



## Brakleen Aerosol

### CRC Industries (CRC Industries New Zealand)

Chemwatch: 4546-61

Version No: 10.1

Safety Data Sheet according to the Health and Safety at Work (Hazardous Substances) Regulations 2017

Chemwatch Hazard Alert Code: 3

Initial Date: 20/02/2001

Revision Date: 10/12/2021

Print Date: 21/07/2026

S.GHS.NZL.EN

## SECTION 1 Identification of the substance / mixture and of the company / undertaking

### Product Identifier

|                               |                                                                  |
|-------------------------------|------------------------------------------------------------------|
| Product name                  | Brakleen Aerosol                                                 |
| Chemical Name                 | Not Applicable                                                   |
| Synonyms                      | 1752470 - Race Series Brakleen 600g; 5089, 1010490 Brakleen 600g |
| Proper shipping name          | AEROSOLS                                                         |
| Chemical formula              | Not Applicable                                                   |
| Other means of identification | Not Available                                                    |

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

|                          |                                                                                                                                                                                                                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevant identified uses | Degreasing brake parts.<br>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.<br>Application is by spray atomisation from a hand held aerosol pack |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Details of the manufacturer or importer of the safety data sheet

|                         |                                                     |
|-------------------------|-----------------------------------------------------|
| Registered company name | CRC Industries (CRC Industries New Zealand)         |
| Address                 | 10 Highbrook Drive East Tamaki Auckland New Zealand |
| Telephone               | +64 9 272 2700                                      |
| Fax                     | +64 9 274 9696                                      |
| Website                 | <a href="http://www.crc.co.nz">www.crc.co.nz</a>    |
| Email                   | - No EMAL ID NEEDED for NZ - JACK                   |

### Emergency telephone number

|                                     |                                              |                                     |
|-------------------------------------|----------------------------------------------|-------------------------------------|
| Association / Organisation          | CRC Industries (CRC Industries New Zealand)  | CHEMWATCH EMERGENCY RESPONSE (24/7) |
| Emergency telephone number(s)       | NZ Poisons Centre 0800 POISON (0800 764 766) | +64 800 700 112 (ID#: 4546-61)      |
| Other emergency telephone number(s) | 111 (NZ Emergency Services)                  | +61 3 9573 3188                     |

## SECTION 2 Hazards identification

### Classification of the substance or mixture

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Classification <sup>[1]</sup>                   | Aerosols, Hazard Category 1, Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2, Carcinogenicity Category 2, Specific Target Organ Toxicity - Single Exposure Category 2, Specific Target Organ Toxicity - Repeated Exposure Category 2, Hazardous to the Aquatic Environment Acute Hazard Category 1, Hazardous to the Aquatic Environment Long-Term Hazard Category 1, Hazardous to Soil Organisms, Hazardous to Terrestrial Vertebrates |
| Legend:                                         | 1. Classified by Chemwatch; 2. Classification drawn from CCID EPA NZ; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI                                                                                                                                                                                                                                                                                                                                                                   |
| Determined by Chemwatch using GHS/HSNO criteria | 2.1.2A, 6.1D (oral), 6.3A, 6.4A, 6.7B, 6.9B, 9.1A, 9.2C, 9.3B                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Label elements

|                     |                                                                                                                                                                                                                                                                                                                                         |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hazard pictogram(s) |     |
| Signal word         | <b>Danger</b>                                                                                                                                                                                                                                                                                                                           |

## Hazard statement(s)

|                  |                                                                          |
|------------------|--------------------------------------------------------------------------|
| <b>H222+H229</b> | Extremely flammable aerosol. Pressurized container: may burst if heated. |
| <b>H302</b>      | Harmful if swallowed.                                                    |
| <b>H315</b>      | Causes skin irritation.                                                  |
| <b>H319</b>      | Causes serious eye irritation.                                           |
| <b>H351</b>      | Suspected of causing cancer.                                             |
| <b>H371</b>      | May cause damage to organs.                                              |
| <b>H373</b>      | May cause damage to organs through prolonged or repeated exposure.       |
| <b>H423</b>      | Hazardous to soil organisms.                                             |
| <b>H432</b>      | Hazardous to terrestrial vertebrates.                                    |
| <b>H410</b>      | Very toxic to aquatic life with long lasting effects.                    |

## Precautionary statement(s) Prevention

|             |                                                                                                |
|-------------|------------------------------------------------------------------------------------------------|
| <b>P210</b> | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| <b>P211</b> | Do not spray on an open flame or other ignition source.                                        |
| <b>P251</b> | Do not pierce or burn, even after use.                                                         |
| <b>P260</b> | Do not breathe mist/vapours/spray.                                                             |

## Precautionary statement(s) Response

|                       |                                                                                                                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>P305+P351+P338</b> | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| <b>P308+P311</b>      | IF exposed or concerned: Call a POISON CENTER/doctor/physician/first aider.                                                      |
| <b>P314</b>           | Get medical advice/attention if you feel unwell.                                                                                 |
| <b>P337+P313</b>      | If eye irritation persists: Get medical advice/attention.                                                                        |

## Precautionary statement(s) Storage

|                  |                                                                              |
|------------------|------------------------------------------------------------------------------|
| <b>P405</b>      | Store locked up.                                                             |
| <b>P410+P412</b> | Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F. |

## Precautionary statement(s) Disposal

|             |                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>P501</b> | Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation. |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|

No further product hazard information.

## SECTION 3 Composition / information on ingredients

### Substances

See section below for composition of Mixtures

### Mixtures

| CAS No        | %[weight] | Name                                            |
|---------------|-----------|-------------------------------------------------|
| 127-18-4      | 20-40     | <u>perchloroethylene</u>                        |
| 75-09-2       | 5-20      | <u>methylene chloride</u>                       |
| 142-82-5      | 20-40     | <u>heptane</u>                                  |
| 124-38-9      | 1-9       | <u>carbon dioxide</u>                           |
| Not Available |           | NOTE: Manufacturer has supplied full ingredient |
| Not Available |           | information to allow CHEMWATCH assessment.      |

**Legend:** 1. Classified by Chemwatch; 2. Classification drawn from CCID EPA NZ; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; \* EU IOELVs available

## SECTION 4 First aid measures

### Description of first aid measures

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye Contact</b>  | <p>If aerosols come in contact with the eyes:</p> <ul style="list-style-type: none"><li>▶ Immediately hold the eyelids apart and flush the eye continuously for at least 15 minutes with fresh running water.</li><li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li><li>▶ Transport to hospital or doctor without delay.</li><li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li></ul>                                              |
| <b>Skin Contact</b> | <p>If solids or aerosol mists are deposited upon the skin:</p> <ul style="list-style-type: none"><li>▶ Flush skin and hair with running water (and soap if available).</li><li>▶ Remove any adhering solids with industrial skin cleansing cream.</li><li>▶ <b>DO NOT use solvents.</b></li><li>▶ Seek medical attention in the event of irritation.</li></ul>                                                                                                                                                                                                                                            |
| <b>Inhalation</b>   | <p>If aerosols, fumes or combustion products are inhaled:</p> <ul style="list-style-type: none"><li>▶ Remove to fresh air.</li><li>▶ Lay patient down. Keep warm and rested.</li><li>▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li><li>▶ 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.</li><li>▶ Transport to hospital, or doctor.</li></ul> |
| <b>Ingestion</b>    | <ul style="list-style-type: none"><li>▶ Avoid giving milk or oils.</li><li>▶ Avoid giving alcohol.</li></ul> <p>Not considered a normal route of entry.</p> <p>If poisoning occurs, contact a doctor or Poisons Information Centre.</p>                                                                                                                                                                                                                                                                                                                                                                   |

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

For acute or short term repeated exposures to petroleum distillates or related hydrocarbons:

- ▶ Primary threat to life, from pure petroleum distillate ingestion and/or inhalation, is respiratory failure.
- ▶ Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO<sub>2</sub> 50 mm Hg) should be intubated.
- ▶ Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
- ▶ A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.
- ▶ Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
- ▶ Lavage is indicated in patients who require decontamination; ensure use of cuffed endotracheal tube in adult patients. [Ellenhorn and Barceloux: Medical Toxicology]

for intoxication due to Freons/ Halons;

A: Emergency and Supportive Measures

- ▶ Maintain an open airway and assist ventilation if necessary
- ▶ Treat coma and arrhythmias if they occur. Avoid (adrenaline) epinephrine or other sympathomimetic amines that may precipitate ventricular arrhythmias. Tachyarrhythmias caused by increased myocardial sensitisation may be treated with propranolol, 1-2 mg IV or esmolol 25-100 microgm/kg/min IV.
- ▶ Monitor the ECG for 4-6 hours

B: Specific drugs and antidotes:

- ▶ There is no specific antidote

C: Decontamination

- ▶ Inhalation; remove victim from exposure, and give supplemental oxygen if available.
- ▶ Ingestion; (a) Prehospital: Administer activated charcoal, if available. **DO NOT** induce vomiting because of rapid absorption and the risk of abrupt onset CNS depression. (b) Hospital: Administer activated charcoal, although the efficacy of charcoal is unknown. Perform gastric lavage only if the ingestion was very large and recent (less than 30 minutes)

D: Enhanced elimination:

- ▶ There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.

**POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition**

- ▶ Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.
- ▶ No specific antidote.
- ▶ Because rapid absorption may occur through lungs if aspirated and cause systematic effects, the decision of whether to induce vomiting or not should be made by an attending physician.
- ▶ If lavage is performed, suggest endotracheal and/or esophageal control.
- ▶ Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.
- ▶ Treatment based on judgment of the physician in response to reactions of the patient

Treat symptomatically.

For acute or short term repeated exposures to perchloroethylene:

- ▶ Tetrachloroethylene / perchloroethylene is well absorbed through the lungs with peak levels more important than duration in determining blood concentration. Lungs excrete most of the absorbed tetrachloroethylene in an unchanged state; about 3% is converted by the liver to form trichloroacetic acid and subsequently excreted by the kidney. Exhaled material has a biological half-life of 65 hours.

**INHALATION:**

- ▶ The treatment of acute inhalation exposures is supportive with initial attention directed to evaluation / support of ventilation and circulation. As with all hydrocarbons care must be taken to reduce the risk of aspiration by proper positioning and medical observation.

#### INGESTION:

- ▶ The ingestion level at which emesis should be induced is difficult to predict in the absence of extensive human studies.
- ▶ The role of charcoal and cathartics remains uncertain.

#### [Ellenhorn and Barceloux: Medical Toxicology]

#### BIOLOGICAL EXPOSURE INDEX - BEI

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

| Determinant                             | Index  | Sampling Time                    | Comments |
|-----------------------------------------|--------|----------------------------------|----------|
| 1. Perchloroethylene in end-exhaled air | 10 ppm | Prior to last shift of work-week |          |
| 2. Perchloroethylene in blood           | 1 mg/L | Prior to last shift of work-week |          |
| 3. Trichloroacetic acid in urine        | 7 mg/L | End of work-week                 | NS, SQ   |

NS: Non-specific determinant; also seen after exposure to other materials

SQ: Semi-quantitative determinant - Interpretation may be ambiguous; should be used as a screening test or confirmatory test.

## SECTION 5 Firefighting measures

### Extinguishing media

#### SMALL FIRE:

- ▶ Water spray, dry chemical or CO<sub>2</sub>

#### LARGE FIRE:

- ▶ Water spray or fog.

### Special hazards arising from the substrate or mixture

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

### Advice for firefighters

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fire Fighting</b>         | <ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ May be violently or explosively reactive.</li> <li>▶ Wear breathing apparatus plus protective gloves.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Fire/Explosion Hazard</b> | <ul style="list-style-type: none"> <li>▶ Liquid and vapour are highly flammable.</li> <li>▶ Severe fire hazard when exposed to heat or flame.</li> <li>▶ Vapour forms an explosive mixture with air.</li> <li>▶ Severe explosion hazard, in the form of vapour, when exposed to flame or spark.</li> </ul> <p>Combustion products include:</p> <ul style="list-style-type: none"> <li>▶ carbon dioxide (CO<sub>2</sub>)</li> </ul> <p>hydrogen chloride<br/>phosgene</p> <ul style="list-style-type: none"> <li>▶ other pyrolysis products typical of burning organic material.</li> </ul> <p><b>Contains low boiling substance:</b> Closed containers may rupture due to pressure buildup under fire conditions.<br/>May emit clouds of acrid smoke</p> |

## 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

|                     |                                                                                                                                                                                                                                                                                                                   |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Minor Spills</b> | <ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours and contact with skin and eyes.</li> <li>▶ Wear protective clothing, impervious gloves and safety glasses.</li> <li>▶ Shut off all possible sources of ignition and increase ventilation.</li> </ul> |
| <b>Major Spills</b> | <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ May be violently or explosively reactive.</li> <li>▶ Wear breathing apparatus plus protective gloves.</li> </ul>                          |

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

## SECTION 7 Handling and storage

### Precautions for safe handling

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Safe handling</b>     | <ul style="list-style-type: none"> <li>▶ Avoid skin contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hollows and sumps.</li> </ul>                                                                                                                                                                                                                                                             |
| <b>Other information</b> | <ul style="list-style-type: none"> <li>▶ Store below 38 deg. C.</li> <li>▶ Keep dry to avoid corrosion of cans. Corrosion may result in container perforation and internal pressure may eject contents of can</li> <li>▶ Store in original containers in approved flammable liquid storage area.</li> <li>▶ <b>DO NOT store in pits, depressions, basements or areas where vapours may be trapped.</b></li> <li>▶ No smoking, naked lights, heat or ignition sources.</li> <li>▶ Keep containers securely sealed.</li> </ul> |

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

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Suitable container</b>      | <ul style="list-style-type: none"> <li>▶ <b>DO NOT use aluminium or galvanised containers</b></li> <li>▶ Aerosol dispenser.</li> <li>▶ Check that containers are clearly labelled.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Storage incompatibility</b> | <ul style="list-style-type: none"> <li>▶ Haloalkenes are highly reactive.</li> <li>▶ Some of the more lightly substituted lower members are highly flammable; many members of the group are peroxidisable and polymerisable.</li> <li>▶ Avoid reaction or contact with potassium or its alloys - although apparently stable on contact with a wide range of halocarbons, reaction products may be shock-sensitive and may explode with great violence on light impact. Severity generally increases with the degree of halocarbon substitution and potassium-sodium alloys give extremely sensitive mixtures.</li> </ul> <p>Tetrachloroethylene:</p> <ul style="list-style-type: none"> <li>▶ decomposes slowly in contact with water or moisture forming trichloroacetic acid and hydrochloric acid</li> <li>▶ reacts violently with concentrated nitric acid (producing carbon dioxide), strong oxidisers, strong alkalis, powdered chemically active metals such as aluminium, barium, beryllium, lithium, zinc</li> <li>▶ is incompatible with nitrogen tetroxide, finely divided metals</li> <li>▶ decomposes in UV light, on contact with red-hot metals, and at temperatures above 150 C, releasing hydrogen chloride, carbon monoxide and phosgene</li> <li>▶ corrodes metals in the presence of moisture</li> <li>▶ can oxidise in presence of air and light.</li> </ul> <p>The presence of 0.5% trichloroethylene as an impurity caused generation of dichloroacetylene during unheated drying over solid sodium hydroxide. Subsequent fractional distillation produced an explosion.</p> <ul style="list-style-type: none"> <li>▶ Segregate from alcohol, water.</li> </ul> |

## SECTION 8 Exposure controls / personal protection

### Control parameters

#### Occupational Exposure Limits (OEL)

#### INGREDIENT DATA

| Source                                         | Ingredient         | Material name                           | TWA                   | STEL                    | Peak          | Notes                                                                             |
|------------------------------------------------|--------------------|-----------------------------------------|-----------------------|-------------------------|---------------|-----------------------------------------------------------------------------------|
| New Zealand Workplace Exposure Standards (WES) | perchloroethylene  | Perchloroethylene (Tetrachloroethylene) | 20 ppm / 136 mg/m3    | 271 mg/m3 / 40 ppm      | Not Available | carcinogen category 1 - Known or presumed human carcinogen skin - Skin absorption |
| New Zealand Workplace Exposure Standards (WES) | methylene chloride | Dichloromethane (Methylene chloride)    | 50 ppm / 174 mg/m3    | Not Available           | Not Available | carcinogen category 2 - Suspected human carcinogen                                |
| New Zealand Workplace Exposure Standards (WES) | heptane            | Heptane (n-Heptane)                     | 400 ppm / 1640 mg/m3  | 2050 mg/m3 / 500 ppm    | Not Available | oto - Ototoxin                                                                    |
| New Zealand Workplace Exposure Standards (WES) | carbon dioxide     | Carbon dioxide                          | 5000 ppm / 9000 mg/m3 | 54000 mg/m3 / 30000 ppm | Not Available | Not Available                                                                     |

### Exposure controls

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Appropriate engineering controls</b> | <p><b>CARE:</b> Use of a quantity of this material in confined space or poorly ventilated area, where rapid build up of concentrated atmosphere may occur, could require increased ventilation and/or protective gear</p> <p>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.</p> <p>The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>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.</p> |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Individual protection measures, such as personal protective equipment</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Eye and face protection</b>                                               | <ul style="list-style-type: none"> <li>▶ No special equipment for minor exposure i.e. when handling small quantities.</li> <li>▶ OTHERWISE: For potentially moderate or heavy exposures:</li> <li>▶ Safety glasses with side shields.</li> <li>▶ NOTE: Contact lenses pose a special hazard; soft lenses may absorb irritants and ALL lenses concentrate them.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Skin protection</b>                                                       | See Hand protection below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hands/feet protection</b>                                                 | <p>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.</p> <p>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.</p> <p>Personal hygiene is a key element of effective hand care.</p> <ul style="list-style-type: none"> <li>▶ Neoprene rubber gloves</li> <li>▶ No special equipment needed when handling small quantities.</li> <li>▶ OTHERWISE:</li> <li>▶ For potentially moderate exposures:</li> <li>▶ Wear general protective gloves, eg. light weight rubber gloves.</li> <li>▶ For potentially heavy exposures:</li> <li>▶ Wear chemical protective gloves, eg. PVC. and safety footwear.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Body protection</b>                                                       | See Other protection below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Other protection</b>                                                      | <ul style="list-style-type: none"> <li>▶ 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.</li> <li>▶ Avoid dangerous levels of charge by ensuring a low resistivity of the surface material worn outermost.</li> </ul> <p>BRETHERRICK: Handbook of Reactive Chemical Hazards.</p> <ul style="list-style-type: none"> <li>▶ Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.</li> <li>▶ For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).</li> <li>▶ 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 and shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds.</li> </ul> <p>No special equipment needed when handling small quantities.</p> <p><b>OTHERWISE:</b></p> <ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ Skin cleansing cream.</li> <li>▶ Eyewash unit.</li> </ul> |

## Recommended material(s)

### GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

**"Forsberg Clothing Performance Index".**

The effect(s) of the following substance(s) are taken into account in the

**computer-generated** selection:

Brakleen Aerosol

| Material          | CPI |
|-------------------|-----|
| BUTYL             | C   |
| CPE               | C   |
| HYPALON           | C   |
| NATURAL RUBBER    | C   |
| NEOPRENE          | C   |
| NITRILE           | C   |
| NITRILE+PVC       | C   |
| PE/EVAL/PE        | C   |
| PVA               | C   |
| PVC               | C   |
| SARANEX-23        | C   |
| SARANEX-23 2-PLY  | C   |
| TEFLON            | C   |
| VITON             | C   |
| VITON/BUTYL       | C   |
| VITON/CHLOROBUTYL | C   |
| VITON/NITRILE     | C   |

## 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.

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

^ - 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 odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.

\* 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.

Ansell Glove Selection

|                                           |
|-------------------------------------------|
| <b>Glove — In order of recommendation</b> |
| AlphaTec® 38-612                          |
| BioClean™ Ultimate BUPS                   |
| AlphaTec® 53-001                          |
| AlphaTec® 58-005                          |
| MICROFLEX® LifeStar EC™ 93-868            |
| MICROFLEX® MidKnight® XTRA 93-862         |
| AlphaTec® Solvex® 37-175                  |
| BioClean™ Emerald BENS                    |
| BioClean™ Extra BLAS                      |
| BioClean™ Fusion (Sterile) S-BFAP         |

The suggested gloves for use should be confirmed with the glove supplier.

- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used
- ▶ Positive pressure, full face, air-supplied breathing apparatus should be used for work in enclosed spaces if a leak is suspected or the primary containment is to be opened (e.g. for a cylinder change)
- ▶ Air-supplied breathing apparatus is required where release of gas from primary containment is either suspected or demonstrated.

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

|                                                       |                                                                                                                                                                              |                                                            |                |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------|
| <b>Appearance</b>                                     | Clear, water white, flammable liquid with ethereal odour; not miscible with water. Supplied as an aerosol pack. Contents under PRESSURE. Contains carbon dioxide propellant. |                                                            |                |
| <b>Physical state</b>                                 | Liquid                                                                                                                                                                       | <b>Relative density (Water = 1)</b>                        | 1.07           |
| <b>Odour</b>                                          | Not Available                                                                                                                                                                | <b>Partition coefficient n-octanol / water</b>             | Not Available  |
| <b>Odour threshold</b>                                | Not Available                                                                                                                                                                | <b>Auto-ignition temperature (°C)</b>                      | Not Available  |
| <b>pH (as supplied)</b>                               | Not Applicable                                                                                                                                                               | <b>Decomposition temperature (°C)</b>                      | Not Available  |
| <b>Melting point / freezing point (°C)</b>            | Not Available                                                                                                                                                                | <b>Viscosity (cSt)</b>                                     | Not Available  |
| <b>Initial boiling point and boiling range (°C)</b>   | 40 initial                                                                                                                                                                   | <b>Molecular weight (g/mol)</b>                            | Not Applicable |
| <b>Flash point (°C)</b>                               | 10                                                                                                                                                                           | <b>Taste</b>                                               | Not Available  |
| <b>Evaporation rate</b>                               | Not Available                                                                                                                                                                | <b>Explosive properties</b>                                | Not Available  |
| <b>Flammability</b>                                   | HIGHLY FLAMMABLE.                                                                                                                                                            | <b>Oxidising properties</b>                                | Not Available  |
| <b>Upper Explosive Limit (%)</b>                      | 22                                                                                                                                                                           | <b>Surface Tension (dyn/cm or mN/m)</b>                    | Not Available  |
| <b>Lower Explosive Limit (%)</b>                      | 1.4                                                                                                                                                                          | <b>Volatile Component (%vol)</b>                           | 100            |
| <b>Vapour pressure (kPa)</b>                          | 26.6 @ 20 C                                                                                                                                                                  | <b>Gas group</b>                                           | Not Available  |
| <b>Solubility in water</b>                            | Immiscible                                                                                                                                                                   | <b>pH as a solution (1%)</b>                               | Not Applicable |
| <b>Vapour density (Air = 1)</b>                       | >1                                                                                                                                                                           | <b>VOC g/L</b>                                             | Not Available  |
| <b>Heat of Combustion (kJ/g)</b>                      | Not Available                                                                                                                                                                | <b>Ignition Distance (cm)</b>                              | Not Available  |
| <b>Flame Height (cm)</b>                              | Not Available                                                                                                                                                                | <b>Flame Duration (s)</b>                                  | Not Available  |
| <b>Enclosed Space Ignition Time Equivalent (s/m3)</b> | Not Available                                                                                                                                                                | <b>Enclosed Space Ignition Deflagration Density (g/m3)</b> | Not Available  |

SECTION 10 Stability and reactivity

|                   |               |
|-------------------|---------------|
| <b>Reactivity</b> | See section 7 |
|-------------------|---------------|

|                                           |                                                                                                                                                                                                            |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Chemical stability</b>                 | <ul style="list-style-type: none"> <li>▸ Elevated temperatures.</li> <li>▸ Presence of open flame.</li> <li>▸ Product is considered stable.</li> <li>▸ Hazardous polymerisation will not occur.</li> </ul> |
| <b>Possibility of hazardous reactions</b> | See section 7                                                                                                                                                                                              |
| <b>Conditions to avoid</b>                | See section 7                                                                                                                                                                                              |
| <b>Incompatible materials</b>             | See section 7                                                                                                                                                                                              |
| <b>Hazardous decomposition products</b>   | See section 5                                                                                                                                                                                              |

## SECTION 11 Toxicological information

### Information on toxicological effects

|                                             |                                                                                                              |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>a) Acute Toxicity</b>                    | There is sufficient evidence to classify this material as acutely toxic.                                     |
| <b>b) Skin Irritation/Corrosion</b>         | There is sufficient evidence to classify this material as skin corrosive or irritating.                      |
| <b>c) Serious Eye Damage/Irritation</b>     | There is sufficient evidence to classify this material as eye damaging or irritating                         |
| <b>d) Respiratory or Skin sensitisation</b> | Based on available data, the classification criteria are not met.                                            |
| <b>e) Mutagenicity</b>                      | Based on available data, the classification criteria are not met.                                            |
| <b>f) Carcinogenicity</b>                   | There is sufficient evidence to classify this material as carcinogenic                                       |
| <b>g) Reproductivity</b>                    | Based on available data, the classification criteria are not met.                                            |
| <b>h) STOT - Single Exposure</b>            | There is sufficient evidence to classify this material as toxic to specific organs through single exposure   |
| <b>i) STOT - Repeated Exposure</b>          | There is sufficient evidence to classify this material as toxic to specific organs through repeated exposure |
| <b>j) Aspiration Hazard</b>                 | Based on available data, the classification criteria are not met.                                            |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Inhaled</b>      | <p>Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo.</p> <p>Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.</p> <p>There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.</p> <p>Inhalation hazard is increased at higher temperatures.</p> <p>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.</p> <p>Central nervous system (CNS) depression may include general 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.</p> <p>Inhalation, by humans, of 1000 parts per million (0.1%) heptanes for 6 minutes was associated with slight dizziness; inhalation of higher concentrations for shorter periods, resulted in vertigo and inco-ordination, and hilarity. Central nervous system involvement occurs very early, even before mucous membrane irritation. Animal testing showed exposure to 1.5-2% for 30 minutes may be fatal. Brief exposure (4 minutes) to 0.5% caused nausea, loss of appetite, and a "gasoline taste" that persisted for several hours after exposure ended.</p> <p>Acute intoxication by halogenated aliphatic hydrocarbons appears to take place over two stages. Signs of a reversible narcosis are evident in the first stage and in the second stage signs of injury to organs may become evident, a single organ alone is (almost) never involved.</p> <p>Depression of the central nervous system is the most outstanding effect of most halogenated aliphatic hydrocarbons. Inebriation and excitation, passing into narcosis, is a typical reaction. In severe acute exposures there is always a danger of death from respiratory failure or cardiac arrest due to a tendency to make the heart more susceptible to catecholamines (adrenalin)</p> <p>Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.</p> <p><b>WARNING: Intentional misuse by concentrating/inhaling contents may be lethal.</b></p> <p>Exposure to high levels of tetrachloroethylene by oral or inhalation may cause dose dependent light-headedness, mood and behavioural changes, seizure, unconsciousness, abnormal bilirubin level, liver and kidney damage in workers. Sudden death may result from anaesthetic doses probably due to depression of the respiratory centre or heart dysfunction. Human studies showed dose dependent neurologic symptoms. It may cause irritation of the eyes, airways and skin.</p> <p>Anaesthetics and narcotic effects (with dulling of senses and odour fatigue) are a consequence of exposure to chlorinated solvents.</p> <p>Individual response varies widely; odour may not be considered objectionable at levels which quickly induce central nervous system effects. High vapour concentrations may give a feeling of euphoria. This may result in reduced responses, followed by rapid onset of unconsciousness, possible respiratory arrest and death.</p> |
| <b>Ingestion</b>    | <p>Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. (ICSC13733)</p> <p>Accidental ingestion of the material may be damaging to the health of the individual.</p> <p>When tetrachloroethylene is used in the treatment of hookworm (4.5 to 6.5 gm orally) the only adverse effect is a drunken-like state. Transient liver toxicity in patients given single oral doses of up to 5 ml had been recorded.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Skin Contact</b> | Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <p>There is some evidence to suggest that the material may cause significant and severe 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.</p> <p>Spray mist may produce discomfort Fluorocarbons remove natural oils from the skin, causing irritation, dryness and sensitivity. Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> <p>Industrial experience shows that exposure to tetrachloroethylene produces localised skin irritation while prolonged skin contact can cause chemical burns and blistering.</p> <p>Absorption by skin may readily exceed vapour inhalation exposure. Symptoms for skin absorption are the same as for inhalation.</p>                                                                                                                                                                                                                                                                                                                                                                                                           |
| Eye     | <p>Limited evidence or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals. Prolonged eye contact may cause inflammation characterised by a temporary redness of the conjunctiva (similar to windburn).</p> <p>Not considered to be a risk because of the extreme volatility of the gas.</p> <p>Irritation of the eyes may produce a heavy secretion of tears (lachrymation).</p> <p>Exposure to high concentrations of tetrachloroethylene vapour causes mild to severe eye irritation, burning or stinging sensations depending on the dose and duration of exposure. Colour vision has equally being reported which is attributed to neurological rather than a direct effect on the eyes.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Chronic | <p>There has been 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.</p> <p>There is some evidence from animal testing that exposure to this material may result in reduced fertility.</p> <p>There is some evidence from animal testing that exposure to this material may result in toxic effects to the unborn baby. Main route of exposure to the gas in the workplace is by inhalation.</p> <p>Exposure to tetrachloroethylene noted in dry cleaners causes menstrual disorder and miscarriage, liver dysfunction, headache and dizziness. Studies done showed high mortality rate resulting from cancers of the lung, cervix, gullet, kidney, skin, lymph/blood system, and colon in dry cleaners and laundry workers. Liver cancer was detected in females but none in male laundry and dry cleaners. However, there is not sufficient statistical data to make an absolute conclusion.</p> <p>The reactivity of an epoxide intermediate may be the reason for the cancer-causing properties of halogenated oxiranes. It is reported that 1,1-dichloroethyne, vinyl chloride, trichloroethylene, tetrachloroethylene and chloroprene all cause cancer. Generally speaking, substances with one halogen substitution show higher potential to cause cancer compared to substances with two.</p> |

| Brakleen Aerosol   | TOXICITY                                            | IRRITATION                                                       |
|--------------------|-----------------------------------------------------|------------------------------------------------------------------|
|                    | Not Available                                       | Not Available                                                    |
| perchloroethylene  | TOXICITY                                            | IRRITATION                                                       |
|                    | Dermal (rabbit) LD50: >10000 mg/kg <sup>[1]</sup>   | Eye (Rodent - rabbit): 162mg - Mild                              |
|                    | Inhalation (Mouse) LC50: 35 mg/l4h <sup>[2]</sup>   | Eye (Rodent - rabbit): 500mg/24H - Mild                          |
|                    | Oral (Rat) LD50: 2629 mg/kg <sup>[2]</sup>          | Eye: adverse effect observed (irritating) <sup>[1]</sup>         |
|                    |                                                     | Skin (Rodent - rabbit): 500mg/24H - Mild                         |
|                    |                                                     | Skin (Rodent - rabbit): 810mg/24H - Severe                       |
|                    |                                                     | Skin: adverse effect observed (irritating) <sup>[1]</sup>        |
|                    |                                                     | Skin: no adverse effect observed (not irritating) <sup>[1]</sup> |
| methylene chloride | TOXICITY                                            | IRRITATION                                                       |
|                    | dermal (rat) LD50: >2000 mg/kg <sup>[2]</sup>       | Eye (Rodent - rabbit): 10mg - Mild                               |
|                    | Inhalation (Rat) LC50: 76 mg/L4h <sup>[2]</sup>     | Eye (Rodent - rabbit): 162mg - Moderate                          |
|                    | Oral (Rat) LD50: 1600 mg/kg <sup>[2]</sup>          | Eye (Rodent - rabbit): 500mg/24H - Mild                          |
|                    |                                                     | Eye: adverse effect observed (irritating) <sup>[1]</sup>         |
|                    |                                                     | Skin (Rodent - rabbit): 100mg/24H - Moderate                     |
|                    |                                                     | Skin (Rodent - rabbit): 810mg/24H - Severe                       |
|                    |                                                     | Skin: adverse effect observed (irritating) <sup>[1]</sup>        |
| heptane            | TOXICITY                                            | IRRITATION                                                       |
|                    | Dermal (rabbit) LD50: >2000 mg/kg <sup>[1]</sup>    | Eye: no adverse effect observed (not irritating) <sup>[1]</sup>  |
|                    | Inhalation (Rat) LC50: >29.29 mg/l4h <sup>[1]</sup> | Skin: adverse effect observed (irritating) <sup>[1]</sup>        |
|                    | Oral (Rat) LD50: >5000 mg/kg <sup>[1]</sup>         | Skin: no adverse effect observed (not irritating) <sup>[1]</sup> |
| carbon dioxide     | TOXICITY                                            | IRRITATION                                                       |
|                    | Not Available                                       | Not Available                                                    |

**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

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PERCHLOROETHYLENE                      | <p>Disinfection byproducts (DBPs) are formed when disinfectants such as chlorine, chloramines and ozone react with organic and inorganic matter in water. Animal studies have shown that some DBPs cause cancer. To date, several hundred DBPs have been identified.</p> <p>Numerous haloalkanes and haloalkenes have been tested for cancer-causing and mutation-causing activities. In general, the potential to cause genetic toxicity is dependent on the nature, number and position of halogen(s) and the size of the molecule. The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> |
| METHYLENE CHLORIDE                     | <p>Inhalation (human) TCLO: 500 ppm/ 1 y - I Eye(rabbit): 10 mg - mild</p> <p>The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| PERCHLOROETHYLENE & METHYLENE CHLORIDE | <p>The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.</p> <p><b>WARNING:</b> This substance has been classified by the IARC as Group 2A: Probably Carcinogenic to Humans.</p>                                                                                                                                                                                                                                                                                                                        |

|                                   |   |                          |   |
|-----------------------------------|---|--------------------------|---|
| Acute Toxicity                    | ✓ | Carcinogenicity          | ✓ |
| Skin Irritation/Corrosion         | ✓ | Reproductivity           | ✗ |
| Serious Eye Damage/Irritation     | ✓ | STOT - Single Exposure   | ✓ |
| Respiratory or Skin sensitisation | ✗ | STOT - Repeated Exposure | ✓ |
| Mutagenicity                      | ✗ | Aspiration Hazard        | ✗ |

Legend: ✗ – Data either not available or does not fill the criteria for classification  
 ✓ – Data available to make classification

## SECTION 12 Ecological information

### Toxicity

| Brakleen Aerosol   | Endpoint      | Test Duration (hr) | Species                       | Value         | Source        |
|--------------------|---------------|--------------------|-------------------------------|---------------|---------------|
|                    | Not Available | Not Available      | Not Available                 | Not Available | Not Available |
| perchloroethylene  | Endpoint      | Test Duration (hr) | Species                       | Value         | Source        |
|                    | EC50          | 72h                | Algae or other aquatic plants | ~0.2mg/L      | 4             |
|                    | BCF           | 1344h              | Fish                          | 25.8-77.1     | 7             |
|                    | EC50          | 48h                | Crustacea                     | 22mg/l        | 1             |
|                    | EC50(ECx)     | 24h                | Crustacea                     | 3.2mg/l       | 1             |
|                    | EC50          | 96h                | Algae or other aquatic plants | 500mg/l       | 1             |
|                    | LC50          | 96h                | Fish                          | >3<6mg/l      | 4             |
| methylene chloride | Endpoint      | Test Duration (hr) | Species                       | Value         | Source        |
|                    | BCF           | 1008h              | Fish                          | 2-5.4         | 7             |
|                    | EC50          | 72h                | Algae or other aquatic plants | 202-286mg/l   | 4             |
|                    | EC50          | 48h                | Crustacea                     | 108.5mg/l     | 1             |
|                    | NOEC(ECx)     | 24h                | Algae or other aquatic plants | 0.98mg/l      | 4             |
|                    | EC50          | 96h                | Algae or other aquatic plants | 0.98mg/l      | 4             |
|                    | LC50          | 96h                | Fish                          | 2-3.3mg/l     | 4             |
| heptane            | Endpoint      | Test Duration (hr) | Species                       | Value         | Source        |
|                    | EC50          | 48h                | Crustacea                     | 0.4mg/l       | 2             |
|                    | NOEC(ECx)     | 504h               | Crustacea                     | 0.17mg/l      | 2             |
|                    | LC50          | 96h                | Fish                          | 0.11mg/l      | 2             |
| carbon dioxide     | Endpoint      | Test Duration (hr) | Species                       | Value         | Source        |
|                    | LC50          | 96h                | Fish                          | 35mg/l        | 1             |

Substances containing unsaturated carbons are ubiquitous in indoor environments. They result from many sources (see below). Most are reactive with environmental ozone and many produce stable products which are thought to adversely affect human health. The potential for surfaces in an enclosed space to facilitate reactions should be considered.

Source of unsaturated substances      Unsaturated substances (Reactive Emissions)      Major Stable Products produced following reaction with ozone.

For Haloalkanes:

Atmospheric Fate: Fully, or partially, fluorinated haloalkanes released to the air can restrict heat loss from the Earth's atmosphere by absorbing infrared emissions from the surface. The major fate of haloalkanes in the atmosphere is via breakdown by hydroxyl radicals. These substances react with atmospheric ozone and nitrates, which also causes them to change, (transform). Chlorofluorocarbons, (CFC), haloalkanes can break down into chlorine atoms in the air, which also contribute to ozone destruction.

For n-Heptane: Log Kow: 4.66; Koc: 2400-8100; Half-life (hr) Air: 52.8; Half-life (hr) Surface Water: 2.9-312; Henry's atm m3 /mol: 2.06; BOD 5 (if unstated): 1.92; COD: 0.06; BCF: 340-2000; Log BCF: 2.53-3.31.

Atmospheric Fate: Breakdown of n-heptane by sunlight is not expected to be an important fate process. If released to the atmosphere, n-heptane is expected to exist entirely in the vapor phase, in ambient air. Reactions hydroxyl radicals in the atmosphere have been shown to be important.

For Tetrachloroethylene (Synonym: Perchloroethylene): log Koc: 2.38 - 2.9. 7; Koc: 209 – 1685; Half-life (hr) H2O surface water: 26.4-2664; Henry's atm m3 /mol: 1.49E-02; BOD 5: 0.06; COD: 0.39; BCF: 38.9-226; Log BCF: 1.59.

Atmospheric Fate: Long-range global transport of tetrachloroethylene is likely. Dry deposition does not appear to be a significant removal process, although substantial evaporation from dry surfaces can be predicted.

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

## Persistence and degradability

| Ingredient         | Persistence: Water/Soil     | Persistence: Air                 |
|--------------------|-----------------------------|----------------------------------|
| perchloroethylene  | HIGH (Half-life = 720 days) | MEDIUM (Half-life = 160.13 days) |
| methylene chloride | LOW (Half-life = 56 days)   | HIGH (Half-life = 191 days)      |
| heptane            | LOW                         | LOW                              |
| carbon dioxide     | LOW                         | LOW                              |

## Bioaccumulative potential

| Ingredient         | Bioaccumulation      |
|--------------------|----------------------|
| perchloroethylene  | LOW (BCF = 77.1)     |
| methylene chloride | LOW (BCF = 40)       |
| heptane            | HIGH (LogKOW = 4.66) |
| carbon dioxide     | LOW (LogKOW = 0.83)  |

## Mobility in soil

| Ingredient         | Mobility               |
|--------------------|------------------------|
| perchloroethylene  | LOW (Log KOC = 106.8)  |
| methylene chloride | LOW (Log KOC = 23.74)  |
| heptane            | LOW (Log KOC = 274.7)  |
| carbon dioxide     | HIGH (Log KOC = 1.498) |

## SECTION 13 Disposal considerations

### Waste treatment methods

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product / Packaging disposal</b> | <p>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.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <ul style="list-style-type: none"> <li>▸ Reduction</li> <li>▸ Reuse</li> <li>▸ Recycling</li> <li>▸ Disposal (if all else fails)</li> </ul> <p>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use.</p> <ul style="list-style-type: none"> <li>▸ <b>DO NOT</b> allow wash water from cleaning or process equipment to enter drains.</li> <li>▸ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</li> <li>▸ Where in doubt contact the responsible authority.</li> <li>▸ Consult State Land Waste Management Authority for disposal.</li> <li>▸ Discharge contents of damaged aerosol cans at an approved site.</li> <li>▸ Allow small quantities to evaporate.</li> <li>▸ <b>DO NOT</b> incinerate or puncture aerosol cans.</li> </ul> |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Disposal Requirements

Packages that have been in direct contact with the hazardous substance must be only disposed if the hazardous substance was appropriately removed and cleaned out from the package. The package must be disposed according to the manufacturer's directions taking into account the material it is made of. Packages which hazardous content have been appropriately treated and removed may be recycled.

The hazardous substance must only be disposed if it has been treated by a method that changed the characteristics or composition of the substance and it is no longer hazardous.

SECTION 14 Transport information

Labels Required

|                  |                                                                                   |
|------------------|-----------------------------------------------------------------------------------|
|                  |  |
| Marine Pollutant |  |
| HAZCHEM          | Not Applicable                                                                    |

Land transport (UN)

|                                    |                           |                             |
|------------------------------------|---------------------------|-----------------------------|
| 14.1. UN number or ID number       | 1950                      |                             |
| 14.2. UN proper shipping name      | AEROSOLS                  |                             |
| 14.3. Transport hazard class(es)   | Class                     | 2.1                         |
|                                    | Subsidiary Hazard         | Not Applicable              |
| 14.4. Packing group                | Not Applicable            |                             |
| 14.5. Environmental hazard         | Environmentally hazardous |                             |
| 14.6. Special precautions for user | Special provisions        | 63; 190; 277; 327; 344; 381 |
|                                    | Limited quantity          | 1000ml                      |

Air transport (ICAO-IATA / DGR)

|                                    |                                                           |                   |
|------------------------------------|-----------------------------------------------------------|-------------------|
| 14.1. UN number                    | 1950                                                      |                   |
| 14.2. UN proper shipping name      | Aerosols, flammable (engine starting fluid)               |                   |
| 14.3. Transport hazard class(es)   | ICAO/IATA Class                                           | 2.1               |
|                                    | ICAO / IATA Subsidiary Hazard                             | Not Applicable    |
|                                    | ERG Code                                                  | 10L               |
| 14.4. Packing group                | Not Applicable                                            |                   |
| 14.5. Environmental hazard         | Environmentally hazardous                                 |                   |
| 14.6. Special precautions for user | Special provisions                                        | A1 A145 A167 A802 |
|                                    | Cargo Only Packing Instructions                           | 203               |
|                                    | Cargo Only Maximum Qty / Pack                             | 150 kg            |
|                                    | Passenger and Cargo Packing Instructions                  | Forbidden         |
|                                    | Passenger and Cargo Maximum Qty / Pack                    | Forbidden         |
|                                    | Passenger and Cargo Limited Quantity Packing Instructions | Forbidden         |
|                                    | Passenger and Cargo Limited Maximum Qty / Pack            | Forbidden         |

Sea transport (IMDG-Code / GGVSee)

|                 |      |
|-----------------|------|
| 14.1. UN number | 1950 |
|-----------------|------|

|                                    |                        |                            |  |
|------------------------------------|------------------------|----------------------------|--|
| 14.2. UN proper shipping name      | AEROSOLS               |                            |  |
| 14.3. Transport hazard class(es)   | IMDG Class             | 2.1                        |  |
|                                    | IMDG Subsidiary Hazard | Not Applicable             |  |
| 14.4. Packing group                | Not Applicable         |                            |  |
| 14.5 Environmental hazard          | Marine Pollutant       |                            |  |
| 14.6. Special precautions for user | EMS Number             | F-D, S-U                   |  |
|                                    | Special provisions     | 63 190 277 327 344 381 959 |  |
|                                    | Limited Quantities     | 1000 ml                    |  |

14.7. Maritime transport in bulk according to IMO instruments

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

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

| Product name       | Group          |
|--------------------|----------------|
| perchloroethylene  | Not Applicable |
| methylene chloride | Not Applicable |
| heptane            | Not Applicable |
| carbon dioxide     | Not Applicable |

14.7.3. Transport in bulk in accordance with the IGC Code

| Product name       | Ship Type      |
|--------------------|----------------|
| perchloroethylene  | Not Applicable |
| methylene chloride | Not Applicable |
| heptane            | Not Applicable |
| carbon dioxide     | Not Applicable |

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

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

| HSR Number | Group Standard                                        |
|------------|-------------------------------------------------------|
| HSR002517  | Aerosols (Flammable, Toxic [6.7]) Group Standard 2017 |

Please refer to Section 8 of the SDS for any applicable tolerable exposure limit or Section 12 for environmental exposure limit.

perchloroethylene is found on the following regulatory lists

- Chemical Footprint Project - Chemicals of High Concern List
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans
- New Zealand Approved Hazardous Substances with controls
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data
- New Zealand Inventory of Chemicals (NZIoC)
- New Zealand Workplace Exposure Standards (WES)

methylene chloride is found on the following regulatory lists

- Chemical Footprint Project - Chemicals of High Concern List
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans
- New Zealand Approved Hazardous Substances with controls
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data
- New Zealand Inventory of Chemicals (NZIoC)
- New Zealand Workplace Exposure Standards (WES)

heptane is found on the following regulatory lists

|                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------|
| New Zealand Approved Hazardous Substances with controls                                                           |
| New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals                       |
| New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data |
| New Zealand Inventory of Chemicals (NZIoC)                                                                        |
| New Zealand Workplace Exposure Standards (WES)                                                                    |

carbon dioxide is found on the following regulatory lists

|                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------|
| FEI Equine Prohibited Substances List - Controlled Medication                                                     |
| FEI Equine Prohibited Substances List (EPSL)                                                                      |
| New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals                       |
| New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data |
| New Zealand Inventory of Chemicals (NZIoC)                                                                        |
| New Zealand Workplace Exposure Standards (WES)                                                                    |

Additional Regulatory Information

Not Applicable

Hazardous Substance Location

Subject to the Health and Safety at Work (Hazardous Substances) Regulations 2017.

| Hazard Class | Quantity (Closed Containers)       | Quantity (Open Containers)         |
|--------------|------------------------------------|------------------------------------|
| 2.1.2A       | 3 000 L (aggregate water capacity) | 3 000 L (aggregate water capacity) |

Certified Handler

Subject to Part 4 of the Health and Safety at Work (Hazardous Substances) Regulations 2017.

| Class of substance | Quantities     |
|--------------------|----------------|
| Not Applicable     | Not Applicable |

Refer Group Standards for further information

Maximum quantities of certain hazardous substances permitted on passenger service vehicles

Subject to Regulation 13.14 of the Health and Safety at Work (Hazardous Substances) Regulations 2017.

| Hazard Class | Gas (aggregate water capacity in mL) | Liquid (L) | Solid (kg) | Maximum quantity per package for each classification |
|--------------|--------------------------------------|------------|------------|------------------------------------------------------|
| 2.1.2A       |                                      |            |            | 1L (aggregate water capacity)                        |

Tracking Requirements

Not Applicable

National Inventory Status

| National Inventory                                | Status                                                                                  |
|---------------------------------------------------|-----------------------------------------------------------------------------------------|
| Australia - AIIC / Australia Non-Industrial Use   | Yes                                                                                     |
| Canada - DSL                                      | Yes                                                                                     |
| Canada - NDSL                                     | No (perchloroethylene; methylene chloride; heptane; carbon dioxide)                     |
| China - IECSC                                     | Yes                                                                                     |
| Europe - EINEC / ELINCS / NLP                     | Yes                                                                                     |
| Japan - ENCS                                      | Yes                                                                                     |
| Korea - KECI                                      | Yes                                                                                     |
| New Zealand - NZIoC                               | Yes                                                                                     |
| Philippines - PICCS                               | Yes                                                                                     |
| USA - TSCA                                        | All chemical substances in this product have been designated as TSCA Inventory ‘Active’ |
| Taiwan - TCSI                                     | Yes                                                                                     |
| Mexico - INSQ                                     | Yes                                                                                     |
| Vietnam - NCI                                     | Yes                                                                                     |
| Russia - FBEPH                                    | Yes                                                                                     |
| UAE - Control List (Banned/Restricted Substances) | No (perchloroethylene; methylene chloride; heptane; carbon dioxide)                     |
| Legend:                                           | Yes = All CAS declared ingredients are on the inventory                                 |

| National Inventory | Status                                                                                                                                        |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
|                    | <i>No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.</i> |

## SECTION 16 Other information

|               |            |
|---------------|------------|
| Revision Date | 10/12/2021 |
| Initial Date  | 20/02/2001 |

### SDS Version Summary

| Version | Date of Update | Sections Updated                                                                                                                     |
|---------|----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 9.1     | 22/04/2021     | Hazards identification - Classification, Identification of the substance / mixture and of the company / undertaking - Synonyms, Name |
| 10.1    | 10/12/2021     | Classification change due to full database hazard calculation/update.                                                                |

### 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.

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
- ES: Exposure Standard
- 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
- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration
- MARPOL: International Convention for the Prevention of Pollution from Ships
- IMSBC: International Maritime Solid Bulk Cargoes Code
- IGC: International Gas Carrier Code
- IBC: International Bulk Chemical Code
  
- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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