

## F-160 PART A

### BARNES PRODUCTS PTY LTD

Chemwatch Hazard Alert Code: 2

Chemwatch: 60-8759

Version No: 8.1

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

Issue Date: 19/03/2023

Print Date: 15/06/2023

S.GHS.NZL.EN.E

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

##### Product Identifier

|                               |                    |
|-------------------------------|--------------------|
| Product name                  | F-160 PART A       |
| Chemical Name                 | Not Applicable     |
| Synonyms                      | F-160 REV 1 PART A |
| 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 | Polyurethane resins. |
|--------------------------|----------------------|

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

|                         |                                                            |
|-------------------------|------------------------------------------------------------|
| Registered company name | BARNES PRODUCTS PTY LTD                                    |
| Address                 | 5 GREENHILLS AVE MOOREBANK NSW 2170 Australia              |
| Telephone               | Barnes Australia +612 9793 7555 Mon-Fri 8am-4:30pm         |
| Fax                     | Barnes Australia +612 9793 7091                            |
| Website                 | <a href="http://www.barnesnz.co.nz">www.barnesnz.co.nz</a> |
| Email                   | sales@barnes.com.au                                        |

##### Emergency telephone number



|                                   |                                                                     |
|-----------------------------------|---------------------------------------------------------------------|
| Association / Organisation        | New Zealand Poisons Information Centre                              |
| Emergency telephone numbers       | Barnes NZ +649 9731 816 - Monday-Thursday 9am-5pm Friday 9am-4.30pm |
| Other emergency telephone numbers | New Zealand Poisons Information Centre 0800 764 766 After Hours     |

#### SECTION 2 Hazards identification

##### Classification of the substance or mixture

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Classification [1]                              | Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 2, Sensitisation (Skin) Category 1, Serious Eye Damage/Eye Irritation Category 2, Acute Toxicity (Inhalation) Category 2, Sensitisation (Respiratory) Category 1, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Carcinogenicity Category 2, Specific Target Organ Toxicity - Repeated Exposure Category 1 |
| Legend:                                         | 1. Classified by Chemwatch; 2. Classification drawn from CCID EPA NZ; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI                                                                                                                                                                                                                                                                                   |
| Determined by Chemwatch using GHS/HSNO criteria | 6.1B (inhalation), 6.1D (oral), 6.3A, 6.4A, 6.5A (respiratory), 6.5B (contact), 6.7B, 6.9A, 6.1E (respiratory tract irritant)                                                                                                                                                                                                                                                                                                |

##### Label elements

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

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

##### Hazard statement(s)

|      |                                      |
|------|--------------------------------------|
| H302 | Harmful if swallowed.                |
| H315 | Causes skin irritation.              |
| H317 | May cause an allergic skin reaction. |
| H319 | Causes serious eye irritation.       |
| H330 | Fatal if inhaled.                    |

|      |                                                                            |
|------|----------------------------------------------------------------------------|
| H334 | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| H335 | May cause respiratory irritation.                                          |
| H351 | Suspected of causing cancer.                                               |
| H372 | Causes damage to organs through prolonged or repeated exposure.            |

**Precautionary statement(s) Prevention**

|      |                                                                                  |
|------|----------------------------------------------------------------------------------|
| P201 | Obtain special instructions before use.                                          |
| P260 | Do not breathe mist/vapours/spray.                                               |
| P271 | Use only outdoors or in a well-ventilated area.                                  |
| P280 | Wear protective gloves, protective clothing, eye protection and face protection. |
| P284 | [In case of inadequate ventilation] wear respiratory protection.                 |
| P264 | Wash all exposed external body areas thoroughly after handling.                  |
| P270 | Do not eat, drink or smoke when using this product.                              |

**Precautionary statement(s) Response**

|                |                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| P304+P340      | IF INHALED: Remove person to fresh air and keep comfortable for breathing.                                                       |
| P308+P313      | IF exposed or concerned: Get medical advice/ attention.                                                                          |
| P310           | Immediately call a POISON CENTER/doctor/physician/first aider.                                                                   |
| P342+P311      | If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician/first aider.                                         |
| P302+P352      | IF ON SKIN: Wash with plenty of water.                                                                                           |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P333+P313      | If skin irritation or rash occurs: Get medical advice/attention.                                                                 |

**Precautionary statement(s) Storage**

|           |                                                                  |
|-----------|------------------------------------------------------------------|
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P405      | Store locked up.                                                 |

**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                                           |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 9048-57-1      | 50-70                                                                                                                                                                                               | <u>MDI, propoxylated</u>                       |
| 101-68-8       | 20-30                                                                                                                                                                                               | <u>4,4'-diphenylmethane diisocyanate (MDI)</u> |
| 25686-28-6     | 5-10                                                                                                                                                                                                | <u>MDI homopolymer</u>                         |
| 108-32-7       | 5-10                                                                                                                                                                                                | <u>propylene carbonate</u>                     |
| <b>Legend:</b> | 1. Classified by Chemwatch; 2. Classification drawn from CCID EPA NZ; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available |                                                |

**SECTION 4 First aid measures****Description of first aid measures**

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye Contact</b>  | <p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>▶ Transport to hospital or doctor without delay.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul> |
| <b>Skin Contact</b> | <p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately remove all contaminated clothing, including footwear.</li> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul> <p>Wash contaminated clothing thoroughly before reuse or destroy.</p>                                                                                                                                                                                                                                                                                                    |
| <b>Inhalation</b>   | <ul style="list-style-type: none"> <li>▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▶ Other measures are usually unnecessary.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Ingestion</b>    | <p><b>DO NOT INDUCE vomiting.</b></p> <p>Rinse mouth out with plenty of water.<br/>Seek medical attention.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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

Treat symptomatically.

Continued...

For sub-chronic and chronic exposures to isocyanates:

- ▶ This material may be a potent pulmonary sensitiser which causes bronchospasm even in patients without prior airway hyperreactivity.
- ▶ Clinical symptoms of exposure involve mucosal irritation of respiratory and gastrointestinal tracts.
- ▶ Conjunctival irritation, skin inflammation (erythema, pain vesiculation) and gastrointestinal disturbances occur soon after exposure.
- ▶ Pulmonary symptoms include cough, burning, substernal pain and dyspnoea.
- ▶ Some cross-sensitivity occurs between different isocyanates.
- ▶ Noncardiogenic pulmonary oedema and bronchospasm are the most serious consequences of exposure. Markedly symptomatic patients should receive oxygen, ventilatory support and an intravenous line.
- ▶ Treatment for asthma includes inhaled sympathomimetics (epinephrine [adrenalin], terbutaline) and steroids.
- ▶ Activated charcoal (1 g/kg) and a cathartic (sorbitol, magnesium citrate) may be useful for ingestion.
- ▶ Mydriatics, systemic analgesics and topical antibiotics (Sulamyd) may be used for corneal abrasions.
- ▶ There is no effective therapy for sensitised workers.

[Ellenhorn and Barceloux; Medical Toxicology]

**NOTE:** Isocyanates cause airway restriction in naive individuals with the degree of response dependant on the concentration and duration of exposure. They induce smooth muscle contraction which leads to bronchoconstrictive episodes. Acute changes in lung function, such as decreased FEV1, may not represent sensitivity.

[Karol & Jin, Frontiers in Molecular Toxicology, pp 56-61, 1992]

Personnel who work with isocyanates, isocyanate prepolymers or polyisocyanates should have a pre-placement medical examination and periodic examinations thereafter, including a pulmonary function test. Anyone with a medical history of chronic respiratory disease, asthmatic or bronchial attacks, indications of allergic responses, recurrent eczema or sensitisation conditions of the skin should not handle or work with isocyanates. Anyone who develops chronic respiratory distress when working with isocyanates should be removed from exposure and examined by a physician. Further exposure must be avoided if a sensitivity to isocyanates or polyisocyanates has developed.

## SECTION 5 Firefighting measures

### Extinguishing media

- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.
- ▶ Foam.

### Special hazards arising from the substrate or mixture

#### Fire Incompatibility

- ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

### Advice for firefighters

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fire Fighting</b>         | <ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> <li>▶ Use water delivered as a fine spray to control fire and cool adjacent area.</li> <li>▶ Avoid spraying water onto liquid pools.</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> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Fire/Explosion Hazard</b> | <ul style="list-style-type: none"> <li>- Combustible.</li> <li>- Moderate fire hazard when exposed to heat or flame.</li> <li>- When heated to high temperatures decomposes rapidly generating vapour which pressures and may then rupture containers with release of flammable and highly toxic isocyanate vapour.</li> <li>- Burns with acrid black smoke and poisonous fumes.</li> <li>- Due to reaction with water producing CO<sub>2</sub>-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed.</li> <li>- Combustion yields traces of highly toxic hydrogen cyanide HCN, plus toxic nitrogen oxides NO<sub>x</sub> and carbon monoxide.</li> </ul> <p>Combustion products include:<br/>carbon dioxide (CO<sub>2</sub>)<br/>and minor amounts of<br/>hydrogen cyanide<br/>other pyrolysis products typical of burning organic material.<br/>May emit corrosive fumes.</p> <p><b>WARNING:</b> Long standing in contact with air and light may result in the formation of potentially explosive peroxides.</p> <p>When heated at high temperatures many isocyanates decompose rapidly generating a vapour which pressurises containers, possibly to the point of rupture. Release of toxic and/or flammable isocyanate vapours may then occur</p> <p>isocyanates<br/>aldehydes<br/>nitrogen oxides (NO<sub>x</sub>)</p> |

## SECTION 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Minor Spills</b> | <ul style="list-style-type: none"> <li>▶ Remove all ignition sources.</li> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours and contact with skin and eyes.</li> <li>▶ Control personal contact with the substance, by using protective equipment.</li> <li>▶ Contain and absorb spill with sand, earth, inert material or vermiculite.</li> <li>▶ Wipe up.</li> <li>▶ Place in a suitable, labelled container for waste disposal.</li> </ul>                                                       |
| <b>Major Spills</b> | <ul style="list-style-type: none"> <li>▶ Liquid Isocyanates and high isocyanate vapour concentrations will penetrate seals on self contained breathing apparatus - SCBA should be used inside encapsulating suit where this exposure may occur.</li> </ul> <p>For isocyanate spills of less than 40 litres (2 m<sup>2</sup>):</p> <ul style="list-style-type: none"> <li>▶ Evacuate area from everybody not dealing with the emergency, keep them upwind and prevent further access, remove ignition sources and,</li> </ul> |

- if inside building, ventilate area as well as possible.
  - ▶ Notify supervision and others as necessary.
  - ▶ Put on personal protective equipment (suitable respiratory protection, face and eye protection, protective suit, gloves and impermeable boots).
  - ▶ Control source of leakage (where applicable).
  - ▶ Dike the spill to prevent spreading and to contain additions of decontaminating solution.
  - ▶ Prevent the material from entering drains.
  - ▶ Estimate spill pool volume or area.
  - ▶ Avoid contamination with water, alkalis and detergent solutions.
  - ▶ Material reacts with water and generates gas, pressurises containers with even drum rupture resulting.
  - ▶ **DO NOT reseal container if contamination is suspected.**
  - ▶ Open all containers with care.
- Moderate hazard.
- ▶ Clear area of personnel and move upwind.
  - ▶ Alert Fire Brigade and tell them location and nature of hazard.
  - ▶ Wear breathing apparatus plus protective gloves.
  - ▶ Prevent, by any means available, spillage from entering drains or water course.
  - ▶ No smoking, naked lights or ignition sources.
  - ▶ Increase ventilation.

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 allow clothing wet with material to stay in contact with skin</b></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 enter confined spaces until atmosphere has been checked.</b></li> <li>▶ Avoid smoking, naked lights or ignition sources.</li> <li>▶ Avoid contact with incompatible materials.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Other information</b> | <p>Consider storage under inert gas.</p> <p>for commercial quantities of isocyanates:</p> <ul style="list-style-type: none"> <li>- Isocyanates should be stored in adequately banded areas. Nothing else should be kept within the same bunding. Pre-polymers need not be segregated. Drums of isocyanates should be stored under cover, out of direct sunlight, protected from rain, protected from physical damage and well away from moisture, acids and alkalis.</li> <li>- Where isocyanates are stored at elevated temperatures to prevent solidifying, adequate controls should be installed to prevent the high temperatures and precautions against fire should be taken.</li> <li>- Where stored in tanks, the more reactive isocyanates should be blanketed with a non-reactive gas such as nitrogen and equipped with absorptive type breather valve (to prevent vapour emissions)..</li> <li>- Transfer systems for isocyanates in bulk storage should be fully enclosed and use pump or vacuum systems. <ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ No smoking, naked lights or ignition sources.</li> <li>▶ Store in a cool, dry, well-ventilated area.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> <li>▶ Protect containers against physical damage and check regularly for leaks.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> </ul> </li> </ul> |

### Conditions for safe storage, including any incompatibilities

|                                |                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Suitable container</b>      | ▶ Packaging as recommended by manufacturer.                                                                                                                                     |
| <b>Storage incompatibility</b> | <ul style="list-style-type: none"> <li>▶ Segregate from alcohol, water, amines</li> <li>▶ Avoid strong acids, bases.</li> <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                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------|-----------------------------------------|--------------------------------|------------|------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| New Zealand Workplace Exposure Standards (WES) | 4,4'-diphenylmethane diisocyanate (MDI) | Diphenylmethane diisocyanate   | 0.02 mg/m3 | 0.07 mg/m3 | Not Available | (dsen) - Dermal sensitiser (rsen) - Respiratory sensitiser (ifv) - The Inhalable Fraction and Vapour (ifv) notation is used when a material exerts sufficient vapour pressure such that it may be present in both particle and vapour phases, with each contributing to a significant portion of exposure |
| New Zealand Workplace Exposure Standards (WES) | 4,4'-diphenylmethane diisocyanate (MDI) | MDI                            | 0.02 mg/m3 | 0.07 mg/m3 | Not Available | (dsen) - Dermal sensitiser (rsen) - Respiratory sensitiser (ifv) - The Inhalable Fraction and Vapour (ifv) notation is used when a material exerts sufficient vapour pressure such that it may be present in both particle and vapour phases, with each contributing to a significant portion of exposure |
| New Zealand Workplace Exposure Standards (WES) | 4,4'-diphenylmethane diisocyanate (MDI) | Methylene bisphenyl isocyanate | 0.02 mg/m3 | 0.07 mg/m3 | Not Available | (dsen) - Dermal sensitiser (rsen) - Respiratory sensitiser (ifv) - The Inhalable Fraction and Vapour (ifv) notation is used when a material exerts sufficient                                                                                                                                             |

| Source | Ingredient | Material name | TWA | STEL | Peak | Notes                                                                                                                                       |
|--------|------------|---------------|-----|------|------|---------------------------------------------------------------------------------------------------------------------------------------------|
|        |            |               |     |      |      | vapour pressure such that it may be present in both particle and vapour phases, with each contributing to a significant portion of exposure |

**Emergency Limits**

| Ingredient                              | TEEL-1     | TEEL-2        | TEEL-3        |
|-----------------------------------------|------------|---------------|---------------|
| 4,4'-diphenylmethane diisocyanate (MDI) | 0.45 mg/m3 | Not Available | Not Available |
| 4,4'-diphenylmethane diisocyanate (MDI) | 29 mg/m3   | 40 mg/m3      | 240 mg/m3     |
| propylene carbonate                     | 34 mg/m3   | 370 mg/m3     | 2,200 mg/m3   |

| Ingredient                              | Original IDLH | Revised IDLH  |
|-----------------------------------------|---------------|---------------|
| MDI, propoxylated                       | Not Available | Not Available |
| 4,4'-diphenylmethane diisocyanate (MDI) | 75 mg/m3      | Not Available |
| MDI homopolymer                         | Not Available | Not Available |
| propylene carbonate                     | Not Available | Not Available |


**Occupational Exposure Banding**

| Ingredient          | Occupational Exposure Band Rating | Occupational Exposure Band Limit |
|---------------------|-----------------------------------|----------------------------------|
| MDI, propoxylated   | E                                 | ≤ 0.1 ppm                        |
| MDI homopolymer     | E                                 | ≤ 0.1 ppm                        |
| propylene carbonate | E                                 | ≤ 0.1 ppm                        |

**Notes:**

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.

**Exposure controls**

|                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Appropriate engineering controls</b>                                      | <ul style="list-style-type: none"> <li>▶ All processes in which isocyanates are used should be enclosed wherever possible.</li> <li>▶ Total enclosure, accompanied by good general ventilation, should be used to keep atmospheric concentrations below the relevant exposure standards.</li> <li>▶ If total enclosure of the process is not feasible, local exhaust ventilation may be necessary. Local exhaust ventilation is essential where lower molecular weight isocyanates (such as TDI or HDI) is used or where isocyanate or polyurethane is sprayed.</li> <li>▶ Where other isocyanates or pre-polymers are used and aerosol formation cannot occur, local exhaust ventilation may not be necessary if the atmospheric concentration can be kept below the relevant exposure standards.</li> <li>▶ Where local exhaust ventilation is installed, exhaust vapours should not be vented to the exterior in such a manner as to create a hazard.</li> </ul> <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. 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.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> |
| <b>Individual protection measures, such as personal protective equipment</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Eye and face protection</b>                                               | <ul style="list-style-type: none"> <li>▶ Safety glasses with side shields.</li> <li>▶ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent]</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.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Skin protection</b>                                                       | See Hand protection below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Hands/feet protection</b>                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Body protection</b>                                                       | See Other protection below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Other protection</b>                                                      | <p>All employees working with isocyanates must be informed of the hazards from exposure to the contaminant and the precautions necessary to prevent damage to their health. They should be made aware of the need to carry out their work so that as little contamination as possible is produced, and of the importance of the proper use of all safeguards against exposure to themselves and their fellow workers. Adequate training, both in the proper execution of the task and in the use of all associated engineering controls, as well as of any personal protective equipment, is essential.</p> <p>Employees exposed to contamination hazards should be educated in the need for, and proper use of, facilities, clothing and equipment and thereby maintain a high standard of personal cleanliness. Special attention should be given to ensuring that all personnel understand instructions, especially newly recruited employees and those with local-language difficulties, where they are known.</p> <ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ P.V.C apron.</li> <li>▶ Barrier cream.</li> <li>▶ Skin cleansing cream.</li> <li>▶ Eye wash unit.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Recommended material(s)

Respiratory protection

Continued...

**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:

F-160 PART A

| Material   | CPI |
|------------|-----|
| PE/EVAL/PE | A   |

\* 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.

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

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

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

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

^ - Full-face

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

- ▶ 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

For spraying or operations which might generate aerosols:

Full face respirator with supplied air.

- ▶ In certain circumstances, personal protection of the individual employee is necessary. Personal protective devices should be regarded as being supplementary to substitution and engineering control and should not be used in preference to them as they do nothing to eliminate the hazard.
- ▶ However, in some situations, minimising exposure to isocyanates by enclosure and ventilation is not possible, and occupational exposure standards may be exceeded, particularly during on-site mixing of paints, spray-painting, foaming and maintenance of machine and ventilation systems. In these situations, air-line respirators or self-contained breathing apparatus complying with the appropriate national standard must be used.
- ▶ **Organic vapour respirators with particulate pre- filters and powered, air-purifying respirators are NOT suitable.**
- ▶ Personal protective equipment must be appropriately selected, individually fitted and workers trained in their correct use and maintenance. Personal protective equipment must be regularly checked and maintained to ensure that the worker is being protected.
- ▶ Air- line respirators or self-contained breathing apparatus complying with the appropriate national standard should be used during the clean-up of spills and the repair or clean-up of contaminated equipment and similar situations which cause emergency exposures to hazardous atmospheric concentrations of isocyanate.

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

|                                                     |                                                                      |                                                |                |
|-----------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------|----------------|
| <b>Appearance</b>                                   | Pale yellow viscous liquid with mild musty odour; reacts with water. |                                                |                |
| <b>Physical state</b>                               | Liquid                                                               | <b>Relative density (Water = 1)</b>            | 1.1 @ 25C      |
| <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>          | >600           |
| <b>pH (as supplied)</b>                             | Not Applicable                                                       | <b>Decomposition temperature (°C)</b>          | >300           |
| <b>Melting point / freezing point (°C)</b>          | Not Available                                                        | <b>Viscosity (cSt)</b>                         | 1254.0 @25C    |
| <b>Initial boiling point and boiling range (°C)</b> | >300                                                                 | <b>Molecular weight (g/mol)</b>                | Not Applicable |
| <b>Flash point (°C)</b>                             | >110 (SCC)                                                           | <b>Taste</b>                                   | Not Available  |
| <b>Evaporation rate</b>                             | Not Available                                                        | <b>Explosive properties</b>                    | Not Available  |
| <b>Flammability</b>                                 | Not Applicable                                                       | <b>Oxidising properties</b>                    | Not Available  |
| <b>Upper Explosive Limit (%)</b>                    | Not Available                                                        | <b>Surface Tension (dyn/cm or mN/m)</b>        | Not Available  |
| <b>Lower Explosive Limit (%)</b>                    | Not Available                                                        | <b>Volatile Component (%vol)</b>               | Negligible     |
| <b>Vapour pressure (kPa)</b>                        | Not Available                                                        | <b>Gas group</b>                               | Not Available  |

|                                 |        |                              |               |
|---------------------------------|--------|------------------------------|---------------|
| <b>Solubility in water</b>      | Reacts | <b>pH as a solution (1%)</b> | Not Available |
| <b>Vapour density (Air = 1)</b> | 8.5    | <b>VOC g/L</b>               | Not Available |

## SECTION 10 Stability and reactivity

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

## SECTION 11 Toxicological information

### Information on toxicological effects

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Inhaled</b>      | <p>Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. The vapour/mist may be highly irritating to the upper respiratory tract and lungs; the response may be severe enough to produce bronchitis and pulmonary oedema. Possible neurological symptoms arising from isocyanate exposure include headache, insomnia, euphoria, ataxia, anxiety neurosis, depression and paranoia. Gastrointestinal disturbances are characterised by nausea and vomiting. Pulmonary sensitisation may produce asthmatic reactions ranging from minor breathing difficulties to severe allergic attacks; this may occur following a single acute exposure or may develop without warning for several hours after exposure. Sensitized people can react to very low doses, and should not be allowed to work in situations allowing exposure to this material. Continued exposure of sensitised persons may lead to possible long term respiratory impairment. Inhalation hazard is increased at higher temperatures.</p>                                                       |
| <b>Ingestion</b>    | Accidental ingestion of the material may be seriously damaging to the health of the individual; animal experiments indicate that ingestion of less than 40 gram may be fatal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Skin Contact</b> | <p>This material can cause inflammation of the skin on contact in some persons. The material may accentuate any pre-existing dermatitis condition. Skin contact with the material may damage the health of the individual; systemic effects may result following absorption. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Eye</b>          | This material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Moderate inflammation may be expected with redness; conjunctivitis may occur with prolonged exposure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Chronic</b>      | <p>There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment. Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population. Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population. Harmful: danger of serious damage to health by prolonged exposure through inhalation. This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Isocyanate vapours are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs. Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia.</p> |

|                                                |                                                    |                                                                                                                              |
|------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>F-160 PART A</b>                            | <b>TOXICITY</b>                                    | <b>IRRITATION</b>                                                                                                            |
|                                                | Not Available                                      | Not Available                                                                                                                |
| <b>MDI, propoxylated</b>                       | <b>TOXICITY</b>                                    | <b>IRRITATION</b>                                                                                                            |
|                                                | Not Available                                      | Not Available                                                                                                                |
| <b>4,4'-diphenylmethane diisocyanate (MDI)</b> | <b>TOXICITY</b>                                    | <b>IRRITATION</b>                                                                                                            |
|                                                | Dermal (rabbit) LD50: >6200 mg/kg <sup>[2]</sup>   | Eye: no adverse effect observed (not irritating) <sup>[1]</sup>                                                              |
|                                                | Inhalation (Rat) LC50: 0.368 mg/L4h <sup>[1]</sup> | Skin (rabbit): 500 mg /24 hours Dermal Sensitiser *Respiratory Sensitiser (g.pig) [* = Bayer CCINFO 2133615]                 |
| <b>MDI homopolymer</b>                         | <b>TOXICITY</b>                                    | <b>IRRITATION</b>                                                                                                            |
|                                                | Oral (Mouse) LD50; 2200 mg/kg <sup>[2]</sup>       | Skin: adverse effect observed (irritating) <sup>[1]</sup>                                                                    |
|                                                | Oral (Rat) LD50: >5000 mg/kg <sup>[1]</sup>        | Eye: no adverse effect observed (not irritating) <sup>[1]</sup><br>Skin: adverse effect observed (irritating) <sup>[1]</sup> |
| <b>propylene carbonate</b>                     | <b>TOXICITY</b>                                    | <b>IRRITATION</b>                                                                                                            |
|                                                | Dermal (rabbit) LD50: >=2000 mg/kg <sup>[1]</sup>  | Eye (rabbit): 60 mg - moderate                                                                                               |
|                                                | Oral (Rat) LD50: >5000 mg/kg <sup>[2]</sup>        | Eye: adverse effect observed (irritating) <sup>[1]</sup><br>Skin (human): 100 mg/3d-I moderate                               |



|                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                  |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Skin (rabbit): 500 mg moderate                                   |
|                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Skin: no adverse effect observed (not irritating) <sup>[1]</sup> |
| <b>Legend:</b>                                                                               | 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                  |
| <b>MDI, PROPOXYLATED</b>                                                                     | No significant acute toxicological data identified in literature search. Polyethers (such as ethoxylated surfactants and polyethylene glycols) are highly susceptible to being oxidized in the air. They then form complex mixtures of oxidation products. Animal testing reveals that whole the pure, non-oxidised surfactant is non-sensitizing, many of the oxidation products are sensitizers. The oxidation products also cause irritation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                  |
| <b>4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI)</b>                                               | Inhalation (human) TClO: 0.13 ppm/30 mins Eye (rabbit): 0.10 mg moderate<br>Aromatic and aliphatic diisocyanates may cause airway toxicity and skin sensitization. Monomers and prepolymers exhibit similar respiratory effect. Of the several members of diisocyanates tested on experimental animals by inhalation and oral exposure, some caused cancer while others produced a harmless outcome. This group of compounds has therefore been classified as cancer-causing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                  |
| <b>MDI HOMOPOLYMER</b>                                                                       | as polymethylene polyphenyl isocyanate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                  |
| <b>PROPYLENE CARBONATE</b>                                                                   | <b>WARNING:</b> This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.<br>The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.<br>for propylene carbonate:<br>Numerous adequate and reliable acute toxicity tests are available on propylene carbonate. Oral and dermal tests meet OECD and EPA test guidelines. Propylene carbonate is practically nontoxic following acute exposures; the oral LD50 is >.5000 mg/kg and the dermal LD50 is >3000 mg/kg. No further testing is recommended.<br>Subchronic studies (13- 14 weeks) of propylene carbonate by inhalation (aerosol) and oral (gavage) routes were conducted in rats according to current guidelines. The oral study indicated low systemic toxicity from propylene carbonate (NOAEL = 5000 mg/kg/day). In the inhalation study, no systemic toxicity was seen at concentrations up to 1000 mg/m <sup>3</sup> ; however, there was periocular irritation and swelling in a few males at 500 and 1000 mg/m <sup>3</sup> . A dermal carcinogenicity study in mice did not indicate tumorigenic potential or systemic toxicity from 2 years of exposure to propylene carbonate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                  |
| <b>MDI, PROPOXYLATED &amp; 4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI) &amp; MDI HOMOPOLYMER</b> | The following information refers to contact allergens as a group and may not be specific to this product.<br>Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.<br>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.<br>Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins.<br>Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema.<br>Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure.<br>Isocyanate vapours are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs. Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia. |                                                                  |
| <b>4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI) &amp; MDI HOMOPOLYMER</b>                         | The substance is classified by IARC as Group 3:<br><b>NOT</b> classifiable as to its carcinogenicity to humans.<br>Evidence of carcinogenicity may be inadequate or limited in animal testing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                  |
| <b>4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI) &amp; PROPYLENE CARBONATE</b>                     | The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                  |
| <b>Acute Toxicity</b>                                                                        | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Carcinogenicity</b> ✓                                         |
| <b>Skin Irritation/Corrosion</b>                                                             | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Reproductivity</b> ✗                                          |
| <b>Serious Eye Damage/Irritation</b>                                                         | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>STOT - Single Exposure</b> ✓                                  |
| <b>Respiratory or Skin sensitisation</b>                                                     | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>STOT - Repeated Exposure</b> ✓                                |
| <b>Mutagenicity</b>                                                                          | ✗                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Aspiration Hazard</b> ✗                                       |
|                                                                                              | <b>Legend:</b> ✗ – Data either not available or does not fill the criteria for classification<br>✓ – Data available to make classification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                  |

## SECTION 12 Ecological information

## Toxicity

|                     | Endpoint      | Test Duration (hr) | Species       | Value         | Source        |
|---------------------|---------------|--------------------|---------------|---------------|---------------|
| <b>F-160 PART A</b> | Not Available | Not Available      | Not Available | Not Available | Not Available |



| MDI, propoxylated | Endpoint      | Test Duration (hr) | Species       | Value         | Source        |
|-------------------|---------------|--------------------|---------------|---------------|---------------|
|                   | Not Available | Not Available      | Not Available | Not Available | Not Available |

| 4,4'-diphenylmethane diisocyanate (MDI) | Endpoint  | Test Duration (hr) | Species   | Value            | Source        |
|-----------------------------------------|-----------|--------------------|-----------|------------------|---------------|
|                                         | LC50      | 96h                | Fish      | 95.24-134.37mg/l | Not Available |
|                                         | BCF       | 672h               | Fish      | 61-150           | 7             |
|                                         | EC50      | 48h                | Crustacea | >100mg/l         | 2             |
|                                         | NOEC(ECx) | 504h               | Crustacea | >=10mg/l         | 2             |

| MDI homopolymer | Endpoint  | Test Duration (hr) | Species   | Value    | Source |
|-----------------|-----------|--------------------|-----------|----------|--------|
|                 | NOEC(ECx) | 504h               | Crustacea | >=10mg/l | 2      |

| propylene carbonate | Endpoint  | Test Duration (hr) | Species                       | Value     | Source |
|---------------------|-----------|--------------------|-------------------------------|-----------|--------|
|                     | LC50      | 96h                | Fish                          | 1000mg/l  | 1      |
|                     | EC50      | 72h                | Algae or other aquatic plants | >900mg/l  | 1      |
|                     | EC50      | 48h                | Crustacea                     | >1000mg/l | 1      |
|                     | NOEC(ECx) | 72h                | Algae or other aquatic plants | 900mg/l   | 1      |

**Legend:** *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*

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

#### Persistence and degradability

| Ingredient                              | Persistence: Water/Soil  | Persistence: Air            |
|-----------------------------------------|--------------------------|-----------------------------|
| 4,4'-diphenylmethane diisocyanate (MDI) | LOW (Half-life = 1 days) | LOW (Half-life = 0.24 days) |
| propylene carbonate                     | HIGH                     | HIGH                        |

#### Bioaccumulative potential

| Ingredient                              | Bioaccumulation      |
|-----------------------------------------|----------------------|
| 4,4'-diphenylmethane diisocyanate (MDI) | LOW (BCF = 15)       |
| propylene carbonate                     | LOW (LogKOW = -0.41) |

#### Mobility in soil

| Ingredient                              | Mobility           |
|-----------------------------------------|--------------------|
| 4,4'-diphenylmethane diisocyanate (MDI) | LOW (KOC = 376200) |
| propylene carbonate                     | LOW (KOC = 14.85)  |

## SECTION 13 Disposal considerations

#### Waste treatment methods

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product / Packaging disposal</b> | <ul style="list-style-type: none"> <li>▶ Containers may still present a chemical hazard/ danger when empty.</li> <li>▶ Return to supplier for reuse/ recycling if possible.</li> <li>Otherwise: <ul style="list-style-type: none"> <li>▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.</li> <li>▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product.</li> <li>▶ <b>DO NOT</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>▶ <b>DO NOT</b> recycle spilled material.</li> <li>▶ Consult State Land Waste Management Authority for disposal.</li> <li>▶ Neutralise spill material carefully and decontaminate empty containers and spill residues with 10% ammonia solution plus detergent or a proprietary decontaminant prior to disposal.</li> <li>▶ <b>DO NOT</b> seal or stopper drums being decontaminated as CO<sub>2</sub> gas is generated and may pressurise containers.</li> <li>▶ Puncture containers to prevent re-use.</li> <li>▶ Bury or incinerate residues at an approved site.</li> </ul> </li> </ul> |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Ensure that the hazardous substance is disposed in accordance with the Hazardous Substances (Disposal) Notice 2017

#### Disposal Requirements

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

Continued...

The hazardous substance must only be disposed if it has been treated by a method that changed the characteristics or composition of the substance and it is no longer hazardous. Only dispose to the environment if a tolerable exposure limit has been set for the substance.  
Only deposit the hazardous substance into or onto a landfill or sewage facility or incinerator, where the hazardous substance can be handled and treated appropriately.

## SECTION 14 Transport information

### Labels Required

|                  |                |
|------------------|----------------|
| Marine Pollutant | NO             |
| HAZCHEM          | Not Applicable |

Land transport (UN): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

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         |
|-----------------------------------------|---------------|
| MDI, propoxylated                       | Not Available |
| 4,4'-diphenylmethane diisocyanate (MDI) | Not Available |
| MDI homopolymer                         | Not Available |
| propylene carbonate                     | Not Available |

Transport in bulk in accordance with the IGC Code

| Product name                            | Ship Type     |
|-----------------------------------------|---------------|
| MDI, propoxylated                       | Not Available |
| 4,4'-diphenylmethane diisocyanate (MDI) | Not Available |
| MDI homopolymer                         | Not Available |
| propylene carbonate                     | Not Available |

## SECTION 15 Regulatory information

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

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

| HSR Number | Group Standard                                                                    |
|------------|-----------------------------------------------------------------------------------|
| HSR002625  | N.O.S. Acutely Toxic Carcinogenic Group Standard 2020                             |
| HSR100425  | Pharmaceutical Active Ingredients Group Standard 2020                             |
| HSR100757  | Veterinary Medicines Limited Pack Size Finished Dose Group Standard 2020          |
| HSR100758  | Veterinary Medicines Non dispersive Closed System Application Group Standard 2020 |

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

#### MDI, propoxylated is found on the following regulatory lists

New Zealand Inventory of Chemicals (NZIoC)

#### 4,4'-diphenylmethane diisocyanate (MDI) is found on the following regulatory lists

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

New Zealand Approved Hazardous Substances with controls

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

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

New Zealand Inventory of Chemicals (NZIoC)

New Zealand Workplace Exposure Standards (WES)

#### MDI homopolymer is found on the following regulatory lists

New Zealand Inventory of Chemicals (NZIoC)

#### propylene carbonate is found on the following regulatory lists

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

New Zealand Inventory of Chemicals (NZIoC)

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

### Hazardous Substance Location

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

| Hazard Class | Quantity (Compliance Certificate) | Quantity (Compliance Certificate - Farms >4 ha) |
|--------------|-----------------------------------|-------------------------------------------------|
| 6.1B         | 250 kg or 250 L                   | 500 kg or 500 L                                 |

**Certified Handler**

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

| Class of substance | Quantities   |
|--------------------|--------------|
| 6.1B               | Any quantity |

Refer Group Standards for further information

**Maximum quantities of certain hazardous substances permitted on passenger service vehicles**

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

| Hazard Class | Gas (aggregate water capacity in mL) | Liquid (L) | Solid (kg) | Maximum quantity per package for each classification |
|--------------|--------------------------------------|------------|------------|------------------------------------------------------|
| 6.1B         | 120                                  | 0,1        | 0,5        |                                                      |
| 6.5A or 6.5B | 120                                  | 1          | 3          |                                                      |

**Tracking Requirements**

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

- Refer to the regulation for more information

**National Inventory Status**

| National Inventory                               | Status                                                                                                                                                                                            |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Australia - AIIIC / Australia Non-Industrial Use | Yes                                                                                                                                                                                               |
| Canada - DSL                                     | Yes                                                                                                                                                                                               |
| Canada - NDSL                                    | No (MDI, propoxylated; 4,4'-diphenylmethane diisocyanate (MDI); MDI homopolymer; propylene carbonate)                                                                                             |
| China - IECSC                                    | Yes                                                                                                                                                                                               |
| Europe - EINEC / ELINCS / NLP                    | Yes                                                                                                                                                                                               |
| Japan - ENCS                                     | No (MDI, propoxylated)                                                                                                                                                                            |
| Korea - KECI                                     | Yes                                                                                                                                                                                               |
| New Zealand - NZIoC                              | Yes                                                                                                                                                                                               |
| Philippines - PICCS                              | Yes                                                                                                                                                                                               |
| USA - TSCA                                       | Yes                                                                                                                                                                                               |
| Taiwan - TCSI                                    | Yes                                                                                                                                                                                               |
| Mexico - INSQ                                    | No (MDI, propoxylated; MDI homopolymer)                                                                                                                                                           |
| Vietnam - NCI                                    | Yes                                                                                                                                                                                               |
| Russia - FBEPH                                   | No (MDI, propoxylated)                                                                                                                                                                            |
| <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**

|                      |            |
|----------------------|------------|
| <b>Revision Date</b> | 19/03/2023 |
| <b>Initial Date</b>  | 03/03/2017 |

**SDS Version Summary**

| Version | Date of Update | Sections Updated                                                                                                                                                                                                                                                                                |
|---------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.1     | 23/12/2022     | Classification review due to GHS Revision change.                                                                                                                                                                                                                                               |
| 8.1     | 19/03/2023     | Hazards identification - Classification, Composition / information on ingredients - Ingredients, Identification of the substance / mixture and of the company / undertaking - Supplier Information, Identification of the substance / mixture and of the company / undertaking - Synonyms, Name |

**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  
AII: Australian Inventory of Industrial Chemicals  
DSL: Domestic Substances List  
NDSL: Non-Domestic Substances List  
IECSC: Inventory of Existing Chemical Substance in China  
EINECS: European INventory of Existing Commercial chemical Substances  
ELINCS: European List of Notified Chemical Substances  
NLP: No-Longer Polymers  
ENCS: Existing and New Chemical Substances Inventory  
KECI: Korea Existing Chemicals Inventory  
NZIoC: New Zealand Inventory of Chemicals  
PICCS: Philippine Inventory of Chemicals and Chemical Substances  
TSCA: Toxic Substances Control Act  
TCSI: Taiwan Chemical Substance Inventory  
INSQ: Inventario Nacional de Sustancias Químicas  
NCI: National Chemical Inventory  
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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