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

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>TYPE N BLUE SOLVENT CEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>Not Available</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>ADHESIVES containing flammable liquid</td>
</tr>
<tr>
<td>Other means of</td>
<td>Not Available</td>
</tr>
<tr>
<td>identification</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Relevant identified uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation. Use according to manufacturer's directions. Type N Solvent Cement for non-pressure joints in PVC-U Pipes and Fittings.</td>
</tr>
</tbody>
</table>

Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>RLA Polymers Pty Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>215 Colchester Road Kilsyth VIC 3137 Australia</td>
</tr>
<tr>
<td>Telephone</td>
<td>+61 3 9728 1644</td>
</tr>
<tr>
<td>Fax</td>
<td>+61 3 9728 6009</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.rlagroup.com.au">www.rlagroup.com.au</a></td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:sales@rlagroup.com.au">sales@rlagroup.com.au</a></td>
</tr>
</tbody>
</table>

Emergency telephone number

<table>
<thead>
<tr>
<th>Association / Organisation</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency telephone numbers</td>
<td>+61 3 9728 1644 (RLA Group Technical Manager) business hours</td>
</tr>
<tr>
<td>Other emergency telephone numbers</td>
<td>132766 (Security Monitoring Service)</td>
</tr>
</tbody>
</table>

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Poisons Schedule</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification [1]</td>
<td>Flammable Liquid Category 2, Eye Irritation Category 2A, Reproductive Toxicity Category 2, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation), Specific target organ toxicity - single exposure Category 3 (narcotic effects), Aspiration Hazard Category 1</td>
</tr>
</tbody>
</table>


Label elements

<table>
<thead>
<tr>
<th>GHS label elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Label Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIGNAL WORD</th>
<th>DANGER</th>
</tr>
</thead>
</table>

Hazard statement(s)

| H225 | Highly flammable liquid and vapour. |
| H319 | Causes serious eye irritation.     |
| H361 | Suspected of damaging fertility or the unborn child. |
| H335 | May cause respiratory irritation.   |
| H336 | May cause drowsiness or dizziness.  |

Continued...
SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances
See section below for composition of Mixtures

Mixtures

<table>
<thead>
<tr>
<th>CAS No</th>
<th>% [weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>78-93-3</td>
<td>&gt;60</td>
<td>methyl ethyl ketone</td>
</tr>
<tr>
<td>108-94-1</td>
<td>10-30</td>
<td>cyclohexanone</td>
</tr>
<tr>
<td>109-99-9</td>
<td>&lt;5</td>
<td>tetrahydrofuran</td>
</tr>
<tr>
<td></td>
<td>balance</td>
<td>Ingredients determined not to be hazardous</td>
</tr>
</tbody>
</table>

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact
If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Seek medical attention without delay; if pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Inhalation
- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

Indication of any immediate medical attention and special treatment needed

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

Treat symptomatically.

for simple ketones:

BASIC TREATMENT

Continued...
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.
> Monitor and treat, where necessary, for pulmonary oedema.
> Monitor and treat, where necessary, for shock.
> **DO NOT use emetics.** Where ingestion is suspected rinse mouth and give up to 200 ml water (5mL/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
> Give activated charcoal.

**ADVANCED TREATMENT**

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Consider intubation at first sign of upper airway obstruction resulting from oedema.
- 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 with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- 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 (ABGs), chest radiographs and electrocardiograph.
- Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- Consult a toxicologist as necessary.

**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**

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

**Advice for firefighters**

<table>
<thead>
<tr>
<th>Fire Fighting</th>
<th>Alert Fire Brigade and tell them location and nature of hazard.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid and vapour are highly flammable.</td>
<td>Prevent, by any means available, spillage from entering drains or water course.</td>
</tr>
<tr>
<td>Severe fire hazard when exposed to heat, flame and/or oxidisers.</td>
<td></td>
</tr>
<tr>
<td>Vapour may travel a considerable distance to source of ignition.</td>
<td></td>
</tr>
<tr>
<td>Heating may cause expansion or decomposition leading to violent rupture of containers.</td>
<td></td>
</tr>
</tbody>
</table>

**Fire/Explosion Hazard**

- Combustion products include: carbon dioxide (CO2) other pyrolysis products typical of burning organic material.
- Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions. **WARNING:** Long standing in contact with air and light may result in the formation of potentially explosive peroxides.

**HAZCHEM**

- YZE

**SECTION 6 ACCIDENTAL RELEASE MEASURES**

**Personal precautions, protective equipment and emergency procedures**

See section 8

**Environmental precautions**

See section 12

**Methods and material for containment and cleaning up**

<table>
<thead>
<tr>
<th>Minor Spills</th>
<th>Remove all ignition sources.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean up all spills immediately.</td>
<td>Avoid breathing vapours and contact with skin and eyes.</td>
</tr>
<tr>
<td>Avoid breathing vapours and contact with skin and eyes.</td>
<td>Control personal contact with the substance by using protective equipment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Spills</th>
<th>Clear area of personnel and move upward.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert Fire Brigade and tell them location and nature of hazard.</td>
<td>May be violently or explosively reactive.</td>
</tr>
<tr>
<td>May be violently or explosively reactive.</td>
<td>Wear breathing apparatus plus protective gloves.</td>
</tr>
</tbody>
</table>

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

**SECTION 7 HANDLING AND STORAGE**

**Precautions for safe handling**
CONTENTS

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

<table>
<thead>
<tr>
<th>INGREDIENT DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Australia Exposure Standards</td>
</tr>
<tr>
<td>Australia Exposure Standards</td>
</tr>
<tr>
<td>Australia Exposure Standards</td>
</tr>
</tbody>
</table>

EMERGENCY LIMITS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>methyl ethyl ketone</td>
<td>Butanone, 2-; (Methyl ethyl ketone; MEK)</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>cyclohexanone</td>
<td>Cyclohexanone; (Ketohexamethylene)</td>
<td>20 ppm</td>
<td>20 ppm</td>
<td>5000 ppm</td>
</tr>
<tr>
<td>tetrahydrofuran</td>
<td>Tetrahydrofuran</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Exposure controls

Appropriate 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.

Personal protection

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Original IDLH</th>
<th>Revised IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>methyl ethyl ketone</td>
<td>3,000 ppm</td>
<td>3,000 [LEL] ppm</td>
</tr>
<tr>
<td>cyclohexanone</td>
<td>5,000 ppm</td>
<td>700 ppm</td>
</tr>
<tr>
<td>tetrahydrofuran</td>
<td>20,000 [LEL] ppm</td>
<td>2,000 [LEL] ppm</td>
</tr>
</tbody>
</table>

Eye and face protection

- Safety glasses with side shields.
- Chemical goggles.
- 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.

Notes

- Store in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- Keep containers securely sealed.

Safe handling

- Containers, even those that have been emptied, may contain explosive vapours.
- Do NOT cut, drill, grind, weld or perform similar operations on or near containers.
- May form explosive peroxides on standing or following concentration by distillation.
- Review of stocks and testing for peroxide content by given tested procedures at 3 monthly intervals is recommended, together with safe disposal of peroxodic samples.

[Peroxide-containing residues can often be rendered innocuous by pouring into an excess of sodium carbonate solution]

Contains low boiling substance:
Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately.
- Check for bulging containers.
- Vent periodically
- Always release caps or seals slowly to ensure slow dissipation of vapours
- DO NOT allow clothing wet with material to stay in contact with skin
- 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.

Other information

- Use in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- Keep containers securely sealed.

Conditions for safe storage, including any incompatibilities

Suitable container

- Glass container is suitable for laboratory quantities
- Packing as supplied by manufacturer.
- Plastic containers may only be used if approved for flammable liquid.
- Check that containers are clearly labelled and free from leaks.
- For low viscosity materials (i): Drums and jerry cans must be of the non-removable head type. (ii): Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C)
- For manufactured product having a viscosity of at least 250 cSt.

Storage incompatibility

- Avoid strong bases.
- The unhindered oxygen atom found on cyclic ethers such as the epoxides, oxetanes, furans, dioxanes and pyrans, carries two unshared pairs of electrons - a structure which favors the formation of coordination complexes and the solvation of cations.
- Cyclic ethers are used as important solvents, as chemical intermediate and as monomers for ring-opening polymerization.
- They are unstable at room temperature due to possibility of peroxide formation; stabiliser is sometimes needed for storage and transportation.
- Note: Ethers lacking non-methyl hydrogen atoms adjacent to the ether link are thought to be relatively safe.
- Avoid reaction with oxidising agents.
### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Blue viscous highly flammable liquid with a characteristic odour of MEK; does not mix with water.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE/EVALPE</td>
<td>A</td>
</tr>
<tr>
<td>BUTYL</td>
<td>C</td>
</tr>
<tr>
<td>BUTYL/NEOPRENE</td>
<td>C</td>
</tr>
<tr>
<td>CPR</td>
<td>C</td>
</tr>
<tr>
<td>HYPALON</td>
<td>C</td>
</tr>
<tr>
<td>NATURAL RUBBER</td>
<td>C</td>
</tr>
<tr>
<td>NATURAL+NEOPRENE</td>
<td>C</td>
</tr>
<tr>
<td>NEOPRENE</td>
<td>C</td>
</tr>
<tr>
<td>NEOPRENE/NATURAL</td>
<td>C</td>
</tr>
<tr>
<td>NITRILE</td>
<td>C</td>
</tr>
<tr>
<td>NITRILE+PVC</td>
<td>C</td>
</tr>
<tr>
<td>PVA</td>
<td>C</td>
</tr>
<tr>
<td>PVC</td>
<td>C</td>
</tr>
<tr>
<td>SARANEX 23</td>
<td>C</td>
</tr>
<tr>
<td>TEFILON</td>
<td>C</td>
</tr>
<tr>
<td>VITON/CHLOROBUTYL</td>
<td>C</td>
</tr>
<tr>
<td>VITON/NEOPRENE</td>
<td>C</td>
</tr>
</tbody>
</table>

**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.

### Recommended material(s)

#### GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the "Forsberg Clothing Performance Index". The effects of the following substance(s) are taken into account in the computer-generated selection:

**TYPE N BLUE SOLVENT CEMENT**

### Skin protection

See Hand protection below

<table>
<thead>
<tr>
<th>Hands/feet protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>◾ Wear chemical protective gloves, e.g. PVC.</td>
</tr>
<tr>
<td>◾ Wear safety footwear or safety gumboots, e.g. Rubber</td>
</tr>
</tbody>
</table>

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care.

### Body protection

See Other protection below

<table>
<thead>
<tr>
<th>Other protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>◾ Overalls.</td>
</tr>
<tr>
<td>◾ PVC Apron.</td>
</tr>
<tr>
<td>◾ PVC protective suit may be required if exposure severe.</td>
</tr>
<tr>
<td>◾ Eyewash unit.</td>
</tr>
</tbody>
</table>

Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are non recommended as they may produce static electricity.

For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).

Non sparking safety or conductive footwear should be considered. Conductive footwear describes a boot or shoe with a sole made from a conductive compound chemically bound to the bottom components, for permanent control to electrically ground the foot an shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds.

### Thermal hazards

Not Available

### Respiratory protection

Type A 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, 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.

<table>
<thead>
<tr>
<th>Required Minimum Protection Factor</th>
<th>Half-Face Respirator</th>
<th>Full-Face Respirator</th>
<th>Powered Air Respirator</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 5 x ES</td>
<td>A-AUS / Class 1</td>
<td>-</td>
<td>A-PAPR-AUS / Class 1</td>
</tr>
<tr>
<td>up to 25 x ES</td>
<td>Air-line*</td>
<td>A-2</td>
<td>A-PAPR-2</td>
</tr>
<tr>
<td>up to 50 x ES</td>
<td>-</td>
<td>A-3</td>
<td>-</td>
</tr>
<tr>
<td>50+ x ES</td>
<td>-</td>
<td>Air-line**</td>
<td>-</td>
</tr>
</tbody>
</table>

* - Full-face

### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odour</td>
<td>Not Available</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not Available</td>
</tr>
<tr>
<td>pH (as supplied)</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical property</th>
<th>Relative density (Water = 1)</th>
<th>Partition coefficient n-octanol / water</th>
<th>Auto-ignition temperature (°C)</th>
<th>Decomposition temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Available</td>
<td>Not Available</td>
<td>515</td>
<td>Not Available</td>
</tr>
</tbody>
</table>
SECTION 10 STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Reactivity</th>
<th>See section 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td>Unstable in the presence of incompatible materials.&lt;br&gt;Product is considered stable.&lt;br&gt;Hazardous polymerisation will not occur.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>See section 7</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>See section 7</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>See section 7</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>See section 5</td>
</tr>
</tbody>
</table>

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled: 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. Inhalation hazard is increased at higher temperatures. 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. Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.

Ingestion: Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. Ingestion of tetrahydrofuran may not, in itself, produce internal injury; however, contaminating levels of furan, present in certain grades of commercial product, may produce liver and kidney injury exacerbated by the intake of alcoholic beverages. 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.

Skin Contact: Repeated exposure may cause skin cracking, flaking or drying following normal handling and use. There is some evidence to suggest that 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. Open cuts, abraded or irritated skin should not be exposed to this material. 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. Skin contact with the material may be harmful; systemic effects may result following absorption.

Eye: The vapour when concentrated has pronounced eye irritation effects and this gives some warning of high vapour concentrations. If eye irritation occurs seek to reduce exposure with available control measures, or evacuate area. There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe irritation may be expected with pain.

Chronic: Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Based on experience with animal studies, exposure to the material may result in toxic effects to the development of the fetus, at levels which do not cause significant toxic effects to the mother. Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following. 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. Long term cyclohexanone exposure may cause liver and kidney changes. Clouding of the eye lens and cataract development may occur. Limited information is available on the chronic (long-term) effects of methyl ethyl ketone in humans. Chronic inhalation studies in animals have reported slight neurological, liver, kidney, and respiratory effects. No information is available on the developmental, reproductive, or carcinogenic effects of methyl ethyl ketone in humans. Developmental effects, including decreased foetal weight and foetal malformations, have been reported in mice and rats exposed to methyl ethyl ketone via inhalation and ingestion. Repeated exposure to tetrahydrofuran (THF) and related compounds has been associated with liver inflammation and fatty degeneration of the liver. Animal testing suggests that this group of compounds can cause liver damage, irritation of the skin and airway, metabolic imbalance, gynaecological disturbance, damage to the adrenal glands and may increase the rate of cancer. Cyclic ethers can cause cancers, especially of the liver. Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS]
### TOXICITY

#### Dermal (rabbit)
- LD50: >8100 mg/kg<sup>1</sup> - mild
- LD50: >947.8 mg/kg<sup>2</sup> - mild
- LD50: >1535 mg/kg<sup>2</sup> - mild

#### Inhalation (rat)
- LC50: 23.5 mg/L<sup>2</sup> - irritant
- LC50: 4947.8 mg/L<sup>2</sup> - irritant
- LC50: 1535 mg/L<sup>2</sup> - irritant

#### Oral (rat)
- LD50: 3474.9 mg/kg<sup>1</sup> - not available

#### Skin (rabbit)
- LD50: 402 mg/24 hr - mild
- LD50: 500 mg/24 hr - mild

### CYCLOHEXANONE

#### Dermal (rabbit)
- LD50: 947.8 mg/kg<sup>2</sup> - irritant
- LD50: 1535 mg/kg<sup>2</sup> - irritant

#### Inhalation (rat)
- LC50: 8000 ppm/4 hr - not available
- LC50: 2100 ppm/3 hr - not available
- LC50: 21000 ppm/3 hr - not available
- LC50: 72 mg/L/2 hr - not available

#### Oral (rat)
- LD50: 1535 mg/kg - not available

#### Skin (rabbit)
- LD50: 13.78 mg/24 hr - open - mild

### TETRAHYDROFURAN

#### Dermal (rat)
- LD50: >2000 mg/kg<sup>1</sup> - not available
- LD50: >14.7 mg/L<sup>1</sup> - not available
- LD50: >2100 mg/L<sup>1</sup> - not available

#### Inhalation (rat)
- LC50: >14.7 mg/L/6 hr<sup>1</sup> - not available
- LC50: >21000 ppm/3 hr<sup>2</sup> - not available
- LC50: >72 mg/L/2 hr<sup>2</sup> - not available

#### Oral (rat)
- LD50: <891 mg/kg<sup>1</sup> - not available

### METHYL ETHYL KETONE

Methyl ethyl ketone is considered to have a low order of toxicity; however, methyl ethyl ketone is often used in combination with other solvents and the toxic effects of the mix may be greater than either solvent alone. Combinations of n-hexane with methyl ethyl ketone and also methyl n-butyl ketone with methyl ethyl ketone show increase in peripheral neuropathy, a progressive disorder of nerves of extremities. Combinations with chloroform also show an increase in toxicity.

### CYCLOHEXANONE

Cyclohexanone irritates the eye and the skin. Signs of CNS depression and weight loss have been noted at higher doses. Other features of toxicity include mottling of the lungs and degenerative changes in the liver and kidney. It is not considered to cause cancers, but it may reversibly reduce fertility. 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.

### TETRAHYDROFURAN

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. Oral (human) LDLo: 50 mg/kg<sup>3</sup> Nil reported

### METHYL ETHYL KETONE & CYCLOHEXANONE

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.

### METHYL ETHYL KETONE & TETRAHYDROFURAN

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.

### CYCLOHEXANONE & TETRAHYDROFURAN

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

### Ecological Information

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Endpoint</th>
<th>Test Duration (hr)</th>
<th>Species</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>methyl ethyl ketone</td>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>228.130mg/L</td>
<td>3</td>
</tr>
<tr>
<td>methyl ethyl ketone</td>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>308mg/L</td>
<td>2</td>
</tr>
</tbody>
</table>
methyl ethyl ketone | EC50 | 96 | Algae or other aquatic plants | >500mg/L | 4
methyl ethyl ketone | EC50 | 384 | Crustacea | 52.575mg/L | 3
methyl ethyl ketone | NOEC | 48 | Crustacea | 68mg/L | 2
cyclohexanone | LC50 | 96 | Fish | 71.940mg/L | 3
cyclohexanone | EC50 | 48 | Crustacea | >100mg/L | 2
cyclohexanone | EC10 | 72 | Algae or other aquatic plants | 3.56mg/L | 4
cyclohexanone | NOEC | 24 | Fish | ca.5mg/L | 1
tetrahydrofuran | LC50 | 96 | Algae or other aquatic plants | 310.515mg/L | 3
tetrahydrofuran | EC50 | 384 | Crustacea | 17.029mg/L | 3
tetrahydrofuran | NOEC | 24 | Fish | >5mg/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

DO NOT discharge into sewer or waterways.

Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>methyl ethyl ketone</td>
<td>LOW (Half-life = 14 days)</td>
<td>LOW (Half-life = 26.75 days)</td>
</tr>
<tr>
<td>cyclohexanone</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>tetrahydrofuran</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>methyl ethyl ketone</td>
<td>LOW (LogKOW = 0.29)</td>
</tr>
<tr>
<td>cyclohexanone</td>
<td>LOW (BCF = 2.45)</td>
</tr>
<tr>
<td>tetrahydrofuran</td>
<td>LOW (LogKOW = 0.46)</td>
</tr>
</tbody>
</table>

Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>methyl ethyl ketone</td>
<td>MEDIUM (KOC = 3,827)</td>
</tr>
<tr>
<td>cyclohexanone</td>
<td>LOW (KOC = 15.15)</td>
</tr>
<tr>
<td>tetrahydrofuran</td>
<td>LOW (KOC = 4.881)</td>
</tr>
</tbody>
</table>

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use.

- 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.
- 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.
- Dispose of 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.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant NO
Land transport (ADG)

UN number 1133
UN proper shipping name ADHESIVES containing flammable liquid
Transport hazard class(es)

Class 3
Subrisk Not Applicable
Packing group II
Environmental hazard Not Applicable
Special precautions for user

Limited quantity 5 L

Air transport (ICAO-IATA / DGR)

UN number 1133
UN proper shipping name Adhesives containing flammable liquid
Transport hazard class(es)

ICAO/IATA Class 3
ICAO / IATA Subrisk Not Applicable
ERG Code 3L
Packing group II
Environmental hazard Not Applicable
Special precautions for user

Cargo Only Packing Instructions 364
Cargo Only Maximum Qty / Pack 60 L
Passenger and Cargo Packing Instructions 353
Passenger and Cargo Maximum Qty / Pack 5 L
Passenger and Cargo Limited Quantity Packing Instructions Y341
Passenger and Cargo Limited Maximum Qty / Pack 1 L

Sea transport (IMDG-Code / GGVSee)

UN number 1133
UN proper shipping name ADHESIVES containing flammable liquid
Transport hazard class(es)

IMDG Class 3
IMDG Subrisk Not Applicable
Packing group II
Environmental hazard Not Applicable
Special precautions for user

EMS Number F-E, S-D
Special provisions Not Applicable
Limited Quantities 5 L

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

METHYL ETHYL KETONE (78-93-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS
Australia Exposure Standards
Australia Hazardous Substances Information System - Consolidated Lists
Australia Inventory of Chemical Substances (AICS)

CYCLOHEXANONE (108-94-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS
Australia Exposure Standards
Australia Hazardous Substances Information System - Consolidated Lists
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

TETRAHYDROFURAN (109-99-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS
Australia Exposure Standards
Australia Hazardous Substances Information System - Consolidated Lists
Australia Inventory of Chemical Substances (AICS)

National Inventory Status
Australia - AICS Y
Canada - DSL  Y
Canada - NDSL  N (cyclohexanone; tetrahydrofuran; methyl ethyl ketone)
China - IECSC  Y
Europe - EINEC / ELINCS / NLP  Y
Japan - ENCS  Y
Korea - KECI  Y
New Zealand - NZIoC  Y
Philippines - PICCS  Y
USA - TSCA  Y

Legend:  
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
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

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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