



## Contact Cleaner Plus #131-6324, 232-4356 (AUS)

### RS Components

Chemwatch: 5582-84

Version No: 2.1

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Chemwatch Hazard Alert Code: 3

Issue Date: 09/01/2023

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L.GHS.AUS.EN.E

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

#### Product Identifier

|                               |  |
|-------------------------------|--|
| Product name                  | Contact Cleaner Plus #131-6324, 232-4356 (AUS) |
| Chemical Name                 | Not Applicable                                 |
| Synonyms                      | Product Code: 131-6324; 232-4356               |
| 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 | Cleaners - precision. |
|--------------------------|-----------------------|

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

|                         |  |
|-------------------------|--|
| Registered company name | RS Components  |
| Address                 | 25 Pavesi Street Smithfield NSW 2164 Australia                 |
| Telephone               | +1 300 656 636   |
| Fax                     | +1 300 656 696   |
| Website                 | <a href="http://www.au.rs-online.com">www.au.rs-online.com</a> |
| Email                   | Not Available  |

#### Emergency telephone number

|                                   |                              |
|-----------------------------------|------------------------------|
| Association / Organisation        | CHEMWATCH EMERGENCY RESPONSE |
| Emergency telephone numbers       | +61 1800 951 288             |
| Other emergency telephone numbers | +61 3 9573 3188              |

Once connected and if the message is not in your preferred language then please dial 01

### SECTION 2 Hazards identification

#### Classification of the substance or mixture

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

#### Chemwatch Hazard Ratings

|              | Min | Max |
|--------------|-----|-----|
| Flammability | 3   | 1   |
| Toxicity     | 1   | 1   |
| Body Contact | 2   | 1   |
| Reactivity   | 1   | 1   |
| Chronic      | 0   | 1   |

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

|                    |  |
|--------------------|--|
| Poisons Schedule   | Not Applicable   |
| Classification [1] | Aerosols Category 1, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2A, Specific Target Organ Toxicity - Single Exposure (Narcotic Effects) Category 3, Hazardous to the Aquatic Environment Long-Term Hazard Category 2 |
| Legend:            | 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI  |

#### Label elements

## Contact Cleaner Plus #131-6324, 232-4356 (AUS)

|                     |   |
|---------------------|---|
| Hazard pictogram(s) |  |
|---------------------|---|

|             |               |
|-------------|---------------|
| Signal word | <b>Danger</b> |
|-------------|---------------|

**Hazard statement(s)**

|           |  |
|-----------|--|
| AUH044    | Risk of explosion if heated under confinement.                           |
| H222+H229 | Extremely flammable aerosol. Pressurized container: may burst if heated. |
| H315      | Causes skin irritation.  |
| H319      | Causes serious eye irritation.   |
| H336      | May cause drowsiness or dizziness.                                       |
| H411      | Toxic to aquatic life with long lasting effects.                         |

**Precautionary statement(s) Prevention**

|      |  |
|------|--|
| P210 | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| P211 | Do not spray on an open flame or other ignition source.  |
| P251 | Do not pierce or burn, even after use.   |
| P271 | Use only outdoors or in a well-ventilated area.  |
| P261 | Avoid breathing mist/vapours/spray.  |
| P273 | Avoid release to the environment.  |
| P280 | Wear protective gloves, protective clothing, eye protection and face protection.               |
| P264 | Wash all exposed external body areas thoroughly after handling.                                |

**Precautionary statement(s) Response**

|                |  |
|----------------|--|
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P312           | Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.  |
| P337+P313      | If eye irritation persists: Get medical advice/attention.  |
| P391           | Collect spillage.  |
| P302+P352      | IF ON SKIN: Wash with plenty of water and soap.  |
| P304+P340      | IF INHALED: Remove person to fresh air and keep comfortable for breathing.   |
| P332+P313      | If skin irritation occurs: Get medical advice/attention.   |
| P362+P364      | Take off contaminated clothing and wash it before reuse.   |

**Precautionary statement(s) Storage**

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

**Precautionary statement(s) Disposal**

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

**SECTION 3 Composition / information on ingredients****Substances**

See section below for composition of Mixtures

**Mixtures**

| CAS No       | %[weight] | Name  |
|--------------|-----------|---|
| 64742-49-0.  | 25-50     | <u>naphtha petroleum, light, hydrotreated</u>                               |
| 109-66-0     | 25-50     | <u>n-pentane</u>  |
| 92128-66-0   | 10-25     | <u>hydrocarbons, C6-7</u>   |
| 1174522-15-6 | 1-5       | <u>hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, &lt;2% aromatic</u> |
| 124-38-9     | 1-5       | <u>carbon dioxide</u>   |

**Legend:** 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 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**

|             |   |
|-------------|---|
| Eye Contact | If aerosols come in contact with the eyes:<br>► Immediately hold the eyelids apart and flush the eye continuously for at least 15 minutes with fresh running water. |
|-------------|---|

Continued...

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|                     |   |
|---------------------|---|
|                     | <ul style="list-style-type: none"> <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>► <b>If swallowed do NOT induce vomiting.</b></li> <li>► If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> <li>► Observe the patient carefully.</li> <li>► Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</li> <li>► Give water to rinse out mouth, then provide liquid slowly and as much as casually can comfortably drink.</li> <li>► Seek medical advice.</li> </ul>                          |

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

For petroleum distillates

- In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption - decontamination (induced emesis or lavage) is controversial and should be considered on the merits of each individual case; of course the usual precautions of an endotracheal tube should be considered prior to lavage, to prevent aspiration.
- Individuals intoxicated by petroleum distillates should be hospitalized immediately, with acute and continuing attention to neurologic and cardiopulmonary function.
- Positive pressure ventilation may be necessary.
- Acute central nervous system signs and symptoms may result from large ingestions of aspiration-induced hypoxia.
- After the initial episode, individuals should be followed for changes in blood variables and the delayed appearance of pulmonary oedema and chemical pneumonitis. Such patients should be followed for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated.
- Gastrointestinal symptoms are usually minor and pathological changes of the liver and kidneys are reported to be uncommon in acute intoxications.
- Chlorinated and non-chlorinated hydrocarbons may sensitize the heart to epinephrine and other circulating catecholamines so that arrhythmias may occur. Careful consideration of this potential adverse effect should precede administration of epinephrine or other cardiac stimulants and the selection of bronchodilators.

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Treat symptomatically.

**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> | <ul style="list-style-type: none"> <li>► Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result</li> </ul> |
|-----------------------------|--|

**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> <li>► If safe, switch off electrical equipment until vapour fire hazard removed.</li> <li>► Use water delivered as a fine spray to control fire and cool adjacent area.</li> <li>► <b>DO NOT</b> approach containers suspected to be hot.</li> <li>► Cool fire exposed containers with water spray from a protected location.</li> <li>► If safe to do so, remove containers from path of fire.</li> <li>► Equipment should be thoroughly decontaminated after use.</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> <li>► Vapour may travel a considerable distance to source of ignition.</li> <li>► Heating may cause expansion or decomposition with violent container rupture.</li> <li>► Aerosol cans may explode on exposure to naked flames.</li> <li>► Rupturing containers may rocket and scatter burning materials.</li> <li>► Hazards may not be restricted to pressure effects.</li> <li>► May emit acrid, poisonous or corrosive fumes.</li> <li>► On combustion, may emit toxic fumes of carbon monoxide (CO).</li> </ul> <p>Combustion products include:</p> <p>carbon monoxide (CO)<br/>carbon dioxide (CO<sub>2</sub>)<br/>other pyrolysis products typical of burning organic material.</p> <p><b>Contains low boiling substance:</b> Closed containers may rupture due to pressure buildup under fire conditions.</p> |
| <b>HAZCHEM</b>               | Not Applicable  |

**SECTION 6 Accidental release measures**

Continued...

**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> <li>▶ Wipe up.</li> <li>▶ If safe, damaged cans should be placed in a container outdoors, away from all ignition sources, until pressure has dissipated.</li> <li>▶ Undamaged cans should be gathered and stowed safely.</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> <li>▶ Prevent, by any means available, spillage from entering drains or water courses</li> <li>▶ No smoking, naked lights or ignition sources.</li> <li>▶ Increase ventilation.</li> <li>▶ Stop leak if safe to do so.</li> <li>▶ Water spray or fog may be used to disperse / absorb vapour.</li> <li>▶ Absorb or cover spill with sand, earth, inert materials or vermiculite.</li> <li>▶ If safe, damaged cans should be placed in a container outdoors, away from ignition sources, until pressure has dissipated.</li> <li>▶ Undamaged cans should be gathered and stowed safely.</li> <li>▶ Collect residues and seal in labelled drums for disposal.</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>▶ <b>DO NOT</b> allow clothing wet with material to stay in contact with skin</li> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hollows and sumps.</li> <li>▶ <b>DO NOT</b> enter confined spaces until atmosphere has been checked.</li> <li>▶ Avoid smoking, naked lights or ignition sources.</li> <li>▶ Avoid contact with incompatible materials.</li> <li>▶ <b>When handling, DO NOT</b> eat, drink or smoke.</li> <li>▶ <b>DO NOT</b> incinerate or puncture aerosol cans.</li> <li>▶ <b>DO NOT</b> spray directly on humans, exposed food or food utensils.</li> <li>▶ Avoid physical damage to containers.</li> <li>▶ Always wash hands with soap and water after handling.</li> <li>▶ Work clothes should be laundered separately.</li> <li>▶ Use good occupational work practice.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> <li>▶ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.</li> </ul> |
| <b>Other information</b> | <ul style="list-style-type: none"> <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</b> store in pits, depressions, basements or areas where vapours may be trapped.</li> <li>▶ No smoking, naked lights, heat or ignition sources.</li> <li>▶ Keep containers securely sealed. Contents under pressure.</li> <li>▶ Store away from incompatible materials.</li> <li>▶ Store in a cool, dry, well ventilated area.</li> <li>▶ Avoid storage at temperatures higher than 40 deg C.</li> <li>▶ Store in an upright position.</li> <li>▶ Protect containers against physical damage.</li> <li>▶ Check regularly for spills and leaks.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> </ul>  |

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

|                                |   |
|--------------------------------|---|
| <b>Suitable container</b>      | <ul style="list-style-type: none"> <li>▶ Aerosol dispenser.</li> <li>▶ Check that containers are clearly labelled.</li> </ul> |
| <b>Storage incompatibility</b> | <ul style="list-style-type: none"> <li>▶ Avoid reaction with oxidising agents</li> </ul>                                      |

**SECTION 8 Exposure controls / personal protection****Control parameters****Occupational Exposure Limits (OEL)****INGREDIENT DATA**

| Source                       | Ingredient | Material name | TWA                  | STEL                 | Peak          | Notes         |
|------------------------------|------------|---------------|----------------------|----------------------|---------------|---------------|
| Australia Exposure Standards | n-pentane  | Pentane       | 600 ppm / 1770 mg/m3 | 2210 mg/m3 / 750 ppm | Not Available | Not Available |

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| Source                       | Ingredient     | Material name                | TWA                     | STEL                    | Peak          | Notes         |
|------------------------------|----------------|------------------------------|-------------------------|-------------------------|---------------|---------------|
| Australia Exposure Standards | carbon dioxide | Carbon dioxide in coal mines | 12500 ppm / 22500 mg/m3 | 54000 mg/m3 / 30000 ppm | Not Available | Not Available |
| Australia Exposure Standards | carbon dioxide | Carbon dioxide               | 5000 ppm / 9000 mg/m3   | 54000 mg/m3 / 30000 ppm | Not Available | Not Available |

**Emergency Limits**

| Ingredient                             | TEEL-1      | TEEL-2       | TEEL-3        |
|--|-------------|--------------|---------------|
| naphtha petroleum, light, hydrotreated | 1,000 mg/m3 | 11,000 mg/m3 | 66,000 mg/m3  |
| n-pentane                              | 3000* ppm   | 33000*** ppm | 200000*** ppm |

| Ingredient   | Original IDLH | Revised IDLH  |
|--|---------------|---------------|
| naphtha petroleum, light, hydrotreated                               | Not Available | Not Available |
| n-pentane  | 1,500 ppm     | Not Available |
| hydrocarbons, C6-7   | Not Available | Not Available |
| hydrocarbons, C11-14<br>n-alkanes, isoalkanes, cyclics, <2% aromatic | Not Available | Not Available |
| carbon dioxide   | 40,000 ppm    | Not Available |

**Occupational Exposure Banding**

| Ingredient                             | Occupational Exposure Band Rating | Occupational Exposure Band Limit |
|--|-----------------------------------|----------------------------------|
| naphtha petroleum, light, hydrotreated | E                                 | ≤ 0.1 ppm                        |
| hydrocarbons, C6-7                     | E                                 | ≤ 0.1 ppm                        |

|               |   |
|---------------|---|
| <b>Notes:</b> | <i>Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.</i> |
|---------------|---|

**MATERIAL DATA**

NOTE P: The classification as a carcinogen need not apply if it can be shown that the substance contains less than 0.01% w/w benzene (EINECS No 200-753-7). Note E shall also apply when the substance is classified as a carcinogen. This note applies only to certain complex oil-derived substances in Annex VI. European Union (EU) List of harmonised classification and labelling hazardous substances, Table 3.1, Annex VI, Regulation (EC) No 1272/2008 (CLP) - up to the latest ATP

**Exposure controls**

|   |  |                                  |
|---|--|----------------------------------|
| <b>Appropriate engineering controls</b> | <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   |                                  |
|   | Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.   |                                  |
|   | The basic types of engineering controls are:   |                                  |
|   | Process controls which involve changing the way a job activity or process is done to reduce the risk.  |                                  |
|   | Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.  |                                  |
|   | Employers may need to use multiple types of controls to prevent employee overexposure.   |                                  |
|   | General exhaust is adequate under normal conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection.   |                                  |
|   | Provide adequate ventilation in warehouse or closed storage areas.   |                                  |
|   | Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.  |                                  |
|   | Type of Contaminant:   | Speed:                           |
|   | aerosols, (released at low velocity into zone of active generation)  | 0.5-1 m/s                        |
|   | direct spray, spray painting in shallow booths, gas discharge (active generation into zone of rapid air motion)  | 1-2.5 m/s (200-500 f/min.)       |
|   | Within each range the appropriate value depends on:  |                                  |
|   | Lower end of the range   | Upper end of the range           |
|   | 1: Room air currents minimal or favourable to capture  | 1: Disturbing room air currents  |
|   | 2: Contaminants of low toxicity or of nuisance value only.   | 2: Contaminants of high toxicity |
|   | 3: Intermittent, low production.   | 3: High production, heavy use    |
|   | 4: Large hood or large air mass in motion  | 4: Small hood-local control only |
|   | Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used. |                                  |
| <b>Personal protection</b>              |       |                                  |

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|                                |  |
|--------------------------------|--|
| <b>Eye and face protection</b> | <ul style="list-style-type: none"> <li>Safety glasses with side shields.</li> <li>Chemical goggles.</li> <li>Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]</li> <li>Close fitting gas tight goggles</li> </ul> <p><b>DO NOT wear contact lenses.</b></p> |
| <b>Skin protection</b>         | See Hand protection below  |
| <b>Hands/feet protection</b>   | <ul style="list-style-type: none"> <li>Neoprene rubber gloves</li> <li>No special equipment needed when handling small quantities.</li> <li><b>OTHERWISE:</b> <ul style="list-style-type: none"> <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> </li> </ul>   |
| <b>Body protection</b>         | See Other protection below   |
| <b>Other protection</b>        | <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> <li>Do not spray on hot surfaces.</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:

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| Material         | CPI |
|------------------|-----|
| PVA              | A   |
| VITON            | A   |
| NITRILE          | B   |
| NEOPRENE         | C   |
| NEOPRENE/NATURAL | C   |
| NITRILE+PVC      | C   |
| PVC              | C   |

\* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

**NOTE:** As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

\* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

**Respiratory protection**

Type 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 5 x ES                       | Air-line*            | AX-2                 | AX-PAPR-2 ^            |
| up to 10 x ES                      | -                    | AX-3                 | -                      |
| 10+ x ES                           | -                    | Air-line**           | -                      |

\* - Continuous Flow; \*\* - Continuous-flow or positive pressure demand

^ - 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(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), 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.
- 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

Aerosols, in common with most vapours/mists, should never be used in confined spaces without adequate ventilation. Aerosols, containing agents designed to enhance or mask smell, have triggered allergic reactions in predisposed individuals.

**SECTION 9 Physical and chemical properties****Information on basic physical and chemical properties**

|  |  |  |               |
|--|--|--|---------------|
| <b>Appearance</b>                          | Colourless highly flammable liquid with solvent like odour; does not mix with water. |  |               |
| <b>Physical state</b>                      | Liquid   | <b>Relative density (Water = 1)</b>            | 0.67 @20C     |
| <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>          | >200          |
| <b>pH (as supplied)</b>                    | Not Applicable   | <b>Decomposition temperature (°C)</b>          | Not Available |
| <b>Melting point / freezing point (°C)</b> | -129.7   | <b>Viscosity (cSt)</b>                         | Not Available |

Continued...

## Contact Cleaner Plus #131-6324, 232-4356 (AUS)

|  |                   |                                  |                |
|--|-------------------|----------------------------------|----------------|
| Initial boiling point and boiling range (°C) | Not Available     | Molecular weight (g/mol)         | Not Applicable |
| Flash point (°C)                             | <0 (CC)           | Taste                            | Not Available  |
| Evaporation rate                             | Not Available     | Explosive properties             | Not Available  |
| Flammability                                 | HIGHLY FLAMMABLE. | Oxidising properties             | Not Available  |
| Upper Explosive Limit (%)                    | 7.8               | Surface Tension (dyn/cm or mN/m) | Not Available  |
| Lower Explosive Limit (%)                    | 1.5               | Volatile Component (%vol)        | Not Available  |
| Vapour pressure (kPa)                        | Not Available     | Gas group                        | Not Available  |
| Solubility in water                          | Immiscible        | pH as a solution (1%)            | Not Applicable |
| Vapour density (Air = 1)                     | Not Available     | VOC g/L                          | 700            |

## SECTION 10 Stability and reactivity

|                                    |  |
|------------------------------------|--|
| Reactivity                         | See section 7  |
| Chemical stability                 | <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> |
| Possibility of hazardous reactions | See section 7  |
| Conditions to avoid                | See section 7  |
| Incompatible materials             | See section 7  |
| Hazardous decomposition products   | See section 5  |

## SECTION 11 Toxicological information

## Information on toxicological effects

|              |   |
|--------------|---|
| Inhaled      | <p>Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination 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>Inhalation hazard is increased at higher temperatures.</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>Acute effects from inhalation of high concentrations of vapour are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterised by headache and dizziness, increased reaction time, fatigue and loss of co-ordination</p> <p><b>WARNING: Intentional misuse by concentrating/inhaling contents may be lethal.</b></p>  |
| Ingestion    | <p>Not normally a hazard due to physical form of product.</p> <p>Considered an unlikely route of entry in commercial/industrial environments</p>  |
| Skin Contact | <p>Evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects.</p> <p>Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>   |
| Eye          | <p>Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals.</p> <p>Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.</p> <p>Direct contact with the eye may not cause irritation because of the extreme volatility of the gas; however concentrated atmospheres may produce irritation after brief exposures..</p>  |
| Chronic      | <p>Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.</p> <p>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.</p> <p>There is some evidence to provide a presumption that human exposure to the material may result in impaired fertility on the basis of: some evidence in animal studies of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects but which is not a secondary non-specific consequence of other toxic effects.</p> <p>There is some evidence that human exposure to the material may result in developmental toxicity. This evidence is based on animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects.</p> <p>Implantation studies in rats show that paraffin oils may be tumourigenic. As a general rule the highly refined paraffins contain a lower level of suspect polycyclic aromatic hydrocarbons than less refined grades and also less than waxes derived from naphthenic base-stocks.</p> <p>Repeated or prolonged exposure to mixed hydrocarbons may produce narcosis with dizziness, weakness, irritability, concentration and/or memory loss, tremor in the fingers and tongue, vertigo, olfactory disorders, constriction of visual field, paraesthesia of the extremities, weight loss and anaemia and degenerative changes in the liver and kidney. Chronic exposure by petroleum workers, to the lighter hydrocarbons, has been associated with visual disturbances, damage to the central nervous system, peripheral neuropathies (including numbness and paraesthesia), psychological and neurophysiological deficits, bone marrow toxicities (including hypoplasia possibly due to benzene) and hepatic</p> |

Continued...

and renal involvement. Chronic dermal exposure to petroleum hydrocarbons may result in defatting which produces localised dermatoses. Surface cracking and erosion may also increase susceptibility to infection by microorganisms. One epidemiological study of petroleum refinery workers has reported elevations in standard mortality ratios for skin cancer along with a dose-response relationship indicating an association between routine workplace exposure to petroleum or one of its constituents and skin cancer, particularly melanoma. Other studies have been unable to confirm this finding.

Hydrocarbon solvents are liquid hydrocarbon fractions derived from petroleum processing streams, containing only carbon and hydrogen atoms, with carbon numbers ranging from approximately C5-C20 and boiling between approximately 35-370 deg C. Many of the hydrocarbon solvents have complex and variable compositions with constituents of 4 types, alkanes (normal paraffins, isoparaffins, and cycloparaffins) and aromatics (primarily alkylated one- and two-ring species). Despite the compositional complexity, most hydrocarbon solvent constituents have similar toxicological properties, and the overall toxicological hazards can be characterized in generic terms. Hydrocarbon solvents can cause chemical pneumonitis if aspirated into the lung, and those that are volatile can cause acute CNS effects and/or ocular and respiratory irritation at exposure levels exceeding occupational recommendations. Otherwise, there are few toxicologically important effects. The exceptions, n-hexane and naphthalene, have unique toxicological properties

**Animal studies:**

No deaths or treatment related signs of toxicity were observed in rats exposed to light alkylate naphtha (paraffinic hydrocarbons) at concentrations of 668, 2220 and 6646 ppm for 6 hrs/day, 5 days/wk for 13 weeks. Increased liver weights and kidney toxicity (male rats) was observed in high dose animals. Exposure to pregnant rats at concentrations of 137, 3425 and 6850 ppm did not adversely affect reproduction or cause maternal or foetal toxicity. Lifetime skin painting studies in mice with similar naphthas have shown weak or no carcinogenic activity following prolonged and repeated exposure. Similar naphthas/distillates, when tested at nonirritating dose levels, did not show any significant carcinogenic activity indicating that this tumorigenic response is likely related to chronic irritation and not to dose. The mutagenic potential of naphthas has been reported to be largely negative in a variety of mutagenicity tests. The exact relationship between these results and human health is not known. Some components of this product have been shown to produce a species specific, sex hormonal dependent kidney lesion in male rats from repeated oral or inhalation exposure. Subsequent research has shown that the kidney damage develops via the formation of a alpha-2u-globulin, a mechanism unique to the male rat. Humans do not form alpha-2u-globulin, therefore, the kidney effects resulting from this mechanism are not relevant in human.

Chronic exposure to pentanes may result in chemical pneumonitis, pulmonary oedema or peripheral neuropathy. Prolonged or repeated inhalation may cause dizziness, weakness, weight loss, anaemia, nervousness, pain in the limbs and peripheral numbness ("pins and needles")

**WARNING: Aerosol containers may present pressure related hazards.**

Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS]

|   |   |   |
|---|---|---|
| Contact Cleaner Plus #131-6324, 232-4356 (AUS)                    | <b>TOXICITY</b>   | <b>IRRITATION</b>   |
|   | Dermal (Rabbit) LD50: 3798 mg/kg <sup>[2]</sup>   | Not Available   |
|   | Inhalation (Rat) LC50: 225564 mg/m <sup>3</sup> /4h <sup>[2]</sup>  |   |
| <b>TOXICITY</b>   |   |   |
| naphtha petroleum, light, hydrotreated                            | Dermal (rabbit) LD50: >1900 mg/kg <sup>[1]</sup>  | Eye: no adverse effect observed (not irritating) <sup>[1]</sup> |
|   | Inhalation(Rat) LC50: >4.42 mg/l4h <sup>[1]</sup>   | Skin: adverse effect observed (irritating) <sup>[1]</sup>       |
|   | Oral (Rat) LD50: >2000 mg/kg <sup>[1]</sup>   |   |
| n-pentane   | <b>TOXICITY</b>   | <b>IRRITATION</b>   |
|   | Dermal (rabbit) LD50: 3000 mg/kg <sup>[2]</sup>   | Not Available   |
|   | Inhalation(Rat) LC50: >25.3 mg/l4h <sup>[1]</sup>   |   |
| hydrocarbons, C6-7  | <b>TOXICITY</b>   | <b>IRRITATION</b>   |
|   | dermal (rat) LD50: >2800-3100 mg/kg <sup>[1]</sup>  | Not Available   |
|   | Inhalation(Rat) LC50: >25.2 mg/l4h <sup>[1]</sup>   |   |
| hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic | <b>TOXICITY</b>   | <b>IRRITATION</b>   |
|   | Dermal (rabbit) LD50: >5000 mg/kg <sup>[2]</sup>  | Not Available   |
|   | Oral (Rat) LD50: >5000 mg/kg <sup>[2]</sup>   |   |
| carbon dioxide  | <b>TOXICITY</b>   | <b>IRRITATION</b>   |
|   | 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 |   |

|  |  |
|--|--|
| NAPHTHA PETROLEUM, LIGHT, HYDROTREATED | DHC Solvent Chemie (for EC No.: 926-605-8)<br>For Low Boiling Point Naphthas (LBNPs):<br><b>Acute toxicity:</b><br>LBNPs generally have low acute toxicity by the oral (median lethal dose [LD50] in rats > 2000 mg/kg-bw), inhalation (LD50 in rats > 5000 mg/m <sup>3</sup> ) and dermal (LD50 in rabbits > 2000 mg/kg-bw) routes of exposure<br>Most LBNPs are mild to moderate eye and skin irritants in rabbits, with the exception of heavy catalytic cracked and heavy catalytic reformed naphthas, which have higher primary skin irritation indices.<br><b>Sensitisation:</b><br>LBNPs do not appear to be skin sensitizers, but a poor response in the positive control was also noted in these studies<br><b>Repeat dose toxicity:</b><br>The lowest-observed-adverse-effect concentration (LOAEC) and lowest-observed-adverse-effect level (LOAEL) values identified following short-term (2-89 days) and subchronic (greater than 90 days) exposure to the LBNP substances. These values were determined for a variety of endpoints after considering the toxicity data for all LBNPs in the group. Most of the studies were carried out by the inhalation route of exposure. |
|  |  |

Renal effects, including increased kidney weight, renal lesions (renal tubule dilation, necrosis) and hyaline droplet formation, observed in male rats exposed orally or by inhalation to most LBNPs, were considered species- and sex-specific. These effects were determined to be due to a mechanism of action not relevant to humans -specifically, the interaction between hydrocarbon metabolites and alpha-2-microglobulin, an enzyme not produced in substantial amounts in female rats, mice and other species, including humans. The resulting nephrotoxicity and subsequent carcinogenesis in male rats were therefore not considered in deriving LOAEC/LOAEL values.

Only a limited number of studies of short-term and subchronic duration were identified for site-restricted LBNPs. The lowest LOAEC identified in these studies, via the inhalation route, is 5475 mg/m<sup>3</sup>, based on a concentration-related increase in liver weight in both male and female rats following a 13-week exposure to light catalytic cracked naphtha. Shorter exposures of rats to this test substance resulted in nasal irritation at 9041 mg/m<sup>3</sup>.

No systemic toxicity was reported following dermal exposure to light catalytic cracked naphtha, but skin irritation and accompanying histopathological changes were increased, in a dose-dependent manner, at doses as low as 30 mg/kg-bw per day when applied 5 days per week for 90 days in rats.

No non-cancer chronic toxicity studies (= 1 year) were identified for site-restricted LBNPs and very few non-cancer chronic toxicity studies were identified for other LBNPs. An LOAEC of 200 mg/m<sup>3</sup> was noted in a chronic inhalation study that exposed mice and rats to unleaded gasoline (containing 2% benzene). This inhalation LOAEC was based on ocular discharge and ocular irritation in rats. At the higher concentration of 6170 mg/m<sup>3</sup>, increased kidney weight was observed in male and female rats (increased kidney weight was also observed in males only at 870 mg/m<sup>3</sup>). Furthermore, decreased body weight in male and female mice was also observed at 6170 mg/m<sup>3</sup>.

A LOAEL of 714 mg/kg-bw was identified for dermal exposure based on local skin effects (inflammatory and degenerative skin changes) in mice following application of naphtha for 105 weeks. No systemic toxicity was reported.

#### Genotoxicity:

Although few genotoxicity studies were identified for the site-restricted LBNPs, the genotoxicity of several other LBNP substances has been evaluated using a variety of in vivo and in vitro assays. While in vivo genotoxicity assays were negative overall, the in vitro tests exhibited mixed results.

For in vivo genotoxicity tests, LBNPs exhibited negative results for chromosomal aberrations and micronuclei induction, but exhibited positive results in one sister chromatid exchange assay although this result was not considered definitive for clastogenic activity as no genetic material was unbalanced or lost. Mixtures that were tested, which included a number of light naphthas, displayed mixed results (i.e., both positive and negative for the same assay) for chromosomal aberrations and negative results for the dominant lethal mutation assay. Unleaded gasoline (containing 2% benzene) was tested for its ability to induce unscheduled deoxyribonucleic acid (DNA) synthesis (UDS) and replicative DNA synthesis (RDS) in rodent hepatocytes and kidney cells. UDS and RDS were induced in mouse hepatocytes via oral exposure and RDS was induced in rat kidney cells via oral and inhalation exposure. Unleaded gasoline (benzene content not stated) exhibited negative results for chromosomal aberrations and the dominant lethal mutation assay and mixed results for atypical cell foci in rodent renal and hepatic cells.

For in vitro genotoxicity studies, LBNPs were negative for six out of seven Ames tests, and were also negative for UDS and for forward mutations. LBNPs exhibited mixed or equivocal results for the mouse lymphoma and sister chromatid exchange assays, as well as for cell transformation and positive results for one bacterial DNA repair assay. Mixtures that were tested, which included a number of light naphthas, displayed negative results for the Ames and mouse lymphoma assays. Gasoline exhibited negative results for the Ames test battery, the sister chromatid exchange assay and for one mutagenicity assay. Mixed results were observed for UDS and the mouse lymphoma assay.

While the majority of in vivo genotoxicity results for LBNP substances are negative, the potential for genotoxicity of LBNPs as a group cannot be discounted based on the mixed in vitro genotoxicity results.

#### Carcinogenicity:

Although a number of epidemiological studies have reported increases in the incidence of a variety of cancers, the majority of these studies are considered to contain incomplete or inadequate information. Limited data, however, are available for skin cancer and leukemia incidence, as well as mortality among petroleum refinery workers. It was concluded that there is limited evidence supporting the view that working in petroleum refineries entails a carcinogenic risk (Group 2A carcinogen). IARC (1989a) also classified gasoline as a Group 2B carcinogen; it considered the evidence for carcinogenicity in humans from gasoline to be inadequate and noted that published epidemiological studies had several limitations, including a lack of exposure data and the fact that it was not possible to separate the effects of combustion products from those of gasoline itself. Similar conclusions were drawn from other reviews of epidemiological studies for gasoline (US EPA 1987a, 1987b). Thus, the evidence gathered from these epidemiological studies is considered to be inadequate to conclude on the effect of human exposure to LBNP substances.

No inhalation studies assessing the carcinogenicity of the site-restricted LBNPs were identified. Only unleaded gasoline has been examined for its carcinogenic potential, in several inhalation studies. In one study, rats and mice were exposed to 0, 200, 870 or 6170 mg/m<sup>3</sup> of a 2% benzene formulation of the test substance, via inhalation, for approximately 2 years. A statistically significant increase in hepatocellular adenomas and carcinomas, as well as a non-statistical increase in renal tumours, were observed at the highest dose in female mice. A dose-dependent increase in the incidence of primary renal neoplasms was also detected in male rats, but this was not considered to be relevant to humans, as discussed previously. Carcinogenicity was also assessed for unleaded gasoline, via inhalation, as part of initiation/promotion studies. In these studies, unleaded gasoline did not appear to initiate tumour formation, but did show renal cell and hepatic tumour promotion ability, when rats and mice were exposed, via inhalation, for durations ranging from 13 weeks to approximately 1 year using an initiation/promotion protocol. However, further examination of data relevant to the composition of unleaded gasoline demonstrated that this is a highly-regulated substance; it is expected to contain a lower percentage of benzene and has a discrete component profile when compared to other substances in the LBNP group.

Both the European Commission and the International Agency for Research on Cancer (IARC) have classified LBNP substances as carcinogenic. All of these substances were classified by the European Commission (2008) as Category 2 (R45: may cause cancer) (benzene content = 0.1% by weight). IARC has classified gasoline, an LBNP, as a Group 2B carcinogen (possibly carcinogenic to humans) and "occupational exposures in petroleum refining" as Group 2A carcinogens (probably carcinogenic to humans).

Several studies were conducted on experimental animals to investigate the dermal carcinogenicity of LBNPs. The majority of these studies were conducted through exposure of mice to doses ranging from 694-1351 mg/kg-bw, for durations ranging from 1 year to the animals lifetime or until a tumour persisted for 2 weeks. Given the route of exposure, the studies specifically examined the formation of skin tumours. Results for carcinogenicity via dermal exposure are mixed. Both malignant and benign skin tumours were induced with heavy catalytic cracked naphtha, light catalytic cracked naphtha, light

straight-run naphtha and naphtha. Significant increases in squamous cell carcinomas were also observed when mice were dermally treated with Stoddard solvent, but the latter was administered as a mixture (90% test substance), and the details of the study were not available. In contrast, insignificant increases in tumour formation or no tumours were observed when light alkylate naphtha, heavy catalytic reformed naphtha, sweetened naphtha, light catalytically cracked naphtha or unleaded gasoline was dermally applied to mice. Negative results for skin tumours were also observed in male mice dermally exposed to sweetened naphtha using an initiation/promotion protocol.

#### Reproductive/ Developmental toxicity:

No reproductive or developmental toxicity was observed for the majority of LBNP substances evaluated. Most of these studies were carried out by inhalation exposure in rodents.

NOAEC values for reproductive toxicity following inhalation exposure ranged from 1701 mg/m<sup>3</sup> (CAS RN 8052-41-3) to 27 687 mg/m<sup>3</sup> (CAS RN 64741-63-5) for the LBNPs group evaluated, and from 7690 mg/m<sup>3</sup> to 27 059 mg/m<sup>3</sup> for the site-restricted light catalytic cracked and full-range catalytic reformed naphthas. However, a decreased number of pups per litter and higher frequency of post-implantation loss were observed following inhalation exposure of female rats to hydrotreated heavy naphtha (CAS RN 64742-48-9) at a concentration of 4679 mg/m<sup>3</sup>, 6 hours per day, from gestational days 7-20. For dermal exposures, NOAEL values of 714 mg/kg-bw (CAS RN 8030-30-6) and 1000 mg/kg-bw per day (CAS RN 68513-02-0) were noted. For oral exposures, no adverse effects on reproductive parameters were reported when rats were given site-restricted light catalytic cracked naphtha at 2000 mg/kg on gestational day 13.

For most LBNPs, no treatment-related developmental effects were observed by the different routes of exposure. However, developmental toxicity was observed for a few naphthas. Decreased foetal body weight and an increased incidence of ossification variations were observed when rat dams were exposed to light aromatic solvent naphtha, by gavage, at 1250 mg/kg-bw per day. In addition, pregnant rats exposed by inhalation to hydrotreated heavy naphtha at 4679 mg/m<sup>3</sup> delivered pups with higher birth weights. Cognitive and memory impairments were also observed in the offspring.

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## Low Boiling Point Naphthas [Site-Restricted]

The High Benzene Naphthas (HBNs; Lower Olefins and Aromatics -LOA - CAT H) Category was developed for the HPV Program by grouping ethylene manufacturing streams (products) that exhibit commonalities from both manufacturing process and compositional perspectives. intermediates. The category includes hydrocarbon product streams associated with the ethylene industry that contain significant levels of benzene, generally with a benzene content greater than 10% and averaging about 55%. This grouping of CAS numbers represents hydrocarbon streams with a carbon number distribution that is predominantly C5- C11, through components boiling at 350 C or higher..

The high benzene naphthas category contains hydrocarbons (aliphatic, aromatic and olefinic) with carbon numbers predominantly in the C5-C10 range and boiling from approximately 30 deg C to 300 deg C. Members of this category contain >0.1% benzene and contain varying amounts of toluene, xylenes and n-hexane. Some category members contain naphthalenes, isoprene and 1,3-butadiene and this has been quantified where possible

All the streams in this category are complex UVCBs containing = 50% paraffins, = 60% isoparaffins, = 90% olefins, = 90% naphthenics, =100% aromatics, and above 0.1% benzene. All streams within this category are expected to have the following classifications H304, H315 and H336, H340, H350 (given their composition) and a flammability classification (either H224 or H226, depending on the flash point and / or the boiling point)

Benzene, as the predominant component in most streams, is expected to be the key driver with respect to health effects endpoints within the SIDS battery of tests. However, as the concentration of benzene is decreased and the concentrations of other components are increased, the observed effects of benzene are expected to diminish and the effects of other components are expected to increase.

The existing epidemiology and toxicology database for the components other than benzene and for mixtures containing the components is extensive. All components present in the streams at concentrations greater than 5% have been tested in at least one toxicity study. Those components having only limited data lack structural alerts for mammalian toxicity and data exist for their structural analogs. The C5 and C6 alkanes and alkenes present in the streams are not expected to significantly contribute to the toxicity profile as these substances are present in the streams at low concentrations and, with the exception of hexane, generally have a low level of toxicity. The toxic effects of hexane (present at < 15%) are unlikely to be observed due to the presence of the other components.

**Genotoxicity:** When tested as pure substances, some of the components other than benzene have caused genetic damage and adverse target organ effects in repeated-dose animal studies. When tested as pure substances, some of the components other than benzene have caused genetic damage and adverse target organ effects in repeated-dose animal studies. However, since the biologically active components of the High Benzene Naphthas streams are metabolized through a common P450 metabolic pathway, it is anticipated that multiple components will compete for the same active enzyme sites. Component toxicities, which are dependent on the formation of biologically active metabolites, may be reduced as less metabolite(s) will be produced through competition for these sites. Direct support for reduction or elimination of toxicities of individual components is provided by results of an existing mouse bone marrow micronucleus test with one of the High Benzene Naphthas streams, Hydrotreated C6-8 Fraction. This stream, containing approximately 55% benzene, was negative in a mouse bone marrow micronucleus test when administered by oral gavage at 5000 mg/kg to male and female CD-1 mice. Several studies have shown that benzene administered orally to CD-1 mice induces high frequencies of micronuclei in bone marrow erythrocytes at doses as low as 110 mg/kg. The presence in the Hydrotreated C6-8 Fraction of other components (approximately 25% toluene, 10% xylene, 7% pentane, 7% ethylbenzene, 3% cyclohexane, and 2% hexane) apparently inhibited the expected clastogenicity of benzene. Other similar interactions between components of the category have also been reported.

**Repeat dose toxicity:** Repeated oral or inhalation exposures to many of the components of the streams in the category have been shown to cause adverse health effects in a variety of organs. However, existing data also show that antagonistic and synergistic interactions occur between some components comprising the streams.

**Developmental toxicity:** Developmental toxicity data exist for most components present in this category at concentrations greater than 5%. In these studies, no convincing evidence was seen for teratogenicity in the absence of maternal toxicity. Foetotoxicity has been reported for some components, but mostly in the presence of maternal toxicity. A Pyrolysis

Gasoline Fraction stream similar to the Pyrolysis Gasoline streams in the HBNs Category has been tested in an oral developmental toxicity study in rabbits. No developmental effects were seen.

**Reproductive toxicity:** Some data for benzene indicates adverse gonadal effects (e.g., atrophy/degeneration, decrease in spermatozoa, moderate increases in abnormal sperm forms), data on reproductive outcomes are either inconclusive or conflicting. However, most studies indicate no effects on reproductive indices, even at high doses. Reproductive organ effects were seen after inhalation exposure to isoprene and hexane.

**Gene Mutation:** Of the identified category components present at concentrations greater than 5%, only 1,3-butadiene and benzene have consistently caused gene mutations in genetic toxicity tests. 1,3- Butadiene was positive in several *in vivo* and *in vitro* tests. Benzene was negative in several standard tests but was positive in an *in vivo* HPRT gene mutation test in mouse spleenocytes. Based on the data for components, the streams in the category are predicted to be negative in the HPV gene mutation test (Ames Test). Negative Ames Tests conducted with two streams (one from this category and one similar to category streams) support this prediction

**Chromosome Aberration:** Benzene has caused chromosome aberrations in *in vitro* and *in vivo* tests. The other most prevalent component in streams in this category, toluene, is negative in both *in vitro* and *in vivo* tests. Of the remaining identified category components present at concentrations greater than 5%, only vinyl acetate, 1,3-butadiene, isoprene, hexane, and naphthalene have been reported to cause chromosome aberrations.

**For petroleum:** This product contains benzene, which can cause acute myeloid leukaemia, and n-hexane, which can be metabolized to compounds which are toxic to the nervous system. This product contains toluene, and animal studies suggest high concentrations of toluene lead to hearing loss. This product contains ethyl benzene and naphthalene, from which animal testing shows evidence of tumour formation.

**Cancer-causing potential:** Animal testing shows inhaling petroleum causes tumours of the liver and kidney; these are however not considered to be relevant in humans.

**Mutation-causing potential:** Most studies involving gasoline have returned negative results regarding the potential to cause mutations, including all recent studies in living human subjects (such as in petrol service station attendants).

**Reproductive toxicity:** Animal studies show that high concentrations of toluene (>0.1%) can cause developmental effects such as lower birth weight and developmental toxicity to the nervous system of the foetus. Other studies show no adverse effects on the foetus.

**Human effects:** Prolonged or repeated contact may cause defatting of the skin which can lead to skin inflammation and may make the skin more susceptible to irritation and penetration by other materials.

Animal testing shows that exposure to gasoline over a lifetime can cause kidney cancer, but the relevance in humans is questionable.

## N-PENTANE

[GENIUM and CCINFO, V.W.&R.]

Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.

\* REACH Dossier

## HYDROCARBONS, C6-7

May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405 Not expected to be a respiratory sensitizer. Not expected to be a skin sensitizer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406 May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material. Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 473 474 476 478 479 Not expected to cause cancer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 453 Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 413 414 415 Not expected to cause harm to breast-fed children. Not expected to cause organ

Continued...

## Contact Cleaner Plus #131-6324, 232-4356 (AUS)

damage from a single exposure. Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 408 413  
For high molecular weight aliphatic hydrocarbons:

**Acute toxicity:**

Four studies were available for acute oral toxicity, dealing with the toxicity of C5-C20 normal paraffins, C14-C17 n-alkanes, C14-C16 paraffins and isohexadecane. All studies were conducted similarly to OECD guideline 401 without GLP compliance. All studies show no mortality at concentrations up to 5000 mg/kg bw.

Three studies were available for acute dermal toxicity, dealing with the toxicity of C5-C20 normal paraffins, C14-C17 n-alkanes and C14-C16 paraffins. All studies were conducted similarly to OECD guideline 402 without GLP compliance. All studies show no mortality at concentrations equal to or higher than 2000 mg/kg bw.

A reliable study and a non-reliable study were available for acute inhalation, dealing with the toxicity of hydrocarbons, C10-C12, isoalkanes, < 2% aromatics and C14-C16 n-paraffins, respectively. All studies were conducted similarly to OECD guideline 403. They all show no mortality at concentrations equal to or higher than 5000 mg/m<sup>3</sup>.

**Sensitisation:**

C9-C14 aliphatic, < 2% aromatic hydrocarbons fluids were determined not to be skin sensitizers using Magnusson and Kligman Guinea-Pig Maximization tests (OECD TG 406). C9-C14 aliphatic, <2% aromatic hydrocarbons fluids were determined not to be skin sensitizers in Human Repeated Insult Patch Tests (HRIFT)

C10-12 isoalkanes (<2% aromatics), C11-C14 n-alkanes (<2% aromatics) and C10-C13 (<2% aromatics) were not dermal sensitizers using a Magnusson and Kligman Guinea-Pig Maximization test (OECD TG 406).

However, skin sensitization studies utilizing C9-14 aliphatics (< 2% aromatics) found no indication of skin sensitization in guinea pigs. Additional studies on C14-C20 aliphatics (<2% aromatics) in humans also found no indication of skin sensitization.

There are no reports of respiratory sensitization from C14-20 aliphatics (<2 % aromatics) in laboratory animals or humans.

**Repeat dose toxicity:**

Oral: C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids are expected to have a low order of repeated dose toxicity by the oral route of exposure. All tests were performed in a manner similar or equivalent to currently established OECD guidelines. In a repeated dose study where C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids were administered via oral gavage, no signs of toxicity were observed at the maximum experimental dose tested, 5000 mg/kg/day.

Inhalation: In a repeated dose study where C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids were administered via inhalation, no signs of toxicity were observed at 10400 mg/m<sup>3</sup>. Based on these observations, the repeat inhalation concentration NOAEL is >=10400 mg/m<sup>3</sup> (10.4 mg/L) for C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids.

Two read-across studies from the structurally analogous test materials "hydrocarbons C12-C16, n-alkanes, isoalkanes, cyclics, <2% aromatics" and "hydrocarbons, C10 -C13, n-alkanes, isoalkanes, cyclics, < 2% aromatics" were analysed. All tests were performed in a manner similar or equivalent to currently established OECD guidelines. The systemic NOAEL were determined to be higher than 1000 and 5000 mg/kg/day, respectively.

Inhalation: a repeated inhalation toxicity study was performed with "Hydrocarbons, C10 – C12, isoalkanes, < 2% aromatics" similarly to OECD guideline 413. Albino rats were exposed for 6 hours/day, 5 days/week for 13 weeks at nominal vapour concentrations of 10400 mg/m<sup>3</sup>, 5200 mg/m<sup>3</sup>, and 2600 mg/m<sup>3</sup> to assess inhalation toxicity. As there were no pathologic changes, changes in organ weights were judged to have been compensatory rather than toxic effects. Based on these results, the No Observed Adverse Effect Concentration (NOAEC) was greater than or equal to 10400 mg/m<sup>3</sup>.

Oral: C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids are expected to have a low order of repeated dose toxicity by the oral route of exposure. All tests were performed in a manner similar or equivalent to currently established OECD guidelines. In a repeated dose study where C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids were administered via oral gavage, no signs of toxicity were observed at the maximum experimental dose tested, 5000 mg/kg/day.

Inhalation: In a repeated dose study where C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids were administered via inhalation, no signs of toxicity were observed at 10400 mg/m<sup>3</sup>. Based on these observations, the repeat inhalation concentration NOAEL is >=10400 mg/m<sup>3</sup> (10.4 mg/L) for C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids.

**Genetic toxicity:**

C9-C14 aliphatic, < 2% aromatic hydrocarbons fluids are not mutagenic using *in vitro* or *in vivo* genotoxicity assays. In bacterial tests, C9-C14 aliphatic, < 2% aromatic hydrocarbons fluids were not mutagenic in *Salmonella* strains tested in the presence or absence of metabolic activation. C9 -C14 aliphatic, <2% aromatic hydrocarbon fluids were negative in a *in vitro* mammalian cell gene mutation assay. In sister chromatid exchange and in chromosomal aberration studies, C9-C14 aliphatic, < 2% aromatic hydrocarbons fluids did not produce an effect. C9-C14 aliphatic, < 2% aromatic hydrocarbons fluids were also non-mutagenic when tested in an *in vivo* mouse bone marrow micronucleus assay and when tested in dominant lethal studies utilizing an inhalation route of exposure. All studies were conducted in a manner similar or equivalent to currently established OECD guidelines. C9-C14 aliphatic, < 2% aromatic hydrocarbons fluids are a non-genotoxic agent and classification is not warranted under the new Regulation (EC) 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP) or under the Directive 67/518/EEC for dangerous substances and Directive 1999/45/EC for preparations.

All Ames tests on "hydrocarbons, C14-C20, n-alkanes, isoalkanes, cyclics,<2% aromatics" showed no mutagenic effect with and without metabolic activation. The chromosome aberration study in CHO cells on "hydrocarbons, C12-C16, n-alkanes, isoalkanes, cyclics,<2% aromatics" also showed no signs of mutagenicity. A mouse lymphoma forward mutation assay performed with hydrodesulfurised kerosene also showed no mutagenic properties.

The weight of evidence is derived from study records reported for the C9-C14 aliphatic, <2% aromatics. C9-C14 aliphatic, <2% aromatics are not genotoxic and are not classifiable as mutagens based upon the results of reliable *in vitro* and *in vivo* studies. In bacterial reverse mutation studies, the C9-C14 aliphatic, <2% aromatics were not mutagenic in the presence or absence of metabolic activation (IUCLID section 7.6.1). In mammalian cells *in vitro*, and in rats *in vivo* there were no mutagenic, clastogenic or aneuploid effects reported in read-across from studies on C9-C14 aliphatic, <2% aromatics: a negative chromosome aberration (Human Peripheral Lymphocyte Chromosomal Aberration Test, Chinese Hamster Ovary Sister Chromatid Exchange Assay); and an *in vivo* inhalation exposure bone marrow chromosomal aberration study and micronucleus test (IUCLID sections 7.6.1 and 7.6.2).

Endpoint Conclusion: No adverse effect observed (negative)

**Toxicity to reproduction:**

C9-C14 aliphatic, <2% aromatic hydrocarbon fluids were examined for reproductive toxicity in a 28 day combined repeated dose toxicity study with the reproduction / developmental toxicity screening test (OECD TG 422). C9-C14 aliphatic, <2% aromatic hydrocarbon fluids were administered oral gavage at a dose of 0, 25, 150, or 1000 mg/kg/day to groups of Sprague-Dawley rats. It was concluded that C9-C14 aliphatic, <2% aromatic hydrocarbon fluids did not induce reproductive toxicity in the parental animals and no effects on the endocrine system were observed. Therefore, the NOAEL was determined to be >=1000 mg/kg bw/day.

C9-C14 aliphatic, <2% aromatic hydrocarbon fluids were examined in a reproduction / developmental toxicity screening test (OECD TG 421). C9-C14 aliphatic, <2% aromatic hydrocarbon fluids were administered by oral gavage at a dose of 0 (vehicle), 100, 300, 1000 mg/kg/day to groups of Sprague-Dawley rats. It was concluded that C9-C14 aliphatic, <2% aromatic hydrocarbon fluids did not induce reproductive toxicity in the parental animals and no effects on the endocrine system were observed. Therefore, the NOAEL was determined to be >=1000 mg/kg bw/day. Based on this study and the lack of systemic toxicity, C9-C14 aliphatic, <2% aromatic hydrocarbon fluids, are not expected to be reproductive toxicants.

In bacterial reverse mutation studies, the C14-C20 aliphatic, <2% aromatics were not mutagenic in the presence or absence of metabolic activation (IUCLID section 7.6.1). In mammalian cells *in vitro*, and in rats *in vivo* there were no mutagenic, clastogenic or aneuploid effects reported in read-across from studies on hydrodesulfurized kerosene kerosene, and jet fuels that included: a negative chromosome aberration (Human Peripheral Lymphocyte Chromosomal Aberration Test, Chinese Hamster Ovary Sister Chromatid Exchange Assay); and an *in vivo* inhalation exposure bone marrow chromosomal aberration study and micronucleus test in rats and mice (IUCLID sections 7.6.1 and 7.6.2).

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2% aromatic hydrocarbon fluids did not induce reproductive toxicity in the parental animals and no effects on the endocrine system were observed. Therefore, the NOAEL was determined to be >=1000 mg/kg bw/day.

#### Exposure in humans:

Seven studies were available on the irritation and/or sensitisation potential of several types of hydrocarbon solvents in volunteers. Clinical tests were conducted with populations ranging from 29 to 112 patients. None of the test substances elicited any sensitisation and/or irritation effects except C5-C20 paraffin, which showed a cumulative irritation effect at 75%. However, this substance was tested under occlusive patch, a condition which exacerbates the irritancy of hydrocarbon solvents.

#### Toxicokinetics:

If C9-C14 aliphatic, <2% aromatic hydrocarbon fluids are absorbed, they are typically metabolized by side chain oxidation to alcohol and carboxylic acid derivatives. These metabolites can be glucuronidated and excreted in the urine or further metabolized before being excreted. The majority of the metabolites are excreted in the urine and to a lower extent, in the faeces. Excretion is rapid with the majority of the elimination occurring within the first 24 hours of exposure. As a result of the lack of systemic toxicity and the ability of the parent material to undergo metabolism and rapid excretion, bioaccumulation of the test substance in the tissues is not likely to occur.

C9-C14 aliphatic, <2% aromatic hydrocarbon fluids are poorly absorbed dermally with an estimated overall percutaneous absorption rate of approximately 2ug/cm<sup>2</sup>/hr or 1% of the total applied fluid. Regardless of exposure route, C9-C14 aliphatic, <2% aromatic hydrocarbon fluids are rapidly metabolized and eliminated.

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#### Short description of key information on absorption rate:

C14-C20 aliphatic, <2% aromatic hydrocarbon fluids can be dermally absorbed, although they tend to partition into the stratum corneum. When dermally absorbed, C14-C20 aliphatic, <2% aromatic hydrocarbon fluids are rapidly metabolized and eliminated.

Approximately 34% of C14-C20 aliphatic, <2% aromatic hydrocarbon fluids are absorbed when ingested. C14-C20 aliphatic, <2% aromatic hydrocarbon fluids is poorly dermally absorbed. Absorption following inhalation is assumed to be similar to ingestion since exposures will be to aerosol. Regardless of exposure route, C14-C20 aliphatic, <2% aromatic hydrocarbon fluids are rapidly metabolized. Bioaccumulation of C14-C20 aliphatic, <2% aromatic hydrocarbon fluids is not expected.

C14-C20 aliphatic, <2% aromatic hydrocarbon fluids are absorbed if ingested. C14-C20 aliphatic, <2% aromatic hydrocarbon fluids undergo metabolism and rapid excretion and low deposition, bioaccumulation of the test substance in the tissues is not likely to occur.

The fate of pristane (2,6,10,14-tetramethylpentadecane) was studied in rats after a single per os administration of 3H-labeled pristane. The balance study showed extensive fecal excretion (66%) mainly as unchanged hydrocarbon, whereas about 14% of ingested pristane was excreted in urine as pristane metabolites and tritiated water. After one week, 8.3% of the ingested 3H still was stored in the carcass and the radioactive distribution in tissues and organs showed a preferential incorporation into adipose tissue and liver. Over 75% of the radioactivity stored in the carcass was associated with pristane metabolites and tritiated water. Tissue metabolites were characterized by thin layer chromatography, gas chromatography, and mass spectrometric analyses. Four metabolites were identified: pristane-1-ol, pristane-2-ol, pristanic acid and 4,8,12-trimethyltridecanoic acid. These results demonstrated that pristane undergoes subterminal hydroxylation or terminal oxidation followed by the classical beta-oxidation process.

Labeled paraffins with 8-18 C atoms prepared from unsaturated hydrocarbons by addition of deuterium have been added in oily solution to normal rats food. After six days an increase of deuterium content in the body fluid of all the rats was observed indicating that the labeled compounds had been metabolized. Deuterium was found in the fatty acids of the body fats and the liver lipids especially after feeding octadecane and hexadecane. Isolating oleic, stearic, and palmitic acids containing deuterium, indicated that methyl- and beta-oxidation of these hydrocarbons has occurred. Fatty acids resulting from the metabolism of hydrocarbons with shorter chains were not deposited but in these cases the urine contained fatty acids with higher deuterium content than after administration of octadecane and hexadecane. According to the deuterium content of the neutral fractions from the liver and body lipids all the hydrocarbons tested were deposited only to a small extent, the largest depots occurring mainly after feeding with octadecane and hexadecane.

#### Discussion on absorption rate:

There have not been any *in vivo* dermal absorption studies of C14 – C20 aliphatic, <2% aromatic hydrocarbon fluids, but there have been *in vitro* studies of similar constituents, particularly hexadecane.

The percutaneous absorption and cutaneous disposition of topically applied neat Jet-A, JP-8, and JP-8(100) jet fuels (25  $\mu$ L/5 cm<sup>2</sup>) was examined by monitoring the absorptive flux of the marker components 14C naphthalene and 4H dodecane simultaneously applied non-occluded to isolated perfused porcine skin flaps ( $a = 4$ ). Absorption of 14C hexadecane was estimated from JP-8 fuel. Absorption and disposition of naphthalene and dodecane were also monitored using a nonvolatile JP-8 fraction reflecting exposure to residual fuel that might occur 24 h after a jet fuel spill. In all studies, perfuse, stratum corneum, and skin concentrations were measured over 5 h. Naphthalene absorption had a clear peak absorptive flux at less than 1 h, while dodecane and hexadecane had prolonged, albeit significantly lower, absorption flux profiles. Within JP-8, absorption was (mean +/- SEM; % dose) hexadecane (0.18 +/- 0.08). The area under the curve (AUC) was determined to be (mean +/- SEM; % dose-h/mL): hexadecane (0.0017 +/- 0.0003).

The flux, permeability coefficient ( $K_p$ ), and binding of hexadecane for porcine skin was determined to be 8.80 +/- 0.00 (nmol/cm<sup>2</sup>/h)  $\times$  10E-3. The permeability coefficient ( $K_p$ ), and binding of hexadecane for human skin were determined to be 7.02 +/- 0.00 (nmol/cm<sup>2</sup>/h)  $\times$  10E-3. Factor of difference (FOD) in the permeability of pig and human skin was 1.28 for hexadecane. The FOD in binding of hexadecane to pig and human skin was found to be 0.76.

#### Over view of percutaneous absorption of hydrocarbon solvents

There are no studies of repeated dose toxicity of hydrocarbon solvents using the dermal route of administration. Accordingly, where it is necessary to calculate dermal DNELs, systemic data from studies utilizing other routes of administration, normally inhalation but also oral data, can be used in some situations. In accordance with ECHA guidance, read across from oral or inhalation data to dermal should account for differences in absorption where these exist. In fact, hydrocarbon solvents are poorly absorbed in most situations, in part because some are volatile and do not remain in contact with the skin for long periods of time and also because, due to their hydrophobic natures, do not partition well into aqueous environments and are poorly absorbed into the blood.

If these differences in relative absorption are introduced into the DNEL calculations to calculate external doses, the DNELs based on systemic effects are highly inflated. This seems potentially misleading as it implies that substances have different intrinsic hazards when encountered by different routes whereas in fact the differences are due ultimately to differences in absorbed dose. .

Several authors have assessed the percutaneous absorption of higher molecular weight aliphatic constituents. Using porcine skin models the percutaneous absorption values for aliphatic constituents ranging from nonane to tetradecane were well below 1  $\mu$ g/cm<sup>2</sup>/hr. Rat and human skin are considered to be more permeable than human skin ( so these numbers can be considered conservative).

Results of percutaneous absorption studies with human skin under *in vivo* conditions produced values ranging from 1 – 2  $\mu$ g/kg/day for decane, undecane and dodecane.

With respect to aromatic hydrocarbons, most of the reported percutaneous absorption values ) are less than 2  $\mu$ g/cm<sup>2</sup>/day.

After considering all of the above, it seems reasonable to assume apparent that across the entire range of hydrocarbon solvent constituents, percutaneous absorption values are less than 2  $\mu$ g/cm<sup>2</sup>/day. Accordingly, when systemic dermal DNELs are calculated using route to route extrapolations, the values will not be corrected for differences in absorption. Rather, 2  $\mu$ g/cm<sup>2</sup>/hr should be used as a common percutaneous absorption rate for all hydrocarbon solvents for which dermal exposure estimates are provided.

Studies indicate that normal, branched and cyclic paraffins are absorbed from the mammalian gastrointestinal tract and that the absorption of n-paraffins is inversely proportional to the carbon chain length, with little absorption above C30. With respect to the carbon chain lengths likely to be present in mineral oil, n-paraffins may be absorbed to a greater extent than iso- or cyclo-paraffins.

The major classes of hydrocarbons have been shown to be well absorbed by the gastrointestinal tract in various species. In many cases, the hydrophobic hydrocarbons are ingested in association with dietary lipids. The dependence of hydrocarbon absorption on concomitant triglyceride digestion and absorption, is known as the "hydrocarbon continuum hypothesis", and asserts that a series of solubilising phases in the intestinal lumen, created by dietary triglycerides and their digestion products, afford hydrocarbons a route to the lipid phase of the intestinal absorptive cell

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(enterocyte) membrane. While some hydrocarbons may traverse the mucosal epithelium unmetabolised and appear as solutes in lipoprotein particles in intestinal lymph, there is evidence that most hydrocarbons partially separate from nutrient lipids and undergo metabolic transformation in the enterocyte. The enterocyte may play a major role in determining the proportion of an absorbed hydrocarbon that, by escaping initial biotransformation, becomes available for deposition in its unchanged form in peripheral tissues such as adipose tissue, or in the liver.

## For alkanes:

Exposure to the commercial hexane (a representative of the ECHA group of hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich) had no effect on the behavior of rats. Rats were tested monthly throughout the exposure for hindlimb splay and grip strength. The NOAEC for sub-chronic neurological effects is 9000 ppm in rats.

In a 13 week subchronic inhalation study, the neurotoxicity of light alkylate naphtha distillate (LAND-2; carbon range C5-C8) was examined in male and female rats and aside from acute CNS effects, no treatment related neurotoxic effects found in any of the treatment groups. The NOAEC was determined to be > 24.3 g/m3 (6646 ppm). Additionally, no neurological effects were reported in the NTP 2 year carcinogenicity study on Stoddard solvent.

## For hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich

n-Hexane was metabolized and excreted within 168 h of iv bolus administration, inhalation exposure or dermal application. Exhaled breath and urine were the two primary routes for the excretion and its metabolites. n-Hexane was widely distributed to the body tissues but were not concentrated significantly by any of those tissues. It was extensively metabolized and a number of radio labeled metabolites were excreted in the urine. n-Hexane and its radio labeled metabolites disappeared from the blood of rats with a half-life of approximately 9-10 h.

Repeated inhalation exposure had no apparent effect on the rates or routes of excretion of either of the test compounds or their metabolites. The absorption rates into the skin, normalised for exposure concentration, was determined to be 0.013 cm/h. The maximum absorption rate into the blood was determined to be 0.005 nmol/h. A comparison of the estimated whole-body skin uptake with the inhalatory uptake from the same atmosphere, revealed that the dermal uptake contributed 0.1% to the total uptake.

C9-C14 aliphatic, <2% aromatic hydrocarbon fluids are absorbed, they are typically metabolized by side chain oxidation to alcohol and carboxylic acid derivatives. These metabolites can be glucuronidated and excreted in the urine or further metabolized before being excreted. The majority of the metabolites are excreted in the urine and to a lower extent, in the faeces. Excretion is rapid with the majority of the elimination occurring within the first 24 hours of exposure. As a result of the lack of systemic toxicity and the ability of the parent material to undergo metabolism and rapid excretion, bioaccumulation of the test substance in the tissues is not likely to occur.

C9-C14 aliphatic, <2% aromatic hydrocarbon fluids are poorly absorbed dermally with an estimated overall percutaneous absorption rate of approximately 2ug/cm2/hr or 1% of the total applied fluid. Regardless of exposure route, C9-C14 aliphatic, <2% aromatic hydrocarbon fluids are rapidly metabolized and eliminated has been fully evaluated. All of the animal studies were performed in a manner similar or equivalent to currently established OECD guidelines. Based on these data, C9-C14 aliphatic, <2% aromatic hydrocarbons have a low order of acute toxicity by the oral, dermal, and inhalation routes of exposure.

In a study examining the oral toxicity of commercial hexane. 6 male rats were given doses of up to 25 ml/kg of test substance by oral gavage. The animals were then observed for 14 days for mortality. No mortality was observed at any of the doses. The oral LD50 is therefore > 25 ml/kg (16.75 g/kg; density of 0.67).

C9-C14 aliphatic, <2% aromatic hydrocarbons is minimally toxic via ingestion where the LD50 is >5000 mg/kg, via dermal exposure where the LD50 is >5000 mg/kg, and by inhalation where the LC50 > 5000 mg/m3. These findings do not warrant classification of C9-C14 aliphatic, <2% aromatic hydrocarbons under the Regulation (EC) 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP) do not warrant classification under the Directive 67/548/EEC for dangerous substances and Directive 1999/45/EC for preparations (DSD/DPD). C9-C14 aliphatic, <2% aromatic hydrocarbons are classified under EU CLP guidelines as a Category 1 aspiration hazard based on its physical and chemical properties (hydrocarbon fluid, viscosity = 20.5 mm2/s) and as an R65 aspiration hazard under the EU DSD/DPD.

One study examined that acute inhalation toxicity of hexane to male rats. Groups of 10 male rats exposed to various large concentrations of hexane vapour for 4 hrs. Animals were then observed for clinical signs and mortality for at least the next 6 days. Several animals died during the exposure period. The LC50 was determined to be 73,680 ppm (259354 mg/m3). Due to the high concentration of the LC50, the test substance would not be classified as toxic by inhalation according to OECD GHS guidelines. Surviving animals experienced severe toxicological effects during the exposure.

## Skin irritation:

For isoparaffinic, normal paraffinic, and mixed C9-C14 aliphatic, <2% aromatic hydrocarbon fluids, the weight of evidence indicates that the erythema and oedema scores (24, 48, and 72 average) are below the classification threshold requirements: 2.0, Directive 67/548/EEC for dangerous substances and Directive 1999/45/EC for preparation; 2.3, the new Regulation (EC) 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP).

For cycloparaffinic C9-C14 aliphatic, < 2% aromatic hydrocarbon fluids, erythema and oedema scores (24, 48, and 72 average) are above the classification threshold requirements: 2.0, Directive 67/518/EEC for dangerous substances and Directive 1999/45/EC for preparation; 2.3, the new Regulation (EC) 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP). This finding warrants classification of the test material as a skin irritant (R38) under Directive 67/518/EEC for dangerous substances and Directive 1999/45/EC for preparations. This finding warrants classification of the test material as a Category 2 dermal irritant under the new Regulation (EC) 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP).

## Eye irritation

Ocular lesion scores (24, 48, and 72 average) are below the classification threshold requirements.

Directive 67/548/EEC for dangerous substances and Directive 1999/45/EC for preparation: 0, cornea opacity; 0, iris lesion; >2.5, redness of the conjunctivae; >2.0, oedema of the conjunctivae (chemosis). Regulation (EC) 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP): 0, cornea opacity; 0, iris lesion; >2.0, redness of the conjunctivae; >2.0, oedema of the conjunctivae (chemosis).

## Respiratory irritation

There are no studies that warrant classification as a respiratory irritant under either the Directive 67/518/EEC for dangerous substances and Directive 1999/45/EC or under the new Regulation (EC) 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP).

## Sensitisation:

A study was performed to determine the concentration of hexane that would be expected to cause sensitization in humans.

Results of previous LLNA experiments were used to calculate the EC3 value, the concentration at which the test substance would produce a 3-fold increase in the proliferative activity of lymph nodes in the LLNA test. The 3-fold increase is considered a positive response for sensitization in the LLNA test. The EC3 value for hexane was determined to be > 100% concentration. The test substance is therefore not sensitizing.

There are no reports of respiratory sensitization from C9-C14 aliphatic, <2% aromatic hydrocarbons fluids in laboratory animals or humans. However, skin sensitization studies utilizing C9-C14 aliphatic, <2% aromatic hydrocarbons fluids found no indication of skin sensitization in guinea pigs. Additional studies in humans also found no indication of skin sensitization. With these observations, it is presumed that C9-C14 aliphatic, <2% aromatic hydrocarbons fluids will not be a respiratory sensitizing agent.

## Repeat dose toxicity,

In a study involving n-hexane, neurological effects were only seen at the highest dose level after an average of 101.3 days of exposure. The LOAEL for neurological effects is 46.2 mmol/kg bw (37973 mg/kg), and the NOAEL is 13.2 mmol/kg bw (1135 mg/kg). Reduced body weight gain was seen at all three dose levels, however was only considered treatment related in the 13.2 and 46.2 mmol/kg bw groups. The NOAEL is therefore 6.60 mmol/kg bw.

In a study involving n-hexane The NOAEC for male rats exposed via inhalation was 2984 ppm based on liver and kidney effects. The LOAEC for male rats was 8992 ppm. The NOAEC for female rats was 8992 ppm

C9-C14 aliphatic, <2% aromatic hydrocarbon fluids are expected to have a low order of repeated dose toxicity by the oral route of exposure. All tests were performed in a manner similar or equivalent to currently established OECD guidelines. In a repeated dose study where C9-C14 aliphatic, <2% aromatic hydrocarbon fluids were administered via oral gavage, no signs of toxicity were observed at the maximum experimental dose tested, 5000 mg/kg/day.

In a repeated dose study where C9-C14 aliphatic, <2% aromatic hydrocarbon fluids were administered via inhalation, no signs of toxicity were observed at 10400 mg/m3. Based on these observations, the repeat inhalation concentration NOAEL is =10400 mg/m3 (10.4 mg/L) for C9-C14 aliphatic, <2% aromatic hydrocarbon fluid

## Genetic toxicity:

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A study examined the in vitro mutagenicity of vapours of the test substance commercial hexane. Plates of *S. typhimurium* were exposed for 7 -8 hrs to test atmospheres of 0, 600, 1000, 3000, 6000, or 9000 ppm of test substance. The test substance did not produce a positive response in any of the test strains. The test substance is not mutagenic.

In a study to determine the in vivo effect of inhalation exposure of commercial hexane on rat bone marrow. Groups of 5 male and 5 female rats were exposed to 0, 900, 3000, and 9000 ppm of test substance vapour for 6 hrs/day for 5 days. There was no statistically significant increase in cell aberrations in any treatment group. The test substance is not mutagenic.

C9-C14 aliphatic, <2% aromatic hydrocarbons fluids are not mutagenic using in vitro or in vivo genotoxicity assays. In bacterial tests, C9-C14 aliphatic, <2% aromatic hydrocarbons fluids were not mutagenic in *Salmonella* strains tested in the presence or absence of metabolic activation. C9-C14 aliphatic, <2% aromatic hydrocarbons fluids were negative in a in vitro mammalian cell gene mutation assay. In sister chromatid exchange and in chromosomal aberration studies, C9-C14 aliphatic, <2% aromatic hydrocarbons fluids did not produce an effect. C9-C14 aliphatic, <2% aromatic hydrocarbons fluids were also non-mutagenic when tested in an in vivo mouse bone marrow micronucleus assay and when tested in dominant lethal studies utilizing an inhalation route of exposure. All studies were conducted in a manner similar or equivalent to currently established OECD guidelines. C9-C14 aliphatic, <2% aromatic hydrocarbons fluids are a non-genotoxic agent and classification is not warranted under the Regulation (EC) 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP) or under the Directive 67/518/EEC for dangerous substances and Directive 1999/45/EC for preparations.

Toxicity to reproduction.

In a study examining the effects of commercial hexane the NOAEC for both male and female rats (adults and offspring) was 3000 ppm (10560 mg/m<sup>3</sup>). The LOAEC for these groups was 9000 ppm based on reduced body weight. There were no adverse effects to reproduction, therefore the NOAEC for reproduction is 9000 ppm (31680 mg/m<sup>3</sup>).

A study to examine the developmental toxicity of commercial hexane in mice, found the maternal NOAEC was 900 ppm, and the maternal LOAEC was 3000 ppm (10560 mg/m<sup>3</sup>) based on colour changes in the lungs. The developmental NOAEC was 3000 ppm and the LOAEC was 9000 ppm (31680 mg/m<sup>3</sup>) in mice.

C9-C14 aliphatic, <2% aromatic hydrocarbon fluids are not developmental toxicants. In two developmental studies (OECD TG 414), pregnant dams were dosed by inhalation with 0, 300, or 900 ppm C9-C14 aliphatic, <2% aromatic hydrocarbon fluids during gestational days 6 through 15. No adverse maternal or fetal effects were noted at any dose level. Thus, C9-C14 aliphatic, <2% aromatic hydrocarbon fluids did not produce any maternal or fetal toxicity or any developmental effects in rats. Based on the study results, the maternal and developmental toxicity NOAEC is >= 900 ppm (5220 mg/m<sup>3</sup>). Based on this study and the lack of systemic toxicity, C9-C14 aliphatic, <2% aromatic hydrocarbon fluids, are not expected to be developmental toxicants.

|                                   |   |                          |   |
|-----------------------------------|---|--------------------------|---|
| 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

|   | Endpoint      | Test Duration (hr)            | Species          | Value         | Source        |
|---|---------------|-------------------------------|------------------|---------------|---------------|
| Contact Cleaner Plus #131-6324, 232-4356 (AUS)                    | Not Available | Not Available                 | Not Available    | Not Available | Not Available |
| naphtha petroleum, light, hydrotreated                            | Endpoint      | Test Duration (hr)            | Species          | Value         | Source        |
| NOEC(ECx)   | 504h          | Crustacea                     | 0.17mg/l         | 2             |               |
| EC50  | 48h           | Crustacea                     | 0.64mg/l         | 2             |               |
| LC50  | 96h           | Fish                          | 4.26mg/l         | 2             |               |
| EC50  | 96h           | Algae or other aquatic plants | 64mg/l           | 2             |               |
| n-pentane   | Endpoint      | Test Duration (hr)            | Species          | Value         | Source        |
| EC50  | 72h           | Algae or other aquatic plants | 1.26mg/l         | 2             |               |
| EC50  | 48h           | Crustacea                     | 2.7mg/l          | 2             |               |
| EC50(ECx)   | 8h            | Algae or other aquatic plants | 1mg/l            | 1             |               |
| LC50  | 96h           | Fish                          | 4.26mg/l         | 2             |               |
| hydrocarbons, C6-7  | Endpoint      | Test Duration (hr)            | Species          | Value         | Source        |
| EC50(ECx)   | 48h           | Crustacea                     | 3mg/l            | Not Available |               |
| EC50  | 72h           | Algae or other aquatic plants | 10000-100000mg/L | Not Available |               |
| EC50  | 48h           | Crustacea                     | 3mg/l            | Not Available |               |
| LC50  | 96h           | Fish                          | 11.4mg/l         | Not Available |               |
| hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic | Endpoint      | Test Duration (hr)            | Species          | Value         | Source        |
| EC50  | 48h           | Crustacea                     | 10-22mg/l        | Not Available |               |
| LC50  | 96h           | Fish                          | 10-100mg/l       | Not Available |               |

Continued...

## Contact Cleaner Plus #131-6324, 232-4356 (AUS)

|                |  |                    |           |           |               |
|----------------|--|--------------------|-----------|-----------|---------------|
|                | EC50(ECx)  | 48h                | Crustacea | 10-22mg/l | Not Available |
| carbon dioxide | Endpoint   | Test Duration (hr) | Species   | Value     | Source        |
|                | LC50   | 96h                | Fish      | 35mg/l    | 1             |
| <b>Legend:</b> | Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data |                    |           |           |               |

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

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

#### Persistence and degradability

| Ingredient     | Persistence: Water/Soil | Persistence: Air |
|----------------|-------------------------|------------------|
| n-pentane      | LOW                     | LOW              |
| carbon dioxide | LOW                     | LOW              |

#### Bioaccumulative potential

| Ingredient     | Bioaccumulation     |
|----------------|---------------------|
| n-pentane      | LOW (BCF = 2.35)    |
| carbon dioxide | LOW (LogKOW = 0.83) |

#### Mobility in soil

| Ingredient     | Mobility           |
|----------------|--------------------|
| n-pentane      | LOW (KOC = 80.77)  |
| carbon dioxide | HIGH (KOC = 1.498) |

### SECTION 13 Disposal considerations

#### Waste treatment methods

|                              |   |
|------------------------------|---|
| Product / Packaging disposal | <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> <li>► Bury residues and emptied aerosol cans at an approved site.</li> </ul> |
|------------------------------|---|

### SECTION 14 Transport information

#### Labels Required

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

#### Land transport (ADG)

|                              |                           |                        |
|------------------------------|---------------------------|------------------------|
| UN number                    | 1950                      |                        |
| UN proper shipping name      | AEROSOLS                  |                        |
| Transport hazard class(es)   | Class                     | 2.1                    |
|                              | Subrisk                   | Not Applicable         |
| Packing group                | Not Applicable            |                        |
| Environmental hazard         | Environmentally hazardous |                        |
| Special precautions for user | Special provisions        | 63 190 277 327 344 381 |
|                              | Limited quantity          | 1000ml                 |

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

|                                     |   |                |
|-------------------------------------|---|----------------|
| <b>UN number</b>                    | 1950  |                |
| <b>UN proper shipping name</b>      | Aerosols, flammable                                       |                |
| <b>Transport hazard class(es)</b>   | ICAO/IATA Class   | 2.1            |
|                                     | ICAO / IATA Subrisk                                       | Not Applicable |
|                                     | ERG Code  | 10L            |
| <b>Packing group</b>                | Not Applicable  |                |
| <b>Environmental hazard</b>         | Environmentally hazardous                                 |                |
| <b>Special precautions for user</b> | Special provisions  | A145 A167 A802 |
|                                     | Cargo Only Packing Instructions                           | 203            |
|                                     | Cargo Only Maximum Qty / Pack                             | 150 kg         |
|                                     | Passenger and Cargo Packing Instructions                  | 203            |
|                                     | Passenger and Cargo Maximum Qty / Pack                    | 75 kg          |
|                                     | Passenger and Cargo Limited Quantity Packing Instructions | Y203           |
|                                     | Passenger and Cargo Limited Maximum Qty / Pack            | 30 kg G        |

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

|                                     |                    |                            |
|-------------------------------------|--------------------|----------------------------|
| <b>UN number</b>                    | 1950               |                            |
| <b>UN proper shipping name</b>      | AEROSOLS           |                            |
| <b>Transport hazard class(es)</b>   | IMDG Class         | 2.1                        |
|                                     | IMDG Subrisk       | Not Applicable             |
| <b>Packing group</b>                | Not Applicable     |                            |
| <b>Environmental hazard</b>         | Marine Pollutant   |                            |
| <b>Special precautions for user</b> | EMS Number         | F-D, S-U                   |
|                                     | Special provisions | 63 190 277 327 344 381 959 |
|                                     | Limited Quantities | 1000 ml                    |

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

Not Applicable

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

| Product name   | Group         |
|--|---------------|
| naphtha petroleum, light, hydrotreated                               | Not Available |
| n-pentane  | Not Available |
| hydrocarbons, C6-7   | Not Available |
| hydrocarbons, C11-14<br>n-alkanes, isoalkanes, cyclics, <2% aromatic | Not Available |
| carbon dioxide   | Not Available |

**Transport in bulk in accordance with the ICG Code**

| Product name   | Ship Type     |
|--|---------------|
| naphtha petroleum, light, hydrotreated                               | Not Available |
| n-pentane  | Not Available |
| hydrocarbons, C6-7   | Not Available |
| hydrocarbons, C11-14<br>n-alkanes, isoalkanes, cyclics, <2% aromatic | Not Available |
| carbon dioxide   | Not Available |

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

naphtha petroleum, light, hydrotreated is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals  
Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

n-pentane is found on the following regulatory lists

Continued...

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals  
 Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) -  
 Schedule 4

Australian Inventory of Industrial Chemicals (AIIC)

hydrocarbons, C6-7 is found on the following regulatory lists

Not Applicable

hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic is found on the following regulatory lists

Not Applicable

carbon dioxide is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)  
 FEI Equine Prohibited Substances List - Controlled Medication

FEI Equine Prohibited Substances List (EPSL)

#### National Inventory Status

| National Inventory                              | Status  |
|---|---|
| Australia - AIIC / Australia Non-Industrial Use | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Canada - DSL                                    | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Canada - NDSL                                   | No (naphtha petroleum, light, hydrotreated; n-pentane; hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic; carbon dioxide)                                     |
| China - IECSC                                   | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Europe - EINECS / ELINCS / NLP                  | No (hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Japan - ENCS                                    | No (naphtha petroleum, light, hydrotreated; hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Korea - KECL                                    | No (hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| New Zealand - NZIoC                             | No (hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Philippines - PICCS                             | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| USA - TSCA                                      | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Taiwan - TCSI                                   | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Mexico - INSQ                                   | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Vietnam - NCI                                   | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| Russia - FBEPH                                  | No (hydrocarbons, C6-7; hydrocarbons, C11-14 n-alkanes, isoalkanes, cyclics, <2% aromatic)  |
| <b>Legend:</b>                                  | Yes = All CAS declared ingredients are on the inventory<br>No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration. |

#### SECTION 16 Other information

|               |            |
|---------------|------------|
| Revision Date | 09/01/2023 |
| Initial Date  | 09/01/2023 |

#### 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  
 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  
 KECL: Korea Existing Chemicals Inventory  
 NZIoC: New Zealand Inventory of Chemicals  
 PICCS: Philippine Inventory of Chemicals and Chemical Substances  
 TSCA: Toxic Substances Control Act

Continued...

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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