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

### Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>Electus Distribution Servisol PCB Clear Lacquer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>Not Available</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>AEROSOLS</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

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

- Application is by spray atomisation from a hand held aerosol pack
- Use according to manufacturer's directions.
- Clear gloss spray paint.

### Details of the supplier of the safety data sheet

- Registered company name: Electus Distribution Pty Ltd
- Address: 320 Victoria Road Rydalmere NSW 2116 Australia
- Telephone: 1300 738 555
- Fax: 1300 758 500
- Website: [https://www.fischerconnectors.com](https://www.fischerconnectors.com)
- Email: cs@soanar.com

### Emergency telephone number

- Emergency telephone number: +61 2 45774866 (George Jones)
- Other emergency telephone numbers: Not Available

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

**HAZARDOUS CHEMICAL, DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.**

<table>
<thead>
<tr>
<th>Poisons Schedule</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification</td>
<td>Aerosols Category 1, Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 2, Eye Irritation Category 2A, Reproductive Toxicity Category 2, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Specific target organ toxicity - repeated exposure Category 2, Acute Aquatic Hazard Category 3, Chronic Aquatic Hazard Category 3</td>
</tr>
</tbody>
</table>

**Legend:**

### Label elements

#### Hazard pictogram(s)

- Flammable
- Corrosive
- Skin Irritant
- Eye Irritant

#### SIGNAL WORD

**DANGER**

### Hazard statement(s)

- **H222** Extremely flammable aerosol.
- **H302** Harmful if swallowed.
- **H315** Causes skin irritation.
- **H319** Causes serious eye irritation.
- **H361** Suspected of damaging fertility or the unborn child.
- **H336** May cause drowsiness or dizziness.
- **H373** May cause damage to organs through prolonged or repeated exposure.
- **H412** Harmful 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.
P211 Do not spray on an open flame or other ignition source.
P251 Pressurized container: Do not pierce or burn, even after use.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P281 Use personal protective equipment as required.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement(s) Response

P308+P313 IF exposed or concerned: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.
P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P330 Rinse mouth.
P332+P313 If skin irritation occurs: Get medical advice/attention.

Precautionary statement(s) Storage

P405 Store locked up.
P410+P412 Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501 Dispose of contents/container in accordance with local regulations.

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>108-88-3</td>
<td>30-60</td>
<td>toluene</td>
</tr>
<tr>
<td>Not Available</td>
<td></td>
<td>hydrocarbon resin</td>
</tr>
<tr>
<td>Not aval.</td>
<td>&lt;10</td>
<td>mineral turpentine</td>
</tr>
<tr>
<td>Not Available</td>
<td>&lt;10</td>
<td>alkyd resin</td>
</tr>
<tr>
<td>68476-85-7</td>
<td>30-60</td>
<td>hydrocarbon propellant</td>
</tr>
</tbody>
</table>

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact

If aerosols come in contact with the eyes:
- Immediately hold the eyelids apart and flush the eye continuously for at least 15 minutes with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact

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

Inhalation

If aerosols, fumes or combustion products are inhaled:
- Remove to fresh air.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- If breathing is shallow or has stopped, ensure clear airway and apply resuscitation, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.
Ingestion

- Avoid giving milk or oils.
- Avoid giving alcohol.
- Not considered a normal route of entry.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casually can comfortably drink.
- Seek medical advice.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

- Toluene is absorbed across the alveolar barrier, the blood/air mixture being 11.2/15.6 (at 37 degrees C.). The concentration of toluene, in expired breath, is of the order of 18 ppm following sustained exposure to 100 ppm. The tissue/blood proportion is 1/3 except in adipose where the proportion is 8/10.
- Metabolism by microsomal mono-oxygenation, results in the production of hippuric acid. This may be detected in the urine in amounts between 0.5 and 2.5 g/24 hr which represents, on average, 0.8 gm/gm of creatinine. The biological half-life of hippuric acid is in the order of 1-2 hours.
- Primary threat to life from ingestion and/or inhalation is respiratory failure.
- Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (PO2 <50 mm Hg or PCO2 > 50 mm Hg) should be intubated.
- Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial damage has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
- A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.
- Epinephrine (adrenaline) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
- Lavage is indicated in patients who require decontamination; ensure use.

BIOLOGICAL EXPOSURE INDEX - BEI

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

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Index</th>
<th>Sampling Time</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>o-Cresol in urine</td>
<td>0.5 mg/L</td>
<td>End of shift</td>
<td>B, NS</td>
</tr>
<tr>
<td>Hippuric acid in urine</td>
<td>1.6 g/g creatinine</td>
<td>End of shift</td>
<td></td>
</tr>
<tr>
<td>Toluene in blood</td>
<td>0.05 mg/L</td>
<td>Prior to last shift of workweek</td>
<td></td>
</tr>
</tbody>
</table>

NS: Non-specific determinant; also observed after exposure to other material

B: Background levels occur in specimens collected from subjects NOT exposed

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

**SMALL FIRE:**
- Water spray, dry chemical or CO2

**LARGE FIRE:**
- Water spray or fog

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

**Fire Fighting**
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- If safe, switch-off electrical equipment until vapour fire hazard removed.
- Use water delivered as a fire spray to control fire and cool adjacent area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

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

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

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

Major Spills

<table>
<thead>
<tr>
<th>SORBENT TYPE</th>
<th>RANK</th>
<th>APPLICATION</th>
<th>COLLECTION</th>
<th>LIMITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feathers - pillow</td>
<td>1</td>
<td>throw</td>
<td>pitchfork</td>
<td>DGC, RT</td>
</tr>
<tr>
<td>cross-linked polymer - particulate</td>
<td>2</td>
<td>shovel</td>
<td>shovel</td>
<td>R,W,SS</td>
</tr>
<tr>
<td>cross-linked polymer - pillow</td>
<td>2</td>
<td>throw</td>
<td>pitchfork</td>
<td>R, DGC, RT</td>
</tr>
<tr>
<td>sorbent clay - particulate</td>
<td>3</td>
<td>shovel</td>
<td>shovel</td>
<td>R, I, P</td>
</tr>
<tr>
<td>treated clay/ treated natural organic - particulate</td>
<td>3</td>
<td>shovel</td>
<td>shovel</td>
<td>R, I</td>
</tr>
<tr>
<td>wood fibre - pillow</td>
<td>4</td>
<td>throw</td>
<td>pitchfork</td>
<td>R, P, DGC, RT</td>
</tr>
</tbody>
</table>

Legend
- DGC: Not effective where ground cover is dense
- R: Not reusable
- I: Not incinerable
- P: Effectiveness reduced when rainy
- RT: Not effective where terrain is rugged
- SS: Not for use within environmentally sensitive sites
- W: Effectiveness reduced when windy

Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control; R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988

Clear area of personnel and move upwind.

Alert Fire Brigade and tell them location and nature of hazard.

May be violently or explosively reactive.

Wear breathing apparatus plus protective gloves.

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

No smoking, naked lights or ignition sources.

Increase ventilation.

Stop leak if safe to do so.

Water spray or fog may be used to disperse / absorb vapour.

Absorb or cover spill with sand, earth, inert materials or vermiculite.

If safe, damaged cans should be placed in a container outdoors, away from ignition sources, until pressure has dissipated.

Undamaged cans should be gathered and stowed safely.

Collect residues and seal in labelled drums for disposal.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

<table>
<thead>
<tr>
<th>Safe handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO NOT allow clothing wet with material to stay in contact with skin</td>
</tr>
<tr>
<td>Avoid all personal contact, including inhalation.</td>
</tr>
<tr>
<td>Wear protective clothing when risk of exposure occurs.</td>
</tr>
<tr>
<td>Use in a well-ventilated area.</td>
</tr>
<tr>
<td>Prevent concentration in hollows and sumps.</td>
</tr>
<tr>
<td>DO NOT enter confined spaces until atmosphere has been checked.</td>
</tr>
<tr>
<td>Avoid smoking, naked lights or ignition sources.</td>
</tr>
<tr>
<td>Avoid contact with incompatible materials.</td>
</tr>
<tr>
<td>When handling, DO NOT eat, drink or smoke.</td>
</tr>
<tr>
<td>DO NOT incinerate or puncture aerosol cans.</td>
</tr>
</tbody>
</table>
DO NOT spray directly on humans, exposed food or food utensils.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storage and handling recommendations contained within this SDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

- Store below 38 deg. C.
- Keep dry to avoid corrosion of cans. Corrosion may result in container perforation and internal pressure may eject contents of can.
- Store in original containers in approved flammable liquid storage area.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- No smoking, naked lights, heat or ignition sources.
- Keep containers securely sealed. Contents under pressure.
- Store away from incompatible materials.
- Store in a cool, dry, well ventilated area.
- Avoid storage at temperatures higher than 40 deg C.
- Store in an upright position.
- Protect containers against physical damage.
- Check regularly for spills and leaks.
- Observe manufacturer's storage and handling recommendations contained within this SDS.

### Conditions for safe storage, including any incompatibilities

- Suitable container: Aerosol disperser.
- Storage incompatibility: Avoid reaction with oxidising agents.

### SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Control parameters

**OCCUPATIONAL EXPOSURE LIMITS (OEL)**

<table>
<thead>
<tr>
<th>INGREDIENT DATA</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA</th>
<th>STEL</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia Exposure Standards</td>
<td>toluene</td>
<td>Toluene</td>
<td>191 mg/m3 / 50 ppm</td>
<td>574 mg/m3 / 150 ppm</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Australia Exposure Standards</td>
<td>mineral turpentine</td>
<td>Mineral turpentine</td>
<td>480 mg/m3</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Australia Exposure Standards</td>
<td>hydrocarbon propellant</td>
<td>LPG (liquified petroleum gas)</td>
<td>1800 mg/m3 / 1000 ppm</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EMERGENCY LIMITS</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>toluene</td>
<td>Toluene</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>hydrocarbon propellant</td>
<td>LPG (liquified petroleum gas)</td>
<td>65,000 ppm</td>
<td>2.30E+05 ppm</td>
<td>4.00E+05 ppm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>Original IDLH</th>
<th>Revised IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>toluene</td>
<td>500 ppm</td>
<td>Not Available</td>
</tr>
<tr>
<td>hydrocarbon resin</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>mineral turpentine</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>alkyd resin</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>hydrocarbon propellant</td>
<td>2,000 [LER] ppm</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**MATERIAL DATA**

- For liquified petroleum gases (LPG):
  - TLV TWA: 1000 ppm, 1800 mg/m3 (as LPG)
  - ES TWA: 1000 ppm, 1800 mg/m3 (as LPG)
  - OES TWA: 1000 ppm, 1750 mg/m3; STEL: 1250 ppm, 2180 mg/m3 (as LPG)
  - IDLH Level: 2000 ppm (lower explosive limit)

No chronic systemic effects have been reported from occupational exposure to LPG. The TLV-TWA is based on good hygiene practices and is thought to minimise the risk of fire or explosion.

**Odour Safety Factor (OSF)**

**for benzene**

- Odour Threshold Value: 34 ppm (detection), 97 ppm (recognition)

**NOTE:** Detector tubes for benzene, measuring in excess of 0.5 ppm, are commercially available. The relative quality of epidemiological data and quantitative health risk assessments related to documented and theoretical leukaemic deaths constitute the basis of the TLV-recommendation.

One study [Dow Chemical] demonstrates a significant fourfold increase in myelogenous leukaemia for workers exposed to average benzene concentrations of about 5 ppm for an average of 9 years and that 2 out of four individuals in the study who died from leukaemia were characterised as having been exposed to average benzene levels below 2 ppm. Based on such findings the estimated risk of leukaemia in workers exposed at daily benzene concentrations of 10 ppm for 40 years is 155 times that of unexposed workers; at 1 ppm the risk falls to 1.7 times whilst at 0.1 ppm the risk is about the same in the two groups. A revision of the TLV-TWA to 0.1 ppm was proposed in 1990 but this has been revised upwards as result of industry initiatives.

**Typical toxicities displayed following inhalation:**

- At 25 ppm (8 hours): no effect
- 50-150 ppm: signs of intoxication within 5 hours
- 500-1500 ppm: signs of intoxication within 1 hour
- 7500 ppm: severe intoxication within 30-60 minutes
- 20000 ppm: fatal within 5-10 minutes

Some jurisdictions require that health surveillance be conducted on occupationally exposed workers. Some surveillance should emphasise (i) demography, occupational and medical history and health advice (ii) baseline blood sample for haematological profile (iii) records of personal exposure.

For trimethyl benzene as mixed isomers (of unstable proportions)

**Odour Threshold Value:** 2.4 ppm (detection)

Use care in interpreting effects as a single isomer or other isomer mix. Trimethylbenzene is an eye, nose and respiratory irritant. High concentrations cause central nervous system depression.
Exposed workers show CNS changes, asthmatic bronchitis and blood dyscrasias at 60 ppm. The TLV-TWA is thought to be protective against the significant risk of CNS excitation, asthmatic bronchitis and blood dyscrasias associated with exposures above the limit.

Odour Safety Factor (OSF)

**OSF=17 (TOLUENE)**

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

**Classification into classes follows:**

- **Class OSF**
  - **A** 550 Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities
  - **B** 26-550 As "A" for 50-90% of persons being distracted
  - **C** 1-26 As "A" for less than 50% of persons being distracted
  - **D** 0.18-1 10-50% of persons aware of being tested perceive by smell that the Exposure Standard is Being reached
  - **E** <0.18 As "D" for less than 10% of persons aware of being tested

**Odour Threshold Value (OTV) ppm**

- For toluene: Odour Threshold Value: 2591 ppm (recognition)
- For butane: Odour Threshold Value: 0.16-6.7 (detection), 1.9-69 (recognition)
- For n-butane: Odour Threshold Value: 0.22 (n-BUTANE)
- For 1,2,4-trimethylbenzene: Odour Threshold Value: 0.18-1

**NOTE:C**

The classification as a cardenoid need not apply if it can be shown that the substance contains less than 0.1% of it in the workplace (UN No. 203-450-8). - European Union (EU) List of harmonised classification and labelling hazardous substances, Table 3.1, Annex VI, Regulation (EC) No 1272/2008 (CLP) - up to the latest ATP

### Exposure 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 stops the contaminant emitted directly from the source. The TLV is based on analogy with pentane by comparing their lower explosive limits in air. It is concluded that this limit will protect workers against the significant risk of drowsiness and other narcotic effects.

**Appropriate engineering controls**

<table>
<thead>
<tr>
<th>Type of Contaminant:</th>
<th>Speed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>aerosols, (released at low velocity into zone of active generation)</td>
<td>0.5-1 m/s</td>
</tr>
<tr>
<td>direct spray, spray painting in shallow booths, gas discharge (active generation into zone of rapid air motion)</td>
<td>1-2.5 m/s (200-500 f/min.)</td>
</tr>
</tbody>
</table>

**Within each range the appropriate value depends on:**

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

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

### Personal protection

Exposure limits of toluene derivatives are based on the significant risk of effects on the nervous system. These are not the only factors involved in the selection of a respirator. The type of workplace, the potential for overexposure, and possible exposure to other contaminants also must be considered. Generally, employers may need to use multiple types of controls to prevent employee overexposure.
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 imants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens adsorption and adoration for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signals of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 69]. (AS/NZS 1336 or national equivalent)

Skin protection

See Hand protection below

Hands/feet protection

- No special equipment needed when handling small quantities.
- OTHERWISE:
  - For potentially moderate exposures:
    - Wear general protective gloves, eg. light weight rubber gloves.
  - For potentially heavy exposures:
    - Wear chemical protective gloves, eg. PVC, and safety footwear.

Body protection

See Other protection below

Other protection

No special equipment needed when handling small quantities.

OTHERWISE:

- Overalls:
- Skin cleansing cream.
- Eyewash unit.
- Do not spray on hot surfaces.
- The clothing worn by process operators insulated from earth may develop static charges far higher (up to 100 times) than the minimum ignition energies for various flammable gas-air mixtures. This holds true for a wide range of clothing materials including cotton.
- Avoid dangerous levels of charge by ensuring a low resistivity of the surface material worn outermost. BRETHRICK: Handbook of Reactive Chemical Hazards.

Recommended material(s)

<table>
<thead>
<tr>
<th>GLOVE SELECTION INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glove selection is based on a modified presentation of the:</td>
</tr>
<tr>
<td>&quot;Forsberg Clothing Performance Index&quot;:</td>
</tr>
<tr>
<td>The effect(s) of the following substance(s) are taken into account in the computer-generated selection:</td>
</tr>
<tr>
<td>Electus Distribution Servisol PCB Clear Lacquer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUTYL</td>
<td>C</td>
</tr>
<tr>
<td>CPE</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>PE/EVAL/PE</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>SARANEX-23 2-Ply</td>
<td>C</td>
</tr>
<tr>
<td>TEFلون</td>
<td>C</td>
</tr>
<tr>
<td>VITON</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.

Respiratory protection

Type AX 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.

<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 10 x ES</td>
<td>-</td>
<td>-</td>
<td>AX-PAPR-AUS / Class 1</td>
</tr>
<tr>
<td>up to 50 x ES</td>
<td>-</td>
<td>AX-AUS / Class 1</td>
<td>-</td>
</tr>
<tr>
<td>up to 100 x ES</td>
<td>-</td>
<td>AX-2</td>
<td>AX-PAPR-2</td>
</tr>
</tbody>
</table>

^ - 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)

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

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Highly flammable liquid; does not mix with water.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Not Available</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not Available</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not Available</td>
</tr>
<tr>
<td>Partition coefficient n-octanol / water</td>
<td>Not Available</td>
</tr>
<tr>
<td>Auto-ignition temperature °C</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>Elevated temperatures.</td>
</tr>
<tr>
<td></td>
<td>Presence of open flame.</td>
</tr>
<tr>
<td></td>
<td>Product is considered stable.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>Not Available</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**
  - Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.
  - Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual. The acute toxicity of inhaled alkylbenzenes is best described by central nervous system depression. As a rule, these compounds may also act as general anaesthetics.
  - Systemic poisoning produced by general anaesthesia is characterised by lightheadedness, nervousness, apprehension, euphoria, confusion, dizziness, drowsiness, tinnitus, blurred or double vision, vomiting and sensations of heat, cold or numbness, twitching, tremors, convulsions, unconsciousness and respiratory depression and arrest. Cardiac arrest may result from cardiovascular collapse. Bradycardia, and hypotension may also be produced. Inhaled alkylbenzene vapours cause death in animals at air levels that are relatively similar (typically 5000 ppm for 4 to 8 hour exposure).
  - It is likely that acute inhalation exposure to alkylbenzenes resembles that to general anaesthetics.
  - Alkylbenzenes are not generally toxic other than at high levels of exposure. This may be because their metabolites have a low order of toxicity and are easily excreted. There is little or no evidence to suggest that metabolic pathways can become saturated leading to spillover to alternate pathways. Nor is there evidence that toxic reactive intermediates, which may produce subsequent toxic or mutagenic effects, are formed.

- **Ingestion**
  - Acute effects from inhalation of high concentrations of vapour are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterised by headache and dizziness, increased reaction time, fatigue and loss of co-ordination.
  - Central nervous system (CNS) depression may include nonspecific discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in respiratory depression and may be fatal.
  - A significant number of individuals exposed to mixed trimethylbenzenes complained of nervousness, tension, anxiety and asthmatic bronchitis. Peripheral blood showed a tendency to hypochromic anaemia and a deviation from normal in coagulability of the blood. Low carbon concentrations ranged from 10 to 60 ppm. Contamination of the mixture with benzene may have been responsible for the blood dyscrasias.
  - High concentrations of mesitylene vapour (5000 to 9000 ppm) caused central nervous system depression in mice. Similar exposures of pseudocumene also produced evidence of CNS involvement.
  - Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in the breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.

- **Skin Contact**
  - Acidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
  - Not normally a hazard due to physical form of product.
  - Considered an unlikely route of entry in commercial/industrial environments.
  - The material produces moderate skin irritation; evidence exists, or practical experience predicts, that the material either produces moderate inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant, but moderate, inflammation when applied to the healthy intact skin of animals (for up to four hours), such inflammation being present twenty-four hours or more after the end of the exposure period.
  - Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.
  - Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
  - Spray mist may produce discomfort.
  - Open cuts, abraded or irritated skin should not be exposed to this material.
  - Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds 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.
Direct contact with the eye may not cause irritation because of the extreme volatility of the gas; however, concentrated atmospheres may produce irritation after brief exposures. Evidence exists, or practical experience predicts, that the material may cause severe eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eyes of experimental animals. Eye contact may cause significant inflammation with pain. Corneal injury may occur; permanent impairment of vision may result unless treatment is prompt and adequate. Repeated or prolonged exposure to irritants may cause inflammation characterised by a temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

**Eye**

**Direct contact with the eye may not cause irritation because of the extreme volatility of the gas; however, concentrated atmospheres may produce irritation after brief exposures.** Evidence exists, or practical experience predicts, that the material may cause severe eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eyes of experimental animals. Eye contact may cause significant inflammation with pain. Corneal injury may occur; permanent impairment of vision may result unless treatment is prompt and adequate. Repeated or prolonged exposure to irritants may cause inflammation characterised by a temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

**Chronic**

**Harmful: danger of serious damage to health by prolonged exposure through inhalation.**

**Serious damage (clear functional disturbance or morphological change which may have toxicological significance) is likely to be caused by repeated or prolonged exposure. As a rule the material produces, or contains a substance which produces severe lesions. Such damage may become apparent following direct application in subchronic (90 day) toxicity studies or following sub-acute (28 day) or chronic (two-year) toxicity tests.**

**Exposure to the material may cause concerns for humans owing to possible developmental toxic effects, generally on the basis that results in appropriate animal studies provide strong suspicion of developmental toxicity in the absence of signs of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not a secondary non-specific consequence of other toxic effects.**

**On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment.**

**Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.**

**Principal route of occupational exposure to the gas is by inhalation.** Chronic toluene habituation occurs following intentional abuse ("sniffing") or from occupational exposure. Ataxia, incoordination and tremors of the hands and feet (as a consequence of diffuse cerebral atrophy), headache, abnormal speech, transient memory loss, convulsions, coma, drowsiness, reduced colour perception, frank blindness, nystagmus (rapid, involuntary eye-movements), hearing loss leading to deafness and mild dementia have all been associated with chronic abuse. Peripheral nerve damage, encephalopathy, giant axonopathy, electrolyte disturbances in the cerebrospinal fluid and abnormal computer tomographic (CT scans) are common amongst toluene addicts. Although toluene abuse has been linked with kidney disease, this does not commonly appear in cases of occupational toluene exposures. Cardiac arrhythmia, multifocal and premature ventricular contractions and supraventricular tachycardia are present in 20% of patients who abused toluene-containing paints. Previous suggestions that chronic toluene inhalation produced human peripheral neuropathy have been discounted. However central nervous system (CNS) depression is well documented where blood toluene exceeds 2.2 mg%. Toluene abusers can achieve transient circulating concentrations of 6.5%. Amongst workers exposed for a median time of 29 years, to toluene, no subacute effects on neurasthenic complaints and psychometric test results could be established. The prenatal toxicity of very high toluene concentrations has been documented for several animal species and man. Malformations indicative of specific teratogenicity have not generally been found. Neonatal toxicity, described in the literature, takes the form of embryo death or delayed foetal growth and delayed skeletal system development. Permanent damage of children has been seen only when mothers have suffered from chronic intoxication as a result of "sniffing".

### Electus Distribution Servisol PCB Clear Lacquer

<table>
<thead>
<tr>
<th>Substance</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>toluene</td>
<td>TOXICITY</td>
<td>IRRITATION</td>
</tr>
<tr>
<td>Dermal (rabbit) LD50: 12124 mg/kg&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Eye (rabbit):2mg/24h - SEVERE</td>
<td></td>
</tr>
<tr>
<td>Inhalation (rat) LC50: 49 mg/l/4H&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Eye (rabbit):0.87 mg - mild</td>
<td></td>
</tr>
<tr>
<td>Oral (rat) LD50: 636 mg/kg&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Eye (rabbit):100 mg/30sec - mild</td>
<td></td>
</tr>
<tr>
<td>Skin (rabbit):500 mg - moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin (rabbit):20 mg/24h-moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin (rabbit):500 mg - moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mineral turpentine</td>
<td>TOXICITY</td>
<td>IRRITATION</td>
</tr>
<tr>
<td>Not Available</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>hydrocarbon propellant</td>
<td>TOXICITY</td>
<td>IRRITATION</td>
</tr>
<tr>
<td>Inhalation (rat) LC50: 84.684 mg/l15 min&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>Inhalation (rat) LC50: 90.17125 mg/l15 min&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>Not Available</td>
<td></td>
</tr>
</tbody>
</table>

**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

### Toluene

**For toluene:**

**Acute Toxicity**

Humans exposed to intermediate to high levels of toluene for short periods of time experience adverse central nervous system effects ranging from headaches to intoxication, convulsions, narcosis, and death. Similar effects are observed in short-term animal studies.

**Humans -** Toluene ingestion or inhalation can result in severe central nervous system depression, and in large doses, can act as a narcotic. The ingestion of about 60 mL resulted in fatal nervous system depression within 30 minutes in one reported case. Constriction and necrosis of myocardial fibers, markedly swollen liver, congestion and haemorrhage of the lungs and acute tubular necrosis were found on autopsy.

Central nervous system effects (headaches, dizziness, intoxication) and eye irritation occurred following inhalation exposure to 100 ppm toluene 6 hours/day for 4 days.

Exposure to 600 ppm for 8 hours resulted in the same and more serious symptoms including euphoria, dilated pupils, convulsions, and nausea. Exposure to 10,000-30,000 ppm has been reported to cause narcosis and death.

Toluene can also strip the skin of lipids causing dermatitis.

**Animals -** The initial effects are instability and incoordination, lachrymation and sniffles (respiratory exposure), followed by narcosis. Animals die of respiratory failure from severe nervous system depression. Cloudy swelling of the kidneys was reported in rats following inhalation exposure to 1600 ppm, 18.90 hours for 3 days.

**Subchronic/Chronic Effects:**

Repeat doses of toluene cause adverse central nervous system effects and can damage the upper respiratory system, the liver, and the kidney. Adverse effects occur as a result from both oral and the inhalation exposures. A reported lowest-observed-effect level in humans for adverse neurobehavioral effects is 88 ppm.

**Humans -** Chronic occupational exposure and incidences of toluene abuse have resulted in hepatomegaly and liver function changes. It has also resulted...
The major target organs for the subchronic/chronic toxicity of toluene are the nervous system, liver, and kidney. Depressed immune response has been reported in male mice given doses of 105 mg/kg/day for 28 days. Toluene in corn oil administered to F344 male and female rats by gavage 5 days/week for 13 weeks, induced prostration, hyperactivity, ataxia, piloerection, lacrimation, excess salivation, and body tremors at doses 2500 mg/kg. Liver, kidney, and heart weights were also increased at this dose and histopathologic lesions were seen at this dose.

**Developmental/Reproductive Toxicity**

Exposures to high levels of toluene can result in adverse effects in the developing human foetus. Several studies have indicated that high levels of toluene can also adversely affect the developing offspring in laboratory animals.

**Humans** - Variable growth, microcephaly, CNS dysfunction, attentional deficits, minor craniofacial and limb abnormalities, and developmental delay were seen in three children exposed to toluene in utero as a result of maternal solvent abuse before and during pregnancy.

**Animals** - Sternebral alterations, extra ribs, and missing tails were reported following treatment of rats with 1500 mg/m3 toluene 24 hours/24 days of gestation. Two of the dams died during the exposure. Another group of rats received 1000 mg/m3 8 hours/day during days 1-21 of gestation. No maternal deaths or toxicity occurred, however, minor skeletal retardation was present in the exposed fetuses. CFLP Mice were exposed to 500 or 1500 mg/m3 toluene continuously during days 6-13 of pregnancy. All dams died at the high dose during the first 24 hours of exposure, however none died at 500 mg/m3. Decreased fetal weight was reported, but there were no differences in the incidences of skeletal malformations or anomalies between the treated and control offspring.

**Absorption** - Studies in humans and animals have demonstrated that toluene is readily absorbed via the lungs and the gastrointestinal tract. Absorption through the skin is estimated at about 1% of that absorbed by the lungs when exposed to toluene vapor. Dermal absorption is expected to be higher upon exposure to the liquid; however, exposure is limited by the rapid evaporation of toluene.

**Distribution** - In studies with mice exposed to radiolabelled toluene by inhalation, high levels of radioactivity were present in body fat, bone marrow, spinal nerves, spinal cord, and brain white matter. Lower levels of radioactivity were present in blood, kidney, and liver. Accumulation of toluene has generally been found in adipose tissue, other tissues with high fat content, and in highly vascularised tissues.

**Metabolism** - The metabolites of inhaled or ingested toluene include benzyl alcohol resulting from the hydroxylation of the methyl group. Further oxidation results in the formation of benzoic acid and benzoic acid. The latter is conjugated with glycine to yield hippuric acid or reacted with glucuronic acid to form benzoyle glucuronide. o-cresol and p-cresol formed by ring hydroxylation are considered minor metabolites.

**Excretion** - Toluene is primarily (60-70%) excreted through the urine as hippuric acid. The excretion of benzoyle glucuronide accounts for 10-20%, and excretion of unchanged toluene through the lungs also accounts for 10-20%. Excretion of hippuric acid is usually complete within 24 hours after exposure.

---

**HYDROCARBON PROPPELLANT**

No significant acute toxicological data identified in literature search.

**for Petroleum Hydrocarbon Gases:**

In many cases, there is more than one potentially toxic constituent in a refinery gas. In those cases, the constituent that is most toxic for a particular endpoint in an individual refinery stream is used to characterize the endpoint hazard for that stream. The hazard potential for each mammalian endpoint for each of the petroleum hydrocarbon gases is dependent upon each petroleum hydrocarbon gas constituent endpoint toxicity values (LC50, LOAEL, etc.) and the relative concentration of the constituent present in that gas. It should also be noted that for an individual petroleum hydrocarbon gas, the constituent characterization toxicity may be different for different mammalian endpoints, again, being dependent upon the concentration of the different constituents in each, distinct petroleum hydrocarbon gas.

All Hydrocarbon Gases Category members contain primary hydrocarbons (i.e., alkanes and alkenes) and occasionally asphyxiants gas like hydrogen. The inorganic component of the petroleum gaseous less toxic than the C1 - C4 are alkanes (the cut off is not female) and not included. Such abnormal accumulation results in the excretion of hydrogen sulfide and leads to chronic renal tubal degeneration, accumulation of cell debris, mineralisation of renal medullary tubules and necrosis. A sustained regenerative proliferation occurs in epithelial cells with subsequent neoplastic transformation with continued exposure. The alpha2 microglobulin is produced under the influence of hormonal controls in male rats but not in females and, more importantly, not in humans. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

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**MINERAL TURPENTINE**

No significant acute toxicological data identified in literature search.

**for Petroleum Hydrocarbon Gases:**

in nephrotoxicity and, in one case, was a cardiac sensitiser and fatal cardiotoxic. Neural and cerebellar dystrophy were reported in several cases of habitual "glue sniffing." An epidemiological study in France on workers chronically exposed to toluene fumes reported leukopenia and neutropenia. Exposure levels were not given in the secondary reference; however, the average urinary excretion of hippuric acid, a metabolite of toluene, was given as 4 g/L compared to a normal level of 0.6 g/L.

**Animals** - The major target organs for the subchronic/chronic toxicity of toluene are the nervous system, liver, and kidney. Depressed immune response has been reported in male mice given doses of 105 mg/kg/day for 28 days. Toluene in corn oil administered to F344 male and female rats by gavage 5 days/week for 13 weeks, induced prostration, hyperactivity, ataxia, piloerection, lacrimation, excess salivation, and body tremors at doses 2500 mg/kg. Liver, kidney, and heart weights were also increased at this dose and histopathologic lesions were seen at this dose.

**Developmental/Reproductive Toxicity**

Exposures to high levels of toluene can result in adverse effects in the developing human foetus. Several studies have indicated that high levels of toluene can also adversely affect the developing offspring in laboratory animals.

**Humans** - Variable growth, microcephaly, CNS dysfunction, attentional deficits, minor craniofacial and limb abnormalities, and developmental delay were seen in three children exposed to toluene in utero as a result of maternal solvent abuse before and during pregnancy.

**Animals** - Sternebral alterations, extra ribs, and missing tails were reported following treatment of rats with 1500 mg/m3 toluene 24 hours/24 days of gestation. Two of the dams died during the exposure. Another group of rats received 1000 mg/m3 8 hours/day during days 1-21 of gestation. No maternal deaths or toxicity occurred, however, minor skeletal retardation was present in the exposed fetuses. CFLP Mice were exposed to 500 or 1500 mg/m3 toluene continuously during days 6-13 of pregnancy. All dams died at the high dose during the first 24 hours of exposure, however none died at 500 mg/m3. Decreased fetal weight was reported, but there were no differences in the incidences of skeletal malformations or anomalies between the treated and control offspring.

**Absorption** - Studies in humans and animals have demonstrated that toluene is readily absorbed via the lungs and the gastrointestinal tract. Absorption through the skin is estimated at about 1% of that absorbed by the lungs when exposed to toluene vapor. Dermal absorption is expected to be higher upon exposure to the liquid; however, exposure is limited by the rapid evaporation of toluene.

**Distribution** - In studies with mice exposed to radiolabelled toluene by inhalation, high levels of radioactivity were present in body fat, bone marrow, spinal nerves, spinal cord, and brain white matter. Lower levels of radioactivity were present in blood, kidney, and liver. Accumulation of toluene has generally been found in adipose tissue, other tissues with high fat content, and in highly vascularised tissues.

**Metabolism** - The metabolites of inhaled or ingested toluene include benzyl alcohol resulting from the hydroxylation of the methyl group. Further oxidation results in the formation of benzoic acid and benzoic acid. The latter is conjugated with glycine to yield hippuric acid or reacted with glucuronic acid to form benzoyl glucuronide. o-cresol and p-cresol formed by ring hydroxylation are considered minor metabolites.

**Excretion** - Toluene is primarily (60-70%) excreted through the urine as hippuric acid. The excretion of benzoyle glucuronide accounts for 10-20%, and excretion of unchanged toluene through the lungs also accounts for 10-20%. Excretion of hippuric acid is usually complete within 24 hours after exposure.

---

**Developmental effects were induced by two of the petroleum hydrocarbon gas constituents, benzene and the C5-C6 hydrocarbon constituent.**

**Repeated exposure of pregnant rats to high concentrations of toluene (around or exceeding 1000 ppm) can cause developmental effects, such as lower birth weight and developmental neurotoxicity on the foetus. However, in a two-generation reproductive study in rats exposed to gasoline vapour condensate, no adverse effects on the foetus were observed.

**Human Effects** - Prolonged/ repeated contact may cause defatting of the skin which can lead to dermatitis and may make the skin more susceptible to irritation and penetration by other materials.

Lifeline exposure of rodents to gasoline produces carcinogenicity although the relevance to humans has been questioned. Gasoline induces kidney cancer in male rats as a consequence of accumulation of the alpha2 microglobulin in histologically normal kidney. Such abnormal accumulation results in the excretion of hydrogen sulfide and leads to chronic renal tubal degeneration, accumulation of cell debris, mineralisation of renal medullary tubules and necrosis. A sustained regenerative proliferation occurs in epithelial cells with subsequent neoplastic transformation with continued exposure. The alpha2 microglobulin is produced under the influence of hormonal controls in male rats but not in females and, more importantly, not in humans. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

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**Genotoxicity:**

Toxicity: The majority of the Petroleum Hydrocarbon Gases Category components are negative for in vitro genotoxicity. The exceptions are benzene and 1,3-butadiene, which are genotoxic in bacterial and mammalian in vitro test systems.

**Developmental Toxicity:** Developmental effects were induced by two of the petroleum hydrocarbon gas components, benzene and the C5-C6 hydrocarbon fraction. No developmental toxicity was observed at the highest exposure levels tested for the other petroleum hydrocarbon gas constituents tested for this
effect. The asphyxiant gases have not been tested for developmental toxicity. Based on LOAEL and NOAEL values, the order of acute toxicity of these constituents from most to least toxic is: Benzene (LOAEL = 20 ppm) > butadiene (NOAEL >=1,000 ppm) > C5-C6 HCs (LOAEL = 3,463 ppm) > C1-C4 HCs (NOAEL >=5,000 ppm; assumed to be 100% 2-butene) > asphyxiant gases (hydrogen, carbon dioxide, nitrogen). Reproductive toxicity: Reproductive effects were induced by only two petroleum hydrocarbon gas constituents, benzene and isobutane (a constituent of the the C1-C4 hydrocarbon fraction). No reproductive toxicity was observed at the highest exposure levels tested for the other petroleum hydrocarbon gas constituents tested for this effect. The asphyxiant gases have not been tested for reproductive toxicity. Based on LOAEL and NOAEL values, the order of reproductive toxicity of these constituents from most to least toxic is: Benzene (LOAEL = 300 ppm) > butadiene (NOAEL >=6,000 ppm) > C5-C6 HCs (NOAEL >=6,521 ppm) > C1-C4 HCs (LOAEL = 9,000 ppm; assumed to be 100% isobutane) > asphyxiant gases (hydrogen, carbon dioxide, nitrogen)

Reproductive toxicity:
Reproductive effects were induced by only two petroleum hydrocarbon gas constituents, benzene and isobutane (a constituent of the C1-C4 fraction). No reproductive toxicity was observed at the highest exposure levels tested for the other petroleum hydrocarbon gas constituents tested for this effect. Based on LOAEL and NOAEL values, the order of reproductive toxicity of these constituents from most to least toxic is: Benzene (LOAEL = 300 ppm) > butadiene (NOAEL >=6,000 ppm) > C5-C6 HCs (NOAEL >=6,521 ppm) > C1-C4 HCs (LOAEL = 9,000 ppm; assumed to be 100% isobutane) > asphyxiant gases (hydrogen, carbon dioxide, nitrogen)

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

<table>
<thead>
<tr>
<th>Electus Distribution Servisol PCB Clear Lacquer</th>
<th>ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
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<table>
<thead>
<tr>
<th>Toluene ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>0.0073mg/L</td>
<td>4</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>3.78mg/L</td>
<td>5</td>
</tr>
<tr>
<td>EC50</td>
<td>72</td>
<td>Algae or other aquatic plants</td>
<td>12.5mg/L</td>
<td>4</td>
</tr>
<tr>
<td>BCF</td>
<td>24</td>
<td>Algae or other aquatic plants</td>
<td>10mg/L</td>
<td>4</td>
</tr>
<tr>
<td>NOEC</td>
<td>168</td>
<td>Crustacea</td>
<td>0.74mg/L</td>
<td>5</td>
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<table>
<thead>
<tr>
<th>Mineral Turpentine ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydrocarbon Propellant ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
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</table>

<table>
<thead>
<tr>
<th>Hydrocarbon Propellant ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Legend:  – Data available but does not fill the criteria for classification
– Data available to make classification
– Data Not Available to make classification

Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>LOW (Half-life = 28 days)</td>
<td>LOW (Half-life = 4.33 days)</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>LOW (BCF = 90)</td>
</tr>
</tbody>
</table>

Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>LOW (KOC = 268)</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. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

- **DO NOT** allow wash water from cleaning or process equipment to enter drains.
- **DO NOT** incinerate or puncture aerosol cans.
- **Discharge contents of damaged aerosol cans at an approved site.**
- **Allow small quantities to evaporate.**

### SECTION 14 TRANSPORT INFORMATION

#### Labels Required

<table>
<thead>
<tr>
<th>Marine Pollutant</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAZCHEM</td>
<td>2Y</td>
</tr>
</tbody>
</table>

#### Land transport (ADG)

- **UN number**: 1950
- **UN proper shipping name**: AEROSOLS
- **Class**: 2.1
- **Subrisk**: Not Applicable
- **Packing group**: Not Applicable
- **Environmental hazard**: Not Applicable

**Special precautions for user**

<table>
<thead>
<tr>
<th>Special provisions</th>
<th>63 190 277 327 344</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited quantity</td>
<td>1000ml</td>
</tr>
</tbody>
</table>

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

- **UN number**: 1950
- **UN proper shipping name**: Aerosols, flammable; Aerosols, flammable (engine starting fluid)
- **ICAO/IATA Class**: 2.1
- **ICAO / IATA Subrisk**: Not Applicable
- **ERG Code**: 10L
- **Packing group**: Not Applicable
- **Environmental hazard**: Not Applicable

**Special precautions for user**

<table>
<thead>
<tr>
<th>Special provisions</th>
<th>A1 A145 A167 A802; A1 A145 A167 A802</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo Only Packing Instructions</td>
<td>203</td>
</tr>
<tr>
<td>Cargo Only Maximum Qty / Pack</td>
<td>150 kg</td>
</tr>
<tr>
<td>Passenger and Cargo Packing Instructions</td>
<td>203; Forbidden</td>
</tr>
<tr>
<td>Passenger and Cargo Maximum Qty / Pack</td>
<td>75 kg; Forbidden</td>
</tr>
<tr>
<td>Passenger and Cargo Limited Quantity Packing Instructions</td>
<td>Y203; Forbidden</td>
</tr>
<tr>
<td>Passenger and Cargo Limited Maximum Qty / Pack</td>
<td>30 kg G; Forbidden</td>
</tr>
</tbody>
</table>

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

- **UN number**: 1950
- **UN proper shipping name**: AEROSOLS
Transport hazard class(es)

IMDG Class: 2.1
IMDG Subrisk: Not Applicable
Packing group: Not Applicable
Environmental hazard: Not Applicable

Special precautions for user
EMS Number: F-D, S-U
Special provisions: 63 190 277 327 344 381 959
Limited Quantities: 1000ml

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

TOLUENE(108-88-3) 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

MINERAL TURPENTINE(NOT AVAIL.) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards

HYDROCARBON PROPELLANT(68476-85-7.) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards
Australia Hazardous Substances Information System - Consolidated Lists
International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft

National Inventory | Status
--- | ---
Australia - AICS | N (mineral turpentine)
Canada - DSL | N (mineral turpentine)
Canada - NDSL | N (toluene; hydrocarbon propellant; mineral turpentine)
China - IECS | N (mineral turpentine)
Europe - EINEC / ELINCS / NLP | N (mineral turpentine)
Japan - ENCS | N (hydrocarbon propellant; mineral turpentine)
Korea - KECI | N (mineral turpentine)
New Zealand - NZIoC | N (mineral turpentine)
Philippines - PICCS | N (mineral turpentine)
USA - TSCA | N (mineral turpentine)

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

Ingredients with multiple cas numbers

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrocarbon propellant</td>
<td>68476-85-7, 68476-86-8.</td>
</tr>
</tbody>
</table>

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.

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

Continued...