



## Ardex RA 88

### Ardex (Ardex NZ)

Chemwatch: 5156-38  
Version No: 2.1.1.1  
Safety Data Sheet according to HSNO Regulations

Chemwatch Hazard Alert Code: 3

Issue Date: 24/05/2016  
Print Date: 26/05/2016  
Initial Date: Not Available  
S.GHS.NZLEN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

Product name	Ardex RA 88
Synonyms	Not Available
Proper shipping name	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S. (contains N-aminoethylpiperazine and 4-nonylphenol, branched)
Other means of identification	Not Available

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Reactive diluents are blended with epoxy resins to improve cure. Compared to typical curing techniques, reactive diluents allow the epoxy resin to be less viscous ("syrupy"). This improves surface wetting and adhesion. Epoxies that have added reactive diluents exhibit longer "pot life" (usable mixing time) than epoxy resins without diluents. Use according to manufacturer's directions.
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### Details of the supplier of the safety data sheet

Registered company name	Ardex (Ardex NZ)	Ardex (Ardex Australia)
Address	32 Lane Street Christchurch Woolston New Zealand	20 Powers Road NSW Seven Hills 2147 Australia
Telephone	+64 3373 6928	1800 224 070
Fax	+64 3384 9779	1300 780 102
Website	Not Available	Not Available
Email	Not Available	Not Available

### Emergency telephone number

Association / Organisation	Not Available	Not Available
Emergency telephone numbers	+64 3373 6900	1800 224 070 (Mon-Fri, 9am-5pm)
Other emergency telephone numbers	Not Available	Not Available

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

**Considered a Hazardous Substance according to the criteria of the New Zealand Hazardous Substances New Organisms legislation. Classified as Dangerous Goods for transport purposes.**

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	1	4
Toxicity	2	4
Body Contact	3	4
Reactivity	1	4
Chronic	3	4

0 = Minimum  
1 = Low  
2 = Moderate  
3 = High  
4 = Extreme

Classification [1]	Flammable Liquid Category 4, Metal Corrosion Category 1, Acute Toxicity (Oral) Category 4, Acute Toxicity (Dermal) Category 4, Skin Corrosion/Irritation Category 1B, Serious Eye Damage Category 1, Skin Sensitizer Category 1, Carcinogenicity Category 1A, Reproductive Toxicity Category 2, Acute Aquatic Hazard Category 2, Chronic Aquatic Hazard Category 2
Legend:	1. Classified by Chemwatch; 2. Classification drawn from CCID EPA NZ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI
Determined by Chemwatch using GHS/HSNO criteria	3.1D, 6.1D (dermal), 6.1D (oral), 6.5B (contact), 6.7A, 6.8B, 8.1A, 8.2B, 8.3A, 9.1B, 9.1D

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### Label elements

GHS label elements	
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SIGNAL WORD	<b>DANGER</b>
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### Hazard statement(s)

H227	Combustible liquid
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H317	May cause an allergic skin reaction.
H350	May cause cancer.
H361	Suspected of damaging fertility or the unborn child.
H411	Toxic to aquatic life with long lasting effects.

### Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

### Precautionary statement(s) Response

P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.

### Precautionary statement(s) Storage

P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

### Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.
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## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

### Substances

See section below for composition of Mixtures

### Mixtures

CAS No	%[weight]	Name
		Part A containing:
25068-38-6	40-70	<u>bisphenol A/ diglycidyl ether resin, liquid</u>
68460-21-9	7-15	<u>trimethylolethane triglycidyl ether</u>
107-21-1	3-7	<u>ethylene glycol</u>
13463-67-7	1-5	<u>titanium dioxide</u>
14808-60-7	0.1-1	<u>silica crystalline - quartz</u>
Not Available	15-30	Ingredients determined not to be hazardous
		Part B Containing:
140-31-8	10-20	<u>N-aminoethylpiperazine</u>
84852-15-3	10-20	<u>4-nonylphenol, branched</u>
107-21-1	3-7	<u>ethylene glycol</u>
100-51-6	1-5	<u>benzyl alcohol</u>
112-24-3	0.5-1.5	<u>triethylenetetramine</u>
14808-60-7	<1	<u>silica crystalline - quartz</u>
Not Available	10-20	Ingredients determined not to be hazardous

## SECTION 4 FIRST AID MEASURES

NZ Poisons Centre 0800 POISON (0800 764 766) | NZ Emergency Services: 111

### Description of first aid measures

<b>Eye Contact</b>	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>▶ 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.</li> <li>▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>▶ Transport to hospital or doctor without delay.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
<b>Skin Contact</b>	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately flush body and clothes with large amounts of water, using safety shower if available.</li> <li>▶ Quickly remove all contaminated clothing, including footwear.</li> <li>▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.</li> <li>▶ Transport to hospital, or doctor.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>▶ If fumes or combustion products are inhaled remove from contaminated area.</li> <li>▶ Lay patient down. Keep warm and rested.</li> <li>▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ 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.</li> <li>▶ Transport to hospital, or doctor.</li> <li>▶ Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.</li> <li>▶ Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).</li> <li>▶ As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.</li> <li>▶ Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.</li> </ul> <p><b>This must definitely be left to a doctor or person authorised by him/her.</b> (ICSC13719)</p>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>▶ For advice, contact a Poisons Information Centre or a doctor at once.</li> <li>▶ Urgent hospital treatment is likely to be needed.</li> <li>▶ <b>If swallowed do NOT induce vomiting.</b></li> <li>▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> <li>▶ Observe the patient carefully.</li> <li>▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</li> <li>▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</li> <li>▶ Transport to hospital or doctor without delay.</li> </ul>

### Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

For acute or short term repeated exposures to ethylene glycol:

- ▶ Early treatment of ingestion is important. Ensure emesis is satisfactory.
- ▶ Test and correct for metabolic acidosis and hypocalcaemia.
- ▶ Apply sustained diuresis when possible with hypertonic mannitol.
- ▶ Evaluate renal status and begin haemodialysis if indicated. [I.L.O.]
- ▶ Rapid absorption is an indication that emesis or lavage is effective only in the first few hours. Cathartics and charcoal are generally not effective.
- ▶ Correct acidosis, fluid/electrolyte balance and respiratory depression in the usual manner. Systemic acidosis (below 7.2) can be treated with intravenous sodium bicarbonate solution.
- ▶ Ethanol therapy prolongs the half-life of ethylene glycol and reduces the formation of toxic metabolites.
- ▶ Pyridoxine and thiamine are cofactors for ethylene glycol metabolism and should be given (50 to 100 mg respectively) intramuscularly, four times per day for 2 days.
- ▶ Magnesium is also a cofactor and should be replenished. The status of 4-methylpyrazole, in the treatment regime, is still uncertain. For clearance of the material and its metabolites, haemodialysis is much superior to peritoneal dialysis.

[Ellenhorn and Barceloux: Medical Toxicology]

It has been suggested that there is a need for establishing a new biological exposure limit before a workshift that is clearly below 100 mmol ethoxy-acetic acids per mole creatinine in morning urine of people occupationally exposed to ethylene glycol ethers. This arises from the finding that an increase in urinary stones may be associated with such exposures.

Laitinen J., et al: *Occupational & Environmental Medicine* 1996; 53, 595-600

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]

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

- ▶ 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 FIREFIGHTING MEASURES

## Extinguishing media

- ▶ Alcohol stable foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

## Special hazards arising from the substrate or mixture

<b>Fire Incompatibility</b>	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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## Advice for firefighters

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> <li>▶ Use fire fighting procedures suitable for surrounding area.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ Combustible.</li> <li>▶ Slight fire hazard when exposed to heat or flame.</li> <li>▶ Heating may cause expansion or decomposition leading to violent rupture of containers.</li> <li>▶ On combustion, may emit toxic fumes of carbon monoxide (CO).</li> </ul> Combustion products include; carbon monoxide (CO) carbon dioxide (CO <sub>2</sub> ) nitrogen oxides (NO <sub>x</sub> ) other pyrolysis products typical of burning organic material May emit corrosive fumes.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

## Personal precautions, protective equipment and emergency procedures

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours/ aerosols/ or dusts and avoid contact with skin and eyes.</li> <li>▶ Control personal contact with the substance, by using protective equipment.</li> <li>▶ Contain and absorb spill with sand, earth, inert material or vermiculite.</li> </ul> In the event of a spill of a reactive diluent, the focus is on containing the spill to prevent contamination of soil and surface or ground water. If irritating vapors are present, an approved air-purifying respirator with organic vapor canister is recommended for cleaning up spills and leaks. For small spills, reactive diluents should be absorbed with sand. <ul style="list-style-type: none"> <li>▶ Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.</li> <li>▶ Check regularly for spills and leaks.</li> </ul>
<b>Major Spills</b>	Industrial spills or releases of reactive diluents are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. An approved air-purifying respirator with organic-vapor canister is recommended for emergency work. <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> </ul>

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

## SECTION 7 HANDLING AND STORAGE

## Precautions for safe handling

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Avoid contact with moisture.</li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ Store in a cool, dry, well-ventilated area.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> <li>▶ <b>DO NOT store near acids, or oxidising agents</b></li> <li>▶ No smoking, naked lights, heat or ignition sources.</li> </ul>

**Conditions for safe storage, including any incompatibilities**

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ <b>DO NOT use aluminium or galvanised containers</b></li> </ul> <p>For low viscosity materials</p> <ul style="list-style-type: none"> <li>▶ Drums and jericans must be of the non-removable head type.</li> <li>▶ Where a can is to be used as an inner package, the can must have a screwed enclosure.</li> </ul> <p>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):</p> <ul style="list-style-type: none"> <li>▶ Removable head packaging;</li> <li>▶ Cans with friction closures and</li> <li>▶ low pressure tubes and cartridges may be used.</li> </ul>
<b>Storage incompatibility</b>	<ul style="list-style-type: none"> <li>▶ Avoid contact with copper, aluminium and their alloys.</li> <li>▶ Avoid cross contamination between the two liquid parts of product (kit).</li> <li>▶ If two part products are mixed or allowed to mix in proportions other than manufacturer's recommendation, polymerisation with gelation and evolution of heat (exotherm) may occur.</li> <li>▶ This excess heat may generate toxic vapour</li> <li>▶ Avoid reaction with amines, mercaptans, strong acids and oxidising agents</li> </ul>

**SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION****Control parameters****OCCUPATIONAL EXPOSURE LIMITS (OEL)****INGREDIENT DATA**

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
New Zealand Workplace Exposure Standards (WES)	ethylene glycol	Ethylene glycol (vapour and mist)	Not Available	Not Available	127 mg/m <sup>3</sup> / 50 ppm	Not Available
New Zealand Workplace Exposure Standards (WES)	titanium dioxide	Titanium dioxide	10 mg/m <sup>3</sup>	Not Available	Not Available	The value for inhalable dust containing no asbestos and less than 1% free silica.
New Zealand Workplace Exposure Standards (WES)	silica crystalline - quartz	Silica-Crystalline, Quartz	0.2 Respirable dust mg/m <sup>3</sup>	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	ethylene glycol	Ethylene glycol (vapour and mist)	Not Available	Not Available	127 mg/m <sup>3</sup> / 50 ppm	Not Available
New Zealand Workplace Exposure Standards (WES)	silica crystalline - quartz	Silica-Crystalline, Quartz	0.2 Respirable dust mg/m <sup>3</sup>	Not Available	Not Available	Not Available

**EMERGENCY LIMITS**

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
bisphenol A/ diglycidyl ether resin, liquid	Epoxy resin (EPON 1001)	90 mg/m <sup>3</sup>	990 mg/m <sup>3</sup>	5900 mg/m <sup>3</sup>
bisphenol A/ diglycidyl ether resin, liquid	Epoxy resin (EPON 1007)	90 mg/m <sup>3</sup>	990 mg/m <sup>3</sup>	5900 mg/m <sup>3</sup>
bisphenol A/ diglycidyl ether resin, liquid	Epoxy resin (EPON 820)	41 mg/m <sup>3</sup>	450 mg/m <sup>3</sup>	2700 mg/m <sup>3</sup>
bisphenol A/ diglycidyl ether resin, liquid	Epoxy resin ERL-2795	32 mg/m <sup>3</sup>	350 mg/m <sup>3</sup>	2100 mg/m <sup>3</sup>
ethylene glycol	Ethylene glycol	10 ppm	40 ppm	60 ppm
titanium dioxide	Titanium oxide; (Titanium dioxide)	10 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
silica crystalline - quartz	Silica, crystalline-quartz; (Silicon dioxide)	0.025 mg/m <sup>3</sup>	0.025 mg/m <sup>3</sup>	0.025 mg/m <sup>3</sup>
N-aminoethylpiperazine	Aminoethylpiperazine, N-	0.45 mg/m <sup>3</sup>	4.9 mg/m <sup>3</sup>	420 mg/m <sup>3</sup>
4-nonylphenol, branched	Nonyl phenol, 4- (branched)	0.074 mg/m <sup>3</sup>	0.82 mg/m <sup>3</sup>	260 mg/m <sup>3</sup>
ethylene glycol	Ethylene glycol	10 ppm	40 ppm	60 ppm
benzyl alcohol	Benzyl alcohol	30 ppm	49 ppm	49 ppm
triethylenetetramine	Triethylenetetramine	3 ppm	5.7 ppm	83 ppm
silica crystalline - quartz	Silica, crystalline-quartz; (Silicon dioxide)	0.025 mg/m <sup>3</sup>	0.025 mg/m <sup>3</sup>	0.025 mg/m <sup>3</sup>

Ingredient	Original IDLH	Revised IDLH
bisphenol A/ diglycidyl ether resin, liquid	Not Available	Not Available
trimethylolethane triglycidyl ether	Not Available	Not Available
ethylene glycol	Not Available	Not Available
titanium dioxide	N.E. mg/m <sup>3</sup> / N.E. ppm	5,000 mg/m <sup>3</sup>
silica crystalline - quartz	N.E. mg/m <sup>3</sup> / N.E. ppm	50 mg/m <sup>3</sup>
Ingredients determined not to be hazardous	Not Available	Not Available
N-aminoethylpiperazine	Not Available	Not Available
4-nonylphenol, branched	Not Available	Not Available
ethylene glycol	Not Available	Not Available
benzyl alcohol	Not Available	Not Available
triethylenetetramine	Not Available	Not Available

silica crystalline - quartz	N.E. mg/m3 / N.E. ppm	50 mg/m3
Ingredients determined not to be hazardous	Not Available	Not Available

### Exposure controls

<b>Appropriate engineering controls</b>	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.
<b>Personal protection</b>	
<b>Eye and face protection</b>	<ul style="list-style-type: none"> <li>Chemical goggles.</li> <li>Full face shield may be required for supplementary but never for primary protection of eyes.</li> <li>Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.</li> </ul>
<b>Skin protection</b>	See Hand protection below
<b>Hands/feet protection</b>	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.</li> <li>When handling liquid-grade epoxy resins wear chemically protective gloves (e.g nitrile or nitrile-butadiene rubber), boots and aprons.</li> <li><b>DO NOT use cotton or leather (which absorb and concentrate the resin), polyvinyl chloride, rubber or polyethylene gloves (which absorb the resin).</b></li> <li><b>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.</b></li> </ul>
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	<ul style="list-style-type: none"> <li>Overalls.</li> <li>PVC Apron.</li> <li>PVC protective suit may be required if exposure severe.</li> <li>Eyewash unit.</li> </ul>
<b>Thermal hazards</b>	Not Available

### Recommended material(s)

#### 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:

Ardex RA 88

Material	CPI
##benzyl	alcohol
BUTYL	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
NITRILE+PVC	C
PE/EVAL/PE	C
PVA	C
PVC	C
TEFLON	C
VITON	C

\* 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.

### Respiratory protection

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

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	ABK-AUS P2	-	ABK-PAPR-AUS / Class 1 P2
up to 50 x ES	-	ABK-AUS / Class 1 P2	-
up to 100 x ES	-	ABK-2 P2	ABK-PAPR-2 P2 ^

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Appearance</b>	Part A: White paste with slight odour; does not mix with water.   Part B: Black paste with slight odour; does not mix with water.		
<b>Physical state</b>	Non Slump Paste	<b>Relative density (Water = 1)</b>	1.27-1.35
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	Not Available
<b>pH (as supplied)</b>	Not Available	<b>Decomposition temperature</b>	Not Available
<b>Melting point / freezing point (°C)</b>	Not Available	<b>Viscosity (cSt)</b>	Not Available
<b>Initial boiling point and boiling range (°C)</b>	Not Available	<b>Molecular weight (g/mol)</b>	Not Applicable
<b>Flash point (°C)</b>	93-149	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Available	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Applicable	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	Not Available	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Available
<b>Lower Explosive Limit (%)</b>	Not Available	<b>Volatile Component (%vol)</b>	Not Available
<b>Vapour pressure (kPa)</b>	Not Available	<b>Gas group</b>	Not Available
<b>Solubility in water (g/L)</b>	Immiscible	<b>pH as a solution (1%)</b>	Not Available
<b>Vapour density (Air = 1)</b>	Not Available	<b>VOC g/L</b>	Not Available

## SECTION 10 STABILITY AND REACTIVITY

<b>Reactivity</b>	See section 7
<b>Chemical stability</b>	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> </ul>
<b>Possibility of hazardous reactions</b>	See section 7
<b>Conditions to avoid</b>	See section 7
<b>Incompatible materials</b>	See section 7
<b>Hazardous decomposition products</b>	See section 5

## SECTION 11 TOXICOLOGICAL INFORMATION

### Information on toxicological effects

<b>Inhaled</b>	<p>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.</p> <p>Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.</p> <p>Inhalation of epoxy resin amine hardeners (including polyamines and amine adducts) may produce bronchospasm and coughing episodes lasting several days after cessation of the exposure. Even faint traces of these vapours may trigger an intense reaction in individuals showing "amine asthma".</p> <p>In animal testing, exposure to aerosols of some reactive diluents (notably o-cresol glycidyl ether, CAS RN: 2210-79-9) has been reported to affect the adrenal gland, central nervous system, kidney, liver, ovaries, spleen, testes, thymus, and respiratory tract.</p> <p>Inhalation of amine vapours may cause irritation of the mucous membrane of the nose and throat, and lung irritation with respiratory distress and cough.</p> <p>Swelling and inflammation of the respiratory tract is seen in serious cases; with headache, nausea, faintness and anxiety.</p> <p>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.</p> <p>Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.</p>
<b>Ingestion</b>	<p>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.</p> <p>The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.</p> <p>Reactive diluents exhibit a range of ingestion hazards. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing larger amounts may cause injury.</p> <p>Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and inco-ordination, giddiness, confusion, delirium and coma.</p> <p>Male rats exposed to a single oral dose of bisphenol A diglycidyl ether (BADGE) at 750, 1000, and 2000 mg/kg/day showed a significantly increase in the number of immature and maturing sperm on the testis. There were no significant differences with respect to sperm head count, sperm motility, and sperm abnormality in the BADGE treatment groups</p> <p>Ingestion of amine epoxy-curing agents (hardeners) may cause severe abdominal pain, nausea, vomiting or diarrhoea. The vomitus may contain blood and mucous.</p> <p>Bisphenol A diglycidyl ethers (BADGEs) produce sensitisation dermatitis characterised by a papular, vesicular eczema with considerable itching of the back of the hand, the forearm and face and neck. This lesion may persist for 10-14 days after withdrawal from exposure and recur immediately on re-exposure. This dermatitis may persist for longer periods following each exposure but is unlikely to become more intense. Lesions may develop a brownish colour and scaling occurs frequently.</p> <p>Amines without benzene rings when swallowed are absorbed throughout the gut. Corrosive action may cause damage throughout the gastrointestinal tract.</p> <p>for ethylene glycol: Ingestion symptoms include respiratory failure, central nervous depression, cardiovascular collapse, pulmonary oedema, acute kidney failure, and even brain damage. Ingestion of 100 ml has caused death. (ChemInfo)</p> <p>Toxicity of ethylene glycol to human (KB) cell cultures has been reported as less than that of ethanol. (NIOSH/ITC)</p> <p>Ethylene glycol produces a three-stage response with the severity of each stage dependent on the amount of ingestion.</p>

<b>Skin Contact</b>	<p>Skin contact with the material may be harmful; systemic effects may result following absorption. The material can produce chemical burns following direct contact with the skin.</p> <p>Bisphenol A diglycidyl ether (BADGE) may produce contact dermatitis characterised by erythema and oedema, with weeping followed by crusting and scaling. A liquid resin with a molecular weight of 350 produced severe skin irritation in rabbits when applied daily for 4 hours over 20 days. Following the initial contact there may be a discrete erythematous lesion, confined to the point of contact, which may persist for 48 hours to 10 days; the erythema may give way to a papular, vesicular rash with scaling.</p> <p>In animals uncured resin produces moderate ante-mortem depression, loss of body weight and diarrhoea.</p> <p>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.</p> <p>Volatile amine vapours produce irritation and inflammation of the skin. Direct contact can cause burns.</p> <p>Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.</p> <p>Skin contact with reactive diluents may cause slight to moderate irritation with local redness. Repeated or prolonged skin contact may cause burns.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>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.</p> <p>Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.</p>
<b>Eye</b>	<p>The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.</p> <p>If applied to the eyes, this material causes severe eye damage.</p> <p>Eye contact with reactive diluents may cause slight to severe irritation with the possibility of chemical burns or moderate to severe corneal injury.</p> <p>Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely.</p>
<b>Chronic</b>	<p>Studies show that inhaling this substance for over a long period (e.g. in an occupational setting) may increase the risk of cancer.</p> <p>Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.</p> <p>Based on experience with animal studies, exposure to the material may result in toxic effects to the development of the foetus, at levels which do not cause significant toxic effects to the mother.</p> <p>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.</p> <p>Bisphenol A diglycidyl ethers (BADGEs) produce sensitisation dermatitis characterised by a papular, vesicular eczema with considerable itching of the back of the hand, the forearm and face and neck. This lesion may persist for 10-14 days after withdrawal from exposure and recur immediately on re-exposure. This dermatitis may persist for longer periods following each exposure but is unlikely to become more intense. Lesions may develop a brownish colour and scaling occurs frequently.</p> <p>For some reactive diluents, prolonged or repeated skin contact may result in absorption of potentially harmful amounts or allergic skin reactions</p> <p>Exposure to some reactive diluents (notably neopentylglycol diglycidyl ether, CAS RN:17557-23-2) has caused cancer in some animal testing.</p> <p>Secondary amines may react with nitrites to form potentially carcinogenic N-nitrosamines.</p> <p>Crystalline silicas activate the inflammatory response of white blood cells after they injure the lung epithelium. Chronic exposure to crystalline silicas reduces lung capacity and predisposes to chest infections.</p> <p>Glycidyl ethers can cause genetic damage and cancer.</p> <p>There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.</p> <p>Exposure to ethylene glycol over a period of several weeks may cause throat irritation, mild headache and low backache. These may worsen with increasing concentration of the substance. They may progress to a burning sensation in the throat, a burning cough, and drowsiness.</p> <p>Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).</p> <p>Ample evidence exists, from results in experimentation, that developmental disorders are directly caused by human exposure to the material.</p>

<b>Ardex RA 88</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Not Available	Not Available
<b>bisphenol A/ diglycidyl ether resin, liquid</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	dermal (rat) LD50: >800 mg/kg <sup>[1]</sup>	Eye (rabbit): 100mg - Mild
	Oral (rat) LD50: 13447 mg/kg <sup>[1]</sup>	
<b>trimethylolethane triglycidyl ether</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Not Available	Not Available
<b>ethylene glycol</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: 9530 mg/kgD <sup>[2]</sup>	Eye (rabbit): 100 mg/1h - mild
	Inhalation (rat) LC50: 50.1 mg/L/8 hr <sup>[2]</sup>	Eye (rabbit): 12 mg/m <sup>3</sup> /3D
	Oral (rat) LD50: 4700 mg/kg <sup>[2]</sup>	Eye (rabbit): 1440mg/6h-moderate
		Eye (rabbit): 500 mg/24h - mild
		Skin (rabbit): 555 mg(open)-mild
<b>titanium dioxide</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Inhalation (rat) LC50: >2.28 mg/4 h <sup>[1]</sup>	Skin (human): 0.3 mg /3D (int)-mild *
	Inhalation (rat) LC50: >3.56 mg/4 h <sup>[1]</sup>	
	Inhalation (rat) LC50: >6.82 mg/4 h <sup>[1]</sup>	
	Inhalation (rat) LC50: 3.43 mg/4 h <sup>[1]</sup>	
	Inhalation (rat) LC50: 5.09 mg/4 h <sup>[1]</sup>	
	Oral (rat) LD50: >2000 mg/kg <sup>[1]</sup>	
<b>silica crystalline - quartz</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Not Available	Nil reported

N-aminoethylpiperazine	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: 866 mg/kg <sup>[1]</sup>	Eye (rabbit): 20 mg/24h - mod
	Oral (rat) LD50: >1000 mg/kg <sup>[1]</sup>	Skin (rabbit): 0.1 mg/24h - mild Skin (rabbit): 5 mg/24h - SEVERE
4-nonylphenol, branched	<b>TOXICITY</b>	<b>IRRITATION</b>
	Oral (rat) LD50: 1246 mg/kg <sup>[1]</sup>	Eye (rabbit): 100 mg - SEVERE Skin (rabbit): 500 mg/24h-SEVERE
ethylene glycol	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: 9530 mg/kgD <sup>[2]</sup>	Eye (rabbit): 100 mg/1h - mild
	Inhalation (rat) LC50: 50.1 mg/L/8 hr <sup>[2]</sup>	Eye (rabbit): 12 mg/m <sup>3</sup> /3D
	Oral (rat) LD50: 4700 mg/kgd <sup>[2]</sup>	Eye (rabbit): 1440mg/6h-moderate Eye (rabbit): 500 mg/24h - mild Skin (rabbit): 555 mg(open)-mild
benzyl alcohol	<b>TOXICITY</b>	<b>IRRITATION</b>
	dermal (rat) LD50: 1000000 ppm/90M <sup>[2]</sup>	Eye (rabbit): 0.75 mg open SEVERE
	Inhalation (rat) LC50: >4.178 mg/L/4h <sup>[2]</sup>	Skin (man): 16 mg/48h-mild Skin (rabbit):10 mg/24h open-mild
triethylenetetramine	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: 805 mg/kgE <sup>[2]</sup>	Eye (rabbit):20 mg/24 h - moderate
	Oral (rat) LD50: 2500 mg/kgE <sup>[2]</sup>	Eye (rabbit): 49 mg - SEVERE Skin (rabbit): 490 mg open SEVERE Skin (rabbit): 5 mg/24 SEVERE
silica crystalline - quartz	<b>TOXICITY</b>	<b>IRRITATION</b>
	Not Available	Nil reported

**Legend:** 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. \* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

<b>BISPHENOL A/ DIGLYCIDYL ETHER RESIN, LIQUID</b>	<p>The following information refers to contact allergens as a group and may not be specific to this product. 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.</p> <p>The chemical structure of hydroxylated diphenylalkanes or bisphenols consists of two phenolic rings joined together through a bridging carbon. This class of endocrine disruptors that mimic oestrogens is widely used in industry, particularly in plastics</p> <p>Bisphenol A (BPA) and some related compounds exhibit oestrogenic activity in human breast cancer cell line MCF-7, but there were remarkable differences in activity. Several derivatives of BPA exhibited significant thyroid hormonal activity towards rat pituitary cell line GH3, which releases growth hormone in a thyroid hormone-dependent manner. However, BPA and several other derivatives did not show such activity.</p> <p>The substance is classified by IARC as Group 3: <b>NOT</b> classifiable as to its carcinogenicity to humans.</p> <p>Evidence of carcinogenicity may be inadequate or limited in animal testing.</p> <p>In mice, dermal application of bisphenol A diglycidyl ether (BADGE) (1, 10, or 100 mg/kg) for 13 weeks produced mild to moderate chronic active dermatitis. At the high dose, spongiosis and epidermal micro abscess formation were observed. In rats, dermal application of BADGE (10, 100, or 1000 mg/kg) for 13 weeks resulted in a decrease in body weight at the high dose. The no-observable effect level (NOEL) for dermal exposure was 100 mg/kg for both sexes. Foetotoxicity has been observed in animal studies Oral (rabbit, female) NOEL 180 mg/kg (teratogenicity; NOEL (maternal 60 mg/kg</p>
<b>TRIMETHYLOLETHANE TRIGLYCIDYL ETHER</b>	<p>The following information refers to contact allergens as a group and may not be specific to this product. 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.</p> <p>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.</p> <p>No significant acute toxicological data identified in literature search.</p>
<b>TITANIUM DIOXIDE</b>	<p>The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. 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.</p> <p>Exposure to titanium dioxide is via inhalation, swallowing or skin contact. When inhaled, it may deposit in lung tissue and lymph nodes causing dysfunction of the lungs and immune system. Absorption by the stomach and intestines depends on the size of the particle. It penetrated only the outermost layer of the skin, suggesting that healthy skin may be an effective barrier.</p> <p><b>WARNING:</b> This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans. * IUCLID</p>

<b>N-AMINOETHYLPIPERAZINE</b>	<p>The following information refers to contact allergens as a group and may not be specific to this product. 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.</p> <p>Ethyleneamines are very reactive and can cause chemical burns, skin rashes and asthma-like symptoms. It is readily absorbed through the skin and may cause eye blindness and irreparable damage. As such, they require careful handling. In general, the low-molecular weight polyamines have been positive in the Ames assay (for genetic damage); however, this is probably due to their ability to chelate copper.</p> <p>The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. 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.</p> <p>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.</p> <p>for piperazine: Exposure to piperazine and its salts has clearly been demonstrated to cause asthma in occupational settings. No NOAEL can be estimated for respiratory sensitisation (asthma).</p> <p>Although the LD50 levels indicate a relatively low level of oral acute toxicity (LD50 1-5 g/kg bw), signs of neurotoxicity may appear in humans after exposure to lower doses. Based on exposure levels of up to 3.4 mg/kg/day piperazine base and a LOAEL of 110 mg/kg, there is no concern for acute toxicity In pigs, piperazine is readily absorbed from the gastrointestinal tract, and the major part of the resorbed compound is excreted as unchanged piperazine during the first 48 hours.</p>
<b>4-NONYLPHENOL, BRANCHED</b>	<p>The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>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.</p> <p>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.</p> <p>Gastrointestinal changes, liver changes, effects on newborn recorded.</p>
<b>BENZYL ALCOHOL</b>	<p>The following information refers to contact allergens as a group and may not be specific to this product. 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.</p> <p>Unlike benzylic alcohols, the beta-hydroxyl group of the members of benzyl alkyl alcohols contributes to break down reactions but do not undergo phase II metabolic activation. Though structurally similar to cancer causing ethyl benzene, phenethyl alcohol is only of negligible concern due to limited similarity in their pattern of activity.</p> <p>For benzoates: Benzyl alcohol, benzoic acid and its sodium and potassium salt have a common metabolic and excretion pathway. All but benzyl alcohol are considered to be unharmed and of low acute toxicity. They may cause slight irritation by oral, dermal or inhalation exposure except sodium benzoate which doesn't irritate the skin. Studies showed increased mortality, reduced weight gain, liver and kidney effects at higher doses, also, lesions of the brains, thymus and skeletal muscles may occur with benzyl alcohol.</p> <p>Adverse reactions to fragrances in perfumes and in fragranced cosmetic products include allergic contact dermatitis, irritant contact dermatitis, photosensitivity, immediate contact reactions (contact urticaria), and pigmented contact dermatitis. Airborne and conjugal contact dermatitis occur. Intolerance to perfumes, by inhalation, may occur if the perfume contains a sensitising principal. Symptoms may vary from general illness, coughing, phlegm, wheezing, chest-tightness, headache, exertional dyspnoea, acute respiratory illness, hayfever, and other respiratory diseases (including asthma).</p> <p>Fragrance allergens act as haptens, i.e. low molecular weight chemicals that are immunogenic only when attached to a carrier protein. However, not all sensitising fragrance chemicals are directly reactive, but require previous activation. A prohaptens is a chemical that itself is non- or low-sensitising, but that is transformed into a hapten outside the skin by simple chemical transformation (air oxidation, photoactivation) and without the requirement of specific enzymatic systems. A prohaptens is a chemical that itself is non- or low-sensitising but that is transformed into a hapten in the skin (bioactivation) usually via enzyme catalysis.</p> <p>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.</p>
<b>TRIETHYLENETETRAMINE</b>	<p>The following information refers to contact allergens as a group and may not be specific to this product. 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.</p> <p>Ethyleneamines are very reactive and can cause chemical burns, skin rashes and asthma-like symptoms. It is readily absorbed through the skin and may cause eye blindness and irreparable damage. As such, they require careful handling. In general, the low-molecular weight polyamines have been positive in the Ames assay (for genetic damage); however, this is probably due to their ability to chelate copper.</p> <p>The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>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.</p> <p>For alkyl polyamines: The alkyl polyamines cluster consists of two terminal primary and at least one secondary amine groups and are derivatives of low molecular weight ethylenediamine, propylenediamine or hexanediamine. Toxicity depends on route of exposure. Cluster members have been shown to cause skin irritation or sensitisation, eye irritation and genetic defects, but have not been shown to cause cancer.</p> <p>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.</p> <p>Triethylenetetramine is a severe irritant to skin and eyes and may induce skin sensitisation. Acute exposure to saturated vapour via inhalation was tolerated without impairment but exposure to aerosol may lead to reversible irritations of the mucous membranes in the airways. Studies done on experimental animals showed that it does not cause cancer or foetal developmental defects.</p> <p>Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).</p>

<b>ETHYLENE GLYCOL</b>	For ethylene glycol: Ethylene glycol is quickly and extensively absorbed through the gastrointestinal tract. Limited information suggests that it is also absorbed through the respiratory tract; dermal absorption is apparently slow. Following absorption, ethylene glycol is distributed throughout the body according to total body water. In most mammalian species, including humans, ethylene glycol is initially metabolised by alcohol.
<b>ETHYLENE GLYCOL</b>	[Estimated Lethal Dose (human) 100 ml; RTECS quoted by Orica]
<b>ETHYLENE GLYCOL</b>	Substance is reproductive effector in rats (birth defects).
<b>ETHYLENE GLYCOL</b>	Mutagenic to rat cells.
<b>SILICA CRYSTALLINE - QUARTZ</b>	<b>WARNING:</b> For inhalation exposure <u>ONLY</u> : This substance has been classified by the IARC as Group 1: <b>CARCINOGENIC TO HUMANS</b>  The International Agency for Research on Cancer (IARC) has classified occupational exposures to <b>respirable</b> (<5 µm) crystalline silica as being carcinogenic to humans. This classification is based on what IARC considered sufficient evidence from epidemiological studies of humans for the carcinogenicity of inhaled silica in the forms of quartz and cristobalite. Crystalline silica is also known to cause silicosis, a non-cancerous lung disease. Intermittent exposure produces; focal fibrosis, (pneumoconiosis), cough, dyspnoea, liver tumours.

<b>Acute Toxicity</b>	✓	<b>Carcinogenicity</b>	✓
<b>Skin Irritation/Corrosion</b>	✓	<b>Reproductivity</b>	✓
<b>Serious Eye Damage/Irritation</b>	✓	<b>STOT - Single Exposure</b>	⊖
<b>Respiratory or Skin sensitisation</b>	✓	<b>STOT - Repeated Exposure</b>	⊖
<b>Mutagenicity</b>	⊖	<b>Aspiration Hazard</b>	⊖

**Legend:** ✗ – Data available but does not fill the criteria for classification  
✓ – Data required to make classification available  
⊖ – Data Not Available to make classification

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
bisphenol A/ diglycidyl ether resin, liquid	LC50	96	Fish	1.2mg/L	2
bisphenol A/ diglycidyl ether resin, liquid	EC50	48	Crustacea	1.1mg/L	2
bisphenol A/ diglycidyl ether resin, liquid	EC50	48	Crustacea	1.7mg/L	2
bisphenol A/ diglycidyl ether resin, liquid	NOEC	504	Crustacea	0.3mg/L	2
bisphenol A/ diglycidyl ether resin, liquid	EC50	72	Algae or other aquatic plants	9.4mg/L	2
ethylene glycol	EC50	Not Applicable	Crustacea	=10mg/L	1
ethylene glycol	LC50	96	Fish	2284.940mg/L	3
ethylene glycol	EC50	48	Crustacea	>100mg/L	2
ethylene glycol	EC50	96	Algae or other aquatic plants	3536mg/L	2
ethylene glycol	NOEC	72	Algae or other aquatic plants	>100mg/L	2
titanium dioxide	LC50	96	Fish	9.214mg/L	3
titanium dioxide	EC50	72	Algae or other aquatic plants	5.83mg/L	4
titanium dioxide	NOEC	336	Fish	0.089mg/L	4
titanium dioxide	EC50	48	Crustacea	1.23mg/L	2
titanium dioxide	EC50	504	Crustacea	0.46mg/L	2
N-aminoethylpiperazine	EC50	48	Crustacea	=32mg/L	1
N-aminoethylpiperazine	EC50	96	Algae or other aquatic plants	175.657mg/L	3
N-aminoethylpiperazine	LC50	96	Fish	>100mg/L	2
N-aminoethylpiperazine	EC50	48	Crustacea	32mg/L	2
N-aminoethylpiperazine	NOEC	48	Crustacea	10mg/L	2
4-nonylphenol, branched	BCF	24	Fish	0.193mg/L	4
4-nonylphenol, branched	EC10	96	Algae or other aquatic plants	0.012mg/L	4
4-nonylphenol, branched	LC50	96	Fish	0.017mg/L	4
4-nonylphenol, branched	EC50	48	Crustacea	0.0844mg/L	2
4-nonylphenol, branched	NOEC	168	Crustacea	0.001mg/L	2
4-nonylphenol, branched	EC50	96	Algae or other aquatic plants	0.027mg/L	2
ethylene glycol	EC50	Not Applicable	Crustacea	=10mg/L	1
ethylene glycol	LC50	96	Fish	2284.940mg/L	3
ethylene glycol	EC50	48	Crustacea	>100mg/L	2
ethylene glycol	EC50	96	Algae or other aquatic plants	3536mg/L	2
ethylene glycol	NOEC	72	Algae or other aquatic plants	>100mg/L	2

benzyl alcohol	EC03	168	Algae or other aquatic plants	=16mg/L	4
benzyl alcohol	LC50	96	Fish	10mg/L	4
benzyl alcohol	NOEC	336	Fish	5.1mg/L	2
benzyl alcohol	EC50	48	Crustacea	230mg/L	2
benzyl alcohol	EC50	72	Algae or other aquatic plants	500mg/L	2
triethylenetetramine	EC50	48	Crustacea	31.1mg/L	1
triethylenetetramine	EC10	72	Algae or other aquatic plants	0.67mg/L	1
triethylenetetramine	EC50	72	Algae or other aquatic plants	2.5mg/L	1
triethylenetetramine	NOEC	72	Algae or other aquatic plants	<2.5mg/L	1
triethylenetetramine	LC50	96	Fish	180mg/L	1

**Legend:**

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Prevent, by any means available, spillage from entering drains or water courses.

**DO NOT discharge into sewer or waterways.**

**Persistence and degradability**

Ingredient	Persistence: Water/Soil	Persistence: Air
bisphenol A/ diglycidyl ether resin, liquid	HIGH	HIGH
ethylene glycol	LOW (Half-life = 24 days)	LOW (Half-life = 3.46 days)
titanium dioxide	HIGH	HIGH
N-aminoethylpiperazine	HIGH	HIGH
4-nonylphenol, branched	HIGH	HIGH
ethylene glycol	LOW (Half-life = 24 days)	LOW (Half-life = 3.46 days)
benzyl alcohol	LOW	LOW
triethylenetetramine	LOW	LOW

**Bioaccumulative potential**

Ingredient	Bioaccumulation
bisphenol A/ diglycidyl ether resin, liquid	LOW (LogKOW = 2.6835)
ethylene glycol	LOW (BCF = 200)
titanium dioxide	LOW (BCF = 10)
N-aminoethylpiperazine	LOW (LogKOW = -1.5677)
4-nonylphenol, branched	LOW (BCF = 271)
ethylene glycol	LOW (BCF = 200)
benzyl alcohol	LOW (LogKOW = 1.1)
triethylenetetramine	LOW (LogKOW = -2.6464)

**Mobility in soil**

Ingredient	Mobility
bisphenol A/ diglycidyl ether resin, liquid	LOW (KOC = 51.43)
ethylene glycol	HIGH (KOC = 1)
titanium dioxide	LOW (KOC = 23.74)
N-aminoethylpiperazine	LOW (KOC = 171.7)
4-nonylphenol, branched	LOW (KOC = 56010)
ethylene glycol	HIGH (KOC = 1)
benzyl alcohol	LOW (KOC = 15.66)
triethylenetetramine	LOW (KOC = 309.9)

**SECTION 13 DISPOSAL CONSIDERATIONS****Waste treatment methods**

<b>Product / Packaging disposal</b>	<ul style="list-style-type: none"> <li>▶ Containers may still present a chemical hazard/ danger when empty.</li> <li>▶ Return to supplier for reuse/ recycling if possible.</li> </ul> <p>Otherwise:</p> <ul style="list-style-type: none"> <li>▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.</li> <li>▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product.</li> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> </ul>
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- ▶ 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.
- ▶ 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: Mixing or slurring in water; Neutralisation followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)
- ▶ Decontaminate empty containers.

Ensure that the disposal of material is carried out in accordance with Hazardous Substances (Disposal) Regulations 2001.

## SECTION 14 TRANSPORT INFORMATION

### Labels Required

	
Marine Pollutant	
HAZCHEM	2X

### Land transport (UN)

UN number	3259
Packing group	III
UN proper shipping name	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S. (contains N-aminoethylpiperazine and 4-nonylphenol, branched)
Environmental hazard	Not Applicable
Transport hazard class(es)	Class : 8 Subrisk : Not Applicable
Special precautions for user	Special provisions : 223; 274 Limited quantity : 5 kg

### Air transport (ICAO-IATA / DGR)

UN number	3259
Packing group	III
UN proper shipping name	Amines, solid, corrosive, n.o.s. *; Polyamines, solid, corrosive, n.o.s. * (contains N-aminoethylpiperazine and 4-nonylphenol, branched)
Environmental hazard	Not Applicable
Transport hazard class(es)	ICAO/IATA Class : 8 ICAO / IATA Subrisk : Not Applicable ERG Code : 8L
Special precautions for user	Special provisions : A3A803 Cargo Only Packing Instructions : 864 Cargo Only Maximum Qty / Pack : 100 kg Passenger and Cargo Packing Instructions : 860 Passenger and Cargo Maximum Qty / Pack : 25 kg Passenger and Cargo Limited Quantity Packing Instructions : Y845 Passenger and Cargo Limited Maximum Qty / Pack : 5 kg

### Sea transport (IMDG-Code / GGVSee)

UN number	3259
Packing group	III
UN proper shipping name	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S. (contains N-aminoethylpiperazine and 4-nonylphenol, branched)
Environmental hazard	Marine Pollutant
Transport hazard class(es)	IMDG Class : 8 IMDG Subrisk : Not Applicable

<b>Special precautions for user</b>	EMS Number	F-A, S-B
	Special provisions	223 274
	Limited Quantities	5 kg

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**SECTION 15 REGULATORY INFORMATION****Safety, health and environmental regulations / legislation specific for the substance or mixture**

This substance is to be managed using the conditions specified in an applicable Group Standard

HSR Number	Group Standard
HSR002596	Laboratory Chemicals and Reagent Kits Group Standard 2006
HSR002661	Surface Coatings and Colourants (Corrosive, Combustible, Toxic [6.7]) Group Standard 2006
HSR002494	Additives, Process Chemicals and Raw Materials (Corrosive, Combustible, Toxic [6.7]) Group Standard 2006
HSR100425	Pharmaceutical Active Ingredients Group Standard 2010
HSR100757	Veterinary Medicine (Limited Pack Size, Finished Dose) Standard 2012

**BISPHENOL A/ DIGLYCIDYL ETHER RESIN, LIQUID(25068-38-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Inventory of Chemicals (NZIoC)

**TRIMETHYLOLETHANE TRIGLYCIDYL ETHER(68460-21-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Not Applicable

**ETHYLENE GLYCOL(107-21-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Workplace Exposure Standards (WES)

New Zealand Inventory of Chemicals (NZIoC)

**TITANIUM DIOXIDE(13463-67-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

New Zealand Workplace Exposure Standards (WES)

New Zealand Inventory of Chemicals (NZIoC)

**SILICA CRYSTALLINE - QUARTZ(14808-60-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

New Zealand Inventory of Chemicals (NZIoC)

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Workplace Exposure Standards (WES)

**N-AMINOETHYLPIPERAZINE(140-31-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Inventory of Chemicals (NZIoC)

**4-NONYLPHENOL, BRANCHED(84852-15-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Inventory of Chemicals (NZIoC)

**ETHYLENE GLYCOL(107-21-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Workplace Exposure Standards (WES)

New Zealand Inventory of Chemicals (NZIoC)

**BENZYL ALCOHOL(100-51-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Inventory of Chemicals (NZIoC)

**TRIETHYLENETETRAMINE(112-24-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Inventory of Chemicals (NZIoC)

**SILICA CRYSTALLINE - QUARTZ(14808-60-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

New Zealand Inventory of Chemicals (NZIoC)

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Workplace Exposure Standards (WES)

**Location Test Certificate**

Subject to Regulation 55 of the Hazardous Substances (Classes 1 to 5 Controls) Regulations, a location test certificate is required when quantity greater than or equal to those indicated below are present.

Hazard Class	Quantity beyond which controls apply for closed containers	Quantity beyond which controls apply when use occurring in open containers
Not Applicable	Not Applicable	Not Applicable

**Approved Handler**

Subject to Regulation 56 of the Hazardous Substances (Classes 1 to 5 Controls) Regulations and Regulation 9 of the Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations, the substance must be under the personal control of an Approved Handler when present in a quantity greater than or equal to those indicated below.

Class of substance	Quantities
6.7A	10 kg or more, if solid 10 L or more, if liquid

Refer Group Standards for further information

**Tracking Requirements**

Not Applicable

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (benzyl alcohol; 4-nonylphenol, branched; N-aminoethylpiperazine; bisphenol A/ diglycidyl ether resin, liquid; silica crystalline - quartz; ethylene glycol; triethylenetetramine; trimethylolethane triglycidyl ether)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (trimethylolethane triglycidyl ether)
Japan - ENCS	N (bisphenol A/ diglycidyl ether resin, liquid; silica crystalline - quartz; trimethylolethane triglycidyl ether)
Korea - KECI	N (trimethylolethane triglycidyl ether)
New Zealand - NZIoC	N (trimethylolethane triglycidyl ether)
Philippines - PICCS	N (trimethylolethane triglycidyl ether)
USA - TSCA	Y
<b>Legend:</b>	Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

**SECTION 16 OTHER INFORMATION****Other information****Ingredients with multiple cas numbers**

Name	CAS No
bisphenol A/ diglycidyl ether resin, liquid	25068-38-6, 25085-99-8
titanium dioxide	100292-32-8, 101239-53-6, 116788-85-3, 12000-59-8, 12188-41-9, 12701-76-7, 12767-65-6, 12789-63-8, 1309-63-3, 1317-70-0, 1317-80-2, 1344-29-2, 13463-67-7, 185323-71-1, 185828-91-5, 188357-76-8, 188357-79-1, 195740-11-5, 221548-98-7, 224963-00-2, 246178-32-5, 252962-41-7, 37230-92-5, 37230-94-7, 37230-95-8, 37230-96-9, 39320-58-6, 39360-64-0, 39379-02-7, 416845-43-7, 494848-07-6, 494848-23-6, 494851-77-3, 494851-98-8, 55068-84-3, 55068-85-4, 552316-51-5, 62338-64-1, 767341-00-4, 97929-50-5, 98084-96-9
silica crystalline - quartz	122304-48-7, 122304-49-8, 12425-26-2, 1317-79-9, 14808-60-7, 70594-95-5, 87347-84-0
silica crystalline - quartz	122304-48-7, 122304-49-8, 12425-26-2, 1317-79-9, 14808-60-7, 70594-95-5, 87347-84-0

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](http://www.chemwatch.net)

The 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.

**Definitions and abbreviations**

PC – TWA: Permissible Concentration-Time Weighted Average  
 PC – STEL: Permissible Concentration-Short Term Exposure Limit  
 IARC: International Agency for Research on Cancer  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 STEL: Short Term Exposure Limit  
 TEEL: Temporary Emergency Exposure Limit,  
 IDLH: Immediately Dangerous to Life or Health Concentrations  
 OSF: Odour Safety Factor  
 NOAEL :No Observed Adverse Effect Level  
 LOAEL: Lowest Observed Adverse Effect Level  
 TLV: Threshold Limit Value  
 LOD: Limit Of Detection  
 OTV: Odour Threshold Value  
 BCF: BioConcentration Factors  
 BEI: Biological Exposure Index

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