($pO_2 < 50$ mm Hg or $pCO_2 > 50$ 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	

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Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

■ SMALL FIRE:
- Water spray, dry chemical or CO_2

LARGE FIRE:
- Water spray or fog.

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.
- If safe, switch off electrical equipment until vapour fire hazard removed.

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

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 100 metres in all directions.

FIRE/EXPLOSION HAZARD

■ - Liquid and vapour are highly flammable.
- Severe fire hazard when exposed to heat or flame.
- Vapour forms an explosive mixture with air.
- Severe explosion hazard, in the form of vapour, when exposed to flame or spark.
- Vapour may travel a considerable distance to source of ignition.
- Heating may cause expansion or decomposition with violent container rupture.
- Aerosol cans may explode on exposure to naked flames.
- Rupturing containers may rocket and scatter burning materials.
- Hazards may not be restricted to pressure effects.
- May emit acrid, poisonous or corrosive fumes.
- On combustion, may emit toxic fumes of carbon monoxide (CO).

Combustion products include: carbon monoxide (CO), carbon dioxide (CO_2), phosphorus oxides (POx), other pyrolysis products typical of burning organic material.
Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

FIRE INCOMPATIBILITY

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

HAZCHEM

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Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

■ Environmental hazard - contain spillage.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Wear protective clothing, impervious gloves and safety glasses.
- Shut off all possible sources of ignition and increase ventilation.
- Wipe up.
- If safe, damaged cans should be placed in a container outdoors, away from all ignition sources, until pressure has dissipated.
- Undamaged cans should be gathered and stowed safely.

MAJOR SPILLS

■ Environmental hazard - contain spillage.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- Remove leaking cylinders to a safe place if possible.
- Release pressure under safe, controlled conditions by opening the valve.
- DO NOT exert excessive pressure on valve; DO NOT attempt to operate damaged valve.
- 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 courses
- No smoking, naked lights or ignition sources.

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- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse / absorb vapour.
- Absorb or cover spill with sand, earth, inert materials or vermiculite.
- If safe, damaged cans should be placed in a container outdoors, away from ignition sources, until pressure has dissipated.
- Undamaged cans should be gathered and stowed safely.
- Collect residues and seal in labelled drums for disposal.

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.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- DO NOT incinerate or puncture aerosol cans.
- DO NOT spray directly on humans, exposed food or food utensils.
- 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 are maintained.

SUITABLE CONTAINER

■ - DO NOT use aluminium or galvanised containers.
- Aerosol dispenser.
- Check that containers are clearly labelled.

STORAGE INCOMPATIBILITY

■ - Avoid reaction with oxidising agents.
- Reacts vigorously with alkalis.
- Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.

STORAGE REQUIREMENTS

■ - Keep dry to avoid corrosion of cans. Corrosion may result in container perforation and internal pressure may eject contents of can.
- 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. Contents under pressure.
- Store away from incompatible materials.
- Store in a cool, dry, well ventilated area.
- Avoid storage at temperatures higher than 40 deg C.
- Store in an upright position.
- Protect containers against physical damage.
- Check regularly for spills and leaks.

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- Observe manufacturer's storing and handling recommendations.

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	Notes
Australia Exposure Standards	Grey Etch Primer (Xylene (o- , m- , p- isomers))	80	350	150	655			
Australia Exposure Standards	n- butanol (n- Butyl alcohol)					50	152	Sk
Australia Exposure Standards	isopropanol (Isopropyl alcohol)	400	983	500	1230			
Australia Exposure Standards	zinc phosphate (Inspirable dust (not otherwise classified))		10					
Australia Exposure Standards	dimethyl ether (Dimethyl ether)	400	760	500	950			
Australia Exposure Standards	phosphoric acid (Phosphoric acid)		1		3			

The following materials had no OELs on our records

• bisphenol A/ epichlorohydrin resin, liquid:	CAS:25068- 38- 6 CAS:25085- 99- 8

EMERGENCY EXPOSURE LIMITS

Material	**Revised**	**IDLH**
xylene	174	900
n- butanol	190	1, 400 [LEL]
isopropanol	220	2, 000 [LEL]
phosphoric acid|1805	1, 000	

NOTES

Values marked LEL indicate that the IDLH was based on 10% of the lower explosive limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.

MATERIAL DATA

BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:
DIMETHYL ETHER:
ZINC PHOSPHATE:

■ Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure

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limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:
- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

GREY ETCH PRIMER:
PHOSPHORIC ACID:

■ The saturated vapour concentration of phosphoric acid exceeds the TLV. The TLV-TWA is based by analogy from comparable experience and data for sulfuric acid. Exposure at or below this limit is thought to prevent throat irritation amongst unacclimatised workers.

Fumes of phosphorus pentoxide at concentrations between 0.8 and 5.4 mg/m3 were reported to be noticeable but not uncomfortable whilst concentrations between 3.6 and 11.3 mg/m3 produced coughing in unacclimatised workers but were tolerable. Concentrations of 100 mg/m3 were unbearable except in inured workers.

GREY ETCH PRIMER:
N-BUTANOL:

■ For n-butanol:

Odour Threshold Value: 0.12-3.4 ppm (detection), 1.0-3.5 ppm (recognition)

NOTE: Detector tubes for n-butanol, measuring in excess of 5 ppm are commercially available.

Exposure at or below the TLV-TWA is thought to provide protection against hearing loss due to vestibular and auditory nerve damage in younger workers and to protect against the significant risk of headache and irritation.

25 ppm may produce mild irritation of the respiratory tract 50 ppm may produce headache and vertigo.

Higher concentrations may produce marked irritation, sore throat, coughing, nausea, shortness of breath, pulmonary injury and central nervous system depression characterised by headache, dizziness, dullness and drowsiness.

6000 ppm may produce giddiness, prostration, narcosis, ataxia, and death.

Odour Safety Factor (OSF)

OSF=60 (n-BUTANOL).

GREY ETCH PRIMER:
XYLENE:

■ for xylenes:

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).

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.

Odour Safety Factor(OSF)

OSF=4 (XYLENE).

GREY ETCH PRIMER:
ISOPROPANOL:

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■ Odour Threshold Value: 3.3 ppm (detection), 7.6 ppm (recognition)

Exposure at or below the recommended isopropanol TLV-TWA and STEL is thought to minimise the potential for inducing narcotic effects or significant irritation of the eyes or upper respiratory tract. It is believed, in the absence of hard evidence, that this limit also provides protection against the development of chronic health effects. The limit is intermediate to that set for ethanol, which is less toxic, and n-propyl alcohol, which is more toxic, than isopropanol.

XYLENE:

■ 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.

N-BUTANOL:

■ Exposed individuals are 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 A or B.

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
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

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BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:

■ For epichlorohydrin

Odour Threshold Value: 0.08 ppm

NOTE: Detector tubes for epichlorohydrin, measuring in excess of 5 ppm, are commercially available.

Exposure at or below the recommended TLV-TWA is thought to minimise the potential for adverse respiratory, liver, kidney effects. Epichlorohydrin has been implicated as a human skin sensitiser, hence individuals who are hypersusceptible or otherwise unusually responsive to certain chemicals may NOT be adequately protected from adverse health effects.

Odour Safety Factor (OSF)

OSF=0.54 (EPICHLOROHYDRIN).

ZINC PHOSPHATE:

■ It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.

At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.

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NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

DIMETHYL ETHER:

■ for dimethyl ether:

The no-effect-level for dimethyl ether is somewhere between 2000 ppm (rabbits) and 50,000 ppm (humans) with possible cardiac sensitisation occurring around 200,000 ppm (dogs). The AIHA has adopted a safety factor of 100 in respect to the 50,000 ppm level in its recommendation for a workplace environmental exposure level (WEEL) which is thought to protect against both narcotic and sensitising effects. This level is consistent with the TLV-TWA of 400 ppm for diethyl ether and should be easily achievable using current technologies. The use of the traditionally allowable excursion of 1.25 to the level of 6.25 ppm is felt to be more than adequate as an upper safe limit of exposure.

Human data:

50,000 ppm (12 mins): Feelings of mild intoxication.
75,000 ppm (12 mins): As above plus slight lack of attenuation.
82,000 ppm (12 mins): Some incoordination, slight blurring of vision
(30 mins): As above plus analgesia of the face and rushing of blood to the face.
100,000 ppm (10-20 mins): Narcotic symptoms; (64 mins): Sickness (assumed to be nausea)
144,000 ppm (36 mins):Unconsciousness.

May act as a simple asphyxiants; these are gases which, when present in high concentrations, reduce the oxygen content in air below that required to support breathing, consciousness and life; loss of consciousness, with death by suffocation may rapidly occur in an oxygen deficient atmosphere.

CARE: Most simple asphyxiants are odourless or possess low odour and there is no warning on entry into an oxygen deficient atmosphere. If there is any doubt, oxygen content can be checked simply and quickly. It may not be appropriate to only recommend an exposure standard for simple asphyxiants rather it is essential that sufficient oxygen be maintained. Air normally has 21 percent oxygen by volume, with 18 percent regarded as minimum under normal atmospheric pressure to maintain consciousness / life. At pressures significantly higher or lower than normal atmospheric pressure, expert guidance should be sought.

PERSONAL PROTECTION

EYE

■ No special equipment for minor exposure i.e. when handling small quantities.
OTHERWISE: For potentially moderate or heavy exposures:
- Safety glasses with side shields.
- NOTE: Contact lenses pose a special hazard; soft lenses may absorb irritants and ALL lenses concentrate them.

HANDS/FEET

■ NOTE:
- The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.
- No special equipment needed when handling small quantities.
- OTHERWISE:
- For potentially moderate exposures:
- Wear general protective gloves, eg. light weight rubber gloves.
- For potentially heavy exposures:
- Wear chemical protective gloves, eg. PVC. and safety footwear.

OTHER

■ No special equipment needed when handling small quantities.
OTHERWISE:
- Overalls.
- Skin cleansing cream.
- Eyewash unit.
- Do not spray on hot surfaces.
- The clothing worn by process operators insulated from earth may develop static charges far higher (up to

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100 times) than the minimum ignition energies for various flammable gas-air mixtures. This holds true for a wide range of clothing materials including cotton.
- Avoid dangerous levels of charge by ensuring a low resistivity of the surface material worn outermost.
BRETHERICK: Handbook of Reactive Chemical Hazards.

RESPIRATOR

•Type BAX-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

■ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.

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

■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

General exhaust is adequate under normal conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection.
Provide adequate ventilation in warehouse or closed storage areas.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

■ Supplied as an aerosol pack. Contents under PRESSURE. Contains highly flammable hydrocarbon propellant.
Grey flammable liquid; does not mix with water.

PHYSICAL PROPERTIES

Liquid.
Gas.
Does not mix with water.

State	Liquid	Molecular Weight	Not Applicable
Melting Range (°C)	Not Available	Viscosity	Not Available
Boiling Range (°C)	Not Available	Solubility in water (g/L)	Immiscible
Flash Point (°C)	- 41 (propellant)	pH (1% solution)	Not Applicable
Decomposition Temp (°C)	Not Available	pH (as supplied)	Not Applicable
Autoignition Temp (°C)	Not Available	Vapour Pressure (kPa)	Not Available
Upper Explosive Limit (%)	Not Available	Specific Gravity (water=1)	Not Available
Lower Explosive Limit (%)	Not Available	Relative Vapour Density (air=1)	Not Available
Volatile Component (%vol)	Not Available	Evaporation Rate	Not Available

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xylene	
log Kow (Prager 1995):	3.12- 3.20
n- butanol	
log Kow (Prager 1995):	0.88
log Kow (Sangster 1997):	0.84
isopropanol	
log Kow (Sangster 1997):	0.05
dimethyl ether	
log Kow (Sangster 1997):	0.1

Section 10 - STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY

■ - Elevated temperatures.
- Presence of open flame.
- Product is considered stable.
- Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
Not normally a hazard due to physical form of product.
Considered an unlikely route of entry in commercial/industrial environments.

EYE

■ If applied to the eyes, this material causes severe eye damage.
N-butanol can cause eye damage, burning sensation, blurring of vision, excessive tear formation and discomfort to bright light.
Not considered to be a risk because of the extreme volatility of the gas.
Eye contact with alkyl ethers (vapour or liquid) may produce irritation,redness and tears.
Isopropanol vapour may cause mild eye irritation at 400 ppm. Splashes may cause severe eye irritation, possible corneal burns and eye damage. Eye contact may cause tearing or blurring of vision.
The liquid produces a high level of eye discomfort and is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.

SKIN

■ Skin contact with the material may be harmful; systemic effects may result following absorption.
The material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.
Repeated exposure may cause skin cracking, flaking or drying following normal handling and use.
Spray mist may produce discomfort.
Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.
Alkyl ethers may defat and dehydrate the skin producing dermatoses. Absorption may produce headache, dizziness, and central nervous system depression.
Open cuts, abraded or irritated skin should not be exposed to this material.

continued...

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.

INHALED
■ Inhalation of 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.
Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo.
The acute toxicity of inhaled alkylbenzenes is best described by central nervous system depression. As a rule, these compounds may also act as general anaesthetics.
Systemic poisoning produced by general anaesthesia is characterised by lightheadedness, nervousness, apprehension, euphoria, confusion, dizziness, drowsiness, tinnitus, blurred or double vision, vomiting and sensations of heat, cold or numbness, twitching, tremors, convulsions, unconsciousness and respiratory depression and arrest. Cardiac arrest may result from cardiovascular collapse. Bradycardia, and hypotension may also be produced.
Inhaled alkylbenzene vapours cause death in animals at air levels that are relatively similar (typically LC50s are in the range 5000 -8000 ppm for 4 to 8 hour exposures). It is likely that acute inhalation exposure to alkylbenzenes resembles that to general anaesthetics.
Alkylbenzenes are not generally toxic other than at high levels of exposure. This may be because their metabolites have a low order of toxicity and are easily excreted. There is little or no evidence to suggest that metabolic pathways can become saturated leading to spillover to alternate pathways. Nor is there evidence that toxic reactive intermediates, which may produce subsequent toxic or mutagenic effects, are formed.
Aliphatic alcohols with more than 3-carbons cause headache, dizziness, drowsiness, muscle weakness and delirium, central depression, coma, seizures and behavioural changes. Secondary respiratory depression and failure, as well as low blood pressure and irregular heart rhythms, may follow. Nausea and vomiting are seen, and liver and kidney damage is possible as well following massive exposures. Symptoms are more acute the more carbons there are in the alcohol.
Inhalation of toxic gases may cause:

- Central Nervous System effects including depression, headache, confusion, dizziness, stupor, coma and seizures;
- respiratory: acute lung swellings, shortness of breath, wheezing, rapid breathing, other symptoms and respiratory arrest;
- heart: collapse, irregular heartbeats and cardiac arrest;
- gastrointestinal: irritation, ulcers, nausea and vomiting (may be bloody), and abdominal pain.

Following inhalation, ethers cause lethargy and stupor. Inhaling lower alkyl ethers results in headache, dizziness, weakness, blurred vision, seizures and possible coma. Low blood pressure, slow heartbeat and cardiovascular collapse may be seen with throat irritation, irregular breathing, pulmonary oedema and respiratory arrest. Nausea, vomiting and salivation may be seen. There have been deaths reported, and convulsions and paralysis can be found in severe cases. Massive exposures can cause damage to the kidney and liver.
Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. Vapour is heavier than air and may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.
Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination.
WARNING:Intentional misuse by concentrating/inhaling contents may be lethal.
Headache, fatigue, tiredness, irritability and digestive disturbances (nausea, loss of appetite and bloating) are the most common symptoms of xylene overexposure. Injury to the heart, liver, kidneys and nervous system has also been noted amongst workers. Temporary memory loss, kidney impairment, temporary confusion and some evidence of disturbance of liver function was reported in workers grossly exposed to xylene (1%). One death was noted, with autopsy revealing lung congestion, oedema and local bleeding of alveoli. Inhaling xylene at 100 ppm for 5-6 hours can increase reaction time and cause slight inco-ordination. Tolerance developed during the work week, but was lost over the weekend. Physical exercise may reduce tolerance. About 4-8% of total absorbed xylene accumulates in fat.
Xylene is a central nervous system depressant.

continued...

CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.
Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.
There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.
Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.
There is some evidence that inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.
There is some evidence from animal testing that exposure to this material may result in toxic effects to the unborn baby.
Based on experience with similar materials, there is a possibility that exposure to the material may reduce fertility in humans at levels which do not cause other toxic effects.
Principal route of occupational exposure to the gas is by inhalation.
Women exposed to xylene in the first 3 months of pregnancy showed a slightly increased risk of miscarriage and birth defects. Evaluation of workers chronically exposed to xylene has demonstrated lack of genetic toxicity. Exposure to xylene has been associated with increased rates of blood cancer, but this may be complicated by exposure to other substances, including benzene. Animal testing found no evidence of cancer-causing activity.
Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS].

TOXICITY AND IRRITATION

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

XYLENE:
N-BUTANOL:
PHOSPHORIC ACID:
GREY ETCH PRIMER:
■ The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

N-BUTANOL:
PHOSPHORIC ACID:
GREY ETCH PRIMER:
■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due 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 mucus production.

BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:
GREY ETCH PRIMER:
■ for 1,2-butylene oxide (ethyloxirane):
Ethyloxirane increased the incidence of tumours of the respiratory system in male and female rats exposed via inhalation. Significant increases in nasal papillary adenomas and combined alveolar/bronchiolar adenomas and carcinomas were observed in male rats exposed to 1200 mg/m3 ethyloxirane via inhalation for 103 weeks. There was also a significant positive trend in the incidence of combined alveolar/bronchiolar adenomas and

continued...

carcinomas. Nasal papillary adenomas were also observed in 2/50 high-dose female rats with none occurring in control or low-dose animals. In mice exposed chronically via inhalation, one male mouse developed a squamous cell papilloma in the nasal cavity (300 mg/m3) but other tumours were not observed. Tumours were not observed in mice exposed chronically via dermal exposure. When trichloroethylene containing 0.8% ethyloxirane was administered orally to mice for up to 35 weeks, followed by 0.4% from weeks 40 to 69, squamous-cell carcinomas of the forestomach occurred in 3/49 males (p=0.029, age-adjusted) and 1/48 females at week 106. Trichloroethylene administered alone did not induce these tumours and they were not observed in control animals . Two structurally related substances, oxirane (ethylene oxide) and methyloxirane (propylene oxide), which are also direct-acting alkylating agents, have been classified as carcinogenic.

■ Oxiranes (including glycidyl ethers and alkyl oxides, and epoxides) exhibit many common characteristics with respect to animal toxicology. One such oxirane is ethyloxirane; data presented here may be taken as representative.

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

ISOPROPANOL:
GREY ETCH PRIMER:

■ Isopropanol is irritating to the eyes, nose and throat but generally not to the skin. Prolonged high dose exposure may also produce depression of the central nervous system and drowsiness. Few have reported skin irritation. It can be absorbed from the skin or when inhaled. Intentional swallowing is common particularly among alcoholics or suicide victims and also leads to fainting, breathing difficulty, nausea, vomiting and headache. In the absence of unconsciousness, recovery usually occurred. Repeated doses may damage the kidneys. A decrease in the frequency of mating has been found in among animals, and newborns have been found to have a greater incidence of low birth weight. Tumours of the testes have been observed in the male rat.

ISOPROPANOL:
XYLENE:

■ 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.

XYLENE:
N-BUTANOL:
GREY ETCH PRIMER:

■ The material may cause 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.

XYLENE:

TOXICITY
Oral (human) LDLo: 50 mg/kg
Oral (rat) LD50: 4300 mg/kg
Inhalation (human) TCLo: 200 ppm
Inhalation (man) LCLo: 10000 ppm/6h
Inhalation (rat) LC50: 5000 ppm/4h
Oral (Human) LD: 50 mg/kg
Inhalation (Human) TCLo: 200 ppm/4h
Intraperitoneal (Rat) LD50: 2459 mg/kg
Subcutaneous (Rat) LD50: 1700 mg/kg
Oral (Mouse) LD50: 2119 mg/kg
Intraperitoneal (Mouse) LD50: 1548 mg/kg

IRRITATION
Skin (rabbit):500 mg/24h Moderate
Eye (human): 200 ppm Irritant
Eye (rabbit): 87 mg Mild
Eye (rabbit): 5 mg/24h SEVERE

continued...

Intravenous (Rabbit) LD: 129 mg/kg
Inhalation (Guinea pig) LC: 450 ppm/4h
Reproductive effector in rats

N-BUTANOL:

TOXICITY	IRRITATION
Oral (rat) LD50: 790 mg/kg	Skin (rabbit): 405 mg/24h- Moderate
Inhalation (human) TCLo: 25 ppm	Eye (human): 50 ppm - Irritant
Inhalation (rat) LC50: 8000 ppm/4h	Eye (rabbit): 1.6 mg- SEVERE
Dermal (rabbit) LD50: 3400 mg/kg	Eye (rabbit): 24 mg/24h- SEVERE
Inhalation (human) TCLo: 86000 mg/m^3	

■ for n-butanol

Acute toxicity: n-Butanol (BA) was only slightly toxic to experimental animals following acute oral, dermal, or inhalation exposure. The acute oral LD50 values for female rats ranged from 790 to 4360 mg/kg. Different strains of rat were used in each of four studies, which may account for the variability. Oral LD50 values for mice, rabbits, hamsters, dogs, and male rats all fell within the same range. The rat inhalation LC0 of 8000 ppm (24000 mg/m3) indicates very low inhalation toxicity (no lethality at 8000 ppm). The rabbit dermal LD50 was 3402 mg/kg, indicating that BA can penetrate the skin, but not very readily. Animal experiments and human experience indicate that BA is, at most, moderately irritating to the skin, but it is a severe eye irritant.
These effects are most likely due to BA's localised defatting and drying characteristics. Although no animal data are available, human studies and experience show that BA is not likely to be a skin sensitiser.
The median odor threshold for BA (0.17 ppm) is well below the lowest nasal irritation threshold in humans (289 ppm), allowing warning of possible chemical exposure prior to nasal irritation occurring. Human studies are complicated by the odor characteristics of the material, as the odor threshold is well below the levels at which irritation is observed.
Repeat dose toxicity: An in vivo toxicokinetics study confirmed the rapid metabolism of n-butyl acetate (BAc) to BA. Hydrolysis of BAc in blood and brain was estimated to be 99 percent complete within 2.7 minutes (elimination t1/2 = 0.41 minute). Thus, organisms exposed to BAc can experience appreciable tissue concentrations of BA. In this way, the results of toxicity studies with BAc can be used as supplemental, surrogate
data to provide information on the toxicity of BA.
A thirteen-week, subchronic exposure to BAc, the metabolic precursor of BA, produced transient hypoactivity (during exposure only) at 1500 and 3000 ppm (7185 and 14370 mg/m3) along with decreased body weight and food consumption, but no post exposure neurotoxicity even at 3000 ppm. A concurrent subchronic neurotoxicity study under the same exposure conditions showed no evidence of cumulative neurotoxicity based upon functional observational battery endpoints, quantitative motor activity, neuropathology and scheduled-controlled operant behavior endpoints. A no observable effect level (NOAEL) of 500 ppm (2395 mg/m3) was reported for systemic effects in rats, and a NOAEL of 3000 ppm (14370 mg/m3) was reported for post exposure neurotoxicity in rats.
Reproductive toxicity: Several studies indicate that BA is not a reproductive toxicant.
Female rats exposed to 6000 ppm (18000 mg/m3) BA throughout gestation and male rats exposed to 6000 ppm (18000 mg/m3) BA for six weeks prior to mating showed no effects on fertility or pregnancy rate. Male rats given BA at 533 mg/kg/day for 5 days had no testicular toxicity.
Developmental toxicity: BA produced only mild foetotoxicity and developmental alterations at or near the maternally toxic (even lethal) dose of 8000 ppm (24000 mg/m3) throughout gestation.
Genotoxicity: An entire battery of negative in vitro tests and a negative in vivo micronucleus test indicate that BA is not genotoxic.
Carcinogenicity: Based upon the battery of negative mutagenicity and clastogenicity findings, BA presents a very small potential for carcinogenicity.

ISOPROPANOL:

TOXICITY	IRRITATION
Oral (human) LDLo: 3570 mg/kg	Skin (rabbit): 500 mg - Mild
Oral (human) TDLo: 223 mg/kg	Eye (rabbit): 10 mg - Moderate
Oral (man) TDLo: 14432 mg/kg	Eye (rabbit): 100mg/24hr- Moderate
Oral (rat) LD50: 5045 mg/kg	Eye (rabbit): 100 mg - SEVERE
Dermal (rabbit) LD50: 12800 mg/kg	
Oral (Human) TDLo: 14432 mg/kg	
Oral (Human) LD: 5272 mg/kg	

continued...

Oral (Human) LD: 3570 mg/kg
Intraperitoneal (Rat) LD50: 2735 mg/kg
Intravenous (Rat) LD50: 1088 mg/kg
Oral (Mouse) LD50: 3600 mg/kg
Intraperitoneal (Mouse) LD50: 4477 mg/kg
Intravenous (Mouse) LD50: 1509 mg/kg
Oral (Dog) LD: 1537 mg/kg
Intravenous (Dog) LD: 1024 mg/kg
Intravenous (Cat) LD: 1963 mg/kg
Oral (Rabbit) LD50: 6410 mg/kg
Intraperitoneal (Rabbit) LD50: 667 mg/kg
Intravenous (Rabbit) LD50: 1184 mg/kg
Intraperitoneal (Guinea pig) LD50: 2560 mg/kg
Inhalation (Mouse) LC50: 53000 mg/m^3/4h
Oral (Rat) LD50: 5000 mg/kg
Intraperitoneal (Rat) TDLo: 800 mg/kg
Inhalation (Rat) LC50: 72600 mg/m^3/4h
Oral (Human) TDLo: 286 mg/kg
Inhalation (Human) TCLo: 35 ppm/4h
Inhalation (Human) TCLo: 150 ppm/2h

■ The material may cause 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.

BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:

TOXICITY	IRRITATION
Oral (rat) LD50: 11400 mg/kg	Eye (rabbit): 100mg - Mild

ZINC PHOSPHATE:

TOXICITY	IRRITATION
Oral (rat) LD50: 15000 mg/kg	

DIMETHYL ETHER:

TOXICITY	IRRITATION
Inhalation (rat) LC50: 308000 mg/m^3	Nil Reported

PHOSPHORIC ACID:

TOXICITY	IRRITATION
Unreported (human) LDLo: 220 mg/kg	Skin (rabbit):595 mg/24h - SEVERE
Oral (rat) LD50: 1530 mg/kg	Eye (rabbit): 119 mg - SEVERE
Oral (rat) LD50: 3500 mg/kg* [Monsanto]*	
Dermal (rabbit) LD50: >1260 mg/kg*	
Inhalation (Rat) LC50: 25.5 mg/m^3/4h	
Inhalation (Mouse) LC50: 25.5 mg/m^3/4h	

■ 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.
phosphoric acid (85%)

CARCINOGEN

Xylenes	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3
Isopropyl alcohol	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3

continued...

Isopropyl alcohol manufacture using strong acids	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	1
Acid mists, strong inorganic	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	1

REPROTOXIN

xylene	ILO Chemicals in the electronics industry that have toxic effects on reproduction	Reduced fertility or sterility

SKIN

n- butanol	Australia Exposure Standards - Skin	Notes	Sk

Section 12 - ECOLOGICAL INFORMATION

ZINC PHOSPHATE:
PHOSPHORIC ACID:
BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:
■ Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters. Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

PHOSPHORIC ACID:
ZINC PHOSPHATE:
■ For Phosphate: The principal problems of phosphate contamination of the environment relates to eutrophication processes in lakes and ponds. Phosphorus is an essential plant nutrient and is usually the limiting nutrient for blue-green algae.
Aquatic Fate: Lakes overloaded with phosphates is the primary catalyst for the rapid growth of algae in surface waters. Planktonic algae cause turbidity and flotation films. Shore algae cause ugly muddying, films and damage to reeds. Decay of these algae causes oxygen depletion in the deep water and shallow water near the shore. The process is self-perpetuating because an anoxic condition at the sediment/water interface causes the release of more adsorbed phosphates from the sediment. The growth of algae produces undesirable effects on the treatment of water for drinking purposes, on fisheries, and on the use of lakes for recreational purposes.

N-BUTANOL:
ISOPROPANOL:
BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:
ZINC PHOSPHATE:
DIMETHYL ETHER:
PHOSPHORIC ACID:
XYLENE:
■ DO NOT discharge into sewer or waterways.

XYLENE:
■ Harmful to aquatic organisms.
For Xylenes:
log Koc : 2.05-3.08; Koc : 25.4-204; Half-life (hr) air : 0.24-42; Half-life (hr) H2O surface water : 24-672; Half-life (hr) H2O ground : 336-8640; Half-life (hr) soil : 52-672; Henry's Pa m3 /mol : 637-879; Henry's atm m3 /mol - 7.68E-03; BOD 5 if unstated - 1.4,1%; COD - 2.56,13% ThOD - 3.125 : BCF : 23; log BCF : 1.17-2.41.
Environmental Fate: Most xylenes released to the environment will occur in the atmosphere and volatilisation is the dominant environmental fate process. Soil - Xylenes are expected to have moderate mobility in soil evaporating rapidly from soil surfaces. The extent of the degradation is expected to depend on its

continued...

concentration, residence time in the soil, the nature of the soil, and whether resident microbial populations have been acclimated. Xylene can remain below the soil surface for several days and may travel through the soil profile and enter groundwater. Soil and water microbes may transform it into other, less harmful compounds, although this happens slowly. It is not clear how long xylene remains trapped deep underground in soil or groundwater, but it may be months or years.
Atmospheric Fate: Xylene evaporates quickly into the air from surface soil and water and can remain in the air for several days until it is broken down by sunlight into other less harmful chemicals. In the ambient atmosphere, xylenes are expected to exist solely in the vapour phase. Xylenes are degraded in the atmosphere with an estimated atmospheric lifetime of about 0.5 to 2 days. Xylene may contribute to photochemical smog formation. p-Xylene has a moderately high photochemical reactivity under smog conditions, higher than the other xylene isomers. The photooxidation of p-xylene results in the production of carbon monoxide, formaldehyde, glyoxal, methylglyoxal, 3-methylbenzylnitrate, m-tolualdehyde, 4-nitro-3-xylene, 5-nitro-3-xylene, 2,6-dimethyl-p-benzoquinone, 2,4-dimethylphenol, 6-nitro-2,4-dimethylphenol, 2,6-dimethylphenol, and 4-nitro-2,6-dimethylphenol.
Aquatic Fate: p-xylene may adsorb to suspended solids and sediment in water and is expected to volatilise from water surfaces. Estimated volatilisation half-lives for a model river and model lake are 3 hours and 4 days, respectively. Measurements taken from goldfish, eels and clams indicate that bioconcentration in aquatic organisms is low. Photo-oxidation in the presence of humic acids may play an important role in the abiotic degradation of p-xylene. p-Xylene is biodegradable and has been observed to degrade in pond water however; it is unclear if it degrades in surface waters. p-Xylene has been observed to degrade in anaerobic and aerobic groundwater; however, it is known to persist for many years in groundwater, at least at sites where the concentration might have been quite high. Ecotoxicity: Xylenes are slightly toxic to fathead minnow, rainbow trout and bluegill and not acutely toxic to water fleas. For Photobacterium phosphoreum EC50 (24 h): 0.0084 mg/L. and Gammarus lacustris LC50 (48 h): 0.6 mg/L.

N-BUTANOL:
■ for n-butanol (syn: BA)
log Kow : 0.88
Koc : 71.6
Half-life (hr) air : 5-52
Half-life (hr) H2O surface water : 2.4-3022
Henry's atm m3 /mol: 5.57E-06
BOD 5: 1.1-2.04,33%
COD : 1.9,92%
ThOD : 2.594
Environmental fate:
BA’s vapor pressure is 0.56 kPa at 200 C, water solubility is 77 g/L at 200 C and a Log Kow is 0.88. Based on level III fugacity modeling, BA will partition 83.5% in air, 5.9% in soil, 10.6% in water, <0.1% in suspended solids, and <0.1% in biota and in sediment. BA degrades in air by reaction with hydroxyl radicals, having a half-life in air of 1.2 to 2.3 days. The volatilisation half-life for BA in water is estimated to be 2.4 hours for streams, 3.9 hours for rivers and 126 days for lakes.
BA is classified as “readily biodegradable” under aerobic conditions. The octanol:water partitioning coefficient (log Kow) for BA ranges from 0.88 to 0.97, and the calculated bioconcentration factor (BCF) is 3. These data indicate that BA has a low potential to bioaccumulate. BA is expected to migrate readily through soil to groundwater and not to sorb to soil particles.
Ecotoxicity:
BA exhibits low toxicity to fish, amphibians and aquatic invertebrates, plants, algae, bacteria and protozoans. However, some algal species are sensitive to BA. Acute toxicity to aquatic life may occur at concentrations greater than 500 mg/l.

ISOPROPANOL:
■ For Isopropanol (IPA):
log Kow: -0.16- 0.28;
Half-life (hr) air: 33-84;
Half-life (hr) H2O surface water: 130;
Henry's atm m3 /mol: 8.07E-06;
BOD 5: 1.19,60%;
COD: 1.61-2.30, 97%;
ThOD: 2.4;

continued...

BOD 20: >70%.
Environmental Fate: IPA is expected to partition primarily to the aquatic compartment (77.7%) with the remainder to the air (22.3%). Overall, IPA presents a low potential hazard to aquatic or terrestrial biota.
Aquatic Fate: IPA has been shown to biodegrade rapidly in aerobic, aqueous biodegradation tests and therefore, would not be expected to persist in aquatic habitats. IPA is expected to volatilize slowly from water. The calculated half-life for the volatilization from surface water (1 meter depth) is predicted to range from 4 days (from a river) to 31 days (from a lake). Hydrolysis is not considered a significant degradation process for IPA, however; aerobic biodegradation of IPA has been shown to occur rapidly under non-acclimated conditions. IPA is readily biodegradable in both freshwater and saltwater (72 to 78% biodegradation in 20 days).
Terrestrial Fate: Soil - IPA is also not expected to persist in surface soils due to rapid evaporation to the air. IPA will evaporate quickly from soil and is not expected to partition to the soil however; IPA has the potential to leach through the soil due to its low soil adsorption. Plants - Toxicity of IPA to plants is expected to be low.
Atmospheric Fate: IPA is subject to oxidation predominantly by hydroxy radical attack. The atmospheric half-life is expected to be 10 to 25 hours. Direct photolysis is not expected to be an important transformation process for the degradation of IPA.
Ecotoxicity: IPA has been shown to have a low order of acute aquatic toxicity and is not acutely toxic to fish and invertebrates. Chronic aquatic toxicity has also been shown to be of low concern and bioconcentration in aquatic organisms is not expected to occur.

BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:
■ Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Significant environmental findings are limited. Oxiranes (including glycidyl ethers and alkyl oxides, and epoxides) exhibit common characteristics with respect to environmental fate and ecotoxicology. One such oxirane is ethyloxirane and data presented here may be taken as representative.
For 1,2-Butylene oxide (Ethyloxirane):
log Kow values of 0.68 and 0.86. BAF and BCF : 1 to 17 L./kg.
Aquatic Fate - Ethyloxirane is highly soluble in water and has a very low soil-adsorption coefficient, which suggests that, if released to water, adsorption of ethyloxirane to sediment and suspended solids is not expected. Volatilization of ethyloxirane from water surfaces would be expected. Ethyloxirane is hydrolysable, with a half-life of 6.5 days, and biodegradable up to 100% degradation and is not expected to persist in water. Models have predicted a biodegradation half-life in water of 15 days.
Terrestrial Fate: When released to soil, ethyloxirane is expected to have low adsorption and thus very high mobility. Volatilization from moist soil and dry soil surfaces is expected. Ethyloxirane is not expected to be persistent in soil.
Atmospheric Fate: It is expected that ethyloxirane exists solely as a vapor in ambient atmosphere. Ethyloxirane may also be removed from the atmosphere by wet deposition processes. The half-life in air is about 5.6 days from the reaction of ethyloxirane with photochemically produced hydroxyl radicals which indicates that this chemical meets the persistence criterion in air (half-life of = 2 days).
Ecotoxicity - The potential for bioaccumulation of ethyloxirane in organisms is likely to be low and has low to moderate toxicity to aquatic organisms. Ethyloxirane is acutely toxic to water fleas and toxicity values for bacteria are close to 5000 mg/L. For algae, toxicity values exceed 500 mg/L.

ZINC PHOSPHATE:
■ Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
For zinc and its compounds:
Environmental fate:
Zinc is capable of forming complexes with a variety of organic and inorganic groups (ligands). Biological activity can affect the mobility of zinc in the aquatic environment, although the biota contains relatively little zinc compared to the sediments. Zinc bioconcentrates moderately in aquatic organisms; bioconcentration is higher in crustaceans and bivalve species than in fish. Zinc does not concentrate appreciably in plants, and it does not biomagnify significantly through terrestrial food chains.
However biomagnification may be of concern if concentration of zinc exceeds 1632 ppm in the top 12 inches of soil.
Zinc can persist in water indefinitely and can be toxic to aquatic life. The threshold concentration for fish is 0.1 ppm. Zinc may be concentrated in the aquatic food chain; it is concentrated over 200,000 times in oysters. Copper is synergistic but calcium is antagonistic to zinc toxicity in fish. Zinc can accumulate in freshwater animals at 5 -1,130 times the concentration present in the water. Furthermore, although zinc

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actively bioaccumulates in aquatic systems, biota appears to represent a relatively minor sink compared to sediments. Steady-state zinc bioconcentration factors (BCFs) for 12 aquatic species range from 4 to 24,000. Crustaceans and fish can accumulate zinc from both water and food. A BCF of 1,000 was reported for both aquatic plants and fish, and a value of 10,000 was reported for aquatic invertebrates. The order of enrichment of zinc in different aquatic organisms was as follows (zinc concentrations in µg/g dry weight appear in parentheses): fish (25), shrimp (50), mussel (60), periphyton (260), zooplankton (330), and oyster (3,300). The high enrichment in oysters may be due to their ingestion of particulate matter containing higher concentrations of zinc than ambient water. Other investigators have also indicated that organisms associated with sediments have higher zinc concentrations than organisms living in the aqueous layer. With respect to bioconcentration from soil by terrestrial plants, invertebrates, and mammals, BCFs of 0.4, 8, and 0.6, respectively, have been reported. The concentration of zinc in plants depends on the plant species, soil pH, and the composition of the soil.

Plant species do not concentrate zinc above the levels present in soil.

In some fish, it has been observed that the level of zinc found in their bodies did not directly relate to the exposure concentrations. Bioaccumulation of zinc in fish is inversely related to the aqueous exposure. This evidence suggests that fish placed in environments with lower zinc concentrations can sequester zinc in their bodies.

The concentration of zinc in drinking water may increase as a result of the distribution system and household plumbing. Common piping materials used in distribution systems often contain zinc, as well as other metals and alloys. Trace metals may enter the water through corrosion products or simply by the dissolution of small amounts of metals with which the water comes in contact. Reactions with materials of the distribution system, particularly in soft low-pH waters, very often have produced concentrations of zinc in tap water much greater than those in the raw or treated waters at the plant of origin. Zinc gives water a metallic taste at low levels. Overexposures to zinc also have been associated with toxic effects. Ingestion of zinc or zinc-containing compounds has resulted in a variety of systemic effects in the gastrointestinal and hematological systems and alterations in the blood lipid profile in humans and animals. In addition, lesions have been observed in the liver, pancreas, and kidneys of animals.

Environmental toxicity of zinc in water is dependent upon the concentration of other minerals and the pH of the solution, which affect the ligands that associate with zinc.

Zinc occurs in the environment mainly in the +2 oxidation state. Sorption is the dominant reaction, resulting in the enrichment of zinc in suspended and bed sediments. Zinc in aerobic waters is partitioned into sediments through sorption onto hydrous iron and manganese oxides, clay minerals, and organic material. The efficiency of these materials in removing zinc from solution varies according to their concentrations, pH, redox potential (Eh), salinity, nature and concentrations of complexing ligands, cation exchange capacity, and the concentration of zinc. Precipitation of soluble zinc compounds appears to be significant only under reducing conditions in highly polluted water. Generally, at lower pH values, zinc remains as the free ion. The free ion (Zn^{+2}) tends to be adsorbed and transported by suspended solids in unpolluted waters.

Zinc is an essential nutrient that is present in all organisms. Although biota appears to be a minor reservoir of zinc relative to soils and sediments, microbial decomposition of biota in water can produce ligands, such as humic acids, that can affect the mobility of zinc in the aquatic environment through zinc precipitation and adsorption.

The relative mobility of zinc in soil is determined by the same factors that affect its transport in aquatic systems (i.e., solubility of the compound, pH, and salinity)

The redox status of the soil may shift zinc partitioning. Reductive dissolution of iron and manganese (hydr)oxides under suboxic conditions release zinc into the aqueous phase; the persistence of suboxic conditions may then lead to a repartitioning of zinc into sulfide and carbonate solids. The mobility of zinc in soil depends on the solubility of the speciated forms of the element and on soil properties such as cation exchange capacity, pH, redox potential, and chemical species present in soil; under anaerobic conditions, zinc sulfide is the controlling species.

Since zinc sulfide is insoluble, the mobility of zinc in anaerobic soil is low. In a study of the effect of pH on zinc solubility: When the pH is <7, an inverse relationship exists between the pH and the amount of zinc in solution. As negative charges on soil surfaces increase with increasing pH, additional sites for zinc adsorption are activated and the amount of zinc in solution decreases. The active zinc species in the adsorbed state is the singly charged zinc hydroxide species (i.e., $Zn[OH]^+$). Other investigators have also shown that the mobility of zinc in soil increases at lower soil pH under oxidizing conditions and at a lower cation exchange capacity of soil. On the other hand, the amount of zinc in solution generally increases when the pH is >7 in soils high in organic matter. This is a result of the release of organically complexed zinc, reduced zinc adsorption at higher pH, or an increase in the concentration of chelating agents in soil. For calcareous soils, the relationship between zinc solubility and pH is nonlinear. At a high pH, zinc in

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solution is precipitated as Zn(OH)2, zinc carbonate (ZnCO3), or calcium zincate. Clay and metal oxides are capable of sorbing zinc and tend to retard its mobility in soil. Zinc was more mobile at pH 4 than at pH 6.5 as a consequence of sorption
Zinc concentrations in the air are relatively low, except near industrial sources such as smelters. No estimate for the atmospheric lifetime of zinc is available at this time, but the fact that zinc is transported long distances in air indicates that its lifetime in air is at least on the order of days. There are few data regarding the speciation of zinc released to the atmosphere. Zinc is removed from the air by dry and wet deposition, but zinc particles with small diameters and low densities suspended in the atmosphere travel long distances from emission sources.
The material is classified as an ecotoxin* because the Fish LC50 (96 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.

DIMETHYL ETHER:
■ Most ethers are very resistant to hydrolysis, and the rate of cleavage of the carbon-oxygen bond by abiotic processes is expected to be insignificant.
Direct photolysis will not be an important removal process since aliphatic ethers do not absorb light at wavelengths >290 nm.
log Kow: 0.1-0.12
Koc: 14
Half-life (hr) air: 528
Half-life (hr) H2O surface water: 2.6-30
Henry's atm m^3 /mol: 9.78E-04
BCF: 1.7
Bioaccumulation: not sig
processes Abiotic: RxnOH*

PHOSPHORIC ACID:
■ May cause long-term adverse effects in the aquatic environment.
On the basis of available evidence concerning either toxicity, persistence, potential to accumulate and or observed environmental fate and behaviour, the material may present a danger, immediate or long-term and /or delayed, to the structure and/ or functioning of natural ecosystems.
Ecotoxicity:
The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9. Acute testing with fish showed 96h-LC50 at about pH 3.5.
Prevent, by any means available, spillage from entering drains or water courses.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
xylene	LOW	LOW	LOW	
n- butanol	LOW	MED	LOW	HIGH
isopropanol	LOW	MED	LOW	HIGH
bisphenol A/ epichlorohydrin resin, liquid	HIGH	No Data Available	LOW	HIGH
zinc phosphate	No Data Available	No Data Available		
dimethyl ether	LOW	No Data Available	LOW	HIGH
phosphoric acid	HIGH	No Data Available	LOW	HIGH

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Section 13 - DISPOSAL CONSIDERATIONS

■ - DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Consult State Land Waste Management Authority for disposal.
- Discharge contents of damaged aerosol cans at an approved site.
- Allow small quantities to evaporate.
- DO NOT incinerate or puncture aerosol cans.
- Bury residues and emptied aerosol cans at an approved site.

Section 14 - TRANSPORTATION INFORMATION

Labels Required: FLAMMABLE GAS

HAZCHEM:
2YE (ADG7)

ADG7:

Class or Division	2.1	Subsidiary Risk:	None
UN No.:	1950	Packing Group:	None
Special Provision:	63, 190, 277, 327	Limited Quantity:	See SP 277
Portable Tanks & Bulk Containers - Instruction:	None	Portable Tanks & Bulk Containers - Special Provision:	None
Packagings & IBCs - Packing Instruction:	PP17, PP87, L2	Packagings & IBCs - Special Packing Provision:	P003, LP02

Name and Description: AEROSOLS

Land Transport UNDG:

Class or division	2.1	Subsidiary risk:	None
UN No.:	1950	UN packing group:	None

Shipping Name:AEROSOLS

Air Transport IATA:

ICAO/IATA Class:	2.1	ICAO/IATA Subrisk:	None
UN/ID Number:	1950	Packing Group:	-
Special provisions:	A145		
Cargo Only Packing Instructions:	203	Maximum Qty/Pack:	150 kg
Passenger and Cargo Packing Instructions:	203	Passenger and Cargo Maximum Qty/Pack:	75 kg
Passenger and Cargo Limited Quantity Packing Instructions:	Y203	Passenger and Cargo Limited Quantity Maximum Qty/Pack:	30 kg G

Shipping Name: AEROSOLS, FLAMMABLE

Maritime Transport IMDG:

IMDG Class:	2	IMDG Subrisk:	SP63
UN Number:	1950	Packing Group:	None
EMS Number:	F- D, S- U	Special provisions:	63 190 277 327 344 959
Limited Quantities:	See SP277	Marine Pollutant:	Yes

Shipping Name: AEROSOLS

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Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE None

REGULATIONS

Regulations for ingredients

xylene (CAS: 1330-20-7) is found on the following regulatory lists;

xylene (CAS: 1330-20-7) is found on the following regulatory lists;
"Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","International Council of Chemical Associations (ICCA) - High Production Volume List"

n-butanol (CAS: 71-36-3) is found on the following regulatory lists;

n-butanol (CAS: 71-36-3) is found on the following regulatory lists;
"Australia Exposure Standards","Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 18: List of products to which the Code does not apply","IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances","International Council of Chemical Associations (ICCA) - High Production Volume List"

isopropanol (CAS: 67-63-0) is found on the following regulatory lists;

isopropanol (CAS: 67-63-0) is found on the following regulatory lists;
"Australia Exposure Standards","Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 18: List of products to which the Code does not apply","IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances","IMO Provisional Categorization of Liquid Substances - List 2: Pollutant only mixtures containing at least 99% by weight of components already assessed by IMO","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "International Fragrance Association (IFRA) Survey: Transparency List"

< 700 (CAS: 25068-38-6,25085-99-8) is found on the following regulatory lists;

< 700 (CAS: 25068-38-6,25085-99-8) is found on the following regulatory lists;
"Australia Hazardous Substances","Australia Inventory of Chemical Substances (AICS)"

zinc phosphate (CAS: 7779-90-0,7543-51-3) is found on the following regulatory lists;

zinc phosphate (CAS: 7779-90-0,7543-51-3) is found on the following regulatory lists;
"Australia Hazardous Substances","Australia Inventory of Chemical Substances (AICS)"

dimethyl ether (CAS: 115-10-6,157621-61-9) is found on the following regulatory lists;

dimethyl ether (CAS: 115-10-6,157621-61-9) is found on the following regulatory lists;
"Australia Exposure Standards","Australia Hazardous Substances","Australia Inventory of Chemical Substances (AICS)","International Council of Chemical Associations (ICCA) - High Production Volume List"

phosphoric acid (CAS: 7664-38-2,16271-20-8) is found on the following regulatory lists;

phosphoric acid (CAS: 7664-38-2,16271-20-8) is found on the following regulatory lists;
"Australia Exposure Standards","Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","Australia National Pollutant Inventory","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix F (Part 3)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","International Council of Chemical Associations (ICCA) - High Production Volume List"

No data for Grey Etch Primer (CW: 4770-26)

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
bisphenol A/ epichlorohydrin resin, liquid	25068- 38- 6, 25085- 99- 8
zinc phosphate	7779- 90- 0, 7543- 51- 3
dimethyl ether	115- 10- 6, 157621- 61- 9
phosphoric acid	7664- 38- 2, 16271- 20- 8

REPRODUCTIVE HEALTH GUIDELINES

Ingredient	ORG	UF	Endpoint	CR	Adeq TLV
xylene	1.5 mg/m3	10	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

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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).

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

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

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This is the end of the MSDS.